United States Department of Agriculture

Draft Environmental Impact Statement

Volume 3: Forest Plan Amendments to incorporate relevant direction from the Northern Continental Divide Ecosystem Draft Grizzly Bear Conservation Strategy

Helena National Forest
Kootenai National Forest
Lewis and Clark National Forest
Lolo National Forest

Forest Service **May 2016**

"…the greatest good for the greatest number in the long run." –Gifford Pinchot, 1st Chief of the Forest Service, 1905

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Volume 3: Draft Environmental Impact Statement for the Forest Plan Amendments to incorporate relevant direction from the Northern Continental Divide Ecosystem Draft Grizzly Bear Conservation Strategy

Lead Agency:	**USDA Forest Service**
Responsible Officials:	William Avey, Forest Supervisor Helena and Lewis and Clark National Forests 2880 Skyway Drive Helena, MT 59602, 406-449-5201
	Christopher S. Savage, Forest Supervisor Kootenai National Forest 31374 U.S. Highway 2 Libby, MT 59923-3022, 406-293-6211
	Timothy Garcia, Forest Supervisor Lolo National Forest 24 Fort Missoula Road Missoula MT 59803, 406-329-3750
For Information Contact:	Joe Krueger, Forest Plan Revision Planning Team Lead 650 Wolfpack Way Kalispell, MT 59901, 406-758-5243

Abstract: This volume of the draft environmental impact statement (DEIS) documents analysis of three alternatives developed for the forest plan amendment to incorporate relevant direction from the Northern Continental Divide Ecosystem Draft Grizzly Bear Conservation Strategy into the Helena, Kootenai, Lewis and Clark, and Lolo National Forest Plans.

Comments on this draft environmental impact statement must be received or postmarked within 120 days of the Environmental Protection Agency's publication of the Notice of Availability in the Federal Register. Please send comments to: Flathead National Forest Supervisor's Office, Attn: Forest Plan Revision, 650 Wolfpack Way, Kalispell, Montana 59901. Electronic comments may be sent to http://www.fs.usda.gov/project/?project=46286. It is important that reviewers provide their comments at such times and in such a way that they are useful to the Agency's preparation of the final environmental impact statement. Therefore, comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions. Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered; however, anonymous comments will not provide the respondent with standing to participate in subsequent administrative or judicial reviews.

The decision to approve the revised forest plan for the Flathead National Forest and the amendment for the Helena, Lewis and Clark, Kootenai, and Lolo National Forests will be subject to the objection process identified in 36 CFR Part 219 Subpart B (219.50 to 219.62). Only those individuals and entities who have submitted substantive formal comments related to the Flathead NF plan revision and the four amendments during the opportunities provided for public comment (beginning with this comment period), will be eligible to file an objection (36 Code of Federal Regulations (CFR) 219.53(a)).

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NOTE: The figures listed below are found in the text of the document. When figures are referenced that are preceded by 1, e.g. figure 1-01, it is within appendix 1 of this draft EIS, and if preceded by B, e.g. B-01, it is in appendix B of the forest plan. Most of the figures in appendix 1 and appendix B are on the cd that accompanies this draft EIS. Figures 6-02 thru 6-05 in appendix 6 of this volume show the areas on the forests covered by the amendments.

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List of Abbreviations in DEIS

Abbreviation	Spelled out
CFR	Code of Federal Regulations
d.b.h.	diameter at breast height
DC	desired condition (forest plan component)
DCA	demographic connectivity area
FW	forestwide (forest plan component)
GA	geographic area
GBCS	Grizzly Bear Conservation Strategy
GDL	guideline (forest plan component)
GIS	geographic information system
INFISH	Inland Native Fish Strategy
MA	management area
mi	mile
mmbf	million board feet
mmcf	million cubic feet
NCDE	Northern Continental Divide Ecosystem
NFS	National Forest System
NRLMD	Northern Rockies Lynx Management Direction
PCA	primary conservation area
RMZ	riparian management zone
STD	standard (forest plan component)
TMDL	total maximum daily load
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

Summary of Volume 3

Proposed Action

The Forest Service proposes to amend the forest plans of the Helena, Kootenai, Lewis and Clark, and Lolo National Forests (also referred to as “amendment forests”) to incorporate relevant direction from the draft Northern Continental Divide Ecosystem (NCDE) Grizzly Bear Conservation Strategy. The Flathead National Forest is concurrently proposing to incorporate the relevant portions of the draft NCDE grizzly bear conservation strategy as part of its plan revision process. Refer to volumes 1 and 2 of the draft environmental impact statement for the information about the revision. The area affected by the amendment (primary conservation area, zone 1, including two demographic connectivity areas, and zone 2) includes about 5.1 million acres of National Forest System lands (figure 1-56).

Purpose and Need

Under the Endangered Species Act of 1973, federal agencies are directed to use their authorities to seek to conserve endangered and threatened species. The forest plans for the amendment forests contain management direction related to grizzly bear habitat that supports recovery of the threatened grizzly bear. In 2013, the U.S. Fish and Wildlife Service announced the availability of the draft NCDE grizzly bear conservation strategy. When finalized, the grizzly bear conservation strategy would become the post-delisting management plan for the NCDE grizzly bear population and its habitat. By incorporating the relevant habitat-related direction from the draft NCDE grizzly bear conservation strategy into the forest plans, the Forest Service will demonstrate to the U.S. Fish and Wildlife Service that adequate regulatory mechanisms exist on national forests within the NCDE to support delisting this grizzly population.

Public Involvement

The Notice of Intent to prepare an environmental impact statement was published in the Federal Register on March 6, 2015. The Notice of Intent asked for public comment on the proposal for a 60-day period (until May 5, 2015). The comment period was subsequently extended by 10 days (until May 15, 2015). As part of the public involvement process, the agency held seven open houses to provide opportunities to better understand the proposed action, so that meaningful public comments could be provided by the end of the scoping period.

Issue Identification

The planning team and responsible officials considered all of the comments received during the scoping period and identified the issues associated with the comments.

Pertaining to the proposed amendment, the Forest Service identified two issues during scoping that would drive alternative development:

- Grizzly bear habitat
- Access and recreation.

Alternatives

The Forest Service developed three alternatives that were considered in detail. Under alternative 1, the no-action alternative, no forest plan amendments or revision would occur. Alternative 2, the modified proposed action, would incorporate those elements of the draft NCDE grizzly bear conservation strategy that are relevant to management of National Forest System lands into the Flathead National Forest's revised forest plan, and into amendments of the current forest plans for the Helena, Kootenai, Lewis and Clark, and Lolo National Forests. Alternative 3 was developed in response to issues identified during public scoping.

Chapter 6 of this draft environmental impact statement presents a detailed description of the effects of the alternatives. Refer to appendices 6 and 7 for a detailed presentation of the modified proposed action and a comparison of the alternatives.

Chapter 4. Purpose and Need for Action—Forest Plan Amendments

4.1 Introduction

The Forest Service is amending the land management plans (forest plans) of the Helena, Kootenai, Lewis and Clark, and Lolo National Forests (also referred to as "amendment forests") to incorporate habitat-related plan components of the Northern Continental Divide Ecosystem (NCDE) draft Grizzly Bear Conservation Strategy. The Flathead National Forest, which also lies within the NCDE, is concurrently proposing to incorporate the relevant plan components of the draft NCDE grizzly bear conservation strategy as part of its forest plan revision (presented in volumes 1 and 2 of this draft environmental impact statement).

4.1.1 History of grizzly bear habitat conservation efforts

In 1975, the U.S. Fish and Wildlife Service (USFWS) listed the grizzly bear as a threatened species in the lower 48 states, giving the species federal protection under the Endangered Species Act of 1973, as amended. Since its listing, government agencies have worked together to improve management coordination and habitat conditions, minimize grizzly bear-human conflicts and bear mortality, and increase public awareness and appreciation for the grizzly bear.

4.1.2 Grizzly Bear Recovery Plan

The Grizzly Bear Recovery Plan (also known as the "recovery plan") (USFWS 1993) outlines actions necessary for the conservation and recovery of the grizzly bear in the contiguous United States. The recovery plan provides guidance and recommendations applicable to each of four identified recovery zones (Northern Continental Divide, Greater Yellowstone, Cabinet-Yaak and Selkirks) and three evaluation areas (Bitterroot, North Cascades, and San Juan) (see figure 1-56).

The NCDE as described on page 10 of the recovery plan is an area of about 5.7 million acres in size, located in the northwestern portion of the state of Montana. The NCDE is contiguous to Canadian grizzly bear populations and habitat. The NCDE includes parts of five proclaimed national forests (Flathead, Helena, Kootenai, Lewis and Clark, and Lolo), Glacier National Park, Bureau of Land Management lands, parts of the Flathead and Blackfeet Indian Reservations, and state and private lands. National Forest System (NFS) lands encompass more than 60 percent of the NCDE (table 1).

The recovery plan calls for dividing each recovery zone into bear management units. In the NCDE, 23 bear management units (figure 1-57) were delineated to identify contiguous complexes of habitat capable of meeting the year-round needs of grizzly bears, to address unique habitat characteristics and grizzly bear activity and use patterns, and to assess the effects of existing and proposed land uses and activities on grizzly bears. The recovery plan relies on bear management units to track population status, assess habitat conditions, and assure that grizzly bears and their habitats are well distributed.

The recovery goal for the NCDE recovery zone, as stated on page 33 of the recovery plan (USFWS 1993), is to sustain: "10 females with cubs inside Glacier National Park and 12 females with cubs outside the park over a running 6-year average both inside the recovery zone and within a 10 mile area surrounding the recovery zone, excluding Canada; 21 of 23 bear management units occupied by females with young from a running 6-year sum of verified sightings and evidence, with no two

adjacent bear management units unoccupied; and known human-caused mortality not to exceed 4 percent of the population estimate based on the most recent 3-year sum of females with cubs. Furthermore, no more than 30 percent of this 4 percent mortality limit shall be females. These mortality limits cannot be exceeded during any consecutive 2 years for recovery to be achieved. Furthermore, recovery cannot be achieved without occupancy in the Mission Mountains portion of this ecosystem."

Table 1. Land ownership within the NCDE recovery zone

Ownership	Acres[1]	Subtotal Acres[1]	Percent of NCDE
US Forest Service		3,485,417	60.9
Flathead National Forest	2,136,536	–	–
Helena National Forest	183,758	–	–
Kootenai National Forest	118,770	–	–
Lewis and Clark National Forest	777,963	–	–
Lolo National Forest	268,390	–	–
Glacier National Park		987,755	17.3
Other Federal Lands[2]		22,973	0.4
Blackfeet Indian Reservation		254,731	4.5
Tribally managed lands[3]	111,094	–	–
Individual allotments[4]	142,730	–	–
Other government	907	–	–
Flathead Indian Reservation Confederated Salish & Kootenai Tribes		144,897	2.5
Tribally managed lands[3]	143,750	–	–
Individual allotments[4]	1,146	–	–
Montana Dept. of Natural Resources Conservation		204,413	3.6
Montana Fish, Wildlife & Parks		36,506	0.6
Total Private Lands		525,860	9.2
Private land on Blackfeet Reservation	82,036	–	–
Private land on Flathead Reservation	4,219	–	–
All other private lands	439,605	–	–
Water		55,311	1.0
Total	–	5,717,863	–

1 Acres are based on geographic information system data from several federal and state sources, dated 1 July 2012, at the 1:100,000 scale. Where these layers were not in agreement, efforts were made to identify the correct owner but there may still be some discrepancies.

2 Includes lands managed by Bureau of Land Management (20,691 acres), Bureau of Reclamation (85 acres), and the USFWS (2,197 acres).

3 Tribal lands managed by the respective Tribes through coordination with the Bureau of Indian Affairs and Council-approved management plans.

4 Allotted lands managed by individual Tribal members through coordination with the Bureau of Indian Affairs.

4.1.3 Development of the Draft NCDE Grizzly Bear Conservation Strategy

An approved recovery plan outlines the management actions that will be needed to achieve recovery of a species that is protected under the Endangered Species Act. In preparation for de-listing, a

conservation strategy often is developed to assure that appropriate protections will be in place to maintain the recovered population into the future. The Grizzly Bear Recovery Plan (USFWS 1993) specifically called for development of a conservation strategy, so that continuity and consistency of management would be provided following de-listing.

The initial steps towards development of the NCDE grizzly bear conservation strategy (also referred to as "conservation strategy") began in 1993. Representatives of Montana Fish, Wildlife and Parks, the Montana Department of Natural Resources and Conservation, the Blackfeet Nation, the Confederated Salish and Kootenai Tribes, Glacier National Park, the U.S. Forest Service, the U.S. Fish and Wildlife Service, U.S. Geological Survey, and the Bureau of Land Management were appointed as members of the Interagency Conservation Strategy Team. Their goal was to describe the management and monitoring programs that would maintain a recovered grizzly bear population in the NCDE.

In May 2013, a draft conservation strategy for the NCDE was released to the public for review and comment (Federal Register vol. 78, no. 86, p. 26064, May 2, 2013). The draft conservation strategy was designed by the Interagency Conservation Strategy Team to:

- Describe and summarize the coordinated strategies, standards and guidelines to manage the grizzly bear population, grizzly bear-human conflicts, and grizzly bear habitat, such that continued conservation of the grizzly bear population in the NCDE will be assured.
- Document the regulatory mechanisms, legal authorities, policies, management documents, and monitoring programs that are needed to maintain the recovered grizzly bear population.
- Document the commitments agreed to by the participating agencies.

When finalized, the conservation strategy will not change the legal status of grizzly bears in the NCDE. The intent is to support delisting from the Endangered Species Act by demonstrating the agencies' ongoing commitment to conserve the species.

4.1.4 Ongoing grizzly bear conservation actions by the Forest Service

Over the years, the Forest Service has undertaken substantial actions both inside and outside the NCDE recovery zone to maintain or improve grizzly bear habitat and to reduce grizzly bear-human conflicts on the national forests. These actions will continue under all of the alternatives. Following are examples of some of those conservation actions.

Issuance of food and attractant storage orders and regulations

Food storage orders require that food, garbage and other attractants are stored properly so that grizzly bears cannot obtain access to them. This prevents food-conditioning of bears, which usually leads to grizzly bear-human conflicts, injuries or fatalities. Food storage orders have been issued and implemented in the NCDE since the mid to late 1980s. In 2010, the Flathead, Helena, Lewis and Clark, and Lolo National Forests jointly issued a food storage order that covered the portions of the forests that are within the NCDE recovery zone. Over time, as more grizzly bears were observed outside the recovery zone, food storage orders have been extended to other portions of the forests to prevent or minimize grizzly bear-human conflicts. The Kootenai National Forest implemented a forestwide food storage order in 2011, which covers portions of both the NCDE and Cabinet-Yaak recovery zones. In addition, the Forest Service has coordinated with communities, counties, and organizations on implementation of local ordinances regarding food and garbage storage on lands adjacent to the national forests.

Bear-resistant containers and facilities

Bear-resistant containers and facilities include bear-resistant food storage boxes and panniers, garbage containers, meat hanging poles, etc. National Forests within the NCDE have provided bear-resistant facilities at campgrounds, trailheads, dispersed campsites, and other areas both within and, in some cases, outside of the recovery zone. Some National Forests have programs to loan or rent bear-resistant containers for short-term uses. The Forest Service has fenced or closed garbage dumps, in coordination with local communities, to further reduce conflicts with grizzly bears.

Information and education

A variety of information and education materials (e.g., pamphlets, brochures, signs, videos, etc.) and programs are provided to the public at Forest Service offices. Signs and brochures about proper behavior and safety procedures in bear country are placed at campgrounds, trailheads, dispersed recreation sites, picnic areas, etc. The Forest Service has cooperated with Montana Fish, Wildlife and Parks and other cooperating institutions and individuals in giving presentations and offering workshops that address bear identification; safe camping, hiking, hunting, and working procedures to use in bear habitat; the use of electric fencing to reduce conflicts between bears and livestock (e.g., chickens, pigs, beehives, sheep, cattle); and the proper use of bear-deterrent pepper spray. Wilderness rangers and other backcountry patrols have been used to inform and educate the public on food storage orders and to check on compliance with these orders. Field patrols have been used during hunting seasons to reduce hunter-caused conflicts and grizzly bear mortalities.

Special grizzly bear requirements in contracts and permits

Many contracts and special use permits in the NCDE contain provisions requiring protection of the grizzly bear and its habitat, as well as proper storage of food and attractants. Some contract and permit provisions require temporary or permanent cessation of permitted activities to resolve grizzly bear-human conflicts. Timber sale prescriptions and contracts incorporate provisions to protect grizzly bear habitat. For example, silvicultural prescriptions are designed to maintain or enhance food sources, timing provisions are aimed at reducing the potential for grizzly bear-human conflicts, and specific contract provisions require proper food storage and temporary or permanent cessation of permitted activities to resolve grizzly bear-human conflicts.

Livestock grazing

Existing livestock grazing permits may include special provisions such as proper storage of food and attractants as well as carcass removal. Annual monitoring of livestock allotments is performed to check on compliance and assess any conflicts. Disposal of animal carcasses has been emphasized to reduce conflicts with grizzly bears.

Land adjustments

Important grizzly bear habitat has been acquired through land exchanges and acquisitions on the NCDE national forests. The cooperative “Legacy Land” acquisition of Plum Creek Timber Company lands by the Nature Conservancy, Flathead National Forest, and Lolo National Forest is a landmark example, to name just one.

Motorized route monitoring

During recent decades, motorized routes have been restricted in some areas in order to provide security for grizzly bears and other wildlife. Annual monitoring is performed to evaluate compliance with access restrictions and to provide information and education to the public. Monitoring also helps to identify when repairs are needed to keep road closures effective.

4.1.5 Relationship between Endangered Species Act listing, the conservation strategy and the forest plans

The grizzly bear population in the NCDE is currently listed as a threatened species under the Endangered Species Act. Federal agencies are directed to use their authorities to seek to conserve endangered species and threatened species. The NCDE grizzly bear population has been increasing in numbers and distribution over the past decade (Mace and Roberts 2011) and all recovery criteria have been met. Habitat conditions and management on the national forests have contributed importantly to the improved status of the grizzly bear.

The USFWS completed a 5-year status review of the grizzly bear in 2011. Part of the status review involved an assessment of the adequacy of regulatory mechanisms, which was one of the factors that led to the listing of the grizzly bear as a threatened species. The USFWS concluded that the existing regulatory mechanisms in the lower 48 States were incomplete. With regard to National Forest System lands, regulatory mechanisms were found lacking or incomplete with respect to incorporating motorized access direction into the forest plans, and portions of some national forests lacked food storage orders, which will become increasingly important to grizzly bear conservation as grizzly bear and human populations both expand.

The grizzly bear recovery plan acknowledges that maintenance of a healthy, recovered grizzly bear population will depend on effective, coordinated management. The draft NCDE grizzly bear conservation strategy provides up-to-date scientific information and a comprehensive set of management recommendations that would sustain the grizzly bear population in the NCDE. Each of the signatories to the conservation strategy will contribute and cooperate as appropriate to its mission and jurisdiction.

One of the ways in which the Forest Service provides guidance for the conservation of federally-listed species and their habitats is through the forest plans. This can be a particularly effective approach for wide-ranging species such as the grizzly bear. Updating the forest plans with the habitat-related elements in the conservation strategy that are relevant to management of National Forest System lands would provide a consistent set of management direction across the national forests in the NCDE.

4.2 Proposed Action

To develop a proposed action that makes changes to a forest plan, the management direction in the current plan, including its amendments, is first reviewed. Effective management direction from the current plan may be retained, or it may be modified or augmented by incorporating relevant new scientific information or direction from other regulatory documents. This section provides an overview of how the need for change was identified and addressed during the development of the proposed action.

Under the Endangered Species Act of 1973, federal agencies are directed to use their authorities to seek to conserve endangered and threatened species. The existing forest plans (Helena, approved by the Regional Forester in 1986; Kootenai, approved by the Regional Forester in 2015; Lewis and Clark, approved by the Regional Forester in 1986; and Lolo, approved by the Regional Forester in 1986) each contain management direction related to grizzly bear habitat that is intended to support recovery of the threatened grizzly bear (reproduced in appendix 6). The forest plans are consistent in referencing the Interagency Grizzly Bear Guidelines (1986). Some forests have subsequently incorporated additional forest plan components or have completed Endangered Species Act section 7

consultations that modified the implementation of the forest plan. As a result, current forest plan direction regarding management of grizzly bear habitat varies between the forests.

The grizzly bear population in the NCDE has now met or exceeded recovery goals. Habitat conditions and management actions on the national forests have contributed importantly to the increased population size and improved status of the grizzly bear across the NCDE. But, supporting a healthy, recovered grizzly population will depend on the Forest Service's continued, effective management of the NCDE grizzly bear's habitat.

In 2013, the USFWS announced the availability of a draft grizzly bear conservation strategy for the NCDE population for public review and input. When finalized, the conservation strategy will become the post-delisting management plan for the NCDE grizzly bears and their habitat. Incorporating this conservation strategy into the forest plans would demonstrate the adequacy of regulatory mechanisms on National Forest System lands to support delisting of the species. Thus, the five national forests in the NCDE propose to update the forest plans where necessary to incorporate the relevant desired conditions, standards, guidelines, and monitoring items related to habitat management on NFS lands to help sustain a recovered grizzly bear population (planning record exhibit V-36).

The Flathead National Forest proposes to incorporate desired conditions, standards, guidelines, and monitoring items into its revised forest plan (as described in volumes 1, 2 and 4), and the Helena, Kootenai, Lewis and Clark, and Lolo National Forests propose to incorporate these components through an amendment of their existing forest plans (as described here in volume 3). The Flathead Forest Plan revision is being prepared following the 2012 planning rule. Under the transition provisions of the 2012 Forest Planning Rule (36 Code of Federal Regulations (CFR) 219.17), an amendment to a plan that was approved or revised under a prior planning regulation, may be initiated under the provisions of the prior planning regulation for 3 years after May 9, 2012, and may be completed and approved under those provisions (36 CFR 219.17 (b)(2)). The Helena, Kootenai, Lewis and Clark, and Lolo National Forests proposed on March 6, 2015 to amend their forest plans in accordance with the 1982 planning regulations, which were in effect prior to November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000). The amendment process is being conducted concurrently with revision of the Flathead Forest Plan to assure that a consistent set of management direction will be established across the national forests in the NCDE.

Adoption of the draft NCDE grizzly bear conservation strategy includes acknowledging the following management zones on National Forest System lands in the NCDE (figure 1-56):

- **Primary conservation area –** the same as the recovery zone identified in the Grizzly Bear Recovery Plan (USFWS (1993))
- **Management zone 1 –** a defined area surrounding the primary conservation area, within which grizzly bear population status and trend would be monitored
- **Salish demographic connectivity area –** a portion of zone 1 with specific habitat measures to allow female grizzly bear occupancy and eventual dispersal to other ecosystems in the lower 48 states (i.e., the Cabinet-Yaak and Bitterroot ecosystems)
- **Management zone 2** – an area where grizzly bears would be expected to be present at low densities, which would provide the opportunity for grizzly bears, particularly males, to move the longer distance between the NCDE and the Greater Yellowstone Ecosystem

- **Management zone 3 –** areas where grizzly bears do not have enough suitable habitat to support long-term survival and occupancy; the management emphasis would be on conflict response. No additional forest plan components are needed or would be proposed for zone 3.
- NFS lands would no longer be designated as **management situations 1**, **2** or **3**.

Key management direction from the conservation strategy is summarized below and incorporated into the draft forest plan components (desired conditions, standards, and guidelines):

- Within the primary conservation area, open motorized route density, total motorized route density, and secure core would be maintained at baseline levels in each grizzly bear subunit, with certain exceptions. High use non-motorized trails would no longer be counted in calculations. Temporary increases in open and total motorized route densities and temporary decreases in secure core would be allowed for projects, as defined in the glossary.
- Food/wildlife attractant storage special orders would apply across NFS lands in the primary conservation area, zone 1 and zone 2.
- Within the primary conservation area, developed recreation sites designed and managed for overnight use would be limited to one new site or one increase in capacity in a bear management unit in a 10-year period, with certain exceptions.
- Vegetation management, livestock allotments, and minerals and energy development would be managed with consideration of grizzly bear habitat and to reduce the risk of grizzly bear-human conflicts.
- In zone 1 and the demographic connectivity areas, habitat protections would focus on limiting miles of roads open to the public during the non-denning season.
- Reconsideration of goals, objectives, land allocations, standards and guidelines that are not related to grizzly bear habitat management is not part of this proposed action for the four national forests whose plans are being amended.

4.3 The Planning Area — the Five NCDE National Forests

The NCDE grizzly bear recovery zone encompasses about 5.7 million acres. Each of the five proclaimed national forests in the NCDE (Flathead, Helena, Kootenai, Lewis and Clark, and Lolo) has its own forest plan, which provides management direction for grizzly bear habitat.

Under the action alternatives, some of the forest plan components would extend beyond the recovery zone identified in the grizzly bear recovery plan (USFWS 2013). This larger area encompasses the primary conservation area (which is the same as the recovery zone), as well as zone 1 (about 4.8 million acres), zone 2 (over 4.5 million acres) and zone 3 (over 12 million acres). The acreage of the recovery zone/primary conservation area, zone 1 including the demographic connectivity areas, zone 2 and zone 3 within each national forest is shown in table 2.

Table 2. Acres of National Forest System land included within the NCDE recovery zone/primary conservation area, zone 1, zone 2 and zone 3. The percent of total acres across all ownerships is shown in parentheses

National Forest	Recovery zone/PCA	Zone 1 including DCA	Zone 2	Zone 3
Flathead	2,136,536 ac (37%)	230,988 ac (5%)	–	-
Helena	183,758 ac (3%)	149,207 ac (3%)	642,786 ac (14%)	5,792 ac (<1%)

National Forest	Recovery zone/PCA	Zone 1 including DCA	Zone 2	Zone 3
Kootenai	118,770 ac (2%)	283,302 ac (6%)	–	-
Lewis and Clark	777,963 ac (14%)	6 ac (<1%)	2 ac (<1%)	972,612 ac (8%)
Lolo	268,390 ac (5%)	386,274 ac (8%)	38 ac (<1%)	-

4.4 Purpose of and Need for Action

The purpose of the proposed action evaluated in this volume of the DEIS is to amend the Helena, Kootenai, Lewis and Clark, and Lolo National Forest Plans to ensure the adequacy of regulatory mechanisms regarding habitat protection across the national forests in the NCDE in support of de-listing of the grizzly bear.

Habitat conditions and management on the Flathead, Helena, Kootenai, Lewis and Clark, and Lolo National Forests have contributed importantly to the increased population size and improved status of the grizzly bear across the NCDE. Supporting a healthy, recovered grizzly bear population will depend on continued, effective management of the NCDE grizzly bear's habitat. There is a need to incorporate relevant direction from the draft NCDE grizzly bear conservation strategy into forest plans, so that the Forest Service will be able to demonstrate to the USFWS that adequate regulatory mechanisms exist in the forest plans to support a delisted grizzly bear population.

4.5 Decision Framework

The responsible officials for the amendments are the Forest Supervisors for the Helena/Lewis and Clark, Kootenai, and Lolo National Forests. The responsible officials will decide whether it is necessary and appropriate to amend the forest plans by incorporating desired conditions, standards, guidelines, and monitoring requirements into the forest plans. Based on the analysis and subsequent public comments, a final environmental impact statement will be prepared and the selected alternative will be identified in a draft record of decision that will be subject to an objection process guided by the direction in 36 CFR Subpart B (219.50 to 219.62). The final record of decision amending the forest plans will be in effect until the forest plans are next revised. Project-level environmental analysis will still need to be completed for specific proposals to implement the direction in the forest plan.

The proposed action for the amendments applies only to the NCDE recovery zone. The Kootenai Forest Plan spans two grizzly bear recovery zones, and the Lolo Forest Plan spans three. No changes in forest plan direction are being considered within the Cabinet-Yaak or Bitterroot recovery zones, or in other areas outside of the NCDE analysis area.

This proposed action is programmatic in nature and guides future implementation of site-specific projects. Additional National Environmental Policy Act compliance would be required for site-specific projects as part of a two-stage decision making process (Council of Environmental Quality regulations for implementing National Environmental Policy Act: 40 CFR 1508.23, 42 USC 4322 (2)(C)), 36 CFR 219.7(f)). Most of the effects of amending or revising forest plans would be indirect effects, in that they would occur later in time. Any direct effects on grizzly bears or other resources would occur when site-specific decisions are made that implement the direction in the forest plan.

Certain other guidance and coordination applicable to management of the grizzly bear may be established through other instruments, such as memoranda of understanding, cooperative agreements, and special orders.

Chapter 5. Alternatives Considered for the Forest Plan Amendments

5.1 Introduction

This chapter describes and compares the alternatives considered. It includes a discussion of how alternatives were developed, the primary issues raised, a description of each alternative considered in detail, and elements common to all alternatives. This section presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. This chapter also includes a discussion of the alternatives that were considered but not analyzed in detail and the rationale for not considering that alternative in detail.

5.2 Development of Alternatives

Refer to Volume 1, section 2.1 for an overview of Council of Environmental Quality regulations with respect to National Environmental Policy Act procedures, and specifically those concerning the development of alternatives.

For the grizzly bear amendment, alternative 1 is the no-action alternative, which reflects the current forest plans, as amended and accounting for current laws, regulations, and requirements of biological opinions. Alternative 2 is the modified proposed action. This alternative is based on the detailed proposed action that was scoped in March 2015, with modifications in response to comments. Alternative 3 was driven by issues identified during public scoping.

All reasonable alternatives to the proposed action must meet the purpose and need for change and address one or more of the identified issues. The responsible officials identified an additional alternative that met the criteria and created a reasonable range of outcomes and effects to inform the decision-making process.

The responsible officials have not identified a preferred alternative at this point, but plan to identify a preferred alternative in the final environmental impact statement after reviewing and considering the public comments on this draft environmental impact statement.

5.3 Public Involvement

As described in volume 1, section 2.3, Public Involvement, the Notice of Intent was published in the Federal Register on March 6, 2015[1]. The Notice of Intent requested public comment on the proposal for a 60-day period (until May 5, 2015), which was subsequently extended by 10 days. The Forest Service held open houses in seven communities throughout the NCDE during the scoping period to provide the public with information, answer questions, and accept comments. Using the comments from the public, other agencies, tribes, and organizations, the interdisciplinary team developed a list of issues to address. The list was then sorted into issues that are specific to the revision effort, specific to the amendment effort, or relevant to both.

[1] Federal Register, Vol. 80, No. 44, March 6, 2015, pp. 12139–12142: *Flathead National Forest, Montana; Revision of the Land Management Plan for the Flathead National Forest and an Amendment of the Helena, Kootenai, Lewis and Clark, and Lolo National Forest Plans to Incorporate Relevant Direction From the Northern Continental Divide Ecosystem Grizzly Bear Conservation Strategy*

5.4 Issues Used for Alternative Development

Issues serve to highlight effects or unintended consequences that may occur from the proposed action or alternatives. The Forest Service reviewed all letters received and identified the following two issues that would drive alternative development pertaining to the proposed amendment:

- Grizzly bear habitat
- Access and recreation.

5.4.1 Grizzly bear habitat

Some respondents stated that the proposed revision and amendments do not include enough protections for grizzly bear habitat, and several offered specific ideas for ways to provide greater protections. Some people wanted all forest plan grizzly bear direction to be mandatory standards, or wanted the same standards to apply across all grizzly bear management zones. Others stated that protections are adequate and wanted more management flexibility. Some wanted more standards or guidelines that address connectivity between the NCDE and other recovery zones, specifically the Greater Yellowstone Ecosystem.

5.4.2 Access and recreation

Some people stated that that proposed action is too limiting to motorized opportunities. Others stated that we need additional closures on roads and trails to protect grizzly bears and should reduce motorized recreation opportunities while increasing opportunities for non-motorized recreation. Some people felt there should be further limits on the number or capacity of developed recreation sites to better protect grizzly bears, while others felt there should be no limitations.

5.4.3 Issues not addressed in this analysis

Management of a grizzly bear hunting season

Some respondents expressed concern that a hunting season might reverse the recovery of the grizzly bear population in the NCDE, and some were also concerned that a hunting season might discourage connectivity between the NCDE and other grizzly bear ecosystems. It was suggested that the Forest Service should play a role in establishing a science-based hunt.

The rationale for not addressing this issue further is that it is outside the scope of this decision. Although management of grizzly bear populations, including numbers, mortality rates, and possible reinstatement of regulated hunting, is discussed in the draft NCDE grizzly bear conservation strategy, whether and when a hunting season would be established is unknown at this time. The USFWS and Montana Fish, Wildlife and Parks have jurisdiction over establishment of a hunting season in the NCDE, and this is not within Forest Service authority.

Delay the National Environmental Policy Act process until the draft conservation strategy is finalized

Some commenters suggested that the Forest Service should not continue the National Environmental Policy Act process on its proposed action until the draft NCDE grizzly bear conservation strategy has been finalized.

The rationale for not delaying the process is that the direction in the draft NCDE grizzly bear conservation strategy for management of grizzly bear habitat constitutes the best available science and the timing is favorable in light of the planning regulations. The proposed action would improve

consistency and provide an updated regulatory framework for habitat management on the five national forests in the NCDE. Under the transition provisions of the 2012 Forest Planning Rule (36 CFR 219.17), an amendment to a plan that was approved or revised under a prior planning regulation may be initiated under the provisions of the prior planning regulation for 3 years after May 9, 2012, and may be completed and approved under those provisions (36 CFR 219.17 (b)(2)). Thus, the Forest Service has an opportunity to amend the Helena, Kootenai, Lewis and Clark and Lolo Forest Plans in accordance with previous planning regulations, concurrently with the Flathead Forest Plan revision. If the same regulatory requirements are used, the process for amending the four forest plans is simpler and expected to take less time to complete. The effects of not amending the forest plans are analyzed and displayed via the no-action alternative.

Habitat-based recovery criteria

Some respondents suggested that habitat-based recovery criteria must be established for the NCDE before de-listing can be considered. They felt that the draft NCDE grizzly bear conservation strategy is premature and should not be the basis for the proposed action.

The Grizzly Bear Recovery Plan established two separate requirements that must be met before a population can be delisted: (1) attainment of the population demographic parameters for that ecosystem within the monitoring period specified; and (2) development and completion of an interagency conservation strategy that will ensure that adequate regulatory mechanisms will continue to be present after delisting (USFWS 1993). In accordance with a Court settlement approved on May 5, 1997 (Fund for Animals v. Babbitt 967 F. Supp. 6 (D.D.C.1997)), the USFWS developed and defined habitat-based recovery criteria for the Greater Yellowstone Ecosystem, which were appended to the recovery plan in 2007. Three objective and measureable criteria were developed to meet the overall goal of maintaining or improving habitat conditions at levels of human activity that existed in 1998 when the population was increasing at 4 to 7 percent per year. The criteria are: a secure habitat standard, a developed site standard, and a livestock allotment standard, all of which will be monitored.

The rationale for not first establishing habitat-based recovery criteria is that the proposed action incorporates the habitat-related portions of the draft NCDE conservation strategy that are relevant to management of National Forest System lands. The proposed forest plan components (desired conditions, standards, guidelines and monitoring items) that address secure core, developed recreation sites, livestock grazing allotments, and other resource management activities that may occur in grizzly bear habitat in the NCDE are very similar to the criteria appended to the recovery plan for the Greater Yellowstone Ecosystem.

The decision whether to delist the grizzly bear is the responsibility of the USFWS.

Population size and growth rate are not delisting criteria

Some people commented that the size and growth rate of the grizzly bear population in the NCDE should not be relied upon as the reason to delist the grizzly bear.

Habitat conditions and management on the Flathead, Helena, Kootenai, Lewis and Clark, and Lolo National Forests have contributed importantly to the increased population size and improved status of the grizzly bear across the NCDE. It is recognized that supporting a healthy, recovered grizzly bear population will depend on continued, coordinated management of the NCDE grizzly bear's habitat. The purpose and need for the revising and amending the forest plans is to provide consistent habitat management direction that will support a recovered population of grizzly bears and provide adequate regulatory mechanisms on National Forest System lands in the NCDE to support de-listing.

The decision whether to delist the grizzly bear is the responsibility of the USFWS.

5.5 Important Points about All Alternatives

All of the alternatives are designed to:

- Meet law, regulation, and policy;
- Incorporate ecosystem management objectives and strategies and contribute towards ecological, social, and economic sustainability;
- Meet the purpose and need for change and address one or more significant issues;
- Provide integrated direction in the forestwide desired conditions, standards, and guidelines;
- Allow for retaining existing permitted activities and facilities; and
- Provide sustainable levels of products and services.

Certain direction, such as Forest Service agency directives and interagency agreements, are established and implemented independent of the forest planning process. Such direction would continue unchanged under all alternatives. Examples include:

- Coordinating the translocation of grizzly bears, including nuisance bears.
- Working cooperatively with the USFWS and Montana Fish, Wildlife and Parks to reduce the number of grizzly bear-human conflicts.
- Participating in meetings of the Interagency Grizzly Bear Committee and the NCDE subcommittee.

5.6 Description of Alternatives

The Forest Service considered three alternatives in detail. Alternative 1, the “no-action alternative,” reflects current management practices regarding grizzly bear habitat, and provides the basis for comparing the existing situation with the action alternatives. Under alternative 1, the forest plans would not be amended, nor would the habitat-related elements of the draft NCDE grizzly bear conservation strategy be included in the Flathead National Forest’s revised forest plan.

Alternatives to the no-action alternative were based on the need for change, comments received during scoping, interagency meetings, and meetings with tribal partners. The alternatives represent a range of possible options for forest plan components related to grizzly bear habitat management.

5.6.1 Elements common to all alternatives

All alternatives in this document provide for the multiple use and sustained yield of goods and services (36 CFR 219.1 (b)) and support recovery of the threatened grizzly bear.

5.6.2 Alternative 1 — no action

Under the no-action alternative, existing forest plans would continue to guide management. Thus, the current provisions for management of grizzly bear habitat in the NCDE would remain in effect. Because of the lack of adequate regulatory mechanisms as determined by USFWS, the grizzly bear would remain listed under the Endangered Species Act. The requirements of biological opinions that address incidental take of grizzly bears are assumed to remain in place.

Revisions of the Flathead, Helena, and Lewis and Clark Forest Plans have been initiated, but are not yet approved; therefore, the no-action alternative reflects the forest plans approved in 1986 and as amended. The Regional Forester approved the revision of the Kootenai National Forest Plan on Jan. 5, 2015, which therefore is part of the no-action alternative.

Alternative 1 relationship to issues

Grizzly bear habitat

All forest plans in the NCDE incorporated the Interagency Grizzly Bear Guidelines (1986). The guidelines are intended to maintain or improve habitat inside the recovery zone, minimize grizzly bear-human conflict potential, and resolve grizzly bear-human conflicts. For each of five management situations, a set of guidelines are provided for coordination of grizzly bear habitat management with five resource management program areas: wildlife management; timber and fire management; range management; recreation management; and minerals, watershed and special uses management. Management situations were identified on National Forest Service lands in the NCDE (table 3) and maps of the Management Situations are included in each of the existing forest plans.

Management situation 1 contains grizzly population centers and habitat components needed for the survival and recovery of the species or a segment of its population. Maintaining and improving grizzly bear habitat and minimizing grizzly bear-human conflict receive the highest management priority in management situation 1.

Management situation 2 includes areas where current information indicates that the area lacks distinct population centers and highly suitable habitat does not generally occur. Some grizzly bear habitat components exist and grizzlies may be present occasionally. The grizzly bear is an important, but not the primary use of the area. Guidelines for management situation 2 are similar to those identified for management situation 1 but in many cases the direction is to be implemented where feasible and/or only where grizzly presence is likely.

Management situation 3 is areas where human presence and developments, such as campgrounds, resorts or other facilities associated with high human use, result in conditions that make grizzly bear presence untenable for humans and/or grizzlies. Grizzly habitat maintenance and improvement are not management considerations. Guidelines address management of attractants where grizzly bear presence is likely.

No direction is given in the 1986 Interagency Grizzly Bear Guidelines for management of grizzly bears or their habitat outside of the recovery zone. Outside the recovery zone, applicable management direction under the existing forest plan, along with any requirements of the incidental take statement of a biological opinion provided by the USFWS, would be implemented.

Table 3. Acres in management situations 1, 2, and 3 within and outside the NCDE grizzly bear recovery zone under current forest plans

Forest	Management Situation (MS) 1 in NCDE recovery zone	MS 1 outside recovery zone	MS 2 in NCDE recovery zone	MS 2 outside recovery zone	MS 3 in NCDE recovery zone	MS 3 outside recovery zone
Flathead NF	2,022,688	–	99,418	–	12,614	–
Helena NF	119,162	–	64,595	–	–	–
Kootenai NF	112,616	7	2	88,231	7,345	2,610

Forest	Management Situation (MS) 1 in NCDE recovery zone	MS 1 outside recovery zone	MS 2 in NCDE recovery zone	MS 2 outside recovery zone	MS 3 in NCDE recovery zone	MS 3 outside recovery zone
Lewis and Clark NF	763,743	–	–	–	14,159	–
Lolo NF	247,721	–	–	–	–	–

Research subsequent to adoption of the Interagency Grizzly Bear Guidelines revealed the potential for motorized access to have substantially greater impacts on the survival and reproductive success of grizzly bears, especially adult females ((McLellan and Shackleton 1988, Mattson, Blanchard, and Knight 1991) Mattson, Knight, and Blanchard (1987), McLellan 1990, Mace and Waller (1996), Schwartz, Haroldson, and White (2010)). Each of the forest plans for the national forests in the NCDE contains some guidance for motorized access management for grizzly bears and/or elk, although the management direction varies. Some of the national forests, through the Endangered Species Act Section 7 consultation process, have modified their implementation of the Forest Plan to comply with the terms and conditions that minimize incidental take of grizzly bears.

The individual forest plans also contain some additional desired conditions, standards, and guidelines pertaining to grizzly bears. These may apply forest-wide or to certain management areas. Appendix 7 provides a detailed list of forest plan direction that is relevant to grizzly bear habitat management on the Helena, Kootenai, Lewis and Clark, and Lolo National Forests.

Access and recreation

Alternative A would continue to provide both motorized and non-motorized recreational opportunities in the same areas and manner as currently. Existing developed recreation sites would be maintained and there would not be limits placed on future development, other than those resulting from budget limitations or other existing forest plan direction.

5.6.3 Alternative 2 — proposed action modified

This alternative is based on the detailed proposed action that was published with the notice of intent on March 6, 2015, with modifications in response to comments.

This alternative would incorporate the habitat-related management direction of the draft NCDE Grizzly Bear Conservation Strategy including limits on new grazing allotments and developed recreation sites, vegetation management guidelines, and mitigation for mineral and energy development on certain lands. The amended management direction would be applicable to the portions of the national forests that have lands within the primary conservation area and/or zones 1 and 2 of the NCDE (figure 1-56). It would maintain baseline conditions for motorized road access across the primary conservation area and zone 1, and would not require additional closure of roads and trails open to public motorized vehicle use. Six new monitoring items would be added under the amendment.

Unless it would result in conflicting direction, most of the existing forest plan standards and guidelines would be retained. The complete text of the proposed action and how it would change the existing direction in each of the forest plans are presented in appendices 6 and 7, respectively.

Alternative 2 relationship to issues

Grizzly bear habitat

A fundamental assumption of the draft NCDE grizzly bear conservation strategy is that maintaining the habitat conditions that existed at the time when all recovery criteria were met will continue to sustain the grizzly bear population over time. Since monitoring showed that all recovery criteria had been met by 2011, the habitat conditions that existed at that time were identified as the baseline to which future land management actions generally would be held. Under certain conditions and in accordance with criteria that are specified in the forest plan standards and definitions, the baseline could be adjusted.

The draft NCDE grizzly bear conservation strategy delineated a primary conservation area, zone 1 including two demographic connectivity areas, zone 2 and zone 3. The acreage of each on National Forest System lands is shown in table 2.

- The primary conservation area would be managed as a population source area, where continuous occupancy by grizzly bears would be maintained. The overall goal for habitat management on federal lands in this area would be to maintain or improve baseline habitat conditions. Forest plan components would be incorporated to address open and total motorized road densities and secure core; developed recreation sites; livestock grazing; vegetation management; and mineral and energy exploration and development.
- Zone 1 is a defined area surrounding the primary conservation area where occupancy by grizzly bears is expected, but at lower densities than found in the primary conservation area. Combined, the primary conservation area and zone 1 would encompass the area within which grizzly bear population status and trend would be monitored.
- Within zone 1, two demographic connectivity areas would be identified: the Salish and the Ninemile demographic connectivity areas. These areas are intended to provide opportunities for female grizzly bears to establish home ranges and exist at low densities, and to facilitate dispersal of grizzly bears from the NCDE to the smaller population in the Cabinet-Yaak ecosystem, and to the Bitterroot ecosystem which does not have a resident population of grizzly bears. Habitat protections would be focused on not increasing the number of miles of roads open for public use, and maintaining current roadless areas to serve as stepping stones to other grizzly bear recovery zones.
- In zone 2, grizzly bears would be expected to be present at low densities. The intent is to maintain existing resource management and recreational opportunities, while providing the opportunity for grizzly bears, particularly males, to move the longer distance between the NCDE and the Greater Yellowstone Ecosystem. Existing forest plan direction would continue to apply.
- Zone 3 primarily consists of areas where grizzly bears do not have enough suitable habitat to support long-term survival and occupancy. The management emphasis would be on conflict response. No additional habitat protection measures are proposed for zone 3.

Access and recreation

There would be no net change in existing levels of motorized road access in the primary conservation area. There would be a new requirement on the Lolo National Forest for no net increase in the miles of open road in the demographic connectivity areas and in zone 1. Compared with alternative 3, more motorized trails could occur in grizzly bear management zone 1. To reduce the risk of grizzly bear-human conflicts on NFS lands in light of increasing human use of the national forests in the future, there would be a limit of one increase per decade in the number or capacity of

new developed recreation sites that are designed and managed for overnight use per bear management unit in the primary conservation area. Outside of the primary conservation area, the number of developed recreation sites could be increased or their capacity could be expanded to meet increased demand.

5.6.4 Alternative 3

Development of alternative 3 was based on various comments and suggestions offered during scoping to provide a greater level of protection for the grizzly bear. Alternative 3 would add several forest plan components that would be more protective of grizzly bears and their habitat on NFS lands as compared to alternatives 1 and 2. These differences are described below. A detailed comparison of the alternatives can be found in appendix 7.

Alternative 3 relationship to issues

Grizzly bear habitat

In addition to the management direction proposed for alternative 2, three more standards would be applied in the primary conservation area. These standards would prohibit opening roads within secure core for temporary motorized use by the public; require mitigation measures to be included in new or re-authorized permits for ski areas to reduce the risk of grizzly bear-human conflicts; and allow no increase above the baseline acreage of areas and miles of routes that are open to over-snow vehicle use in the den emergence time period. In addition, new oil and gas leases in the primary conservation area and zone 1 (including the demographic connectivity areas) must include a no surface occupancy stipulation.

Furthermore, under this alternative, all of the direction for vegetation management in the primary conservation area under alternative 2 would be extended to the Salish and Ninemile demographic connectivity areas. Direction for livestock grazing would apply not only to the primary conservation area, but also to zone 1 including the Salish and Ninemile demographic connectivity areas.

To help support occupancy by female grizzly bears in the Salish and Ninemile demographic connectivity areas, there would be no net increase above the baseline in the linear miles of trails and roads that are open to the public for motorized use during the non-denning season. In zone 1 outside the demographic connectivity areas, there would be no net increase above the baseline in the linear miles of roads open to motorized use by the public during the non-denning season.

On the Helena National Forest, forest plan components would be added to recognize the potential importance of the expanded grizzly bear distribution zone located in the Blackfoot and Divide landscapes west of Interstate 15 (figure 1-58) in facilitating the movement of grizzly bears to the Greater Yellowstone Ecosystem. A desired condition would encourage consolidation of NFS lands adjacent to highways and support of conservation easements with willing landowners. A standard would require that motorized routes (roads and trails) open to public motorized use not exceed 2.4 mi/mi^2 within this area.

Access and recreation

Alternative 3 would maintain the same level of opportunity for public use of roads for motorized vehicle use but would restrict the opportunity to increase motorized trails within the demographic connectivity areas. In the primary conservation area, there would also be no increase in motorized over-snow vehicle use during the den emergence (late spring) time period. To reduce the risk of grizzly bear-human conflicts on NFS lands, increases in the number or capacity of new developed

recreation sites designed and managed for overnight use would be limited in the primary conservation area for grizzly bears, same as under alternative 2. Outside of the primary conservation area, there would be no restrictions on increases in the number of developed recreation sites or their capacity.

5.6.5 Alternatives considered but eliminated from detailed study

Federal agencies are required to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative approaches to achieve the purpose and need, or requested that forest plan components applicable to the primary conservation area be extended to zone 1, demographic connectivity areas, zone 2, and/or outside of the NCDE. The following alternatives were considered, but dismissed from detailed study for the reasons summarized in this section.

Apply Flathead National Forest Plan Amendment 19 to all the bear management subunits in the primary conservation area

Some people suggested that the Flathead National Forest Plan Amendment 19 management direction of 19-19-68 (percent of the subunit with open motorized route density >1 mi/mi^2, percent of the subunit with total motorized route density >2 mi/mi^2, and percent of the subunit in secure core, respectively) be applied to all bear management subunits in the primary conservation area. Many of these commenters felt that amendment 19 management direction is the best available science.

For the Flathead National Forest, this is the same as the “no-action” alternative. The analysis of this alternative will show that closing/decommissioning of additional roads will be required to meet amendment 19 standards in grizzly bear subunits where the Flathead National Forest manages over 75 percent of the land and where 19-19-68 direction has not yet been met, as well as other actions to address total motorized route density and core deficiencies (such as reclamation or decommissioning or berming), unless site-specifically amended.

For the amendment forests, this alternative differs from the no-action alternative because a few subunits with more than 75 percent federal ownership have not attained the amendment 19 numeric objectives and, through Endangered Species Act Section 7 consultation, are not planned to do so. On the Helena National Forest, the open motorized route density requirement was adjusted to less than 22 percent for the Red Mountain subunit. On the Kootenai National Forest, a higher open motorized route density was established under the revised Forest Plan for their two subunits. On the Lolo National Forest, open motorized route density, total motorized route density and secure core were adjusted for the Swan subunit. In these particular subunits, it was not feasible to meet all of the 19-19-68 criteria due to their unique configuration, proximity to private land developments, the need to maintain open roads for emergency egress, and/or other characteristics that were carefully analyzed and addressed through the Endangered Species Act Section 7 consultation process.

In some grizzly bear subunits, closing additional roads to meet 19-19-68 would deny private or other agency land owners to access to their property, which is required by law and policy. Therefore, this alternative would not be feasible to implement in all subunits.

It should also be noted that the amendment 19 management direction of 19-19-68 was based upon a study of habitat use by eight female bears in the Swan Mountains. Today we have a much more extensive body of knowledge about the grizzly bear population in the NCDE, which shows that the demographic recovery criteria have been met, even though every subunit in the primary conservation

area does not meet 19-19-68. For the above reasons, application of amendment 19 to all bear management subunits was not carried forward for detailed analysis.

No administrative use of roads that have public restrictions

Some people commented that there should be no allowance for administrative use of roads that have public restrictions on motorized use (in other words, remove NCDE-STD-AR-01).

This request to prohibit administrative use of roads is not practicable. It is the case that many restricted roads receive no administrative use at any time. However, at certain times or in certain locations, administrative use is necessary to safely conduct activities such as release of captured grizzly bears, cleaning and maintaining culverts, and completing project work.

Administrative use has been ongoing during the period in which the grizzly bear population has met recovery plan objectives. Traffic volumes are comparatively light on roads with administrative use, resulting in less disturbance/displacement of bears than would occur on roads open to the public. Mace and others assessed the seasonal use of habitat within 0.3 mi of roads by 13 female and 5 male grizzly bears. They found that most grizzly bears showed a neutral response or even selected for habitats within 0.3 mi of closed roads or open roads with less than 10 vehicles per day (Mace et al. (1996)). There have been no grizzly bear mortalities associated with administrative use of roads in the NCDE. Mortality risk is higher on roads that are open for use by the public. Experience on the Flathead NF has shown that administrative use is necessary on some restricted roads, and has been compatible with a stable to increasing grizzly bear population. For these reasons, this alternative was not carried forward for detailed analysis.

Shorten project implementation guidelines

There was a suggestion to drop guideline NCDE-GDL-AR-01, which limits implementation of projects to no more than 5 years in a 10-year period. There was a similar objection to NCDE-GDL-AR-02, which requires restoring open motorized route density, total motorized route density and secure core within 1 year of project completion. The commenters stated that these guidelines would allow too much impact to bears and the duration should be shorter.

Experience with projects implemented in the NCDE has shown that a shorter duration in many cases would not be practicable. For vegetation management projects, a duration of four to five years is typical, due to the need to sequence activities such as pre-harvest weed treatment, water quality best management practices on roads, timber harvest, slash treatment, tree planting, and road closures and/or reclamation. Other seasonal restrictions under the forest plans further limit the operating season to favor the needs of bears during key time periods, making a shorter duration impractical. Many projects of 5-year duration have been implemented during the period when the grizzly bear population in the NCDE has been increasing. As noted above, there have been no grizzly bear mortalities associated with administrative use of roads in the NCDE. For these reasons, this alternative was not carried forward for detailed analysis.

Prohibit temporary increases in motorized route density and temporary decreases in secure core

Some people suggested that no temporary increases in open motorized route density, total motorized route density, or temporary decreases in secure core (to allow for project activities) should be allowed.

If no such temporary changes were allowed, many projects that are needed to meet resource management objectives would have to be forgone. For example, In the Cabinet-Yaak recovery area,

the Kootenai Forest Plan allows a temporary decrease in secure core to address the needs of bull trout (road/stream restoration) in the Cabinet-Yaak recovery area. Similar resource needs exist in the NCDE. Many projects that necessitated temporary increases in road density have been implemented during the period when the grizzly bear population in the NCDE has been increasing. A substantial amount of secure core is located in wilderness and other management areas where no motorized access exists and no temporary decreases in secure core would occur. On the Flathead National Forest, temporary decreases in secure core have only occurred as a result of adjacent project activities where the buffered area extended into secure core. For these reasons, the suggested alternative was not carried forward.

Add a rest period following temporary decrease in secure core

Some people said that there should be a rest period of 10 or 20 years following temporary decreases in secure core due to projects.

There is no science indicating that a rest period is needed (R. Mace, pers. comm. 6-18-15 meeting, planning record exhibit V-29). The original concept of a 10-year rest period for secure habitat was based upon a theoretical calculation to give a generation of bears a time period without temporary disturbance (from the time a female bear is born, to its first litter (6 years) and then raising offspring to 2½ years old). This rest period was recommended at a time when the grizzly bear population was much smaller and standards for secure core habitat were being formulated but not yet in place. Furthermore, female grizzlies are now known to have cubs at an earlier average age (4 years old) in the NCDE. Grizzly bear experts do not believe a rest period is necessary for continued bear recovery because secure core is now in place, and believe that temporary decreases allowed under Standard NCDE-STD-AR-03 will support a recovered grizzly bear population (R. Mace, T. Manley, and C. Servheen, pers. comm. 6-18-15 meeting). For these reasons, this alternative was not carried forward for detailed analysis.

Primary conservation area and zone 1 should have the same road standards

Some people commented that road standards for the primary conservation area should be applied to zone 1 as well.

The draft grizzly bear conservation strategy identified the primary conservation area as the source area for the NCDE population. The objective for zone 1 is continual occupancy by grizzly bears, but at expected lower density than in the primary conservation area. In zone 1, NFS lands are at lower elevations and are generally not consolidated or are intermingled with other land ownerships, making application of the same standards problematic. In their study of grizzly bears in the Swan Valley, Mace and Waller (1998) concluded that road use restrictions on multiple-use lands in lower elevation, mixed ownership settings would be of limited value unless habituation and mortality levels are also minimized on adjacent private lands. The majority of grizzly bear mortalities in the NCDE continue to occur on private lands (Mace et al. 2015). Monitoring of grizzly bear mortality will include zone 1 to assure that a healthy population is maintained. For these reasons, this alternative was not carried forward for detailed analysis.

Remove secure core from the suitable timber base

Some people said that secure core in the primary conservation area, and/or habitat to provide security in both of the demographic connectivity areas, should be removed from the suitable timber base.

Through the forest planning process under the National Forest Management Act, certain lands are to be identified as being suitable for timber production, which are managed to achieve a regulated

schedule of harvest. In some areas that are not identified as suitable for timber production, timber harvest (which might yield commercial products) may be allowed to achieve other resource objectives. In some areas, such as congressionally designated wilderness areas, timber harvest is prohibited. There are nearly 2 million contiguous acres of designated wilderness on the Flathead, Helena, Lewis and Clark, and Lolo National Forests.

The 2015 Kootenai Forest Plan removed grizzly bear secure core areas from the lands identified as suitable for timber production. However, timber harvest is still allowed within secure core where needed to meet other resource objectives, such as improving grizzly bear foraging habitat.

The Helena, Lewis and Clark, and Lolo Forest Plans did not consider grizzly bear secure core when identifying the lands suitable for timber production. However, the existing forest plans and the two alternatives considered in detail contain forest plan components that would constrain timber management in a way that is compatible with grizzly bear recovery and would support de-listing of the grizzly bear. Changing the lands identified as suitable for timber production is not necessary to meet the purpose and need of the amendment to the Helena, Kootenai, Lewis and Clark, and Lolo Forest Plans.

For the Flathead revised forest plan, the alternatives studied in detail include consideration of varying degrees of commercial timber harvest, and the acres of land suited for timber production vary by alternative. The analysis for the revision considers the extent to which appropriate use of timber harvest can be beneficial to bears by increasing production of some bear foods (Waller and Mace 1997) and would be needed in order to address a number of “Need for Change” topics in the revision (e.g., need to improve composition, structure, and landscape patterns of vegetation; need to provide a reasonable level of goods and services including timber products; and reduction of wildfire risk). The analysis also addresses effects on grizzly bear secure core.

For these reasons, this alternative was not carried forward for detailed analysis.

Identify an additional demographic connectivity area on the Helena National Forest

Many commenters suggested that a third demographic connectivity area should be identified on the Helena National Forest at the south end of the NCDE to facilitate movement of bears to the Greater Yellowstone Ecosystem.

The purpose of a demographic connectivity area is to provide opportunities for female grizzly bears to establish home ranges and exist at low densities. Demographic connectivity areas were included in the draft grizzly bear conservation strategy to provide for demographic connectivity to the nearby Cabinet-Yaak Ecosystem, which has a very small number of grizzly bears, and the Bitterroot Ecosystem, which does not have a resident bear population.

In contrast, the Greater Yellowstone Ecosystem has a robust bear population. In consideration of its geographic isolation, the objective of Zone 2 is to provide habitat conditions that allow male bears to move through and infuse genetic diversity in the Greater Yellowstone Ecosystem. This would contribute to the recovery plan’s (p. 56) estimated need to bring in one bear from another area every 10 years. Male bear movement is believed to be sufficient to provide for gene flow unless grizzly bear populations are very small (Proctor et al. 2012).

Thus, establishment of a demographic connectivity area is not needed in this vicinity. However, to respond to the expressed concern, a forest plan component was added to alternative 3 that would limit the density of roads in the expanded grizzly bear distribution zone (figure 1-58) on the west

side of the Helena National Forest in zone 1 and a portion of zone 2, to facilitate male bear movement and gene flow from the NCDE to the Greater Yellowstone Ecosystem.

Additional demographic connectivity areas/habitat protections in the Big Belt and Little Belt Mountains

Some people recommended that additional demographic connectivity areas and/or habitat protections should be applied in the Big Belts or Little Belts and adjoining areas to facilitate movement of bears from the NCDE to the Greater Yellowstone Ecosystem.

The Greater Yellowstone Ecosystem has a robust bear population. However, in recognition of its geographic isolation, the draft NCDE Grizzly Bear Conservation Strategy recommended management that would allow male bears to move through and infuse genetic diversity into the Greater Yellowstone Ecosystem population. Existing direction in Forest Service and BLM land management plans has not precluded male grizzly bears from occupying zone 2 in low densities, and therefore the conservation strategy recommended continuing to apply the existing direction.

The purpose of a demographic connectivity area is to provide opportunities for female grizzly bears to establish home ranges and exist at low densities. Habitat conditions that support occupancy by females exceed what is needed to allow for movement and genetic interchange by male bears.

At this time, grizzly bears have not been observed in the Big Belt or Little Belt Mountain ranges. It is possible bears could be there in the future, but these are isolated mountain ranges with inherent limitations in providing habitat connectivity. Under alternative 3, genetic interchange would be highlighted in the expanded grizzly bear distribution zone on the west side of the Helena National Forest (figure 1-58), which has a better potential to meet this goal.

Additional habitat protections in these mountain ranges do not appear to be needed to achieve the goal of genetic interchange, and therefore this alternative was eliminated from detailed analysis.

Apply all of the primary conservation area habitat standards and guidelines to zone 2

Some people recommended that all of the habitat standards and guidelines applicable to the primary conservation area be extended to zone 2. It was argued that because no successful dispersals have yet been documented to occur from the NCDE to the Greater Yellowstone Ecosystem, that the same habitat protections that have been applied in the recovery zone to support survival and reproduction must be needed. Some commenters were concerned that zone 2 may be a mortality sink.

The intent for the primary conservation area and zone 2 are different: in zone 2 the intent is to allow movement by male bears sufficient for genetic interchange from the NCDE to the Greater Yellowstone Ecosystem. Male grizzlies have much larger home ranges, move greater distances, and do not show the same affinity for secure core as females. Zone 2 is not intended to support occupancy by female bears, and occupancy of zone 2 is not necessary for recovery of the NCDE population.

There is no evidence that there is a mortality sink on NFS lands in zone 2. Food storage orders and other wildlife habitat management direction are in place on most NFS lands, and a food storage order would be required on NFS lands in zone 2 under alternatives 2 and 3.

The goals for the primary conservation area and zone 2 are very distinct, and managing them in the same way is not necessary to support recovery of the grizzly bear population. For these reasons, this alternative was eliminated from detailed analysis.

Include the Beaverhead–Deerlodge National Forest in this decision

Some people recommended that the amendment should include the Beaverhead-Deerlodge National Forest, perhaps by identifying a demographic connectivity area, to address connectivity between the NCDE and the Greater Yellowstone Ecosystem.

The amendment is focused on establishing direction for the national forests that were addressed in the habitat management sections of the draft NCDE grizzly bear conservation strategy, which does not include the Beaverhead-Deerlodge National Forest. We agree that connectivity between ecosystems is important, and alternatives 2 and 3 both address connectivity between the NCDE and the Greater Yellowstone Ecosystem. Movement of bears from the NCDE to the Greater Yellowstone Ecosystem is supported by the food storage order on the Beaverhead-Deerlodge National Forest and by limits on open road densities under the revised Beaverhead-Deerlodge Forest Plan. Changes to management direction on the Beaverhead-Deerlodge National Forest are not needed to provide for genetic interchange, and are outside the scope of this decision which is to provide management direction to maintain the recovered grizzly bear population in the NCDE. For these reasons, this alternative was eliminated from detailed analysis.

Facilitate bear movement with elk security standards in zones 1 and 2

Some commenters suggested adding elk security standards to apply in zones 1 and 2 to facilitate bear movement.

Under the existing forest plans, motorized use of roads may be restricted during the big game hunting season, roughly Oct. 1 – Dec. 1, to provide security for elk. While these restrictions could also result in conditions supportive of bear movement, there would be no benefit to grizzly bears for most of the non-denning season. Alternative 2, the proposed action, would have a standard for all of zone 1 to maintain linear road miles open to the public at 2011 baseline levels throughout the non-denning season. Alternative 3 also would add a standard that would restrict motorized routes in zone 1 and the demographic connectivity areas. A standard limiting road density to less than 2.4 mi/mi^2 in zones 1 and 2 in the Blackfoot and Divide landscapes on the Helena National Forest is also proposed under alternative 3 to facilitate the movement of bears to the Greater Yellowstone Ecosystem. Plan components for grizzly bears would likely benefit elk, but adding forest plan components specifically for elk management is outside the scope of the decision for the amendment forests.

Prohibit all motorized over-snow recreation

Some commenters proposed allowing no motorized winter recreation use to eliminate any potential impacts on grizzly bears and other wildlife.

As stated in the draft grizzly bear conservation strategy (USFWS 2013) and 5-year review on the status of the grizzly bear (USFWS (2011)), there is no known or discernible impact from current levels of winter motorized recreation on the population of grizzly bears in the NCDE. The NCDE population has recovered with existing levels of over-snow use. A standard was added to alternative 3 to minimize the potential for motorized over-snow vehicles to disturb female grizzly bears during the den emergence tine period. No further restrictions or prohibitions are believed necessary or appropriate to maintain the recovered population. For these reasons, this alternative was eliminated from detailed analysis.

Extend the dates defining the denning season

There was a comment suggesting that the date used to define the start of the non-denning season be changed from April 1 or April 15 to March 15.

This request is not supported by the best available information. The dates used in the draft grizzly bear conservation strategy (April 1 west of the Continental Divide and April 15 east of the Continental Divide) are based upon information from more than 250 known grizzly bear dens in the NCDE (R. Mace pers. comm. 2014). The April 1/April 15 dates are already conservative in providing protection to bears emerging from dens. For example, in 2015, a year with lower than average snowfall and early snow melt, on the west side of the NCDE, April 23 was first male emergence, and the first female emergence was on April 28. In the future, if the best available information shows that grizzly bears are coming out of their dens at an earlier date, forest plans could be amended. For these reasons, this alternative was eliminated from detailed analysis.

No increase in developed recreation sites on NFS lands in the primary conservation area or zones 1, 2 and/or 3

Some people suggested not allowing any increases in developed recreation sites on NFS lands in the primary conservation area, or in zones 1, 2 and/or 3.

The proposed action includes the provisions in the draft NCDE grizzly bear conservation strategy that limit increases in the number or capacity of developed recreation sites designed and managed for overnight use that are open to the public during the non-denning season to one per decade per bear management unit. Developed recreation sites can impact bears through temporary or permanent habitat loss and displacement, but the primary concern is grizzly bear-human conflicts caused by unsecured bear attractants, habituation, and food conditioning, which can lead to grizzly bear mortality or removal from the ecosystem. The risks of grizzly bear-human conflicts and grizzly bear mortality are higher at those developed recreation sites that support overnight public use.

Efforts such as food storage orders, bear-resistant containers, and public education provided jointly by U.S. Forest Service bear rangers and Montana Fish, Wildlife and Parks bear biologists have been implemented to help reduce the risk of conflicts within the NCDE recovery area. In recent years, there have been no grizzly bear mortalities at developed recreation sites within the NCDE recovery area, although grizzly bear-human conflicts have occurred at some developed recreation sites. Most of the grizzly bears killed or removed by management agencies in the NCDE in the past had been involved in conflicts related to unsecured attractants such as garbage, bird feeders, pet/livestock feed and human foods. Although the majority of these conflicts and mortalities occurred on private lands, developed recreation sites on public lands remain of concern. For this reason, the conservation strategy team concluded it is important to limit increases in the number or capacity of developed recreation sites to levels that occurred during the period when the grizzly bear population was stable to increasing (USFWS 2013). Because there is not a strong pattern of grizzly bear mortalities associated with developed recreation sites in the NCDE, they did not feel it necessary to preclude any increases within the primary conservation area.

The conservation strategy team concluded that there is not a biological reason to limit developed recreation sites in zones 1, 2 or 3 in the NCDE. Because such restrictions would not contribute in a meaningful way to achieving the goals of zones 1, 2 or 3, that proposal was not analyzed in detail.

We investigated the idea of allowing no increases in developed recreation sites within areas that are identified as being important for habitat connectivity, such as in proximity to highways. However, it is more difficult to predict the areas where grizzly bears will cross highways than for some other

wildlife species. Topography, time of day, highway traffic volume, availability of bridges or underpasses, and other variables may influence bear movements (Waller and Servheen 2005). After discussion with grizzly bear experts (see planning record exhibit V-32), we concluded that the science is not available to enable identification of important areas for connectivity across highways throughout the NCDE, or between the NCDE and other ecosystems. Therefore this was not carried forward for detailed analysis at this time.

Grizzly bear reproduction and mortality will be monitored by Montana Fish, Wildlife and Parks, and if monitoring determines there is a need for addition restrictions on developed recreation sites on NFS lands in the future, forest plans could be amended to do so.

Restrict logging operations during spring

Some people suggested there should be a mandatory standard restricting all logging operations during the spring time period.

Spring grizzly bear habitat varies over time and space within the NCDE, depending on annual spring snow conditions, disturbances such as wildfires and avalanches, and vegetation conditions at microsites which change due to plant succession. While the characteristics of key spring habitat are well researched and documented, they cannot be reliably mapped across the NCDE. For these reasons, grizzly bear biologists believe that guideline NCDE-GDL-VEG-01 appropriately deals with key spring habitat during site-specific analysis (R. Mace, pers. comm. 6-18-2015 meeting, planning record exhibit V-29). It is not necessary or reasonable to preclude other forest management activities, such as burning, weed spraying, and implementation of best management practices, that may need to be completed during the spring time period in order to prevent resource damage and/or to meet wildlife, fish and water quality objectives. For these reasons, this alternative was not carried forward for detailed analysis.

Extend plan components for livestock grazing in the primary conservation area to all other zones

Some people suggested extending the desired conditions, standards and guidelines for livestock grazing in the primary conservation area to all other zones.

There is no scientific or anecdotal evidence that grazing of cattle at existing levels on NFS lands has resulted in grizzly bear mortalities or other population-level impacts. However, while experience has shown that grizzly bears and cattle can be compatible on public lands, there is a strong history of conflicts between grizzly bears and domestic sheep. Almost all domestic sheep allotments have been removed from NFS lands in the NCDE primary conservation area.

Under alternative 2, forest plan components that would place constraints on livestock grazing in the primary conservation area would be incorporated. This is based on the philosophy espoused in the conservation strategy of continuing management that occurred during time of grizzly bear population increase and recovery. Grizzly bear survival and mortality would be monitored across both the primary conservation area and zone 1 to assure that a healthy population is maintained.

The goal of zone 2 is to provide the opportunity for movement of grizzly bears, particularly males, from the NCDE to the Greater Yellowstone Ecosystem. The emphasis is on maintaining existing resource management while preventing and responding to demonstrated conflicts. It should be noted that zone 2 is dominated by private landownership. Response to grizzly bear–livestock conflicts on private lands is provided by Montana Fish, Wildlife and Parks bear management specialists in the NCDE and is not within U.S. Forest Service authority.

Zone 3 is not needed for recovery of the grizzly bear, but is an area where responding to human-grizzly bear conflicts would be emphasized. Zone 3 is also dominated by private landownership. Adding the standards for livestock grazing that are applicable to the primary conservation area is not needed and likely would not be effective in zone 3.

In response to public comments, most of the desired conditions, standards and guidelines related to livestock grazing would be extended to zone 1 under alternative 3. However, an alternative that extended the forest plan components to zones 2 and 3 was not carried forward for detailed analysis.

Extend plan components for the primary conservation area or demographic connectivity area to zone 3

Some people suggested extending desired conditions, standards and guidelines for the primary conservation area or demographic connectivity areas to zone 3 to provide connectivity to the Greater Yellowstone Ecosystem.

The conservation strategy team determined that zone 3 is not needed for recovery of the NCDE population or for connectivity to the Greater Yellowstone Ecosystem. The level of habitat management necessary to sustain the recovered population and to provide for female occupancy is not needed in zone 3. Additional emphasis on connectivity of the NCDE and Greater Yellowstone Ecosystem bear populations will be analyzed under alternative 3 as described previously. For these reasons, this alternative was eliminated from detailed analysis.

Reduce the level of protection for the grizzly bear

In response to the proposed action, some commenters suggested that the level of protection of grizzly bear habitat should be further reduced to allow more development and use of natural resources.

The proposed action is believed to be what is necessary to provide the adequate regulatory mechanisms that would support a recovered grizzly bear population in the NCDE, help to sustain its long-term persistence, and support its de-listing. Relaxing or eliminating those forest plan components would not meet the purpose and need for the action. For these reasons, this alternative was eliminated from detailed analysis.

Under the draft NCDE grizzly bear conservation strategy, the grizzly bear population will be monitored. If new information becomes available that would support less restrictive management, forest plans could be amended.

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Chapter 6. Affected Environment and Environmental Consequences for the Forest Plan Amendments

6.1 Introduction

This chapter summarizes the physical, biological, social, and economic environments of the NCDE analysis area and the potential consequences that may be caused by implementing any of the alternatives described in chapter 2. Within each resource section, the boundaries of the area used for the resource analysis is described. The discussions of resources and potential effects utilize existing information included in assessments, other forest planning documents, published scientific papers, and other sources as indicated.

6.2 Relationship between Programmatic and Site-specific Analyses

This draft environmental impact statement is a programmatic document that considers the effects of revising one forest plan and amending four forest plans. It discloses the environmental consequences on a broad scale. This is in contrast to analyses for site-specific projects. The environmental consequences are described at a forest level of analysis and do not predict what will happen each time the forest plan is implemented through a project. The environmental effects of individual projects will depend on the implementation of each project, the environmental conditions at each project location, and the application of the standards and guidelines in each case.

The affected environment and environmental consequences discussions in this chapter provide a reasonable prediction of consequences on the national forests in the NCDE. However, this document does not describe every environmental process or condition.

The Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (40 CFR §§ 1500–1508) define direct effects as those occurring at the same time and place as the proposed action and alternatives. Direct effects would result from implementation of site-specific projects and would be evaluated when those decisions are made. Most of the effects of programmatic plans would be indirect effects because they would occur later in time. The analysis of effects is based primarily on projections of how future activities would be conducted and would differ between alternatives.

6.3 Budget Levels

The Forest Service budget directly affects the level of activities that may occur as a result of forest plan implementation. To analyze effects without consideration of expected budgets would be a misrepresentation of expected outcomes. Budgets are expected to remain flat or decrease in the future.

6.4 Geographic and Climatic Setting

The NCDE analysis area extends south from the U.S.-Canada border and straddles the Continental Divide. This mountainous region sits at the boundary between warm, wet, maritime airflows from the Pacific Ocean, and cooler, drier airflows from Canada. The portion of the NCDE west of the

divide is characterized by a cool, temperate, maritime-influenced climate, while the eastern portion has a cold continental climate.

Soil type and depth, aspect, and elevation all contribute to effective moisture availability for vegetation establishment and growth. Vegetation on the west side of the divide is generally more diverse and productive than on the east side.

Recent climate change has influenced vegetation along with stressors such as invasive species (e.g., white-pine blister rust), elevated levels of native insects and pathogens, drought, and uncharacteristically severe wildfires. Recent research suggests that climate change in the future will likely further exacerbate those stressors and stress complexes (Iverson and McKenzie 2013).

For this draft environmental impact statement, downscaled climate models published by the Northern Region Adaptation Partnership (Halofsky and others 2015), which is incorporated by reference, were used to provide the context for effects analyses. Key findings for observed and projected climate for the central and east subregions are:

- Over the historical period of record (1895-2012), the annual mean monthly minimum temperature increased by about 2.6°F (central subregion) and by about 2.2°F (east subregion, while the annual mean monthly maximum temperature increased by about 1.3°F (central subregion) and by about 1.8°F (east subregion). During the same period, annual mean monthly precipitation increased slightly, by an average of about 0.1 in/month (central subregion) with no change in annual mean monthly precipitation in the east subregion.
- By 2100, projections are for an increase of 6-12°F in the annual mean monthly minimum temperature, and 5-11°F in the annual mean monthly maximum temperature. The average monthly minimum temperature in spring and autumn, or the average monthly maximum temperature in winter, may rise above freezing for the first time.
- Winter and spring are likely to be slightly wetter, and summer slightly drier by 2100. While annual mean monthly precipitation is projected to increase by about 0.2-0.3 inches/month, projections for precipitation have greater uncertainty than those for temperature.
- In montane watersheds, warmer water temperatures, earlier snowmelt-driven runoff, earlier declines to summer base flow, downhill movement of perennial channel initiation, and more intermittent flows are projected, as well as indirect changes attributable to altered and perhaps novel disturbance regimes. For animals restricted to freshwater aquatic environments for most or all of their lives, such as fishes, amphibians, mussels, and aquatic macroinvertebrates, changes in habitat and in hydrologic regimes are likely to lead to marked shifts in their abundance and distribution.

6.5 Wildlife

6.5.1 Introduction

The wildlife section presents information about selected terrestrial species including: the grizzly bear, other species listed as threatened or endangered or proposed for listing under the Endangered Species Act, Forest Service sensitive species, and management indicator species.

6.5.2 Legal and administrative framework

Endangered Species Act of 1973, as amended: In Section 2 of the Endangered Species Act, it is “declared to be the policy of Congress that all federal departments and agencies shall seek to

conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this act." Section 7 directs federal departments and agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats. Species and critical habitat that are proposed for listing are also provided protection under the Endangered Species Act. Section 9 prohibits the import, export, take, possession, sale, etc. of endangered fish and wildlife species.

As part of the forest planning process, Endangered Species Act Section 7 consultation with the USFWS was completed by each forest for the species that were listed at that time, which included the grizzly bear. Each of the forest plans in the NCDE received a "no jeopardy" biological opinion from the USFWS. Subsequent to the approval of the forest plans, additional consultations have occurred for forest plan amendments, new listings of species and critical habitat such as for the Canada lynx, and other federal actions as required by the Endangered Species Act. Site-specific analyses and section 7 consultations are also conducted for projects that may affect listed species and/or designated critical habitat.

National Forest Management Act of 1976: Under the National Forest Management Act, forest plans are to provide for the diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet the overall multiple-use objectives. The National Forest Management Act requires that projects be consistent with the forest plan.

Sikes Act of 1974, as amended: The Sikes Act directs the Secretaries of Interior and Agriculture to cooperate with the States in developing comprehensive plans to plan, maintain and coordinate the conservation and rehabilitation of wildlife, fish, and game, including but not limited to protection of species considered threatened or endangered pursuant to section 4 of the Endangered Species Act (16 USC 1533) or considered to be threatened, rare, or endangered by the State agency.

Forest and Rangelands Renewable Resources Planning Act of 1974: provides for the Forest Service, Department of Agriculture, to protect, develop, and enhance the productivity and other values of certain of the Nation's lands and resources. In developing, maintaining, and revising plans for units of the National Forest System, such plans shall provide for multiple use and sustained yield of products and services in accordance with the Multiple-Use Sustained-Yield Act of 1960, and, in particular, include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness.

Sensitive species policy: Sensitive species are protected and managed under the Regional Forester's sensitive species program through the Forest Service directives system. Species that are candidates for listing under the Endangered Species Act (i.e., warranted for listing but precluded by higher priority actions) ordinarily are identified and managed by the Forest Service as sensitive species.

6.5.3 Key indicators for analysis

To focus the analysis of effects of the alternatives, key indicators are identified for each species. Resource elements identify the limiting factors or habitat attributes known to be important to the species, and the measures further define how effects will be estimated.

6.5.4 Methodology and analysis process

The analysis of effects on wildlife includes those species that are listed or proposed as threatened or endangered species under the Endangered Species Act (including the grizzly bear), Regional Forester-designated sensitive wildlife species, and management indicator species identified in each

of the forest plans. The affected environment section briefly summarizes, for the NCDE as a whole, the status and trend of the each species, its life history attributes and habitat associations, and responses to human activities, based on a review of published literature, local data and other available scientific information.

The effects of the alternatives are analyzed separately for each of the national forests where the species is known or suspected to occur. Whether and to what degree implementation of the forest plan management direction would change the key indicators is estimated and described. The depth and detail of analysis is commensurate with the likelihood of occurrence of the species in the affected areas, the predicted response of the species to management activities, the magnitude of effects expected, and the degree of risk to the species.

The analysis of the indirect effects of implementing the forest plan generally considers the effects across each national forest as a whole. Cumulative effects are estimated based on the condition and trend of habitat for the species across all ownerships in the NCDE, as appropriate to the range of each species.

Past actions were considered in the descriptions of existing conditions. The analysis of indirect effects considers activities that may occur during the anticipated life of the plan, which is generally about 15 years after approval. Analysis of cumulative effects may extend beyond the life of the forest plan, because factors such as vegetation management, road management, and climate change have the potential to affect wildlife habitat for long time periods.

6.5.5 Grizzly bear

Key indicators for analysis

The draft NCDE grizzly bear conservation strategy (2013) identified six key habitat features and human activities relevant to management of NFS lands that have the greatest potential to impact grizzly bears. These are: (1) the amount and distribution of secure core, (2) motorized route densities, (3) developed recreation sites, (4) livestock allotments, (5) vegetation management, and (6) mineral and energy development. The analysis of effects of the alternatives (volume 1 for the Flathead National Forest and volume 3 for the other four forests and cumulative effects) is focused on these six aspects of grizzly bear habitat in the NCDE. Additionally, the framework of the grizzly bear management zones is designed to address grizzly bear-human conflicts and connectivity in the NCDE.

The key indicators and measures used to focus the effects analysis are summarized in table 4. The key indicators were developed after considering key stressors, public comments, and issues identified during scoping.

Table 4. Key indicators for assessing effects to grizzly bears

Resource Element	Measure
Grizzly bear secure core and motorized route densities – influence on habitat quality/availability in the primary conservation area	Percentage of each bear management unit subunit in secure core, percent with open motorized route density more than 1 mi/mi^2, and percent with total motorized route density more than 2 mi/mi^2. Potential impacts due to temporary reductions to allow for projects or administrative use

Resource Element	Measure
Motorized routes in zone 1 to support occupancy by female grizzly bears	Change in linear miles of roads open to public use during the non-denning season in zone 1 on NFS lands
Developed recreation sites - grizzly bear–human conflict potential in the primary conservation area	Number and capacity of sites with overnight use in the primary conservation area by national forest, and history of conflicts
Livestock grazing allotments - potential for conflicts or mortality risk	Number of cattle and sheep allotments and history of conflicts within primary conservation area, zone 1 and DCAs
Vegetation management – potential effects on habitat/bear foods and human-caused disturbance/ displacement	Plan components to minimize adverse effects in the primary conservation area, DCA, and zone 1
Oil, gas and mineral development - potential habitat loss, bear displacement, mortality risk, grizzly bear–human conflicts	Mineral withdrawals, number of leases, no-surface occupancy stipulations, potential for development in the PCA and zone 1
Grizzly bear attractants and mortality risk	Plan components that address food storage
Risk of disturbance of females with cubs in den emergence time period	Acres of denning habitat open to over-snow use during den emergence time period
Connectivity – female grizzly bear occupancy and population connectivity to Cabinet-Yaak and Bitterroot recovery zones	Change in permeability (linear road miles or road density) and mortality risk in DCAs
Connectivity – genetic interchange with the Greater Yellowstone Ecosystem	Plan components that provide for movement of male bears, focusing on the Blackfoot and Divide landscapes

Methodology and analysis process

All alternatives are designed to conserve the grizzly bear and provide the regulatory framework to support a recovered grizzly bear population in the NCDE, within the inherent capability of the plan area and U.S. Forest Service authority. The habitat-related information and recommendations provided in the draft NCDE Grizzly Bear Conservation Strategy (USFWS 2013) were considered in developing forest plan components and analyzing the effects of the alternatives. The Forest Service coordinated and consulted with the USFWS throughout the planning process and will continue to do so.

Information sources

Information on the amount and distribution of secure core habitat, motorized route densities, developed recreation sites, and livestock allotments was updated in 2014 by the NCDE geographic information system specialist, based upon input from multiple land managers within the NCDE. Some data have changed since publication of the draft grizzly bear conservation strategy due to better knowledge of on-the-ground conditions, correction or re-alignment of location data, etc.

Incomplete and unavailable information

The NCDE conservation strategy is currently in draft, but provides a compilation of the best available scientific information at this time. The final NCDE grizzly bear conservation strategy is expected to be published in time to be considered while completing the final environmental impact statement and Record of Decision.

The road inventory used for calculations of road miles and densities and secure core for grizzly bears is based upon the USFS INFRA database. The USFS does not have complete knowledge of its old

road system, whether culverts are in place on old roads, or of road systems on adjacent private lands. The Forest Service periodically updates the INFRA database as new aerial images and other data become available. Analysis is based upon the best available scientific information.

Spatial and temporal analysis

The analysis of indirect effects is focused on those portions of the national forest where grizzly bear habitat management direction would apply. This varies by alternative as follows.

- Under the no-action alternative (existing forest plan direction for each of the national forests), habitat management direction would be applied to the NCDE recovery zone within grizzly bear management units as defined in the 1993 Recovery Plan, and where applicable to specific management situations as defined in the 1986 Interagency Grizzly Bear Guidelines. The NCDE recovery zone is divided into 23 bear management units (figure 1-57), of which all but two contain NFS lands. Additional requirements from the forest plan or biological opinions may apply to areas outside the recovery zone where grizzly bears are present.
- Under the action alternatives, amended management direction would apply to NFS lands within a larger area than the recovery zone. This larger area was identified by the draft NCDE grizzly bear conservation strategy in recognition of the expansion of the bear population into areas outside the recovery zone, the attendant need to establish appropriate management direction in those areas, and the desirability of providing connectivity to grizzly bear populations in other recovery zones. The analysis area is divided into a primary conservation area (referred to as the NCDE recovery zone in the no-action alternative) and management zones 1 and 2 as defined in the draft NCDE grizzly bear conservation strategy.

The analysis area for grizzly bear cumulative effects encompasses the entire area defined in the draft grizzly bear conservation strategy (USFWS 2013) including zones providing connectivity to other grizzly bear ecosystems. This area includes parts of five national forests (Flathead, Helena, Kootenai, Lewis and Clark, and Lolo), Glacier National Park, Bureau of Land Management lands, parts of the Flathead and Blackfeet Indian Reservations, and state and private lands. The NCDE is contiguous to Canadian grizzly bear populations and habitat. NFS lands encompass more than 60 percent of the NCDE. Forest plan components such as standards and guidelines apply only to those lands and facilities under Forest Service jurisdiction. Grizzlies are a wide-ranging species and are affected by activities on private and other agency lands that can have substantial impacts on their survival and distribution.

Grizzly bears are expected to continue to be a “conservation-reliant” species in the NCDE (Scott et al. 2005), with the need to continue to coordinate management of the population across multiple land ownerships and jurisdictions. Therefore the analysis assumes that the amended management direction will remain in place throughout the life of the forest plans.

The temporal analysis considers indirect effects of activities that may occur during the anticipated life of the Plan, which is about 15 years. Past actions were considered in the description of the affected environment and existing conditions. Because certain USFS actions and environmental conditions have the potential to affect grizzly bears over longer time periods, cumulative effects are considered over a longer time period of several decades. When projections are made further into the future, the level of uncertainty for potential consequences rises.

Affected environment

Geographic distribution of the grizzly bear

Historically, grizzly bears were widely distributed across North America between the Great Plains and the Pacific Ocean, with a strong association with the Rocky Mountains, coastal mountains, shortgrass prairie, and sagebrush desert ecoregions (Mattson and Merrill 2002). The distribution of grizzly bears contracted dramatically following European and Asian settlement because of human-caused mortality, habitat loss, and population fragmentation (USFWS 1993, Mattson and Merrill 2002). Currently, grizzly bears exist primarily in the mountainous regions of western North America (Proctor et al. 2012).

In 1975, the grizzly bear was listed as a threatened species in the lower 48 states under the Endangered Species Act (USFWS 1993). In 2011, USFWS completed a 5-year status review, and estimated that the overall population size had increased to about 1,500 grizzly bears in the lower 48 States (USFWS (2011)). Grizzly bears exist in four identified recovery zones: Northern Continental Divide, Greater Yellowstone, Cabinet-Yaak and Selkirk Mountains. Of these, the Northern Continental Divide Ecosystem supports the largest population.

Grizzly bears are well distributed throughout the NCDE. In 2004, at least one female bear was detected in each of the 23 bear management units, and an additional 12 were detected outside the recovery zone (Kendall et al. 2009). Costello and others evaluated occupancy of the 23 bear management units in the NCDE by females with offspring during 2004–2014. Using the 6-year running tally as set forth in the Recovery Plan (USFWS (1993)), they documented full occupancy of the recovery zone starting in 2009 and continuing through 2014. In addition, using similar methods, they documented full occupancy throughout areas of Zone 1 (Costello et al. 2016 in press).

The overall distribution of grizzly bears currently encompasses 13.6 million acres, covering the entire recovery zone, most of zone 1, and parts of zones 2 and 3 (Costello et al. 2016 in press). Both males and females are becoming increasingly common along streams and in shrubby draws to the east of the recovery zone boundary along the Rocky Mountain Front. Three female grizzly bear dens have been documented in short-grass prairie habitat along the eastern front of the Rocky Mountains (Mace and Roberts (2014)). The distribution of grizzly bears (Mace and Roberts 2015) is shown in figure 1.

Within the NCDE, grizzly bear densities vary geographically, but generally decrease toward the south and on the periphery of the ecosystem (Kendall et al. 2009). This pattern is presumed to reflect in part environmental gradients across the NCDE that influence habitat productivity (i.e., food distribution and abundance).

Using genetic analysis, Kendall and others identified six subpopulations in the NCDE (Kendall et al. 2009). However, genetic differentiation values were generally low and few barriers to bear genetic exchange appear to exist within the NCDE. Overall, the NCDE population appears to be well connected to populations in Canada.

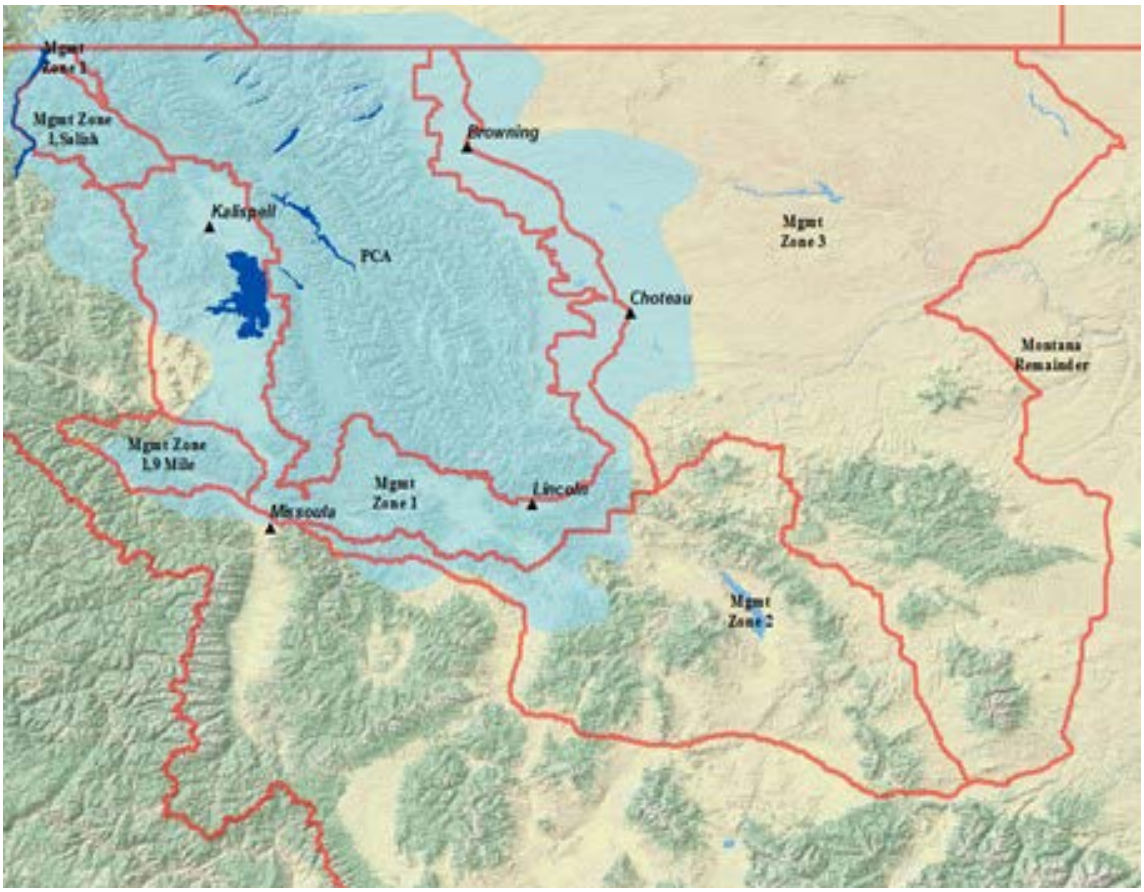

Figure 1. **NCDE grizzly bear distribution, both sexes (from Mace and Roberts 2015).**

Proctor and others (2012) used genetic data from 3,134 grizzly bears along with radiotelemetry location data from 792 grizzly bears across the distribution in western Canada and northern United States to assess large-scale movement patterns and genetic connectivity among bear populations. In the northern, more remote portion of their distribution in Canada, grizzly bear populations were found to be well-connected, with movement, dispersal, and gene flow influenced by distance and natural topographic features (e.g. extensive icefields), as would be expected. In contrast, in the southeastern part of their distribution, rates of movement and genetic interchange were impaired due to anthropogenic influences. Population fragmentation in these areas, as measured by genetic discontinuities, corresponded to human settlement, highways, and human-caused mortality.

Proctor and others (2012) further analyzed data from 1,508 bears to investigate sex-specific movement rates. Highway traffic, human settlement, and human-caused mortality influenced sex-specific movement rates between adjacent areas. Male and female bears both moved across areas with minimal human settlement (0 to 20 percent). Females sharply reduced their movement rates as traffic volume increased on highways and in areas where settlement increased to more than 20 percent. Males exhibited a more gradual reduction of movement as traffic and settlement increased. In areas where more than 50 percent of the land was settled, both sexes had a similar marked reduction in movements. Other researchers have also documented that adult grizzly bears, particularly females, are reluctant to cross high-speed, high-traffic volume highways (Gibeau et al. (2002)) (Waller and Servheen 2005).

Dispersal between disjunct populations can play an important role in the persistence of a species. Inter-population movements can reduce competition for resources and mates in the source population, increase genetic diversity in the receiving population, facilitate colonization and recolonization of unoccupied habitats, and augment the numbers of small populations (Dobson and Jones (1985), Hanski and Gilpin (1997) (Mattson and Merrill 2002)).

Grizzly bear dispersal distances are comparatively short relative to its body size and large home range size (Bowman et al. 2000). Young dispersing grizzly bears, especially females, tend to establish home ranges within or overlapping their mother's (Schwartz, Miller, and Haroldson 2003). McLellan and Hovey (2001) measured the distances between the home range center of a mother and those of her dispersed offspring (30 offspring, 12 females and 18 males) over 20 years. They reported that females dispersed, on average, 5.9 miles from their maternal home range, while males dispersed 17.9 miles. Using genetic analysis of 711 grizzlies in southwestern Canada, Proctor and others (2004) estimated that females, on average, dispersed 8.6 miles from the center of the natal home range; males on average dispersed 25 miles from a natal or maternal home range. The maximum dispersal distances estimated by Proctor et al. were about 47 miles for a female and 104 miles for a male. Because females disperse only short distances and their dispersal process is gradual, the female component of the bear population may be more susceptible to becoming isolated (McLellan and Hovey 2001).

Based on its large population size, increasing trend, and lack of genetic differentiation, the NCDE appears to be capable of serving as a source population for other grizzly bear populations in the contiguous United States (USFWS 2013). Without female connectivity, small populations are not viable over the long term. Demographic connectivity with the NCDE population may especially be important to support the threatened grizzly bear population in the Cabinet-Yaak ecosystem. The NCDE population also has the potential to be a source population for the Bitterroot potential recovery zone.

The Greater Yellowstone Ecosystem has a robust bear population, but there is a concern about a lack of genetic diversity due to its geographic isolation from other populations to the north. Because of this, the recovery plan (p. 56) estimated there will be a need for one male bear to move to the Greater Yellowstone from another recovery area every 10 years (USFWS 1993). Available information indicates that bears are moving south from the NCDE through the west side of the Helena National Forest, rather than through the Big Belts or Little Belts (see Mace and others (2015) for distribution of grizzly bears in the NCDE and Bjornlie and others (2014) for the Greater Yellowstone Ecosystem). The area identified as the "Expanded Grizzly Bear Distribution Zone" on the west side of the Helena National Forest includes a portion of the Blackfoot Landscape south of Highway 200 and all of the Continental Divide landscape (figure 1-58). The number of credible grizzly bear reports from this area has been increasing in recent years as the population in the NCDE increases and more bears are exploring new territory further to the south (Mace and Roberts 2012). DNA sampling has found that grizzlies as far south as the Anaconda Range have come from the NCDE (J. Jonkel pers. comm. 2007 in Pengeroth 2013). As of 2012, male grizzly bears were documented as far south as Butte, Montana (Mace and Roberts 2012).

Grizzly bear population size and trend in the NCDE

In 2004, a DNA-based mark-recapture study was conducted in a 7.8 million acre area of occupied grizzly bear range in and around the NCDE recovery zone. Extrapolating from the 563 individuals detected, the overall grizzly bear population in the NCDE was calculated to be 765 grizzly bears (Kendall et al. (2009)). Between 2004 and 2009, Mace and others radio-collared and monitored 83 different female grizzly bears in the NCDE, and calculated that the population was increasing at a

rate of 3.06 percent per year (95 percent confidence interval = 0.928–1.102) (Mace and Roberts 2012). Coupled with concurrent studies of population size, Mace and others (2012) estimated that more than 1,000 grizzly bears resided in and adjacent to the NCDE recovery zone in 2012.

As of 2014, the population estimate for the NCDE is 960 grizzly bears with an estimated population growth rate of 2.3 percent/year (Costello et al. 2016 in press). Costello's estimates differ slightly from Mace et al. (2012; table 5.1) including a slightly lower, but still positive, estimate of the annual rate of population growth ($\lambda = 1.023$) for the NCDE grizzly bear population (compared to $\lambda = 1.031$ in Mace et al. 2012). Costello and others stated: "we do not believe the observed difference in the two estimates is a result of actual population change. Our current models included a covariate for trend, and no negative trend was observed in any of the vital rates. Rather, we believe that the differences between Mace et al. (2012) and this report can be attributed to: (1) an increase in sample sizes for estimation of all vital rates; (2) better representation of conflict females in the estimation of vital rates; and (3) subtle but significant differences in methods of analysis".

Survival of adult and subadult females is thought to have the largest influence on grizzly bear population trend (Mace and Waller 1997). In the NCDE, human-caused mortality is the most significant factor influencing grizzly bear survival. Of 337 bear mortalities documented between 1998 and 2011, 290 (86 percent) were human-caused (Mace and Roberts 2012). Of the human-caused mortalities, the major causes were management removals (removed from the population due to conflicts with humans or property, 31 percent), illegal kills (21 percent), defense of life (15 percent), collisions with trains (11 percent) and collisions with automobiles (10 percent). Recognizing that management removals were documented with 100 percent accuracy, whereas other deaths often go unreported, Costello et al. (2016 in press) further analyzed the data to provide a corrected estimate of unreported mortalities. This revealed that poaching/malicious kills likely accounted for the highest proportion of total independent bear mortality (27 percent), followed by management removals (16 percent), illegal defense of property (11 percent), and natural causes (9 percent). The majority of management removals result from conflicts at sites associated with frequent or permanent human presence (USFWS 2013). Unsecured attractants on private lands such as chicken coops, garbage, human foods, pet/livestock foods, bird food, livestock carcasses, wildlife carcasses, barbeque grills, compost piles, orchard fruits, or vegetable gardens are usually the source of these conflicts. Despite these mortalities, the survival rate for adult females (the most important group affecting population trend), is high at 0.947, with a 95 percent confidence interval of 0.919–0.972 (Costello et al 2016 in press).

Legal hunting of grizzly bears has not occurred in Montana since 1991 (Pac and Dood 1998). Grizzly bears are occasionally killed by poachers, are mistakenly killed during the black bear hunting season, and are killed in self-defense (Costello et. al 2016 in press). MFWP instituted a mandatory black bear hunter testing and certification program to help educate hunters in distinguishing species and reducing grizzly bear mortalities due to mistaken identity.

Many factors have led to recovery of the grizzly bear. Habitat management on NFS lands, including motorized travel restrictions, improvements in securing food and other attractants, carefully designed habitat restoration, and use of prescribed and managed use fire have contributed to recovery. Based on data including the locations of grizzly bear observations, grizzly bear-human conflicts, bear mortalities, and DNA and telemetry research, it is clear that the NCDE grizzly bear population has been increasing and has expanded well beyond the recovery zone boundary (Mace and Roberts 2011).

Habitat in the NCDE

Grizzly bears use a wide variety of habitats, including open to forested, temperate through alpine habitats. The NCDE recovery zone includes about 5.7 million acres of land, of which about 60 percent is NFS lands. Using verified grizzly bear locations from 2000–2014 to create a current distribution map for the NCDE, Mace and Roberts (2014) estimated that bears are currently occupying an area of about 13.2 million acres, more than double the size of the recovery zone.

Grizzly bear populations persisted historically in areas with large expanses of habitat but no permanent human presence, and where the frequency of contact with humans was low (Mattson and Merrill 2002). Maintaining large blocks of secure habitat is important to the survival and reproductive success of grizzly bears, especially females (Mace et al. 1999) Schwartz et al. 2010), and is a major goal of the draft NCDE grizzly bear conservation strategy.

The NCDE contains large acreages of Congressionally-designated wilderness, totaling about 1.7 million acres within the recovery zone/primary conservation area (figure 1-59). The Wilderness Act of 1964 precludes road construction, motorized and mechanized uses, permanent human habitation, new livestock allotments, new mining claims, new oil and gas leases, or other developments that would impair the wilderness character of wilderness areas, except for those specifically allowed by the enabling legislation (e.g., Shaefer air strip). Wilderness areas provide a high degree of security for grizzly bears.

The NCDE also contains substantial acreage of inventoried roadless areas (figure 1-60). These roadless areas, as well as certain other lands that have little or no permanent human presence or road development, are distributed throughout the NCDE. Inventoried roadless areas contribute to secure habitat for grizzly bears.

Grizzly bears are large animals with high metabolic demands during the non-denning season. Adequate nutritional quality and quantity are important factors for successful reproduction. The search for energy-rich food appears to be a driving force in grizzly bear behavior and habitat selection. Bears are dependent upon learned food locations within their home ranges and can switch food habits according to which foods are available. Mattson et al. (1991) hypothesized that grizzly bears are always sampling new foods in small quantities so that they have alternative options in years when preferred foods are scarce.

The varying climate, topography, and vegetative conditions throughout the NCDE provide for a variety of habitats and foods for bears to consume during different seasons. During spring and early summer, before berry crops are available, grizzly bears in the NCDE eat roots/corms/bulbs and other vegetation (Aune and Kasworm 1989, McLellan and Hovey 1995). Grizzlies in the NCDE consume a wide variety of berries once they become available during the summer months (McLellan and Hovey 1995). During the summer, grizzly bears also may feed on concentrations of lady bird beetles and army cutworm moths on rocky talus slopes at high elevations (Mattson et al. 1991, Servheen 1983, Aune and Kasworm 1989). During late summer to fall, grizzly bears in the NCDE continue to eat berries but also consume more meat and roots/bulbs/corms (Aune and Kasworm 1989, McLellan and Hovey 1995). In the past, grizzlies were known to feed on whitebark pine nuts in the late summer to fall, particularly in the Whitefish Range and on the Rocky Mountain Front (Aune and Kasworm 1989, Kendall and Arno 1990). High infection rates and mortality of whitebark pine caused by white pine blister rust (Kendall and Keane 2001) have dramatically reduced or eliminated this food source for bears in the NCDE, although the bear population has been increasing despite the loss of this food source.

Teisberg and others studied grizzly bear population health and body condition, finding that adult females throughout the NCDE entered their dens with average fat levels above those thought to be critical for cub production. Bears on the southwestern, southern, and eastern periphery of the NCDE consumed a significantly higher proportion of meat in their diets than those in the interior or northwestern periphery. However, there was no evidence to indicate that the widely varying food resources across the NCDE are inadequate to meet the needs of reproductively-active adult females. As truly opportunistic omnivores, grizzly bears in all regions of the NCDE exploit diverse combinations of food items to arrive at productive body conditions (Teisberg et al. 2015).

Grizzly bears hibernate in dens during the winter months. Both males and females have a tendency to use the same general area to hibernate year after year, but the same den is rarely reused by an individual (Linnell et al. (2000)). Most grizzly bear dens in the NCDE are located at elevations above 6,400 feet (Mace and Waller 1997), with the average elevation somewhat higher on the Rocky Mountain Front (Aune 1994). The average elevation of 252 grizzly bear dens in the NCDE ranged from 6,427 to 6,906 feet (R. Mace unpublished data 2014, planning record exhibit V-21). It has been estimated that about 47 percent (1,647,863 acres) of National Forest System land in the primary conservation area provides potential denning habitat (R. Mace unpublished data 2014, planning record exhibit V-41). The availability of denning habitat is not likely to be a limiting factor for grizzly bears in this area (USFWS 2013).

On the west side of the NCDE, 52 separate females monitored during 1987–88 to 2012–13 entered their dens between the first week of October and the fourth week of November, with most occurring the fourth week of October; 72 females emerged in the spring between the third week of March and the fourth week of May, with most occurring during the second week of April (Mace and Roberts 2014). On the east side (Rocky Mountain Front), grizzlies (both male and female) entered dens between October 10 and December 5, with a median date of November 7; they emerged in the spring between March 10 and May 13, with a median date of April 7 (Aune 1994). Males typically enter dens later in the fall and emerge earlier in the spring than do females.

Grizzly bear response to human activities

Research has clearly demonstrated that the presence of roads and associated human activities impact grizzly bears by displacing them from important habitats and lowering their survival rates during the non-denning season (Mattson et al. 1987, (McLellan and Shackleton 1988), Mace et al. 1996, (Waller and Mace 1997), (Boulanger and Stenhouse 2014). Mace and Manley (1993) also showed that grizzly bears adjusted their habitat use patterns to both total road densities and open road densities, as well as the traffic levels on roads.

Research findings from the Swan Mountain Range of the Flathead National Forest have been used to evaluate the effects of motorized route density on grizzly bears in the NCDE since 1995. Mace et al. (1996) converted a linear road map to a total road density map using a 1 km^2 (0.39 mi^2) moving window analysis, and reported the following relationships to road density:

- Road density was lower within the composite of the multiannual home ranges of 14 adult and subadult female grizzly bears (0.6 km/km^2 or 0.95 mi/mi^2) than was road density outside the composite home range (1.1 km/km^2 or 1.7 mi/mi^2)
- As total road density increased, probability of selection by grizzly bears declined;
- 56 percent of the composite female home range was unroaded, compared to 30 percent outside the composite home range

- Within seasonal ranges, grizzly bears were more likely to use areas with higher road densities during spring than during other seasons
- Selection for habitats within a 0.3 mi buffer around roads decreased as traffic volume increased.

Based on these and related findings, Flathead National Forest Plan Amendment 19 established limits for total motorized route density (no more than 19 percent with density exceeding 2 mi/mi^2), open motorized route density (no more than 19 percent with density exceeding 1 mi/mi^2), and secure core (at least 68 percent) within each bear management unit subunit that has more than 75 percent NFS lands. In bear management unit subunits with less than 75 percent NFS lands, no net increase in total motorized route density (the percent of area with more than 2 mi/mi^2) or open motorized route density (the percent of area with more than 1 mi/mi^2) would be allowed, and no net decrease in the percentage of secure core in a subunit would be allowed.

The Interagency Grizzly Bear Committee's Access Task Force (Committee 1998) developed guidelines for the management of motorized routes in grizzly bear habitat. The access task force endorsed the basic premise of managing open and total route densities and secure core during the non-denning season as an effective strategy to support recovery of the species, although they noted that other strategies may also be effective. Under the alternatives being considered for the Flathead Forest Plan revision and the amendments of the Helena, Kootenai, Lewis and Clark, and Lolo National Forests, the moving window analysis method would continue to be used to calculate motorized route density and to assess the effects on grizzly bears in the primary conservation area.

Conservation of female grizzly bears is generally considered fundamental to increasing grizzly bear numbers (USFWS 1993, Mace and Waller 1997). The primary conservation area (same as the grizzly bear recovery zone) is intended to serve as a source area for grizzly bears. To analyze the effects of the alternatives in the primary conservation area, the moving window analysis method was used. The research findings described above provide a basis to evaluate the effects of motorized route density on grizzly bears. The moving window method has been used since 1995, enabling comparison of past, present, and reasonably foreseeable future effects.

Outside the primary conservation area, within Zone 1 and the demographic connectivity areas, the draft conservation strategy established a goal to maintain grizzly bear occupancy, but at a lower density than in the primary conservation area. In recognition of the differing grizzly bear management objectives for Zone 1 and the demographic connectivity areas, a different method for analyzing the effects of motorized use during the non-denning season was used. The analysis of effects on bears relied on recent work by Boulanger and Stenhouse (2014), who studied 142 grizzly bears monitored in Alberta from 1999-2012. They reported that survival rates of females with cubs of the year or yearlings were lower than for females without cubs or with two year olds in areas with higher road densities. Road densities less than or equal to 2.4 linear mi/mi^2 appeared to be a threshold for grizzly bear occupancy in Alberta. Bear mortality was reduced when road density was below 1.6 mi/mi^2, and areas with less than 1.2 mi/mi^2 were described as being capable of serving as core conservation areas. To estimate effects, the linear density of roads or routes (roads and trails) open to public motorized use in zone 1 and the demographic connectivity areas were compared to the Alberta threshold values.

The impacts of winter activities on denning bears are not well studied, but there is no evidence to indicate that current levels of snowmobile use are inhibiting the recovery of the grizzly bear population in the NCDE. Mace assessed the distribution of 252 known grizzly bear dens in the NCDE with respect to areas open to over-snow use or closed to over-snow use (project file exhibit V-45). No apparent avoidance by grizzly bears of areas open to over-snow use was found, with den

distribution similar to availability of habitat. In a review of the limited information available on black, brown (grizzly), and polar bears, Linnell and others (2000) reported that bears readily den within 0.6–1.2 mi of human activity (roads, habitations, industrial activity), and appear to be undisturbed by most activity that occurs at distances farther than 0.6 mi. They cautioned that human activity within 0.6 mi may lead to den abandonment, especially early in the denning season, which could cause cub mortality. However, anecdotal information indicates that snowmobile use at a known den site did not cause the bear to abandon its den (Hegg, Murphy, and Bjornlie (2010)) and monitoring of den occupancy for three years on the Gallatin National Forest in Montana did not document any den abandonment (Gallatin National Forest 2006). Litter abandonment by grizzlies due to snowmobiling activity has not been documented in the lower 48 States (Hegg et al. 2010), nor have adverse effects on bears from snowmobiles been substantiated (Mace and Waller (1997)).

However, bear research scientists and managers have suggested that in the period shortly before or after den emergence in the spring, a female with cubs may be particularly vulnerable to disturbance by snowmobiles. The cubs have limited mobility for several weeks after den emergence and the mothers and their cubs have high energetic needs (Haroldson et al. 2002, Mace and Waller 1997). Females with cubs have been documented to spend a few days to a few weeks near the den after emergence. During this time the bears were very lethargic and approachable. Disturbance that caused a female to prematurely leave the den in spring or move from the den area could impair the nutritional status of the female and her cubs. There is also the potential of separating a mother and cub, resulting in cub mortality. However, such effects have never been documented and there are no known scientific papers supporting this potential impact.

As described previously, Mace and Roberts (2014) reported that 72 females on the west side of the Continental Divide emerged in the spring between the third week of March and the fourth week of May, with most occurring during the second week of April. In three earlier grizzly bear denning studies conducted in the NCDE, the den emergence period was similar. The median date of exit on the east side of the Continental Divide was April 7 (Aune and Kasworm 1989); Apri1 14 in the Swan Mountains (Mace and Waller 1997); and in early April in the Mission and Rattlesnake Mountains (Servheen and Klaver 1983). Among the different age and sex classes, females with cubs entered their dens earlier and emerged later. After leaving the den site, grizzlies usually moved to lower elevation habitats such as riparian areas and avalanche chutes to forage during the spring (Mace and Waller 1997).

Developed recreation sites are sites or facilities on federal lands with features that are intended to accommodate public use and recreation. Examples include campgrounds, trailheads, rental cabins, fire lookouts, summer homes, and visitor centers. Developed recreation sites can impact bears through temporary or permanent habitat loss and displacement, but the primary concern is grizzly bear-human conflicts caused by unsecured bear attractants, habituation, and food conditioning, which could lead to grizzly bear mortality or removal from the ecosystem (Knight, Blanchard, and Eberhardt (1988)), Developed recreation sites that support overnight public use have a higher potential to increase both the levels of bear attractants and grizzly bear mortality risk. Grizzly bear-human conflicts have occurred at developed recreation sites on NFS lands, although efforts such as food storage orders, bear-resistant containers, and public education have been implemented to help reduce the risk of conflicts. Most of the grizzly bears killed or removed by management agencies in the NCDE in the past had been involved in conflicts related to unsecured attractants such as garbage, bird feeders, pet/livestock feed and human foods. Although the majority of these mortalities occurred on private lands, developed recreation sites on public lands in the primary conservation area remain of concern.

When the grizzly bear was listed in 1975, the USFWS identified "…livestock use of surrounding national forests" as detrimental to grizzly bears "…unless management measures favoring the species are enacted." (40 CFR 31734, p. 31734). Impacts to grizzly bears from livestock operations potentially include competition for preferred forage, displacement of bears due to livestock-related activity, and direct mortality due to control actions resulting from livestock depredation or learned use of bear attractants such as livestock carcasses and feed.

While grizzly bears frequently coexist with large livestock such as adult cattle without preying on them, when grizzly bears encounter smaller animals such as domestic sheep, domestic goats, calves or chickens, they will often attack and kill them (Knight and Judd 1983, Anderson et al. 2002). If repeated depredations occur, managers may relocate bears or remove them from the population. Thus, areas with small domestic livestock have the potential to become population sinks (Knight, Blanchard, and Mattson 1988). Because of the increased risk to grizzly bears posed by actions taken to protect sheep and other small livestock, the 1986 Interagency Grizzly Bear Guidelines emphasized the reduction of these types of allotments.

Approximately 7 percent of all human-caused grizzly bear mortalities in the NCDE between 1998 and 2011 were due to management removal actions associated with livestock depredations. In the NCDE, most livestock depredations by grizzly bears occur on sheep, but also on young cattle. Most livestock-related grizzly bear mortalities occur east of the Continental Divide, on private lands or on the Blackfeet Indian Reservation along the Rocky Mountain Front.

There are permitted grazing operations on NFS land for horses and mules in the NCDE, primarily associated with outfitter and guide operations or Forest Service administrative use. There is no evidence of conflicts with bears due to depredation, attractants, or forage competition related to horse and mule grazing permits. Honeybees, classified as livestock in Montana (MCA 15-24-921), can be attractants to some grizzly bears. Tools such as electric fencing have been and are being used effectively to reduce potential conflicts with beekeeping.

Vegetation management may alter the amount and arrangement of cover and forage, and can locally increase bear foods through improved growth of grasses, forbs and berry-producing shrubs (Zager et al. 1983). However, the roads and human activity associated with timber harvest can negatively affect grizzly bears by disturbing or displacing bears from habitat during logging activities and increasing mortality risk (Zager et al. 1983). Grizzly bears in the NCDE occupy numerous different habitat types, but generally prefer to forage in areas with some type of hiding cover nearby, particularly in daylight hours (Aune and Kasworm (1989) (Waller and Mace 1997). Waller (1992) reported that grizzly bears avoided lower elevation, more accessible harvested stands as well as stands less than 30–40 years old where the vegetation had not recovered enough to provide security cover.

Mineral and oil and gas development may potentially increase grizzly bear mortality risk from associated motorized use, habituation, and/or increased grizzly bear-human encounters and conflicts. Permanent habitat loss, habitat fragmentation, and displacement from habitat may also occur.

Mineral development refers to surface and underground hardrock mining and coal production, which is regulated by permits on NFS lands. There are no Plans of Operation or Notices of Intent to explore or operate any commercial mines inside the primary conservation area on NFS or Bureau of Land Management lands, except for the Cotter Mine on the Helena National Forest. The production of oil and natural gas is conducted through a leasing process. Of the 247 oil and gas leases inside the primary conservation area, nine lease holders have submitted Applications for Permit to Drill to the Bureau of Land Management, one of which is on private lands. There have been eleven Applications

for Permit to Drill submitted in zone 1, only three of which are on NFS lands. The Applications for Permit to Drill include surface use plans of operation, which will require evaluation and analysis in compliance with the National Environmental Policy Act.

Improperly stored garbage, livestock and pet foods pose a significant risk of habituating bears to human presence and/or conditioning grizzly bears to seek out anthropogenic foods and attractants. Food-conditioned grizzly bears have learned to enter unsecured garbage receptacles, sheds and other buildings in search of a food reward. Food-conditioning and accessibility of attractants often leads to mortality of the grizzly bear by management removal or by people defending their life or property. Bears are particularly susceptible to anthropogenic foods and attractants during years of poor natural food production, such as a berry crop failure. Measures that make food, garbage and livestock carcasses inaccessible through proper storage or disposal are very effective in reducing grizzly bear-human conflicts and the potential for injuries or mortalities.

More than 17 percent of the NCDE is private land, and the majority of grizzly bear-human conflicts and bear deaths have occurred on private lands in rural roaded areas (Mace et al. 1996). These conflicts often involved bears that were food-conditioned or habituated to human presence. Nearly 60 percent of management removals resulted from conflicts caused by unsecured food, garbage, pet and livestock foods, carcasses, orchard fruits, vegetable gardens, etc. that attracted bears into proximity of humans.

Efforts by the Forest Service to keep human food, garbage and other attractants unavailable to bears are ongoing. A food storage order was first issued for the Bob Marshall wilderness complex in 1998. Food storage orders have been supplemented or updated since then on the Flathead, Helena, Lewis and Clark, and Lolo National Forests. This has included extending food storage orders as the grizzly bear population has expanded outside the recovery zone, to prevent or minimize grizzly bear–human conflicts. Forest-wide food storage orders were issued by the Lolo National Forest in 2011. The Kootenai National Forest also implemented a forestwide food storage order in 2011, covering lands within both the NCDE and the Cabinet-Yaak recovery zones. A summary of food storage orders that are currently in effect on NFS lands throughout the NCDE are shown in table 5. These food storage orders apply only to the national forests and do not address food storage on adjacent lands that are under other ownerships.

Table 5. Current food storage orders on NFS lands in the NCDE

National Forest	Year	Area to which the Food Storage Order is Applicable
Flathead	2010 and 2011	Lands within the NCDE as well as Tally Lake Ranger District and the Island Unit of the Swan Lake Ranger District
Helena	2005 and 2010	Lincoln Ranger District (the 2005 order applies to lands south of Highway 200; the 2010 order (which replaced the previous 2000 order) applies north of Highway 200)
Kootenai	2011	Forestwide, both NCDE and Cabinet-Yaak recovery zones
Lewis and Clark	2010	Lands within the NCDE (Rocky Mountain Division)
Lolo	2011	Forestwide (supersedes the 2010 order)

Environmental consequences

Effects common to all alternatives

Congressionally-designated wilderness comprises about 30 percent (1.7 million acres) of the NCDE recovery zone/primary conservation area (see figure 1-59). The Wilderness Act of 1964 defined wilderness as "an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." No road construction, mechanized activities, permanent human habitation, or construction of developed recreation sites are allowed within designated wilderness. The Wilderness Act allows livestock allotments that pre-dated passage of the Wilderness Act and mining claims staked before January 1, 1984, to persist within wilderness areas, but no new grazing permits or mining claims are allowed. If pre-existing mining claims are pursued, the plans of operation are subject to validity examination. Wilderness areas are considered long-term secure habitat for grizzly bears (USFWS 2011).

Wilderness study areas are identified by Congress or in the forest plans. These are areas that meet the criteria for wilderness designation, and are managed in a manner that does not impair their wilderness character until such time as Congressional action is completed. Wilderness study areas are assumed to provide secure core for grizzly bears. Within the primary conservation area is the 34,000-acre Ten Lakes Wilderness Study Area.

Inventoried roadless areas are managed in accordance with the 2001 Roadless Area Conservation Rule (36 CFR 294 Subpart B). The roadless rule established prohibitions on road construction, road reconstruction, and timber harvesting within inventoried roadless areas on NFS lands, with limited exceptions. Motorized uses that do not require roads are not prohibited. Unless withdrawn from mineral entry, roads could be constructed if required for locatable mineral exploration or development. Most inventoried roadless areas will contribute secure core habitat for grizzly bears, and this would not change under any of the alternatives.

Indirect effects of the alternatives – Helena National Forest

Alternative 1 — no action, Helena National Forest

Under the no-action alternative, the Interagency Grizzly Bear Guidelines (1986) would continue to be applied to the portion of the Helena National Forest located within the NCDE recovery zone. The Helena National Forest has a small proportion of land within the recovery zone, comprising only 183,758 acres (about 3 percent of the recovery zone). Three subunits within the Monture Landers Fork bear management unit occur on the Helena National Forest (figure 1-61).

The Interagency Grizzly Bear Guidelines were designed to maintain and improve habitat, minimize grizzly bear-human conflict potential, and resolve grizzly bear-human conflicts, in coordination with various resource management programs. The Interagency Grizzly Bear Guidelines give the most stringent protection to grizzly bear habitat in management situation 1, where grizzly bear population centers occur. The guidelines for management situations 2 and 3 are less stringent than those in management situation 1, in order to facilitate management of other resources. On the Helena National Forest, about 63 percent of the acres within the recovery zone are designated as

management situation 1, with about 37 percent designated as management situation 2 (Helena Forest Plan appendix D).

Under the Helena Forest Plan, the management of grizzly bears outside the recovery zone is addressed in the Forest Plan, appendix E. The appendix provides guidance for identifying grizzly bear habitat that is not currently inventoried and for determining levels of bear activity. Management guidance applies to areas of known grizzly bear activity (observations in 6 out of the last 10 years, including observations of females with cubs or yearlings at least 5 of the 10 years). The Forest would continue to follow the direction in Helena Forest Plan appendix E under this alternative.

Food storage orders are in place on the Lincoln Ranger District, both for the northern portion that is within the NCDE recovery zone and for the southern portion of the Blackfoot landscape. There is no food storage order for the remainder of the "expanded grizzly bear distribution zone", but forest staff would continue to educate users about proper food and attractant storage in that area.

Motorized route density and secure core inside the NCDE recovery zone
Under the no-action alternative, the Forest Service would continue to implement the standard limiting open road density in management situations 1 and 2 to less than or equal to 0.55 mi/mi^2, to minimize human-caused grizzly bear mortality.

The Helena National Forest Plan did not establish levels for open motorized route density, total motorized route density and secure core. In 2006, Endangered Species Act section 7 consultation was reinitiated to evaluate the effects of continued implementation of the forest plan. In the resulting biological opinion, USFWS required that no net increase in open and total motorized route densities and no net decrease in security core be allowed within the three grizzly bear subunits on the Helena National Forest. Additionally, some changes were mandated for the Red Mountain subunit. It is expected that these mandatory terms and conditions would remain in place under this alternative. As of 2014, the open motorized route density (percent of area >1 mi/mi^2), total motorized route density (percent of area >2 mi/mi^2) and percent secure core are shown in table 6.

One of the three bear management unit subunits, Alice Creek, is composed of less than 75 percent NFS lands. The Alice Creek subunit includes 6,240 acres acquired in 2006 and 2011 from The Nature Conservancy, previously owned by Plum Creek Timber Company. The Blackfoot non-winter travel plan decision will update the baseline for the Alice Creek subunit to recognize the incorporation of these lands.

The levels of open and total route density and secure core in the Arrastra Mountain subunit were generally considered to be acceptable in the 2006 biological opinion. The Blackfoot non-winter travel plan is in preparation and is evaluating a reduction in the total motorized route density (percentage of area with more than 2 mi/mi^2) in the Arrastra Mountain subunit, which would improve habitat conditions for the grizzly bear.

The Red Mountain subunit meets the forest plan standard that requires no more than 0.55 mi/mi^2 of open roads in management situations 1 and 2 (Forest Plan page II-19). The 2006 biological opinion on the forest plan specified that, through the travel planning process, the Red Mountain subunit was to be brought to open motorized route density less than or equal to 22 percent and security core greater than or equal to 68 percent within 5 years. That level has not been achieved. The Blackfoot non-winter travel plan is in preparation and is evaluating reduction of open motorized route density and total motorized route density, and an increase in secure core in the Red Mountain subunit. Existing road densities are likely having adverse effects on a few individual bears in this area.

Table 6. Baseline levels for motorized route density and secure core by bear management unit subunits on the Helena National Forest under alternative 1. Source: 2014 travel plan revised BA

BMU Subunit	≥75% NFS lands	OMRD (% of area >1 mi/mi^2)	TMRD (% of area >2 mi/mi^2)	Secure Core (% of area)
Alice Creek	no	10	18	70
Arrastra Mountain	yes	19	21	72
Red Mountain	yes	26	25	56

BMU = bear management unit
OMRD = open motorized route density; TMRD = total motorized route density

Other direction related to motorized routes that directly or indirectly benefits the grizzly bear would continue to be implemented. For example, forest-wide standards that are directed at maintaining or improving seasonal habitat or security areas for big game species (such as elk) would remain in place, and would help to minimize the effects of open roads on grizzly bears.

Overall, implementation of the forest plan direction pertaining to motorized routes, along with the requirements of biological opinions and incidental take statements, have contributed to reducing mortality risk and maintaining or improving habitat conditions for the grizzly bear within the recovery zone. Some impacts would continue to occur in the form of disturbance/displacement of individual bears, particularly in the Red Mountain subunit where the motorized access density is higher than in the other subunits, but these effects would likely be minor. The forest plan itself does not address open motorized route density, total motorized route density and secure core, which are now known to be important to grizzly bear conservation in the recovery zone, so this deficiency has been addressed through Endangered Species Act Section 7 consultations. It is assumed that because the forest plan does not provide the needed regulatory mechanisms to support delisting, the grizzly bear would remain listed under the Endangered Species Act and the requirements of the biological opinions would remain in place under this alternative.

Motorized route density outside the NCDE recovery zone
The current known distribution of grizzly bears outside of the NCDE recovery zone includes the area south of Highway 200 in the Upper Blackfoot and Divide landscapes (see figure 1). There are approximately 354,600 acres that are outside of the recovery zone, but within the “expanded grizzly bear distribution zone” as shown in figure 1-58 (152,000 acres in the upper Blackfoot landscape and 202,600 acres in the Divide landscape). Grizzly bears are known to occur at low density throughout much of the expanded distribution zone.

There are no forest plan road density standards applicable to the expanded grizzly bear distribution zone, except for those addressing elk during the hunting season. The level of road development and use largely has been based on the objectives, desired conditions, standards and guidelines established under the forest plan for individual management areas. In the 2013 biological assessment, a rough estimate of the relative level of expected road use was inferred from the goals, objectives, and standards of the each management areas. Management area R-1, which comprises about 16,000 acres (5 percent), is allocated for non-motorized uses, so road density is assumed to be zero. Management Areas M-1 (uneconomical/ unfeasible), P-3 (Electric Peak Roadless Area), W-1 (wildlife habitat) and W-2 (wildlife/big game habitat), which together comprise about 120,600 acres (35 percent), are expected to have low road densities currently and little or no road development planned. Moderate road densities are expected in management areas H-1 and H-2 (Tenmile municipal watershed), as well as L-1(livestock grazing) and L-2 (livestock grazing and elk habitat), which altogether comprise

about 42,500 acres (12 percent). Relatively high road densities are expected in the 166,500 acres (48 percent) that are within management areas T-1, T-3, T-4, and T-5 (productive timberlands).

In its 2006 biological opinion, USFWS required the Forest Service to consult if a net increase in permanent system roads should exceed 4 linear miles during the subsequent 5-year period in the area outside of the recovery zone but within the Lincoln Ranger District. In its 2014 biological opinion, USFWS again included a requirement concerning permanent roads: that the Forest Service consult if a net increase in permanent system roads should exceed 5 linear miles during the subsequent 10-year period in the Divide landscape, and if a net increase in temporary roads should exceed 30 miles over the next 10 years in the Divide landscape.

Under the 2016 decision on the Divide Travel Plan, the function of a number of existing roads would shift (closing some, converting others to motor trails) but no construction of any new permanent roads will be authorized. Overall, the motor trail system in the Divide Travel Plan Area will increase by 45 miles, from 20 miles to 65 miles. Roads open to full-sized vehicles, however, will decrease by 156 miles, from 415 miles to 259 miles. The result will be a net decrease of 129 miles in motor routes open to vehicle use during the grizzly bear non-denning period. This complies with the terms and conditions of the 2014 incidental take statement, which is assumed to remain in place for the life of the forest plan under the no action alternative.

Motorized over-snow vehicles use during the den emergence period
Within NFS lands in the Monture Landers Fork bear management unit, there are 63,322 acres of modeled denning habitat (planning record exhibit V-41). About 64 percent of the modeled denning habitat occurs within the Scapegoat Wilderness where motorized use is prohibited. About 89 percent of all denning habitat is within designated wilderness or other areas that would remain closed to motorized over-snow vehicle use.

Under the Blackfoot winter travel decision, the season ending date for the Copper Bowls extended use area was set as May 31. The season ending date for the remainder of the designated motorized over-snow vehicle winter use areas and trails within the recovery zone is March 31. By implementing a March 31 closure date, with the exception of the Copper Bowls, there is very little potential for motorized over-snow vehicle use to overlap with den emergence of grizzly bears. In the Copper Bowls play area, the amount of modeled denning habitat (approximately 3,233 acres) as well as foraging habitat is limited due to the rock slopes at the head of the drainage. Any impacts to grizzly bears within the recovery zone during the den emergence period are expected to be minor under this alternative.

Outside the recovery zone, the Blackfoot winter travel analysis (2009) identified 99,413 of modeled denning habitat on NFS lands. Of this, 36,091 acres are within the expanded grizzly bear distribution zone in the upper Blackfoot landscape. Under the winter travel plan, 79 percent of the modeled denning habitat is closed to motorized over-snow vehicle use and 21 percent is open to motorized over-snow vehicle use. The ending date for motorized over-snow vehicle use outside the recovery zone is April 15. Over-snow vehicle use south of Highway 200 generally is minimal by April, due to poor snow conditions and limited access on lower elevation lands.

Grizzly bears continue to range southward from the recovery zone, although they are relatively scarce in the Divide landscape (Helena National Forest, Divide travel plan BA 2015). During the winter of 2008/2009, a female grizzly fitted with a radio collar by Montana Fish, Wildlife and Parks denned south of Highway 200. This was the first time that a grizzly bear den had been documented on the Helena National Forest outside of the NCDE recovery zone. There are relatively few verified occurrences of grizzly bears south of highway 12, although there are five reports since 1991of a sow

with cubs in that area. Thus, there is a potential for adverse effects to grizzly bears during the den emergence period under this alternative, although the likelihood of this occurring is low.

Developed recreation sites
Developed recreation sites are of concern because frequent or prolonged human occupancy may result in increased bear attractants, increasing the risk of grizzly bear-human conflicts or grizzly bear mortality. Under the existing Helena Forest Plan, there is a forest-wide standard stating that new campgrounds and other developed recreation facilities, such as boat ramps or picnic areas, will generally not be constructed. Existing developed recreation sites will be maintained, but emphasis instead is given to providing dispersed recreation opportunities.

Within the recovery zone, the Helena National Forest has one bear management unit, Monture Landers Fork, with three subunits. There is no history of grizzly bear mortalities associated with developed recreation sites on the Helena National Forest.

In the grizzly bear distribution zone outside the recovery area, there are no developed recreation sites and it is unlikely that new developments designed and managed for overnight use would be constructed under the no action alternative.

Given the relatively small number and size of developed recreation sites in the primary conservation area on the Helena National Forest, the forest plan direction that new developments generally will not be constructed, and the lack of history of conflicts, the risk of mortality for grizzly bears would be low under this alternative.

Livestock allotments
Within the recovery zone, only one sheep allotment remains on the Helena National Forest. There are also two cattle allotments within the recovery zone. The sheep are closely managed on this allotment. No grizzly bear mortalities have occurred on the forest as a result of sheep or cattle grazing. Four mortalities and one bear relocation have occurred as a result of livestock depredations that occurred on private land in the Lincoln area.

In the expanded grizzly bear distribution area outside the recovery zone, two additional sheep allotments are active, along with 30 cattle allotments (9 in the Upper Blackfoot and 21 in the Divide landscape). There have been no reported bear mortalities or management actions towards grizzly bears associated with livestock on NFS lands. Off of the national forest, grizzly bear mortality associated with livestock depredation has occurred in the expanded distribution zone.

Under the no-action alternative, within the recovery zone a number of regulations and practices related to livestock allotments have been and would continue to be implemented to minimize grizzly bear-livestock and related grizzly bear-human conflicts on NFS lands. These include but are not limited to:

- Use of the Interagency Grizzly Bear Guidelines to reduce livestock impacts to important grizzly bear habitats and protect food production areas (wet alpine and subalpine meadows, stream bottoms, aspen groves and other riparian areas).
- Use of the Interagency Grizzly Bear Guidelines for management of grizzly bear-livestock conflict situations.
- Provisions in grazing permits providing for the cancellation, suspension, or temporary cessation of activities if needed to resolve a grizzly conflict situation.

- Reduction of the number of open and active sheep grazing allotments when opportunities arise with willing permittees.
- Reduction in the potential for grizzly bear-human conflicts due to livestock food, carcasses, and poor or inadequate livestock management practices through implementation and enforcement of Attractant Storage rules, which require bear-resistant storage of all livestock food and reporting of all livestock carcasses within 24 hours of discovery.

In addition, the 2014 biological opinion and incidental take statement includes the following mandatory terms and conditions:

- Allow no new sheep allotments on the Forest within the NCDE recovery zone.
- Include a provision in all grazing permits that occur within the recovery zone and distribution area requiring the permittee to notify the Forest of any grizzly bear depredation on livestock or conflicts between grizzly bears and livestock, even if the conflict did not result in the loss of livestock within 24 hours of discovery. The Forest shall work with Montana Fish, Wildlife and Parks and Wildlife Control personnel to determine the appropriate action.
- Include a provision in all grazing permits that occur within the recovery zone and distribution area requiring the permittee to notify the Forest Service of any livestock losses, regardless of the cause, within 24 hours of discovery. Agency personnel and the permittee would then jointly determine how to properly treat or dispose of livestock carcasses so as to eliminate any potential attractant for bears.

Under the no-action alternative, current levels of grazing intensity are not expected to displace grizzly bears or to negatively impact important bear food production areas. Based on the lack of history of conflicts, the mortality risk associated with livestock grazing on the Helena National Forest is moderate to low. Continued implementation of management direction under the no-action alternative regarding livestock grazing is expected to be compatible with sustaining a recovered population of grizzly bears in the NCDE.

Vegetation management
The forest would continue to follow the Interagency Grizzly Bear Committee vegetation management guidelines in management situations 1 and 2 grizzly bear habitat. These guidelines specify that measures that maintain, and/or improve grizzly bear habitat and populations will be specified in project design. A summary of the Interagency Grizzly Bear Guidelines for timber and fire management include:

- All proposed logging and burning activities will be evaluated for their effects on grizzlies and their habitat.
    - Logging and burning activities will occur at a time or season when the area is of little or no biological importance to the bear.
    - Grizzly bear habitat will be improved through vegetation manipulation.
- Habitat management in forested cover should provide a balance of all successional stages.
- Roads used for timber sale purposes will be single purpose roads only, and will be closed to public use not associated with timber sale operation and administration.
- Desirable clearcut features include: (1) one or more leave or cover patches in cuts over 10 acres (2) minimum soil scarification where soil disturbance impedes the reestablishment of grizzly

foods (3) slash disposal by spring broadcast burning (4) protection of hydric stream bottoms, wet meadows, marshes and bogs from soil disturbance and security cover removal.

- Prescribed burning in habitat types that are not managed for timber production could be used to approximate a natural fire frequency in order to promote berry-producing shrubs.

The vegetation management guidelines would provide for diverse cover and forage conditions and would reduce the potential for grizzly bear displacement through timing of timber sale activities. Although there may be short-term impacts to individual bears from timber management activities and associated road use, these impacts have been and would continue to be managed acceptably by applying the Interagency Grizzly Bear Guidelines on the Helena National Forest.

Mineral and oil and gas development
The only commercial mining rights within the recovery zone on Forest Service or Bureau of Land Management managed lands are for the Cotter Mine on the Helena National Forest. There is no activity occurring at the site.

All NFS lands are available for the staking of claims for locatable minerals under the general mining law, unless withdrawn from mineral entry by an act of Congress or through the withdrawal process under the Federal Lands Policy and Management Act. As part of the Rocky Mountain Front Mineral Withdrawal, the Secretary of the Interior withdrew acres open to the staking of claims for locatable minerals, including a withdrawal area on the Lincoln Ranger District known as Alice Creek/Indian Meadows, totaling 26,589 acres (see Forest Plan Amendment 19). These lands were withdrawn for 20 years and the withdrawal could be extended for another 20 years. Under this alternative, the withdrawal would continue to protect grizzly bear habitat values and minimize the potential for grizzly bear disturbance/displacement in the withdrawal area over the life of the plan.

Oil and gas leasing would continue to have a stipulation requiring no surface occupancy in management situation 1 grizzly bear habitat under this alternative. No surface occupancy would also be applied to overlapping occupied denning and summer habitat in management situation 2. Timing restrictions may be applied in management situation 2 to denning areas, spring habitat, or summer areas, as described in amendment 13. With a no surface occupancy stipulation, access to oil and gas deposits would require horizontal drilling from outside the boundaries of the no surface occupancy areas. This prevents the loss of grizzly bear habitat and limits the potential for habituation or disturbance/displacement of bears.

Genetic interchange
The existing Helena Forest Plan does not provide specific management direction to provide for bear movement that would support genetic interchange with the Greater Yellowstone Ecosystem. Nevertheless, in recent years the number of credible grizzly bear reports in the grizzly bear distribution area, which includes a portion of the Blackfoot landscape south of Highway 200 and all of the Divide landscape (), has been increasing as the population in the NCDE increases and more bears are exploring new territory further to the south (Mace and Roberts 2012).

The Montana Highway 200 corridor through the Lincoln Ranger District, including private lands adjacent to Montana Highway 200, represents an area of potential fragmentation that could affect genetic interchange with the Greater Yellowstone Ecosystem grizzly bear population. Rural residences, open roads, motor trails, developed recreation facilities, livestock grazing, mining operations and other human activities are spread throughout the southern portion of the Divide landscape, which is displayed in the biological assessment for grizzly bears on the west side of the Helena National Forest (Pengeroth 2013), although ample portions of it are unroaded or lightly roaded. For the purpose of analyzing road density, the 317 mi^2 Divide landscape was split into 13

management areas, all of which had road densities averaging less than 2.0 mi/mi^2 as of 2012. On National Forest System lands, the existing density of open roads and motorized trails is less than 1.5 mi/mi^2 (see planning record exhibit V-35). This density is expected to suffice to permit the movement of grizzly bears (Boulanger and Stenhouse 2014). As of 2012, no new roads had been constructed by the Forest Service in the Divide Landscape in the previous 10 years, and 23 miles were decommissioned in the previous 4 years.

Continued implementation of the Helena Forest Plan is likely to provide habitat conditions that would support movement of dispersing bears, particularly male bears, to the adjoining Beaverhead-Deerlodge National Forest, where the forest plan also limits road densities to a level that will support bear movement.

Summary and conclusion for alternative 1

The existing Helena Forest Plan, which incorporated the Interagency Grizzly Bear Guidelines, together with food storage orders on the Lincoln Ranger District, and biological opinions that provided mandatory terms and conditions to avoid or minimize incidental take, have been effective in reducing the potential for grizzly bear-human conflicts and grizzly bear mortality and have contributed to the improved status of the NCDE grizzly bear population. The food storage orders do not cover the remainder of the “expanded grizzly bear distribution zone” but forest staff would continue to educate users about proper food and attractant storage in that area. Some minor effects to individual bears would be anticipated as a result of forest management actions under this alternative, but continued implementation of the no-action alternative would be compatible with contributing to a recovered grizzly bear population. However, because the existing forest plan does not contain the standards that are needed to manage motorized access in the grizzly bear recovery zone, it does not provide the regulatory mechanisms and assurances needed to support de-listing of the NCDE population. Neither does the plan provide specific management direction for areas outside the recovery zone that are now occupied by bears. Grizzly bears in the distribution zone would potentially be exposed to higher mortality risk as compared to the other alternatives. It is expected that under this alternative, the grizzly bear would remain listed in the NCDE and continue to be managed in accordance with requirements of USFWS’ biological opinions and incidental take statements.

Alternative 2 — proposed action modified, Helena National Forest

Under this alternative, specific reference to the Interagency Grizzly Bear Guidelines, including the delineation of management situations, would be removed from the forest plan. However, much of the existing forest plan management direction that is based on the Interagency Grizzly Bear Guidelines would be retained as shown in appendix 7. Additional desired conditions, standards and guidelines, and monitoring items would be added as recommended in the draft grizzly bear conservation strategy.

The Helena National Forest contains land within the primary conservation area (representing about 3 percent of the total), zone 1 (representing about 3 percent of the total), zone 2 (about 14 percent of the total) and zone 3 (less than 1 percent) (figure 1-62). Habitat management on federal lands in the primary conservation area would be designed to maintain or improve habitat conditions compared to baseline conditions, while allowing resource management activities to continue. Less stringent protection would be applied in zone 1 than in the primary conservation area. A standard requiring a food storage order would include the primary conservation area, zone 1 and zone 2. No additional habitat protections would be required in zone 2 or zone 3.

Motorized route density and secure core in the primary conservation area
Under the proposed action, a forest plan standard (NCDE-STD-AR-02) would be added for the primary conservation area that requires no net increase from the baseline for total motorized route density and open motorized route density within bear management unit subunits, and no net decrease from the baseline for the percent of secure core in bear management unit subunits. No further reductions of open motorized route density, total motorized route density or increase in secure core would be required under this alternative. In contrast to the no-action alternative, the secure core definition used in the draft NCDE grizzly bear conservation strategy and the proposed action does not include high intensity use non-motorized trails. Because of the change in procedures, the baseline levels differ slightly under the action alternatives, as shown in table 7.

Table 7. Baseline levels for motorized route density and secure core by bear management unit subunits on the Helena National Forest under alternatives 2 and 3. Source: NCDE 2013 monitoring report.

BMU Subunit	≥75% NFS lands	OMRD (% of area >1 mi/mi^2)	TMRD (% of area >2 mi/mi^2)	Secure Core (% of area)
Alice Creek	no	10	17	71
Arrastra Mountain	yes	17	19	74
Red Mountain	yes	24	21	61

BMU = bear management unit
OMRD = open motorized route density; TMRD = total motorized route density

Several studies have documented displacement of individual grizzly bears from non-motorized trails to varying degrees (Jope 1985, (McLellan and Shackleton 1988) Kasworm and Manley 1990, (Mace and Waller 1996) White et al. 1999). However, none of these studies documented increased mortality risk from foot or horse trails or population level impacts due to displacement. For example, while Mace and Waller found that grizzly bears were located further than expected (i.e., displaced) from high-use trails (90 visitors/day) in the Swan Mountains, they reported there were no historic or recent records of grizzly bear-human conflict in their study area (Mace and Waller 1996). Similarly, while some grizzly bears in Glacier National Park were displaced to some degree by non-motorized trails (Jope 1985, White et al. 1999), conflicts and grizzly bear mortalities there are rare and are related almost exclusively to campgrounds and other developed human-use areas. Furthermore, there are no clear methods or criteria to accurately measure and identify “high intensity use” trails, which resulted in data inconsistencies. The lack of demonstrable effects and the difficulty of distinguishing “high intensity use” non-motorized trails led to the decision by the conservation strategy team to eliminate this from the definition of secure core. The resulting change in the baseline does not represent a discernible change in effects to grizzly bears.

Other standards would establish consistent definitions and procedures for managing administrative use (NCDE-STD-AR-01), temporary changes during project activities (NCDE-STD-AR-03 and NCDE-GDL-AR-02), and short-term public use (NCDE-STD-AR-04). Under this alternative, a set of standards and guidelines for motorized access that are consistent across the NCDE would be formalized in the forest plan, rather than being requirements of a biological opinion and incidental take statement. The amended forest plan direction would provide the needed regulatory mechanisms at such time as the grizzly bear is de-listed and no longer protected under the Endangered Species Act.

Motorized route density in zones 1, 2 and 3
In zone 1 on the Helena National Forest (see figure 1-62), standard NCDE-HNF Zone 1-STD-01 would be added. This standard would require no net increase in miles of roads open to public

motorized use on NFS lands above the baseline. The intent is to provide for continual occupancy by grizzly bears in zone 1, but at expected lower densities than in the primary conservation area located to the north, by maintaining the conditions that have been compatible with a stable to increasing grizzly bear population.

No additional management direction regarding motorized routes would be required for zones 2 or 3. Existing Helena Forest Plan management direction, which describes the objectives, desired conditions, standards and guidelines for individual management areas, would continue to be applied.

Motorized over-snow vehicles use during the den emergence period
The proposed action would not add any forest plan direction specific to motorized over-snow vehicle use. Existing forest plan direction would continue to be followed, with the same effects as under the no-action alternative.

Developed recreation sites
Under this alternative, there would be a limit of one increase in the number or the overnight capacity of developed recreation sites designed and managed for overnight use per bear management unit/decade on NFS lands in the primary conservation area. (This limit would not apply to the "expanded grizzly bear distribution zone".) The existing Helena Forest Plan standard stating that new campgrounds and other developed recreation facilities, such as boat ramps or picnic areas, will generally not be constructed, would remain in place under this alternative.

The risk of mortality for grizzly bears would be low under this alternative (about the same as under the no-action alternative) because of the relatively small number and size of developed recreation sites on the Helena National Forest (table 31), because of the forest plan direction that new developments generally will not be constructed, and because there have been few grizzly bear-human conflicts associated with developed recreation sites on the national forest.

Livestock allotments
Existing forest plan direction to reduce livestock impacts and to minimize grizzly bear-livestock conflicts on NFS lands in the primary conservation area would be retained. Additional standards and guidelines applicable to the primary conservation area would be added as shown in appendix 6 of this DEIS. These include a requirement that new permits incorporate measures to reduce the risk of grizzly bear-human conflicts. Livestock carcasses must be reported within 24 hours. No increase in the number of cattle allotments, or in the number of sheep allotments or permitted sheep animal unit months would be allowed. To reduce the potential risk of grizzly bear-human conflicts, sheep grazing permits in non-use status should be phased out and sheep allotments closed if an opportunity arises with a willing permittee.

As discussed for the no-action alternative, existing livestock grazing allotments have been compatible with a recovered grizzly bear population. Based on the lack of history of conflicts, the mortality risk associated with livestock grazing on the Helena National Forest appears to be moderate to low. The additional standards and guidelines would further reduce the potential for conflicts on NFS lands in the primary conservation area.

Vegetation management
Under this alternative, existing forest plan standards and guidelines for vegetation management would be retained. Additional desired conditions and guidelines applicable to the primary conservation area would be added as shown in appendix 6 of this DEIS. The added direction is very similar to the Interagency Grizzly Bear Guidelines in encouraging a mosaic of successional stages; restricting logging activities in time and space as needed; designing projects to maintain or improve

grizzly bear habitat quality or quantity where it would not increase the risk of grizzly bear-human conflicts; and retaining cover as needed along grass/forb/shrub openings, riparian wildlife habitat, or wetlands.

Alternative 2 specifically allows for temporary increases in open and total motorized route density and temporary decreases in secure core under NCDE-AR-STD-03 to allow for project activities. This differs from the existing forest plan and programmatic biological opinion. However, this type of limited temporary change has been evaluated and allowed through project-level section 7 consultations, in order to accommodate post-fire salvage, timber harvest, and road management projects in the NCDE. Page 51 of the conservation strategy describes six projects affecting 18 subunits, and the temporary changes that were allowed, which provided the basis for NCDE-AR-STD-03. There have been very few instances on the Helena National Forest when these temporary changes have been necessary. No measurable difference in effects between the alternatives is expected as a result of incorporating this standard into the forest plan.

The vegetation management guidelines would provide for diverse cover and forage conditions and would reduce the potential for grizzly bear displacement through timing of timber sale activities. Although there may be short-term impacts to individual bears from timber management activities and associated road use, these impacts have been and would continue to be managed acceptably.

Mineral and energy development
Most of the existing forest plan direction related to mineral and energy development would be retained. Additional desired conditions, standards and guidelines applicable to the primary conservation area and zone 1 would be added as shown in appendix 6 of this DEIS.

The grizzly bear conservation strategy did not include a standard requiring no surface occupancy for leases in the primary conservation area, because the other measures were thought to be sufficient for a recovered population of grizzly bears. To provide consistent direction across the NCDE, this alternative would remove the existing standard requiring no surface occupancy in the areas formerly designated as management situation 1 and 2 on the Helena National Forest. In this respect, this alternative potentially would allow more impact on grizzly bears and their habitat than the other alternatives.

Genetic interchange
Alternative 2 identifies the expanded grizzly bear distribution zone (figure 1-58) south of Highway 200 on the south portion of the Lincoln Ranger District and on the north portion of the Helena Ranger District as being within zone1 and zone 2. The addition of standard NCDE-STD-WL-02 will require establishment of a food storage order that applies to zone 2, which may help to reduce grizzly bear-human conflicts and grizzly bear mortality risk. Implementation of this alternative is likely to provide habitat conditions that would support movement of dispersing bears, particularly male bears, to the adjoining Beaverhead-Deerlodge National Forest and promote genetic interchange with the Greater Yellowstone Ecosystem.

Summary and conclusion for alternative 2
Under this alternative, the amended Helena Forest Plan would incorporate standards to maintain baseline levels of open and total motorized route density and secure core in the primary conservation area, and would update management direction for coordination of various resource management programs with grizzly bear habitat in the primary conservation area. The amendment would also add a desired condition and a standard requiring no net increase from the baseline in roads open to public motorized use on NFS lands in zone 1 to allow for occupancy by bears. Standard NCDE-STD-WL-02 would result in extending the food storage order, which would reduce mortality risk in zone 2.

The mortality risk associated with livestock grazing on the Helena National Forest appears to be moderate to low, and the additional standards and guidelines under this alternative would further reduce the potential for conflicts on NFS lands in the primary conservation area. To provide consistent direction across the NCDE, this alternative would remove the existing standard requiring no surface occupancy in the areas formerly designated as management situation 1 and 2 on the Helena National Forest, potentially allowing more impact on grizzly bears. The current population trend in the NCDE is stable to increasing, and the amended Helena Forest Plan under alternative 2 would contribute to sustaining the recovered grizzly bear population.

Alternative 3 — Helena National Forest

Under this alternative, the same changes to forest plan desired conditions, standards, guidelines and monitoring items would be made as under Alternative 2. In addition, several additional desired conditions, standards and guidelines would be added. The effects of these additional forest plan components are described below.

Primary conservation area

Four additional standards would be applied in the primary conservation area. NCDE-STD-AR-04 would be modified to explicitly state that roads within secure core cannot be opened for temporary motorized use by the public. Although administrative use could still occur, this standard may reduce the risk of human-caused mortality and lessen the potential for disturbance/displacement of female grizzly bears with cubs from secure core. NCDE-STD-AR-07 would require that new or reauthorized ski area permits include mitigation measures to reduce the risk of grizzly bear-human conflicts. NCDE-STD-AR-08 would not allow any increase above the baseline in the acreage of areas and miles of routes open to use by motorized over-snow vehicle use in the den emergence (i.e. late spring) time period. This would minimize impacts to bears, particularly females with cubs, during this sensitive period. NCDE-STD-MIN-08 would require that no surface occupancy stipulations be applied to any new oil and gas leases in the primary conservation area and zone 1. Under the no-action alternative, there is a no surface occupancy stipulation for management situation 1 and in some cases for management situation 2. Under alternative 2, there is not a requirement for no surface occupancy in the primary conservation area. In comparison, alternative 3 would be less likely to cause disturbance or displacement of bears as a result of oil and gas exploration and development than the other two alternatives.

Taken together, these four additional standards would provide additional assurance that habitat quality of the primary conservation area would be maintained, that bears are not displaced from important habitats, and that the risk of grizzly bear-human conflicts would be minimized. Thus alternative 3 would be more protective of grizzly bears and their habitat in the primary conservation area than the other two alternatives.

Helena National Forest expanded grizzly bear distribution zone

A desired condition, NCDE-HNF Zone 1&2-DC-02, would apply to the expanded grizzly bear distribution zone (see glossary and figure 1-58) on the Helena National Forest. In this area, NFS lands adjacent to highways would be consolidated and conservation easements with willing landowners would be supported in a manner that provides habitat connectivity, facilitates movement of wildlife, and reduces barriers to north-south movement of grizzly bears. Alternative 3 would also add NCDE-HNF Zone 1&2-STD-02 which would limit motorized routes (roads and trails) that are open to public motorized to no more than 2.4 mi/mi^2, calculated as the miles of motorized routes on NFS lands divided by the acres of NFS lands within the expanded grizzly bear distribution zone. These forest plan components would help to assure that conditions that support grizzly bear presence

and the opportunity for movement of male bears from the NCDE to the Greater Yellowstone Ecosystem would be maintained through time.

Summary and conclusion for alternative 3
The four additional standards would reduce the potential for disturbance/displacement of grizzly bears, particularly females, in secure core, during the den emergence period, and in areas where oil and gas development is occurring, within the primary conservation area. Mitigation measures for new or reauthorized ski areas would help to minimize the risk of grizzly bear-human conflicts in these areas. The importance of the grizzly bear distribution zone for facilitating movement of bears, particularly males, to the Greater Yellowstone Ecosystem would be recognized and road density specifically would be managed to support the presence of bears. Thus alternative 3 would be more protective of grizzly bears and their habitat than the other two alternatives.

Indirect effects of the alternatives — Kootenai National Forest

Alternative 1 — no action, Kootenai National Forest
The Kootenai National Forest has almost 120,000 acres of land within the NCDE recovery zone (about 2 percent of the recovery zone), divided among two grizzly bear unit subunits (figure 1-63). Currently, 112,616 acres are identified as management situation 1, 2 acres as management situation 2 and 7,345 acres as management situation 3.

The 2015 Kootenai Forest Plan provides motorized access management direction for grizzly bear habitat within the Selkirk and Cabinet-Yaak and the NCDE grizzly bear recovery zones, and for areas occupied by bears that are outside the recovery zones. The forest plan incorporates by reference the Interagency Grizzly Bear Guidelines. Guideline FW-GDL-WL-15 states that elements of the Interagency Grizzly Bear Guidelines, or a conservation strategy once the grizzly bear is delisted, would be applied to project activities.

Motorized route densities and secure core inside the recovery zone
The Kootenai National Forest lands within the NCDE are within the Murphy bear management unit, which included the Krinklehorn and Therriault subunits, and a small portion of the Stillwater River bear management unit. Under the Kootenai Forest Plan, road densities are limited to no more than the existing baseline of open and total motorized route density in the two subunits.

The Krinklehorn bear management unit subunit currently meets recommended levels for open motorized route density, total motorized route density, and secure core (i.e., 19-19-68). The existing motorized route densities are not likely to adversely affect grizzly bear in this subunit.

In the Therriault subunit, total motorized route density and secure core currently meet recommended levels. The open motorized route density in the Therriault subunit (23 percent with a density of more than 1 mi/mi^2) meets Forest Plan standards, but exceeds 19 percent in order to accommodate a main access road to campgrounds and trailheads that loops through the subunit. This level of open motorized route density may cause adverse effects on individual grizzly bears in the area but is not likely to negatively affect the overall NCDE population.

Motorized route density outside the recovery zone
The area outside the recovery zone where there is recurring use by grizzly bears on the Kootenai National Forest has been referred to as the “bears outside the recovery zones” area (or BORZ). A number of grizzly bears, including females with cubs, have been documented in this area. To date, there are no records of female bears denning outside of the recovery zone.

The motorized access amendment limited linear road miles to no more than the existing baseline of open and total permanent roads in the area outside of the recovery zone where there is recurring use by bears. Implementation of the access amendment is expected to limit the potential for displacement of grizzly bears from key habitats and the risk of human-caused mortality on the Kootenai National Forest. By moderating the effects of roads and maintaining existing levels of security, grizzly bears are expected to continue to use these areas under the no-action alternative.

Motorized use by over-snow vehicles during the den emergence period
Over-snow vehicle use occurs within the NCDE recovery zone on the Kootenai National Forest. There are 7 miles of groomed routes and 4 miles of ungroomed routes. Off-route use occurs on approximately 7,905 acres or 18 percent of the 44,724 acres of modeled denning habitat on the Kootenai National Forest.

Forestwide standard FW-STD-WL-05 prohibits grooming of snowmobile routes in grizzly bear core habitat in the spring after April 1 of each year. Furthermore, FW-GDL-WL-01 states that management activities should avoid or minimize disturbance in areas of predicted denning habitat during spring emergence (April 1 through May 1).

Disturbance from snowmobiles in the period shortly after den emergence of a female with cubs is the primary concern. Considering the relatively small acreage affected in the NCDE and the forest-wide standard and guideline aimed at minimizing impacts in the den emergence period, there is a potential to negatively affect female bears with cubs, but the impact would likely be small. To address the concern about disturbance in the den emergence period, the biological opinion on the existing forest plan includes a requirement for the Kootenai National Forest and the USFWS to cooperatively develop a plan to monitor the scope and magnitude of late-season snowmobiling (post April 15) in the Cabinet-Yaak and NCDE recovery zones.

Developed recreation sites
The Kootenai National Forest has two grizzly bear management units: Murphy Lake and Stillwater River bear management units which currently have the following developed recreation sites: 5 cabins, 19 campgrounds, 20 day-use sites and 40 trailheads. The forest plan requires permits and operating plans to specify measures to reduce grizzly bear-human conflicts and grizzly bear mortality by making wildlife attractants (e.g., food and garbage) inaccessible through proper storage or disposal (FW-STD-WL-04). There is also a forestwide food storage order in place for the Kootenai National Forest. While there is a potential for the developed recreation sites to affect bears through habituation or food conditioning, the likelihood is low and the impact on the overall NCDE population would be minor.

Livestock grazing
There is one cattle grazing allotment on 4,880 acres on the Kootenai National Forest portion of the NCDE recovery zone. Eleven allotments overlap the area outside the recovery zone where grizzly bears occur in the Tobacco geographic area.

The revised forest plan includes measures to address potential mortality risks to bears associated with livestock grazing. Because few acres are subject to livestock grazing, existing allotments are not expected to increase, and there is no history of grizzly bear-human conflicts and management actions in these subunits related to grazing, it is unlikely that livestock grazing will result in habituation or have other adverse effects on the grizzly bear. The food storage order in effect on the Kootenai National Forest also helps to minimize the potential for attractant-related human-caused grizzly bear mortality.

Vegetation management
Vegetation management (i.e., timber harvest, salvage, planting, thinning, fuels treatment, prescribed fires) may impact grizzly bears by affecting food resource availability, proximity to escape cover, human disturbance and potential for conflicts, or temporarily shifting grizzly bears into less secure areas.

Under the revised forest plan, there are 218,212 acres suitable for timber production within bear management units (16 percent of the bear management units in both the Cabinet-Yaak and NCDE recovery zones) and 333,925 acres suitable for timber production in areas outside the recovery zones where grizzly bears now occur (59 percent of the area). However, within management area 6 (general forest), none of the acres of grizzly bear secure core habitat are identified as suitable for timber production. Vegetation management in secure core habitat could be done only to meet resource needs such as, insect and disease mitigation and salvage harvest, wildlife habitat diversity and fuels management.

In the area outside of recovery zones where there is recurring use by grizzly bears, there would be fewer undisturbed areas available to bears. However, the motorized access amendment limited the miles of open, total, and temporary roads to the baseline levels, and any timber harvest activities that will occur within multiple watersheds must be scheduled in a manner to minimize disturbance of grizzly bears.

Under the revised forest plan, timber harvest units, which remove cover, at times may be placed along open roads, to meet objectives other than optimizing grizzly bear habitat. However, this is not expected to have a negative effect on grizzly bears, since most bears are displaced from the area adjacent to open roads (Mace et al. 1996).

Mineral and energy development
Under the forest plan, the majority of Kootenai National Forest lands, with the exception of management areas 1a and 1c (wilderness and wilderness study areas) would be available for mineral leasing (e.g., oil, gas, coal, geothermal resources, potassium, sodium, phosphates, oil shale, and sulfur). This is also the case with locatable minerals, with the exception of 150,100 acres that are withdrawn from mineral entry under the revised plan. Hence, future mining activities could occur in grizzly bear habitat under the revised plan.

The effects of future mining activities on grizzly bears are expected to be similar to those occurring at existing mining sites (e.g., Troy Mine). Such effects may include loss of habitat within the footprint of the mine, disturbance to grizzly bears from road use and mining activities, displacement from habitat from road use or mine development, or impacts to habitat connectivity.

The extent of these effects would be limited by elements of the revised forest plan. Any mining proposal on the forest would be considered in terms of forest wide desired conditions that trend toward providing remote areas for species with large home ranges, recovering federally-listed species, facilitating denning and habitat use through low levels of disturbance, and managing motorized access to promote recovery (FW-DC-WL-01 through 05). At the project level, forest wide guidelines and standards would address potential effects of mining proposals on connectivity and linkage areas (FW-GDL-WL-12 through 14), food storage and attractants (FW-STD-WL-04, Food Storage Order), disturbance of grizzly bears (FW-GDL-WL-01), and access management (FW-STD-WL-02 and 03). Any mining proposals would be subject to additional site-specific analysis. Project development and mitigation plans would be designed to avoid, minimize, or compensate for any adverse effects associated with the mining proposal.

Demographic connectivity
Occupancy and movement by female bears into the area outside the recovery zone has been documented. In 2006, a radiocollared female grizzly bear with a cub spent most of the summer in the Salish Mountains of Montana less than 2 miles east of the edge of the Cabinet-Yaak recovery zone, while denning within the boundaries of the NCDE recovery zone (Kasworm et al. 2010).

The open road density within the Tobacco geographic area where there is recurring use by bears is about 2 mi/mi^2. This level of open road density should allow for occupancy by bears (Boulanger and Stenhouse 2015). However, demographic connectivity between the Cabinet-Yaak and the NCDE recovery zones could be hindered by higher levels of mortality along Highways 2 and 93 (Servheen et al. 2003). Implementation of the motorized access amendment (which requires no net increase in linear miles of roads open for public use in these areas) will moderate the effects associated with the lack of security, but does not address the mortality risk to grizzly bears attempting to cross these major highways.

The forest-wide Food Storage Order would continue to minimize the risk of grizzly bear–human conflicts, particularly in the lower elevations which often have higher concentrations of human development. This contributes to conditions on NFS lands that are likely to foster movement of grizzly bears, including in time occupancy by females with cubs needed for demographic connectivity.

In their biological opinion on the Kootenai forest plan, USFWS (2013) concluded that the areas outside the recovery zones will likely continue to support grizzly bear movement and linkage, although some adverse effects on individual bears are anticipated from open road miles and from site-specific projects in those areas. However, substantial negative effects on the population would not be anticipated.

Summary and conclusion for alternative 1
The Kootenai Forest Plan established standards specific to the NCDE portion of the Forest, and carried forward the Interagency Grizzly Bear Guidelines and the 2011 grizzly bear access management direction, which provide guidance for management of habitat within the recovery zone, limit motorized route density, and apply seasonal restrictions to motorized access in key areas. The forest wide food storage order minimizes grizzly bear-human conflicts and bear mortality. Grizzly bear habitat on the Kootenai National Forest is anchored by large acreages of designated wilderness and inventoried roadless areas that are unlikely to be affected by human disturbance at a level that would impact bears. Some effects to individual bears would be anticipated as a result of management actions under this alternative, but continued implementation of the no-action alternative would be compatible with contributing to a recovered grizzly bear population on NFS lands in the NCDE. The forest plan does provide the regulatory mechanisms needed to support de-listing of the NCDE population, but lacks some elements of the grizzly bear conservation strategy that would provide greater consistency across NFS lands in the NCDE.

Alternative 2 — proposed action modified, Kootenai National Forest
Under this alternative, specific reference to the Interagency Grizzly Bear Guidelines, including the delineation of management situations, would be superseded by the amendment. However, much of the management direction that is based on the Interagency Grizzly Bear Guidelines would be retained, and updated where needed as shown in appendix 7.

Habitat management on federal lands in the primary conservation area would be designed to maintain or improve habitat conditions compared to baseline conditions, while allowing resource management activities to continue. Less stringent protection would apply in zone 1 and the

demographic connectivity area than in the primary conservation area. The Kootenai National Forest contains land within the primary conservation area (about 2 percent of the total) and zone 1 including the Salish demographic connectivity area (about 6 percent of the total) (figure 1-64).

Motorized route density and secure core in the primary conservation area
Under the proposed action, a forest plan standard (NCDE-STD-AR-02) would be added that requires no net increase from the baseline for total motorized route density and open motorized route density within bear management unit subunits, and no net decrease from the baseline for the amount of core area in bear management unit subunits in the primary conservation area. Kootenai Forest Plan standard FW-WL-STD-03 is to maintain or improve open motorized route density, total motorized route density, and secure core in bear management unit subunits in the NCDE. There would be no difference in effects expected under alternatives 1 and 2 in this regard. In contrast to the no-action alternative, the secure core definition used in the proposed action does not include high intensity use non-motorized trails. However, no high intensity non-motorized trails have been identified in the NCDE on the Kootenai National Forest, so the change in definition does not result in any difference in effects between the alternatives. The baseline levels are shown in table 8.

Table 8. Baseline levels for motorized route density and secure core by bear management unit subunits on the Kootenai National Forest under all alternatives. Source: NCDE 2013 monitoring report

BMU Subunit	>75% NFS lands	OMRD (% of area >1 mi/mi2)	TMRD (% of area >2 mi/mi2)	Secure Core (% of area)
Krinklehorn	yes	22	14	75
Therriault	yes	26	12	71

BMU = bear management unit
OMRD = open motorized route density; TMRD = total motorized route density

Other standards would establish consistent definitions and procedures for managing administrative use (NCDE-STD-AR-01), temporary changes during project activities (NCDE-STD-AR-03 and NCDE-GDL-AR-02), and short-term public use (NCDE-STD-AR-04).Under the proposed action alternative, a set of standards and guidelines for motorized access would be consistently applied across the NCDE. For the Kootenai National Forest, there is no substantive difference between alternatives 1 and 2. Both require no net increase in motorized route densities and no net decrease in secure core.

Motorized route density in zone 1 and the Salish demographic connectivity area
The Kootenai National Forest has 276,190 acres that are within the Salish demographic connectivity area, and about 6,500 acres in zone 1 outside of the demographic connectivity area. The area identified in the motorized access amendment as outside the recovery areas where grizzly bears are now present extends farther west and south than the Salish demographic connectivity area and zone 1, and the boundaries elsewhere do not completely align.

Under the proposed action, standard NCDE-KNF Zone 1-STD-01 states that the Kootenai National Forest portion of zone 1 and the Salish demographic connectivity area would be managed according to FW-STD-WL-02. That is, there shall be no increases in permanent linear miles of open or total miles of road within the “bears outside a recovery zone” area, with listed exceptions and an allowance for temporary increases under specified conditions. Standard NCDE-KNF Zone 1-STD-02 clarifies that areas on the Kootenai National Forest that are not within the “bears outside a recovery zone” polygon, but are in zone 1 (about 6,500 acres) and in the Salish demographic connectivity area (about 9,200 acres), shall be managed according to Kootenai Forest Plan standards and guidelines.

Because the motorized access amendment moderated the effects of roads on bears and maintained existing levels of security in zone 1 and the Salish demographic connectivity area, the effects of the proposed action alternative are the same as for the no-action alternative. Grizzly bears are expected to be able to continue to access resources and use zone 1 and the Salish demographic connectivity area.

Motorized use of over-snow vehicles in the den emergence period
Under this alternative, no additional management direction would be proposed for over-snow vehicle use during the den emergence period. Existing forest plan direction would be retained. The effects would be the same as under alternative 1.

Developed recreation sites
The proposed action alternative would impose a limit of no more than one increase in the number or capacity of developed recreation sites per bear management unit per decade. The no-action alternative does not have a limit on the number or capacity of developed recreation sites. Therefore this alternative would have lower potential for human/bear encounters at developed recreation sites. However, given the lack of past grizzly bear-human conflicts at developed recreation sites on the Kootenai National Forest, the difference in effects on grizzly bears between alternatives 1 and 2 is likely to be small.

The forestwide food storage order would remain in place and would limit the potential for attractants to be a problem. There is still a potential for the developed recreation sites to affect bears through habituation or food conditioning, but the likelihood is low and the impact on the overall NCDE population would be minor.

Livestock allotments
Existing forest plan direction to reduce livestock impacts and to minimize grizzly bear-livestock conflicts on NFS lands in the primary conservation area would be retained. Additional standards and guidelines applicable to the primary conservation area would be added as shown in appendix 6 of this DEIS. These include a requirement for new permits to incorporate measures to reduce the risk of grizzly bear-human conflicts. Livestock carcasses must be reported within 24 hours. No increase in the number of cattle allotments, or in the number of sheep allotments or permitted sheep animal unit months would be allowed.

As discussed for the no-action alternative, existing livestock grazing allotments have been compatible with a recovered grizzly bear population. Based on the few acres subject to livestock grazing in the primary conservation area and the lack of history of grizzly bear and livestock conflicts, the mortality risk associated with livestock grazing on the Kootenai National Forest appears to be low. The additional standards and guidelines would further reduce the potential for conflicts on NFS lands in the primary conservation area.

Vegetation management
Under this alternative, existing forest plan standards and guidelines for vegetation management would be retained. Additional desired conditions and guidelines applicable to the primary conservation area would be added as shown in appendix 6 of this DEIS. The added direction is very similar to the Interagency Grizzly Bear Guidelines in encouraging a mosaic of successional stages; restricting logging activities in time and space as needed; designing projects to maintain or improve grizzly bear habitat quality or quantity where it would not increase the risk of grizzly bear-human conflicts; and retaining cover as needed along grass, forb and shrub openings, riparian wildlife habitat, or wetlands.

The existing forest plan and the programmatic biological opinion did not specifically provide for temporary decrease in secure core and/or temporary increases in total and open motorized route density in the primary conservation area. However, through project-level section 7 consultations in the NCDE, temporary changes have been allowed to accommodate projects such as post-fire salvage, timber harvest, and road management projects. Page 51 of the conservation strategy describes six projects affecting 18 subunits, and the temporary changes that were allowed, which provided the basis for the standard NCDE-AR-STD-03. By adding this standard, the allowances made for project implementation are expected to continue.

The vegetation management plan components would provide for diverse cover and forage conditions and would reduce the potential for grizzly bear displacement through timing of timber sale activities. Although there may be short-term impacts to individual bears from timber management activities and associated road use, these impacts have been and would continue to be managed acceptably.

Mineral and energy development
Existing forest plan standards pertaining to mineral and energy development would be retained. Additional desired conditions, standards and guidelines applicable to the primary conservation area and zone 1 would be added as shown in appendix 6 of this DEIS. The additional standards and guidelines would apply to new or reauthorized permits, leases or plans of operation and would provide guidance for mitigation of mineral development impacts, proper storage and handling of wildlife attractants, timing restrictions for ground-disturbing activities in spring habitat and seismic activity in denning habitat, management of motorized traffic and helicopter use, noise reduction, and worker safety when living near and working in grizzly bear habitat.

These measures will help to ensure that mineral and energy development will be done in a manner that minimizes habitat loss and disturbance/displacement of grizzly bears. Any future developments would be subject to site-specific analysis and design.

Demographic connectivity
The proposed action alternative would carry forward the motorized access amendment management direction where applicable to the Salish demographic connectivity area. The effects would be the same as under the no-action alternative. The management direction applicable to the Salish demographic connectivity area is expected to support occupancy by grizzly bears, including female bears.

Summary and conclusion for alternative 2
Under this alternative, the Kootenai Forest Plan would maintain baseline levels of open and total motorized route density and secure core in the primary conservation area, and would continue to provide for coordination of various resource management programs with grizzly bear habitat in the primary conservation area. The existing forest plan has been effective in contributing to the recovery of the grizzly bear population in the NCDE, and updating the management direction to incorporate the draft grizzly bear conservation strategy would provide consistency across NFS lands in the NCDE so that conditions supporting recovery are maintained. The management direction applicable to the Salish demographic connectivity area is expected to support occupancy by grizzly bears, including female bears. Some effects to individual bears would be anticipated as a result of forest management actions under this alternative, but continued implementation of this alternative would contribute to a recovered grizzly bear population on NFS lands in the NCDE.

Alternative 3 — Kootenai National Forest
Under this alternative, the same changes to forest plan desired conditions, standards, guidelines and monitoring items would be made as under Alternative 2. In addition, several additional desired

conditions, standards and guidelines would be added. The effects of these additional forest plan components are described below.

Primary conservation area
Four additional standards would be applied in the primary conservation area. NCDE-STD-AR-04 would be modified to explicitly state that roads within secure core cannot be opened for temporary motorized use by the public. Although administrative use could still occur, this standard may reduce the risk of human-caused mortality and lessen the potential for displacement female grizzly bears with cubs from secure core. NCDE-STD-AR-07 would require that new or reauthorized ski area permits include mitigation measures to reduce the risk of grizzly bear-human conflicts. NCDE-STD-AR-08 would not allow any increase above the baseline in the acreage of areas and miles of routes open to use by over-snow vehicles in the den emergence (i.e. late spring) time period. This would minimize impacts to bears, particularly females with cubs, during this sensitive period. NCDE-STD-MIN-08 would require that no surface occupancy stipulations be applied to any new oil and gas leases in the primary conservation area and zone 1. Taken together, these additional standards would provide additional assurance that habitat quality of the primary conservation area would be maintained, that bears are not displaced from important habitats, and that the risk of grizzly bear-human conflicts would be minimized. Thus alternative 3 would be more protective of grizzly bears and their habitat in the primary conservation area than the other two alternatives.

Salish demographic connectivity area only
Under alternative 3, all of the vegetation management guidelines that apply to the primary conservation area alternative 2 would also be applicable to the Salish demographic connectivity area. The effect of this would likely be to reduce the potential for adverse grizzly bear disturbance/displacement and to design vegetation management activities to protect, maintain, increase and/or improve grizzly habitat quantity or quality within the demographic connectivity areas where it would not increase the risk of grizzly bear–human conflicts. This would be beneficial in encouraging and maintaining occupancy by female grizzly bears.

Zone 1 including the Salish demographic connectivity areas
A desired condition (NCDE-KNF Zone 1-DC-02) would be added to encourage consolidation of land ownership and support for conservation easements with willing landowners in areas that lie between the primary conservation area and the Salish demographic connectivity area. The intent would be to provide for habitat connectivity and to facilitate the movement of wildlife.

NCDE-KNF Zone 1-STD-01 would allow no increase in the linear miles of open roads, total roads or motorized trails, in the portion of zone 1 and the demographic connectivity area that coincide with the BORZ. Motorized trails were not included as part of the standard under alternative 2, but are likely to have similar impacts as roads on grizzly bears. Under NCDE-KNF Zone 1-STD-02**,** there shall be no net increase in the miles of roads open to public motorized use during the non-denning season in the portion of zone 1 that is outside the BORZ polygon. This area has relatively high road density (3.54 mi/mi^2). However because of the small acreage involved, the overall effects on the NCDE bear population are anticipated to be minor.

Summary and conclusion for alternative 3
The four additional standards would reduce the potential for disturbance/displacement of bears, particularly females, in secure core, during the den emergence period, and in areas where oil and gas development is occurring, within the primary conservation area. Mitigation measures for new or reauthorized ski areas could help to minimize the risk of grizzly bear-human conflicts in these areas. Additional guidelines for vegetation management and additional standard limiting the linear miles of

open roads, total roads or motorized trails within the Salish demographic connectivity area/Tobacco BORZ would help to meet the intent of providing habitat conditions that support occupancy by female grizzly bears. An additional desired condition for zone 1 outside the demographic connectivity area would help to provide habitat connectivity and facilitate the movements of grizzly bears. Thus alternative 3 would be more beneficial to grizzly bears and their habitat than the other two alternatives.

Indirect effects of the alternatives—Lewis and Clark National Forest

Alternative 1 — no action

The Lewis and Clark National Forest has almost 778,000 acres within the NCDE recovery zone (about 14 percent of the recovery zone). About 763,740 acres were designated as management situation 1, no acres were designated as management situation 2, and management situation 3 was designated on 14,159 acres on the forest. There are six bear management units on the Lewis and Clark National Forest, divided into 13 subunits (figure 1-65). Two of the subunits are completely within designated wilderness.

Under the no-action alternative, applicable portions of the Interagency Grizzly Bear Guidelines (1986) would continue to be applied on the Lewis and Clark National Forest within the NCDE recovery zone (Lewis and Clark Forest Plan appendix V). The Interagency Grizzly Bear Guidelines address maintaining and improving habitat, minimizing grizzly bear-human conflict potential, and resolving grizzly bear-human conflicts, in coordination with various resource management programs. The Interagency Grizzly Bear Guidelines were designed to give the most stringent protection to grizzly bear habitat in management situation 1, where grizzly bear population centers occur, with more lenient guidelines that would facilitate other resource programs in other management situations.

The forest plan contains a number of standards for coordination of road construction and use with occupied grizzly bear habitat.

Motorized route densities and secure core inside the recovery zone

The Lewis and Clark Forest Plan does not contain a road density standard for the NCDE recovery zone. The Interagency Grizzly Bear Guidelines Access Task Force (1998) recommended that the percentage of area with open motorized route density of more than 1 mi/mi^2, the percentage of area with total motorized route density more than 2 mi.mi^2, and the percentage of secure core be evaluated using a moving window analysis method. The Lewis and Clark National Forest has not adopted specific limits on motorized access densities, but has conducted moving windows analyses for travel management planning.

Most of the subunits on the Lewis and Clark National Forest contain less than 75 percent NFS lands (see table 9). Two of the bear management unit subunits are located wholly within wilderness. The eleven other subunits have been evaluated through two travel plans completed for the Rocky Mountain Division: Birch Creek South and Badger-Two Medicine. Both travel plan decisions substantially reduced motorized access. USFWS concurred with the determination that the travel plan decisions are not likely to adversely affect the grizzly bear. The low road densities and high percentage of secure core on the Lewis and Clark National Forest provide excellent quality and availability of habitat for grizzly bears, including females with cubs.

Table 9. Baseline levels for motorized route density and secure core by bear management unit subunits on the Lewis and Clark National Forest under alternative 1

BMU Subunit	>75% NFS lands	OMRD (percent >1 mi/mi^2)	TMRD (percent >2 mi/mi^2)	Secure Core (percent of area)
Lick Rock	yes	0	0	91
Roule Biggs	yes	0	0	89
South Fork Willow	yes	14	3	78
West Fork Beaver	yes	17	5	70
Badger	no	0	0	94
Birch	no	0	0	93
Deep Creek	no	9	3	66
Falls Creek	no	0	0	85
Heart Butte	no	1	0	81
Pine Butte	no	7	2	67
Scapegoat	no	5	1	78
Teton	no	15	4	72
Two Medicine	no	3	1	87

BMU = bear management unit
OMRD = open motorized route density; TMRD = total motorized route density

Motorized route densities outside the recovery zone
The Lewis and Clark Forest Plan does not require management for grizzly bears or their habitat outside of the recovery zone. It is important to note that this portion of the forest is comprised of disjunct mountain ranges. The lands in these isolated mountain ranges are more than 60 air miles away from the recovery zone, separated by land that is almost entirely in private ownership. To date, no grizzly bears have been documented on the Lewis and Clark National Forest outside of the recovery zone.

Nevertheless, the forest plan contains direction that could provide some benefits to grizzly bears should they occur in the areas outside the recovery zone. In particular, the forest plan contains standards that control the type and intensity of activities, including road management, in order to conserve other wildlife species, such as elk. To coordinate management with the needs and objectives for elk, Forest Plan appendix F provides the Elk Logging Study, which is focused on maintaining elk summer range habitat effectiveness. Forest Plan appendix G provides the Montana Fish and Game Commission Road Management Policy, which specifically addresses road density in conjunction with percent hiding cover, during the elk hunting season.

Grizzly bears are not expected to inhabit on a regular basis the mountain ranges that are outside the recovery zone, and their occupancy is not an objective of the Grizzly Bear Conservation Strategy for zone 3. Elk management guidelines would help to reduce the mortality risk for any bears that occasionally use these areas.

Motorized use by over-snow vehicles during the den emergence period
Developed Recreation Forest-wide Management Standards A-2 include:

- (5) Administer provisions of the Endangered Species Act in occupied T&E species habitat (Forest Plan appendix I). Use the Management Guidelines developed under the Interagency Rocky Mountain Front Wildlife Monitoring/Evaluation Program to avoid or mitigate conflicts between developed recreation and threatened and endangered species (Forest Plan appendix I).

One of the measures included in the interagency wildlife guidelines is: Avoid human activities in grizzly bear habitat components which provide important food sources during spring and early summer, April 1 to July 15.

There is no snowmobiling on the Rocky Mountain Ranger District as of April 1, except on three main access roads, where it is allowed as long as snow conditions permit. Snowmobiles are not allowed to leave these roads. This activity is not expected to have any effects on grizzly bears during the den emergence period.

Developed recreation sites
The Badger-Two Medicine, Birch-Teton, Dearborn-Elk and North Fork Sun River bear management units are largely within designated wilderness and contain very few developed recreation sites. Trailheads are the primary type of developed recreation sites in these bear management units. The South Fork Sun-Beaver-Willow bear management unit, and to a lesser extent the Teton Sun River bear management unit, have a substantial number of residences and overnight cabins and bunkhouses, as well as trailheads. There is no history of recurring conflicts at developed recreation sites on the Lewis and Clark National Forest.

Livestock allotments
An existing Forest Plan standard requires that livestock grazing that affects grizzly bears and/or their habitat will be made compatible with grizzly needs or such uses will be disallowed or eliminated. In addition, the Interagency Wildlife Management Guidelines (Forest Plan appendix I) provides guide1ines that are specifically oriented toward minimizing the potential for conflicts between grizzly bears and 1ivestock:

- Livestock grazing on important spring habitat for grizzly bears should be deferred until after July 1.
- Boneyards and livestock dumps are prevalent along the East Front and are frequented by grizzly bears. Ranchers and landowners should be encouraged to place carcasses of dead livestock and garbage on remote areas of their land. Dead cows and calves should be hauled a considerable distance from calving grounds to discourage bears from feeding on carrion and newborn calves.
- Sheep grazing allotments in management situation 1, as defined in the Yellowstone Guidelines, on lands administered by government agencies should be eliminated.
- In riparian habits that receive high amounts of bear use, fencing to exclude livestock grazing and trampling may be necessary where livestock turn-out dates-prior to July 1 are allowed

There are 21 cattle grazing allotments, but no sheep grazing allotments within the recovery zone on the Lewis and Clark National Forest. Current grazing allotments and intensity of use would continue under the no-action alternative.

Approximately 7 percent (21 of 290) of all human-caused grizzly bear mortalities in the NCDE between 1998 and 2011 were due to management removal actions associated with livestock depredations. These livestock-related grizzly bear mortalities occurred on private lands or on the Blackfeet Indian Reservation along the Rocky Mountain Front, east of the Continental Divide.

Under the no-action alternative, livestock grazing would not be anticipated to displace grizzly bears or negatively impact important bear food production areas. Based on the lack of sheep allotments, no recent history of conflicts, and no known mortalities associated with livestock grazing on NFS lands, the mortality risk associated with livestock grazing on the Lewis and Clark National Forest is very low. Continued implementation of management direction under the no-action alternative regarding

livestock grazing is expected to be compatible with sustaining a recovered population of grizzly bears in the NCDE.

Vegetation management
The forest would continue to follow the Interagency Grizzly Bear Guidelines for vegetation management in management situation 1 and 2 grizzly bear habitat. These guidelines specify that measures that maintain and/or improve grizzly bear habitat and populations will be specified in project design. A summary of the Interagency Grizzly Bear Guidelines for timber and fire management include:

- All proposed logging and burning activities will be evaluated for their effects on grizzlies and their habitat.
    - Logging and burning activities will occur at a time or season when the area is of little or no biological importance to the bear.
    - Grizzly bear habitat will be improved through vegetation manipulation.
- Habitat management in forested cover should provide a balance of all successional stages.
- Roads used for timber sale purposes will be single purpose roads only, and will be closed to public use not associated with timber sale operation and administration.
- Desirable clearcut features include: (1) one or more leave or cover patches in cuts over 10 acres (2) minimum soil scarification where soil disturbance impedes the reestablishment of grizzly foods (3) slash disposal by spring broadcast burning (4) protection of hydric stream bottoms, wet meadows, marshes and bogs from soil disturbance and security cover removal.
- Prescribed burning in habitat types that are not managed for timber production could be used to approximate a natural fire frequency in order to promote berry-producing shrubs.

The vegetation management guidelines would provide for diverse cover and forage conditions and would reduce the potential for grizzly bear displacement through timing of timber sale activities. Although there may be short-term impacts to individual bears from timber management activities and associated road use, these impacts have been and would continue to be managed acceptably by applying the Interagency Grizzly Bear Guidelines.

Mineral and oil and gas development
A forest wide standard for oil and gas leasing, exploration, drilling, field development, and production (G-2) requires that activities be restricted, delayed, or modified to prevent adverse effects on threatened and endangered species and their habitat. Additional measures are included in forest plan appendix I, Interagency Wildlife Management Guidelines, to coordinate oil and gas exploration and development with grizzly bear habitat, including the following:

- Establish flight patterns in advance when activities require the use of he1icopters. Flight patterns should be located to avoid seasonally important grizzly bear habitat constituent elements and habitat components during the designated seasonal use periods.
- Seismic or exploratory drilling activities should not be conducted within a minimum of one mile of den sites during the October 15 to April 15 period.
- Seismic permits should include a provision providing for cancellation or temporary cessation of activities, if necessary, to prevent grizzly bear-human conflicts.
- Scheduling of well drilling on adjacent sites, within important grizzly bear use areas, should be staggered to provide a disturbance free area for displaced bears.

- Pipeline construction required for the development of a gas or oil field should be condensed into the shortest time frame possible and subject to seasonal restrictions when conducted in important grizzly bear habitat.
- Field operation centers associated with seismic or oil/gas exploration activities should be placed carefully to avoid seasonally important habitat components or constituent elements. Such placement of sites is necessary in order to avoid direct potential conflicts between man and grizzly bear.

With regard to locatable minerals, Public Law 109-432 made lands outside of designated wilderness areas on the Rocky Mountain Ranger District of the Lewis and Clark National Forest, some areas of the Flathead National Forest, and Bureau of Land Management lands along the Rocky Mountain Front unavailable to future location and entry under the General Mining Act of 1872. While this law prohibited the establishment of new claims, it did not eliminate claims that existed at the time the law was passed.

With regard to leasable minerals, in 1997 a decision was issued to make the entire Rocky Mountain Ranger District of the Lewis and Clark National Forest unavailable for future leasing. In 2006, lands outside of designated wilderness areas on the Rocky Mountain Ranger District, some areas of the Flathead National Forest, and Bureau of Land Management lands along the Rocky Mountain Front were withdrawn permanently from any future mineral, oil, natural gas, or geothermal leasing and all forms of location, entry and patent under mining laws, by Public Law109-432, the Tax Relief and Health Care Act of 2006.

It was not necessary to withdraw lands inside designated wilderness areas from future leasing because new leases are already prohibited by the Wilderness Act in these areas.

While Public Law 109-432 prohibited the establishment of new leases, it did not eliminate leases that existed at the time the law was passed. Many leases on federal lands that existed at the time Public Law 109-432 was passed have been voluntarily retired. As of 2012, there were 247 oil and gas leases in the recovery zone, most of which are on the Flathead National Forest. Of these, 235 are currently suspended, pending forest wide leasing analyses.

Under the no-action alternative, the likelihood of development of leasable or locatable minerals occurring within the recovery zone on the Lewis and Clark National Forest is low. Any exploration or development that did occur would be subject to existing forest plan standards and site-specific analyses.

Summary and conclusion for alternative 1

The existing Lewis and Clark Forest Plan, which incorporated the Interagency Grizzly Bear Guidelines, has been effective in contributing to the improved status of the NCDE grizzly bear population. Grizzly bear habitat on the Lewis and Clark National Forest is anchored by large areas of designated wilderness and inventoried roadless areas that are unlikely to be affected by human disturbance at a level that would impact bears. Implementation of the food storage order on the Rocky Mountain Division would continue to minimize the potential for grizzly bear-human conflicts and bear mortality within the recovery zone. Some minor effects to individual bears would be anticipated under this alternative, but continued implementation of the no-action alternative together with travel plan decisions applicable to the recovery zone would be compatible with contributing to a recovered grizzly bear population on NFS lands. However, because the existing forest plan does not contain the standards that are needed to manage motorized access in the grizzly bear recovery zone, it does not provide the regulatory mechanisms needed to support de-listing of the NCDE population.

It is expected that under this alternative, the grizzly bear would remain listed in the NCDE and continue to be managed in accordance with requirements of USFWS' biological opinions and incidental take statements.

Alternative 2 — proposed action modified, Lewis and Clark National Forest
Under this alternative, specific reference to the Interagency Grizzly Bear Guidelines, including the delineation of management situations, would be removed from the forest plan. However, much of the management direction that is based on the Interagency Grizzly Bear Guidelines would be retained in the form of new standards and guidelines. Where needed, existing forest plan direction would be updated based on the draft grizzly bear conservation strategy as shown in appendix 7 of this DEIS.

The Lewis and Clark National Forest contains land within the primary conservation area (777,963 acres or 14 percent of the total) and zone 3 (967,047 acres or 8 percent of the total), with negligible amounts in zone 1 (6 acres) and zone 2 (2 acres) (figure 1-66). Habitat management on federal lands in the primary conservation area would be designed to maintain or improve habitat conditions compared to baseline conditions, while allowing resource management activities to continue. No additional habitat protections would be applied to zones 1, 2 or 3.

Motorized route density and secure core in the primary conservation area
Under the proposed action, a Forest Plan standard (NCDE-STD-AR-02) would be added that require no net increase in total motorized route density and open motorized route density within bear management unit subunits, and no net decrease in the amount of core area in bear management unit subunits. Other standards would establish consistent definitions and procedures for managing administrative use (NCDE-STD-AR-01), temporary changes during project activities (NCDE-STD-AR-03 and NCDE-GDL-AR-02), and short-term public use (NCDE-STD-AR-04). This would not constitute a change in how the forest plan is currently being implemented. However, the amendment would establish a set of standards and guidelines that are consistent across the NCDE. This would provide the needed regulatory mechanisms to support de-listing of the grizzly bear from protections of the Endangered Species Act.

In contrast to the no-action alternative, the secure core definition used in the proposed action does not include high intensity use non-motorized trails. As discussed previously for the Helena National Forest, the lack of demonstrable effects and the difficulty of accurately distinguishing "high intensity use" non-motorized trails led to the decision by the conservation strategy team to eliminate this from the definition of secure core. The baseline levels for motorized access using this definition are shown in table 10.

Table 10. Baseline levels for motorized route density and secure core by bear management unit subunits on the Lewis and Clark National Forest under alternatives 2 and 3

BMU Subunit	>75% NFS lands	OMRD (percent >1 mi/mi^2)	TMRD (percent >2 mi/mi^2)	Secure Core (percent of area)
Lick Rock	yes	0	0	100
Roule Biggs	yes	0	0	100
South Fork Willow	yes	14	4	81
West Fork Beaver	yes	17	5	79
Badger	no	0	0	94
Birch	no	0	0	93
Deep Creek	no	9	3	69
Falls Creek	no	0	0	85

BMU Subunit	>75% NFS lands	OMRD (percent >1 mi/mi^2)	TMRD (percent >2 mi/mi^2)	Secure Core (percent of area)
Heart Butte	no	1	0	81
Pine Butte	no	7	2	70
Scapegoat	no	5	1	78
Teton	no	16	5	72
Two Medicine	no	3	1	87

BMU = bear management unit
OMRD = open motorized route density; TMRD = total motorized route density

Motorized route density in zone 3
The proposed action alternative does not include standards and guidelines related to motorized route density that would be applicable in zone 3. Grizzly bears are not currently known to occur in zone 3 on the Lewis and Clark National Forest and any that should occur there would not be needed for recovery of the population. Habitat conditions and effects on grizzly bears would be the same for zone 3 as under the no-action alternative.

Motorized use of over-snow vehicles during the den emergence period
Under this alternative, no additional management direction would be proposed for over-snow vehicle use during the den emergence period. Existing forest plan direction would be retained. The effects would be the same as under alternative 1.

Developed recreation sites
The proposed action alternative would impose a limit of no more than one increase in the number or capacity of developed recreation sites per bear management unit per decade within the primary conservation area. The current forest plan does not contain such a limit, but there have been few increases in developed recreation sites during the life of the forest plan. There also have been no recurring grizzly bear-human conflicts associated with existing developed recreation sites in the primary conservation area. Therefore the effects to grizzly bears are anticipated to be the same under alternatives 1 and 2.

Livestock allotments
Existing forest plan direction to reduce livestock impacts and to minimize grizzly bear-livestock conflicts on NFS lands in the primary conservation area would be retained. Additional standards and guidelines applicable to the primary conservation area would be added as shown in appendix 6 of this DEIS. New permits must incorporate measures to reduce the risk of grizzly bear-human conflicts. Livestock carcasses must be reported within 24 hours (which is already a requirement of the food storage order). No increase in the number of cattle allotments, or in the number of sheep allotments or permitted sheep animal unit months would be allowed. To reduce the potential risk of grizzly bear-human conflicts, sheep grazing permits in non-use status should be phased out and sheep allotments closed if an opportunity arises with a willing permittee.

Currently there are 21 cattle allotments in the primary conservation area on the Lewis and Clark National Forest. There are no sheep grazing allotments in the primary conservation area. As discussed for the no-action alternative, existing livestock grazing allotments have been compatible with a recovered grizzly bear population. The additional standards and guidelines would promote consistency across NFS lands in the NCDE and minimize the potential for conflicts on the national forest in the primary conservation area. Based on the lack of history of conflicts, the mortality risk

associated with livestock grazing on the Lewis and Clark National Forest would continue to be very low under this alternative.

Vegetation management
Under this alternative, existing forest plan standards and guidelines for vegetation management would be updated with desired conditions and guidelines applicable to the primary conservation area as shown in appendix 6 of this DEIS. The added direction is very similar to the Interagency Grizzly Bear Guidelines in encouraging a mosaic of successional stages; restricting logging activities in time and space as needed; designing projects to maintain or improve grizzly bear habitat quality or quantity where it would not increase the risk of grizzly bear-human conflicts; and retaining cover as needed along grass/forb/shrub openings, riparian wildlife habitat, or wetlands.

The vegetation management guidelines would provide for diverse cover and forage conditions and would reduce the potential for grizzly bear displacement through timing of timber sale activities. Although there may be short-term impacts to individual bears from timber management activities and associated road use, these impacts have been and would continue to be managed acceptably.

Mineral and energy development
Current forest plan standards for existing seismic exploration, for existing oil and gas leasing, exploration, drilling, field development, and production, and for locatable and common variety minerals would be retained. Additional desired conditions, standards and guidelines applicable to the primary conservation area would be added as shown in appendix 6 of this DEIS. The additional standards and guidelines would apply to new or reauthorized permits, leases or plans of operation and would provide guidance for mitigation of mineral development impacts, proper storage and handling of wildlife attractants, timing restrictions for ground-disturbing activities in spring habitat and seismic activity in denning habitat, management of motorized traffic and helicopter use, noise reduction, and worker safety when living near and working in grizzly bear habitat.

These measures will help to ensure that mineral and energy development will be done in a manner that minimizes habitat loss and disturbance/displacement of grizzly bears. Any future developments would be subject to site-specific analysis and design.

The existing forest plan has been effective in contributing to the recovery of the grizzly bear population in the NCDE, and continued implementation of the food storage order in the primary conservation area would minimize the potential for grizzly bear-human conflicts and bear mortality.

Summary and conclusion for alternative 2
Under this alternative, the amended Lewis and Clark Forest Plan would incorporate standards to maintain baseline levels of open and total motorized route density and secure core in the primary conservation area, and would update management direction for coordination of various resource management programs with grizzly bear habitat in the primary conservation area. Updating the management direction would provide consistency across NFS lands in the NCDE so that habitat conditions supporting recovery are maintained. The amended Lewis and Clark Forest Plan under alternative 2 would contribute to sustaining a recovered grizzly bear population on NFS lands in the NCDE.

Alternative 3 — Lewis and Clark National Forest
Under this alternative, the same changes to forest plan desired conditions, standards, guidelines and monitoring items would be made as under Alternative 2. In addition, several additional desired conditions, standards and guidelines would be added.

As described previously for the Helena and Kootenai National Forests, four additional standards would be applied in the primary conservation area. NCDE-STD-AR-04 would be modified to explicitly state that roads within secure core cannot be opened for temporary motorized use by the public. Although administrative use could still occur, this standard may reduce the risk of human-caused mortality and lessen the potential for displacement of female grizzly bears with cubs from secure core. NCDE-STD-AR-07 would require that new or reauthorized ski area permits include mitigation measures to reduce the risk of grizzly bear-human conflicts. NCDE-STD-AR-08 would not allow any increase above the baseline in the acreage of areas and miles of routes open to use by over-snow vehicles in the den emergence (i.e. late spring) time period. This would minimize impacts to bears, particularly females with cubs, during this sensitive period. NCDE-STD-MIN-08 would require that no surface occupancy stipulations be applied to any new oil and gas leases in the primary conservation area and zone 1.

Taken together, these additional standards would provide additional assurance that habitat quality of the primary conservation area would be maintained, that bears are not displaced from important habitats, and that the risk of grizzly bear-human conflicts would be minimized. Thus alternative 3 would be more protective of grizzly bears than the other two alternatives.

Indirect effects of the alternatives — Lolo National Forest

Alternative 1 — no action

Under the no-action alternative, the Interagency Grizzly Bear Guidelines (1986) would continue to be applied on the portion of the Lolo National Forest located within the NCDE recovery zone. The Lolo National Forest has roughly 268,000 acres within the NCDE recovery zone (5 percent of the total). There are seven subunits within three bear management units (Rattlesnake, Upper South Fork Flathead and Monture/Landers Fork) on the Lolo National Forest (figure 1-67).

The Interagency Grizzly Bear Guidelines address maintaining and improving habitat, minimizing grizzly bear-human conflict potential, and resolving grizzly bear-human conflicts, in coordination with various resource management programs. The Interagency Grizzly Bear Guidelines were designed to give the most stringent protection to grizzly bear habitat in management situation 1, where grizzly bear population centers occur, with more lenient guidelines that would facilitate other resource management objectives in the other management situations. On the Lolo National Forest, 222,290 acres were designated as management situation 1, and 25,430 acres were designated as management situation 2.

The Lolo Forest Plan does not address the management of grizzly bears outside the recovery zone. Subsequent Endangered Species Act Section 7 consultations provided analysis and guidance for areas outside the recovery zone.

Motorized route density and secure core inside the recovery zone

The Lolo Forest Plan contains several standards that guide the coordination and management of forest roads. For example, standard 49 (p. II-17) limits roads to the minimum number and design standard to meet resource needs. Standard 52 (pp. II-18 and II-19) directs the management of forest roads to provide for resource protection, wildlife needs, commodity removal, and a wide range of recreation opportunities. Part (e) specifically addresses grizzly bear habitats, providing for seasonal road closures if necessary to reduce the risk of human-caused bear mortality; closure of all non-arterial systems April 15 to June 15 within designated essential habitat spring range; and closure of roads that bisect identified critical habitat components July 15 thru October 15.

However, the Lolo Forest Plan does not contain specific requirements regarding motorized route density or secure core in grizzly bear habitat in the NCDE. During the early 1990s a grizzly bear recovery strategy was developed for the Lolo National Forest that included definitions, standards and guidelines related to road density, activity scheduling, and displacement areas that would be applied within the recovery zone. In 1996, USFWS administratively amended the 1982 biological opinion on the Lolo Forest Plan and also provided an incidental take statement regarding access management and grizzly bears (USFWS 1996). New research information regarding the impacts of roads on grizzly bears, recommendations in the Interagency Grizzly Bear Committee's Access Taskforce Report (1994), and the access management goals of the Lolo National Forest's grizzly bear recovery strategy were considered in formulating the incidental take statement. Terms and conditions included, in part, requiring no more than 19 percent of a subunit exceeding 1 mi/mi^2 of open motorized route density, no more than 19 percent of a subunit exceeding 2 mi/mi^2 of total motorized route density, and minimum secure core of 68 percent or greater of a subunit, all to be achieved within 5 years.

Compliance with the terms and conditions of the 1996 incidental take statement led to substantial restrictions and decommissioning of roads on the Lolo National Forest, which likely contributed to the recovery of the NCDE grizzly bear population. Five of the seven bear management unit subunits on the Lolo National Forest fully meet the criteria for motorized route density and secure core (see table 11). The Mission subunit does not, but the Forest Service manages less than 75 percent of the land in this subunit; therefore this subunit has been managed for no net loss. The Swan subunit also does not meet all of the criteria.

Table 11. Baseline levels for motorized route density and secure core by bear management unit subunits on the Lolo National Forest under all alternatives. Source: NCDE 2013 monitoring report

BMU Subunit	>75% NFS lands	OMRD (percent >1 mi/mi^2)	TMRD (percent >2 mi/mi^2)	Secure Core (percent of area)
Monture	yes	0	1	99
Mor-Dun	yes	16	12	78
North Scapegoat	yes	0	0	100
South Scapegoat	yes	13	18	74
Mission	no	23	53	33
Rattlesnake	yes	3	13	79
Swan	yes	33	17	55

BMU = bear management unit, OMRD = open motorized route density; TMRD = total motorized route density

In 2011, the Lolo National Forest reinitiated consultation for the access management strategy for the Swan bear management unit subunit, due to non-compliance with portions of the 1996 incidental take statement. In recognition of its unique characteristics, the requirements were modified to: no more than 17 percent total motorized route density, no more than 31 percent open motorized route density with no more than 22 percent open motorized route density during the spring, and at least 55 percent secure core.

The high road densities and low amount of secure core in the Swan and Mission bear management unit subunits may be displacing grizzly bears from seasonally important feeding sites, increasing the risk of habituation of some grizzly bears to human activities and increasing the risk of human-caused mortality of bears. However, given the habitat conditions on the rest of the Lolo National Forest and NCDE, and the improved status of the NCDE population, USFWS concluded that the adverse effects

on individual grizzly bears in the Swan subunit are not likely to result in measureable effects to the grizzly bear population (USFWS 2011).

Under the no-action alternative, the forest would continue to comply with the terms and conditions of the incidental take statement related to access management. Five of the seven bear management unit subunits would continue to provide a high percentage of secure core, indicating that habitat would be readily accessible to bears. Continued implementation of the no-action alternative would maintain these conditions.

Motorized route density outside the recovery zone
The current Lolo Forest Plan does not require management for grizzly bears or their habitat outside of the recovery zone. The forest plan restricts open road densities to 1.1 mi/mi^2 in highly productive big game summer range, and as described above, requires that management of roads be coordinated with other resource objectives including grizzly bear habitat.

In 2004, the Lolo National Forest analyzed the effects of its forest plan direction on grizzly bears occurring both inside and outside the recovery zone (USDA Forest Service 2004). USFWS issued a biological opinion and incidental take statement on August 30, 2004, focusing on access management, livestock grazing, and food and attractant storage. The biological opinion required the Lolo National Forest to contact the USFWS if a net increase in permanent system roads exceeds 2 linear miles in the distribution area outside the recovery zone during the subsequent 4-year period. Since 2004, no new permanent roads have been constructed in the grizzly bear distribution area outside of the NCDE recovery zone, and 5.14 miles have been decommissioned in the distribution area. The 2004 biological opinion and incidental take statement was extended in 2012. The term and condition was administratively amended as follows: The Forest will contact the USFWS if more than 2 miles of new permanent road over the 2004 baseline, or 7.14 miles total, will be constructed over the next 10 years in the distribution area outside of the NCDE recovery zone.

High road densities and lack of secure core would continue to exist across many areas within the grizzly bear distribution area outside the recovery zone. This would have impacts on individual bears.

Motorized use by over-snow vehicles during the den emergence period
On the Lolo National Forest, Seeley Lake within the NCDE is a major snowmobile destination area. Groomed snowmobile routes and snowmobile play areas are concentrated outside the recovery zone except for the large block of former Plum Creek Timber land in the Mission Subunit, and on NFS lands in the lower elevation areas in the Swan Subunit and in the Dun Creek drainage in the Mor-Dun Subunit. The Monture, North Scapegoat, South Scapegoat, and Rattlesnake Subunits are dominated by wilderness and roadless areas where snowmobile use is restricted by area closures or topography. Spring road closures are in place around Morrell Falls, Richmond Peak, and Clearwater Lake to specifically protect grizzly bear from snowmobile and other motorized disturbance during the non-denning period from April 1-June 30. There are two groomed snowmobile routes totaling 94 miles on the edge of secure core habitat. All 315 mi^2 of secure core habitat are closed year-long to snowmobile use. There are 78 mi^2 outside secure core habitat within the recovery zone that are open to snowmobile use. Since the Forest plan does not restrict over-snow vehicle use during the den emergence period, there could be effects to individual female grizzly bears. However, because of the limited amount of snowmobile use that is allowed or occurs within the recovery area, the impact would be expected to be small.

Developed recreation sites
Under the current forest plan, a forest-wide standard states that the Forest Service will not significantly expand the capacity of developed recreation sites on the Lolo National Forest during the next 10-year period. (This standard does not include trailheads in the definition of developed recreation sites.) Emphasis will be placed on increasing the use of existing sites by making them usable by a wide segment of society including the elderly and handicapped. Those existing sites receiving low levels of public use or which are not cost effective to operate will be considered for temporary or permanent closure. This emphasis would continue under the no-action alternative. It is acknowledged that the forest has had to respond to increasing use in some areas by hardening dispersed sites and installing facilities to provide for sanitation and public safety.

The Monture Landers Fork bear management unit and the Upper South Fork bear management unit are largely designated as wilderness. The Upper South Fork and Rattlesnake bear management units have few developed recreation sites other than trailheads.

From 2000 through 2010, four known grizzly bear mortalities occurred inside the Lolo National Forest boundary, and 14 mortalities occurred off of the Forest but in the occupied distribution area south of the forest boundary (Mace and Roberts 2011). Causes of death included collisions with cars, mistaken identify, illegal shooting, and defense of life. None of the mortalities on the Lolo National Forest were known or suspected to be associated with food conditioning or attractants.

While there is a potential for the developed recreation sites to affect bears through habituation or food conditioning, there is no history of recurring conflicts at developed recreation sites on the Lolo NF.

Livestock allotments
There is only one cattle grazing allotment within the recovery zone, located on the Seeley Lake Ranger District, and there are no sheep grazing allotments. Within the recovery zone, the Forest Plan directs that grazing be managed to reduce the number of grizzly bear-human conflicts, and reduce or eliminate the need for removal of grizzly bears from the population.

In the grizzly bear distribution area outside of the recovery zone, there are three cattle allotments. One is located on the Ninemile Ranger District, but it has not been grazed since 1994. The second cattle allotment is the 4Mile allotment, which is an active allotment on the Superior Ranger District. It is located near St. Regis and is within the Salish demographic connectivity area. The third is the O'Keefe allotment, located within zone 1 on the Missoula Ranger District. No known incidents of grizzly bear mortality or grizzly bear-human conflict have occurred on the Lolo National Forest from livestock grazing-related management control actions since the grizzly bear was listed in 1975 (USDA Forest Service 2012).

Continued livestock grazing under the no action alternative is not expected to negatively affect or increase the risk of human-caused mortality of grizzly bears.

Vegetation management
The forest would continue to follow the Interagency Grizzly Bear Guidelines for vegetation management in management situation 1 and 2 grizzly bear habitat. These guidelines specify that measures that maintain, and/or improve grizzly bear habitat and populations will be specified in project design. A summary of the Interagency Grizzly Bear Guidelines for timber and fire management include:

- All proposed logging and burning activities will be evaluated for their effects on grizzly bears and their habitat.
    - Logging and burning activities will occur at a time or season when the area is of little or no biological importance to the bear.
    - Grizzly bear habitat will be improved through vegetation manipulation.
- Habitat management in forested cover should provide a balance of all successional stages.
- Roads used for timber sale purposes will be single purpose roads only, and will be closed to public use not associated with timber sale operation and administration.
- Desirable clearcut features include: (1) one or more leave or cover patches in cuts over 10 acres (2) minimum soil scarification where soil disturbance impedes the reestablishment of grizzly foods (3) slash disposal by spring broadcast burning (4) protection of hydric stream bottoms, wet meadows, marshes and bogs from soil disturbance and security cover removal.
- Prescribed burning in habitat types that are not managed for timber production could be used to approximate a natural fire frequency in order to promote berry-producing shrubs.

The vegetation management guidelines would provide for diverse cover and forage conditions and would reduce the potential for grizzly bear displacement through timing of timber sale activities. Although there may be short-term impacts to individual bears from timber management activities and associated road use, these impacts have been and would continue to be managed acceptably using the Interagency Grizzly Bear Guidelines.

Mineral and energy development
Lolo Forest Plan standard 41 requires that “Before oil and gas lease stipulation recommendations are made, site specific analysis of environmental effects will be made. Stipulations which are displayed in appendix F and based upon the Environmental Analysis for Oil and Gas of Non-wilderness Lands on the Lolo National Forest, 9/20/82, will be recommended in accordance with management area direction in Chapter III. In some instances, the stipulations will include a provision for ‘no surface occupancy’. The lessee or designated operator has the right to explore for and extract oil/gas from his/her lease in accordance with the stipulations attached to the lease.”

The magnitude of effects from leasable or locatable minerals exploration and development thus would be limited by provisions of the forest plan. Any such proposals would be subject to additional site-specific analysis. Project development and mitigation plans would be designed to avoid, minimize, or compensate for any adverse effects associated with the mining proposal.

Demographic connectivity
The existing forest plan does not have specific provisions that encourage demographic connectivity to the Cabinet-Yaak and Bitterroot ecosystems. However, forest plan standard 27 directs that management practices be compatible with habitat needs of threatened and endangered species, consistent with the goal of recovery.

Summary and conclusion for alternative 1
The existing Lolo Forest Plan, which incorporated the Interagency Grizzly Bear Guidelines, together with biological opinions that provided mandatory terms and conditions to avoid or minimize incidental take, have been effective in contributing to the improved status of the NCDE grizzly bear population. Implementation of the forest-wide food storage order would continue to assist with minimizing grizzly bear-human conflicts. Some local or minor effects to individual bears would be anticipated as a result of management activities under this alternative, but continued implementation

of the no-action alternative would be expected to be compatible with contributing to a recovered grizzly bear population on NFS lands in the NCDE. The forest plan does not provide specific management direction for areas outside the recovery zone that are now occupied by bears, or direction to encourage demographic connectivity to the Cabinet-Yaak and Bitterroot ecosystems. Because the existing forest plan does not contain the standards that are needed to manage motorized access in the grizzly bear recovery zone, it does not provide the regulatory mechanisms and assurances needed to support de-listing of the NCDE population. It is expected that under this alternative, the grizzly bear would remain listed in the NCDE and continue to be managed in accordance with requirements of USFWS' biological opinions and incidental take statements.

Alternative 2 — proposed action modified, Lolo National Forest

Under this alternative, specific reference to the Interagency Grizzly Bear Guidelines, including the delineation of management situations, would be removed from the forest plan. However much of the existing management direction that is based on the Interagency Grizzly Bear Guidelines would be retained. Where needed, existing forest plan direction would be updated based on the draft grizzly bear conservation strategy as shown in appendix 7 of this DEIS.

Habitat management on federal lands in the primary conservation area would be designed to maintain or improve habitat conditions compared to baseline conditions, while allowing resource management activities to continue. Less stringent protection would be applied in zones 1 and 2 than in the primary conservation area. The Lolo National Forest contains land within the primary conservation area (about 5 percent of the total), zone 1 including the Ninemile demographic connectivity area (about 8 percent of the total), and zone 2 (figure 1-68). The acreage in zone 2 is negligible (38 acres) and occurs at the Bonita Work Center, an administrative facility that is no longer in use.

Motorized route density and secure core in the primary conservation area.

Under the proposed action, Forest Plan standard NCDE-AR-STD-02 would require no net increase from the baseline in total motorized route density and open motorized route density within bear management unit subunits, and no net decrease from the baseline in the amount of core area in bear management unit subunits within the primary conservation area. Other standards would establish consistent definitions and procedures for managing administrative use (NCDE-STD-AR-01), temporary changes during project activities (NCDE-STD-AR-03 and NCDE-GDL-AR-02), and short-term public use (NCDE-STD-AR-04). This would not constitute a change in how the forest plan is currently being implemented; however, a consistent set of standards and guidelines would be formalized in the forest plan, rather than being requirements of a biological opinion and incidental take statement. Thus, the direction would remain in place and provide the needed regulatory mechanisms at such time as the grizzly bear is de-listed from the Endangered Species Act.

In contrast to the no-action alternative, the secure core definition used in the proposed action does not include high intensity use non-motorized trails. As discussed previously for the Helena National Forest, the lack of demonstrable effects and the difficulty of accurately distinguishing "high intensity use" non-motorized trails led to the decision by the conservation strategy team to eliminate this from the definition of secure core. Baseline levels for the Lolo NF are the same under all alternatives and are shown in table 11.

Motorized route density in zone 1 and the Ninemile demographic connectivity area

Under the proposed action alternative, a standard would be added to the Lolo National Forest portion of zone 1 including the Ninemile demographic connectivity area requiring no net increase from the baseline in miles of roads open to public motorized use on NFS lands. This standard would limit the

disturbance, displacement and mortality risk associated with open roads, and would encourage grizzly bear occupancy and movement in the Ninemile demographic connectivity area.

Motorized use by over-snow vehicles during the den emergence period
Under the proposed action alternative, there would be no change to the direction pertaining to over-snow vehicle use during the den emergence period. The effects on bears would be the same as under the no-action alternative.

Developed recreation sites
Within the primary conservation area, the proposed action would limit increases in the number or capacity of developed recreation sites to one increase per bear management unit per decade above the baseline. This direction would be more restrictive than the no-action alternative. However, given the low emphasis on development of new recreation sites, and the lack of past grizzly bear-human conflicts at developed recreation sites on the Lolo National Forest, the difference in effects on grizzly bears between alternatives 1 and 2 is likely to be small.

Livestock allotments
Existing forest plan direction to reduce livestock impacts and to minimize grizzly bear-livestock conflicts on NFS lands in the primary conservation area would be retained. Additional standards and guidelines applicable to the primary conservation area would be added. New permits would need to incorporate measures to reduce the risk of grizzly bear-human conflicts. Livestock carcasses would need to be reported within 24 hours. No increase in the number of cattle allotments, or in the number of sheep allotments or permitted sheep animal unit months would be allowed. To reduce the potential risk of grizzly bear-human conflicts, sheep grazing permits in non-use status should be phased out and sheep allotments closed as an opportunity arose with a willing permittee.

As discussed for the no-action alternative, the two existing livestock grazing allotments have been compatible with a recovered grizzly bear population. The mortality risk associated with livestock grazing on the Lolo National Forest has been very low. The additional standards and guidelines would maintain a low potential for conflicts on NFS lands in the primary conservation area.

Vegetation management
Under this alternative, existing forest plan standards and guidelines for vegetation management would be retained. Additional desired conditions and guidelines applicable to the primary conservation area would be added. The added direction is very similar to the Interagency Grizzly Bear Guidelines in encouraging a mosaic of successional stages; restricting logging activities in time and space as needed; designing projects to maintain or improve grizzly bear habitat quality or quantity where it would not increase the risk of grizzly bear-human conflicts; and retaining cover as needed along grass, forb and shrub openings, riparian wildlife habitat, or wetlands. No additional measures would be applied to Zone 1 or the Ninemile demographic connectivity area.

The vegetation management guidelines for the primary conservation area would provide for diverse cover and forage conditions and would reduce the potential for grizzly bear displacement through timing of timber sale activities. Although there may be short-term impacts to individual bears from timber management activities and associated road use, these impacts have been and would continue to be managed acceptably.

Mineral and energy development
Existing forest plan standards pertaining to mineral and energy development would be retained. Additional desired conditions, standards and guidelines applicable to the primary conservation area and zone 1 would be added. The additional standards and guidelines would apply to new or

reauthorized permits, leases or plans of operation and would provide guidance for mitigation of mineral development impacts, proper storage and handling of wildlife attractants, timing restrictions for ground-disturbing activities in spring habitat and seismic activity in denning habitat, management of motorized traffic and helicopter use, noise reduction, and worker safety when living near and working in grizzly bear habitat.

With these measures in place, grizzly bears would likely continue to use areas where development occurs with minimal habitat loss and slight temporary disruptions to habitat use patterns. Any future developments would also be subject to site-specific analysis and design.

Demographic connectivity
The proposed action alternative would establish additional management direction requiring no net increase in motorized use of roads open to the public in zone 1 and the Ninemile demographic connectivity area. This would be expected to contribute the conditions needed to support occupancy by grizzly bears, including female bears, and connectivity with the Cabinet-Yaak and Bitterroot Ecosystems.

Summary and conclusion for alternative 2
Under this alternative, the amended Lolo Forest Plan would incorporate standards to maintain baseline levels of open and total motorized route density and secure core in the primary conservation area, and would update management direction for coordination of various resource management programs with grizzly bear habitat in the primary conservation area. Direction would also be added to guide management in the Ninemile demographic connectivity area. The current population trend in the NCDE is stable to increasing, and the amended Lolo Forest Plan under alternative 2 would contribute to sustaining a recovered grizzly bear population in the NCDE.

Alternative 3 — Lolo National Forest
Under this alternative, the same changes to forest plan desired conditions, standards, guidelines and monitoring items would be made as under Alternative 2. In addition, several additional desired conditions, standards and guidelines would be added. The effects of these additional forest plan components are described below.

Primary conservation area
As described previously, four additional standards would be applied in the primary conservation area. NCDE-STD-AR-04 would be modified to explicitly state that roads within secure core cannot be opened for temporary motorized use by the public. Although administrative us could still occur, this standard may reduce the risk of human-caused mortality and lessen the potential for displacement of female grizzly bears with cubs from secure core. NCDE-STD-AR-07 would require that new or reauthorized ski area permits include mitigation measures to reduce the risk of grizzly bear-human conflicts. NCDE-STD-AR-08 would not allow any increase above the baseline in the acreage of areas and miles of routes open to use by over-snow vehicles in the den emergence (i.e. late spring) time period. This would minimize impacts to bears, particularly females with cubs, in this sensitive period. NCDE-STD-MIN-08 would require that no surface occupancy stipulations be applied to any new oil and gas leases in the primary conservation area and zone 1. Taken together, these additional standards would provide additional assurance that habitat quality of the primary conservation area would be maintained, that bears are not displaced from important habitats, and that the risk of grizzly bear-human conflicts would be minimized. Thus alternative 3 would be more protective of grizzly bears than the other two alternatives.

Ninemile demographic connectivity area only
Under alternative 3, all of the vegetation management guidelines that apply to the primary conservation area alternative 2 would also be applicable to the Ninemile demographic connectivity area. The effect of this would likely be to reduce the potential for adverse grizzly bear disturbance/displacement and to design vegetation management activities to protect, maintain, increase and/or improve grizzly habitat quantity or quality within the demographic connectivity area where it would not increase the risk of grizzly bear–human conflicts. This would be beneficial in encouraging occupancy by female grizzly bears.

NCDE-LNF Zone 1-STD-02 would allow no net increase above the baseline in miles of roads and trails open to public motorized use within the Lolo National Forest portion of the Ninemile demographic connectivity area, with certain exceptions, in order to support grizzly bear occupancy.

Zone 1 outside the demographic connectivity areas
A desired condition (NCDE-LNF Zone 1-DC-02) would be added to encourage consolidation of land ownership and support for conservation easements with willing landowners in areas that lie between the primary conservation area and the Salish and Ninemile demographic connectivity area. The intent would be to provide for habitat connectivity and to facilitate the movement of wildlife.

NCDE-LNF Zone 1-STD-01 would allow no net increase above the baseline of miles of roads open to public motorized use on NFS lands in zone 1 outside the Ninemile demographic connectivity area, with certain exceptions.

Summary and conclusion for alternative 3
The four additional standards would reduce the potential for disturbance/displacement of grizzly bears, particularly females, in secure core, during the den emergence period, and in areas where oil and gas development is occurring, within the primary conservation area. Mitigation measures for new or reauthorized ski areas would help to minimize the risk of grizzly bear-human conflicts in these areas. The additional guidelines for vegetation management and the additional standard limiting the linear miles of roads and trails open to public motorized use within the Ninemile demographic connectivity area would help to meet the intent of providing habitat conditions that support occupancy by grizzly bears, particularly female bears. Additional desired conditions and for zone 1 outside the demographic connectivity area would help to provide habitat connectivity and facilitate the movements of grizzly bears. Thus alternative 3 would be more beneficial to grizzly bears and their habitat than the other two alternatives.

Indirect effects of the alternatives — Flathead National Forest

Concurrently with the proposed action to amend the forest plans for the Helena, Kootenai, Lewis and Clark, and Lolo National Forests, the Flathead National Forest proposes to include in its revised forest plan the same set of desired conditions, standards, guidelines, and monitoring items pertaining to the grizzly bear. The alternatives being considered and the indirect effects of the alternatives on the grizzly bear for the Flathead National Forest are described in detail in volume 1 of this DEIS. To provide the full picture of the effects of the alternatives on NFS lands in the NCDE, a brief summary and conclusions for each of the alternatives considered for the Flathead forest plan revision are provided here.

For the Flathead National Forest, alternative A depicts the no action alternative, while for the amendment forests, alternative 1 is the no action alternative. Flathead National Forest alternatives B (proposed action) and D contain the same direction specific to grizzly bears in the NCDE as alternative 2 (proposed action modified) does for the amendment forests. Flathead National Forest

alternative C (wilderness emphasis) provides the same direction specific to grizzly bears in the NCDE as alternative 3 does for the amendment forests.

As part of the revision process, the Flathead National Forest is considering a broader scope of issues and alternatives. In addition to the forest-wide components (desired conditions, standards and guidelines) that are being evaluated for the NCDE amendment forests, the Flathead National Forest is also contemplating changes in management areas. The number of unique management areas and their specific attributes differ between the existing Flathead forest plan (alternative A) and action alternatives B, C, and D.

The following sections provide the summary and conclusions concerning the effects of each of the alternatives being considered for the Flathead National Forest, along with a corresponding table that displays the management area (MA) categories and acreages by alternative. To assist comparison of the alternatives, the management areas have been grouped into eight national management area categories. The categories depict a spectrum with categories 1 and 2 having the lowest levels of development, while category 8 is a highly altered environment. See planning record exhibit V-44 for a description of the management area categories and a cross-walk of management areas in each management area category. The management area categories and the acreage of each within the NCDE management zones on the Flathead National Forest are also summarized in volume 1, table 3.

Summary and conclusion for alternative A

The Flathead National Forest has about 2.1 million acres within the NCDE recovery zone (about 37 percent of the recovery zone). There are 10 bear management units on the Flathead National Forest, divided into 73 subunits (figure 1-32).

The existing Flathead Forest Plan, which incorporated the Interagency Grizzly Bear Guidelines, has been effective in contributing to the improved status of the NCDE grizzly bear population. Grizzly bear habitat on the Flathead National Forest is anchored by close to 1.2 million acres in management area category 1 (table 12) that are unlikely to be affected by human disturbance at a level that would impact grizzly bears. In other management area categories, the Forest would continue to decrease open and total road densities in grizzly bear subunits that do not meet 19-19-68, further increasing habitat security on NFS lands within the recovery zone/primary conservation area. Some minor effects to individual bears would be anticipated under this alternative due to temporary increases in open and total road density and temporary decreases in habitat security, especially in management area category 5, but continued implementation of the no-action alternative would be compatible with contributing to a recovered grizzly bear population on NFS lands. There would continue to be a risk of grizzly bear-human conflicts on NFS lands, especially in management area category 8, where concentrations of attractants may be present. However, implementation of food storage orders would continue to minimize the potential for grizzly bear-human conflicts and bear mortality across the Forest. Energy and mineral development has been minor on the Flathead National Forest and is expected to continue to be so in the future. However, the existing forest plan does not limit livestock grazing, developed recreation sites, and does not contain the regulatory framework necessary for de-listing of the NCDE population.

Table 12. Alternative A: approximate NFS acres by management area (MA) category (cat.) on the Flathead National Forest within the NCDE recovery zone/primary conservation area and outside NCDE recovery zone (zone 1 and the Salish demographic connectivity area)

Area of the Flathead	MA Cat. 1	MA Cat. 2	MA Cat. 3	MA Cat. 4	MA Cat. 5	MA Cat. 6	MA Cat. 7	MA Cat. 8
NCDE recovery zone/PCA	1,153,150	28,285	339,469	180,558	372,540	55,814	-	6,712
Salish DCA, Zone 1	157	5,397	9,705	3,357	77,224	-	-	-
Zone 1 outside Salish DCA	2	-	23,731	9,602	99,812	1,507	-	1,054
Outside NCDE	-	202	3,327	1,380	19,824	-	-	5

Summary and conclusion for alternative B

Grizzly bear habitat on the Flathead National Forest would be anchored by over 1.4 million acres in management area category 1 (table 13) that are unlikely to be affected by human disturbance at a level that would impact grizzly bears. Under this alternative, the revised Flathead Forest Plan would incorporate standards to maintain baseline levels of open and total motorized route density and secure core in the primary conservation area that have supported grizzly bear habitat recovery.

Table 13. Alternative B: approximate NFS acres by management area (MA) category (cat.) on the Flathead National Forest within the NCDE recovery zone/primary conservation area and outside NCDE recovery zone (zone 1 and the Salish demographic connectivity area)

Area of the Flathead	MA Cat. 1	MA Cat. 2	MA Cat. 3	MA Cat. 4	MA Cat. 5	MA Cat. 6	MA Cat. 7	MA Cat. 8
NCDE recovery zone/PCA	1,415,876	45,661	-	177,372	492,295	-	-	5,236
Salish DCA, Zone 1	-	5,810	-	1,207	88,820	-	-	2
Zone 1 outside Salish DCA	2	1,191	-	7,509	125,857	-	-	1,148
Outside NCDE	8	202	-	-	24,529	-	-	-

Existing mechanized use and motorized over-snow use would be allowed as a suitable use in recommended wilderness as long as certain conditions are maintained (see Recreation section of chapter 3 for more details). Alternatives B has the greatest potential for temporary increases in motorized access for projects in the primary conservation area, because this alternative has the greatest number of acres in category 5. Outside the primary conservation areas, alternatives B and C have a very similar number of acres in category 5. Some minor effects to individual bears would be anticipated as a result, but application of forestwide standards and guidelines would be expected to continue to support a recovered grizzly bear population on NFS lands. All alternatives have very similar acreage in MA 8. There would continue to be a risk of grizzly bear-human conflicts on NFS lands, especially in management area category 8, where concentrations of attractants may be present.

However, implementation of food storage orders would continue to minimize the potential for grizzly bear-human conflicts and bear mortality across the Forest.

Alternative B would update management direction for coordination of various resource management programs with grizzly bear habitat in the primary conservation area, including livestock grazing and developed recreation. Energy and mineral development has been minor on the Flathead NF and is expected to continue to be so in the future, but this alternative includes additional requirements to mitigate effects to grizzly bears. Alternative B provides the regulatory framework necessary for de-listing of the NCDE population and would provide consistency across NFS lands in the primary conservation area, so that habitat conditions supporting recovery are maintained.

Summary and conclusion for alternative C

Grizzly bear habitat on the Flathead National Forest would be anchored by over 1.6 million acres in national management category 1 (table 14) that are unlikely to be affected by human disturbance at a level that would impact grizzly bears. Mechanized and motorized use would not be allowed as a suitable use in recommended wilderness, reducing the future risk of all motorized and mechanized forms of human disturbance in all seasons more than the other alternatives. As with the other action alternatives, the revised Flathead Forest Plan would incorporate standards to maintain baseline levels of open and total motorized route density and secure core in the primary conservation area that have supported grizzly bear habitat recovery.

Table 14. Alternative C: approximate NFS acres by management area (MA) category (cat.) on the Flathead National Forest within the NCDE recovery zone/primary conservation area and outside NCDE recovery zone (zone 1 and the Salish demographic connectivity area)

Area of the Flathead	MA Cat. 1	MA Cat. 2	MA Cat. 3	MA Cat. 4	MA Cat. 5	MA Cat. 6	MA Cat. 7	MA Cat. 8
NCDE recovery zone/PCA	1,634,040	42,085	-	90,185	364,971	-	-	5,258
Salish DCA, Zone 1	5,950	414	-	1,207	88,267	-	-	2
Zone 1 outside Salish DCA	13	1,075	-	7,560	125,796	-	-	1,264
Outside NCDE	10	202	-	-	24,527	-	-	-

Alternative C has the lowest potential for temporary increases in motorized access for projects in the primary conservation area, because this alternative has the lowest number of acres in category 5. Some minor effects to individual bears would be anticipated as a result, but application of forestwide standards and guidelines would be expected to continue to support a recovered grizzly bear population on NFS lands. All alternatives have very similar acreage in management area category 8. There would continue to be a risk of grizzly bear-human conflicts on NFS lands, especially in management area category 8, where concentrations of attractants may be present. However, implementation of food storage orders would continue to minimize the potential for grizzly bear-human conflicts and bear mortality across the Forest. This alternative would update management direction for coordination of various resource management programs with grizzly bear habitat in the primary conservation area, including livestock grazing and developed recreation. Energy and mineral development has been minor on the Flathead National Forest and is expected to continue to be so in the future, but this alternative includes additional requirements to mitigate effects to grizzly bears.

The same changes to forest plan desired conditions, standards, guidelines and monitoring items would be made as under alternatives B and D. In addition, several additional desired conditions, standards and guidelines would be added. Four additional standards would be applied in the primary conservation area. NCDE-STD-AR-04 would be modified to explicitly state that roads within secure core cannot be opened for temporary motorized use by the public. This would reduce the risk that female grizzly bears with cubs would be disturbed or displaced from secure core by the public. NCDE-STD-AR-07 would require that new or reauthorized ski area permits include mitigation measures to reduce the risk of grizzly bear-human conflicts. NCDE-STD-AR-08 would not allow any increase above the baseline in the acreage of areas and miles of routes open to use by over-snow vehicles in the den emergence time period (i.e., late spring). This, in concert with additional recommended wilderness, would reduce potential impacts to bears, particularly females with cubs, because areas where snowmobile use would be suitable in the den emergence period would be greatly reduced in size (see figures B-03 to B-05). NCDE-STD-MIN-08 would require that no surface occupancy stipulations be applied to any new oil and gas leases in the primary conservation area and zone 1. Taken together, these additional standards and management area direction would lower the risk of grizzly-bear human conflicts and displacement in the future. Thus, alternative C would be more protective of individual grizzly bears than the other two alternatives. Alternative C provides the regulatory framework necessary for de-listing of the NCDE population and would provide consistency across NFS lands in the NCDE, so that habitat conditions supporting recovery are maintained

Summary and conclusion for alternative D

Similar to alternative B, grizzly bear habitat on the Flathead National Forest would be anchored by almost 1.4 million acres in management area category 1 (table 15) that are unlikely to be affected by human disturbance at a level that would impact grizzly bears. However, alternative D would have no acres in recommended wilderness and more acres in a variety of backcountry management areas (see Recreation section of chapter 3 for more details). Outside the primary conservation area, alternative D has slightly less acres in management area category 5 than alternatives B and C. Reasons for this are varied, but for example, alternative D has a larger forest-wide acreage of management area 7, focused recreation areas, especially in areas close to human communities. Some focused recreation areas would be managed for timber production, but others would not (see Recreation section of chapter 3 for more details). As with the other action alternatives, the revised Flathead Forest Plan would incorporate standards to maintain baseline levels of open and total motorized route density and secure core in the primary conservation area that have supported grizzly bear habitat recovery.

Table 15. Alternative D: approximate NFS acres by management area (MA) category (cat.) on the Flathead National Forest within the NCDE recovery zone/primary conservation area and outside NCDE recovery zone (zone 1 and the Salish demographic connectivity area)

Area of the Flathead	MA Cat. 1	MA Cat. 2	MA Cat. 3	MA Cat. 4	MA Cat. 5	MA Cat. 6	MA Cat. 7	MA Cat. 8
NCDE recovery zone/PCA	1,363,101	71,650	-	205,919	480,629	-	-	5,258
Salish DCA, Zone 1	-	5,810	-	1,207	88,820	-	-	2
Zone 1 outside Salish DCA	2	1,191	-	15,696	117,671	-	-	1,148
Outside NCDE	10	202	-	-	24,527	-	-	-

Alternative D has slightly less potential for temporary increases in motorized access for projects in the primary conservation area, because this alternative has slightly less acres in management area category 5. Outside the primary conservation area, there would be more emphasis on regeneration harvest, especially in the wildland urban interface. Some minor effects to individual bears would be anticipated as a result, but application of forestwide standards would be expected to continue to support a recovered grizzly bear population on NFS lands. All alternatives have very similar acreage in management area category 8. There would continue to be a risk of grizzly bear-human conflicts on NFS lands, especially in management area category 8, where concentrations of attractants may be present. However, implementation of food storage orders would continue to minimize the potential for grizzly bear-human conflicts and bear mortality across the Forest. This alternative would update management direction for coordination of various resource management programs with grizzly bear habitat in the primary conservation area, including livestock grazing and developed recreation. Energy and mineral development has been minor on the Flathead National Forest and is expected to continue to be so in the future, but this alternative includes additional requirements to mitigate effects to grizzly bears. Alternative D provides the regulatory framework necessary for de-listing of the NCDE population and would provide consistency across NFS lands in the NCDE, so that habitat conditions supporting recovery are maintained.

Cumulative effects on the grizzly bear

Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7). The analysis of cumulative effects provides a larger context in which to evaluate the effects of the five forest plans, by considering conditions across all land ownerships within the NCDE.

Both the grizzly bear recovery plan and the draft NCDE conservation strategy emphasized the need to coordinate management across multiple land ownerships and jurisdictions to sustain the NCDE grizzly bear population through time. In this section, the cumulative impacts of: (1) management by other federal agencies, state agencies, tribes, and private landowners on NCDE-wide habitat quality; (2) grizzly bear-human conflicts on lands not managed by the Forest Service; (3) effects of land management on connectivity between the NCDE and adjacent grizzly bear ecosystems; and (4) future climate change are considered.

NCDE-wide habitat quality

Other federal lands – Glacier National Park lands represent about 19 percent of the primary conservation area. The Bureau of Land Management, USFWS and Bureau of Reclamation collectively manage a very small fraction (0.4 percent) of the primary conservation area. Under the Endangered Species Act, all federal agencies are directed to use their authorities to seek to conserve endangered species and threatened species and must consult with the USFWS if their actions may affect a listed species or its critical habitat. Federal land management is guided by agency land-use plans, the Interagency Grizzly Bear Guidelines, and the requirements of biological opinions. Management of grizzly bear habitat on federal lands has been an important factor leading to the recovery of the NCDE grizzly bear population.

The expectation in developing the NCDE conservation strategy is that the signatories will incorporate the relevant set of habitat standards and guidelines into their respective management plans. All federal agencies would manage motorized access within the primary conservation area so that: (1) there is no net decrease in secure core from the baseline and no net increase in open and total motorized route densities; (2) the number and capacity of developed recreation sites are limited; (3) there is no net increase in the number of livestock allotments and no net increase in the number of

sheep from the baseline; (4) vegetation management will be conducted in a way that is compatible with grizzly bear habitat needs; and (5) mineral and energy development will be designed to avoid, minimize, or mitigate adverse impact to grizzly bears.

Actions undertaken by the federal agencies could have short-term negative effects, such as disturbance/displacement of individual grizzly bears. However, no adverse cumulative effects are anticipated to accrue to the NCDE population as a result of actions by other federal agencies.

State lands – Montana Department of Natural Resources and Conservation lands comprise about 3.6 percent of the primary conservation area and 6.2 percent of zone 1. In 2011, the Montana Department of Natural Resources and Conservation in conjunction with USFWS completed a habitat conservation plan, which has a 50-year term. This is a comprehensive program to conserve federally-listed species and minimize incidental take during ongoing forest management activities in western Montana. Within the area delineated as the primary conservation area, zone 1 and zone 2, the Montana Department of Natural Resources and Conservation manages about 574,000 acres of state trust lands. Of this, approximately 204,000 acres are located within the primary conservation area.

The Swan River State Forest has been a party to the Swan Valley Grizzly Bear Conservation Agreement along with Plum Creek Timber Company, the Flathead National Forest, and USFWS since 1995. This agreement has coordinated timber harvest activities and associated road management across the multiple land ownerships in the Swan Valley in a manner that has contributed to the recovery of the grizzly bear population. Under this agreement, three years of rest (during which low-intensity, administrative activities may occur, but public access is restricted) must be provided after three years of management activities; areas with open road density >1 mi/mi^2 must not exceed 33 percent of each bear management subunit; road closure devices are maintained; and seasonal road closures are implemented (USFWS et al. 1995).

Recently, a land transfer known as the Legacy Project has been completed in the Swan Valley. The Nature Conservancy and The Trust for Public Land agreed to purchase lands from Plum Creek Timber Company and then sell or donate these lands to Federal, State, and private owners. The vast majority of these lands have become Federal (USFS) or State (Montana Department of Natural Resources and Conservation) owned, and any lands that were sold to private owners have safeguards (e.g., conservation agreements) attached to them so that the integrity of wildlife habitat is maintained. The “fiber agreement” that was part of the Legacy Project and necessitated coordination of timber harvest on Legacy lands has now ended. In the foreseeable future, Montana Department of Natural Resources and Conservation may be managing their lands in the Swan Valley using their Habitat Conservation Plan, rather than the conservation agreement.

On all lands under the habitat conservation plan, the Montana Department of Natural Resources and Conservation is committed to minimizing construction of new open roads in riparian area wetlands and avalanche chutes. Motorized activities are suspended within 0.6 mi of a known active grizzly bear den. Visual cover is retained in riparian and wetland areas. Information is provided to all contractors and training is provided to employees about living and working in bear habitat.

Within the primary conservation area and zone 1 (zone 1 is called “non-recovery occupied habitat” in the habitat conservation plan), Montana Department of Natural Resources and Conservation agreed to minimize the construction of new open roads; prohibit commercial forest management activities, pre-commercial thinning and heavy equipment slash treatments during April 1–June 15 in spring bear habitat; minimize helicopter operations requiring flights lower than 500 m in seasonally important grizzly bear habitat; limit the number of active gravel pits; and discourage new domestic sheep grazing allotments. Spring habitat restrictions are implemented on about 48,600 acres in the

Stillwater and Coal Creek State Forests, and 31,700 acres in the Swan River State Forest. Currently, the Montana Department of Natural Resources and Conservation has very few grazing licenses on very limited ownership in the NCDE. Fewer than 9,000 acres within the primary conservation area and about 30,700 acres in the non-recovery occupied habitat are grazed by livestock. Information and education programs and other measures are being taken to avoid and minimize the risk of human-bear conflicts. Prompt removal of livestock carcasses also minimizes risk of bear-livestock conflicts.

Additional protective measures apply to the primary conservation area, including capping the miles of open and restricted roads in the Stillwater Block and Swan River State Forest. The Stillwater Block will maintain 22,007 acres of security zones where management and administrative uses are prohibited during the non-denning season. The Swan Habitat Conservation Plan strategy is that 4 years of activity must be followed by 8 year rest periods across 5 management subzones. The impacts to important grizzly bear habitats are minimized; all primary road closure devices are examined and repaired annually; and no new grazing licenses for sheep and other small livestock will be authorized. The transportation plan for the Stillwater and Coal Creek State Forests capped road construction to 19.3 more miles of permanent road, and reduced the miles of road open year-round by 15 percent.

The transportation plan for the Swan River State Forest under the HCP would cap new permanent roads at 70 miles (none open to the public), allowed a minimal net increase in linear open road miles, and called for an additional 41 miles of road to restrict commercial forest activities during the spring season. The Montana Department of Natural Resources has no commitments to manage secure core habitat for grizzly bears on the Swan River State Forest.

While there could be some short-term adverse effects on a few individual bears, implementation of the habitat conservation plan is not likely to cause cumulative adverse effects on the NCDE grizzly bear population.

Montana Department of Fish, Wildlife and Parks - A very small proportion of the land within the primary conservation area (0.6 percent) and zone 1 (1.2 percent) are managed by the Montana Department of Fish, Wildlife and Parks. Montana's Wildlife Management Areas are managed with wildlife and wildlife habitat conservation as the primary concern along with providing for enjoyment by the public. Some wildlife management areas are open for hunting or camping and others are not. Several are closed to the public during the winter and spring periods. The Montana Department of Fish, Wildlife and Parks is a very active in providing public information and education about conserving grizzly bears and their habitat.

Given the agency's mission to conserve wildlife and its small holdings with the primary conservation area and zone 1, no adverse cumulative effects on the NCDE grizzly bear population are anticipated due to management actions of the Montana Department of Fish, Wildlife and Parks.

Tribal lands – The Blackfeet Indian Reservation represents about 4.5 percent of the primary conservation area and about 5.6 percent of zone 1. Within the Blackfeet Indian Reservation, there are about 175,000 forested acres. These are managed under the Blackfeet Nation Forest Management Plan, which is expected to be in effect until 2030. Nearly all of the acres under the forest management plan occur within the primary conservation area or zone 1. Under the forest management plan, no net increase in overall road density levels is allowed.

Lands managed by the Confederated Salish and Kootenai Tribes comprise about 2.5 percent of the primary conservation area and nearly 11 percent of zone 1. Of the acreage that is within the primary

conservation area, 91 percent of reservation lands are in the Mission Mountains Tribal Wilderness Area or the South Fork Jocko Primitive Area. No commercial forest activities occur in these areas. There will be no permanent increase in open or total road densities and no permanent decreases in secure core within the wilderness area. In the South Fork Jocko Primitive Area, there will be no net increase in open roads. The forest management plan (2000) provides the following guidance for motorized access management on the remaining lands: open road densities shall not exceed 4 mi/mi^2; total road miles shall remain at or below what existed in 1999; total road densities will be reduced over the life of the plan by removing 15 percent of road spurs; and roads in timber sale areas shall be closed after timber harvest is completed. Vegetation management direction in the primary conservation area restricts the locations and methods of harvest in some areas; hiding cover is retained along major highways near identified crossing areas; and during the duration of a timber sale and for two years afterward, adjacent drainages must remain undisturbed. On the Flathead Indian Reservation, there is no livestock grazing within the primary conservation area. Under the conservation agreement, the standards for management of livestock grazing would be the same as for the federal agencies.

Existing management direction on tribal lands has been in place during the period when the NCDE grizzly bear population was stable to increasing. There may be some adverse effects on individual grizzly bears, for example due to high road densities outside of tribal wilderness areas. However the overall suite of management direction along with efforts of tribal bear management specialists will minimize adverse effects. Cumulative adverse effects to the NCDE population are not expected as a result of management actions on tribal lands.

Private lands – Privately-owned lands comprise about 10 percent of the 5.7 million acre primary conservation area, nearly 48 percent of zone 1. Privately-owned lands occur within and adjacent to NFS lands throughout the NCDE.

The human population in northwest Montana has grown at a relatively high rate during the past few decades, and growth is expected to continue. Increasing residential development and demand for recreational opportunities can result in habitat loss, habitat fragmentation, and increases in grizzly bear-human conflicts. These impacts are likely to intensify, although appropriate residential planning, outreach about how to minimize adverse effects, and assistance in resolving conflicts can help mitigate these impacts.

Increasing development on private lands has the potential to have cumulative adverse effects on the NCDE grizzly bear population. Monitoring of population status will provide a mechanism to identify areas of concern so that appropriate preventive or corrective actions can be taken.

Canadian lands – Grizzly bear populations in the lower 48 States are not separated biologically from grizzly bears in Canada. However, there are distinct differences in population status, habitat management, and regulatory mechanisms between the two countries. Overall, Canada supports approximately 27,000 grizzly bears in relatively contiguous populations (Ross 2002). Grizzly bears are listed as a species of “special concern” under the Canadian Species at Risk Act, but this designation is given to any species that is sensitive to human activities, and does not indicate an extinction risk (USFWS 2011).

In contrast to the U.S., there is no national land management agency to establish and implement habitat management programs across Canada. The national parks and provincial parks have uniform habitat protections in place for grizzly bears. Provincial management plans have been developed for grizzly bears in British Columbia and Alberta. In Canada immediately north of the NCDE, the main human activities that have impacted grizzly bears and their habitat are timber harvesting, oil and gas

exploration and development, coal mining, and the proliferation of roads and other human developments related to these industries. On February 18, 2010, the British Columbia Premier announced that mining, oil, gas, and coal development were no longer permissible land uses in the Canadian portion of the North Fork Flathead River basin, removing a substantial threat to the NCDE population (USFWS 2011).

There is no evidence to suggest that adverse cumulative impacts are now or will occur due to land management activities in Canada.

Grizzly bear-human conflicts
Between 1999–2008, 201 human-caused mortalities were recorded in the NCDE. The top three sources of mortality were management removals (27 percent), illegal kills (25 percent) and trains (12 percent) (USFWS 2011). The majority (67 percent) of the management removals were related to unsecured attractants.

Other federal lands – Within Glacier National Park, food storage regulations (pursuant to 36 CFR 2.10 (d)) prohibit anyone from leaving food unattended or stored improperly where it could attract or otherwise be available to wildlife. On Bureau of Land Management land within the NCDE recovery zone, the NCDE food storage guidelines are incorporated into their contracts. The NCDE food storage guidelines are also incorporated into contracts in areas that are outside the recovery zone (primary conservation area) but in an area known to be occupied by grizzly bears. The National Bison Range complex is located within the NCDE and administered by USFWS. These refuges are day-use only, with no overnight camping allowed. Users are expected to pack out their trash; there are no garbage receptacles anywhere on the refuges.

All federal agencies are making efforts to prevent or reduce grizzly bear-human conflicts. No adverse cumulative effects are anticipated to accrue to the NCDE population as a result of actions by the other federal agencies.

State lands – Food and attractant storage programs for Montana Department of Natural Resources and Conservation staff and contractors reduce the risk of human-bear conflicts. On Department lands within the NCDE recovery zone and on scattered school trust lands within the NCDE and Cabinet-Yaak recovery zones, contract language requires the removal of garbage from work sites daily. Outside the NCDE and Cabinet-Yaak recovery zones but in known occupied grizzly bear habitat, timber sale contract language requires the removal of garbage from work sites daily. For Department lands outside the recovery zones and outside known occupied grizzly bear habitat, precautions are taken on a case-by-case basis only if known bear activity occurs. Recreationists are expected to pack out their trash. As a partner in the Blackfoot Challenge, Montana Department of Natural Resources and Conservation has placed bear-resistant dumpsters at state land locations where bear-attractant conflicts have been known to occur. The Department provides all of its cabin leasees with a brochure “Living with Bears” that explains measures that should be taken to minimize bear-human conflicts. No Montana Department of Natural Resources and Conservation employees or contractors have been involved in a grizzly bear-human conflict that resulted in a management action or death of a grizzly bear.

Montana Department of Fish, Wildlife and Parks – The Department completed a grizzly bear management plan for western Montana in 2006, and a grizzly bear management plan for southwestern Montana in 2013. These documents establish goals and strategies to manage and enhance grizzly bear populations and to minimize the potential for human-grizzly bear conflicts. The Department also employs several bear management specialists to work with landowners and educate the public in an effort to avoid or resolve grizzly bear-human conflicts and to reduce grizzly bear

mortalities. Food storage guidelines are in place in some state parks and wildlife management areas, and bear-resistant dumpsters are in place in most state parks.

The State of Montana allows regulated hunting for black bears and other wildlife species. There is a potential for grizzly bear mortality by hunters to occur as a result of mistaken bear identification or self-defense especially in proximity to the carcasses of harvested animals. Montana Department of Fish, Wildlife and Parks provides a variety of public information and education programs, including a mandatory black bear hunter testing and certification program to help educate hunters in distinguishing species, which are aimed at reducing human-caused mortalities. Black bear hunting seasons have also been shortened in recent years, reducing the potential for mistaken identity. These efforts have helped to decrease legal and illegal shooting mortalities.

Hunting of grizzly bears has not been allowed in Montana since 1991. In a recovered, delisted population of grizzly bears, the Department would assume management responsibility for the grizzly bear population. Management could include regulated hunting in the future, when and where appropriate, which potentially could increase support among some segments of the public. The Department would monitor the level of mortality to due hunting and its effects on the NCDE grizzly bear population.

Tribal lands – The Blackfeet Indian Reservation has a food storage order in in place under the Blackfeet Fish and Wildlife Code of Regulations (chapter 3, section 17) which applies to all lands within the exterior boundaries of the reservation which are designated as normally being occupied by bears. The regulations govern food storage and sanitation in camping and nonresidential situations and also govern the removal of livestock carcasses that may attract bears into conflict situations. In addition, beekeepers in bear country are encouraged to install electric fencing around beehives

All lands within the primary conservation area on the Blackfeet Indian Reservation are currently allotted for livestock grazing. A bear management specialist(s) works with livestock producers to minimize and manage bear-livestock conflicts. Existing sheep allotments will be monitored, evaluated and phased out if the opportunity arises with willing permittees.

On the Flathead Indian Reservation, there is a food storage order for backcountry areas in the primary conservation area. As warranted, residents are notified of bear activity and precautionary measures that should be taken to reduce bear-human conflict. Tribal biologists provide assistance in mitigating situations where food and attractant storage is an issue.

Although there has been a history of grizzly bear mortalities related to livestock on the Blackfeet Indian Reservation, the rate of increase of the grizzly bear population indicates that the level of mortality has been sustainable. The Blackfeet Nation and the Confederated Salish and Kootenai Tribes have taken actions, such as hiring bear management specialists and providing information and education, to reduce grizzly bear-human conflicts. Therefore no adverse cumulative impacts are anticipated due to grizzly bear-human conflicts on tribal lands.

Private lands – Private lands continue to account for a disproportionate number of conflicts and grizzly bear mortalities in the NCDE. These impacts are likely to intensify, although appropriate residential planning, outreach and information about how to avoid conflicts, tools such as bear resistant containers and electric fencing, and assistance in resolving conflicts can help mitigate these impacts. Walters and Holling (1990) stated that managing human-caused mortality, monitoring both population and habitat parameters, and responding when necessary with adaptive management are the best ways to ensure a healthy grizzly population. The USFS does not have authority to manage grizzly bear-human conflicts or human-caused mortality on private lands. Population monitoring and

management of human-grizzly bear conflicts is under the authority of Montana Fish Wildlife and Parks.

The Montana Fish Wildlife and Parks, Confederated Salish and Kootenai Tribes, and the Blackfeet Nation employ bear specialists who work with landowners in an effort to reduce risks to grizzly bears and humans on private, public lands or tribal lands. Bear specialists provide information and assistance to landowners on appropriate ways to secure food and attractants from grizzly bears, and respond to reports of conflicts with nuisance black and grizzly bears. These programs have been successful in informing the public, reducing the availability of attractants to grizzly bears on private and public lands, and reducing human-caused mortalities of grizzly bears. These programs and their positive results are expected to continue for the foreseeable future.

Increasing development on private lands and the accompanying risk of grizzly bear-human conflicts has the potential to have cumulative adverse effects on the NCDE grizzly bear population. Monitoring of population status and grizzly bear-human conflicts will provide a mechanism to identify areas of concern so that appropriate preventive or corrective actions can be taken.

Effects of management and development on connectivity with adjacent ecosystems
Other federal lands – The network of federal lands in northwestern Montana provide a high degree of landscape permeability for grizzly bears. Federal agencies have been cooperating in improving habitat connectivity and mitigating impacts of highways and other developments that impede movement by wildlife including grizzly bears. No adverse cumulative impacts on connectivity are anticipated.

State lands –Under the habitat conservation plan, maintenance of eight security zones comprising 22,007 acres in the Stillwater Block and adherence to seasonal restrictions in that transportation plan would facilitate important linkage between the Whitefish and Salish Mountain Ranges. The Swan Valley Grizzly Bear Conservation Agreement also provides a framework for cooperative management and it would continue to facilitate effective linkage across the valley. The Montana Department of Natural Resources and Conservation's habitat conservation plan also has provisions that help to maintain the integrity of linkages in the Swan valley to provide for movement between suitable habitats and recovery zones, if it were to go into effect in this area. Thus, under either strategy into the future, effective linkage is likely to be maintained on state trust lands.

The sale or other disposal of some state lands is allowed. However, under the habitat conservation plan, removal of lands is capped at five percent of the baseline acreage of certain areas including the grizzly bear NCDE recovery zone.

The Department management direction contributes to maintaining or improving connectivity, and adverse cumulative effects are not anticipated.

Montana Department of Fish, Wildlife and Parks – Grizzly bear management plans establish goals and strategies to manage and enhance grizzly bear populations and to minimize the potential for human-grizzly bear conflicts. A long-term goal is to allow the populations in western and southwestern Montana to reconnect through the intervening, currently-unoccupied habitats. No adverse cumulative impacts on connectivity are anticipated.

Tribal lands – On the Flathead Indian Reservation lands within the Ninemile demographic connectivity area, the above-mentioned requirements under the forest management plan also apply. There is a tribally-designated wilderness, Sleeping Woman, and tribally-designated roadless areas, Burgess and the Ravalli Valley complex, that help to facilitate grizzly bear occupancy and

movements within the demographic connectivity area. In a 54-mile stretch of highway 93 between Evaro and Polson, more than 50 wildlife crossing structures have been constructed. Hiding cover is retained on the reservation adjacent to highway 93 at Evaro and in the Ravalli Corridor to provide conditions that facilitate movement of wildlife. No adverse cumulative impacts on connectivity are anticipated as a result of tribal actions.

Future climate change

The USFWS examined climate change and potential future effects on the grizzly bear in its 5-year status review (USFWS 2011). The most likely ways in which climate change may potentially affect grizzly bear habitat include: reduction in snowpack levels; shifts in the denning season; shifts in the abundance and distribution of some natural food sources; and changes in fire regimes due to summer drought.

Reduced snowpack or shorter winter season could improve over-winter survival of bears, assuming that sufficient bear foods are available later in the fall and earlier in the spring. However, a shorter denning period could increase the potential for spring and fall encounters between grizzly bears and hunters and/or recreationists, which in turn would increase the risk of mortality to grizzly bears.

With respect to shifts in the denning season, the draft NCDE grizzly bear conservation strategy defined denning season dates and stated that dates will be adjusted if the 10-year average den emergence data for females or females with offspring shows a shift of at least a week. Denning in the NCDE has been monitored and the analysis of effects of alternatives on denning habitat uses modelled denning habitat provided by Mace (2014), which is the best available scientific information.

The extent and rate to which individual plant species or plant communities will be impacted by climate change is difficult to foresee with any level of confidence (Walther et al. 2002) (Fagre, Peterson, and Hessl 2003). However, there is general consensus that grizzly bears are flexible enough in their diet that they will not be impacted directly by plant community changes in response to climate change (Servheen and Cross 2010).

The draft grizzly bear conservation strategy states: “Most grizzly bear biologists in the U.S. and Canada do not expect habitat changes predicted under climate change scenarios to directly threaten grizzly bears (Servheen and Cross 2010). These changes may even make habitat more suitable and food sources more abundant. However, these ecological changes may also affect the timing and frequency of grizzly bear/human interactions and conflicts (Servheen and Cross 2010).”

Fire frequency and severity are predicted to increase in the western U.S. as a result of climate change. Large, uncharacteristically severe wildfires that convert mature forest to early successional condition alter the availability of grizzly bear foods and cover, potentially changing how bears use the landscape. Decreases in forest cover could benefit grizzly bears by increasing the production of shrubs, berries and root crops in the years following large fires (Blanchard and Knight 1996).

The potential positive and negative effects of climate change would likely be variable across the ecosystem and are difficult to predict. Grizzly bears are habitat generalists and opportunistic omnivores, which may make them less susceptible to changes in plant communities than some other species of wildlife. The high degree of uncertainty emphasizes the importance of long-term monitoring of the grizzly bear population, so that any necessary adjustments can be made.

Summary of cumulative effects on grizzly bear

The national forests comprise the majority (60 percent) of lands in the NCDE primary conservation area; thus Forest Service management actions make a substantial contribution to the conservation of the grizzly bear population. The actions of other landowners in the NCDE are also very important since the grizzly bear is a wide-ranging species that uses a broad range of elevations and habitats during the year.

Road densities, developed recreation sites, livestock grazing, vegetation management, and development of minerals and oil and gas on federal, state, and tribal lands have the potential to cause disturbance and displacement of bears, fragmentation of habitat, and increased risk of human-grizzly bear conflicts. However, while some individual bears may be adversely impacted by these management activities, the NCDE population has achieved recovery status while these activities were ongoing. When finalized, all signatories to the GBCS will make commitments appropriate to their jurisdiction to contribute to sustaining the recovered population in the NCDE. Coordination and exchange of information between federal and state agencies and the tribes concerning the status and trend of the NCDE grizzly bear population is expected to continue into the foreseeable future. Therefore no cumulative adverse impacts are anticipated as a result of habitat management.

There is a potential for adverse cumulative impacts as a consequence of grizzly bear-human conflicts on private lands. If the NCDE population is delisted, the results and analysis of monitoring will be reviewed annually by a coordinating committee. Any deviations from population and/or habitat standards stipulated in the conservation strategy will be noted and a biology and management review will be initiated. If the deviations cannot be corrected, the coordinating committee may petition USFWS for relisting under the Endangered Species Act.

Substantial efforts have been made to provide for connectivity of the NCDE grizzly bear population with other ecosystems and are expected to continue. Under the action alternatives, demographic connectivity areas would be established and purposefully managed by the federal agencies, DNRC and the Flathead Indian Reservation to encourage connectivity to the Cabinet-Yaak and Bitterroot ecosystems. Additionally, an area on the Helena National Forest would be identified for coordinated management that would support movement of male bears to the Greater Yellowstone ecosystem. These actions will contribute to maintaining or improving connectivity, and no adverse cumulative effects are anticipated.

Climate change may alter grizzly bear habitat and behavior, but the predicted changes are not anticipated to have a significant negative effect on grizzly bear survival and reproduction in the NCDE.

6.5.6 Other endangered, threatened, proposed and candidate species

Introduction

To facilitate the preparation of biological assessments and fulfill the requirements of section 7(c) of the Endangered Species Act, as amended, the USFWS has generated web-based species lists of threatened, endangered, proposed, and candidate species for each national forest. The Montana Field Office's web site was accessed on July 7, 2015, to obtain species lists for the Helena, Kootenai, Lewis and Clark, and Lolo National Forests.

In addition to the grizzly bear, two other species, the Canada lynx and the yellow-billed cuckoo, are listed as a threatened species under the Endangered Species Act. One species that is a candidate for listing, the Sprague's pipit, also occurs in the area. Table 16 shows the known or suspected

distribution of each of these species on the five national forests in relation to the NCDE recovery zone/primary conservation area, and zones 1, 2 and 3.

Table 16. Threatened, endangered, proposed, and candidate terrestrial wildlife species and their known or suspected occurrence on the Flathead, Helena, Kootenai, Lewis and Clark, and Lolo National Forests

Species	Listing Status	Flathead	Helena	Kootenai	Lewis and Clark	Lolo
Canada lynx (Lynx canadensis)	Threatened	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA, zones 1 and 2	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA	NCDE/PCA, zone 1, Ninemile DCA
Yellow-billed Cuckoo, Western DPS (Coccyzus americanus)	Threatened	-	-	-	-	Zone 1, Ninemile DCA
Sprague's pipit (Anthus spragueii)	Candidate	–	Zone 2	–	NCDE/PCA, zone 3	–

NCDE = NCDE recovery zone

Canada lynx

Key indicators for analysis

In the Lynx Conservation Strategy and Assessment (USDA (2013c)), anthropogenic influences are placed in either the "upper tier" or the "lower tier". The upper tier includes anthropogenic influences that are of greatest concern to the conservation of the lynx: climate change, vegetation management, wildland fire management, and fragmentation of habitat. Recreation (including snowmobiling), minerals and energy development, forest/backcountry roads and trails, and grazing by domestic livestock, which are the factors of most concern in the grizzly bear conservation strategy, were placed in the "lower tier" of anthropogenic influences on lynx. It is thought that these activities could affect individual lynx, but are not likely to have a substantial effect on lynx populations and lynx habitat, and are of less concern for conservation of the species. The analysis of effects of the alternatives is focused on these anthropogenic influences, with emphasis on the upper tier.

Methodology and analysis process

Spatial and temporal analysis

The Helena, Kootenai, Lewis and Clark, and Lolo National Forests contain a suite of forest plan components aimed at providing for the conservation and recovery of the Canada lynx (USDA 2007b). Lynx habitat is divided into lynx analysis units which are intended to facilitate analysis and monitoring of the effects of management actions on lynx habitat. Lynx analysis units do not depict actual lynx home ranges, but approximate the size of a female's home range and contain year-round habitat components (USDA (2013c)). Since lynx analysis units encompass lynx habitat on NFS lands as well as other land ownerships, they are also used for analysis of cumulative effects of activities on all lands.

The temporal analysis for lynx considers the fact that not all mapped lynx habitat provides suitable conditions at any given point in time, because natural events (e.g., fire, plant succession, insect and disease) and vegetation management activities are constantly changing forest composition and

structure. The period considered for analysis of indirect effects is activities that may occur during the anticipated life of the forest plan, which is generally about 15 years after approval. Because actions such as vegetation management and climate change have the potential to affect Canada lynx and their critical habitat for longer time periods, the temporal analysis for cumulative effects may extend beyond the life of the forest plans.

Affected environment

Population status and distribution

The range of Canada lynx extends from Alaska across much of Canada (except for the coastal forests), with southern extensions into parts of the western United States, the Great Lakes states, and New England. Lynx distribution is closely aligned with the distribution of snowshoe hares and boreal forests (McKelvey, Aubry, and Ortega 1999).

In Montana, lynx are primarily restricted to northwestern portion of Montana from the Purcell Mountains east to Glacier National Park, then south through the Bob Marshall Wilderness Complex to Highway 200, based on 81,523 telemetry points obtained from resident lynx during 1998–2007 (Squires et al. 2013). Using the criteria employed for the Northern Rockies Lynx Management Direction (USDA 2007b), the Helena, Kootenai, Lewis and Clark, and Lolo National Forests are all considered to be “occupied” by lynx.

Habitat

Snowshoe hares are the primary winter prey of lynx in Montana (Squires and Ruggiero (2007)), as is true throughout the range of lynx (Aubry, Koehler, and Squires (1999)). Lynx have special adaptations as a predator of snowshoe hares, including a lightweight body frame and proportionately large paws that enable them to travel on top of deep snow. Dense horizontal cover, persistent snow, and moderate to high snowshoe hare densities (greater than 0.2 hares/acre) are common attributes of lynx habitat (USDA 2013c).

In northwestern Montana, lynx typically were found in boreal and subalpine coniferous forests in areas of gentle topography (Squires et al. 2013). Lynx primarily selected mature multi-story stands during winter, composed mostly of mature Engelmann spruce and subalpine fir trees. Conifer boughs touching the snow and the young trees in the understory provided the dense horizontal cover that supported higher-density snowshoe hare populations at varying snow depths throughout the winter. Lynx were more restricted to stands with high density of horizontal cover in winter than in summer (Squires et al. 2010). Lynx used mid- to high-elevation forests (4,134–7,726 feet) during winter, and slightly higher elevations during summer in Montana (Squires et al. 2010). During the summer months, lynx made more use of regenerating forests with abundant small diameter (1–3 in.) and pole-sized (3–7 in. diameter at breast height) trees, dense shrubs, and high horizontal cover (Squires et al. 2010).

The lynx recovery outline (USFWS (2005) stratified lynx habitat into 3 categories: core, secondary, and peripheral. Core areas are places where long-term persistence of lynx and recent evidence of reproduction have been documented, and the quality and quantity of habitat is available to support both lynx and snowshoe hare life needs. Six core areas were identified in the recovery outline, one of which is in northwestern Montana/northeastern Idaho. The recovery outline stated that lynx conservation efforts should be focused on core areas to ensure the continued persistence of lynx in the contiguous United States.

Secondary and peripheral areas have fewer and more sporadic current and historical records of lynx and reproduction has not been documented. Habitat may be patchier, drier, and/or more maritime. In

secondary/peripheral areas, the focus of management is on providing a mosaic of forest structure to support snowshoe hare prey resources for individual lynx that infrequently may move through or reside temporarily in the area. Landscape connectivity should be maintained to allow for lynx movement and dispersal.

For analysis and management purposes, lynx habitat is delineated into lynx analysis units. Lynx analysis units do not depict actual lynx home ranges, but approximate the size of a female's home range and contain year-round habitat components. A lynx analysis unit must contain at least 10 mi^2 of primary vegetation (e.g., spruce/fir) to be capable of supporting lynx (USDA 2013c). It is not necessary to delineate lynx analysis areas in secondary and peripheral areas, although that may have been done in accordance with prior recommendations.

Thirty lynx analysis units have been delineated on lands administered by the Helena National Forest: 17 in the Blackfoot landscape (all in lynx core/designated critical habitat), six in the Divide landscape (two within lynx core and designated critical habitat, and four in secondary), three in the Elkhorns landscape, and four in the Big Belts landscape. The best lynx habitat and the most robust population are in the Blackfoot landscape of the Lincoln Ranger District. The Divide landscape supports a small but apparently persistent population of lynx. Tracking surveys backed by 39 DNA samples identified an adult male lynx that was present for at least three years and an adult female lynx that was present for at least one full year, as well as evidence of the presence of one or more additional lynx (Gehman and Jakes 2007, Gehman et al. 2010) in this area. Habitat in the Divide landscape connects to the Blackfoot landscape and the adjoining Garnet Range, which has the southernmost lynx population in Montana (USDA 2013c). The Big Belts and Elkhorns landscapes are considered lynx secondary areas. These areas are not occupied by resident lynx, although transient animals have been documented in the Big Belts landscape.

On the Kootenai National Forest, 47 lynx analysis units have been delineated, all within the lynx core area. This encompasses about 67 percent of the Kootenai National Forest (roughly 1,492,600 out of 2,219,100 acres). A large portion of the acreage in lynx analysis units (62 percent) overlaps with the Cabinet-Yaak and NCDE recovery zones for grizzly bear on the forest. If both bear management units and the bears outside of recovery zone polygons are included, there is 87 percent overlap with the total lynx analysis unit acreage.

On the Lewis and Clark National Forest, lynx occur as a resident population. There are 57 lynx analysis units on the Lewis and Clark National Forest, 27 of which are on the Rocky Mountain Ranger District. Large patches of boreal forest on the Lewis and Clark National Forest are well connected to large areas of lynx habitat on the Flathead and Lolo National Forests to the west, and Glacier National Park to the north. The Castle, Crazy and Little Belt mountain ranges are considered lynx secondary areas, and may occasionally host transient dispersing lynx. The Highwood Mountains and Little Snowy Ranges are small, isolated mountain ranges, separated from each other and from other lynx habitat by significant stretches of low elevation, often agricultural landscapes that do not support lynx or their primary prey species, and are considered lynx peripheral areas. The 27 lynx analysis units on the Rocky Mountain Division overlap with the NCDE grizzly bear recovery zone/primary conservation area.

There are a total of 54 lynx analysis units on the Lolo National Forest, 17 of which are within the amendment action area. Four of the lynx analysis units are wholly within the primary conservation area (Big Slide, Scapegoat, Lake and Monture). Nine lynx analysis units are in both the primary conservation area and zone 1 (Cottonwood Dunham, Morrell, Rice, Clearwater, Marshall Deer, Placid, Boles, Gold and Rattlesnake). Four lynx analysis units are within the Ninemile demographic connectivity area (Frenchtown, McCormick, Upper Ninemile Siegel, and Ninemile Divide). Lynx are

known to be resident on the Lolo National Forest in all lynx analysis units that lie north of Interstate 90 and east of Montana Highway 93, based on extensive surveys and research conducted since 1998. As part of a multi-species carnivore monitoring program, lynx have been surveyed on the Lolo National Forest since 2007 using methods developed by Squires et al. (2004). In 2010 and 2011, this method (snow tracking and DNA collection) was implemented forest-wide. Since 2012, surveys have been concentrated in the Southwestern Crown of the Continent analysis area; over a 4-year period, 198 lynx detections were recorded inside lynx core/critical habitat and 1 lynx was detected outside of but adjacent to critical habitat. Portions of the forest to the west do not support resident lynx and are considered lynx secondary areas.

Environmental consequences - Canada lynx

Effects common to all alternatives

Current direction specific to lynx, which addresses vegetation management, livestock grazing, human uses, and linkage areas, will not be changed under any of the alternatives. The following summarizes the existing management direction that addresses the first tier of anthropogenic influences identified in the 2013 Lynx Conservation Assessment and Strategy.

- Climate change. No direction specific to climate change was established, since this is outside the control of the Forest Service.
- Vegetation management. Objectives VEG O1, VEG O2, and VEG O4 encourage managing vegetation to mimic or approximate natural succession and disturbance processes while maintaining lynx habitat components; providing a mosaic of habitat conditions through time that support dense horizontal cover and high densities of snowshoe hare; and focusing vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover. Standard ALL S1 requires that vegetation management projects maintain habitat connectivity in a lynx analysis unit and/or linkage area. Standard VEG S1 allows no additional regeneration harvest if more than 30 percent of the lynx habitat in lynx analysis unit is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat. VEG S2 does not allow timber management projects to regenerate more than 15 percent of lynx habitat on NFS lands within a lynx analysis unit in a ten-year period. VEG S5 generally precludes pre-commercial thinning projects that reduce snowshoe hare habitat from the stand initiation structural stage until the stand no longer provides winter snowshoe hare habitat. Standard VEG S6 protects snowshoe hare habitat in multi-story mature or late successional forests. Guideline G1 encourages projects that are designed to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Guideline VEG G5 is to provide habitat for alternative prey species, particularly red squirrel, in each lynx analysis unit. Guideline VEG G11 is to provide denning habitat distributed in each lynx analysis unit.
- Wildland Fire Management. Objective VEG O3 encourages fire use activities that restore ecological processes and maintain or improve lynx habitat. Under guideline VEG G4, prescribed fire activities should not create permanent travel routes that facilitate snow compaction, and permanent firebreaks should not be constructed on ridges or saddles. Guideline VEG G10 is to consider all the vegetation standards when designing fuel treatment projects within the wildland-urban interface to promote lynx conservation. Fuel treatment projects within the wildland-urban interface that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on a national forest.

- Fragmentation of habitat. In areas of intermingled land ownership, objective LINK O1 encourages the Forest Service to work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat. In linkage areas, potential highway crossing will be identified (LINK S1), Forest Service lands should be retained in public ownership (LINK G1), and livestock grazing in shrub-steppe habitats should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages. Guideline HU G6 specifically mentions that methods to avoid or reduce the effects on lynx in lynx habitat should be used when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development.

Indirect effects of alternative 1 — the no-action alternative
The forest plan management direction specific to the Canada lynx would continue to be implemented. As described in the Northern Rockies Lynx Management Direction Final Environmental Impact Statement (USDA 2007c), some adverse effects would occur, primarily due to vegetation and fuels management, but the overall direction would conserve the Canada lynx.

Indirect effects of alternative 2 — the proposed action modified
Lynx and grizzly bear habitat overlap to a large extent in northwestern Montana. On the Kootenai National Forest, for example, 87 percent of the total acreage in lynx analysis units is within a grizzly bear recovery zone (NCDE and Cabinet-Yaak) or a “bears outside of recovery zone” polygon.

The additional standards and guidelines for grizzly bear are not likely to have a measureable effect on lynx. Lynx are specialist predators of snowshoe hares; in contrast, grizzly bears are habitat generalists, omnivores, and often are attracted to human food and garbage. Lynx are most limited by habitat and the availability of snowshoe hare prey during the winter; bears hibernate during the winter months. Lynx also do not appear to avoid roads and human activities in the way that grizzly bears do.

Subalpine forest structure that provides snowshoe hare habitat is important to lynx. Under alternative 2, existing forest plan standards and guidelines for vegetation management would be retained, with additional desired conditions and guidelines applicable to the primary conservation area. The added guidelines encourage maintaining a mosaic of successional stages; restricting logging activities in time and space as needed; designing projects to maintain or improve grizzly bear habitat quality or quantity where it would not increase the risk of grizzly bear-human conflicts; and retaining cover as needed along grass, forb and shrub openings, riparian wildlife habitat, or wetlands. No additional vegetation management measures would be applied to zone 1 or to the Salish and Ninemile demographic connectivity areas. The alternative 2 desired conditions, standards and guidelines for grizzly bears would not alter and are compatible with the existing forest plan direction for lynx.

There is little evidence that summer recreation (p. 80), minerals exploration and development (pp. 83-84), forest roads and trails (pp. 84-85) or livestock grazing (p. 85) would have substantial negative effects on lynx or their habitat (USDA 2013c). The limits on oil and gas development and on expansion of developed recreation sites under this alternative could contribute to maintaining connectivity within and between areas of lynx habitat.

Indirect effects of Alternative 3
Under this alternative, the same changes to forest plan desired conditions, standards, guidelines and monitoring items would be made as under Alternative 2. In addition, several additional desired conditions, standards and guidelines would be added.

In the primary conservation area, four additional standards would be applied. NCDE-STD-AR-04 would be modified to explicitly state that roads within secure core cannot be opened for temporary motorized use by the public. This would not be expected to have a measurable effect on lynx or their habitat. NCDE-STD-AR-07 would require that new or reauthorized ski area permits include mitigation measures to reduce the risk of grizzly bear-human conflicts. This would have no effect on lynx. NCDE-STD-AR-08 would not allow any increase above the baseline in the acreage of areas and miles of routes open to use by over-snow vehicles in the den emergence time period (i.e. late spring). Snowmobiles have not been shown to disturb or displace lynx, and late spring snow naturally becomes compacted, so this standard would have little or no effect on lynx. NCDE-STD-MIN-08 would require that no surface occupancy stipulations be applied to any new oil and gas leases in the primary conservation area and zone 1. Depending on the location of the leases, this could be beneficial to lynx by reducing the potential for habitat loss and fragmentation.

Under alternative 3, all of the vegetation management guidelines that apply to the primary conservation area under alternative 2 would also be applicable to the Ninemile and Salish demographic connectivity areas. This could be beneficial to lynx by maintaining forest connectivity, although the demographic connectivity areas are generally located in lower elevation valleys, rather than the subalpine habitats where lynx reside.

Cumulative effects on lynx

Future climate change is expected to impact lynx habitat by further reducing the cold climatic conditions that create and maintain boreal forests as lynx habitat. Reduced snowpack and earlier snow melt may also reduce the lynx's competitive edge as a predator of snowshoe hares in deep, fluffy snow. Warmer temperatures may lead to a reduction in available habitat for lynx as subalpine forests recede to even higher elevations.

Continuing development of private lands to support increased human populations will likely increase habitat fragmentation and may reduce or sever habitat connectivity between blocks of public lands.

Canada has a legal trapping season for lynx. Some lynx home ranges overlap the international border, making those lynx susceptible to harvest. The state of Montana prohibits trapping of lynx; however, legal trapping of other species occurs in Montana and lynx could be unintentionally injured or killed. Poaching may occur, but the magnitude of this form of mortality while unknown is probably small.

Canada lynx critical habitat

Affected environment

On September 12, 2014, USFWS issued a final rule revising the critical habitat designation and the distinct population boundary for the contiguous United States distinct population segment of the Canada lynx (Federal Register vol. 79, no. 177, pp. 54782-54846). Under the Endangered Species Act, specific areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features which (1) are essential to the conservation of the species and (2) may require special management considerations or protection. The physical and biological features that are essential for the conservation of the species are called the primary constituent elements. Areas outside the geographical area occupied by the species at the time it is listed could also be designated as critical habitat, if a designation limited to its current range would be inadequate to ensure the conservation of the species.

The designation of critical habitat does not prohibit development or forest management activities, but federal agency actions must not result in destruction or adverse modification of critical habitat. The federal action must be separately evaluated for effects on the species and on its critical habitat. To determine if the action would result in destruction or adverse modification of critical habitat, this analysis focuses on the primary constituent elements. The primary constituent elements for lynx critical habitat, which are unchanged from the previous rule issued in 2009, are:

Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:

a) Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface;

b) Winter snow conditions that are generally deep and fluffy for extended periods of time;

c) Sites for denning that have abundant coarse woody debris, such as downed trees and root wads; and

d) Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.

USFWS designated five units of critical habitat, in the States of Idaho, Maine, Minnesota, Montana, Washington, and Wyoming. For the lynx, only areas that were within the range of the species at the time of listing were designated as critical habitat.

Lynx critical habitat unit 3 consists of 9,783 mi^2 in the Northern Rocky Mountains of northwest Montana and northeast Idaho (figure 1-49). Lynx are known to be widely distributed throughout this unit, and breeding has been documented in multiple locations. Lynx critical habitat unit 3 coincides with the lynx core area in northwestern Montana/northeastern Idaho. Lynx critical habitat unit 3 overlaps to a large extent the NCDE recovery zone for the grizzly bear.

On the Kootenai National Forest, 32 of the 49 lynx analysis units (65 percent), comprising approximately 909,816 acres, are located within critical habitat unit 3. The western portions of the Lewis and Clark National Forest, and the northern portion of the Divide GA on the Helena National Forest are within critical habitat unit 3. On the Lolo National Forest, lynx critical habitat encompasses all lynx analysis units that lie north of Interstate 90 and east of Montana Highway 93.

Portions of the Helena National Forest, including the Big Belt and Elkhorn Ranges, and the Lolo Pass area of the Lolo National Forest were not designated as critical habitat. Although extensive surveys have been conducted, these areas continue to lack evidence of lynx occupancy and the habitat quality appears to be inadequate to support lynx.

The Northern Rockies Lynx Management Direction Final Environmental Impact Statement was prepared prior to the final designation of critical habitat, and therefore did not include an analysis of the effects on critical habitat. Nevertheless, the amendment adopted forest plan components that contribute to maintaining the primary constituent elements of lynx critical habitat and avoid actions that potentially could adversely modify critical habitat. Table 17 lists the forest plan components in relation to the primary constituent elements of lynx critical habitat.

Table 17. Canada lynx critical habitat primary constituent element in relation to lynx management direction in the forest plans

Primary Constituent Element	Primary Constituent Element Description	Associated Objective, Standard and/or Guideline
1.	Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:	VEG O1, VEG O2, VEG O3, VEG O4
a	Presence of snowshoe hares and their preferred habitat conditions, including dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface	VEG O1, VEG O2, VEG O3, VEG O4; VEG S1, VEG S2, VEG S5 and VEG S6; VEG G1, VEG G4, VEG G5 and VEG G10; GRAZ G1, GRAZ G2, GRAZ G3, and GRAZ G4; HU G1, HU G2, HU G8
b	Winter snow conditions that are generally deep and fluffy for extended periods of time;	VEG G4; HU G4, HU G11, and HU G12
c	Sites for denning that have abundant coarse woody debris (downed trees and root wads);	VEG O1; VEG G11; HU G1
d	Matrix habitat (e.g., hardwood forest, dry forest, non-forest or habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.	ALL S1; GRAZ G4; HU G3 and HU G7; LINK S1 and LINK G2

Environmental consequences — Lynx critical habitat

Effects common to all alternatives

In its final rule designating lynx critical habitat, USFWS identified the following federal actions that potentially could adversely modify critical habitat: (1) actions that would reduce or remove understory vegetation within boreal forest stands on a scale proportionate to the large landscape used by lynx; (2) actions that would cause permanent loss or conversion of the boreal forest on a scale proportionate to the large landscape used by lynx; and (3) actions that would increase traffic volume and speed on roads that divide lynx critical habitat. As described in the previous section on effects to lynx, regulatory mechanisms that would conserve the lynx were adopted into the forest plans through the Northern Rockies Lynx Management Direction in 2007. That direction specifically limits actions that would reduce or remove understory vegetation within lynx analysis units and provides guidance for maintaining connectivity and linkage areas. This management direction would not change under any of the alternatives.

Indirect effects of the no action alternative

The existing forest plan direction addresses the primary concerns relative to critical habitat and would remain in place. While it is possible that implementation of the forest plans could result in some local, short term negative effects on lynx critical habitat, it is very unlikely that actions would be undertaken across large landscapes that would cause adverse modification of lynx critical habitat.

Indirect effects of alternative 2 — the proposed action modified
The proposed action would not change existing forest plan direction pertaining to lynx foraging habitat including dense horizontal cover and mature multistoried stands, lynx denning habitat, winter snow conditions, or lynx linkage areas. The limits on oil and gas development and developed recreation sites under this alternative could contribute to maintaining connectivity within and between areas of lynx habitat.

Indirect effects of alternative 3
Alternative 3 would not change existing forest plan direction pertaining to lynx foraging habitat including dense horizontal cover and mature multistoried stands, lynx denning habitat, winter snow conditions, or lynx linkage areas. The requirement for a no surface occupancy stipulation for new oil and gas leases and the limit placed on developed recreation sites under this alternative could contribute to maintaining connectivity within and between areas of lynx habitat. Applying the vegetation management guidelines to zone 1 and the demographic connectivity areas, in addition to the primary conservation area, would be compatible with maintaining habitat connectivity for lynx.

Cumulative effects on lynx critical habitat
Future climate change is expected to impact lynx habitat by further reducing the cold climatic conditions that create and maintain boreal forests and deep persistent snow. Reduced snowpack and earlier snow melt may reduce the lynx's competitive edge as a predator of snowshoe hares in deep, fluffy snow. Warmer temperatures may lead to a reduction in available habitat for lynx as subalpine forests recede to even higher elevations. Although there is a potential for future changes in climate to contribute adverse cumulative effects, the magnitude and imminence of the impacts are uncertain.

Development of private lands to support increased human populations will likely continue and may reduce or sever habitat connectivity across valleys that are located between blocks of lynx habitat on public lands.

Yellow-billed Cuckoo, western distinct population segment

Key indicator for analysis

The key indicator for determining effects to yellow-billed cuckoo is:

- Availability of riparian woodland nesting habitat with dense understory foliage: The change in amount and quality of riparian habitat dominated by cottonwood and willow.

Methodology and analysis process

The western yellow-billed cuckoo has not been confirmed to occur or breed on NFS lands in the NCDE. Based on the existence of potential nesting habitat, USFWS considers that it "may be present" on the Lolo National Forest. Therefore the analysis of effects was limited to the Lolo National Forest.

Affected environment

Population status and distribution
The yellow-billed cuckoo is a medium-sized bird, about 12 inches in length. The western subspecies generally is larger than the eastern subspecies and differs in the timing of its migration and breeding (Franzreb and Laymon (1993)).

On October 3, 2014, the USFWS published the final rule to list the yellow-billed cuckoo as a threatened distinct population segment in the western portion of its range in the United States, Canada, and Mexico (Federal Register vol. 79, no. 192, pp. 59992–60038). The western distinct population segment of the yellow-billed cuckoo is located west of the crest of the Rocky Mountains. This population was found to be threatened by two factors:

- First, habitat destruction, modification, and degradation from dam construction and operations, water diversions, river flow management; stream channelization and stabilization; conversion to agricultural uses, such as crops and livestock grazing; urban and transportation infrastructure; and increased incidence of wildfire threaten the yellow-billed cuckoo western distinct population segment. These factors also contribute to fragmentation and promote conversion to nonnative plant species, particularly tamarisk. The majority of the habitat for the cuckoo is on private lands and continues to be lost or significantly altered.
- Second, rarity and small and isolated population sizes cause the remaining western yellow-billed cuckoo populations to be increasingly susceptible to further declines through lack of immigration, reduced populations of prey species (i.e., food items), pesticides, and collisions with tall vertical structures during migration. The serious and ongoing threat of small overall population size, which is the result of other threats in combination, leads to an increased chance of local extirpations.

There are very few occurrences of the yellow-billed cuckoo recorded west of the Continental Divide in Montana. A few records indicate that yellow-billed cuckoos occur in the Flathead River area, but no information exists to confirm breeding in that area. USFWS indicates that the species “may be present” on the Lolo National Forest.

Habitat

Western yellow-billed cuckoos breed in riparian habitats, particularly woodlands with cottonwoods (*Populus fremontii*) and willows (*Salix* sp.) in the western U.S. (Laymon and Halterman (1987)). The amount of cottonwood-willow-dominated vegetation cover in the landscape and the width of riparian habitat have been found to influence cuckoo distribution and abundance in Arizona (Johnson et al. 2010).

Environmental consequences — Yellow-billed cuckoo

The western subspecies of yellow-billed cuckoo has not been documented to occur within the NCDE recovery zone or the primary conservation area, demographic connectivity areas or zones 1, 2 or 3. However, riparian woodlands on the Lolo National Forest west of the Continental Divide may provide habitat for the yellow-billed cuckoo. None of the alternatives would alter the management of riparian deciduous forests along rivers. Therefore, no effects to this species or its habitat are anticipated under any of the alternatives.

As there would be no direct or indirect effects from the alternatives, no cumulative effects would occur.

Sprague’s pipit

Key indicator for analysis

The key indicator for determining effects to Sprague’s pipit is:

- Native prairie habitat for nesting and brood-rearing: Loss or fragmentation of suitable nesting habitat.

Methodology and analysis process

Within the NCDE, the few observations of Sprague's pipit indicate that it is an occasional transient on the Helena and Lewis and Clark National Forests. There are no verified records of breeding. The analysis of effects is limited to the Helena or Lewis and Clark National Forests.

Affected environment

Population status and distribution

The Sprague's pipit is a small passerine bird that is endemic to the Northern Great Plains. The species is migratory, present in the Northern Great Plains only during the spring and summer seasons. The breeding distribution includes portions of Alberta, Saskatchewan, and Manitoba, North and South Dakota, and Montana. The greatest number of detections during the North American Breeding Bird Survey between 2006 and 2012 were in central Alberta and extreme northeastern Montana (Sauer et al. 2014). The wintering range is primarily in Texas, but also includes south-central and southeast Arizona, southern New Mexico, southern Oklahoma, southern Arkansas, northwest Mississippi, southern Louisiana, and northern Mexico (Federal Register vol. 79, no. 234, Friday, December 5, 2014, p. 72453).

Although the Sprague's pipit has a large population size overall, it has experienced long-term declines in its distribution, number of subpopulations, and population size (Nature Serve, accessed May 15, 2014). As a result, the species is a candidate for listing under the Endangered Species Act. The 12-month finding published on September 15, 2010, concluded that listing was warranted but precluded by higher-priority listing actions (Federal Register vol. 75, no. 158, pp. 56028–56050). The listing priority number assigned to Sprague's pipit was "2," indicating a high magnitude of threats and the threats are imminent. However, in its 2014 Candidate Notice of Review, USFWS revised the listing priority for this species to an "11," indicating a moderate to low magnitude of threats and non-imminent threats (Federal Register vol. 79, no. 234, Friday, December 5, 2014, p. 72453). This downgrade reflects new information indicating that the population decline has leveled off, that the primary threat is limited to conversion of prairie to cropland on the breeding range, and that oil and gas development does not constitute a threat to the population.

Within the NCDE, the species is likely an occasional transient on the Helena and Lewis and Clark National Forests. There is one observation each in the Highwoods, Elkhorns, Rocky Mountain Range, and Castles geographic areas. None of these observations were made within the past 20 years and may be much older. There is very little if any habitat that meets the breeding requirements of the Sprague's pipit on the Helena or Lewis and Clark National Forests, and there are no verified records of Sprague's pipits breeding on either national forest.

Habitat

The Sprague's pipit is strongly tied to native prairie, with preferred grass height of 4 to 12 inches (Sutter (1997), Dieni and Jones (2003)). The best predictor of Sprague's pipit presence appears to be the amount of native grassland within 0.25 mi of the breeding parcel (Davis et al. (2013)).

The primary threat to the species is loss of native prairie habitat due to conversion to cropland.

Environmental consequences — Sprague's pipit

The analysis area is at the southwestern edge of the breeding distribution of the Sprague's pipit. None of the alternatives would change the management direction applicable to the prairie habitats inhabited by breeding Sprague's pipits. No conversion of prairie habitat to cropland will occur on NFS lands. Therefore none of the alternatives would affect this species or its grassland habitat.

As there would be no direct or indirect effects, no cumulative effects would occur.

6.5.7 Sensitive wildlife species

Introduction

Sensitive species are managed under the authority of the National Forest Management Act and administratively designated by the Regional Forester (Forest Service Manual 2670.5). Under the provisions of the 1982 planning rule, Forest Service sensitive species were addressed as part of the forest plans. The regulations and agency policy required that viable populations of native and desired non-native species are to be maintained, and actions that may cause a species to become threatened or endangered are to be avoided (Forest Service Manual 2670.22).

Table 18 identifies the Regional Forester's sensitive species that are known or suspected to occur on the amendment forests. This list of sensitive species was refined to show only those that may occur within the NCDE recovery zone/primary conservation area, demographic connectivity areas, and zones 1, 2 and 3.

Methodology and analysis process

Each of the existing forest plans was reviewed to identify management direction that is applicable to sensitive species and to important habitats such as snags, old growth and riparian habitat. The management direction is summarized here.

Table 18. Sensitive species known, or suspected to occur, within the NCDE grizzly bear recovery zone/primary conservation area, Salish or Ninemile demographic connectivity areas, or zones 1-3

Species	Helena	Kootenai	Lewis and Clark	Lolo
American peregrine falcon (*Falco peregrinus anatum*)	NCDE/PCA, zones 1, 2, 3	zone 1, Salish DCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Bald eagle (*Haliaeetus leucocephalus*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Black-backed woodpecker (*Picoides arcticus*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Common loon (*Gavia immer*)	–	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA	NCDE/PCA, zone 1
Flammulated owl (*Otus flammeolus*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1, Salish DCA	-	NCDE/PCA, zone 1, Ninemile DC
Greater sage-grouse (*Centrocercus urophasianus*)	-	-	Zone 3	-
Harlequin duck (*Histrionicus histrionicus*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1
Bighorn sheep (*Ovis canadensis*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Fisher (*Martes pennanti*)	NCDE/PCA, zones 1, 2	NCDE/PCA, zone 1, Salish DCA		NCDE/PCA, zone 1, Ninemile DCA

Species	Helena	Kootenai	Lewis and Clark	Lolo
North American wolverine (*Gulo gulo luscus*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Gray wolf (*Canis lupus*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Northern bog lemming (*Synaptomys borealis*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1 Salish DCA	NCDE/PCA	NCDE/PCA, zone 1, Ninemile DCA
Towsend's big-eared bat (*Corynorhinus townsendii*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1 Salish DCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Coeur d'Alene salamander (*Plethodon idahoensis*)	–	NCDE/PCA, zone 1, Salish DCA	–	–
Boreal toad (*Bufo boreas*)	NCDE/PCA, zones 1, 2, 3	NCDE/PCA, zone 1, Salish DCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Northern leopard frog (*Rana pipiens*)	NCDE/PCA, zones 1, 2, 3	Zone 1	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA
Plains spadefoot (*Spea bombifrons*)	NCDE/PCA, zones 1, 2, 3	–	–	–
Greater short-horned lizard (*Phrynosoma hernandesi*)	–	–	NCDE/PCA, zone 3	–

Helena National Forest

The Helena Forest Plan includes forest-wide goals (p. II-1) to maintain habitat for big game and other wildlife species (goal 2), and specifically to identify, maintain or enhance habitats to facilitate recovery of bald eagle, peregrine falcon, and gray wolf (goal 8), which have recovered and are now on the list of sensitive species. Forest-wide standards for wildlife and fisheries (pp. II-17 to II-21) provide specific measures for protection of bald eagles and peregrine falcons and gray wolf, and standards for management of old growth and snag habitat. Additional standards pertaining to general watershed guidance (p. II-25), seismic exploration (p. II-28), road management (p. II-31), riparian areas (pp. II-34 and II-35) assure coordination of resource management programs with wildlife habitat needs.

Kootenai National Forest

The 2015 Kootenai Forest Plan provides management direction specifically aimed at protection of sensitive species and important habitats. Forestwide GOAL-WL-02 is to manage and schedule activities to avoid or minimize disturbance to sensitive species and to manage habitat to promote their perpetuation into the future. (p. 28). There are numerous forestwide desired condition statements (pp. 28–30) that express the intention to protect nests, den sites and other birthing and rearing areas of sensitive species from human disturbance during the period they are active (FW-DC-WL-01), to provide a system of large remote areas to accommodate species such as some wide-ranging carnivores (FW-DC-WL-02), to provide habitat for bald eagles and peregrine falcons (FW-DC-WL-06 and 07) and for native ungulates (FW-DC-WL-16) and wolf packs (FW-DC-WL-18), to provide aquatic and riparian habitats, old growth forest, snags and large tree habitat, down logs, fire-killed trees and cave habitats (FW-DC-WL-10 to 15). Numerous forest-wide guidelines (pp. 30–33)

address protection of active nesting or denning sites of bald eagles, raptors, harlequin duck, common loon, Townsend's big-eared bat, wolf, and other sensitive, threatened, or endangered species.

Lewis and Clark National Forest

The existing Lewis and Clark Forest Plan (including amendment 12) provides management direction aimed at protection of sensitive species and important habitats. Long-range goal 3 (p. 2-2) is to promote high quality wildlife and fish habitats for public benefit and includes giving special emphasis to sensitive species (plant, animal, and fish) management. Forestwide wildlife and fish objectives (p. 2-5) include gathering inventory data and providing coordination with other programs to ensure maintenance of sensitive species populations. Forestwide standards addressing sensitive species include requirements to conduct a biological evaluation of each program or activity which is Forest Service funded, authorized or carried out on occupied sensitive species habitat, to determine whether the activity may affect the species (C-2(2) p. 2-32), to use current research data in resource planning and administration affecting sensitive species and their habitats (C-2(4), p. 2-32), and to establish an active public information and education program addressing threatened and endangered and sensitive species management (C2(11), p. 2-34). There are also forestwide standards to maintain bald eagle and peregrine falcon habitat (C2(12), p. 2-34) and for management of snags and down logs (C-4, pp. 2-35 and 2-36).

Lolo National Forest

The Lolo Forest Plan contains management direction aimed at protection of sensitive species and important habitats. Forestwide goal 2 (p. II-1) is to provide habitat for viable populations of all indigenous wildlife species and for increasing populations of big-game animals. A forest plan objective is to provide habitat for viable populations of the diverse wildlife and fish species on the Forest, with special attention given to species dependent on snags, old growth areas, and riparian zones (p. II-2). Forestwide wildlife standard 27 (p. II-13) also requires in part that plant and animal species that are not threatened or endangered, but where viability is a concern (i.e., sensitive species), be managed to maintain population viability. Wildlife standard 25 provides direction to provide sufficient snags and dead material to maintain 80 percent of the population of snag-using species, and wildlife standard 28 requires that land management practices be designed to have a minimum impact on the aquatic ecosystem.

Effects common to all alternatives

All of the forest plans contain direction to protect sensitive species and their habitats. A biological evaluation is conducted for all projects that may impact sensitive species, which helps to minimize or avoid adverse impacts on sensitive species.

Peregrine falcon

Key indicator for analysis

The key indicator for determining effects to peregrine falcon is:

- Cliffs adjacent to river corridors and valley bottoms, avian prey base: Habitat loss or reductions in prey populations.

Affected environment

Population status and distribution
Widespread use of organochlorine pesticides (e.g., dichlorodiphenyltrichloroethane, DDT) in the 1970s, which caused eggshell thinning and reproductive failure, led to drastic declines in peregrine falcon populations. Subsequently, successful recovery efforts were completed, and the peregrine falcon was de-listed in 1999 from the Endangered Species Act (Federal Register Vol. 64, No. 164, pp. 46542–46558). As of 2003, data from the first 5 years of post-delisting monitoring indicated that there were 3,005 nesting pairs of American peregrine falcons in the United States, Canada, and Mexico, compared to approximately 1,750 pairs at the time of de-listing (Federal Register Vol. 71, No. 198, page 60563). Estimates of territory occupancy, nest success, and productivity in 2003 and in later years have all substantially exceeded the target values needed to sustain recovery of the species.

The Montana Peregrine Institute (2015) tracks 178 historical territories. The average number of active territories over 3-year periods has increased from 14 in 1994-1996 to 89 in 2009-2011.

Habitat
The peregrine falcon inhabits a wide range of habitats including arctic tundra, sea coasts, montane meadows and prairies, and urban centers. Nests are typically placed on cliff ledges or crevices, but some peregrine falcons will also use tall buildings and bridges near good foraging areas. Adult falcons are known to reuse the same nest site for several decades (White et al. (2002)). Peregrine falcons feed primarily on birds, generally medium-size passerines up to small waterfowl, along major rivers and lakes.

In Montana, breeding and wintering habitat occurs primarily along large lakes and major river drainages. Typical nesting habitat on the national forests is comprised of cliffs where the nest scrape is located, and adjacent river corridors and valley bottoms for foraging. In Montana, the nesting period is generally June and July (Montana Natural Heritage Program and MFWP 2015).

Peregrine falcon nest failure can occur due to human disturbances such as recreational climbing (Hamann et al. (1999)). The species can become habituated to human intrusion, although pairs nesting in remote locations probably have lower tolerance than those nesting in urban or frequently-visited sites (White et al. 2002). Activities within one-half mile of an active nest site may have the potential to impair foraging and cause nest abandonment (Hamann et al. 1999).

Environmental consequences — peregrine falcon

Indirect effects of alternative 1 — Helena, Kootenai, Lewis and Clark, and Lolo National Forests
The existing forest plan direction pertaining to peregrine falcons would be retained. The cliff nesting habitat of peregrine falcons is unlikely to be affected by management of grizzly bear habitat on NFS lands, and riparian foraging habitats are identified during site-specific analysis and managed in accordance with the forest plan. Recovery and de-listing of the peregrine falcon occurred during implementation of the existing forest plans. Under the no-action alternative, continued expansion of the population and re-occupancy of historical habitat is expected to occur.

Indirect effects of alternatives 2 and 3 — Helena, Kootenai, Lewis and Clark, and Lolo National Forests
Existing forest plan direction that is specific to the peregrine falcon and its habitat would not be changed under either alternative 2 or 3. The amended grizzly bear management direction is not expected to affect habitat for the peregrine falcon or its avian prey.

Cumulative effects — Helena, Kootenai, Lewis and Clark, and Lolo National Forests
Since there would be no direct or indirect effects under any of the alternatives, no cumulative effects would occur.

Bald Eagle

Key indicators for analysis

The key indicators for determining effects to bald eagle are:

- Forested habitat adjacent to lakes, rivers and wetlands: The predicted change in quality or availability of habitat.
- Human disturbance during nesting period: The predicted change in quality or availability of habitat

Affected environment

Population status and distribution
The bald eagle was removed from the federal list of threatened and endangered species in 2007, but is still protected by the Bald and Golden Eagle Protection Act. Recovery of the population has been attributed to the substantial reduction of environmental contaminants, particularly the banning of DDT (dichlorodiphenyltrichloroethane), and to habitat protection (Hammond 2010a).

In Montana, there has been a steady increase in the number of breeding bald eagles in Montana, from fewer than 100 nesting territories in 1989 to almost 500 in 2008 (Hammond 2010b). Suitable but unoccupied nesting habitat for bald eagles remains available, and it is likely that the population will continue to expand in Montana.

Habitat
Important year-round habitat includes wetlands, major water bodies, spring spawning streams, ungulate winter ranges, and open water areas (USBR 1994). During the winter, roost trees are used by bald eagles for shelter.

Nesting sites (both current nesting and suitable habitats) are generally located within larger forested areas near large lakes and rivers where nests are usually built in the tallest, oldest, large-diameter trees, primarily along large river corridors, lakes and reservoirs. Nesting site selection is dependent upon local food availability and disturbance from human activities. The majority of breeding habitat is not located on NFS lands, but is distributed along large reservoirs and major river systems. Important foraging habitat may be ten miles or more from the nest.

The majority of the diet is fish, such as salmonids, suckers and whitefish. In the winter, waterfowl and carrion become more important food sources (USBR 1994).

Habitat management guidelines for bald eagles in Montana emphasize maintaining prey bases; maintaining forest stands currently used or suitable for nesting, roosting, and foraging; planning for

future potential nesting, roosting, and foraging habitat; and minimizing disturbances from human activities in nest territories, at communal roosts, and at important feeding sites (USBR 1994).

Forest Service activities that may have direct or indirect impacts on bald eagles include timber harvest, road construction, prescribed fire, and fire suppression that could alter habitat or disturb nesting birds. Nest failure can also occur due to human disturbance from recreation or industrial activities, such as helicopter use or blasting. The period in which activities have the greatest influence on nesting and rearing activities generally occurs between February 1 and August 15 (Hammond 2010b).

Environmental consequences — bald eagle

Indirect effects of the no action alternative — Helena, Kootenai, Lewis and Clark and Lolo National Forests

The bald eagle population has increased dramatically during the period when the existing Helena, Kootenai, Lewis and Clark, and Lolo National Forest Plans were implemented. Each of the forest plans provides specific emphasis for management of bald eagle habitat. The Forest Service uses information outlined in the Montana Bald Eagle Management Plan (USBR 1994, Hammond 2010b) and National Bald Eagle Management Guidelines (USFWS 2007) during project analysis, which includes protecting known nesting and foraging areas. Under the no-action alternative, it is likely the bald eagle population will continue to expand both on and off NFS lands.

Indirect effects of alternative 2 — Helena, Kootenai, Lewis and Clark and Lolo National Forests

The effects on the bald eagle would be similar to the no-action alternative. Existing forest plan management direction specific to the bald eagle would be retained. The additional standards and guidelines that would limit new developed recreation sites in the primary conservation area could benefit the bald eagle by reducing the potential for nest site disturbance or displacement caused by human presence and associated activities. These potential benefits may or may not occur, depending on site-specific locations and conditions.

Indirect effects of alternative 3 — Helena, Kootenai, Lewis and Clark and Lolo National Forests

The effects on the bald eagle would be similar to the other alternatives. This alternative would add NCDE-STD-MIN-08, which would require that new oil and gas leases in the primary conservation area and zone 1 require a no surface occupancy stipulation. This standard may help to minimize habitat loss and disturbance to eagles. Whether there would be benefits to the bald eagle would depend on site-specific locations and conditions.

Cumulative effects

Contaminants and poisons, such as pesticides and lead, continue to cause mortality of bald eagles. Powerline electrocution is also a source of mortality, although efforts to change the design and otherwise protect eagles have been implemented in many areas. Wind energy development can also cause eagle mortality but is subject to review and regulation under the Bald and Golden Eagle Protection Act. Increasing residential and other development along rivers and lakes can disturb and displace eagles from important nesting and foraging habitat. There is a potential for adverse cumulative impacts from all of these factors. However, given the existing regulatory protections and the bald eagles' continuing upward population trend, these impacts in combination with the alternatives being considered are not expected to have cumulative adverse effects on the overall population.

Black-backed woodpecker

Key indicators for analysis

The key indicator for determining effects to black-backed woodpecker is:

- Amount of recently-burned conifer forest: The predicted change in availability of habitat and prey base.

Affected environment

Population status and distribution
Black-backed woodpeckers range from central Alaska and northern Canada to montane areas of California and New England. Black-backed woodpeckers are year-long residents in Montana.

Habitat
Burned conifer forests and other insect-infested forests provide key conditions necessary for both nesting and foraging by black-backed woodpeckers. They are cavity nesting birds, and occupy forested habitats that contain high densities of recently dead or dying trees, especially post-fire areas (Dixon and Saab 2000). Large, stand-replacing burns provide high concentrations of wood boring beetles that are a primary food source for black-backed woodpeckers (Hutto (2008)). Black-backed woodpeckers occur at highest densities in one to six-year-old burned areas and in stands that burned with high severity (Hutto 1995) (Saab, Russell, and Dudley (2007)).

Burned forests are believed to act as source habitats from which birds emigrate once post-fire conditions become unsuitable. Nappi and Drapeau (2009) found high nest densities and reproductive success in severely-burned spruce forests, with declining nest success as the time since burn increased. They suggested that old forest (including mature and old growth forest habitats) may sustain populations in regions with longer fire cycles.

In a conservation assessment for the black-backed woodpecker, Samson (2005 (amended in 2006)) found a significant increase in the amount of acreage burned throughout the Northern Region when comparing 1990–1993 (66,743 acres) against 2000–2003 (1,139,537 acres). Throughout the Northern Region, habitat for black-backed woodpecker currently is well distributed, well connected, and there are no gaps that would limit black-backed woodpecker movements (Samson 2005 (amended in 2006)).

Environmental consequences — black-backed woodpecker

Indirect effects of alternative 1 — Helena, Kootenai, Lewis and Clark, and Lolo National Forests
The Helena, Kootenai, Lewis and Clark, and Lolo National Forests would continue to implement their current forest plan direction pertaining to snag habitat. Population numbers and distribution of black-backed woodpeckers would likely continue to fluctuate primarily in response to large stand-replacing fires and insect outbreaks.

Indirect effects of alternatives 2 and 3 — Helena, Kootenai, Lewis and Clark, and Lolo National Forests
Existing forest plan management direction pertaining to snags or post-fire salvage harvest would not change under either of the action alternatives. The grizzly bear management direction would maintain motorized access in the primary conservation area at baseline levels. Therefore no change

from the current rate of removal of snags for firewood cutting or post-fire salvage is expected in those areas. No effects to this species or its habitat are anticipated.

Cumulative effects
As there would be no direct or indirect effects, no cumulative effects would occur.

Common loon

Key indicators for analysis

The key indicator for determining effects to common loon is:

- Island and shoreline habitat on large lakes, and fish prey base: Change in availability of habitat or prey base.

Affected Environment

Population status and distribution
Common loons breed on lakes in the forested regions of Alaska, Canada, and the most northern portions of the continental United States, and winter along the coasts. Globally, the population is considered "secure." Montana lists the common loon as a species of concern.

Montana supports the largest breeding population of common loons in the western continental United States. The 10-year average summer count is 216 individuals, consisting of an average of 62 territorial pairs, 52 non-breeding "single" adults, and 41 chicks. Since surveys began in the late 1980s, the population has remained stable (Hammond 2009).

Common loons are long-lived birds with a relatively low reproductive rate. The average age of first-time breeders is about 7 years old. Loons lay only one to two eggs and raise no more than one brood per year. Both parents defend the territory and raise the young (Hammond 2009). In Montana, about 50 percent of loon nests fail each year due to natural causes (flooding, predation) and human factors (disturbance). Juvenile loons typically spend their first three winters on or near the western coast before returning to their natal area (Hammond 2009).

Common loons nest on the Lolo and Kootenai National Forests. The adult loon population in the Tobacco-Stillwater and Clearwater-Swan drainages represents about 30 percent of Montana's total population (Kelly 1992). Common loons are not known to nest on the Helena or Lewis and Clark National Forests, but migrating birds have been recorded on the Rocky Mountain Range, Upper Blackfoot, and Little Belts geographic areas, and on the edge of Big Belts and Divide landscapes on adjacent large reservoirs (USDA 2015).

Habitat
In Montana, common loons generally nest on lakes larger than about 13 acres in size and below 5,000 feet in elevation (Skaar 1990 cited in Hammond 2009). If nesting on a small lake, they may use an adjacent lake for supplementary foraging.

Successful nesting requires nesting sites and nursery areas that are sheltered from winds and human disturbances. Loon nests are typically located on islands situated in open water, along transitional swamp shorelines or within marshes (Kelly 1992). Nest sites are generally located within 4 feet of the water's edge. Once the eggs have hatched and the young are ready to leave the nest, the family moves to a nursery area, a shallow water area protected from wind, waves, and other loons, and with abundant insects and small fish (Hammond 2009).

Water quality is an important habitat feature for breeding loon success. Loons are visual predators; therefore, clear water is crucial for foraging efficiency (Hammond, Mitchell, and Bissell (2012)). Loons feed mostly on small fish such as yellow perch and various minnow species. Other aquatic organisms may also be consumed.

Analysis by Hammond and others (2012) suggested that the loon population is limited by intraspecific interactions rather than available foraging habitat. Therefore, conservation efforts should be focused on lake complexes that have high numbers of territorial pairs.

Loons are extremely territorial and sensitive to disturbance during the nesting season. Eggs in nests may be susceptible to loss due to predation or cooling if disturbance keeps the incubating adult off of the nest for prolonged periods of time. Disturbance of nesting pairs by recreationists and development surrounding occupied lakes has been thought to be an important stressor of loons. Kelly (1992) reported an increase in productivity on several lakes in northwest Montana after implementing information and education programs and deploying floating signs around nests. These efforts appear to have been successful in mitigating the potential negative effects of disturbance on reproductive potential (Hammond et al. 2012). The Forest Service has partnered with the State of Montana, the Loon Society and the Common Loon Working Group over many years to monitor loon productivity, provide public education, and place signs near occupied loon nests to prevent boaters from disturbing nesting loons.

Environmental consequences — common loon

Indirect effects of alternative 1 — Kootenai and Lolo National Forests
On the Kootenai and Lolo National Forests, recreational access sites, such as campgrounds and boat ramps, are provided on several lakes that also support nesting loons. The Forest Service will continue with cooperative efforts to provide public information and education and to place floating signs around active loon nests.

Indirect effects of alternatives 2 and 3 — Kootenai and Lolo National Forests
Under the proposed action alternative and alternative 3, existing forest plan direction would remain in place. Limits on new developed recreation sites in the primary conservation area could benefit the common loon by reducing the potential for nest site disturbance or displacement caused by human presence and associated activities in those portions of the Kootenai and Lolo National Forests. These potential benefits may or may not occur, depending on site-specific locations and conditions.

Indirect effects of the alternatives — Helena and Lewis and Clark National Forests
Forest Service actions are not expected to have any effect on migrating loons. Therefore there will be no effects from any of the alternatives on the Helena National Forest or the Lewis and Clark National Forest.

Cumulative effects
Increasing human population and associated developments may increase the potential for disturbance and displacement of nesting loons, reducing their reproductive success.

Climate change could affect loons by altering water levels, water temperatures, and vegetation. If climate change alters precipitation and the timing of spring melt, water levels may fluctuate more during nesting than occurred previously. This may impact reproductive success if nests become submerged or elevated as the water level varies. Water temperatures may impact the suitability of lakes for different fish species, thereby changing prey abundance. Aquatic vegetation, which is important for nests, could be altered, and this may change nest site availability.

Flammulated owl

Key indicators for analysis

The key indicator for determining effects to flammulated owl is:

- Ponderosa pine and Douglas-fir forest: The change in availability of habitat and insect prey base.

Affected environment

Population status and distribution

Flammulated owls are known to breed along the western border of Montana and winter in Mexico. Estimates of the amount of habitat currently available for the flammulated owl in the Northern Region (Samson 2005 (amended in 2006)) indicate that habitat is abundant and well distributed across the national forests.

Flammulated owl surveys were carried out throughout the Northern Region in 2005 (Cilimburg 2006). Flammulated owls were detected on the Helena National Forest, in the Upper Blackfoot, Divide, Big Belts and Elkhorn landscapes. Owls were again detected in 2008 and 2014 surveys conducted on the Helena National Forest.

On the Kootenai National Forest, late-successional forests are considered to be well-distributed and there is estimated to be a substantial amount of habitat for the flammulated owl. Under the 2015 Kootenai Forest Plan, snag densities and the amount of the forest in a large tree size class are projected to increase over the next 50 years.

The Lewis and Clark National Forest is on the eastern edge of the mapped distribution of flammulated owls and likely does not support a population. Surveys conducted on the Lewis and Clark National Forest in 2008 did not detect flammulated owls. The Rocky Mountain Ranger District is included in the range-wide distribution map for this species, but lacks ponderosa pine habitat. The Little Belt, Highwood, Castle, Crazy, and Snowy mountain ranges are outside the known range of the species (USDA 2015).

On the Lolo National Forest, a Northern Region survey conducted in 2005 detected singing male owls at 35 of the randomly selected points, suggesting the species is relatively common in areas accessible by roads in the Douglas-fir and ponderosa pine zone. A number of additional surveys were conducted between 2005 and 2014 in conjunction with regional monitoring, forest old growth monitoring, and project area surveys, which also detected flammulated owls. According to the 2001-2013 wildlife monitoring report, the Lolo National Forest provides a substantial amount of habitat, estimated at about 16,000 acres.

Habitat

Older ponderosa pine forests and ponderosa pine/Douglas-fir forests are favored by flammulated owls, but breeding locations have also been documented in Douglas-fir forest types and occasionally in grand fir, western larch, spruce/fir, lodgepole pine and mature quaking aspen stands (Smucker, Cilimburg, and Fylling 2008). Flammulated owl home ranges vary in size, but average about 37 acres (McCallum 1994).

Flammulated owls consistently select habitat that combines open forest stands (35 to 65 percent canopy closure) with large trees and snags, occasional clusters of thick understory vegetation, and adjacent grassland or forest openings. Roosting occurs in fairly dense stands, whereas relatively open stands seem to be selected for foraging and for nest sites (McCallum 1994). Nests are placed in both

live and dead, large-diameter trees with cavities, commonly excavated by pileated woodpecker, northern flicker, or sapsuckers (Cilimburg 2006). Flammulated owls prey primarily on nocturnal moths and insects in stands with an overstory of old ponderosa pine/Douglas-fir trees (Linkhart et al. 1998).

Fire exclusion allows growth of young Douglas-firs that suppress recruitment of shade intolerant and large diameter trees, and may reduce the amount of open understory needed for flammulated owl foraging (Samson 2005 (amended in 2006)). A lack of low-intensity disturbance may have caused a decrease in the larger size classes of trees in ponderosa pine cover types. Large, stand-replacing fires can be detrimental to habitat needed for nesting. However, logging prescriptions or lower-intensity fires that maintain large trees/snags needed for nesting and the open conditions needed for feeding can be beneficial (McCallum 1994).

Threats to flammulated owls are detrimental changes in the structure of ponderosa pine and Douglas-fir stands as well as loss of large snags needed for nesting. Ponderosa pine has been impacted by recent heavy insect infestations on the Helena National Forest.

Environmental consequences — flammulated owl

Indirect effects of alternative 1 — Helena, Kootenai and Lolo National Forests
Habitat for this species would remain well-distributed on the Helena, Kootenai and Lolo National Forests under the no action alternative. Forest plan management direction would continue to provide for the protection and management of old growth and snag habitats that are important for this species.

Indirect effects of alternatives 2 and 3 — Helena, Kootenai and Lolo National Forests
Existing forest plan management direction pertaining to old growth forest and snags would be retained. Implementation of standards that limit the miles of motorized routes in zone 1 on the Lolo National Forest and in the Salish and Ninemile demographic connectivity areas could benefit this species by reducing the potential for future loss of snags due to public firewood cutting. These potential benefits may or may not occur, depending on site-specific locations and conditions. None of the other grizzly bear habitat direction is expected to effect flammulated owls.

Cumulative effects
Climate change is increasing the frequency and severity of wildfires and insect epidemics. Uncharacteristically-severe fires in ponderosa pine and Douglas-fir forests cause the loss of nesting and foraging habitat used by flammulated owls. However the existing amount and condition of the habitat in this area lessens this concern for the foreseeable future.

Greater Sage-grouse

Key indicators for analysis

The key indicator for determining effects to sage-grouse is:

- Amount and condition of sagebrush habitat: Habitat loss or fragmentation

Methodology and analysis process

The greater sage-grouse is not known or likely to occur on any of the amendment forests, with only one report from zone 3 on the Lewis and Clark National Forest. The analysis of effects is limited to that portion of the Lewis and Clark National Forest.

Affected environment

Population status and distribution
Greater sage-grouse occur in eleven States (Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Colorado, Utah, South Dakota, and North Dakota) and two Canadian provinces (Alberta and Saskatchewan), currently occupying approximately 56 percent of their historical range. Greater sage-grouse depend on a variety of shrub-steppe habitats throughout their life cycle, and are obligate users of several species of sagebrush.

In 2010, the USFWS issued a 12-month finding that greater sage-grouse was warranted for listing under the Endangered Species Act (Federal Register vol. 75, pp. 13910, March 23, 2010). However, based on new information about the status of the species, potential threats, regulatory mechanisms, and conservation efforts, USFWS in 2015 determined that listing is not warranted at this time (Federal Register Vol. 80, pp. 59857-59942, October 2, 2015).

USFWS does not consider that the greater sage-grouse “may be present” on any of the amendment forests (planning record exhibits #00116, #00117, #00118 and #00119). Neither the species nor its habitat are known or suspected to occur within the NCDE recovery zone, the primary conservation area, or zones 1 or 2. There is one winter sighting from the east end of the Little Belt Mountains (in zone 3) on the Lewis and Clark National Forest. There are no active leks on NFS lands, with the nearest active lek 12 miles from Highwood Mountains (also in zone 3).

Habitat
Sage-grouse are strongly tied to sagebrush habitats (Connelly et al. (2000)). Leks (breeding display sites) typically occur in open areas surrounded by sagebrush. Most sage-grouse nests are placed under sagebrush, and experience greater nest success (53 percent) than those nesting under other plant species (22 percent). In general, sage-grouse nests are placed under shrubs having larger canopies and more ground and lateral cover, as well as in stands with more shrub canopy cover than at random sites. Grass height and cover also are important components of sage-grouse nest sites. Grass associated with nest sites and with the stand of vegetation containing the nest was taller and denser than grass at random sites.

Early brood-rearing areas occur in upland sagebrush habitats relatively close to nest sites. High plant species richness with abundant forbs and insects characterize brood areas. During June and July, grouse usually move to more mesic sites, including sagebrush, small burned areas within sagebrush, wet meadows, farmland, and other irrigated areas adjacent to sagebrush habitats.

Sage-grouse use a variety of habitats during fall. Fall movements to winter range are slow and meandering. Winter habitat is characteristically sagebrush with greater than 20 percent canopy cover. During winter, sage-grouse feed almost exclusively on the leaves of sagebrush.

Environmental consequences — greater sage-grouse

It is not likely that sage-grouse occur on any of the amendment forests, and the only report of the species is from zone 3 on the Lewis and Clark National Forest. None of the alternatives would alter management of sagebrush habitats, or would change existing management direction in grizzly bear zone 3. If the distribution of the greater sage-grouse were to expand in the future in response to conservation efforts, there would still be no effects anticipated on the greater sage-grouse or its habitat.

As there would be no direct or indirect effects, no cumulative effects would occur.

Harlequin Duck

Key indicators for analysis

The key indicator for determining effects to harlequin duck is:

- Water quality and disturbance on fast-flowing rivers and streams: Change in availability of habitat and prey base.

Affected environment

Population status and distribution

Harlequin ducks are sea ducks that breed inland on mountain streams (Cassirer and Groves (1994)). The western North America population of harlequin ducks breeds from northwestern Wyoming through northern Montana, eastern and northern Idaho, and into Oregon, Washington, and possibly northern California. After breeding, harlequin ducks return to the coasts of North American and Greenland.

Approximately 150–200 pairs of harlequin ducks breed in Montana (Reichel and Genter (1996)). Most ducks are located in tributaries of the lower Clark Fork River; tributaries of the North, Middle, and South Forks of the Flathead River; streams coming off the east front of the Rocky Mountains; and the Boulder River.

Harlequin ducks and their habitat, although uncommon, are fairly well distributed across the Kootenai National Forest and the Lolo National Forest. The Helena National Forest and the Lewis and Clark National Forest represent the easternmost distribution of the western North America population; harlequin ducks are known to breed on the Upper Blackfoot landscape and the Rocky Mountain Division (USDA 2015). Single males have been observed along the Missouri River, on the Smith River, and on the East Boulder River, but these are single, unrepeated observations with no evidence of breeding.

Habitat

Harlequin ducks use clear, fast-flowing rivers and streams for nesting and brood-rearing (Casey 2000). Instream loafing sites include boulders or gravel bars adjacent to swiftly flowing water. Rivers and streams that lack human disturbance (e.g., boating, fishing, residences) and access by road or trail are more likely to be used by harlequin ducks. Likelihood of use is also higher where there is dense hiding cover along the stream (overhanging shrub vegetation), logjams, undercut stream banks, and woody debris (Cassirer and Groves (1994)). Harlequins primarily feed on benthic insects during breeding season and also may feed on crustaceans, mollusks, and small fishes (NatureServe).

Potential risks and threats to harlequin ducks from activities on NFS lands include the following (Casey 2000):

- Activities that result in streambank or channel alteration that eliminate or reduce cover and food supply. These include channelization, damming, livestock grazing, brush removal, timber harvest, gravel extraction, logjam removal, dredging, bank rip-rap, and road construction.
- High water during nesting may destroy nests, and high flows during early brood rearing may cause loss of broods. Low water will render feeding and brood rearing habitats unavailable. Hydropower development, stream diversion or damming, mining, timber harvest, wildfire, and road construction have the potential to alter the timing, amount, and duration of stream flow.

- Sedimentation, pesticide contamination, and toxic chemical pollution of streams may reduce the supply of macroinvertebrates or reduce the ducks' ability to find prey. Activities that could cause these impacts include road construction and use, timber harvest, livestock grazing, toxic chemical spills, and mining.
- Human activity, either instream or on the bank, is of concern in part because harlequin ducks do not have an opportunity to re-nest after failure or brood loss. Males depart for the coastal wintering areas soon after nesting commences, while females remain on the breeding stream even after experiencing nest failure or brood loss. Activities that may disturb or displace harlequin ducks include boating use, angler use, hiking, camping, and land management activities in and along streams during the breeding season.

Environmental consequences — harlequin duck

Indirect effects of alternative 1 — Helena, Kootenai, Lewis and Clark, and Lolo National Forests
The existing Helena, Kootenai, Lewis and Clark, and Lolo National Forest Plans contain management direction that protects the riparian stream habitats used by harlequin ducks. Although harlequin ducks are rare, management direction appears to be sufficient to maintain their distribution and successful breeding.

Indirect effects under alternatives 2 and 3 — Helena, Kootenai, Lewis and Clark, and Lolo National Forests
Existing forest plan management direction specific to harlequin ducks and their stream habitat would be retained under the proposed action alternative. The action alternatives would add limits on new developed recreation sites that could benefit harlequin ducks by reducing the potential for nest site disturbance or displacement caused by human presence and associated activities in the future. These potential benefits may or may not occur, depending on site-specific locations and conditions. None of the other forest plan components for grizzly bear habitat under these alternatives would be expected to affect harlequin ducks.

Cumulative effects
Small population size, restricted distribution, narrow habitat requirements, and vulnerability of large portion of the population to catastrophic events such as high streamflow or coastal oil spills are significant concerns for the harlequin duck. Water pollution in coastal wintering areas and hunting in wintering areas also have been identified as potential threats (MNHP and MFWP 2015). Climate change has the potential to alter the timing, amount, and duration of stream flow, which may impact nesting success and the availability of macroinvertebrate prey. In combination with the effects of the alternatives, cumulative adverse effects are not expected to occur.

Bighorn sheep

Key indicators for analysis

The key indicator for determining effects to bighorn sheep is:

- Disease risk, as determined by effective separation of bighorn sheep from domestic sheep and goats: The change in risk of transmission of disease from domestic livestock

Affected environment

Population status and distribution

Bighorn sheep are distributed throughout western North America, from southern and central British Columbia and Alberta southward into Mexico. Federal lands, primarily administered by the Bureau of Land Management and Forest Service, provide the majority of habitats for bighorn sheep populations (O'Brien et al. 2014).

Historically, bighorn sheep were numerous in Montana and were used for food and other purposes by Native Americans and the early explorers. Settlement led to significant declines of bighorns and other big game species. Bighorn sheep die-offs have been recorded in Montana since the early 1920s (MFWP 2010). As of 2008, there were about 5,700 bighorn sheep in 45 distinct populations (MFWP 2010). Between 2009 and 2011, bighorn sheep numbers in Montana declined by about 20 percent, due to pneumonia-associated die-offs and subsequent poor to nonexistent lamb recruitment in herds that had experienced disease (Butler, Garrott, and Rotella (2013)).

Two bighorn sheep herd units overlap with the Helena National Forest. These are the Elkhorn (also known as Radersburg), which had a severe die-off in 2008 from which it is unlikely to recover, and the Beartooth-Gates of the Mountains, which has a relatively stable population.

There are four bighorn sheep herd units on the Kootenai National Forest: Kootenai Falls, Ural-Tweed, Galton Range (also known as Ten Lakes) and Cabinet (also known as Berray Mountain), all small populations of fewer than 100 animals. The Ural/Tweed and Galton Range herds are especially valuable because they are native populations that have the "Trench" genotype.

On the Lewis and Clark National Forest, there are four bighorn sheep herd units within the Southern Rocky Mountain Front complex, which historically were used as a source population for transplants elsewhere. However, these herds, as well as the North Fork Birch-Teton herd unit, experienced a severe die-off in 2010.

Seven bighorn sheep herd units overlap with the Lolo National Forest: North Clark Fork, St Regis Cut-off, Paradise, Grave Creek, John Long Range, West Rock Creek, and Lower Blackfoot. All are robust populations that were at or above the population objective as of 2008 (MFWP 2010).

Habitat

Bighorn sheep may occupy a wide array of habitats, ranging from alpine areas to low elevation river breaks. They are typically found on cliffs, mountain slopes and rolling foothills, and tend to avoid areas with dense timber. Escape cover or terrain, comprised of steep (60 percent or greater) open slopes, usually with rocky outcrops, in proximity to open foraging areas is a feature in all seasons. Bighorn sheep forage on forbs early in the spring, switching to grasses and shrubs as summer progresses and in the fall and winter. Snow depth may be an important driver of sheep movement to winter ranges, which tend to be at low elevation or on south-facing slopes (MFWP 2010).

Respiratory disease epidemics are considered a primary factor limiting bighorn sheep populations in most of the western United States (O'Brien et al. 2014). Clifford and others (2009) estimated that the risk of pathogen transmission was higher where strong overlap existed between livestock allotments and known bighorn sheep movements. Sells and others (2015) analyzed 22 epizootics that occurred in 43 herds in Montana between from 1979–2013 and found that, within the area of each herd distribution plus a 9 mile buffer, the occurrence of private land, weed control using domestic sheep or goats, pneumonia history, and herd density were positively associated with risk of pneumonia.

Bighorn sheep of both sexes are known to make occasional long-distance exploratory movements outside their typical home range, which increase the risk of contact with domestic sheep or other infected herds and spreading the pathogens upon return to their own herds. Rams have a greater tendency than ewes to make long-distance movements (O'Brien et al. 2014). In Idaho, O'Brien and others (2014) recorded summer-season forays by bighorn sheep, with 50 percent of foraying males traveling at least 5 mi and 10 percent of foraying males traveling at least 13.5 mi beyond their core herd home range boundary. In Montana, DeCesare and Pletscher (2006) detected relatively long-range (12 to 20.5 mi) movements outside of their home ranges by males in three herds.

To reduce the risk of respiratory disease, the Wild Sheep Working Group (2012) made three recommendations to land management agencies. First, reduce the risk of association by eliminating overlap of domestic sheep or goat allotments or grazing permits/tenures within wild sheep habitat; second, ensure that annual operating instructions or their equivalent include measures to minimize domestic association with wild sheep and confirm appropriate methods to remove stray domestic sheep or goats; and third, manage wild sheep habitat to promote healthy populations in areas without domestic sheep or goats.

Historically, there were many conflicts between grizzly bears and domestic sheep. Over many years, the Forest Service has worked with permittees to resolve conflicts that occurred on grazing allotments on NFS lands. Nearly all sheep allotments have been phased out or relocated outside the grizzly bear recovery zone/primary conservation area. Currently, there are only two remaining sheep allotments in the recovery zone/primary conservation area, which are on the Helena National Forest and are very closely managed, for example by bringing in the sheep at night.

Montana Fish, Wildlife and Parks identified seven habitat issues for Montana bighorn sheep herds. These issues include the following:

- Habitat loss and fragmentation and displacement of bighorns caused by residential and resort developments
- Fragmentation of habitat and vehicular collision losses due to highway development and maintenance
- Habitat loss and fragmentation and population reduction and displacement to less productive habitats due to industrial developments such as dam development, hard rock mining, oil and gas development and exploration, and electrical transmission lines
- Livestock grazing on private and public lands, particularly conversion of allotments from cattle to domestic sheep
- Loss of habitat and connectivity due to forest succession or woody plant encroachment into former grasslands or shrub grasslands, caused in part by historical overgrazing and fire suppression
- Reduction or loss of productivity of seasonal ranges due to invasive plant species, and risk of disease transmission when domestic animals are used for weed control
- Human disturbance on critical winter and lambing ranges (MFWP 2010).

Environmental consequences — bighorn sheep

Helena National Forest

Indirect effects of the no-action alternative: Currently, there are two active sheep grazing allotments on the Helena National Forest, in the Blackfoot landscape. The current number of sheep allotments

and animal unit months would likely remain the same on the Forest. There is no expectation that domestic sheep grazing would be increased within the recovery zone.

Over ten air miles currently separate the boundaries of the grazing allotments from the areas known to be occupied by bighorn sheep. Sheep in these allotments on the Lincoln Ranger District only graze during the day, and are returned to private land at night due to concerns about predation by grizzly bears. This management practice likely further minimizes the potential for contact between those domestic sheep and wild bighorn sheep. Overall, the potential for disease transfer from domestic sheep to bighorn sheep within the allotments is low and likely to remain so.

Indirect effects of alternative 2: A forest plan standard would be added that would not allow any increase in the number of active sheep allotments or permitted animal unit months above the baseline within the primary conservation area. In addition, grazing by or trailing of small livestock for weed control within the primary conservation area must include measures to reduce the risk of conflicts with grizzly bears. The potential for disease transfer from domestic sheep to bighorn sheep within the primary conservation area would remain low. These standards provide additional assurance that the level of sheep grazing will not increase in the future.

Outside of the recovery zone/primary conservation area, there would be no difference between alternatives 1 and 2 with regard to sheep grazing. The sensitive species status of the bighorn sheep assures that habitat requirements and disease transmission risks will be considered in future site-specific decisions.

Indirect effects of alternative 3: The forest plan standards under alternative 2 would also apply to zone 1 under this alternative. This would further reduce the potential for disease transfer between wild and domestic sheep on the Helena National Forest.

Kootenai National Forest

Indirect effects of the no-action alternative: No active or vacant domestic sheep or goat allotments occur on or adjacent to the Kootenai National Forest. Pack goats are rare and the use of domestic goats for weed control currently does not occur on the Forest. The Forest Plan would allow grazing to occur as long as vulnerable resources are protected (FW-DC-GRZ-01). This direction will provide protection for bighorn sheep if domestic sheep grazing were to be proposed in the future, although this is unlikely.

Indirect effects of alternative 2: This alternative would not allow any increase in the number of sheep allotments or animal unit months above the baseline in the primary conservation area. As there are no allotments currently, the effects would be the same as under the no-action alternative.

Outside of the recovery zone/primary conservation area, there would be no difference between alternative2 and the no-action alternative with regard to sheep grazing. The sensitive species status of the bighorn sheep assures that habitat requirements and disease transmission risks will be considered in future site-specific decisions.

Indirect effects of alternative 3: The forest plan standards under alternative 2 would also apply to zone 1 (including the demographic connectivity areas) under this alternative. This would further reduce the potential for disease transfer between wild and domestic sheep.

Lewis and Clark National Forest

No-action alternative: Currently, there are no domestic sheep grazing allotments within the grizzly bear primary conservation area on the Lewis and Clark National Forest.

Indirect effects of alternatives 2 and 3: A forest plan standard would be added that would not allow any increase in the number of active sheep allotments or permitted animal unit months above the baseline within the primary conservation area. In addition, grazing by or trailing of small livestock for weed control within the primary conservation area must include measures to reduce the risk of conflicts with grizzly bears. There is no potential for disease transfer from domestic sheep to bighorn sheep within the primary conservation area. The additional standards under this alternative provide additional assurance that the level of sheep grazing will not increase in the future.

Outside of the recovery zone/primary conservation area, there would be no difference between alternatives with regard to sheep grazing (the Lewis and Clark National Forest has virtually no acreage in zone 1). The sensitive species status of the bighorn sheep assures that habitat requirements and disease transmission risks will be considered in future site-specific decisions.

Lolo National Forest

Indirect effects of the no-action alternative: There are no active or vacant domestic sheep or goat allotments currently in the primary conservation area or elsewhere on the Lolo National Forest. Forest Plan standard 4 states that: conflicts between livestock and big game will be resolved so big game are allocated the forage required to meet their needs; domestic livestock will be allowed to utilize any forage surplus not conflicting with the planned expansion of big-game populations; and reductions in livestock numbers will be avoided if possible, but will be acceptable to meet management goals. According to the 2000-2001 monitoring report, livestock grazing has been diminishing over time on the Lolo National Forest due to a variety of reasons including: the economics of small scale ranching operations, the loss of private ranch lands to subdivision and development, concerns over conflicting resource issues and values, and the loss of transitory range as past timber harvest units revegetate. Currently, the potential for disease transfer from domestic sheep to bighorn sheep on the national forest is relatively low.

Indirect effects of alternative 2: This alternative would not allow any increase in the number of sheep allotments or animal unit months above the baseline in the primary conservation area. As there are no allotments currently, the effects would be the same as under the no-action alternative. Outside of the recovery zone/primary conservation area, there would be no difference between alternatives 1 and 2 with regard to sheep grazing. The sensitive species status of the bighorn sheep assures that habitat requirements and disease transmission risks will be considered in future site-specific decisions.

Indirect effects of alternative 3: The forest plan standards under alternative 2 would also apply to zone 1 (including the Ninemile demographic connectivity area) under this alternative. This would further reduce the potential for disease transfer between wild and domestic sheep.

Cumulative effects

Bighorn sheep may interact with domestic sheep and goats on private lands adjacent to the national forests. Vegetation treatments that improve or maintain bighorn habitat at lower elevations on NFS lands have the potential to draw bighorn sheep closer to private lands with domestic sheep. The Forest Service coordinates with Montana Fish, Wildlife and Parks on the management of big game habitat, which provides a means to identify and resolve potential concerns about interactions of bighorn sheep with domestic sheep on adjacent private lands. In combination with the alternatives, adverse cumulative effects are not anticipated to occur.

Fisher

Key indicators for analysis

The key indicator for determining effects to fisher is:

- Mature coniferous forest with large-diameter trees: The change in amount or distribution of habitat

Affected environment

Population status and distribution

Trapping, as well as large regional fire events in 1910 and 1934, likely contributed to regional fisher population declines in the early 1900s (Jones 1991). In five separate reintroduction efforts, fishers were translocated from Minnesota and British Columbia to the northern Rocky Mountains between 1959 and 1991 (Weckwerth and Wright 1968, Vinkey et. al 2006).

Fishers have a large home range size and naturally occur at low density in the Rocky Mountains (Schwartz et al. (2013)). In Montana, the species is legally trapped under a limited quota system, allowing for take of two individuals in trapping district 1 and five in trapping district 2, which are located in northwestern Montana, with a sub-quota of two female fishers (MFWP 2015).

Habitat

Fishers are more likely to occur in areas with wetter, milder climates characterized by higher mean annual precipitation, mid-range winter temperatures, and topography in the form of drainages or valleys (Olson and others 2014). Fishers disproportionately use stands and regional landscapes characterized by large diameter trees (Schwartz et al. 2013). In Idaho, Jones and Garton (1994) found that fishers selected mature and old growth forests during the summer in Idaho, and also selected stands with abundant snags and cavities. Moist forested habitats with continuous overhead cover and riparian zones may be used as travel corridors. Fishers clearly avoid openings, such as clearcuts, open areas, and grassy slopes, as well as stands dominated by ponderosa pine and lodgepole pine (Jones and Garton 1994). Fishers appear to be restricted to areas with relatively low snow accumulation (Jones 1991).

Fishers hunt for prey on the forest floor and in trees and snags. Snowshoe hares are the most common prey for fishers, although they are noted for their ability to prey on porcupines. Major winter foods include carrion, snowshoe hare, mice, and voles, while the summer diet may also include bird eggs, fish, and fruit (Heinemeyer and Jones 1994).

The state's predictive habitat model indicates that moderate to high suitability fisher habitats comprise approximately 6,504 mi^2 in west central and northwestern Montana, with trapping district 2 having over 50 percent more high suitability habitat than in trapping district 1 (MFWP 2013).

The most recent regional assessment of fisher habitat (USDA Forest Service 2014) estimated that there are fewer than 5,000 acres of fisher habitat on the Helena National Forest, which is not sufficient to sustain a fisher population or to contribute to sustaining a fisher population. Some fisher sightings and hair snare (DNA) samples have been reported from the Lincoln area, which also has the best fisher habitat. A few hair snare samples have also been collected in the Divide landscape.

The Kootenai National Forest provides a substantial amount of habitat for the fisher, as described in the final environmental impact statement for the 2015 forest plan. Currently, the amount of habitat on the Forest is estimated to be above the historical range of variability.

There have been four observations of fisher on the Rocky Mountain Division in the past 15 years, two of which were unconfirmed tracks. However, no habitat suitable for the fisher has been identified on the Lewis and Clark National Forest (USDA FS 2014). It is unlikely that the species is present, and if legitimate, the observations likely were transient individuals.

The Lolo National Forest has participated in grid-based hair trap surveys for fisher annually since 2007. From 2007 through 2012, 66 sampling units covering over 1,000,000 acres were surveyed on the Lolo, with 24 of the units surveyed twice. According to the 2000-2013 wildlife monitoring report, 14 of 16 fisher detections through DNA analysis occurred on the Lolo, with the remaining two occurring on the Bitterroot National Forest.

Threats to fisher are loss of mature forest including large-diameter live trees with heart rot and snags needed for resting and denning. Vegetation management and fire suppression have influenced habitat of this species and its prey by altering composition and structure. High quality habitats for the fisher, unlike that for grizzly bear, are not strongly associated with low levels of human population and roads (Carroll et al. 2001).

Environmental consequences — fisher

Indirect effects — Helena National Forest
Although the Helena National Forest has a limited habitat base for the fisher, individuals are present in mature forest habitat. None of the alternatives would change the forest plan direction pertaining to fisher habitat. There would be no effect anticipated on fisher from any of the alternatives.

Indirect effects — Kootenai National Forest
Under the no-action alternative, both snags and the large/very large size class are projected to increase. Although the overall amount of fisher habitat may decline, it will remain within the historical range of variability.

None of the forest plan direction for mature forests and snag habitats will change under alternatives 2 or 3. The effects would be the same as for the no-action alternative.

Indirect effects — Lolo National Forest
Under the no-action alternative, the amount of old growth forest and the number of snags and large and very large trees are projected to increase. It is expected that the Lolo National Forest would continue to contribute a significant proportion of the fisher habitat and population in Montana.

None of the forest plan standards for old growth and snag habitats will change under alternatives 2 or 3. The effects would be the same as for the no-action alternative.

Cumulative effects
Moderate to high amounts of contiguous cover are a consistent predictor of fisher occurrence at large spatial scales. Future climate change is expected to lead to more frequent and severe wildfires, which alters forest composition and structure in ways that are likely to diminish the capacity to support fishers. Large wildfires along with timber harvest may reduce the amount of available habitat for fishers over time.

Trapping may affect the distribution and persistence of fisher populations. Trapping is regulated by the Montana, Fish Wildlife and Parks. Fisher are one of the five furbearers that are required to be reported, registered and pelt tagged so the actual number of harvested animals is known. A quota of 7 fisher, which may only be taken in trapping districts 1 and 2, has been in place since 1996. A female

subquota of two females provides an additional measure of protection for the reproductive segment of the population, to further insure harvest has no influence on statewide population status (MFWP 2013). No adverse cumulative effects on fisher are anticipated as a result of trapping.

Gray wolf

Key indicators for analysis

The key indicators for determining effects to gray wolf are:

- Habitat diversity, especially on ungulate winter range: The change in amount or distribution of habitat
- Habitat security: Road density.

Affected environment

Population status and distribution

The gray wolf was extirpated from the western United States during the early 1900s, due primarily to conflicts with people and loss of habitat. In 1973, the Northern Rocky Mountain subspecies (*Canis lupus irremotus*) was listed as endangered under the Endangered Species Act. Wolves from Canada began to naturally colonize adjoining habitat in the United States around 1979, and denning was first documented in northwest Montana in 1986 (Ream et al. 1989). By 2002, the Northern Rocky Mountain wolf population had met the numerical, distributional, and temporal recovery criteria of maintaining at least 30 breeding pairs evenly distributed among three recovery areas (northwest Montana, central Idaho and the Greater Yellowstone Area) for 3 years in a row (Federal Register vol. 74, no. 62, pp. 15123-15188). The wolf was delisted in Montana and Idaho in May of 2011. The recovered population remains secure under state management (USFWS review of the 2013 wolf population in the Northern Rocky Mountains DPS, April 21, 2014).

Within the NCDE, wolf packs are established throughout the Helena (except in the Big Belt landscape), Kootenai and Lolo National Forests. On the Lewis and Clark National Forest, wolf packs are established in all but the Highwood, Snowy, and Castle mountain ranges.

Gray wolves live in packs that generally consist of a socially dominant pair, their offspring of the previous year, and new pups; other breeding-age adults sometimes are also present. Average wolf pack size in Montana is about five individuals. In 2013, 412 wolves in 104 packs were verified in the northwestern portion of Montana.

Montana wolf pack territories average around 200 mi^2 in size and can be 300 mi^2 or larger. Pack territories are dynamic and change from year to year, depending on prey availability and relationships with neighboring packs (Bradley et al. 2014b).

Habitat

Key components of wolf habitat include a sufficient, year-round prey base of ungulates and alternative prey; suitable and somewhat secluded denning and rendezvous sites; and sufficient space with minimal exposure to humans (USFWS 1987).

In northwestern Montana, the primary prey of wolves includes white-tailed deer, mule deer, elk, and moose (Kunkel and Pletscher 1999). Alternative prey for wolves includes rodents, vegetation and carrion. Some wolves kill domestic livestock such as cattle and sheep when available (Fritts, Bangs,

and Gore (1994)). Ungulate winter ranges, usually located on lower slopes or valley bottoms, are key to wolf survival.

Pack activity is centered on the den site and nearby rendezvous sites from late April to September. Wolves commonly den in sites with low levels of disturbance, often within 400 yards of water. A wolf pack may move up to 6 mi to a number of rendezvous sites, typically meadows or past timber harvest areas, until the pups can travel with adults.

Humans are the primary cause of wolf mortality. In 2014, for example, the number of known wolf mortalities in Montana was 308, of which at least 301 were human-caused. There were 213 taken by legal harvest, 10 by illegal harvest, 57 due to control actions, 11 due to vehicle collisions, 6 killed under SB 200, 2 killed incidentally, one legal tribal take, and one was euthanized. One wolf died of natural causes and six died of unknown causes (Bradley et al. 2014a). Frequently used roads can reduce wolf habitat security and increase the potential for legal and illegal mortality (Person and Russell 2008).

In Minnesota, Thiel (1985) reported that road densities of 0.9 mi/mi^2 were a threshold for wolf occurrence in his study area. This threshold was attributed to human-related mortality of wolves being correlated with the distribution and density of roads. Mech and others (1988) investigated wolf distribution relative to road density over the entire occupied or potentially occupied range of the wolf in Minnesota. The average density of roads in areas inhabited by wolves was 0.58 mi/mi^2 while the area uninhabited by wolves had a road density of 1.4 mi/mi^2. The roads themselves did not prevent wolves from inhabiting an area; rather, higher road density was associated with increased risk of human-caused mortality, or with land uses that may also have affected wolf security.

Wolves generally avoid areas of high open road and trail density (Whittington, St Clair, and Mercer 2005). In the NCDE, motorized routes closed to provide security habitat for elk and grizzly bears also provide security habitat for wolves.

Extraterritorial forays are common for wolves and may result in permanent dispersal. Such movements might be more common when the opportunity to establish new packs is high, when food resources in the natal area are scarce, or breeding opportunities in the natal pack are limited (Fuller Fuller (1989)). Dispersal distances observed in the Northern Rockies averaged about 60 miles (Boyd and Pletscher 1999). Analysis of the northwest Montana and the central Idaho recovery areas indicated that large areas of suitable habitat are available to provide connectivity between the two areas; however, the Greater Yellowstone recovery area appears to be poorly linked to the other populations through relatively narrow and largely discontinuous habitat (Oakleaf et al. (2006)).

Theoretically, wolves potentially could live wherever prey populations and human tolerance or separation are adequate (Fritts, Bangs, and Gore (1994)). Analysis of 56 packs in the Northern Rocky Mountains indicated that more forest land cover, lower human population density, higher elk density and lower domestic sheep density were the primary factors related to wolf occupation and pack persistence (Oakleaf et al. 2006); their habitat modeling also suggested that tracts of suitable habitat remain unoccupied in the Rocky Mountains.

Environmental consequences — gray wolf

Indirect effects of the no-action alternative — Helena, Kootenai, Lewis and Clark, and Lolo National Forests

Existing management direction in the Helena, Kootenai, Lewis and Clark, and Lolo National Forest Plans has contributed importantly to the recovery of the gray wolf population in the Northern

Rockies. This includes both appropriate management of winter and summer habitats for deer and elk on NFS lands in coordination with population goals established by the state of Montana, and management of key features of wolf habitat, including protection when needed of den and rendezvous sites on NFS lands. The large areas of wilderness and roadless areas within the NCDE along with management of road densities to achieve big game, grizzly bears, and other resource objectives, will continue to provide habitat security for wolves on the national forests.

Indirect effects of alternatives 2 and 3 — Helena, Kootenai, Lewis and Clark, and Lolo National Forests
Existing management direction pertaining to the wolf and to elk and deer will be unchanged. Motorized access in the primary conservation area, zone 1 and the demographic connectivity areas would not increase above the baseline, so there would be no change in wolf security in these portions of the forests.

Cumulative effects
Big game winter ranges occur at lower elevations that are often predominantly privately-owned. Conflicts between wolves and livestock may develop in these areas, and this situation would not be changed by any of the alternatives. Warmer and drier conditions due to climate change are likely to result in winter ranges gradually shifting to higher elevations, which may result in fewer conflicts on private lands that formerly provided important elk and deer winter ranges.

Northern bog lemming

Key indicators for analysis

The key indicator for determining effects to Northern bog lemming is:

- Peatland habitat: The change in amount of peatland habitat

Affected environment

Population status and distribution
The northern bog lemming is a boreal species, occurring from the northern treeline in North America, southward into Washington, Idaho, Montana, Minnesota, and New England. The bog lemming is found in peatlands, which are uncommon landscape features in the Northern Rockies (Chadde et al. (1998)), and wet meadows.

On Sept. 29, 2014, WildEarth Guardians submitted a petition to list the northern bog lemming as threatened or endangered. On September 18, 2015, the USFWS published a 90-day finding that the petition presented substantial information indicating that listing may be warranted, and initiated a status review.

Peatlands (bogs and fens) form gradually, with rates of peat accumulation estimated to be less than 1 inch per century in boreal and temperate climates (Crum 1988 cited in Chadde et al. 1998). The integrity of peatland ecosystems is tied to hydrologic conditions and nutrient input from the larger surrounding landscape. Due to the accumulation of water-holding organic matter, peatlands are exceptionally stable and may persist for centuries in the absence of disturbance. However, the ability of peatlands to recover from disturbance is low. Recovery from a major disruption or the removal of vegetation may require centuries (Chadde et al 1998).

In Montana, peatlands are concentrated in the western one-third of the State. Prior to 1992, evidence of bog lemmings in Montana was limited to six locations; these occurrences were on the west side of

Glacier National Park and in the Rattlesnake drainage north of Missoula. Northern bog lemmings have now been documented at 26 locations in Montana, ranging in elevation from 3,000 to 7,000 feet, with the majority of observations above 4,600 feet (MNHP-MTFWP (2015b)).

This species is known to occur on the Kootenai, Lewis and Clark, and Lolo National Forests. The northern bog lemming has not been observed on the Helena National Forest, although there is potential habitat in upper portions of the Blackfoot landscape.

Habitat

The primary habitat of northern bog lemmings is peatlands, but they have also been detected in mossy forests, wet sub-alpine meadows, and alpine tundra (Reichel and Corn 1997). Large mats of sphagnum moss characterize most of the habitat patches where northern bog lemmings have been identified. Sphagnum moss has been found to be the best indicator that northern bog lemmings are present (Reichel and Beckstrom 1994).

Northern bog lemmings are active day and night throughout the year. They feed on mosses, grasses, sedges, and other herbaceous vegetation, and may also eat snails, slugs, and other invertebrates. Bog lemmings occupy surface runways and burrow systems that are up to a foot deep. Their young are born in nests that may be underground or on the surface under concealing vegetation.

Northern bog lemmings have a small home range of less than 1 acre in size. They are social and may be found in small colonies with population densities that may reach 36 individuals per acre (Reichel and Corn 1997).

Management recommendations (MNHP-MTFWP (2015b)) for lemmings include:

- assuming that northern bog lemmings are present at sphagnum or fen moss habitat patches unless site-specific surveys indicate otherwise,
- restricting timber harvest to a zone beyond a 100 meter buffer surrounding sphagnum or other fen moss mats, or associated riparian areas which could provide corridors for dispersal to adjacent patches of suitable habitat
- minimizing livestock grazing in drainages with unsurveyed moss mats present, and maintaining good to excellent range conditions there and in occupied habitat, and
- eliminating management activities that could destroy moss mats (road-building, pothole blasting, trail construction, dam construction, alteration of surface and subsurface waterflow, recreational vehicle use in fen habitats).

Environmental consequences — northern bog lemming

Indirect effects of the no-action alternative

The existing management direction in the Helena, Kootenai, Lewis and Clark and Lolo National Forest Plans provides protection to wetland and peatland habitats.

Indirect effects of alternatives 2 and 3

Existing forest plan direction pertaining to riparian and wetland habitats would be retained. Additional management direction that would limit livestock grazing in the primary conservation area and in zone 1 under alternative 3, as well as motorized access in the primary conservation area, zone 1 and the demographic connectivity areas could indirectly benefit bog lemmings by reducing the potential for impacts to peatland habitats. These potential benefits are highly uncertain given the rarity of the species, and may or may not occur, depending on site-specific locations and conditions.

Cumulative effects
Future climate change could change the amount and distribution of northern bog lemming habitat. Reduced precipitation and higher temperatures may reduce the extent of peatland or bog habitats, although this is uncertain. It is unknown if new areas of habitat would be created at higher elevations as climate changes. Depending on the amount of new habitat created, and its proximity to existing habitat, displaced northern bog lemmings may or may not be able to access an adequate amount habitat. Northern bog lemmings are not highly mobile and may have difficulty reacting to induced shifts in habitat. Bog and peatland habitat is naturally fragmented, adding to the difficulty for bog lemmings to shift their distribution (USDA 2010). In combination with the alternatives, no adverse cumulative impacts are anticipated.

Townsend's big-eared bat

Key indicators for analysis

The key indicator for determining effects to Townsend's big-eared bat is:

- Degradation of cave habitat or disturbance of roosts: The change in availability of habitat

Affected environment

Population status and distribution
Townsend's big-eared bats are found throughout western North America, from British Columbia south into Mexico. The species is considered globally secure, but locally imperiled or vulnerable due to its rare and localized occurrence throughout its range, as well as its specialized habitat needs (MNHP-MTFWP (2015b)). It is a state species of concern in Montana.

The distribution and status of bats remain poorly known in Montana. Four maternity colonies of Townsend's big-eared bats have been found in natural caves and one in an abandoned mine in Montana. There are also a few documented hibernacula in the state. The species appears to be experiencing a downward trend in the western United States, including lower numbers at one of the known maternity colonies in Montana (MNHP-MTFWP (2015b)).

In 2005, the Forest Service's Northern Region initiated bat surveys using a grid sampling system on selected national forests to gain a better understanding of the composition and distribution of bat species. The selected forests in Montana were the Gallatin, Helena, Flathead, Kootenai, and Lewis and Clark. Eleven species of bats, represented by 795 total individuals, were captured during late-June to mid-August 2005. Nine Townsend's big-eared bats were captured at two sites on the Helena National Forest. The capture of pregnant or lactating females provided evidence of reproduction (Hendricks and Maxell 2005).

Numerous mines and caves exist on the Helena National Forest, which provide potential habitat for bats.

Only one natural cave is known to exist on the Kootenai National Forest (Kootenai Forest Plan FEIS 2013). Abandoned and inactive mines and rock/talus slopes are scattered throughout the national forest, some of which could provide habitat for bats, especially where located near river systems, larger lakes and wetland areas. Snags, bridges, buildings, and rock crevices are available throughout the Forest and could provide habitat for roosting and foraging. However, no maternity roosts, hibernacula, or other occupied roosting habitat are known to exist on the Kootenai National Forest (Hendricks and Maxell 2005).

Fourteen observations of Townsend's big-eared bat have been documented on the Lewis and Clark National Forest, all in the Big Belts and Little Belts mountain ranges. All observations were documented at or near mines or caves. Numerous mines and caves exist on the Forest, with concentrations in some areas of the Little Belts. Few of the known mines and caves have been inventoried for bats, and the actual distribution of the bats remains largely unknown.

Although an inventory for this species on the Lolo National Forest is incomplete, surveys of selected abandoned mines during the summer confirmed the presence of this species on the forest. A subsequent winter hibernacula survey recorded regionally significant numbers of Townsend's big-eared bats on the Lolo National Forest.

Habitat

The term roost is used to describe any place a bat may use to rest, digest, socialize, mate, give birth, or sleep. Day and night roosts are usually separate locations. During the day, bats sleep or enter a semi-lethargic state in a day roost. Some bats use a night roost to rest and digest evening and night meals. Pregnant females congregate in maternity roosts to give birth and raise their young. Maternity colonies, which are formed during the spring and summer, are typically composed of 20 to 180 females. Males and non-reproductive females gather in separate locations called bachelor colonies. Bats that do not migrate south for the winter hibernate in hibernacula.

Caves and abandoned mines are the primary roost sites for Townsend's big-eared bat during all stages of its life cycle (Pierson et al. 1999). Temperature and airflow are important for both hibernacula and maternity colonies. Bridges and hollow trees may be used as night roosts.

Townsend's big-eared bats feed on various nocturnal flying insects near the foliage of trees and shrubs, especially near beaver pond complexes, meadows, and streams (Fellers and Pierson 2002). This species forages in a variety of habitat types, although it typically does not use large clear-cuts or regenerating stands in early seral stages (USDA 2013).

Although disturbance is a concern, the maternity colony at Lewis and Clark Caverns in Montana has persisted for over a century despite daily exposure to tour groups. However, the numbers of bats there have been steadily declining (USDA 2013).

The following management activities have the potential to impact bats or their habitat by causing disturbance, roost abandonment, or mortality:

- Disturbance of roosting sites, especially hibernacula and maternity sites, primarily by recreational activities in or near caves, but also from mining, road construction, and other activities near roosts;
- Habitat degradation or alteration of day roosts, maternity roosts, or hibernacula (caves, mines, old buildings) could affect the persistence of individual colonies;
- Timber harvest and wildfire may reduce the availability of roost trees and indirectly reduce prey populations due to changes in forest composition and structure;
- Road and right-of-way construction could result in the direct removal of snag or cave habitat, as well as the additional loss over time of snags along open roads due to fuel wood cutting;
- Grazing practices may alter vegetation, which may alter the invertebrate community;
- Caves and/or abandoned mines and buildings may be removed or closed due to human safety concerns resulting in habitat loss; and

- Environmental contaminants, including pesticides, heavy metals, and petroleum may cause mortality of bats; the use of insecticides in foraging areas has the potential to reduce the prey base.

Environmental consequences — Townsend's big-eared bat

Indirect effects of the no-action alternative
The current Helena, Kootenai, Lewis and Clark, and Lolo National Forest Plan provide direction to protect cave habitat and to maintain snags at least to minimum specified levels.

Indirect effects of alternatives 2 and 3
None of the management direction to be added under this alternative is likely to adversely affect the habitat of this species. Limiting road densities in the primary conservation area and zone 1 could benefit bats by reducing the potential for snag loss at or near maternity sites, hibernacula sites, or roost sites. These potential benefits would depend on site-specific locations and conditions.

Cumulative effects
White-nose syndrome is a fungal disease that continues to spread and decimate bat populations in the northeastern and midwestern United States. It has not yet reached the western United States. Recreational cave and mine exploration on all land ownerships has the potential to spread the disease. Cave/mine closures are in place in the areas where white-nose syndrome has been confirmed. There is a decontamination protocol in place for NFS lands, which should aid in slowing the spread of the disease. In combination with the alternatives, no adverse cumulative effects are anticipated.

Wolverine

Key indicators for analysis

The key indicator for determining effects to wolverine is:

- Persistent spring snow for denning habitat: The change in availability of habitat

Affected environment

Population status and distribution
On August 13, 2014, USFWS withdrew its previous (February 4, 2013) proposal to list the wolverine as a threatened species (Federal Register vol. 79, no. 156, pp. 47522–47545). USFWS concluded that sufficient information was lacking to make a reliable prediction about how wolverines are likely to respond to impacts to habitat that may result from climate change, and whether such habitat changes will pose a threat in the future. Additionally, the best available scientific and commercial information indicated that other potential stressors such as land management, recreation, infrastructure development, and transportation corridors do not pose a threat to the wolverine (p. 47539). In a recent ruling in the Montana Circuit Court, USFWS was instructed to review that decision.

The wolverine occurs throughout the arctic regions and also in subarctic areas and boreal forests of Eurasia and North America. In the southern portions of the wolverine's range in western North America, wolverine populations occupy peninsular extensions into the North Cascades Range in Washington and the Northern Rockies of Montana, Idaho and Wyoming. Populations once existed but were extirpated from the Sierra Nevada of California and the southern Rocky Mountains of Colorado, Wyoming and New Mexico. However, wolverine populations have been expanding in the

North Cascades and the northern Rocky Mountains from sources in Canada, and wolverine recently have been detected in Colorado, California, Wyoming, and Utah. Continued population growth and expansion is possible and even likely (Federal Register vol. 79, no. 156, pp. 47522–47545).

Wolverines are believed to occur throughout the NCDE, although surveys are incomplete and detection of wolverines can be difficult. The species has been documented to occur on the Lewis and Clark National Forest in all geographic areas except the Highwood, Snowy and Castle mountain ranges. There is a single trapping record from the Crazies from over 40 years ago. On the Lolo National Forest, genetic sampling conducted from 2012 to 2014 verified three individual wolverines on the Seeley Lake Ranger District.

Habitat

Wolverines use a wide variety of habitats, including alpine and arctic tundra and coniferous forests. Deep, persistent, and reliable spring snow cover (April 15 to May 14) is the best overall predictor of wolverine occurrence in the contiguous United States (Inman et al. 2013, Magoun and Copeland 1998, Aubry, McKelvey, and Copeland 2007) (Copeland et al. (2010)). In Montana, wolverines are generally restricted to high elevations where deep snow persists.

Home range sizes are large, disproportionately so for a mammal of its size. In Montana and northern Idaho, home ranges have been documented as large as 148 mi^2 for males, although female home ranges tend to be smaller. The availability and distribution of food is likely the primary factor determining wolverine movements and home range size (Hornocker and Hash 1981). Wolverines frequently travel long distances over rough terrain and deep snow, and adult males generally cover greater distances than females (Hornocker and Hash 1981, Inman et al. 2009, Copeland and Yates 2006).

Female wolverines use natal (birthing) dens that are excavated in snow. Persistent, stable snow greater than 5 feet deep appears to be a requirement for natal dens, because it provides security for offspring and buffers cold winter temperatures. Wolverines appear to choose areas of high structural diversity for dens, including components such as logs or boulders (Magoun and Copeland 1998). Female wolverines forage close to their den sites in early summer, progressively ranging further from dens as kits become more independent.

The wolverine is primarily a scavenger of carrion, but also preys on small animals and birds, and eats fruits, berries, and insects when available (Hornocker and Hash 1981). Wolverines have an excellent sense of smell that enables them to find food, even beneath deep snow. Inman and others (2013) found a link between persistent snow and wolverine foraging strategy. Wolverines appear to rely on the cold and snow to cache carrion.

Forest management activities appear to have little impact on wolverines, and the majority of wolverine habitat in the NCDE is in higher-elevation areas that are largely wilderness, inventoried roadless, or lands otherwise relatively unavailable for development. Wolverines appear to be capable of dispersing between habitats and through areas where human developments such as transportation corridors occur (Schwartz et al. 2009).

Climate change has been discussed as the greatest potential impact to wolverine numbers and distribution, because of the apparent requirement for deep, persistent snow in order for females to den and reproduce successfully. Wolverines' need for relatively cold average temperatures and for persistent snow explains their occurrence largely in the upper elevations of mountains in the contiguous U.S. It appears that low elevation and valley bottom habitats are used only for dispersal and not for foraging or reproduction in Montana and elsewhere in the Northern Rockies (Inman et al.

2009). If climate change affects montane habitats, and particularly the timing, depth, or duration of snowpack, it might impact wolverine numbers and distribution. However, there is a great deal of uncertainty regarding what the impacts of climate change might be at higher elevations.

Environmental consequences — wolverine

None of the alternatives would impact the extent of persistent spring snow, or of trapping mortalities, which are the two factors identified by the USFWS as most likely to impact wolverine populations. Neither would the action alternatives alter the effects of climate change on wolverine habitat. At the programmatic level, no direct, indirect or cumulative effects on wolverine can be identified as a result of the alternatives.

Coeur d'Alene salamander

Key indicator for analysis

The key indicator for determining effects to Coeur d'Alene salamander is:

- Rock formations with surface water: The change in availability of habitat

Affected environment

Population status and distribution
The distribution of this species is limited to northern Idaho, northwest Montana and southeast British Columbia. Within the NCDE, it occurs on the Kootenai and Lolo National Forests.

Habitat
Salamanders respire through their skin and are restricted to cool, damp environments. Habitat for the Coeur d'Alene salamander includes three major habitat categories: springs and seeps, waterfall spray zones, and stream edges (MNHP and MFWP 2015).

The species is found in conjunction with both persistent and intermittent surface water. Known populations occur in association with sharply fractured rock formations (used for underground refugia) from 1,600 to 5,000 feet in elevation. This fractured rock is often found in the Belt Rock formation but can also occur in talus and in other geologic types (Cassirer et al. 1994).

Coeur d'Alene salamanders generally occur in coniferous forest, but are not restricted to a particular overstory species or aspect. Populations have been found in areas with ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziezii*), western larch (*Larix occidentalis*), western red cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*) overstories, and at all aspects (Cassirer et al. 1994).

Roads, timber harvest or other vegetation management can isolate populations and fragment habitat. Removing rock from salamander habitats can also be detrimental.

Environmental consequences — Coeur d'Alene salamander

Indirect effects of the no-action alternative — Kootenai and Lolo National Forests
Existing forest plan management direction provides protection to this species and the fractured rock and wetland environments it inhabits. As a sensitive species, the potential effects of project activities on the unique habitat of this species will be evaluated.

Indirect effects of alternatives 2 and 3 — Kootenai and Lolo National Forests
Existing management direction pertaining to sensitive species and aquatic and riparian habitats would remain in effect. The grizzly bear management direction would not change and is compatible with existing direction applicable to the habitat for this species.

As there would be no direct or indirect effects, no cumulative effects would occur.

Boreal (Western) toad

Key indicators for analysis

The key indicator for determining effects to boreal toad is:

- Breeding habitat, lakes, ponds and wetlands: The change in availability of habitat

Affected environment

Population status and distribution
The boreal toad occurs throughout western Montana. Its range includes mountainous areas of the western United States and Canada, extending northward into southeastern Alaska (MNHP and MFWP 2014).

Habitat
Adult toads congregate at ponds in early spring to breed, typically in May and June. After breeding, adult toads disperse into surrounding terrestrial habitats. They may move more than 0.5 mi from their aquatic breeding sites after the breeding season is finished. Toads can remain away from surface water for relatively long periods of time. Juveniles are often present in wetlands adjacent to breeding sites, and may overwinter along the borders of sites where they developed. Breeding and nursery habitat includes permanent and ephemeral lakes, ponds, streams, and ditches, with a preference for shallow, warm areas with mud or silt bottoms (Maxell (2000)).

A study of boreal toads in Glacier National Park found that they increased in occurrence after fires in 2001 and 2003. The authors suggested that toads exploited severely burned areas because these sites were more open and that toads could use burned areas without great risk of increased water loss as long as they had cover. They also found that boreal toads shifted their use away from severely burned habitats to moderately burned areas later in the summer because partially burned areas had more ground/canopy cover and likely retained more soil moisture (Guscio (2007)).

Breeding sites used by toads can undergo a high level of fluctuation in water levels due to natural variation in groundwater and runoff levels as well as through changes in water yield caused by tree harvest and fires. Use of certain herbicides or pesticides within 100 meters of streams or other water bodies used by toads can also be lethal during certain stages of the toad life cycle (Maxell (2000)).

Road construction, timber hauling, timber harvest, and fuel reduction activities all have the potential to negatively impact toads through disruption of travel routes or directly through crushing, as toads may congregate near roads, or travel in large numbers, making them vulnerable to being run over by vehicles (Maxell (2000)).

Factors that impact the water level, temperature, or vegetation in breeding sites may impact use of those areas for breeding, or success of breeding activity. Small breeding ponds created by seeps may dry out in some years before metamorphosis occurs, killing tadpoles and rendering reproduction entirely unsuccessful at that site for the year. Livestock grazing in shallow breeding ponds may

remove emergent vegetation used by larvae, and trampling by livestock may crush large numbers of tadpoles. Changes in hydrology or water temperature due to natural events such as wildfires may also impact breeding sites.

Changes in beaver activity have been observed to correlate with changes in the number of tadpoles observed at a pond that has been monitored on the Lewis and Clark National Forest multiple times annually for over 15 years (Lewis and Clark National Forest unpublished data). It appears that observed changes in water depth, flow, and temperature related to beaver activity at that site may have impacted breeding activity or success.

Maintaining a number of breeding sites scattered across the landscape, connected by streams and by forest that provides microsites as described above, may be key to maintaining widespread breeding populations of western toads. This may be particularly important east of the Continental Divide, near the edge of western toad distribution and where the landscape is generally drier.

Western toads may congregate around roads in the late evening and early morning, making them vulnerable to being run over by vehicles (Maxell 2000).

Environmental consequences — boreal toad

None of the alternatives would change management direction pertaining to pond and wetland habitats on the Helena, Kootenai, Lewis and Clark or Lolo National Forests. Therefore, none of the alternatives are anticipated to have any measurable effects on this species or its habitat. As a sensitive species, the potential effects of project activities on individual toads and their habitat would be evaluated.

As there would be no direct or indirect effects, no cumulative effects would occur.

Northern leopard frog

Key indicators for analysis

The key indicator for determining effects to Northern leopard frog is:

- Breeding habitat, lakes, ponds and wetlands: The change in availability of habitat

Affected environment

Population status and distribution

This species is considered globally secure. Populations within the mountains of western Montana are a species of concern with a state rank of S1.

Habitat

Northern leopard frogs require a mosaic of habitats to meet annual requirements of all life stages. Separate sites are generally used for breeding and overwintering, but this may occur in the same pond in some cases. Breeding habitats used by northern leopard frogs in Montana include low elevation and valley bottom ponds, spillway ponds, beaver ponds, stock reservoirs, lakes, creeks, and pools in intermittent streams, warm water springs, potholes, and marshes with emergent vegetation. During winter, northern leopard frogs usually are inactive underwater on the bottom of deeper streams and ponds or springs that do not freeze and are well oxygenated, sometimes under bottom rubble and debris, in water as deep as 33.5 inches (MNHP and MFWP 2015).

Eggs are laid and larvae usually develop in shallow warm and still water, generally in areas well exposed to sunlight. Generally eggs are attached to vegetation just below the surface of the water. In summer, adults and juveniles commonly feed in open or semi-open wet meadows and fields with shorter vegetation, usually near the margins of water bodies. They do not use drier upland habitats.

Metamorphosed frogs eat various small invertebrates, including various insects, spiders, leeches, and snails obtained along the water's edge or in nearby meadows or fields. Larvae eat algae, plant tissue, organic debris, and probably some small invertebrates.

Breeding sites west of the Continental Divide should be protected from livestock, and organic and chemical (e.g., pesticide and herbicide) contamination. Bullfrogs, parasites and fungal, bacterial, and viral pathogens should not be introduced to these sites (MNHP and MFWP 2015).

Environmental consequences - northern leopard frog

None of the alternatives is anticipated to have any measurable effects on this species or its wetland habitat.

As there would be no direct or indirect effects, no cumulative effects would occur.

Plains spadefoot

Key indicators for analysis

The key indicator for determining effects to plains spadefoot is:

- Breeding habitat, lakes, ponds and wetlands: The change in availability of habitat.

Affected environment

The plains spadefoot toad is a medium-sized toad that ranges throughout the Great Plains, from southwestern Canada, across the western United States and into northern Mexico. It is usually found in areas with soft sandy/gravelly soils near permanent or temporary bodies of water.

Plains spadefoot toads are nocturnal. For much of each year, the toads remain largely inactive in burrows of their own construction or in rodent burrows. They typically emerge to breed only during spring and fall rains. Breeding takes place in temporary pools of water left by rainfall. Eggs are laid in clutches numbering from 10-250, hatching within 48 hours of being laid. The larvae can change into tadpoles in as little as two weeks. Tadpoles and toadlets have been observed in stock ponds and small ephemeral reservoirs, usually in sagebrush-grassland habitats.

No special management needs are currently recognized for this species. However, at permanent and semi-permanent water bodies (reservoirs and stock ponds) where breeding has been observed, portions of the shoreline where emergent vegetation might develop could be fenced to create exclosures that protect breeding adults, eggs and tadpoles from trampling and the removal of emergent cover by livestock (MTNHP and MFWP 2016).

Environmental consequences - plains spadefoot

None of the alternatives is anticipated to have any measurable effects on this species or its habitat.

As there would be no direct or indirect effects, no cumulative effects would occur.

Greater short-horned lizard

Key indicators for analysis

The key indicator for determining effects to the greater short-horned lizard is:

- Semiarid habitat with loose sandy soil: The change in availability of habitat.

Affected environment

Population status and distribution
Short-horned lizards are widely distributed across North America, occupying semiarid plains to high elevations in the mountains (Stebbins (2003)).

Habitat
The short-horned lizard may be found in a wide range of habitats including shortgrass prairie, sagebrush, and juniper, pine or fir forests. The soil in these habitats can be stony or rocky but usually has fine loose soil or sand present (MNHP and MFWP 2016).

Short-horned lizards are diurnal, being most active during mid-day and burrowing at night. The mating season is in spring (May to June). They give birth to 5 to 48 live young from July to September.

Short-horned lizards are “sit-and-wait” predators. They feed primarily on ants, but will also take an occasional grasshopper or beetle. Often, they can be found sitting in the vicinity of ant nests or trails. They rely extensively on camouflage to avoid predators.

Environmental consequences — greater short-horned lizard

This species does not appear to have specific habitat requirements that will be affected by existing forest plan direction or the alternatives. No effects on this species or its habitat are anticipated under any of the alternatives.

As there would be no direct or indirect effects, no cumulative effects would occur.

6.5.8 Terrestrial management indicator species

Introduction

The Helena, Kootenai, Lewis and Clark, and Lolo Forest Plans were developed in accordance with the 1982 regulations for implementation of the National Forest Management Act. The 1982 regulations specified that fish and wildlife habitat shall be managed to maintain viable populations of native and desired non-native vertebrate species in the planning area. To assure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals, and the habitat must be well distributed, so that individual animals can interact with others in the planning area. In order to estimate the effects of forest plan alternatives on fish and wildlife populations, the regulations called for certain vertebrate and/or invertebrate species present in the area to be selected as management indicator species. The 1982 regulations established the following categories of species to be considered for selection as management indicator species: plant and animal species identified on state and federal lists as endangered or threatened; species with special habitat needs that may be influenced significantly by planned management programs; species commonly hunted, fished, or trapped; non-game species of special interest; and additional plant or animal species selected because their population changes are believed to indicate the effects

of management activities on other species of selected major biological communities or on water quality. Monitoring of population trends in relationship to habitat changes is to be conducted in order to validate the assumptions and projections of the forest plan.

Each of the four forest plans has its own unique set of management indicator species, selected to address the forest's characteristics, habitat conditions, management issues, and range of alternatives under consideration. Each forest plan established management direction to guide the maintenance and improvement of habitat for its management indicator species to the degree consistent with overall multiple use objectives. Monitoring plans were developed to track population trends in relationship to habitat changes, in coordination with state fish and wildlife agencies to the extent practicable.

Below, the list of terrestrial management indicator species is shown for each forest plan. (Fish and other aquatic species selected as management indicator species are addressed in the aquatics section of this document.) For each management indicator species, the reason its selection, its distribution in relation to the zones identified in the grizzly bear conservation strategy, and a brief description of each species' habitat associations are provided.

Helena National Forest

Eleven species of wildlife, representing three categories of management indicator species, were selected in the Helena Forest Plan (see table 19).

Table 19. Terrestrial management indicator species in the Helena National Forest Plan

Management indicator species	Selection category	Occurs in the PCA, zone 1 or zone 2?	Indicator/habitat associations
American marten	Special habitat needs- mature tree dependent group	Yes	Mature coniferous subalpine forests with large-diameter snags and logs; small mammal prey
Pileated woodpecker	Special habitat needs- old growth dependent group	Yes	Mid-elevation conifer forests with large-diameter ponderosa pine and western larch trees; wood-boring insect prey
Northern goshawk	Special habitat needs- old growth dependent group	Yes	Diverse forest landscape with dense old growth stands for nesting; avian and mammalian prey
Hairy woodpecker	Special habitat needs- snag dependent species group	Yes	Nests in snags in a wide variety of coniferous and deciduous forests; insect prey
Grizzly bear, gray wolf, bald eagle and peregrine falcon	Threatened and endangered species	Yes	(See analysis in previous sections)
Elk and mule deer	Commonly hunted species	Yes	Coniferous forests interspersed with grasslands or shrublands; limited open road density on summer and winter ranges
Bighorn sheep	Commonly hunted species	Yes	(See analysis in sensitive wildlife species section)

Affected environment — American marten (mature dependent group)

The American marten is a solitary carnivore that inhabits mature stands of coniferous forests in North America. In the western United States, martens occur primarily in mid- to high-elevation

forests with a strong component of subalpine fir, Engelmann spruce, and lodgepole pine and pockets of coarse woody debris (Buskirk and Ruggiero (1994)). Martens typically inhabit mature forests with at least 30 percent canopy cover, which offer protection from predators and enhance the moist conditions favorable for its small mammal prey. Martens generally avoid large openings. Large snags, stumps, and logs are used for resting, natal (birth) dens, foraging, and protection from the elements, particularly during the winter (Thompson and Colgan 1994). Because of the strong association with mature and old growth forests, martens are sensitive to timber harvest and other vegetation management practices.

Marten habitat is abundant and well distributed on the Helena National Forest, and the species is known to be present. In 2008, about 35 percent of forested stands were estimated to provide suitable marten habitat forest wide. The ongoing mountain pine beetle epidemic will reduce the amount of mature and old growth forest, although the extent of the decrease is not yet known.

Environmental consequences — American marten

None of the alternatives would alter the existing management direction concerning retention of mature forest or snags and down logs. Open road access for firewood cutting would remain about the same under all alternatives, and would not have a measurable detrimental effect on this species. Marten habitat and populations may decline as a result of the mountain pine beetle epidemic, but are expected to remain well-distributed across the Helena National Forest under all alternatives.

Affected environment — pileated woodpecker and northern goshawk (old growth dependent group)

The pileated woodpecker occurs in mid-elevation forests of the Northern Rockies (Hutto 1995). For nesting and roosting, pileated woodpeckers require large, standing dead trees greater than 20 inches in diameter at breast height. They have a strong preference for ponderosa pine and western larch as nest trees (McClelland and McClelland (1999)) but may also nest in Douglas-fir, cottonwood, and mature western white pine trees. Heart rot appears to be an important feature of suitable nest trees. Typical nest stands are at least 50 to 100 contiguous acres in size. Foraging sites include standing trees (dead and alive), large logs and stumps, where the woodpeckers feed on a variety of wood-boring insects (Bull (1987)) such as carpenter ants. Cavities created by pileated woodpeckers for feeding or nesting are later utilized by dozens of other wildlife species. On the Helena National Forest, the distribution of pileated woodpeckers is limited to the Lincoln Ranger District.

Goshawks are territorial and maintain large home ranges (about 5,820 acres per pair, varying with prey populations and habitat conditions) (Reynolds, Graham, and Reiser (1992)). Northern goshawk nesting territories are composed of dense groups of mature nesting trees, abundant prey (squirrels, hares, larger songbirds, grouse), and mid-level flyways. Closed-canopy old growth forests are typically used for nesting and post-fledging habitat. In other seasons and activities, the goshawk benefits from a diverse landscape pattern (Reynolds, Graham, and Reiser (1992)), Beier and Drennan 1997). Suitable habitat for the goshawk is well distributed across the Northern Region of the Forest Service (Samson 2005 (amended in 2006)). Extensive survey work since the Helena Forest Plan was adopted has demonstrated that goshawks are widespread across the forest, although population densities are naturally low.

To maintain viable populations of old growth dependent species, it was estimated that 10 percent of commercial forest in riparian areas and 5 percent of forests in the dry mix and cool working groups must be maintained in old growth condition on the Helena National Forest (Helena National Forest Plan, page V/6). The forest plan standards require that 5 percent of each third-order drainage be managed for old growth. The 2009 monitoring report documented that the estimated percentage of

old growth on all forested lands on the Helena National Forest at that time was 12.2 percent (90 percent confidence interval of 10.1 to 14.5 percent). Recently, large numbers of lodgepole pine and ponderosa pine trees have died and forest canopies opened up as a result of a bark beetle epidemic, which is likely to measurably reduce the suitability of nesting stands and foraging habitat for these two species.

Environmental consequences — pileated woodpecker and northern goshawk

None of the alternatives would change the current management direction in the forest plan that pertains to old growth forest habitat. Open road access for firewood cutting would remain about the same under all alternatives, and would not have a measurable detrimental effect on the species. Suitable habitat and populations of pileated woodpecker and northern goshawk may decline over time as a result of the mountain pine beetle epidemic, but it is expected that forest plan standards will continue to be met. The species will remain well-distributed across the Helena National Forest under all alternatives.

Affected environment — hairy woodpecker (snag dependent group)

Hairy woodpeckers inhabit a wide spectrum of forest habitats, including coniferous and deciduous forests, and ranging from open areas created by stand replacing fire or timber harvest, to mature forests (Hutto and Young (1999), page 22). Hairy woodpeckers excavate a nest cavity in dead or decaying trees that are at least 10 inches in diameter. They may forage on smaller-diameter trees dead and dying trees, live trees, logs, stumps, and on the ground. The diet of the hairy woodpecker includes wood borers, bark beetles, ants, and grubs as well as on fruits, berries, and sometimes seeds. The cavities they excavate may later be used by many different animals.

Hairy woodpeckers were selected to represent snag-dependent species (Helena National Forest Plan Environmental Impact Statement, page III/26). Past wildlife surveys and numerous point-count surveys by the Northern Region Landbird Survey Program indicate that the hairy woodpecker is common and widely distributed on the Helena National Forest. Nesting and foraging opportunities for hairy woodpeckers and other cavity dependent species are currently increasing dramatically as a result of the bark beetle epidemic.

Environmental consequences — hairy woodpecker (snag dependent group)

None of the alternatives would alter the existing management direction concerning retention of snags and down logs. Open road access for firewood cutting would remain about the same under all alternatives, and would not have a measurable detrimental effect on this species. Hairy woodpecker habitat and populations are expected to remain well-distributed across the Helena National Forest under all alternatives.

Affected environment — elk and mule deer (commonly hunted species)

Elk inhabit open to dense coniferous forests interspersed with grasslands or shrublands. Forbs and grasses are preferred over shrubs in their diet. Elk are seasonally migratory, moving between traditional winter ranges (generally 4,000 ft. in elevation or less) and summer ranges. Winter ranges provide forage and protective cover needed to survive severe weather conditions. Summer range provides calving areas, nutritious forage needed to support growth and reproduction, and adequate hiding and thermal cover. Elk are known to avoid roads, with the degree of avoidance varying by season, the location and type of use of the road, traffic volume, and availability of cover (Lyon 1983). During the fall, elk seek larger, less roaded blocks of habitat that reduce their vulnerability to hunting (Hillis et al. 1991). Elk security during the hunting season is considered the primary limiting

factor on elk populations (Wisdom et al. 2000). The Helena Forest Plan target population for elk was set at 6,400 elk by the year 2000, which has been achieved.

Mule deer are widely distributed in subalpine habitats in the summer, moving to low elevation, shrub-dominated slopes in the winter. Shrubs are an important food item year round, with forbs being important in spring, summer and fall. Grass makes up only a minor part of the diet for mule deer. Good quality winter range is critical to sustain mule deer populations.

One of the goals of the Forest Plan is to maintain and improve the habitat over time to support big game and other wildlife species. In order to accomplish this goal, the forest plan contains both forest wide and MA-specific standards and guidelines to maintain desired habitat conditions for big game, specifying the minimum amounts of hiding cover on elk summer range, thermal cover on winter range, and open road densities. Road management is implemented to maintain or improve big game security, with restrictions on motorized vehicles on winter ranges and on elk calving grounds and nursery areas. Elk/mule deer habitat effectiveness (which integrates consideration of cover/forage, open road density, and livestock impacts on elk habitat potential) is monitored. Travel planning has been completed on portions of the Forest and monitoring has been ongoing in those areas to evaluate road closure effectiveness. Wildlife habitat enhancement projects have also been ongoing to maintain and enhance big game habitat.

Environmental consequences — elk and mule deer

The effects of implementing the Helena Forest Plan are generally occurring as predicted for elk and mule deer. Existing management direction will remain in place under all alternatives. Wilderness areas, recommended wilderness, inventoried roadless areas and other non-motorized areas will continue to provide security habitat. Management direction to provide secure core for grizzly bears will contribute to elk security habitat, although grizzly bears do not occur throughout the distribution of elk on the Helena National Forest. Deer and elk populations are expected to remain well distributed across the Forest.

Kootenai National Forest

Two species or species groups of wildlife were selected as management indicator species for the Kootenai Forest Plan Final Environmental Impact Statement analysis (see table 20).

Affected environment — elk

The elk was selected as a management indicator species because of concern about the availability of security habitat; it was not selected because of a viability concern. Security habitat is defined as timbered stands on NFS lands at least 250 acres in size and greater than 0.5 miles from open motorized routes during the hunting season, calculated for a planning subunit (Kootenai Forest Plan Final Environmental Impact Statement page 329).

Table 20. Terrestrial management indicator species in the Kootenai National Forest Plan

Management indicator species	Selection category	Occurs in the PCA, zone 1 or zone 2	Indicator/habitat associations
Elk	High social importance and sensitive to the availability of security habitat	Yes	Security areas

Management indicator species	Selection category	Occurs in the PCA, zone 1 or zone 2	Indicator/habitat associations
Landbird assemblage	Moving toward desired conditions for vegetation would maintain or restore habitat for insectivores	Yes	Open forest structures, mature forests, burned forests, and snags

The forest plan contains the following management direction specifically for elk:

FW-DC-WL-16. Habitat for native ungulates (elk, deer, moose, bighorn sheep, and mountain goat) is managed in coordination with state agencies. Cover and forage are managed according to FW-DC-VEG-01, FW-DC-VEG-02, FW-DC-VEG-04, FW-DC-VEG-05 and FW-DC-VEG-11.

FW-OBJ-WL-02. Elk. Over the life of the Plan, increase by 1 the number of planning subunits that provide at least 30 percent elk security (see glossary) and increase by 1 the number of high emphasis planning subunits (determined in cooperation with Montana Fish, Wildlife, and Parks; see FW-DC-WL-16) that provide at least 50 percent elk security.

FW-GDL-WL-10. Elk. Management activities in planning subunits should maintain existing levels of elk security (see glossary). Where possible, management activities in high and medium emphasis planning subunits (determined in cooperation with Montana Fish, Wildlife and Parks; see FW-DC-WL-16) should improve elk security.

Currently, many planning subunits on the Forest already provide at least 30 percent security habitat for elk. Only a few high emphasis planning subunits have more than 50 percent security habitat.

Environmental consequences — elk

Elk security habitat will be maintained or increased under all alternatives. Wilderness areas, recommended wilderness, inventoried roadless areas and other non-motorized areas will continue to provide security habitat. Management direction to provide secure core for grizzly bears will also contribute to elk security habitat, although grizzly bears do not occur throughout the distribution of elk on the Kootenai National Forest.

Landbird assemblage (hairy woodpecker, chipping sparrow, olive-sided flycatcher, hammond's flycatcher, and dusky flycatcher)

A landbird assemblage (insectivorous birds) was identified as a management indicator species to analyze and monitor the desired conditions for vegetation. There was no viability concern identified for any of the individual species in the assemblage. The following is a brief summary of habitat associations (Hutto and Young 1999):

- The chipping sparrow prefers open, coniferous woodlands, edges near openings, and early-successional forests with shrubs. This species feeds in low vegetation or on the ground for insects and the seeds of grasses and annuals.
- The hairy woodpecker uses coniferous forests, including mature forests, along with edges and burned areas. The hairy woodpecker uses cavities in snags for nesting and feeds primarily on insects found on the surface or subsurface of trees.
- The Hammond's flycatcher uses mature coniferous forests that contain canopy openings. The Hammond's flycatcher primarily captures insects in the air.

- The olive-sided flycatcher uses open coniferous forests, edges near openings, or early-successional forests that contain residual conifers or snags to provide singing and foraging perches. The olive-sided flycatcher captures insects in the air.
- The dusky flycatcher uses open coniferous forests, open areas with scattered trees, and brushy areas, and catches insects in the air.

In addition to the forestwide vegetation desired conditions to maintain or improve habitat for diverse species, including landbirds, the Kootenai Forest Plan includes the following objective:

FW-OBJ-WL-03. Landbird assemblage (insectivores). The outcome is the management of planned ignitions on 1,000 to 5,000 acres, annually, to provide habitat for olive-sided flycatchers, hairy woodpeckers, chipping sparrows, and Hammond's and dusky flycatchers. (Also see FW-OBJ-FIRE-02, which provides additional habitat for these species.)

Environmental consequences — landbird assemblage

Under all alternatives, the existing forest plan will maintain or improve the habitat components for this group of species, including snags, mature forest, openings/edge habitat, and open forest. By trending towards the desired conditions for vegetation and fire, a diversity of habitats and landscape patterns similar to those found historically under natural disturbance processes will be provided. Management of open road access will limit the amount of area subject to loss of snags from firewood cutting.

Lewis and Clark National Forest

Twenty species of wildlife, representing four categories of management indicator species, were selected in the Lewis and Clark National Forest Plan (see table 21).

Table 21. Terrestrial management indicator species in the Lewis and Clark National Forest Plan

Management indicator species	Selection category	Occurs in the PCA, zone 1 or zone 2	Indicators/habitat associations
Northern goshawk	Special habitat needs - old growth forest	Yes	Diverse forest landscape with dense old growth stands for nesting; avian and mammalian prey
Northern three-toed woodpecker	Special habitat needs –tree cavity conifer	Yes	Nests in snags in subalpine coniferous forests; insect prey
Grizzly bear, gray wolf, bald eagle and peregrine falcon	threatened and endangered species	Yes	(See analysis in previous wildlife species sections)
Elk, mule deer, bighorn sheep, white-tailed deer, mountain goat, black bear, mountain lion, blue grouse	commonly hunted species	Yes	Diversity of forest, shrubland and grassland habitats For bighorn sheep, see sensitive wildlife species section

Management indicator species	Selection category	Occurs in the PCA, zone 1 or zone 2	Indicators/habitat associations
Bobcat, beaver	commonly trapped species	Yes	Bobcat: rocky, vegetated hillsides with small mammal prey base Beaver: streams and ponds with riparian deciduous forest habitat
Golden eagle, prairie falcon, wolverine, Canada lynx	special interest	Yes	Golden eagle and prairie falcon: nesting cliffs adjacent to prairie habitat Wolverine: see sensitive wildlife species section Lynx: see Threatened and Endangered wildlife species section

Affected environment — northern goshawk

The Lewis and Clark National Forest identified northern goshawk as a management indicator species for old growth habitat. Forest Plan monitoring item C-8 provides that "Old Growth Habitat" will be monitored by sampling active nesting goshawk territories. A more detailed description of habitat use by the goshawk is presented in the Helena National Forest section, above.

The number of known goshawk territories increased from 2006–2009 (see table 22) but this was primarily due to greater survey and monitoring efforts. The number of occupied territories and active nests fluctuated year to year. This type of fluctuation is natural in goshawk populations. No conclusions on population trend are available from the monitoring data at this time.

Table 22. Goshawk monitoring results on the Lewis and Clark National Forest 2006–2009

Results of Monitoring	2006	2007	2008	2009
Number of known territories	40	42	43	53
Number of monitored territories (%)	25 (63)	41 (98)	42 (98)	50 (94)
Number of occupied territories (%)	16 (64)	24 (59)	16 (38)	27 (54)
Number of active nests (%)	13 (52)	17 (41)	7 (17)	25 (50)

Environmental consequences — northern goshawk

None of the alternatives would change the current management direction in the forest plan that pertains to old growth forest habitat. Open road access for firewood cutting would remain about the same under all alternatives, and would not have a measurable detrimental effect on the species. The species is expected to remain well-distributed across the Lewis and Clark National Forest under all alternatives.

Affected environment — northern three-toed woodpecker

The northern (American) three-toed woodpecker is a medium-sized, black-and-white woodpecker. It breeds from northern Alaska, across Canada's boreal regions, and south into the Rocky Mountains in the United States. This woodpecker is generally a permanent resident with no regular latitudinal

migration, although it can be somewhat nomadic. It inhabits subalpine coniferous forests, especially spruce, larch and fir, and may move into areas that have burned or are experiencing insect outbreaks. The nest cavity is excavated in a dead tree, usually a conifer or aspen tree with hears rot. Its diet is mostly wood-boring insects, particularly the spruce bark beetle, and may also include fruit and tree sap (MNHP and MFWP 2015).

Environmental consequences — northern three-toed woodpecker

None of the alternatives would alter the existing management direction concerning retention of snags and down logs. Open road access for firewood cutting would remain about the same under all alternatives, and would not have a measurable detrimental effect on this species. Northern three-toed woodpecker habitat and populations are expected to remain at similar levels across the Lewis and Clark National Forest under all alternatives.

Affected environment — elk, mule deer, white-tailed deer, mountain goat, black bear, mountain lion, blue grouse (commonly hunted species)

The Lewis and Clark National Forest Plan identified elk, mule deer, white-tailed deer, black bear, bighorn sheep, mountain goat, and mountain lion as management indicator species in the category of commonly hunted species (Lewis and Clark USDA (1986b), page 2-37). In addition to food, water, and shelter, hunted species also seek areas where they are less vulnerable to harvest. These may be areas with light or no hunting pressure or areas providing plentiful cover (e.g., dense forests or hilly terrain). The category of commonly hunted species was selected to assure coordination and cooperation with Montana Department of Fish, Wildlife and Parks. There was not a viability concern identified for these species.

As described previously for the Helena National Forest, both elk and mule deer move seasonally between summer and winter ranges. Elk primarily forage on grasses while mule deer are selective browsers of shrubs and forbs.

White-tailed deer occupy a variety of forest habitats and are primarily distributed at lower elevations and valley bottoms. Low-elevation winter range may extend below national forest boundaries. Shrubs are the most important food source, although white-tailed deer use grasses in the spring and forbs when available. Compared to other big game animals, white-tailed deer may be more sensitive to harsh winter conditions due to their small body size and short legs, with fawns being particularly susceptible to mortality during February and March (MFWP 2006). Deep snow accumulation may also make white-tailed deer more susceptible to being killed by predators, especially mountain lions (MFWP 2006). During the winter, white-tailed deer select areas with a dense forest canopy. The snow is not as deep in these stands because the canopy intercepts much of the snow. Thermal cover, probably the most important feature of winter range, is provided by tree crowns that help moderate the effects of severe weather. As winter temperatures decrease and snow depths increase, deer are increasingly restricted these areas to minimize energy expenditures. Optimum thermal cover is 60 to 80 percent of the critical winter landscape. Existing motorized vehicle access management strategies provide good security and habitat effectiveness. Winter weather severity, hunting harvest and predation, and disease are significant factors affecting population trend of white-tailed deer (Mackie Mackie et al. (1998)).

Mountain goats inhabit alpine and subalpine habitats in association with very rugged terrain that provides security. They are found at the highest elevations during summer and move lower in winter to cliff faces and steep terrain where snow depths are less and security from predators is available. In the past, the mountain goat population on the Rocky Mountain Front had served as a reliable source population for reintroductions across the state. However, the population recently has been in decline.

In 2009, Montana Fish, Wildlife and Parks augmented the Rocky Mountain Front population by translocating goats from a healthy population in the Crazy Mountains. Mountain goats are sensitive to human disturbance and over-hunting. On the Lewis and Clark National Forest, road densities and associated disturbance are generally low due to the limited number of roads and the high, steep, rugged habitat used by mountain goats.

Black bears inhabit forested habitats throughout Canada and in many eastern and western states. The distribution in Montana is closely associated with coniferous forest habitats within the various mountain ranges in the state. Mace and Chilton-Radandt (2011) found no relationship between black bear densities at DNA study areas and either road density or the proportion of the area classified as roadless. Black bears hibernate during the winter, using natural cavities in trees or under rocks, logs, or brush piles as dens. The diet is primarily herbaceous vegetation, along with berries, fruits, nuts, insects, tree bark and rodents (Jonkel and Cowan (1971)). In Montana, black bear density is greatest in the moist, coniferous habitats of the northwest and generally declines in the less moist habitats towards the south (Mace and Chilton-Radandt 2011). On average, approximately 1,030 black bears were harvested in Montana annually between 1987 and 2006, with about 14 percent of the average annual harvest occurring in region 4 (the area encompassing the Lewis and Clark National Forest). Annual harvest has been increasing in most bear management units in region 4.

The mountain lion is a large cat that preys primarily on white-tailed deer, elk, and mule deer. They inhabit mountains and foothills where they have access to prey populations. Mountain lions are territorial and solitary, except for females accompanied by males or kittens. Females den in caves, rock crevices, and brush piles, where they leave their kittens while hunting. Mountain lions usually hunt by stealth at night and cache unused food for later use. The mountain lion population in region 4 generally is stable with respect to recent harvest and quota levels (Kujala (2011)).

Blue (dusky) grouse are found in high elevation conifer forests during winter. During the early spring, they descend to lower altitudes, where they inhabit forest edges and openings. Broods may be found quite far from timber during summer and early fall (MNHP-MTFWP (2015a)). The diet is mainly leaves, flowers and conifer needles. Blue grouse spend most of their time foraging on the ground, but also forage for buds and needles in coniferous trees, particularly during the winter (Zwickel and Bendell (2005)). Reliable population data are not available for the dusky grouse, since its territorial calling season peaks in April, well before the Breeding Bird Survey begins. Sample sizes on the Christmas Bird Count are also low, since it is very inconspicuous in winter.

Environmental consequences — commonly hunted species

Some of the commonly hunted species are sensitive to disturbance by human activities. The level of wheeled motorized vehicle access can influence the vulnerability of big game to legal and illegal shooting. Road closures, especially when implemented during the fall and winter seasons at the lower elevations and in valley bottoms, are beneficial in sustaining big game populations. All alternatives will continue to offer a relatively secure environment due to existing wheeled motorized vehicle access management strategies for grizzly bear, although grizzly bears do not occur throughout the distribution of elk on the Lewis and Clark National Forest. Coordination and cooperation with the state wildlife management agency will continue under all alternatives.

Affected environment — bobcat and beaver (commonly trapped species)

Bobcats use a variety of habitats, but are primarily associated with rimrock and grassland/shrubland areas. Natural rocky areas provide den sites. Bobcats may be active during all hours but are primarily nocturnal. The primary prey is jackrabbits, snowshoe hares and other medium-sized rodents (MNHP and MFWP 2015).

Beavers occupy ponds, small lakes, meandering streams, and rivers. Their diet includes a variety of woody and herbaceous species, particularly willows, alder, and aspen.

Environmental consequences — bobcat and beaver

Populations of bobcat and beaver are expected to be more strongly influenced by trapping regulations than by habitat management. The habitats used by these species will not be affected by either of the action alternatives. There will be no direct, indirect or cumulative effects to the commonly trapped management indicator species.

Affected environment — golden eagle and prairie falcon (special interest)

Golden eagles nest on cliffs and in large trees (occasionally on power poles), and hunt over native prairie, shrub-steppe and open woodlands. Golden eagles eat primarily jackrabbits, ground squirrels, and carrion, and may occasionally prey on deer and pronghorn (mostly fawns), waterfowl, grouse, weasels, skunks, and other animals. Shooting, trapping, ingestion of poisoned bait or lead fragments in carrion, collisions with wind turbines and electrocutions from high voltage powerlines have been identified as threats to golden eagle populations. Breeding Bird Survey data for Montana show annual population increases of 1 percent per year during 1966-2009 and 1.7 percent per year for 1999-2009 (the increases were not statistically significant).

Prairie falcons use cliffs for nesting, and prairie habitats for hunting. Most nesting territories in Montana are located between 4,000 and 6,000 ft. in elevation. Common prey of prairie falcons in Montana are western meadowlarks, horned larks, and ground squirrels. Population estimates vary and there are insufficient data to determine trends based upon Breeding Bird Survey data. There has been a significant increase in the number of prairie falcons detected on Christmas Bird Counts for the period 1966–2012. Loss of prairie habitat is the primary threat to prairie falcons.

Environmental consequences — golden eagle and prairie falcon (special interest)

None of the alternatives would change the management direction applicable to the prairie habitats inhabited by golden eagles and prairie falcons. Therefore there would be no direct, indirect effects, or cumulative effects.

Lolo National Forest

The Lolo Forest Plan identified three management indicator species (table 23).

Table 23. Terrestrial management indicator species on the Lolo National Forest

Management indicator species	Selection category	Occurs in the PCA, zone 1 or zone 2	Indicator/habitat associations
Pileated woodpecker	Special habitat needs - mature/old growth forest	Yes	Mid-elevation conifer forests with large-diameter ponderosa pine and western larch trees and wood-boring insect prey
Northern goshawk	Special habitat needs - old growth forest	Yes	Diverse forest landscape with dense old growth stands for nesting and abundant prey

Management indicator species	Selection category	Occurs in the PCA, zone 1 or zone 2	Indicator/habitat associations
Elk	Commonly hunted	Yes	Coniferous forests interspersed with grasslands or shrublands, with limited open road density on summer and winter ranges

Affected environment — pileated woodpecker and northern goshawk

The pileated woodpecker was selected as a management indicator species representing the group of species associated with mature/old growth forest with limited management. The analysis of the management situation completed for the Lolo National Forest in the 1980s estimated that these species were at 70 percent of potential population levels and declining due to continuing harvest of old-growth timber (USDA (1986c), pages VI-17 and VI-18). It was thought that the species in this group were capable of adapting only to limited management activities, such as light thinning.

More recent estimates based on Forest Inventory and Assessment plot data for the Northern Region indicate that habitat for the pileated woodpecker is abundant and well distributed across the Region (Samson 2005 (amended in 2006)). On the Lolo, there are 98,463 acres of habitat available for nesting and 157,981 acres for winter foraging (winter is considered a critical time of year for this woodpecker). Region-wide population monitoring has shown that northern goshawks are relatively common and widespread during the breeding season in managed landscapes of the Northern Region. Population monitoring data collected for breeding birds along random transects across the Region, including the Lolo National Forest, from 1994 to 2000 show a clear upward trend in pileated woodpecker numbers, indicating viability is not a concern (University of Montana LandBird Monitoring Program, http://www.birdsource.org/LBMP/).

The northern goshawk was selected as the management indicator species for the group of species associated with natural old growth forest. In the analysis of the management situation prepared in the 1980s, it was estimated that population levels were 70 percent of potential on the east half and 40 percent on the west half of the Lolo National Forest, for an average of 55 percent of potential. The goshawk was thought to have a very low tolerance to management activities, and to be declining significantly with the harvest of old growth forests (USDA (1986c), pages VI-17 and VI-18).

The Lolo National Forest has maintained over 8 percent of its land base in old growth forest condition, thus meeting its 1986 Forest Plan allocation objectives. With an increasing emphasis on restoring the historical distribution and condition of old growth, the Forest has cautiously proceeded forward with treating old growth stands in the warm-dry, low- to mid- elevation habitat groups where significant structural changes have occurred since European settlement (Hessburg et al. 2000). A study was conducted to monitor old growth vegetation management treatments that were completed across the Forest between 1995 and 2005 (Brewer et al. 2008). Fifteen of the 17 (88 percent) old growth stands that were assessed for the effects of management treatments, including ecosystem maintenance burning, timber harvest, and timber harvest followed by burning, continued to meet the old growth definition after treatment. In comparison, only one of the 11 (9 percent) study stands retained its values as live old growth forest habitat after being burned by wildfire.

Pileated woodpecker use of untreated (control), treated, and burned areas was relatively common with the highest number of stands with large cavities occurring in 63 percent of the untreated stands sampled, 44 percent of the treated stands sampled, and 33 percent of the stands affected by wildfire.

All 16 treated stands provided habitat consistent with typical conditions for this species, and this is corroborated by the presence of large cavities at frequencies similar to the control stands.

For goshawks, old growth treatments on the Forest generally occurred in goshawk foraging habitat and outside of their nesting habitat. Goshawk monitoring included 208 broadcast calling stations (104 in 2006, 104 in 2007) with five goshawks responding to broadcast alarm calls (two in 2006, and three in 2007) for an overall detection rate of 2.4 percent. Four (two vocal approaches, two silent approaches) of the five total goshawk detections were elicited from broadcast calling stations located inside four separate stands that had been treated with improvement cuts and/or ecosystem burns to improve old growth characteristics, and one detection was elicited from an untreated stand.

Environmental consequences — pileated woodpecker and northern goshawk

None of the alternatives would change the current management direction in the Lolo Forest Plan that pertains to old growth forest habitat. Open road access for firewood cutting would remain about the same under all alternatives, and would not have a measurable detrimental effect on the species. The species are expected to remain well-distributed across the Lolo National Forest under all alternatives.

Affected environment — elk

As described previously, elk inhabit open to dense coniferous forests interspersed with grasslands or shrublands. Elk are seasonally migratory, moving between traditional winter ranges and higher-elevation summer ranges. Elk security during the hunting season is considered the primary limiting factor on elk populations (Wisdom, Holthausen et al. 2000). Elk numbers in northwestern Montana are currently stable with good calf recruitment in 2014 (Montana Fish, Wildlife and Parks 2014). Within Region 2 as a whole, in 2015 the elk population is slightly above the state's population objective (MFWP 2015).

Environmental consequences — elk

Existing management direction will remain in place under all alternatives. Elk populations are expected to remain well distributed across the Forest. Wilderness areas, recommended wilderness, inventoried roadless areas and other non-motorized areas will continue to provide security habitat. Management direction to provide secure core for grizzly bears will also contribute to elk security habitat, although grizzly bears do not occur throughout the distribution of elk on the Lolo National Forest.

6.6 Watershed, Soils, Riparian, and Aquatic Habitat

6.6.1 Introduction

This section of the analysis includes soils, watersheds, riparian, aquatic species and habitat. The affected environment and environmental consequences include a discussion for all 5 forests. Determinations for bull trout, Kootenai River white sturgeon, westslope cutthroat trout and pearlshell mussel are included at the end of the section.

6.6.2 Legal and administrative framework

Federal Law

Clean Water Act: The Federal Water Pollution Control Act, or Clean Water Act, is the principal law concerned with polluting activity in the nation's streams, lakes, and estuaries. Originally enacted in 1948, it has been revised by amendments in 1972 (P.L. 92-500) that gave the act its current form and

spelled out ambitious programs for water quality improvements that are now being put in place by industries and cities. Congress refined these amendments in 1977 (P.L. 95-217) and 1981 (P.L. 97-117). The 1987 amendments added:

- **A new Section 319 to the act**, under which States were required to develop and implement programs to control nonpoint sources of pollution, or rainfall runoff from farm and urban areas, as well as construction, forestry, and mining sites.
- **Section 303(d) of the Clean Water Act** requires states to identify pollutant-impaired water segments and develop "total maximum daily loads" that set the maximum amount of pollution that a water body can receive without violating water quality standards.
    - A water quality classification of streams and lakes to show support of beneficial uses.
    - Anti-degradation policies that protect water quality and stream conditions in systems where existing conditions exceed standards.

Organic Administration Act: States that the mission of national forests is to "…provide favorable conditions of water flow…"

Multiple-Use Sustained-Yield Act of 1960: Congress has affirmed the application of sustainability to the broad range of resources over which the USDA Forest Service has responsibility. The Multiple Use Standard Yield Act confirms the USDA Forest Service's authority to manage the national forests and grasslands, "for outdoor recreation, range, timber, watershed, and wildlife and fish purposes," (16 U.S.C. § 528), and does so without limiting the USDA Forest Service's broad discretion in determining the appropriate resource emphasis or levels of use of the lands of each national forest and grassland.

National Environmental Policy Act (NEPA) (1969): Requires analysis of projects to insure the anticipated effects upon all resources within the project area are considered prior to project implementation (40CFR1502.16).

Endangered Species Act (1973) as amended: Section 7(a) (1) supports biotic sustainability by requiring that, "All…federal agencies shall…utilize their authorities in furtherance of the purposes of this act by carrying out programs for the conservation of endangered species and threatened species…" Section 7(a) (2) of the Endangered Species Act includes direction that federal agencies, in consultation with the USFWS, will not authorize, fund, or conduct actions that are likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat.

National Forest Management Act (NFMA) (1976): Under the National Forest Management Act, forest plans are to provide for the diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet the overall multiple-use objectives. The National Forest Management Act requires that projects be consistent with the forest plan.

The National Forest Management Act states that management activities on NFS lands will not produce substantial and permanent impairment of productivity. The agency assures that productivity is maintained by establishing soil quality standards. Since 1999, physical soil disturbance has been the focus of soils management on NFS lands. Forest Service Manual chapter 2550, Region 1 Soil Management Supplement, provides a benchmark that indicates when changes in soil properties and conditions may result in a notable change or impairment of soil quality. Not all soil disturbance results in substantial or permanent impairment of productivity. The manual defines levels of soil disturbance (e.g., compaction, displacement, rutting, severe burning, surface erosion, loss of surface

organic matter, and soil mass movement) that are considered detrimental (of a great enough magnitude to potentially cause substantial impairment). Because soil disturbance recovers toward natural conditions either naturally or through restoration activities, no more than 15 percent of an activity area may have detrimental soil disturbance. This low level of detrimental soil disturbance allows recovery to occur between management activities.

Regulation and policy

Applicable Forest Service Manual and Handbook Direction (policy) follows:

- Forest Service manuals and handbooks within the 2500 file code designation contain direction for soil and watershed management.
- Forest Service manuals and handbooks within the 2600 file code designation contain direction on species and habitat management that supports recovery of listed species and maintenance of viable populations on NFS lands.
- In 2010, Forest Service Manual chapter 2550, Soil Management, was revised at the national level. The emphasis of soil management was changed to include long-term soil quality and ecological function. The manual defines six soil functions: soil biology, soil hydrology, nutrient cycling, carbon storage, soil stability and support, and filtering and buffering.
- The objectives of the national direction on NFS lands are (1) to maintain or restore soil quality, and (2) to manage resource uses and soil resources to sustain ecological processes and function so that desired ecosystem services are provided in perpetuity.

Executive Orders

Executive Order 11988: Directs federal agencies take action on federal lands to avoid, to the extent possible, the long-and short-term adverse impacts associated with the occupancy and modification of floodplains. Agencies are required to avoid the direct or indirect support of development on floodplains whenever there are reasonable alternatives and evaluate the potential effects of any proposed action on floodplains.

Executive Order 11990, as amended: Requires federal agencies exercising statutory authority and leadership over federal lands to avoid to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. Where practicable, direct or indirect support of new construction in wetlands must be avoided. Federal agencies are required to preserve and enhance the natural and beneficial values of wetlands.

Executive Order 12962 (June 7, 1995): Acknowledges the recreational value of aquatic biota by stating the objectives "to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by: “(h) evaluating the effects of federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order”.

6.6.3 Methodology and analysis process

The approach used in this analysis is to take a programmatic look at the forestwide scale of past, present, and reasonably foreseeable activities on the forest that may positively or negatively affect water resources. Since the forest plan makes no “on the ground” decisions, the most appropriate indicators for cumulative effects are reflected in the size and magnitude of different resource programs most likely to affect water resources either positively or negatively.

When water quality is affected, off site effects can occur. Yet, since the forest plan prescribes no specific activity in any specific area, potential spatial and temporal effects to water quality cannot be attributed to any specific watershed. Therefore, cumulative effects to water quality can only be described in terms of potential to generally affect trends on a forestwide scale. In other words, the cumulative effects of a program at the forest plan scale as opposed to the effects from a project at the project scale can only be discussed in terms of general programmatic tendencies either toward improved or declining water quality or fisheries habitat at no specific site. Consequently, there is no easily defined area that may experience cumulative effects beyond the forest boundary.

Therefore, the potential cumulative effects from forest programs to water quality will generally be discussed at the forest scale. The temporal scale for this analysis will be limited to the life of this plan, generally 10 to 15 years.

Watershed conservation practices and forest plan standards prescribe extensive measures to manage aquatic and riparian resources. If all applicable measures are implemented and if they are effective, adverse effects from any of the alternatives should be minimized. However, as levels of activity increase, the risk that conservation practices will not be properly implemented or will not be entirely effective increases. Therefore, alternatives that propose higher levels of activity for various resources pose greater inherent risks to aquatic and riparian resources. This analysis did not directly model the effects on stream processes and water quality, because predictions of outcomes for delivery and routing of water, sediment, and woody debris and their effects on streams and river systems are not applicable at the broad scale. Therefore, broad-scale outcomes were qualitatively estimated for effects on hydrologic function and watershed processes for NFS lands within the project area.

Qualitative estimates of effects are inferred from predicted outcomes for certain landscape and aquatic variables that evaluated vegetation, disturbances, and varying activity levels with considerations to specific land allocations and analysis requirements. The rationale for using these outcomes is that they are key processes or activities that influence hydrologic systems and contribute to the protection and maintenance of ecological functions required for healthy watersheds.

6.6.4 Affected environment

The parent geology of the project area is predominantly metasedimentary rock consisting of quartzite, siltite, argillite, and dolomite species. The surficial soils consist primarily of unconsolidated material of glacial origin overlaid with loess containing ash derived from volcanic eruptions in the Cascade Mountains to the west, most notably the eruption of Mt. Mazama in Oregon some 6,800 years ago. Most soils are well-drained gravels, although clay lenses of generally lacustrine origin do inhibit water percolation in areas scattered throughout the project area, creating numerous small bogs and wetlands.

Most of the project area is forested, with isolated patches of talus and bedrock exposure. Vegetation habitat types range from dry, mixed forest to upper subalpine forest and encompass patches of virtually all habitat types that exist in the NCDE. Riparian areas are generally confined to narrow strips along perennial and intermittent stream channels. Drainage networks are typically dendritic, with higher gradient, lower order streams combining to form streams of lower gradient and greater stream order. Annual precipitation ranges from about 20 inches per year at lower elevations up to 100 inches per year, much of which falls as winter snow, at the higher elevations.

The aquatic systems in the inland northwest evolved over millions of years under the influence of many geologic forces and processes. The present character and resiliency of the systems, climate, and geological processes have evolved following the last ice age, approximately 10,000 years ago.

Since then the aquatic systems have been subject to a wide array of disturbances and events. These disturbances have often been intense and cyclic in nature and may appear to recur somewhat randomly, but with predictable frequency. The watersheds and their dependent resources have evolved under this “pulse” disturbance regime so that they can effectively respond to those natural disturbances while sustaining their long-term functions, processes, and condition.

Around the beginning of the 20th century, the influx of human populations began in the inland northwest along with the development of the land and resources to support those populations. This has resulted in many new human-caused disturbances to the watershed systems, and the pattern of many of those disturbances has tended to be a more sustained or “press” disturbance regime. A press disturbance forces an ecosystem to a different domain or set of conditions (Reeves et al. 1995). Many of those disturbances tend to mimic historic “natural” processes, but the frequency and intensity has been greatly amplified. In some cases, the watershed systems have begun to adjust to those press disturbances; or have become altered by them, resulting in stressors to aquatic dependent resources.

Human activities have altered stream channels by direct modification; such as channelization, removal of large woody debris, dams and diversions, historical log drives; and building infrastructure such as roads, railways, bridges, and culverts that have encroached on riparian areas and stream channels. Humans have also indirectly affected the incidence, frequency, and magnitude of disturbance events. This has affected inputs and outputs of sediment, water, and vegetation. These factors have combined to cause changes in channel conditions throughout many parts of the five national forests resulting in aquatic and riparian habitat conditions different from those that existed prior to human development. Natural (primarily wildfire, floods, and landslides) and human-caused (timber harvest, fire suppression, road construction, mining, dams, introduction of non-native species, recreation, and grazing) disturbances over the last century have led to changes in the physical watersheds and in the fish and amphibians dependent on them (Lee et al. 1997).

Roads can have some of the greatest effects to watersheds and aquatic biota. Roads can change the runoff characteristics of watersheds, increase erosion and sediment delivery to streams, and alter channel morphology (Furniss et al. 1991). These direct effects lead to changes in habitats for fish and amphibians. Although current BMPs for road construction are designed to minimize the effects to watersheds, many miles of road existing on the landscape were not built to these standards or are placed in stored service. As a result, these roads either continue to affect watersheds through chronic erosion or are at risk for mass failure from undersized stream crossings or locations on sensitive land types.

Priority watersheds

The Flathead, Helena, Kootenai and Lolo Forest Plans were amended on August 30, 1995 by the Inland Native Fish Strategy (INFISH) (U.S. Department of Agriculture, Forest Service, 1995). This interim strategy was designed to provide additional protection for existing populations of native trout, outside the range of anadromous fish, on 22 national forests in the Pacific Northwest, Northern and Intermountain Regions. Implementing this strategy was deemed necessary as these species were at risk due to habitat degradation, introduction of exotic species, loss of migratory forms and over-fishing. As part of this strategy, the Regional Foresters designated a network of priority watersheds. Priority watersheds are drainages, which still contain excellent habitat, or assemblages of native fish, provide for metapopulation objectives, or are watersheds, which have excellent potential for restoration. Table 24 lists of priority bull trout watersheds.

Table 24. Priority bull trout watersheds

South Fork Flathead	Middle Fork Flathead	Swan River	North Fork Flathead	Kootenai River	Blackfoot River	Clearwater River
Danaher	Bowl	South Lost	Trail	Phillips/Sophie	Copper Creek	Morrell
Youngs	Clack	Woodward	Whale	Wigwam	Monture	Clearwater
S.F. Flathead River	Shafer	Goat	Red Meadow	Grave	N. Fk. Blackfoot	
Gordon	Long	Squeezer	Coal		Landers Fork	
White River	Strawberry	Lion	Big		Little Blackfoot	
Big Salmon	Morrison	Piper	Cyclone		Cottonwood	
Little Salmon	Granite	Jim	Frozen			
Spotted Bear River	Bear	Cold				
Sullivan		Elk				
Wounded Buck		Lindbergh				
Wheeler		Holland				

The Inland Native Fish Strategy also established riparian management objectives (RMOs) and riparian habitat conservation areas (RHCA). Riparian management objectives are habitat parameters that describe good fish habitat. Where site-specific data is available, these objectives can be adjusted to better describe local stream conditions. The objectives for stream channel conditions provide the criteria against which attainment or progress toward attainment of riparian goals is measured. Riparian habitat conservation areas are portions of watersheds where riparian-dependent resources receive primary emphasis. These areas are defined for four categories of stream or waterbody dependent on flow conditions and presence of fish. The RHCAs are areas within specific management activities and are subject to standards and guidelines in the Inland Native Fish Strategy in addition to existing standards and guidelines in the Forest Plans.

Soils

Certain attributes associated with soils on forest make them sensitive or susceptible to management caused impairment of soil quality and productivity. Sensitive soil properties on the forest are the organic surface horizons, mass wasting events, and thin-lithic soils.

Land use practices, such as grazing, logging, and mining, have been occurring on forest service lands since their inception. Activity impacts are evident on the soil landscape today. Dynamic soil characteristics may be indicators of impaired productivity. Compaction may restrict plant rooting, may lower water-holding capacity and may decrease infiltration. Loss of surface soil through displacement and mixing may decrease soil productivity. Displacement occurs during temporary road construction, excavation of skid trails and landings, and displacement of soils during ground-based harvest. Areas with ground disturbance may become more favorable for weed invasion, which can reduce overall soil productivity.

The soil organic layer is extremely important to all soils on the forest. Soil organic matter is fundamentally important to sustaining long-term soil productivity and is influenced by fire, harvest activities, and decomposition and accumulation rates. The organic component of soil is a large

reserve of nutrients and carbon and is the primary site for microbial activity. Forest soil organic matter influences many critical ecosystem processes, including the formation of soil structure. Soil organic matter is also the primary location for nutrient recycling and humus formation, which enhances nutrient and water storage and overall fertility. Soil organic matter depends on inputs of biomass (e.g., vegetative litter, fine woody debris) to build and maintain the surface soil horizons, support soil biota, enhance water-holding capacity, and prevent surface erosion. A review of the soil data and interpretations from the NRCS Web Soil Survey shows that a majority of the plan area has soils sensitive to erosion should the surface organic layer be removed.

Woody debris in the form of slash can provide a practical and effective mitigation for reducing harvest impacts on soil physical function and processes. Some controversy has emerged in recent years over the role of coarse woody debris in maintaining long-term soil productivity. The controversy involves the fact that coarse wood contains very little in the way of nutrients. Regardless, recent research still recommends leaving enough of this material on the ground after treatment to encourage biodiversity and ecological function (e.g., microbial action, mushroom production) (Page-Dumroese et al. 2010).

Species descriptions and habitat requirements

This analysis only considers bull trout (*Salvelinus confluentus*), westslope cutthroat trout (*Oncorhynchus clarki lewisi*), Kootenai River white sturgeon (*Acipenser transmontanus)* and western pearlshell mussel *(Margaritifera falcata)*. These are the aquatic species in the NCDE action area that are listed under the Endangered Species Act or are on the Regional Forester's sensitive species list. Other native species known to be present in the project area are mountain whitefish (*Prosopium williamsoni*), and sculpin (*Cottus sp.*). Tailed frogs (*Ascaphus truei*) are also present in the watersheds. Non-native brook trout (*S. fontinalis*), rainbow trout (*O.mykiss*), grayling, (*Thymallus arcticus*), and brown trout (*Salmo trutta*) are present within the project, primarily within the Rocky Mountain Front streams and some Blackfoot River drainages.

White sturgeon — Kootenai National Forest

The white sturgeon inhabits large rivers, lakes, and marine environments from southern California to Cook Inlet of Alaska. It is a migratory species that can reach lengths of nearly 20 feet, weights of 1,970 pounds, and ages of 100 years or more.

The white sturgeon native to the Kootenai River drainage of Montana, Idaho, and British Columbia has been geographically isolated from the lower Columbia River stocks by Bonnington Falls (Cora Linn Dam), near Nelson, British Columbia. White sturgeon migrate freely throughout the Kootenai River (Andrusak 1980), but are uncommon upstream of Bonners Ferry, Idaho (Graham 1981, Apperson 1992). There are no published reports of sturgeon using lateral tributaries in Idaho or Montana (Partridge 1983). The Kootenai River white sturgeon exhibits both the riverine and adfluvial life histories. Most adult fish reside in Kootenay Lake, and make extended (> 60 mi) migrations to spawn in a stretch below Bonners Ferry, Idaho.

The Kootenai River white sturgeon was listed as an endangered species in 1994 (USFWS 1994 September). The recovery plan for the Kootenai River population of the white sturgeon was completed in 1999 (USFWS 1999b). Critical habitat has been designated for Kootenai River white sturgeon; however, none was designated on the Kootenai National Forest.

In the Kootenai River, white sturgeon have not successfully spawned in recent years due to changes in river flow dynamics resulting from operations of the Libby Dam. Past land management activities

conducted by the Forest Service, such as road construction and timber harvest, are considered a secondary impact to populations of this species (Lee et al. 1997).

White sturgeon spawn during spring peak flows when velocities are high and turbidity is elevated. The fertilized eggs sink to the bottom and then hatch within a few weeks. The newly hatched sac-fry briefly drift with the current before retreating into the substrate for up to a month. The juveniles eventually emerge from the substrate and begin a free-roaming life. Juvenile fish use a wide range of depths and water velocities as habitat.

Older fish are relatively sedentary in the deepest locations of the Kootenai River drainage, often selecting low velocity waters greater than twenty feet deep and with sand substrates. There are very few areas within the lower Kootenai River that contain substrates greater in size than sand. White sturgeon are opportunistic feeders and subsist on insects, clams, snails, plant material, and fish (Brown 1971).

Western pearlshell mussel — sensitive species on the Lolo, Lewis and Clark, Helena, Kootenai National Forests

Western pearlshell (*Margaritifera falcata*) is a state species of special concern in Montana (S2) and also included on the Region 1 Sensitive Species list (USDA Forest Service 2011b). Montana's populations of *M. falcata* may be significantly contracting and becoming less viable with stream-decreased flows, warming, and degradation. Previously reported mussel beds in the larger rivers (Blackfoot, Big Hole, Bitterroot, Clark Fork,) are extirpated from the drainage or are at such low densities that long-term viability is unlikely. This mussel species appears to have crossed the continental divide in Montana from west to east with its salmonid host, the westslope cutthroat trout, *Oncorhynchus clarki lewisi*. This is the only native trout in the Missouri River headwaters. Reports of the eastern *M. margaritifera* in Montana are apparently due to the mistaken assumption that a mussel could not cross the continental divide (MNHP and MFWP 2011b).

Western pearlshell occurs in sand, gravel, and even among cobble and boulders in low to moderate gradient streams up to larger rivers. This species prefers stable gravel and pebble substrates in low-gradient trout streams and intermountain rivers. Western pearlshell is found in runs and riffles in stable main-current channel areas. This mussel is intolerant of silt and warm water temperatures (Stagliano et al. 2007).

In large river systems, *M. falcata* attains maximum density and age in river reaches where large boulders structurally stabilize cobbles and interstitial gravels. Boulders tend to prevent significant bed scour during major floods. Boulder-sheltered mussel beds, although rare, may be critical for population recruitment elsewhere within the river, especially after periodic flood scour of less protected mussel habitat. In localized areas, where canyon reaches are aggrading with sand and gravel, *M. falcata* is often replaced by *Gonidea angulata*.

Nearly all mussels require a host or hosts during the parasitic larval portion of their life cycle. Hosts are usually fish species, and hosts for *M. falcata* in Montana were typically and historically *Oncorhynchus* spp. (e.g., westslope cutthroat trout); but *Salmo* and *Salvelinus* (introduced species) and even *Rhinicthys* and *Catostomus* (dace and suckers) are anticipated to be suitable hosts as well.

Pearlshell mussels have been found in the Blackfoot, Clearwater and Tobacco River drainages within the analysis area.

Bull trout — threatened species

The final rule to list bull trout as threatened in the Columbia River basin was published on June 10, 1998. The USFWS listed all populations of bull trout within the coterminous United States as a threatened species, combining bull trout in the Coastal-Puget Sound populations (Olympic Peninsula and Puget Sound regions) and Saint Mary-Belly River populations (east of the Continental Divide in Montana) with previous listings of three separate distinct population segments of bull trout in the Columbia River, Klamath River, and Jarbidge River basins (63 FR 31647, June 10, 1998; 64 FR 17110, April 8, 1999). USFWS designated critical habitat for bull trout throughout the U.S. range on September 30, 2010. Critical habitat encompasses about 18,795 miles of streams and 488,252 acres of lakes and reservoirs in Idaho, Oregon, Washington, Montana and Nevada. The recovery plan for the conterminous United States population of bull trout was finalized in 2015. In its most recent status review for bull trout, USFWS (2008) identified historical habitat loss and fragmentation, interaction with nonnative species, and fish passage issues as the most significant primary threat factors affecting bull trout. These threats are addressed in the recovery plan for each of the six recovery units. The Kootenai, Flathead and Lolo National Forests are within the Columbia Headwaters recovery unit.

Two basic life history forms of bull trout are known to occur: resident and migratory. Resident bull trout spend their entire lives in their natal streams, while migratory bull trout travel downstream as juveniles to rear in larger rivers (fluvial types) or lakes (adfluvial types). Bull trout in the NCDE are an adfluvial migratory group, with juveniles moving downstream to rivers or lakes at age 2-3, and then returning around age 6 to spawn. Bull trout spawning occurs in the fall, and the eggs incubate in the stream gravel until hatching in January (Fraley and Shepard 1989). The alevins remain in the gravel for several more months and emerge as fry in early spring. Unlike many anadromous salmonids, which spawn once and die, bull trout are capable of multi-year spawning (Fraley and Shepard 1989). The historic range of bull trout stretched from California, where the species is now extinct, to the Yukon Territory of Canada (Hass and McPhail 1991).

Several factors have contributed to the decline of bull trout. Habitat degradation, interaction with exotic species, over harvesting, and fragmentation of habitat by dams and diversions, are all factors contributing to the decline (Rieman and McIntyre 1995). A change in the species composition of Flathead Lake is perhaps the most important factor in the decline of the upper Flathead bull trout subpopulation (McIntyre 1998). Between 1968 and 1975, opossum shrimp (*Mysis relicta*) were stocked in three lakes with tributaries feeding into Flathead Lake; the shrimp were then able to migrate downstream and they became established in Flathead Lake. The shrimp were documented in Flathead Lake in 1981, and populations peaked in 1986. Two non-native species, lake trout (*Salvelinus namaycush*) and lake whitefish (*Coregonus clupeaformis*), expanded as juvenile fish benefited from the addition of shrimp to the prey base.

It is believed that the expansion of the lake trout and lake whitefish contributed to the decline of bull trout (McIntyre 1998). The mechanisms of the decline are not well understood, however, it is assumed that the loss of kokanee as a food source for bull trout and competition/predation with lake trout was a major contributor to the decline in bull trout. Bull trout populations remain healthy in Swan Lake and Hungry Horse Reservoir. Lake trout are absent from Hungry Horse but have recently been documented in Swan Lake which has raised concern among land and fishery managers and efforts are underway to reduce lake trout.

Critical habitat was designated in 2010 with the aim of providing sufficient habitat to allow for genetic and life history diversity, to ensure that bull trout are well distributed across representative habitats, and to ensure sufficient connectivity among populations. USFWS designated 32 critical

habitat units within six recovery units as critical habitat for bull trout. Two critical habitat units, the Kootenai River Basin and the Clark Fork River Basin overlap with the amendment analysis area.

The primary constituent elements are those habitat components that are essential for the primary biological needs of foraging, reproducing, rearing of young, dispersal, genetic exchange, or sheltering. They are:

- Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.
- Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.
- An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
- Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.
- Water temperatures ranging from 2 to 15°C (36 to 59°F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.
- In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.
- A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.
- Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.
- Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

Westslope cutthroat trout — sensitive species, management indicator species

Westslope cutthroat trout is a sensitive species on forests within the NCDE. A sensitive species is defined as one that is susceptible to activity impacts or habitat alterations and is designated primarily to emphasize habitat protection and prevent population declines that would lead to a threatened designation (Forest Service Manual 2670).

The USFWS was petitioned by environmental groups to include the westslope cutthroat trout under the protection of the Endangered Species Act. In 2003, the USFWS determined that the listing was not warranted due to wide species distribution, available habitat on public lands, and conservation

efforts underway by state and federal agencies. The South Fork Flathead River drainage is considered a stronghold for westslope cutthroat trout throughout its range (Shepard et al. 2005).

The primary reasons for this species' decline are similar to those discussed above for the bull trout. Habitat loss is considered a widespread problem. Cutthroat trout have declined due to poor grazing practices, historic logging practices, mining, agriculture, residential development, and the lingering impact of forest roads. Fish have been unable to use countless miles of spawning habitat due to barriers created by dams and road culverts. Genetic introgression with rainbow trout threatens long-term persistence of westslope cutthroat trout (Hitt 2003).

Westslope cutthroat trout have two possible life forms, resident and migratory. Migratory forms are further divided into adfluvial (migrates to lakes) or fluvial (migrates to rivers). All life forms spawn in tributary streams in the springtime when water temperature is about 10 Celsius and flows are high (Liknes and Graham 1988). Cutthroat trout spawn when they are about 4 or 5 years old, and only a few survive to spawn again (McIntyre and Rieman 1995). Fry emerge in late June to mid-July and spend one to four years in their natal streams. Resident fish spend their entire lives in tributary streams, while migratory forms may travel miles as they move between waterbodies and spawning habitat.

Bull trout and westslope cutthroat trout status by watershed

South Fork Flathead River

The South Fork Flathead River originates at the confluence of Danaher and Youngs creeks in the Bob Marshall Wilderness area and flows north 57 miles into Hungry Horse Reservoir. It drains a 1,663 square mile area with an average annual discharge of 3,522 cubic feet per second (cfs). Bull trout are native to the South Fork Flathead River drainage and are distributed throughout the Flathead River Basin. Prior to human intervention, migratory bull trout that spawned and reared in the South Fork occupied Flathead Lake as adults. Construction of Hungry Horse Dam in 1952-53 blocked access to the entire South Fork drainage. About 38 percent of the spawning and rearing area once available to the Flathead bull trout population was cut off (Zubik and Fraley 1987).

The construction of Hungry Horse Dam in 1952 isolated the South Fork population of bull trout from the rest of the Flathead River system. The Montana Bull Trout Scientific Group (1995a) reported that the South Fork Flathead drainage upstream from Hungry Horse Dam is the "most intact native fish ecosystem remaining in western Montana." Currently, sub-adult bull trout upstream of the dam in Hungry Horse Reservoir or in the South Fork mainstem above the reservoir reside for several years prior to maturity and migration into tributaries to spawn. The majority of the spawning and rearing habitats for the South Fork bull trout population are located in the back country areas, most of which is in the Bob Marshall Wilderness. Juvenile bull trout rear from one to four years before moving downstream to the mainstem or to the reservoir.

The Montana Bull Trout Scientific Group (1995a) reported that the South Fork bull trout population trend is stable based on available data. However, they cautioned that data are limited and more long-term information is needed for a full assessment. This is significantly different than the rest of the Flathead River Basin subpopulations. The current status of Flathead River subpopulations of migratory bull trout in the Middle Fork and North Fork Flathead River are depressed and the trend is declining.

Two known disjunct populations of bull trout occur in the South Fork Flathead River drainage. Big Salmon Lake supports a migratory bull trout population which uses 5.5 miles of Big Salmon Creek upstream from the lake to a barrier falls for spawning and rearing. Doctor Lake also supports a bull

trout population, however little is known about this population, but it is suspected to spawn and rear in a short reach of Doctor Creek upstream of the lake (Montana Bull Trout Scientific Group 1995a).

Core areas are drainages that currently contain the strongest remaining populations of bull trout and that must be given highest priority for protection as they will be the primary source of fish for recolonization (Rieman and McIntyre 1993). They are usually relatively undisturbed and have been identified as needing the highest level of protection (MBTSG 1995a). Core areas in the South Fork include the entire drainages of Wounded Buck, Wheeler, and Sullivan creeks. Also included as core areas are tributaries to the river upstream of the reservoir (Spotted Bear River, Bunker Creek, Little Salmon Creek, White River, Gordon Creek, Youngs Creek, and Danaher Creek) and the South Fork itself above Gordon Creek.

Nodal habitats are waters which provide migratory corridors, overwintering areas, or other areas that are otherwise essential to bull trout at some point in their life history (MBTSG 1995a). Nodal habitat for the South Fork population is provided by the mainstem South Fork Flathead River downstream from Gordon Creek, including Hungry Horse Reservoir (MBTSG 1995a).

The Bull Trout Recovery Plan (USFWS 2015) has suggested that an appropriate conservation goal is to maintain the status quo. It is believed that protecting and maintaining the existing native species complex through natural production; maintaining the current genetic structure and diversity; and ensuring operation of Hungry Horse Dam does not exceed the desired minimum pool level that the conservation goal to meet bull trout life history requirements in the South Fork Flathead River will be met.

Westslope cutthroat populations in the South Fork of the Flathead River drainage are arguably the strongest within their range, given that there are no non-native fish and the area is primarily wilderness.

Middle and North Fork Flathead River

The Flathead River drainage supports one of the highest migratory bull trout populations in the United States. Historically, prior to the construction Hungry Horse Dam and Reservoir, Flathead Lake bull trout had access to all three forks of the Flathead River (North, South, and Middle Forks) and bull trout were widely distributed throughout the drainage. The Middle and North Fork populations are considered one meta-population since these fish depend on Flathead Lake for a major part of their life cycle. Juvenile fish rear in the tributaries of the Middle and North Fork for one to three years before migrating back to Flathead Lake (Fraley and Sheppard 1989).

The Middle Fork of the Flathead River originates in the Great Bear Wilderness at the confluence of Bowl and Strawberry Creeks. It flows for 47 miles to Bear Creek along U.S. Highway 2 where it forms the southern boundary of Glacier National Park. It then flows for 54 miles to its confluence with the North Fork. There are 19 streams in the Middle Fork subbasin which are known to support bull trout, including five in Glacier National Park.

At present, the predominant life history form of bull trout in the North and Middle Fork system is the lacustrine-adfluvial. No resident populations are known to exist and there are no indications that fluvial populations are present. Adfluvial fish reach sexual maturity in Flathead Lake at about age 6 and migrate upriver beginning in April. They reach the North and Middle Forks in June and July and enter tributaries in August with spawning commencing in late September and October when water temperatures drop to 9-10°C (48.2 to 50°F) (Fraley and Sheppard 1989). Incubation of eggs to emergence of swim up fry lasts about 200 days with emergence occurring in April. Juvenile bull trout rear for 2 to 3 years in the streams until they migrate downstream to Flathead Lake.

Unlike the South Fork bull trout population, recent monitoring data (MFWP 2015) indicate declining numbers of spawning bull trout in the Middle Fork and North Fork River systems. The mechanisms for the decline in the Flathead Lake migratory population are not completely understood but include the introduction and subsequent population increase in mysis shrimp in Flathead Lake, which in turn, changed the composition of the fish community in Flathead Lake. Lake trout *(Salvelinus namaycush)* and lake whitefish *(Coregonus clupeaformis)* now dominate the fish community and may be responsible for the decline in bull trout as well as other species. These changes in the Flathead Lake and River system are considered the primary threat to bull trout in the entire drainage system. Lake trout and bull trout competition has been documented elsewhere. Donald and Alger (1992) looked at 34 lakes in the distributional overlap of the species and found that in 28 cases, only one species was present. In the lakes where they were sympatric, lake trout were the dominant species and three case histories were documented where lake trout completely displaced bull trout. A secondary threat is the high incidental catch of bull trout and the strong fisheries management emphasis on introduced species (MBTSG 1995b). Forestry issues are also considered important in the managed portions of the Middle and North subbasins.

Core areas are drainages that currently contain the strongest remaining populations of bull trout and that must be given highest priority for protection as they will be the primary source of fish for recolonization (Rieman and Mclntyre 1993). Core areas in the Middle Fork include: Nyack, Park, Ole, Bear, Long, Granite, Morrison, Schafer, Clack, Strawberry, and Bowl Creek drainages. Core areas in the North Fork include: Trail, Whale, Red Meadow, Coal and Big Creek drainages.

Nodal habitat for this population is provided by the mainstem rivers. Nodal habitats are waters which provide migratory corridors, overwintering areas, or other areas that are otherwise essential to bull trout at some point in their life history (MBTSG 1995b). The restoration goal for the migratory population of bull trout in the Flathead River drainage is to maintain or restore self-sustaining populations in the core areas, protect the integrity of the population genetic structure, and enhance the migratory component of the population (MBTSG 1995b). The specific goal is increase bull trout spawners to the level recorded in the 1980's and to maintain this level for 3 generations. The average 1980 redd count in the Middle Fork index streams was 151 (MBTSG 1995b). In 2013, 137 redds were counted in the index streams.

Westslope cutthroat trout that are migratory have also been affected by lake trout predation in Flathead Lake while resident populations remain strong.

Swan River

At present, the Swan River drainage provides habitat for one of the strongest collections of local migratory bull trout populations remaining in the State of Montana (MBTSG 1996b). At least 23 tributaries support some level of juvenile bull trout rearing (Leathe and Enk 1985). Bull trout spawning occurs in at least 10 tributary drainages. Major spawning and rearing areas in the Swan River drainage are highly groundwater influenced which reduces the risk of impact from drought conditions. Bull trout are thought to be primarily adfluvial fish and mature in Swan Lake, located at the northern end of the Swan Valley. The recent invasion of lake trout into Swan Lake may threaten the long-term viability of this population. Lake trout have been surpressed by gillnetting since 2010 with about 5,000-7,000 lake trout removed annually. Core areas include: Elk Creek, Cold Creek, Jim Creek, Piper Creek, Lion Creek, Goat Creek, Woodward Creek, Soup Creek, and Lost Creek as well as Swan Lake, Holland Lake and Lindbergh Lake.

Westslope cutthroat trout populations remain strong in some tributary streams but have been replaced by brook trout and have hybridized with rainbow trout in other streams.

Blackfoot River
There are two bull trout local populations within the Blackfoot River core area on the Helena National Forest – Landers Fork and Poorman Creek, identified by the 2002 Draft Bull Trout recovery Plan and the Conservation Strategy for Bull Trout on NFS lands in Western Montana.

Historically, bull trout populations were well distributed throughout the core area and were likely in much higher densities than they are today. It is thought that up to 1,000 bull trout redds may have been historically present in the Blackfoot River Core Area. As with most bull trout populations, overall numbers were likely highly variable from year to year, based on natural climatic and disturbance patterns. These redd numbers were generated from estimating the potential in each of the 16 major spawning tributaries to the Blackfoot River (Union, Gold, Belmont, Cottonwood, Monture, Chamberlain, North Fork Blackfoot, Nevada, Arrastra, Beaver, Willow, Poorman, Upper Willow, Landers, Alice, and the upper Blackfoot).

Bull trout populations in the Blackfoot River were likely first exposed to mining -caused impacts in the late 1800's in the form of small scale mining. This mining was focused mainly south of the Blackfoot River in the Lincoln area (eastern Nevada Creek tributaries to Anaconda Creek) and in the northern Garnet mountain range (Ashby to Chamberlain Creek). The mining method was often an instream "placer" type operation that directly disrupted fish habitat and stream functions. Once disturbed in this fashion, streams rarely have the ability to naturally recover to their predisturbance level.

Westslope cutthroat populations are impacted from competition with brook trout and hybridization with rainbow trout in some areas but overall local populations are well distributed.

Monture Creek subpopulation of bull trout
This watershed is a mixture of alpine ridges and cirques, moderately steep to steep soils formed in slightly weathered sedimentary rocks, and undulating deep soils on glacial moraines. The upper section of the drainage is managed by the Forest Service. The lower section of the drainage is a mixture of Plum Creek, private and state land. Monture Creek is considered a core area. The highest redd count was 93 in 2002 and 63 redds were counted in 2013.

Clearwater subpopulation of bull trout
Due to the glaciated nature of the Clearwater drainage, many streams are lower gradient and provide preferred fish habitat. The Clearwater flows from its headwaters through a chain of several lakes, where it eventually drains into the Blackfoot River. The Forest Service manages about 70 percent of the Upper Clearwater, the remaining 30 percent a combination of Plum Creek and private ownership. In the lower section of the Clearwater sub-population the Forest Service manages about 5 percent, with private ownership making up the rest. The most significant uses and impacts are associated with timber and recreation. The highest redd count was 74 in 2012 and 49 redds were counted in 2013.

Copper Creek subpopulation of bull trout
Streams currently known to support fisheries located within this watershed include Copper Creek and tributaries to Copper Creek including lower Red Creek, lower Cotter Creek, Snowbank Creek, the North Fork of Copper Creek and an unnamed tributary to Copper Creek in the headwaters (section 2 is the confluence). The majority of the basin is in public ownership. The Copper Creek drainage has been affected by wildfire, timber harvest, roading, and recreation. Some of the past timber harvest and existing roads, including approximately five miles of the main access road, are located within the riparian habitat conservation area of Copper Creek and its tributaries. The highest redd count was 82 in 2009 and 22 redds were counted in 2013.

Landers Fork subpopulation of bull trout
Bull trout have been documented in Lander's Fork below Silver King Falls. Fish collected in Lander's Fork were juvenile bull trout or westslope cutthroat trout with the exception of one brown trout. No brook trout were found in any of the samples. Lander's Fork above Silver King Falls is not believed to be historical bull trout habitat as Silver King Falls is an upstream migration barrier.

Kootenai River
The Wigwam River drainage in the United States is a 30,792-acre watershed that flows north into British Columbia, Canada. The major lakes in the drainage include Big and Little Therriault Lakes, Paradise Lake, and Wolverine Lakes. Bull trout and westslope cutthroat trout are codominant species, with some mountain whitefish (*Prosopium williamsoni*) and largescale suckers (*Catostomus macrocheilus*) also represented. Due to partial fish passage barriers, the whitefish and suckers rarely occur in the U.S. portion of the Wigwam. The Wigwam River is a bull trout core area (a population stronghold). The Kootenai National Forest Plan lists the Wigwam River as a priority bull trout watershed.

Grave Creek is considered one of the major fisheries streams on the Fortine Ranger District. This drainage produces both resident and migratory populations of bull trout, cutthroat trout, and a moderate run of rainbow trout. Grave Creek is considered the major spawning stream south of the Canadian border for Lake Koocanusa's bull trout population and is a priority bull trout watershed. The Tobacco/Grave bull trout subpopulation (stock) is a part of the larger upper Kootenai River meta-population. The Tobacco/Grave population consists of both migratory and resident forms. Bull trout are known to inhabit or reproduce in Grave Creek and the following tributaries: Lewis, Blue Sky, Clarence, Stahl, and Williams Creeks. Migratory fish from Lake Koocanusa are known to spawn in Grave, Lewis, Blue Sky, Clarence, and Stahl Creeks. The upper reaches of Stahl and Williams Creeks support instream falls that are fish barriers. Only Williams Creek is known to have an isolated population of resident bull trout above the falls.

Sun, Teton, Two Medicine, Badger, Deep, and Dearborn rivers
Bull trout are not present in these drainages. The most widespread impact to aquatic habitats in these drainages is the stocking of nonnative fish. This has eliminated westslope cutthroat trout of conservation-level purity from most of the historically populated stream reaches. The few isolated populations that still persist represent unique genetic diversity from the range east of the continental divide (Leary et al. 1987, Allendorf and Leary 1988). Survey work jointly conducted by the USFS and Montana Fish, Wildlife and Parks recently led to the discovery of a previously unknown remnant population. This is the last known genetically pure population in the entire Sun River drainage. Historically, fish were unable to colonize the Sun River above the falls at Diversion Dam located approximately 1.5 miles downstream from Gibson Dam. Although fish are not native to this portion of the Sun River drainage, this area has been stocked with both natives and nonnative fish species and is dominated by nonnative trout.

Several other river and large stream networks occur within this area. These include headwater portions of the Two Medicine River, Badger Creek, the Teton River, Deep Creek, and the Dearborn River. Thirty-four conservation populations of westslope cutthroat trout are known to occur in this geographic area. Headwater tributaries of Badger Creek contain five of the eight tested populations with 100 percent genetic purity. There are not any genetically pure populations known in Dearborn River drainages. There is one in each of the Two Medicine River and Teton River systems. Preliminary testing indicates that Deep Creek contains genetically pure fish from west of the continental divide. These are likely the result of an unauthorized transplant from west of the continental divide to an area above a waterfall that is a natural fish barrier.

6.6.5 Environmental consequences

Introduction

In the past two decades, there has been a net reduction of roads across all forests. These tended to be roads that were in excess of what was needed for management or recreational activities, or were difficult or expensive to maintain, or both. Roads were also decommissioned to benefit wildlife, fish, and improve water quality. In the past, roads have been a primary cause in the reduction of water quality due to sedimentation from roads that were connected to streams. Decommissioning has disconnected many of these roads as a sediment source; roads constructed in the last decade meet standards for water conservation practices. Much of the road decommissioning has taken place inside the primary conservation area, with little accompanying road construction.

Effects of the no-action alternative on soil and aquatics

The effects on soil and water resources from the alternatives for grizzly bear habitat conservation are in direct proportion to the amount of activity that is allowed. In general, there would be no adverse effects. Alternative 1 would allow the present levels of activities to continue and would maintain the current condition of soil and water resources. There are additional opportunities for road decommissioning within and outside the primary conservation area as forests address excess roads from past logging and heavily roaded NFS lands recently acquired through land exchanges such as in the Swan valley. Some additional road construction may be needed to address access needs for timber management and fuel hazard reduction, especially within 1½ miles of structures.

Effects of alternatives 2 and 3 on soil and aquatics

Alternatives 2 and 3 would have the same effects from roads as alternative 1 because activities that would cause disturbance such as road building would remain at the 2011 baseline. Levels of open motorized road density, total motorized route density and secure core under alternative 1 are set by biological opinion terms and conditions. The secure habitat standard and the developed site standard would limit these activities. There would be a limit on overnight-use developed recreation sites, allowing an increase of one developed site in each bear management unit/decade under alternatives 2 and 3 which, depending on the location, would result in soil disturbance and potential impacts on aquatics if constructed within riparian areas.

Alternative 3 would further reduce activities inside such as voluntarily reductions in allotments for sheep, no increases in road miles in zone 1, no surface occupancy for new leases in the primary conservation area, no increase in late spring snowmobiling. These activities would further reduce disturbance to soil and reduce the potential for sediment to reach stream channels. Consequently, where current soil and water conditions are less than desired, reduction of disturbance levels would provide an opportunity for recovery. Where current conditions reflect desired conditions, there would be no effect.

Effects on bull trout, bull trout critical habitat, westslope cutthroat trout and western pearlshell mussel

Alternative 1 is the no-action alternative. The Lolo, Kootenai and the Blackfoot River drainage on the Helena National Forest plans were amended in 1995 by the Inland Native Fish Strategy, which will continue to provide standard and guidelines to limit management actions that may impact aquatic species. The Inland Native Fish Strategy did not apply to the Lewis and Clark National Forest. Westslope cutthroat trout on the Lewis and Clark National Forest largely occur along the Rocky Mountain Front where management activities that may impact this species are largely limited, except for grazing.

Alternatives 2 and 3 propose several standard and guidelines that will be beneficial to aquatic species because they limit the amount of road construction, grazing, recreational development or mining surface occupancy that may adversely impact aquatic species. The greatest benefits will be derived for aquatic species in the primary conservation area, followed by the demographic connectivity area, zone1 and zone 2 respectively. The following are a synopsis of beneficial standards or guidelines (there are no standard and guidelines that provide adverse effects to fish):

- NCDE-STD-AR-01 – This standard will limit the amount of vehicle traffic in the primary conservation area which will for some vegetation to become established on the road surface and limit sediment production. Gated roads also benefit native fish by making fishing access more remote.
- NCDE-STD-AR-02 – This standard will limit road construction in the primary conservation area which will reduce sediment production.
- NCDE-STD-AR-05 – This will limit the number of recreation sites in the primary conservation area which if they are proposed near streams will provide benefits in the long term since there can be no more than 1 in a bear management unit.
- NCDE-GDL-AR-02 – Restoring temporary roads in the primary conservation area within one year will reduce potential sediment inputs following management activities.
- NCDE-STD-GRZ-04 – Capping sheep allotments and animal unity months in the primary conservation area and demographic connectivity area/zone 1 under alternative 3 may reduce impacts to aquatic species depending on the location of the allotment.
- NCDE-STD-GRZ-05 –Capping the number of cattle allotments in the primary conservation area and demographic connectivity area/zone 1 under alternative 3 may reduce impacts to aquatic species depending on the location of the allotment.
- NCDE-GDL-GRZ-02 –Protecting riparian areas for grizzly bears will also provide protection for aquatic species and habitat.
- NCDE-STD-MIN-05 – Measures provide for riparian habitat conservation area restoration and maintenance for operating plans.
- NCDE-STD-MIN-08 – Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), new oil and gas leases shall include a no surface occupancy stipulation under alternative 3 that will benefit aquatic species by limiting surface disturbance depending on the location of the proposal.

Bull trout critical habitat is present within the primary conservation area and zone 1, any standard and guideline that limits roads or ground disturbance may provide beneficial effects to the sediment primary constituent element. There are no potential adverse effects to critical habitat from any of the action alternatives.

Cumulative Effects

There are no adverse direct or indirect effects to aquatic species; therefore there are no cumulative effects from the action alternatives.

Effects determinations

Based on the analysis of all alternatives, including the No Action Alternative, other interrelated and interconnected activities, and the cumulative effects of other federal and non-federal activities within the Planning Area it has been determined that the implementation of the No Action Alternative or the

other Action Alternatives, “may affect not likely to adversely affect” bull trout and designated bull trout critical habitat. Bull trout should benefit by less road construction and less recreational development. Temporary roads and developed recreation sites depending on location may still have some level of impact.

There will be “no effect” on Kootenai River white sturgeon since they do not occur within the analysis area although they do occur on the Kootenai National Forest below Libby dam.

Implementing any alternative including the No Action Alternative “May impact individual westslope cutthroat trout and pearlshell mussels but would not lead toward federal listing under the ESA”. These species are listed as region 1 sensitive species on the Kootenai, Lolo, Helena, and Lewis and Clark National Forests.

6.7 Forest Vegetation and Timber Management

6.7.1 Introduction

Forest vegetation of the Northern Rocky Mountains is dynamic, with changes occurring through natural processes as well as management activities. Natural disturbance processes include fire, windstorms, landslides, and insect and disease outbreaks. Management of forest vegetation includes such things as timber harvest, planting, thinning and other timber stand improvement activities, and prescribed burning. Plant succession, natural disturbances and management activities together have produced the current forest vegetation conditions. Natural processes will continue to operate under all alternatives. This section addresses the issue of administrative access and vegetation management for grizzly bear and the potential effects on activities associated with forest vegetation management.

Vegetation management is used to move vegetation towards desired conditions, reduce hazardous fuels, and treat insect and disease infestations, as well as provide wood products for local communities. Vegetation management includes activities such as commercial timber harvest, thinning, and pruning, as well as prescribed burning. The effects to prescribed burning is addressed under the Fire and Fuels section.

6.7.2 Legal and administrative framework

Law and executive orders

Federal law

The **National Forest Management Act** (NFMA) of 1976: This act sets forth the requirements for land and resource management plans for the NFS. The Act provides for balanced consideration of all resources. It requires the United States Forest Service to plan for diversity of plant and animal communities. The forest plans, in compliance with NFMA, establish forestwide management direction, goals, objectives, standards, and guidelines for the management of forest vegetation.

6.7.3 Key indicators for analysis

The key indicators for Forest Vegetation and Timber Management are the following:

- Acres of management areas suitable for timber production and potential changes to timber harvest
- Acres in need of stand tending and potential change to access for management.

6.7.4 Methodology and analysis process

The analysis only considers acres of land identified as suitable for timber production within the analysis area. More information on suitable lands can be found in the forest plans for the Helena, Kootenai, Lewis and Clark and Lolo National Forests.

Designation of suitable timber lands was determined in the Forest Plans. Timber land suitability is based in part on factors such as rainfall, temperature, or other growing conditions affecting the ability of trees to establish cover on a site. The potential for successful regeneration within five years or for irreversible damage from timber harvest to soil, slope, or other watershed conditions are also factored into the suitability determination. There may also be special areas designated by statute, executive order, or regulation where timber harvest is prohibited. Timber suitability within the analysis area was determined using GIS or database queries based on suitability designations from the forest plans.

The acres of potential stand tending need were derived from past regeneration harvest within the analysis area. Queries were made to the Forest Service Activity Tracking System (FACTS) database for regeneration harvest within the past 20 years.

The vegetation and timber management analysis is based on changes to administrative access and direction for vegetation management activities.

Information sources

Data used in this analysis is from the Helena, Kootenai, Lewis and Clark and Lolo forest plans and current GIS maps of timber suitability. The Forest Service Activity Tracking System database for each forest was used to determine areas with timber regeneration activities within the past 20 years.

Incomplete and unavailable information

There is no incomplete or unavailable information for this topic.

Analysis area

The affected area for direct and indirect effects to forest vegetation management is the lands administered by the Helena, Kootenai, Lewis and Clark and Lolo National Forests within the primary conservation area, demographic connectivity areas, zone 1, and a portion of zone 2. This area represents the NFS lands where changes may occur to vegetation management as a result of changes to administrative access.

6.7.5 Affected environment

Forest Plans for the Helena and Lewis and Clark and the Lolo were approved in the late 1980s. The Kootenai has recently revised their forest plan, with a final decision in 2015. Timber management goals, objectives, and standards were identified for each forest along with a numerical upper limit for timber harvest, or allowable sale quantity (ASQ). Lands suitable for timber production were also identified in each existing forest plans.

The Helena and Lewis and Clark forest plans (USDA 1986a and 1986b) identify areas that are suitable for timber production. Approximately 26 percent of the Helena National Forest (or 251,600 acres) and 15 percent of the Lewis and Clark National Forest (or 282,307 acres) was identified as suitable for timber production in 1986. Almost the entire Helena National Forest (99.5 percent) and 42 percent of the Lewis and Clark National Forest are within the analysis area. The allowable sale quantity for the Helena was set at 15 mmbf and the Lewis and Clark at 12 mmbf.

The Kootenai forest plan identified 793,700 acres suitable for timber production, or 36 percent of the forest. Only 18 percent of the Kootenai National Forest is within the analysis area, which limits the effect of the alternatives on its overall management. The allowable sale quantity for the Kootenai was set at 80.2 mmbf, with a predicted timber offer at 47.5 mmbf.

The 1986 Lolo Forest Plan identified 1,003,900 acres suitable for timber production, or 48 percent of the forest. Approximately 30 percent of the Lolo National Forest is within the analysis area. The allowable sale quantity for the Lolo was set at 131 mmbf for decades 2 through 5 of the forest plan.

Management areas containing lands suitable for timber production

To estimate the potential effect on timber harvest, the management areas that contain lands suitable for timber production were analyzed and summarized for each amendment forest (see table 25). Note that these are not acres suitable for timber production. Rather, they are the acres and percent of management areas that are suitable for timber production. Lands suitable for timber production are found within these management areas, but not all acres meet the criteria for lands suitable for timber production (are physically and technically capable of timber production without damage to other resources or inconsistent with management of other resources). Management areas were used as an estimate of timber suitability. A total of 916,028 acres of management areas suitable for timber production are within the analysis area.

Table 25. Acres and percent of management areas suitable for timber production by national forest, by area, and total inside and outside the analysis area

Forest	PCA	Zone 1 inside DCA	Zone 1 outside DCA	Zone 2	Total management area acres suitable within the Analysis Area	Acres management area suitable outside the Analysis Area
Helena	29,076 (16%)	-	60,679 (41%)	184,782 (29%)	274,537 (28%)	138
Kootenai	18,367 (15%)	270,147 (98%)	2,925 (45%)	-	291,439 (72%)	1,117,179
Lewis and Clark	44,090 (6%)	-	-	-	44,090 (6%)	724,574
Lolo	49,990 (19%)	173,669 (73%)	82,303 (54%)	-	305,962 (46%)	850,522

The Lolo has the most acres of management areas suitable for timber production, with the Kootenai and Helena in a close second and third. The Lewis and Clark has very few acres of management areas suitable for timber production within the analysis area. The Kootenai, Lolo, and Lewis and Clark also have large acreages of lands suitable management areas that are outside the analysis area, limiting the overall effect of the alternatives on the total timber program on these forests.

Historical harvest of timber

Table 26 displays acres regeneration harvested from 1985 through 2013 inside the analysis area by national forest. This harvest has occurred to meet forest plan goals, objectives, standards and guidelines. A total of 118,500 acres have been regeneration harvested within the analysis area, with

the majority (more than 60 percent) occurring on the Kootenai within the demographic connectivity area.

Table 26. Acres of regeneration harvest by national forest, by area inside the analysis area from 1985 through 2013

Forest	PCA	Zone 1 inside DCA	Zone 1 outside DCA	Zone 2	Total acres Regen harvest within the Analysis Area
Helena	3,300	-	3,800	14,600	21,700
Kootenai	1,700	71,800	1,200	-	74,700
Lewis and Clark	300	-	-	-	300
Lolo	3,300	12,400	6,100	-	21,800

Source: Infra database query combined with analysis area 4/15/16

As a result of regeneration harvest activities and reforestation, there are many areas of young even-aged stands that are meeting land management objectives. However, many of these young stands will require stand tending in the form of thinning or stocking control to maintain desired growth and species composition. Managers wanting to maintain the dominance of seral, shade intolerant species must evaluate these stands as they develop and consider the need for some stand tending.

6.7.6 Environmental consequences

Effects common to all alternatives

Each alternative would have varying effects on land managers' abilities to treat forest vegetation using timber harvest. As stated elsewhere in this document, this is a programmatic decision that does not identify site-specific actions. Therefore, the comparison of alternatives described here is based on generalized effects associated with access and vegetation management standards and guidelines. Access is necessary to respond to forest health needs, to manage vegetation to achieve restoration goals, and to provide commodity outputs.

There is no change to acres suitable for timber production under any alternative. Effects will be described through the potential to access suitable timber lands for commercial timber harvest and to provide for stand tending needs.

Alternative 1 — no action

For the Helena, Lewis and Clark, and Lolo, the forests would continue to follow the Interagency Grizzly Bear Committee vegetation management guidelines in management situations 1 and 2 grizzly bear habitat. These guidelines specify that measures that maintain, and/or improve grizzly bear habitat and populations will be specified in project design.

Under the revised forest plan for the Kootenai, there are 218,212 acres suitable for timber production within bear management units (16 percent of the bear management units in both the Cabinet-Yaak and NCDE recovery zones) and 333,925 acres suitable for timber production in areas outside the recovery zones where grizzly bears now occur (59 percent of the area). None of the acres of grizzly bear secure core habitat are identified as suitable for timber production. Vegetation management in secure core habitat could be done only to meet resource needs such as, insect and disease mitigation and salvage harvest, wildlife habitat diversity and fuels management.

For all amendment forests, access to lands suitable for timber production within grizzly bear habitat is allowed within specified limits under the forest plans or the Interagency Grizzly Bear Committee vegetation management guidelines. Space and time considerations for grizzly bears limits access for commercial timber harvest, as well as for stand tending needs. On the Helena, Lewis and Clark, and Lolo national forests, access to lands suitable for timber production and areas with stand tending needs in areas outside the recovery zone is somewhat greater under this alternative, as the forest plans do not contain specific management direction for grizzly bears in these areas. However, requirements of biological opinions and incidental take statements remain in place and may limit access to these areas.

Alternative 2 — proposed action modified

Under this alternative, existing forest plan desired conditions, objectives, standards, and guidelines for vegetation management on the amendment forests would be retained. Additional desired conditions and guidelines for vegetation management within the primary conservation area would be added as shown in appendix 6 of this draft environmental impact statement. The added direction is very similar to the Interagency Grizzly Bear Guidelines in encouraging a mosaic of successional stages; restricting logging activities in time and space as needed; designing projects to maintain or improve grizzly bear habitat quality or quantity where it would not increase the risk of grizzly bear-human conflicts; and retaining cover as needed along grass/forb/shrub openings, riparian wildlife habitat, or wetlands. This direction does not apply outside of the primary conservation area.

Under alternative 2, standards would be added within the primary conservation areas to establish consistent definitions and procedures for managing road access for administrative use (NCDE-STD-AR-01) and temporary changes during project activities (NCDE-STD-AR-03 and NCDE-GDL-AR-02. For the amendment forests, there is no substantive difference between alternatives 1 and 2 within the primary conservation areas to access for timber harvest or stand-tending needs. For all amendment forests, both alternative 1 and alternative 2 require no net increase in motorized route densities and no net decrease in secure core. There is some flexibility in accessing core through NCDE-STD-AR-03, which would allow for some timber harvest within these areas and access to stands for stand-tending needs. However, on the Kootenai there are no lands suitable for timber production within core. On the other amendment forests, access to core has been allowed through site-specific project consultation. Thus, little change in access for timber harvest or stand-tending needs in primary core areas on the amendment forests is expected under alternative 2.

On the Helena and Lolo National Forests, additional standards would be applied to zone 1 (both forests) and the demographic connectivity area (on the Lolo). For these forests, a standard would be added requiring no net increase in miles of roads open to public motorized use on NFS lands above the baseline within zone 1. Compared to alternative 1, it is expected there would be some reduction in access to these areas for timber harvest and stand tending needs.

For zone 1 and the demographic connectivity area on the Kootenai National Forest, direction under the revised forest plan would be retained, with no increases in permanent linear miles of open or total miles of road within the “bears outside a recovery zone” area, with listed exceptions and an allowance for temporary increases under specified conditions. Thus, there is no difference between alternative 2 and alternative 1 in access for timber harvest or stand-tending needs in these areas.

The Lewis and Clark National Forest does not have any areas in zone 1 and no change to management for vegetation in areas outside the primary conservation area.

Alternative 3

Under this alternative, the same changes to forest plan desired conditions, standards, guidelines and monitoring items would be made as under Alternative 2. Under this alternative, the vegetation guidelines (NCDE-GDL-VEG-01 through NCDE-GDL-VEG-05) direction is extended to include the demographic connectivity areas on the Kootenai and the Lolo. An additional standard for access management would be added to zone 1 and a portion of zone 2 (the expanded grizzly bear distribution zone) on the Helena, limiting motorized routes (roads and trails) that are open to public motorized to no more than 2.4 mi/mi^2, calculated as the miles of motorized routes on NFS lands divided by the acres of NFS lands within these individual areas. Within the Kootenai National Forest in the bears outside recovery zone (BORZ) polygons, which overlaps with portion of NCDE zone 1 including the Salish demographic connectivity area, no increases in permanent linear miles of open roads, total roads or motorized trails will occur on NFS lands, although a temporary increase in open and total miles of road is allowed under specified conditions. In zone 1 outside of the area covered by the Tobacco BORZ, there will be no net increase above the baseline in miles of roads open to public motorized use during the non-denning season on NFS lands. Within the Lolo National Forest zone 1 and the Ninemile demographic connectivity area, there will be no net increase above the baseline in miles of roads (or roads and trails in the Ninemile DCA) open to public motorized use during the non-denning season on NFS lands, with certain exceptions. See standards NCDE-HNF Zone 1&2-STD-02, NCDE-KNF Zone 1-STD-03, and NCDE-LNF Zone 1-STD-02.

Expansion of the vegetation guidelines to the demographic connectivity areas does not limit access for vegetation management on the Kootenai and Lolo.

The effect of the additional standard limiting motorized routes on the Helena, Kootenai, and Lolo National Forests would limit access to areas suitable for timber production and stands needing tending in the demographic connectivity areas (Kootenai and Lolo) and the expanded grizzly bear distribution zone (Helena). There is no change to access for vegetation management on the Lewis and Clark under alternative 3.

Cumulative Effects

Across the amendment forests, a reduction in access results in a decrease in opportunities to access lands suitable for timber harvest and for future stand-tending needs. Past, present, and reasonably foreseeable project level activities within the NCDE are expected to include actions which would improve other resource conditions through road storage and decommissioning activities. This could result in a reduction in opportunities for future timber harvest and stand tending needs.

6.8 Threatened and Endangered, Proposed and Candidate Plant Species

6.8.1 Introduction

The USFWS Montana Field Office's web site was accessed on 7/22/15 to obtain species lists for the Helena, Kootenai, Lewis and Clark, and Lolo National Forests. The plant species included in this analysis are Spalding's campion (*Silene spaldingii)*, which is listed as threatened under the Endangered Species Act, and whitebark pine (*Pinus albicaulis*), which is a candidate species and is on the Regional Forester's Sensitive Species list. Table 27 shows the occurrence of these plant species within the grizzly bear NCDE recovery zone/primary conservation area and zones 1, 2 and 3.

Table 27. Suspected occurrence of Spalding's campion and known or suspected occurrence of whitebark pine within the NCDE grizzly bear recovery zone/primary conservation area and zones 1, 2 and 3 on the Helena, Kootenai, Lewis and Clark, and Lolo National Forests

Species	Helena	Kootenai	Lewis and Clark	Lolo
Spalding's campion (*Silene spaldingii*)	–	Zone 1, Salish DCA	–	Zone 1
Whitebark Pine (Pinus albicaulis)	NCDE/PCA, zones 1 and 2	NCDE/PCA	NCDE/PCA, zone 3	NCDE/PCA, zone 1, Ninemile DCA

6.8.2 Legal and administrative framework

Endangered Species Act: Under the Endangered Species Act of 1973, the Forest Service has a legal requirement to use its authorities to seek to conserve endangered species and threatened species and designated critical habitat. Species and critical habitat that are proposed for listing are also provided protection under the Act.

National Forest Management Act: Under the National Forest Management Act of 1976, forest plans are to provide for the diversity of plant and animal communities based on the suitability and capability of the specific land area to meet the overall multiple-use objectives, within the multiple-use objective.

Sensitive species policy: Species that are candidates for listing under the Endangered Species Act and that occur on NFS lands normally are placed on the Regional Forester's sensitive species list. Sensitive species (plants and animals) are protected and managed under the sensitive species program through the Forest Service directives system.

6.8.3 Key indicators for analysis

The known threats and/or stressors that have the potential to negatively affect the plant species are identified as the key indicators. Potential adverse effects are considered based upon the likelihood and intensity to which the various alternatives may affect the threats/stressors.

6.8.4 Methodology and analysis process

Analysis area

The analysis area used for direct and indirect effects is the lands administered by the Helena, Kootenai, Lewis and Clark, and Lolo National Forests within the primary conservation area, zone 1 including the Salish and Ninemile demographic connectivity areas, and a portion of zone 2.

Information sources

Available information sources were obtained from available Federal Register notices, survey records, the recovery plan, and published literature. Some uncertainty remains as to the distribution of *Silene spaldingii* populations. The analysis considered both the known distribution of the plant and descriptions of suitable occupied habitat.

6.8.5 Affected environment

Spalding's campion

Spalding's campion (also known as Spalding's catchfly) is an herbaceous perennial plant in the pink family (Caryophyllaceae). It was listed as a threatened species under the Endangered Species Act on October 10, 2001.

Spalding's campion is a regional endemic found predominantly in bunchgrass grasslands and sagebrush-steppe, and occasionally in open pine communities, in eastern Washington, northeastern Oregon, west-central Idaho, western Montana, and the southern edge of British Columbia, Canada. As of 2007, there were 99 known populations of Spalding's campion (USFWS 2007). Occupied habitat occurs in five physiographic regions: the Palouse Grasslands in west-central Idaho and southeastern Washington; the Channeled Scablands in eastern Washington; the Blue Mountain Basins in northeastern Oregon; the Canyon Grasslands of the Snake River and its tributaries in Idaho, Oregon, and Washington; and the Intermontane Valleys of northwestern Montana.

Spalding's campion is described as "suspected" to occur on the on the Flathead, Kootenai and Lolo National Forests. Surveys to date have not confirmed the presence of this plant, although suitable habitat is thought to exist on the national forests. Populations are known to occur on the Lost Trail Wildlife Refuge and on private lands near these national forests. The recovery plan identified potential key conservation areas that overlap with the Flathead and Kootenai National Forests.

Whitebark pine

Whitebark pine is a native conifer tree that occurs in western North America in the Coastal Mountain Ranges (from British Columbia, Washington, Oregon, down to east-central California) and Rocky Mountain Ranges (from northern British Columbia and Alberta to Idaho, Montana, Wyoming, and Nevada). It grows at the highest forested elevations on cold, windy, snowy sites (Arno and Hoff (1990)). On productive upper subalpine sites, whitebark is the major seral species that in the absence of fire is eventually replaced by shade tolerant species, while on harsh upper subalpine forests and at treeline it can dominate as climax vegetation (Keane et al. (2012)). Whitebark pine trees produce large, dense seeds that lack wings and therefore depend upon birds and squirrels for seed dispersal across the landscape. It is known to occur on all of the national forests in the NCDE.

Whitebark pine is experiencing an overall long-term pattern of decline. Threats include habitat loss and mortality from the non-native white pine blister rust, mountain pine beetles, catastrophic fire, environmental stresses due to climate change, and the inadequacy of existing regulatory mechanisms. This species is ecologically very significant in maintaining snow pack and regulating runoff, initiating succession after fire or other disturbance events, and providing seeds that are a high-energy food source for many species of wildlife, including grizzly bears (Tomback, Arno, and Keane (2001)).

On July 18, 2011, the USFWS determined that the whitebark pine warrants protection under the Endangered Species Act, but adding the species to the federal list of endangered and threatened wildlife and plants is precluded by the need to address other listing actions of a higher priority (Federal Register vol. 76, no. 138, pages 42631–42654). Therefore, whitebark pine is designated as a candidate species. USFWS has assigned it a listing priority number of 2, indicating the threats are imminent and of high magnitude. Whitebark pine is included on the sensitive species list for the Northern Region.

On the Kootenai National Forest, the most recent inventory information indicates that some live whitebark pine trees occur on approximately 2 percent of its forested area (Forest Service 2010). The Kootenai National Forest has been implementing many of the whitebark pine restoration actions that were suggested by Keane et al. (2012). For example, the Kootenai National Forest has been collecting seed, identifying rust resistant trees testing rust resistance of progeny, conducting prescribed burns, planting seedlings, and monitoring sites (Forest Service 2010). However, to date the number of acres that have had some form of restoration action has been limited, due to budgetary limitations, difficult logistics in accessing the remote, high elevation sites, and other factors.

According to forest inventory and analysis data, living whitebark pine trees are present on about 12 percent of the Helena and Lewis and Clark National Forests, representing about 333,350 acres. It is dominant on far fewer acres; the whitebark pine cover type occurs on only 4 percent of the two national forests. The geographic areas with the highest proportion of living whitebark trees are the Crazy Mountains, Castle Mountains, Elkhorns, and Rocky Mountain Range (USDA 2015).

Live whitebark pine trees are present on about 6.4 percent of the Lolo National Forest, representing about 137,190 acres, though it is the dominant species on only an estimated 38,100 acres (1.8 percent of the forest) (Source: forest inventory and analysis data base).

6.8.6 Environmental consequences

Spalding's campion

The recovery plan for *Silene spaldingii* identified habitat loss due to human development, habitat degradation associated with excessive grazing, and invasions of aggressive nonnative plants as threats. In addition, the loss of genetic variability and adverse effects of inbreeding are a problem for many small, fragmented populations where genetic exchange is limited. Other potential threats include changes in fire frequency and seasonality, off-road vehicle use, and herbicide spraying and drift.

Because the species is not known to occur on NFS lands, and because the management direction pertaining to the grizzly bear would not affect the prairie habitats of the Spalding's campion, no direct, indirect or cumulative effects are anticipated under any of the alternatives.

Whitebark pine

Several interrelated threats to whitebark pine raise concerns about the long-term viability of whitebark ecosystems (Federal Register vol. 76, no. 138, pp. 42631-42654, July 19, 2011).

- Fire suppression: After a century of suppression, many whitebark pine stands are experiencing a species conversion to shade-tolerant trees, and a lack of suitable seedbeds for regeneration. As a result, whitebark pine has lost its competitive advantage (USFWS 2011).
- Climate change: In a warmer climate, the species' fundamental habitat may shift to cooler sites at higher elevations and latitudes. Recent studies indicate that whitebark pine is one of the most vulnerable tree species in the northern Rocky Mountains to climate change. The adaptive capacity of whitebark pine is thought to be relatively low because its dispersal is fairly limited, it is often outcompeted by other subalpine conifers, and it is highly susceptible to mountain pine beetle and blister rust (Hansen and Phillips 2015).
- White pine blister rust: White pine blister rust is an exotic fungal disease against which whitebark pine has limited resistance. Since blister rust was introduced to North America in 1910, it has spread through the range of five-needled pines. As this disease has moved into

fragile, high-elevation ecosystems, normal successional pathways have been altered. Blister rust typically infects nearly all individuals of the host species, causing branch and stem cankers that eventually kill most of the infected trees.

- Mountain pine beetle: Five-needled pines are susceptible to this aggressive bark beetle. In densely stocked stands, whitebark is more likely to be attacked because of stress from competition. Mountain pine beetle accelerates the loss of key mature cone-bearing trees.
- Although whitebark pine is known to occur on all of the National Forests in the NCDE, the management direction pertaining to the grizzly bear would not influence the threats identified above, nor would it affect the alpine habitats of the whitebark pine. No direct, indirect or cumulative effects on whitebark pine are anticipated under any of the alternatives.

6.9 Non-native Invasive Plants

6.9.1 Introduction

A plant species is considered to be an invasive plant if it meets two criteria: (1) it is nonnative to the ecosystem under consideration, and its introduction causes, or (2) is likely to cause, economic or environmental harm or harm to human health (Executive Order 13112, 1999). Non-native invasive plants include exotic plants and noxious weeds. Exotic plants are species that have been introduced inadvertently or intentionally to an area, usually from a different continent; however, not all exotic species are invasive species.

The term noxious weed is a legal designation and is defined by Montana Code Annotated (MCA 7-22-2101, 2014) is, “any exotic plant species established or that may be introduced in the state that may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses or that may harm native plant communities.”

6.9.2 Legal and administrative framework

Federal law

The **Federal Noxious Weed Act of 1974** states that each federal agency shall establish and adequately fund an undesirable plant management program; complete and implement cooperative agreements with state agencies regarding the management of undesirable plant species on federal lands under the agency's jurisdiction; and establish an integrated management system to control or contain undesirable plant species targeted under cooperative agreements.

The **Federal Insecticide Fungicide and Rodenticide Act** (public law 92-516) requires all pesticides to be registered with the Environmental Protection Agency. The law also states that it is unlawful to use any registered pesticide in a manner inconsistent with its labeling.

The **Carlson-Foley Act of 1968** (public law 90-583) authorizes and directs heads of Federal Departments and Agencies to permit control of noxious plants by State and local governments on a reimbursement basis in connection with similar and acceptable weed control programs being carried out on adjacent non-federal land. In other words, this act permits county and state officials to manage noxious weeds with herbicides on Federal lands and to be reimbursed for that management, given that other applicable laws such as the National Environmental Policy Act are also met.

The **Federal Land Policy and Management Act of 1976** (public law 94-579) provides authority to control weeds on rangelands as part of a rangeland improvement program.

Executive orders

Executive Order 13112: Directs federal agencies to prevent the introduction of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally-sound manner; to monitor invasive species populations accurately and reliably; to provide for restoration of native species and habitat conditions in ecosystems that have been invaded; to conduct research on invasive species and develop technologies to prevent introduction; to provide for environmentally sound control of invasive species; and to promote public education on invasive species and the means to address them. All of these actions are subject to the availability of appropriations.

State and local law

The **State of Montana County Noxious Weed Management Act** states that it is unlawful for any person to permit any noxious weed to propagate or go to seed on the person's land, except that any person who adheres to the noxious weed management program of the person's weed management district or who has entered into and is in compliance with a noxious weed management agreement is considered to be in compliance with this section.

Other regulation, policy, and guidance

Forest Service Manual 2900 ensures that forest management activities are designed to minimize or eliminate the possibility of establishment or spread of invasive species on NFS lands, or to adjacent areas.

Forest Service Manual 2070, Vegetation Ecology: Provides direction for the use of native and non-native seed use on NFS lands. Specifically emphasizes the use of native seed mixes in all revegetation, rehabilitation and restoration projects on Forest Service land.

Forest Service National Strategic Framework for Invasive Species Management (USDA (2013b)): Provides broad and consistent strategic direction on the prevention, detection, and control of invasive species. Incorporates the invasive species systems approach to respond to threats over the next 5 to 10 years.

6.9.3 Key indicators for analysis

The key indicator used for assessing effects to invasive species is the difference in frequency, intensity, or type of management activity or natural processes by alternative, insofar as they may potentially disturb the ground and result in greater risk of weed spread or invasion. This includes both human-caused and natural disturbances, such as access and motorized use, recreational uses, livestock grazing, fire (wildfire and prescribed fire) and vegetation management (including timber harvest). The process for identifying risk and impacts resulting from invasive species is completed by Forest Service botanists and vegetation specialists.

Vegetation management

Ground-disturbing activities, equipment transport and use associated with management activities such as timber harvesting, fire treatments and fire suppression, or other authorized uses are a common vector influencing the establishment and expansion of non-native invasive species. Both establishment and expansion of invasive plants is dependent on seed sources in the area or seed transported from another area and local soil and climate conditions. Most of these risks are minimized with site-specific treatments, site restoration and rehabilitation.

Access and motorized use

A main vector for seed spread is vehicle use (e.g., road construction and maintenance equipment, logging vehicles, and passenger cars and trucks) (Taylor et al. 2012). Many existing infestations can be found along, or have originated from, roadsides because vehicle traffic provides ideal means for noxious weed spread. Roads and vehicle traffic pose difficult challenges to management of invasive species.

Transportation of weed seed by contractor or special use vehicles, or equipment, on NFS roads is managed to a degree. Contract stipulations are used to require specific actions, e.g., vehicle and equipment washing, to lessen the possibility of weed transport to reduce the risk of new infestations. Use of roads by the general public presents a greater risk, because of the lack of control measures and the lack of knowledge about invasive species spread.

Recreation

Recreational activities, including non-motorized, are another vector for potential seed establishment and dispersal. Recreation activities and areas receive concentrated and frequent use and continual ground disturbance. Generally, wilderness areas and large unroaded lands are less likely to contain invasive weeds due to less widespread public access, especially via motorized means. However, these large unroaded areas are vulnerable to weed infestation and spread from recreational uses. Seed transport happens inadvertently, by humans, dogs, and pack stock. Trails that receive high uses, including those in wilderness areas, are vulnerable to invasive weed infestation, and may serve as vectors for spread into surrounding sites. Bike and horse trails, and motorized trails are at higher risk of introduction, spread and establishment of weeds compared to hiking trails. Areas of high use and ground disturbance occur within wilderness areas and are as vulnerable to weed infestation as developed sites outside wilderness. Frequently, infestations are found around trailheads, trails, campgrounds, and other developed recreation sites. These seed sources pose a risk of further spread into wilderness and undeveloped lands. Areas located immediately adjacent to and surrounding developments tend to experience the most disturbance, while the peripheries of these areas are less disturbed and less likely to be favorable for invasive species establishment and persistence.

Motorized and mechanized recreation vehicles are another common vector of seed transport and establishment primarily because there is minimal control over allowing weed-free passenger and recreation vehicles to travel Forest roads and trails.

Methods used to help prevent invasive species from being introduced and spreading into recreation areas include public education and requirements for use of weed-free hay for pack stock, in addition to weed control methods used by the Forest, contractors and volunteer groups.

Livestock grazing

Invasive species expansion may also occur with the transport of seed by livestock from infested areas. Seeds can be spread through livestock feces, fleeces, and hooves (Belsky and Gelbard (2000)), and many can pass through an animal’s digestive system and retain the ability to germinate ((Belsky and Gelbard (2000)). Native grazers such as mule deer, bighorn sheep and elk, and some birds such as mourning doves, can also perform this same method of seed spread. Conversely, domestic livestock grazing (in a process known as prescribed grazing) has also been shown to be an effective method in managing large invasive plant infestations while assisting the ecological succession process (Jacobs (2007)).

Localized areas where excessive grazing duration and use contributes to reduced ground cover can become potentially susceptible to invasive plant establishment, and areas with low plant cover and

frequent disturbance are most at risk to invasion. Generally, these areas are often roadsides, stream banks and areas where stock congregate, such as salt blocks.

Fire and fuels

Although the Forest Service is attempting to restore historical fire regimes to the landscape, it can have a detrimental impact to the ecosystem post-fire, depending on the occurrence of invasive species infestations pre-fire. Fire often results in an increase in non-native species diversity and cover, whether it is from prescribed burn or wildfire (Keeley (2006); Zouhar et al. (2008)). Typically, the burned area experiences an increase in invasive species, both forbs and grasses, within 1–3 years post-burn (Zouhar et al. (2008)). From studies conducted in close-canopy forests in the West, it has been observed that non-native species with easily dispersed seed can infest a burned area where there were no invasive plants pre-burn. Some species (e.g., St. John's wort) tend to die back when the canopy closes post-fire. Other species (e.g., Canada thistle) persist in closed canopy conditions. Other than areas heavily infested with cheatgrass, there is no evidence that the presence of invasive plants in the forested landscape changes fire regimes.

6.9.4 Methodology and analysis process

Analysis area

The geographic scope of the analysis for non-native invasive plants is the NFS lands of the amendment forests that lie within the GBCS primary conservation area, zones 1 through 3, and the Salish and Ninemile demographic connectivity areas. These areas represent the NFS lands where changes may occur from activities that result from the proposed action.

For cumulative effects, the analysis area also includes the Flathead NFS lands in the primary conservation area, zone 1 and Salish demographic connectivity area and non-NFS lands within and immediately adjacent to the administrative boundary of all five forests.

Information sources

Primary information sources include the Montana Noxious Weed List (MNWP (2015)), collaboration with county weed coordinators, and the results of project-specific invasive plant risk assessments to identify invasive species needing management across the forests. As project areas are surveyed, new infestations are inventoried. Existing data on invasive species is stored in the Natural Resource Manager's Threatened, Endangered, and Sensitive Plants, and Invasive Species database (NRM-TESP-IS).This database is continually updated with inventoried infestations.

Unavailable information includes invasive species infestations which are known or suspect, but have not yet been inventoried. Wilderness and research natural areas are examples of areas that are not well inventoried. There is also a lack of information on areas that are weed-free, especially in vegetation types at highest risk. The Natural Resource Manager database is continually updated to match up to field observations that are reported by project personnel.

6.9.5 Affected environment

Non-native invasive plants have not adapted to or evolved with the local environment, which means they have no natural enemies. These plants generally disrupt the natural processes of the environment. They displace native plants or reduce forage for some animal species, degrade natural communities, change hydrology, change microclimatic features, increase soil erosion, alter wildfire intensity and frequency, and cost millions of dollars in treatments and fire suppression to land management agencies and governments. Because non-native invasive species have no natural control

in the place to which they are introduced, they tend to spread aggressively and reduce overall native community biodiversity.

Invasive plant inventory

The Natural Resource Manager database is continually updated to match up to field observations that are reported by project personnel. However, there are still many areas on the amendment forests that have not been inventoried. The following subsections summarize the most recent inventory of invasive species on the amendment forests.

Helena and Lewis and Clark National Forests

As of December (2014), 142,052 acres (or 5 percent) of the Helena and Lewis and Clark National Forests are associated with invasive plant inventories and there are 26 currently recorded species. Approximately 98 percent of the current inventoried invasive plant infestations occur within 0.5 mile of major transportation routes (system roads and trails). Fifteen percent of the inventoried infestations on the Helena and Lewis and Clark National Forests are within 30 feet of major system roads and trails (USDA (2015a)).

The most abundant invasive plant species on the Helena and Lewis and Clark National Forests are spotted knapweed, dalmation toadflax, musk thistle, Canada thistle, houndstongue and leafy spurge. The species of highest priority for treatment and containment are spotted knapweed, leafy spurge, toadflax species (yellow and dalmation), orange and meadow hawkweed and those species that are on the state noxious list but not currently present on the Helena and Lewis and Clark National Forests (e.g., yellow starthistle). These species are known to be highly aggressive (e.g., spotted knapweed) or are not currently established on the National Forests (e.g., yellow starthistle).

Kootenai National Forest

On the Kootenai National Forest, it is fairly common to see invasive species along many roadsides, railroad and utility rights-of-way, and other disturbed areas, such as gravel pits. Spotted knapweed, tansy ragwort, rush skeleton weed, and other weed species have migrated away from the road right-of-way onto undisturbed hillsides, especially within the drier vegetation types. Orange hawkweed has an increased presence on moist habitat types under full canopies and is converging on the edges of the Cabinet Mountain Wilderness. Weeds are also becoming established in harvest units where the seeds have been brought by machinery and other vectors such as wildlife, cattle, railcars, and/or wind (USDA (2013a)).

Mapping of noxious weeds on the Kootenai National Forest has only occurred on a limited basis, and total infested acreage is not known. Forest Plan monitoring indicates that existing weed infestations on the Forest have increased greatly over the past 25 years (USDA 2003, as cited in USDA (2007a)). Spotted knapweed is listed as the most common weed on the Forest. In 1995, county weed specialists estimated that spotted knapweed infested over 240,000 acres in Lincoln County and 175,000 acres in Sanders County (Hirsch and Leitch 1996). Of the 240,000 acres of spotted knapweed in Lincoln County, 180,000 acres was believed to occur on federal lands and of the 175,000 acres in Sanders County, 57,750 acres were believe to occur on federal lands (Hirsch and Leitch 1996). An effort to map orange and meadow hawkweed on the Forest by section was attempted several years ago. Sections were categorized and mapped as non-infested, less than 5 acres infested, 5 to 40 acres infested, or over 40 acres infested. The end result was that most of the Forest was displayed as infested, with a high percentage of the Forest sections in the greater than 40 acres infested category (USDA (2007a)).

Lolo National Forest

There is not a comprehensive weed inventory for the Lolo National Forest. An estimate inventory was conducted in 1999 for 23 species of weeds and indicated that 258,300 acres in the Lolo National Forest were infested (USDA (2007d)). Another estimate was made in 2005 for the same 23 species and totaled approximately 391,700 acres (USDA (2007d)). As of 2007, there were 21 invasive species found on the Lolo National Forest, and 10 invasive species found nearby that had not yet established on the forest (USDA (2007d)).

Populations of widespread invaders, such as spotted knapweed, sulfur cinquefoil, houndstongue and Canada thistle, are widespread and continue to expand. Since they became established, in some cases decades ago, they have increased on the Lolo National Forest. These weeds have also invaded both disturbed and undisturbed areas.

New invaders such as the hawkweeds and common toadflax have become established relatively recently. Some of these infestations were first seen on the Lolo National Forest in the last few years, while others have been here longer but have only recently been discovered. Most new invaders have limited distribution.

Potential invaders such as yellow starthistle, purple loosestrife, salt cedar and dyer's woad have not been found on the Lolo National Forest yet, but do occur nearby. Based on the extent of the infestations in adjacent areas and states, these weeds have the potential to become established and impact other resources on the Lolo National Forest. Table 28 shows the estimated acres infested with invasive species for the amendment forests and the Flathead National Forest (for cumulative effects analysis).

Table 28. Estimated acres with non-native invasive plant species

Forest	Invasive species (acres)
Flathead[1]	25,300
Helena[2]	107,871
Kootenai[3]	Not known[3]
Lewis and Clark[2]	34,181
Lolo[4]	350,000

Sources

1. USDA Forest Service (2014) Flathead Assessment
2. USDA Forest Service (2015) Helena and Lewis and Clark National Forests Forest Plan Assessment
3. USDA Forest Service. (2007). Final Environmental Impact Statement (FEIS), chapter 3. Kootenai National Forest Invasive Plant Management. Kootenai National Forest Lincoln, Sanders, and Flathead Counties, Montana Bonner and Boundary Counties, Idaho. pp. 3-7. Mapping of noxious weeds on the Forest has only occurred on a limited basis, and total infested acreage is not known4
4. USDA Forest Service 2007, Lolo National Forest Integrated Weed Management Record of Decision

Non-native invasive plant management

Forest Service Policy (specifically Executive Order 13112; Forest Service Manual 2900) and the National Invasive Species Strategic Framework (USDA (2013b)) identify prevention of the introduction and establishment of non-native plant species as an agency objective. This policy directs the Forest Service to:

- Determine the factors that favor establishment and spread of invasive plants
- Analyze invasive species risks in resource management projects

- Design management practices that reduce these risks.

The desired condition inferred from Executive Order 13112 and Forest Service Manual 2900 and the national strategy is the prevention of new infestations (within the area where activities would occur or from the use of travel routes associated with those activities) and to manage the infestations currently established on the forest through control measures.

For all forests, management goals for invaders are to:

- Potential invaders—prevent establishment, and if found, promptly eradicate
- New invaders—for small infestations, eradicate, and for larger infestations, reduce
- Widespread invaders—contain areas that are already infested and reduce plant populations.

Methods used to prevent invasive species from being introduced and spreading into new areas include closing infested areas to travel, washing vehicles and equipment upon entering an area, and using weed-free seed and straw mulch for re-vegetation. Treatments such as manual, mechanical, biological, and chemical methods are generally limited to localized areas and those species on the Montana state list. Containment combines prevention and treatment with the objective of limiting spread of an existing infestation and reducing the acres of existing infestations by treating around the perimeter of the infestation. Invasive weed management in cooperation with private and agency partners, county weed districts and others is important in all of these treatment activities.

Seeding of temporary roads as a conservation measure to reduce invasive species infestations has been occurring on National forests for many years. Desirable non-native mixes of grasses and forbs have primarily been used in the past. Native grasses and forbs have been used more in recent years.

Infestations in some sites have been reduced by these measures. However, in spite of these control efforts, existing infestations continue to invade disturbed areas and intact plant communities. It is still common to see noxious weeds along many roadsides, railroad and utility rights-of-way, and other disturbed areas, such as gravel pits.

6.9.6 Environmental consequences

The proposed action and alternatives represent programmatic decisions; therefore, they will have no direct effects on invasive plant species. Direct effects would occur at the project level when site-specific decisions are made. Most of the effects identified in this analysis would be considered indirect effects in that they would occur later in time.

Alternative 1 — no action

Management direction

Existing forest plans and amendments contain management direction currently being used by the amendment forests to address non-native invasive plants. The management direction includes forestwide goals, objectives, desired conditions, standards and guidelines pertaining to non-native invasive species.

Helena National Forest

The Helena National Forest plan (USDA (1986a)) specifies cooperating with the State of Montana and county weed boards to confine present infestations and prevent invasive species establishment in new areas and using an integrated pest management approach that includes mechanical, chemical

and biological methods. Forest Plan amendment 6 (USDA (1993)) added standards to implement an integrated pest management approach in the Bob Marshall Wilderness complex.

Kootenai National Forest
The Kootenai National Forest plan specifies containing or eradicating populations through use of integrated pest management approaches and cooperating with other agencies to assist control efforts across jurisdictional boundaries. The treatment goal is 30,000 to 75,000 acres to reduce non-native invasive plant density, infestation size, and/or occurrence, including along eligible wild river segments (USDA (2015b)).

Lewis and Clark National Forest
The Lewis and Clark forest plan's direction (USDA (1986b)) for invasive plants includes public education to prevent resource degradation and spread of noxious weeds, reseeding with desirable plant species, determining effective environmentally acceptable practices to control noxious weeds and other pests, especially around streams, bogs, and associated riparian habitat; upland game bird nesting habitat; and other sensitive non-target animal or habitat which may be adversely affected by spraying; and cooperating with other agencies, private individuals, contractors, and permittees to control noxious weed and pest infestations. Lewis and Clark Forest Plan amendment 11 added standards to implement an integrated pest management approach for weeds in the Bob Marshall Wilderness (USDA (1993)).

Lolo National Forest
The Lolo Forest Plan's (USDA (1986c)) current direction for noxious weeds includes specific treatment types in a few areas such as Homestead Meadows. Amendment 11 (USDA (1993)) added forestwide direction to assess conditions on site, consider risk factors, and to prioritize weed prevention measures. Additionally, Lolo Forest Plan amendment 17 added standards to implement an integrated pest management approach for weeds in the Bob Marshall Wilderness complex (USDA (1993)).

Indirect effects of the no-action alternative

Ground disturbance is an important factor to the establishment and spread of invasive species and the locations of infestations are also important. Disturbance does not always lead to plant invasion, but it may provide a temporary location or "safe site" for a potential invasive species to establish a founding population (Radosevich 2007). Adverse impacts from invasive species can be further exacerbated by interactions with fire, native pests, weather events, human actions, and environmental change.

Under the no-action alternative, management direction to address non-native invasive plant species is already in place and would continue to be followed. The effects of continuing the no-action alternative, as contrasted to the proposed action, show in the following key areas.

Vegetation management
Management direction to address non-native invasive plant species is already in place and has been followed where these plants are known to occur, or potential habitat is suspected to exist. Continuation of current invasive plant species management would still be available to treat grizzly bear habitat (including secure core).

Motorized use and access
No further reduction in motorized road access density is anticipated and no changes to motorized use and access would occur. Correspondingly, no changes attributable to motorized use and access are

expected to occur to affect ground disturbance and invasive plant species in the areas where grizzly bears occur. Continuation of current invasive plant species management would still be available to treat infestations.

Recreation
Management direction to address non-native invasive plant species is already in place and has been followed where these plants are known to occur, or potential habitat is suspected to exist. Continuation of current invasive plant species management would still be available to treat infestations related to use of recreation sites.

Under the no-action alternative there is no constraint, related to the GBCS, on the number of recreation developments that could be constructed as there is under the proposed action. Because there is no constraint under the no-action alternative, there could be more ground disturbance, and the potential for invasive species to establish and spread could increase. This increase may not be noticeable on the ground when site-specific factors are considered or attributable solely to activities related to recreation developments. Treatments would continue as would prevention efforts. However, for comparison of alternatives qualitatively, the lack of a constraint for the number of recreation developments is a distinctive feature of the no-action alternative for the Amendment Forests.

Livestock grazing
The establishment and spread of noxious weeds is primarily related to surface disturbance created. To evaluate the impact of livestock grazing management on invasive species under each alternative, it was assumed that alternatives that increase grazing opportunity result in increased potential for invasive species to establish and spread. Conversely, alternatives that limit grazing opportunity would be expected to decrease potential for invasive species to establish and spread. Because these assumptions result in the same relationships analyzed in the livestock grazing section (see section 6.12), the effects and consequences to noxious weeds would be the same as those presented in that discussion.

Fire and fuels
The establishment and spread of noxious weeds is primarily related to the amount of surface disturbance created. To evaluate the impact of proposed fire and fuels management on noxious weeds under each alternative, it was assumed that alternatives that provide more opportunity for fires and fuels management activities result in increased potential for invasive species to establish and spread. Conversely, alternatives that limit fire and fuels management activities would be expected to decrease potential for invasive species to establish and spread. For the analysis it was also assumed that fire and fuels treatment acres would not exceed timber harvest acres in any alternative. Because these assumptions result in the same relationships analyzed in the fires and fuel management section (see section 6.7), the effects and consequences to noxious weeds would be the same as those presented in that discussion.

Alternative 2 — proposed action modified

Effects of the proposed action for the amendment forests

Vegetation management
Adaptive weed treatments and revegetation of disturbed areas would still be used under this alternative for the amendment forests to combat weed establishment and infestation and to improve grizzly habitat. Under the proposed action, for all five forests, these treatments may be restricted in

spring in the primary conservation area and zone 1 to decrease grizzly bear-human conflicts, but could still be implemented during spring to meet objectives. The proposed action's guidelines are not anticipated to result in adverse impacts as invasive species could still be treated effectively under the proposed action as under the no-action alternative.

Motorized use and access

Under alternative 2, standards would be added within the primary conservation areas to establish consistent definitions and procedures for managing road access for administrative use (NCDE-STD-AR-01) and temporary changes during project activities (NCDE-STD-AR-03 and NCDE-GDL-AR-02. Compared to alternative 1, there would be a new requirement on the Lolo National Forest for no net increase in the miles of open road in the demographic connectivity areas and in zone 1. Both alternative 1 and alternative 2 require no net increase in motorized route densities and no net decrease in secure core. For all amendment forests, there is no substantive difference between alternatives 1 and 2 within the primary conservation areas in motorized access. Ground disturbance in association with this threshold of motorized use and access would be an indirect effect that may potentially affect invasive species establishment and spread. Treatments would continue as would prevention efforts.

Recreation

Management direction to address non-native invasive plant species is already in place and has been followed where these plants are known to occur, or potential habitat is suspected to exist. Continuation of current invasive plant species management would still be available to treat infestations related to use of recreation sites.

Under the no-action alternative there is no constraint, related to the GBCS, on the number of recreation developments that could be constructed as there is under the proposed action. However, there is constraints under the no-action alternative, which should result in less ground disturbance, and less potential for invasive species to establish and spread. This decrease may not be noticeable on the ground when site-specific factors are considered or attributable solely to activities related to recreation developments. Treatments would continue as would prevention efforts. However, for comparison of alternatives qualitatively, the constraint for the number of recreation developments under the proposed action is a distinctive feature of the alternative for the amendment forests.

Livestock grazing

The establishment and spread of noxious weeds is primarily related to surface disturbance created. To evaluate the impact of livestock grazing management on noxious weeds under each alternative, it was assumed that alternatives that increase grazing opportunity result in increased potential for invasive species to establish and spread. Conversely, alternatives that limit grazing opportunity would be expected to decrease potential for invasive species to establish and spread. Under this alternative, management direction would reduce permitted use of grazing sheep and cattle within the primary conservation area more than the no-action alternative, resulting in potentially less establishment and spread of weeds due to grazing impacts. Because these assumptions result in the same relationships analyzed in the livestock grazing section (see section 6.12) the effects and consequences to noxious weeds would be the same as those presented in that discussion.

Fire and fuels

The establishment and spread of noxious weeds is primarily related to the amount of surface disturbance created. To evaluate the impact of proposed fire and fuels management on noxious weeds under each alternative, it was assumed that alternatives that provide more opportunity for fires and fuels management activities result in increased potential for invasive species to establish and

spread. Conversely, alternatives that limit fire and fuels management activities would be expected to decrease potential for invasive species to establish and spread. For the analysis it was also assumed that fire and fuels treatment acres would not exceed timber harvest acres in any alternative. Because these assumptions result in the same relationships analyzed in the fires and fuel management section (see section 6.7), the effects and consequences to noxious weeds would be the same as those presented in that discussion.

Alternative 3

Management direction

Alternative 3 proposes the same management direction for non-native invasive species that is proposed for the proposed action.

Indirect effects of alternative 3

Reduced permitted use of grazing sheep and cattle in the primary conservation area and in zone 1 including the Salish and Ninemile demographic connectivity areas, resulting in slightly less potential effect on weed establishment and spread than either alternative 1 or 2.

Climate change

Climate change is likely to result in differing responses among invasive plant species, resulting from differences in their ecological and life history characteristics. As documented in the Northern Rockies Adaptation Partnership Vulnerability Assessment (NRAP (2015)), climate change could result in either range expansion or contraction of an invasive species. For example, modeling indicates that leafy spurge is likely to contract and spotted knapweed is likely to shift in range. Invasive species are generally adaptable, capable of relatively rapid genetic change, and many have life history strategies (e.g., prolific seed production, extensive deep roots) which can enhance their ability to invade new areas in response to changes in ecosystem conditions. Warmer temperatures, and associated drier conditions, more severe or frequent droughts, and more favorable conditions for wildland fire may increase the ability of invasive plants to establish and out-compete native plants. These changes may provide more opportunities for invasive plants to gain an advantage over native species, and spread beyond the amendment forests' boundaries under all alternatives.

Summary of effects

Under the proposed action and alternative 3 for the amendment forests, and unlike the no-action alternative, managing road densities to the 2011 baseline; limiting management activities within the primary conservation area and zone 1, such as adjusting the timing of vegetation management treatments, use of roads and reduced new recreation developments are all expected to result in less ground disturbance and less possibility for invasive species to establish and spread, depending on site-specific conditions. Invasive species could and would still be treated where they occur under the proposed action. Natural seed establishment and spread of invasive species would not be affected under this alternative.

Cumulative effects

The effects that past activities have had on non-native invasive plants were discussed in the affected environment section and are reflected in the current condition. Therefore, past activities are not carried forward into the cumulative effects analysis. Cumulative effects include the effects of implementing the GBCS on the amendment forests as well as the Flathead National Forest. Under

the action alternatives, including the proposed action, the GBCS is implemented the same across the five forests, including the guideline for suggested timing restrictions for treatment of weeds.

Invasive species spread without regard to administrative boundaries. As such, the cumulative effects of the Forest Service's treatment of weeds on any of the NCDE forests, under any alternative, including the no-action alternative, may negatively or beneficially impact collocated federal, state and private lands depending upon the specific site. Likewise, adjacent or nearby landowners specific site conditions and weed treatment efforts also would affect weed conditions and treatments on amendment forests' land. Under all of the alternatives, coordination with state and local agencies and communication with the public would continue to maximize opportunities to combat the spread of undesirable, non-native invasive species.

Effects summary

Non-native plant species infestations are consistently identified through site-specific surveys. Suggested timing restrictions for treatments may be more restrictive under the proposed action (and alternative 3), than under the no-action alternative, depending upon the site location and species being treated. However, both the proposed action and alternative 3 provide, for invasive species to be treated outside of the suggested restrictions to be effective on the landscape and to meet Forest Service objectives. Thus, all three alternatives result in no adverse effect with regard to non-native invasive species management.

6.10 Rare/Sensitive Plant Species

6.10.1 Introduction

A sensitive species is a species, subspecies, or variety of plant for which a regional forester has determined a concern for its population viability because of a current or predicted downward habitat or population trend. Sensitive species are managed and protected under the regional forester's sensitive species program. The Forest Service has determined that these species need special management to maintain and improve their status on the national forests to prevent a need for listing under the Endangered Species Act. The Forest Service is required to identify and mitigate potential effects to sensitive species from federal land-disturbing actions. To comply with the Sensitive Species Program, forest botanists conduct inventories during project planning to locate sensitive plant species.

This section focuses on sensitive species other than threatened, endangered and candidate species, which are discussed in section 6.4. This section also contains a cumulative effects analysis, which includes discussion of the sensitive plant species associated with the Flathead National Forest.

6.10.2 Legal and administrative framework

Law and executive orders

The **Forest and Rangelands Renewable Resources Planning Act of 1974** provides for maintenance of land productivity and the need to protect and improve the soil and water resources.

The **National Forest Management Act of 1976**: "It is the policy of the Congress that all forested lands in the NFS shall be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth and conditions of stand designed to secure the maximum benefits of multiple use sustained yield. Plans developed shall provide for the diversity of plant and animal

communities based on the suitability and capability of the specific land area in order to meet the overall multiple-use objectives, and within the multiple-use objective."

Forest Service Manual 2600, Wildlife, Fish, and Sensitive Plant Habitat Management, chapter 2670, Threatened, Endangered and Sensitive Plants and Animals.

6.10.3 Key indicators for analysis

The key indicator for assessing differences among alternatives in effects to sensitive species are tied to the potential location and intensity of ground-disturbing activities (e.g., vegetation management/grizzly bear habitat and construction/reconstruction of roads, motorized use and access, and recreation). Naturally occurring threats and stressors such as drought, flooding, wind, insects, and wildland fire (both prescribed fire and the use of natural, unplanned ignitions to meet resource objectives) also cause ground disturbance and stress species.

6.10.4 Methodology and analysis process

The analysis process for identifying impacts to sensitive species is completed by Forest Service botanists and vegetation specialists. Existing geospatial information systems, data as entered through the Natural Resource Manager and literature is reviewed.

The Montana National Heritage Program maintains a database of species information and status rankings in accordance with National Heritage Network guidelines and methodologies. The Montana National Heritage Program status rankings (shown in table 29) categorize the risks to viability associated with each species the Montana National Heritage Program evaluates. These rankings, other criteria in Forest Service Handbook 1909.12, chapter 10, section 12.52 and CFR 219.9(b)(3) are considered by the Regional Forester, who identifies the list in coordination with each forest's supervisor. In response to new or changed information on plant species, the Regional Forester occasionally adds or removes species. Thus, the list is dynamic and expected to change well as into the future.

This analysis is programmatic in nature, considers the affected environment at a broad scale, and may use assumptions to help define the affected environment and determine effects. Known and potential stressors and threats from implementation of alternatives to rare plants were identified and reviewed. Potential adverse effects were considered based upon the likelihood and intensity to which they could occur.

Table 29. Global and Montana state rankings

Global Ranking	State Ranking	Definition
G1	S1	At high risk because of extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.
G2	S2	At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.
G3	S3	Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.
G4	S4	Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.

Stressors and threats

Stressors/threats are defined as activities (Forest Service or otherwise) or natural conditions that currently or potentially have negative effects on the diversity of rare plant communities or their habitat. Threats can be divided into direct and habitat reduction.

- Direct threats/stressors are often associated with ground disturbance from wildlife and livestock grazing (trampling and herbivory), recreational activities (trampling), and other activities that could impact populations either through loss of individuals or indirectly through disruption of soil, or increased risk of competition with invading non-native invasive species.
- Habitat reduction also results from ground or vegetation disturbance, but generally occurs at a larger, longer-term, or permanent scale. Activities and conditions that are stressors/threats for habitat reduction include invading non-native invasive species, road construction and reconstruction, drought, flood, and disease.
- Additionally, climate change, which may result in abnormal changes to precipitation amounts, precipitation distribution, and temperature extremes, can affect rare plants. The possibility of withering from increased and prolonged summer temperatures or drought conditions is a potential local and widespread stressor resulting from climate change.

Analysis area

The geographic scope of the analysis for effects to sensitive plants analysis area is the NFS lands of the amendment forests that lie within the Grizzly Bear Conservation Strategy primary conservation area, zone 1, and the Salish and Ninemile demographic connectivity areas, and zones 2 and 3. Range of species may extend beyond the GBCS management zones, but this area represents the NFS lands where changes may occur to rare plants or habitats from activities that result from the proposed action and alternatives.

For cumulative effects, the analysis area also includes the Flathead NFS lands in the GBCS management zones and other areas identified for cumulative impact consideration.

Information sources

Primary information source is the list of sensitive species that is determined by the Regional Forester. Incomplete information exists for many rare plant species as to their viability, biology, habitat, etc., so the majority of the species statuses are derived from expert opinion and/or panel consensus, specifically at biannual meetings held by the Montana Native Plant Society in conjunction with the Montana Natural Heritage Program. Though there are uncertainties and gaps in data and knowledge about most rare plant species, the best available information is used in this analysis to assess the existing condition and determine potential effects among the alternatives. Information gaps relevant to sensitive species may be filled in through future inventories, plan monitoring program results, or research, and this information would be integrated into databases and site-specific analyses as it becomes available.

6.10.5 Affected environment

Sensitive and rare species habitats are managed to maintain population viability, to prevent the need for federal listing, and to determine the status and distribution of threatened, endangered, sensitive, and other rare plants. Habitat that would be suitable within project areas, and which could be affected by project-related activities, is surveyed to determine the presence of rare plant species. Protection measures are then implemented to provide for the diversity of plant and animal communities following the National Forest Management Act and Forest Service policy.

The rare plant species included in the analysis are those that are listed under the current Regional Forester's Sensitive Species list (USDA (2011)) and not already discussed in volume 2, section 3.5, Threatened, Endangered and Candidate species.

The rare plants in table 30 are found throughout the amendment forests. Populations of these rare plants are found in habitats that range from very wet environments (aquatic, wetlands, riparian areas, bogs, fens) to mixed environments (moist and dry forest areas, moist and dry grasslands), to dry environments at low and high elevations.

Distribution, habitat information, and population data for each species are available from the Idaho Conservation Data Center, Washington Natural Heritage Program, Montana Natural Heritage Program, and NatureServe databases.

6.10.6 Environmental consequences

Potential consequences come from activities or natural conditions that currently do or potentially may have adverse effects on the diversity of rare plant communities or their habitat. Consequences are generally direct, such as trampling of a sensitive plant from livestock grazing or human use; or herbivory); a result of ecological processes, (for example from fire, fire exclusion, insects, and disease); and habitat reduction (e.g., loss of habitat during oil and gas exploration/development or road construction and maintenance).

A decision resulting from this analysis would not proceed at the project level until further site-specific National Environmental Policy Act analyses are completed. Then, at the project-level, habitat found to be suitable for sensitive species, and which could be affected by project-related activities, is surveyed to determine the presence of sensitive plant species within an analysis area. Following National Forest Management Act, Forest Service policy, and site-specific National Environmental Policy Act, protection measures are implemented at the project level to provide for the diversity of plant and animal communities and habitats are identified and avoided on a site-by-site basis.

Forestwide direction for all alternatives

For sensitive species, management efforts to ensure the diversity of rare plant communities or their habitat are already in place. The Forest Service management policy (Forest Service Handbook 2609.25, 1.25, 1988 and Forest Service Manual 2670) ensures that for all rare plant species, the following measures will be taken:

- Biological evaluations will be written for all activities that may affect sensitive species and their habitat;
- "Effects" of activities will be determined as similar to those for threatened, endangered, or proposed species; and
- Special management emphasis will be included in all management activities to ensure the viability of the sensitive species and to preclude trends toward endangerment that would result in the need for federal listing. This Forest Service management policy will be employed at a species level in all alternatives to ensure its mandates are achieved and that sensitive species are conserved.

All of the alternatives implement the protection measures noted above for law, regulation, and policy. In addition, the action alternatives do not change the Inland Native Fish Strategy (USDA (1995)) as current Forest Plan direction. The Inland Native Fish Strategy contains riparian management

objectives for habitat conservation areas and a comprehensive set of standards and guidelines related to what kind of activities may or may not occur within the riparian areas. Though not specifically designed to do so, many of the Inland Native Fish Strategy standards and guidelines serve as protection measures for the rare plants associated with aquatic and/or riparian habitats.

At the scale of each amendment forest singly, the four amendment forests together, and the amendment forests with the Flathead National Forest, it is important to note the difficulties associated with assessing the impacts of the proposed amendment to more than 89 rare plants. Plant species may be rare for a number of reasons, such as evolutionary history, population ecology, historic or current human activities, climate and other factors or more likely, a combination of multiple factors. Human activities may or may not be responsible for the current distribution and abundance of the rare plant species presented in table 30. This analysis looks at effects at the local (direct) and widespread (habitat reduction) scales.

Table 30. Sensitive species on the Helena, Kootenai, Lewis and Clark, and Lolo National Forests

Genus	Species	Type[a]	G Rank	S Rank	Helena[b]	Kootenai[b]	Lewis and Clark[b]	Lolo[b]	Habitat Type[c]
Agastache	*cusickii*	2	G2G3	S1					
Antennaria	*densifolia*	2	G3	S1					
Arabis	*fecunda*	2	G2	S2				S	
Astragalus	*barrii*	2	G3	S2S3					
Astragalus	*lackschewitzii*	2	G2	S2	S		K		
Astragalus	*scaphoides*	2	G3	S2					
Balsamorhiza	*macrophylla*	2	G3G5	S1					
Botrychium	*ascendens*	2	G2G3	S1		K	K		M
Botrychium	*crenulatum*	2	G3	S2	K	K			M
Botrychium	*hesperium*	2	G3G4	S2		K			M
Botrychium	*paradoxum*	2	G2	S2	S	K	K	S	C
Botrychium	*pedunculosum*	2	G2G3	S1		K			M
Carex	*idahoa*	2	G2Q	S2					
Castilleja	*covilleana*	2	G3G4	S2					
Collema	*curtisporum*	2	G3	S2		K			
Epipactis	*gigantea*	2	G3G4	S2	S	S	K	K	P
Erigeron	*lackschewitzii*	2	G3	S2			K		
Grimmia	*brittoniae*	2	G1	S1		K		K	D, M
Grindelia	*howellii*	2	G3	S2S3	S	S		K	D
Haplopappus	*aberrans*	2	G3	S1					
Nodobryoria	*subdivergens*	2	G2	S2		K			S
Penstemon	*lemhiensis*	2	G3	S2					
Phlox	*kelseyi*	2	G2	S2	K		K	S	
Pinus	*albicaulis*	2	G4	S2	K	K	K	K	C
Saxifraga	*tempestiva*	2	G2	S2	S				
Waldsteinia	*idahoensis*	2	G3	S1				K	
Adoxa	*moschatellina*	3	G5	S2				K	
Allium	*acuminatum*	3	G5	S1				K	D

Genus	Species	Type[a]	G Rank	S Rank	Helena[b]	Kootenai[b]	Lewis and Clark[b]	Lolo[b]	Habitat Type[c]
Amerorchis	*rotundifolia*	3	G5	S2S3	S	K	K	S	M
Aquilegia	*brevistyla*	3	G5	S2	S		K		
Athysanus	*pusillus*	3	G4	S1				S	
Bidens	*beckii*	3	G4	S2		K		K	A
Brasenia	*schreberi*	3	G5	S2		K		K	A
Carex	*amplifolia*	3	G4	S1		K			M
Carex	*chordorrhiza*	3	G5	S2		K		S	A
Carex	*lacustris*	3	G5	S1					
Carex	*prairea*	3	G5?	S2		K			P
Carex	*rostrata*	3	G5	S1		K		K	A
Carex	*vaginata*	3	G5	S1		K			DR
Clarkia	*rhom boidea*	3	G5	S2		K		K	
Claytonia	*arenicola*	3	G4	S1				K	
Corydalis	*sempervirens*	3	G4G5	S1		K			D
Cypripedium	*fasciculatum*	3	G4	S2		K		K	D
Cypripedium	*parviflorum*	3	G5	S3	K	K	K	K	DR
Cypripedium	*passerinum*	3	G4G5	S2	S	K	K	S	DR
Drosera	*anglica*	3	G5	S2	K	K	S	K	P
Drosera	*linearis*	3	G4	S1	K	S	S		P, C
Dryopteris	*cristata*	3	G5	S2		K		K	P
Eleocharis	*rostellata*	3	G5	S2					D
Elymus	*innovatus*	3	G5	S1			K		
Eriophorum	*gracile*	3	G5	S2		K			P
Eupatorium	*occidentale*	3	G4	S2		S		S	C
Gentianopsis	*macounii*	3	G5	S1			K		
Gentianopsis	*simplex*	3	G4	S1		S		S	A, DR
Goodyera	*repens*	3	G5	S2S3	S		K		
Heteranthera	*dubia*	3	G5	S1					
Heterocodon	*rariflorum*	3	G5	S1		K		K	

Genus	Species	Type[a]	G Rank	S Rank	Helena[b]	Kootenai[b]	Lewis and Clark[b]	Lolo[b]	Habitat Type[c]
Idahoa	*scapigera*	3	G5	S1				S	
Juncus	*hallii*	3	G4G5	S2	K		S		
Lathyrus	*bijugatus*	3	G4	S1		K			D
Liparis	*loeselii*	3	G5	S1					
Lomatium	*geyeri*	3	G4	S2		K			P
Lycopodiella	*inundata*	3	G5	S1		S			P
Lycopodium	*dendroideum*	3	G5	S1		K			C, DR, M
Lycopodium	*lagopus*	3	G5	S1		K			M
Meesia	*triquetra*	3	G5	S2		K		S	P
Mertensia	*bella*	3	G4	S1				K	
Mimulus	*ampliatus*	3	G4	S1		K			M
Mimulus	*breviflorus*	3	G4	S1		K			M
Mimulus	*clivicola*	3	G4	S1		S		K	D
Ophioglossum	*pusillum*	3	G5	S2		K			P
Oxytropis	*podocarpa*	3	G4	S1	S		K		
Petasites	*frigidus*	3	G5	S1					
Phegopteris	*connectilis*	3	G5	S2		K			M
Polygonum	*douglasii*	3	G5T4	S2	K		K		
Potamogeton	*obtusifolius*	3	G5	S2			K	S	
Potentilla	*quinquefolia*	3	G5	S2			K		
Psilocarphus	*brevissimus*	3	G4	S2		K			A
Salix	*barrattiana*	3	G5	S1			S		
Scheuchzeria	*palustris*	3	G5	S2		K		K	P
Schoenoplectus	*subterminalis*	3	G4G5	S2	K	K	S	K	A
Scorpidium	*scorpioides*	3	G4G5	S2		K			P
Thalictrum	*alpinum*	3	G5	S2	S		S		
Trichophorum	*cespitosum*	3	G5	S2		K	K		A, DR
Trifolium	*eriocephalum*	3	G5	S2				S	
Trifolium	*gymnocarpon*	3	G4	S2				K	
Utricularia	*intermedia*	3	G5	S1		K			A

Genus	Species	Type[a]	G Rank	S Rank	Helena[b]	Kootenai[b]	Lewis and Clark[b]	Lolo[b]	Habitat Type[c]
Veratrum	*californicum*	3	G5	S1	S				
Viola	*selkirkii*	3	G5?	S1		K			M

a Type = 2 - Rangewide Imperilment, 3 - Regional/State Imperilment

b Presence: K = known, S = suspected

c Habitat guild: A = Aquatic, P = Peatland, DR = Deciduous Riparian, M = Moist Forest, D= Dry Forest, C = Cold Forest, and Forested Subalpine, S = Subalpine Grassland

Alternative 1 — no action

Existing forest plans and amendments contain management direction currently being used by the amendment forests to address sensitive species. The management direction includes forest-wide goals, objectives, desired conditions, standards and guidelines pertaining to sensitive species, which are summarized here.

Under the no-action alternative, because there would be no changes to current management direction for any of the amendment forests, there would be no direct, indirect or cumulative effects. However, because the no-action alternative is the baseline to which the action alternatives are compared, it is important to understand what actions would continue under the no-action alternative.

Management direction for alternative 1 — no action

Management direction for sensitive species is found in current plans under threatened, endangered and candidate species. The management direction includes forestwide goals, objectives, desired conditions, standards and guidelines pertaining to sensitive species, which are summarized here. Stated in varying ways in current plans, in general, the amendment forests manage habitat to maintain population viability, to prevent the need for federal listing, and to determine the occurrence, status, and distribution of threatened, endangered, sensitive, and other rare plants. Surveys for rare plants are conducted prior to project activities.

Indirect effects of alternative 1

Continuing current management under the no-action alternative would have no negative effects to rare plants for any of the amendment forests. Not adopting the GBCS would not change protection or management of rare species.

Alternatives 2 — proposed action modified

Management direction

Under the proposed action, there is no direction specific to rare plants being proposed. However, there are potential consequences to rare plants from forest plan amendment components associated with other resource programs, specifically, vegetation management (e.g., with grizzly bear habitat), motorized use and access (including roads), recreation, and livestock grazing.

Effects common to all amendment forests

Effects to sensitive species are indirect by virtue of other programs conducted by the amendment forests (and the Flathead National Forest for cumulative effects) to implement the GBCS. These effects are similar across the amendment forests and are summarized below.

Vegetation management

Direction that is proposed for the amendment forests is specific to vegetation management activities and includes a guideline that suggests use of native seed mixes or those less palatable to grizzly bears for revegetation in the primary conservation area and zone 1 areas.

Ground disturbance and trampling of vegetation during the conduct of vegetation management activities associated with implementing the GBCS, which are presented throughout this volume, could potentially result in loss of individual rare plants that are found within grizzly bear habitat. Additionally, ground disturbance could make site-specific conditions favorable to invasive species establishment and spread.

These potential impacts are anticipated to be of low potential because, like the no-action alternative, the Forest Service would conduct site-specific surveys for sensitive species prior to project implementation. The surveys would allow information to be used for rare species avoidance and seed selection choices that do not compete with rare plants and are not preferred by grizzly bears. Additionally, the site-specific surveys would include invasive species identification for treatment purposes (see section 6.5).

Motorized use and access

To decrease the potential for grizzly bear-human conflicts, the GBCS has requirements to manage road densities to the 2011 baseline and to limit vegetation management activities (that may require access and/or motorized use) in time and space, if needed, within the primary conservation area. This temporary restriction may result in less potential for ground disturbance, inadvertent trampling, and potential loss of sensitive species during the spring. However, the guideline also allows for activities such as precommercial thinning, burning, weed spraying and implementation of best management practices to occur in the spring if necessary to meet objectives and percent resource damage. Under this alternative, there would be no increase in linear road miles in zone 1 and the demographic connectivity areas, which is a change for the Lolo National Forest.

Site-specific surveys for sensitive species are conducted prior to conducting projects, such as building roads, but similar to the no-action alternative, surveys are not conducted in association with road maintenance activities, or general motorized use and accessing of roads. Thus, the potential for effects to rare species with motorized use and access associated with the implementation of the GBCS in comparison to the no-action alternative is comparatively equal at the programmatic level.

Recreation

Ground disturbance may result with construction, use, and maintenance of new recreation developments. Under the proposed action alternative, and unlike the no-action alternative, the number of new recreation developments in the primary conservation area is restricted to one increase in number or capacity of overnight-use developed recreation sites per bear management unit per decade. In contrast to the no-action alternative, this restriction results in a potential reduction for ground disturbance and associated reduction in potential for inadvertent trampling and loss of individual species. A site-specific survey for sensitive species would be conducted prior to implementation that lessens the potential for loss of larger populations of sensitive species that a recreation footprint would impact.

Livestock grazing

Ground disturbance and trampling of rare plants that results from livestock grazing could potentially result in loss of individual rare plants if these plants are found within grizzly bear habitat that also lies within livestock allotments. Additionally, ground disturbance could make site-specific conditions favorable to invasive species establishment and spread. These potential impacts are anticipated to be of low potential because, like the no-action alternative, the Forest Service surveys for sensitive species in association with grazing allotment management. The surveys allow information to be used for rare species avoidance.

To evaluate the impact of livestock grazing management on rare plants under each alternative, it was assumed that alternatives that increase grazing opportunity result in increased potential for disturbance and trampling of rare plants. Conversely, alternatives that limit grazing opportunity would be expected to decrease potential disturbance and trampling of rare plants.

Under the proposed action, management direction would reduce permitted use of grazing sheep and cattle within the primary conservation area, which is more restrictive than the no-action alternative. Furthermore, under this alternative, sheep grazing animal unit months would not increase beyond the existing levels.

Alternative 3

Management direction

Alternative 3 proposes no changes to rare plant species management for any of the amendment forests. Effects to rare plants would be a consequence of programs that implement the following direction under alternative 3, which is different than direction proposed under the proposed action.

Indirect effects of alternative 3

The consequences to rare plant species from direction under alternative 3 are the same as presented under alternative 2, with the exception of motorized use and access and livestock grazing.

Motorized use and access

Motorized use and access is the same or more restricted than alternative 2 in the primary conservation area. There would be no temporary motorized use by the public of roads in secure core, no increase in over-snow motorized vehicle use in the den emergence period in the primary conservation area and no surface occupancy required for any new oil and gas leases in the primary conservation area and zone 1. Compared to the proposed action the potential for disturbance that could impact rare plants is slightly decreased in this alternative.

Within the Kootenai National Forest and Lolo National Forest demographic connectivity areas, there will be no increase in motorized routes (roads and trails) open to public motorized use on NFS lands to support bear occupancy.

Livestock grazing

Under alternative 3, management direction would reduce permitted use of grazing sheep and cattle within the primary conservation area and zone 1, which is more restrictive than the no-action alternative and the proposed action. Furthermore, under this alternative, sheep grazing animal unit months would not increase beyond the existing levels.

Cumulative effects

The effects that past activities have had on rare plants were discussed in the “Affected Environment” section and are reflected in the current condition. Therefore, past activities are not carried forward into the cumulative effects analysis. Cumulative effects include the impacts of implementing the GBCS on the amendment forests as well as the Flathead National Forest. Under the action alternatives, including the proposed action, the GBCS is implemented the same across the five forests, including the guideline for seed choices for revegetation activities.

NFS lands play a critical role in the conservation of plant species including rare plants. In the future, human populations are likely to expand and result in greater human presence and pressure on public lands, for example for recreational uses. These trends suggest not only that public land will play an increasingly important role in the conservation of species, but also that management to assist recovery and/or prevention of federal listing of species will be an increasingly difficult challenge.

Climate change

Climate change is likely to result in differing responses among rare plant species, because of differences in their ecological and life history characteristics. Climate change could result in either range expansion or contraction of rare plant species, which is dependent on the particular plant species. Unlike invasive species, rare plant species are not particularly adaptable to changes in their habitat including when those changes result from climate variabilities, particularly if a change in climate is long term. Thus, a trend toward either warmer temperatures, drier conditions, more severe or frequent droughts, and more favorable conditions for wildland fire; or the opposite trend of cooler temperatures, moist conditions, and less favorable conditions for wildfire, may either increase or decrease the ability of some rare plant population to persist, depending on the particular species. Because a rare plant's persistence is directly related to climate that is favorable to their particular habitat requirements, climate changes should be expected to result in consequences to rare plant populations. Additionally, any change in climate condition that negatively affects a rare plant's persistence would also make it vulnerable to competition for habitat resources by other plant species, including non-native invasive species. The proposed action and alternatives do not propose actions that are known to either manipulate or influence climate. Thus, the potential effects of climate change to rare plants are independent of the action and common among all alternatives.

Effects summary

Rare plant species habitats and populations are identified through site-specific surveys and protected from impacts by ground-disturbing activities through avoidance and/or site-specific design criteria and mitigation. The proposed action would not contribute to any cumulative negative effects on sensitive plant species or their habitats and is more restrictive in ground disturbing activities than the no-action alternative. Alternative 3, because of the inclusion of addition restrictions with grazing in zone 1 is more protective of rare species than both the proposed action and the no-action alternative. However, because all alternatives require site-specific rare plant surveys before projects are implemented, none of the alternatives are likely to adversely, or disproportionally over the no-action alternative, affect rare plants to a measurable degree. Implementing the GBCS may also contribute to a positive cumulative effect in limiting development and disturbance in close proximity of sensitive plant populations and habitats within grizzly bear habitat.

6.11 Fire and Prescribed Fire

6.11.1 Introduction

Forest vegetation of the Northern Rocky Mountains is dynamic, with changes occurring through natural processes as well as management activities. Natural disturbance processes include fire, windstorms, landslides, and insect and disease outbreaks. Management of forest vegetation includes such things as timber harvest, planting, thinning and other timber stand improvement activities, and prescribed burning. Plant succession, natural disturbances and management activities together have produced the current forest vegetation conditions. Natural processes will continue to operate under all alternatives. This section addresses the issue of administrative access and vegetation management for grizzly bear and the potential effects on activities associated with prescribed burning and wildfire. For a discussion of effects to mechanical treatments is addressed under the Forest Vegetation and Timber Management section.

Response to wildfire and the use of prescribed fire occurs on the landscape utilizing various means of transportation. This is the primary effect to these activities from this amendment.

6.11.2 Key indicators for analysis

Road access for fuels management and fire suppression is the key indicator.

6.11.3 Methodology and analysis process

Due to the nature of the proposal and the very limited scope of impact to fire/fuels, professional judgement related to effects of the proposed action and the alternatives restrictions of access was the primary means of analysis of effects to fire and fuels management.

6.11.4 Analysis area

The analysis area includes the entire amendment area.

6.11.5 Affected environment

The plans to the Helena, Lewis and Clark and Lolo NFs were approved in 1986 and the Kootenai in 2015. Each of these plans provides for the response to wildfires on their units and direction for fuels management including prescribed fire.

6.11.6 Environmental consequences

Effects common to all alternatives

The alternatives would have no direct effect on current direction that is provided in each forest's management plan as it relates to prescribed fire and wildfire management. Access in response to wildfire is an exception provided for in all alternatives, and thus does not affect the amendment forests. The primary effect is the access necessary to implement effective implementation of prescribed fire projects.

Alternative 1 — no action

Management direction for alternative 1 — no action

Vegetation management in secure core habitat could be done only to meet resource needs such as, insect and disease mitigation and salvage harvest, wildlife habitat diversity and fuels management. There should be no effect on prescribed burning opportunities on the amendment forests.

On the amendment forests, access to in areas outside the recovery zone is somewhat greater under this alternative, as the forest plans do not contain specific management direction for grizzly bears in these areas. However, requirements of biological opinions and incidental take statements remain in place and may limit access to these areas.

Alternatives 2 — proposed action modified

Management direction

Under alternative 2, standards would be added within the primary conservation areas to establish consistent definitions and procedures for managing road access for administrative use (NCDE-STD-AR-01) and temporary changes during project activities (NCDE-STD-AR-03 and NCDE-GDL-AR-02. For the amendment forests, there is no substantive difference between alternatives 1 and 2 within the primary conservation areas. For all amendment forests, both alternative 1 and alternative 2 require no net increase in motorized route densities and no net decrease in secure core. There is some flexibility in accessing core through NCDE-STD-AR-03. Access to core will be allowed through

site-specific project consultation. Thus, little change in access for prescribed fire in primary core areas on the amendment forests is expected under alternative 2.

On the Helena and Lolo, additional standards would be applied to zone 1 (both forests) and the demographic connectivity area (on the Lolo). For these forests, a standard would be added requiring no net increase in miles of roads open to public motorized use on NFS lands above the baseline within zone 1. Compared to alternative 1, it is expected there would be some reduction in access to these areas for prescribed fire.

For zone 1 and the demographic connectivity area on the Kootenai, direction under the revised forest plan would be retained, with no increases in permanent linear miles of open or total miles of road within the “bears outside a recovery zone” area, with listed exceptions and an allowance for temporary increases under specified conditions. Thus, there is not difference between alternative 2 and alternative 1 in access for prescribed fire.

The Lewis and Clark does not have any areas in zone 1 and no change to management for vegetation in areas outside the primary conservation area.

Alternative 3

Under this alternative, the same changes to forest plan desired conditions, standards, guidelines and monitoring items would be made as under Alternative 2. Under this alternative, the vegetation guidelines (NCDE-GDL-VEG-01 through NCDE-GDL-VEG-05) direction is extended to include the demographic connectivity areas on the Kootenai and the Lolo. An additional standard limiting motorized roads and trails would be added to the demographic connectivity areas on the Kootenai and the Lolo NF. In zone 1 and a portion of zone 2 (the expanded grizzly bear distribution zone) on the Helena, motorized routes (roads and trails) that are open to public would be limited to no more than 2.4 mi/mi^2, calculated as the miles of motorized routes on NFS lands divided by the acres of NFS lands within these individual areas. See standards NCDE-HNF Zone 1&2-STD-02, NCDE-KNF Zone 1-STD-01, and NCDE-LNF Zone 1-STD-02.

Expansion of the vegetation guidelines to the demographic connectivity areas does not limit access for vegetation management on the Kootenai and Lolo.

The effect of the additional standard limiting motorized routes on the Helena, Kootenai, and Lolo national forests would limit access to areas for prescribed fire in the demographic connectivity areas (Kootenai and Lolo) and the expanded grizzly bear distribution zone (Helena). There is no change to access for vegetation management on the Lewis and Clark under Alternative 3.

Cumulative effects

There likely would be no effect to wildfire suppression success with the current access and proposed future access given the exceptions provided. However, for prescribed fire the timing component related to treatments in 5 years over a 10 year period, may have minor influences when considering the weather and smoke constraints that sometime effect the ability to prescribed burn especially if the project is multifaceted in the implementation (e.g., harvest then prescribed fire).

6.12 Air Quality

6.12.1 Introduction

Air quality is dependent on the type and amount of pollutants emitted into the atmosphere, those that currently exist in the atmosphere, the size and topography of the air shed, and the prevailing meteorological and weather conditions. Sources of pollution within the Forest may include particulate generated from timber and mining operations and prescribed fire. Dust from forest roads may also contribute to fine particulates in the air.

The focus of this discussion is on smoke and how the various alternatives could affect smoke production through the use of prescribed fire, the use of natural, unplanned ignitions to meet resource objectives, or emissions from unwanted wildfires. Of all potential sources of air pollution from management activities that occur on the Forests (e.g., road dust, mining operations, emissions from logging equipment and recreational vehicles), smoke is the most substantial contributor to air quality and visibility. Smoke can create public health issues as well as reduce the ability to view the scenery on the Forest. However, as discussed in the “Fire and Prescribed Fire” and forest “Forest Vegetation and Timber Management” sections of the draft environmental impact statement, there is strong need to use fire to maintain and restore the fire-adapted ecosystems on the Forests and as a tool to reduce hazardous fuels in the wildland-urban interface.

6.12.2 Key indicators for analysis

The key indicators are ambient air quality and visibility, specifically:

- An alternative would be considered to have potentially significant impacts if implementing the alternative would result in a National Ambient Air Quality Standards (NAAQS) non-compliance violation as determined by the Montana Department of Environmental Quality.
- An alternative would be considered to have potentially significant impacts to visibility if implementing an alternative would result in changes to/degradation of visual quality, views, and the aesthetic landscape.

6.12.3 Methodology and analysis process

A qualitative assessment of smoke emissions and consequences to ambient air quality and visibility was used as the indicators for effects to air quality. The actual quantitative values of smoke and other emissions that would be produced by each alternative are too variable to accurately predict. Therefore, the comparison of alternatives is based on a qualitative assessment of the relative amounts and timing of smoke that may be emitted by the alternatives.

6.12.4 Affected environment

Air quality is highly influenced by climate. The majority of the affected environment for the Revision and Amendment proposed action lies west of the Continental Divide. Here, the climate can be described as a modified north Pacific coast-type where winters are milder, precipitation is more evenly distributed throughout the year, summers are cooler in general, and winds are lighter than on the eastern side of the Divide. There is more cloudiness in the west in all seasons, humidity runs a bit higher, and the growing season is shorter than in the eastern plains areas (Western Regional Climate Center 2015).

Pollutants

The Environmental Protection Agency defines 6 of 33 known air pollutants as criteria pollutants for which National Ambient Air Quality Standards are set. The most common violation of a standard from smoke is that of the particulate matter 2.5 ($PM_{2.5}$) size standard. Wildfires are considered a naturally occurring event from which smoke impacts may not be prevented. For natural events, the state Department of Environmental Quality is required to have a natural emergency action plan that identifies procedures such as notifying the public of health impacts of smoke and how to decrease and/or minimize exposure. Prescribed fires that are ignited by land managers are considered anthropogenic and, therefore subject to regulation, have been converted from concentration units (ppm) to mass units ($\mu g/m^3$) using different standard conditions.

Smoke

The Forest Service participates in an organization known as the Montana/Idaho Airshed Group for prescribed burns within the state of Montana. Group members submit prescribed burns to the smoke management unit for daily, site-specific approval. The smoke management unit is responsible for making sound and timely decisions to maximize the amount of smoke being put in the air (acres burned) and minimizes adverse air quality impacts based on individual airsheds throughout Montana and Idaho. This plan provides some flexibility should a National Ambient Air Quality Standards violation occur because of smoke. Adherence to the Montana/Idaho Airshed Group Operating Guide (2010) is the current accepted smoke management plan for the state of Montana.

Air quality is addressed for every prescribed burn in the individual prescribed fire plan. The Forest Service Handbook requires a documented burn plan that contains all of the elements outlined in the 2008 Interagency Prescribed Fire Planning and Implementation Procedures Guide. This guide prompts the burn plan author to address all laws and regulations concerning smoke management as well as the potential for localized nuisance smoke impacts.

In 1998 the Environmental Protection Agency released the Interim Air Quality Policy on Wildland and Prescribed Fires (Interim Policy) (USEPA 1998). The document was published with the intent of integrating two public policy goals, “(1) to allow fire to function, as nearly as possible, in its natural role in maintaining healthy wildland ecosystems, and (2) to protect public health and welfare by mitigating the impacts of air pollutant emissions on air quality and visibility.” This document recognizes the goal of the National Fire Plan (1995, revised in 2001) to implement fuel reduction projects in the wildland-urban interface and return fire to landscapes, and the impacts this will have on air quality.

The Montana/Idaho Airshed Group (2010) defines impact zones as areas identified as smoke sensitive or with existing air quality problems. Within the affected environment, these areas include Eureka, Libby, Thompson Falls, Missoula and Kalispell. Impact zones are created for populated areas where air quality concerns to public health arise as National Ambient Air Quality Standards are sometimes exceeded or close to exceeding. Areas of population generally exist in valley bottoms where mixing and dispersion of air is reduced. Sources of pollution within these impact zones, including smoke, are closely monitored and regulated.

Visibility

The scenic vistas of the nation’s national parks and wilderness areas are protected under amendments of the Clean Air Act. There are three classifications (I, II and III) where emissions of particulate matter and sulfur dioxide are to be restricted. The restrictions are most severe in class I areas and are progressively more lenient in class II and III areas, with class III not exceeding the National Ambient

Air Quality Standards. The most stringent protection is required for federal class I areas, which include wilderness areas exceeding 500 acres. Congress declared the following as a national visibility goal for these areas:

The prevention of any future, and the remedying of any existing impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution. (42 United States Code. § 7491 Section 169A)

Mandatory class I areas within the affected environment for the amendment include the Bob Marshall Wilderness Area, Cabinet Mountains Wilderness Area, Gates of the Mountains Wilderness Area, Scapegoat Wilderness Area, and Selway-Bitterroot Wilderness Area, which are managed by the Forest Service, and Glacier National Park, managed by the National Park Service.

According to the Environmental Protection Agency (1997), the pollutants that contributed to reduced visibility on the worst days for Glacier National Park are primarily sulfates (utility and industrial boilers) and organic carbon (vehicles and other industrial processes), and to a lessor and relatively equal degree, nitrates (vehicles and industrial boilers), elemental carbon (diesel, wood, other combustion) and soil dust.

Visibility for NFS lands is monitored at five sites: Glacier National Park, Monture, Gates of the Mountains, Sula, and Cabinet Mountains via the Interagency Monitoring of Protected Visual Environments (IMPROVE) network.

6.12.5 Environmental consequences

Management direction for alternative 1 — no action

Existing forest plans and amendment management direction, with applicable permit and contract-specific terms and conditions, represent the existing management being used by the amendment forests to address air quality. This direction represents the no-action alternative. Under the no-action alternative, because there would be no changes to current management direction, there would be no direct, indirect or cumulative effects for any of the amendment forests. However, because the no-action alternative is the baseline to which the proposed action and alternatives are compared, it is also important to understand what actions would continue under the alternative. This section includes a summarization of current management direction for each amendment forest and an evaluation of effects and trends of continuing that management.

Helena National Forest

Current direction is to maintain the existing air quality on the forest and provide for no significant deterioration in class I areas. Specifically, the airsheds for the Bob Marshall, Scapegoat, and Gates-of-the-Mountains wilderness areas are managed to meet class I air quality standards and class II for the Great Bear and the Bob Marshall addition, in the Lewis and Clark National Forest. Current direction also includes guidance to manage activities that affect air quality in compliance with federal and state standards, the Montana Cooperative Smoke Management Plan, and through cooperation with the Montana Air Quality Bureau's prevention of significant deterioration (PSD) program and state implementation plan (SIP). Direction in the plan specific to the fire management program is to permit fire in wilderness to the maximum possible, as constrained by agreements with the Montana/Idaho State Airshed Group.

Kootenai National Forest

Current forest-wide direction is to meet applicable federal, state, or tribal air quality standards. Prescribed burning is planned to meet those standards, including areas classified as class I airsheds (i.e., Cabinet Mountains Wilderness) and nonattainment areas (i.e., Libby, Montana). Additionally, the Forest is cooperating with federal, state, tribal, and local air quality agencies as appropriate in meeting applicable air quality requirements.

Within the Libby GA, because the airshed that surrounds the community of Libby is a nonattainment area for exceeding the allowable air quality standards for fine particulate matter, Lincoln County has established burning restrictions that limits the ability of the Kootenai National Forest to use planned ignitions in the area.

Lewis and Clark National Forest

Current plan direction is to manage the airshed in the Bob Marshall and Scapegoat wilderness areas to meet class I air quality standards and class II for the Great Bear and the Bob Marshall addition.

Lolo National Forest

Current direction for the Lolo National Forest is to maintain air quality at a level adequate for the protection and use of NFS lands without exceeding federal and state air quality standards. Additionally, prescribed fire objectives for smoke management are to meet Montana/Idaho Airshed Group constraints. The airsheds of the Bob Marshall and Scapegoat wilderness areas, and the Selway-Bitterroot, are managed (primarily via wilderness fire management plans) to meet class I air quality standards, and class II in the Great Bear and the Bob Marshall addition in the Lewis and Clark National Forest. The Lolo plan also requires, where manageable or negotiable, identification and mitigation of outside [air quality] influences, particularly when a prevention of significant deterioration action that may impact the wilderness is received from the Montana Department of Environmental Quality.

Direct and indirect effects for the no-action alternative — all forests

Air quality for all forests under the no-action alternative would experience continued short and long term effects under current management. Continued use of prescribed fire has the greatest potential to influence short-term air quality and visibility in local areas. All Forests have plan components (i.e., current management direction) that require meeting air quality standards established by federal and state agencies through requirements of the state implementation plans and smoke management plans. Current direction influences the use of prescribed fire by restricting how much vegetation can be burned and when and where burns can occur. Limited use of prescribed fire affects the rate and volume of smoke and particulate emissions, which in turn limits impacts to visibility.

Alternatives 2 and 3

Management direction for alternatives 2 and 3

Effects of forest-wide direction, management area direction and GA direction for air quality

Air quality for all forests under the action alternatives would experience short- and long-term effects under proposed management. Use of prescribed fire has the greatest potential to influence short-term air quality and visibility in local areas. All action alternatives must meet air quality standards established by federal and state agencies through requirements of state implementation plans and smoke management plans. Use of prescribed fire under the action alternatives would be restricted by how much vegetation can be burned, and when and where burns can occur. The costs of conducting

prescribed fires also increase as a result of burning regulations, which also affects how much vegetation is burned. These limitations for the use of prescribed fire affects the rate and volume of smoke and particulate emissions, which in turn limits impacts to visibility.

Because there would be no changes to current management direction that would directly impact prescribed burning, there would be no direct, indirect or cumulative effects for any of the amendment forests directly related to air quality/visibility from the proposed alternatives.

Cumulative effects

None.

Effects summary

Because there would be no changes to current management direction that would directly impact prescribed burning, there would be no direct, indirect or cumulative effects for any of the amendment forests directly related to air quality/visibility from the proposed alternatives.

6.13 Recreation and Access

6.13.1 Introduction

The National Forests within the NCDE are comprised of diverse vegetation, magnificent mountains, wild rivers, and abundant wildlife. The public is attracted to the area, with opportunities for a variety of recreation activities. Viewing the grizzly bear and other wildlife is an integral part of the visitation.

Naturally, as people visit and recreate in the NCDE, the potential exists for grizzly bears and humans to interact. Recreation activities and grizzly bear-human interactions have been monitored and evaluated over the last 25 years. Particular efforts that are deemed effective in managing grizzly bear-human interactions include:

- Information and education about recreating and living in bear country
- Implement food storage orders to reduce grizzly bear/human conflict
- Limiting human development and access within bear areas
- Managers being responsive to grizzly bear/human conflicts.

6.13.2 Legal and administrative framework

Organic Administration Act of June 4, 1897 (30 Stat. 11, as amended): This act authorizes the establishment of national forests.

Multiple-Use Sustained-Yield Act of June 12, 1960 (P.L.86-517, 74 Stat.215): This act provides direction to the NFS lands to provide access and recreation opportunities. The act states, “The policy of Congress is that national forests are established and administered for outdoor recreation…”

Federal Land Policy and Management Act of October 21, 1976 (P.L. 94-579, 90 Stat. 2742, as amended): This act declares (per Sec. 102) that “…the public lands be managed in a manner that…will provide for outdoor recreation and human occupancy and use.”

National Trails System Act of October 2, 1968 (P.L. 90-543, 82 Stat.919, as amended): This act establishes the National Trails System and authorizes planning, right-of-way acquisition, and construction of trails established by Congress or the Secretary of Agriculture

Forest and Rangeland Renewable Resources Planning Act of August 17, 1974 (P.L. 93-378, 88 Stat. 476, as amended): This act declares (per Sec. 10) that "…the installation of a proper system of transportation to service the NFS ….shall be carried forward in time to meet anticipated needs on an economical and environmentally sound basis…"

National Forest Roads and Trails Act of October 13, 1964 (P.L. 88-657, 78 Stat. 1089, as amended): This act declared that an adequate system of roads and trails be constructed and maintained to meet the increasing demand for recreation and other uses. This act authorizes road and trail systems for the national forests. It authorizes granting of easements across NFS lands, construction and financing of maximum economy roads (Forest Service Manual 7705), and imposition of requirements on road users for maintaining and reconstructing roads, including cooperative deposits for that work.

6.13.3 Key indicators for analysis

Key indicators for recreation and access include the following:

- Number of developed recreation sites with overnight capacity in the primary conservation area
- Acres of denning habitat open to over-snow use during den emergence time period
- Change in motorized access for roads, trails and areas.

6.13.4 Methodology and analysis process

Information sources

The Forest Service's Infra database was used to determine mileage and/or acreage for roads, trails, and areas open to motorized use.

Analysis area

The analysis of indirect effects is focused on those portions of the national forest where grizzly bear habitat management direction would apply. This varies by alternative as follows:

- Under the no-action alternative (existing forest plan direction for each of the national forests), habitat management direction would be applied to the NCDE recovery zone within grizzly bear management units as defined in the 1993 Recovery Plan, and where applicable to specific management situations as defined in the 1986 Interagency Grizzly Bear Guidelines.
- Under the action alternatives, amended management direction would apply to NFS lands within a larger area. This larger area was identified by the draft NCDE grizzly bear conservation strategy in recognition of the expansion of the bear population into areas outside the recovery zone, the attendant need to establish appropriate management direction in those areas, and the desirability of providing connectivity with grizzly bear populations in other recovery zones. The analysis area is divided into a primary conservation area (referred to as the NCDE recovery zone in the no-action alternative) and management zones 1 and 2 as defined in the draft NCDE grizzly bear conservation strategy.

6.13.5 Affected environment

Recreation and access affected environment all Amendment forests

Recreational use within the analysis area is well established and is an integral part of the management and use of the land. Opportunities provided include a range from semi-primitive non-

motorized cross-country travel to motorized summer and winter travel on a well-developed transportation system; remote backpack and horse camping to developed campgrounds with tables, toilets, and other amenities; and from a feeling of remoteness and solitude to one associated with the presence of other users.

Developed recreation sites

Developed recreation sites provide much of the infrastructure necessary for the enjoyment of a wide variety of recreation activities in the analysis area. Table 31 identifies the number of recreation sites by categories of developed recreations sites and by forest within the primary conservation area. In addition to specific categories such as campgrounds or trailheads, the other developed recreation category includes day-use sites such as boat and fishing facilities; administrative sites such as cabin rentals; and residences such as recreation residences and summer home complexes that were established from the 1920s through the early 1960s and are a permitted use from the national forests.

In the primary conservation area, there are 39 campgrounds to provide an overnight experience and 133 trailheads to provide access into the national forests. Summer home complexes are recreation residences that were established from the 1920s through the early 1960s and are a permitted use from the national forests.

Each developed recreation site has an estimated capacity; for some sites this is calculated as value termed “persons at one time”. These data are documented in the project record and are available from the Forest Service Infra database. Exceptions to the use of persons at one time and estimations of capacity are recreation residences that are counted by permit or complex. Table 32 summarizes overnight capacity at developed sites.

Developed recreation sites are of concern because frequent or prolonged human occupancy may result in increased bear attractants and grizzly bear mortality risk. There is no history of grizzly bear mortalities associated with developed recreation sites on the Lewis and Clark National Forest, Helena National Forest, Kootenai National Forest and Lolo National Forest.

Table 31. Number of developed recreation sites by categories and by amendment forest in the primary conservation area

Forest	Developed campgrounds	Day Use	Trailheads	Administrative sites	Overnight sites/building	Residences
Helena	3	8	17	3	0	0
Kootenai	19	20	40	2	5	0
Lewis and Clark	14	7	52	25	7	99
Lolo	3	7	24	6	3	0

Table 32. Overnight developed sites capacity on the amendment forests in the primary conservation area

Forest	Campground Capacity[1]	Cabins Capacity[1]	Residence Capacity[1]	Lodges Capacity[1]
Helena	35	0	0	0
Kootenai	112	5	0	0
Lewis and Clark	148	25	99	3

Lolo	15	3	0	0

1. Measurement of capacity varies by site type. Campgrounds are by number of site in the campground; cabins and residences are by number of permits or complexes; and lodge capacity is by number of rooms.

Motorized travel routes — all amendment forests

Travel routes include the roads and trails. Table 33 shows the miles of motorized access routes open for travel (year-around or seasonally) by forest based on the baseline geographic information system data. Within a forest, open motorized access routes are further distinguished by the miles within the primary conservation area, zone 1 (within and outside the demographic connectivity areas) and zone 2 (table 33). Table 34 displays acres and miles of motorized over-snow vehicle use within the primary conservation area and zones 1 and 2 and table 35 the acres and miles of over-snow vehicle use outside of denning season within the primary conservation area.

Table 33. Miles of open roads and motorized trails within the primary conservation area, zones 1 and 2, and demographic connectivity areas by Amendment forest

Forest	Open Roads (mile)	Motorized Trails (mile)
Helena PCA	124	21
Helena Zone 1	302	34
Helena Zone 2	879	66
Kootenai PCA	110	0
Kootenai Zone 1, within Salish DCA	871	4
Kootenai Zone 1, outside of Salish DCA	25	9
Kootenai Zone 2	--	--
BORZ[1]	805	0
Lewis and Clark PCA	99	71
Lewis and Clark Zone 1	--	--
Lewis and Clark Zone 2	--	--
Lolo PCA	90	7
Lolo Zone 1, within the Ninemile DCA	553	42
Lolo Zone, outside of the Ninemile DCA	324	2
Lolo Zone 2	<1	--

1. BORZ = bears outside recovery area

Table 34. Motorized over-snow vehicle use routes and motorized over-snow vehicle use areas within the primary conservation area and zones 1 and 2, by Amendment forest

Forest	Motorized Over-Snow Vehicle Routes (mile)	Motorized Over-snow Use Areas (acres)
Helena PCA	97	63,754
Helena zone 1	72	129,485
Helena zone 2	238	255,812
Kootenai PCA	294	106,155
Kootenai zone 1	1,282	270,845

Forest	Motorized Over-Snow Vehicle Routes (mile)	Motorized Over-snow Use Areas (acres)
Kootenai zone 2	NA	NA
Lewis and Clark PCA	60	29,181
Lewis and Clark zone 1	NA	NA
Lewis and Clark zone 2	NA	NA
Lolo PCA	77	76,280
Lolo zone 1	716	319,731
Lolo zone 2	0	38

Table 35. Acres/miles of over-snow vehicles routes/areas outside of denning season within the primary conservation area by Amendment forest

Forest	Motorized Over-snow Vehicles Routes (miles)	Motorized Over-snow Vehicles Areas (acres)
Helena	14	63,754
Kootenai	294	106,155
Lewis and Clark	36	0
Lolo	54	73,476

Forest Plan direction and changes in developed site capacity in the primary conservation area

Helena National Forest

Under the existing Helena Forest Plan, there is a forestwide standard stating that new campgrounds and other developed recreation facilities, such as boat ramps or picnic areas, will generally not be constructed. Existing developed recreation sites will be maintained, but emphasis instead is given to providing dispersed recreation opportunities.

Kootenai National Forest

The Forest Plan direction is to have recreation facilities at key locations to accommodate concentrations of use, and protect the natural resources of the area. Dispersed camping opportunities consider resource concerns, activity conflicts, or over use. For food and garbage storage, these would not contribute to conflicts between recreation users and wildlife.

Lewis and Clark National Forest

The Forest Plan forestwide direction is to increase recreational use of camping, picnicking, and other developed site opportunities from 198,500 to 230,100 recreation visitor days by 2030 by expanding existing sites and developing new recreation sites. Developed recreation sites may be closed, eliminated or relocated if they provide little or no opportunity, are in conflict with other values, or are not cost efficient in the service they provide.

There is also direction to manage fee campgrounds, heavy-use campgrounds, and heavy use picnic areas at full service levels. For low-use campgrounds and picnic areas, manage at a reduced service level. When there are user conflicts or damage to forest resources and recreation facilities, patrols and educational programs would be increased as necessary. Maintain all facilities to protect investment and provide safe, sanitary, and reasonably attractive sites.

The Forest Plan also requires using the management guidelines in appendix I, Interagency Wildlife Management Guidelines, to avoid or mitigate conflicts between developed recreation and threatened and endangered species.

Lolo National Forest

The Forest Plan direction for developed recreation is to maintain at the current levels. The Lolo has the following forest plan direction:

- The Forest Service will not significantly expand the capacity of developed recreation sites on the Lolo National Forest during the next 10-year period. Emphasis would be placed on increasing the use of existing sites by making them usable by a wide segment of society including the elderly and handicapped. Those existing sites receiving low levels of public use or which are not cost effective to operate will be considered for temporary or permanent closure.
- In MA 7, developed campgrounds or picnic areas will be maintained and rehabilitated, but generally not expanded beyond present capacity.
- In MA 11, developed recreation facilities, such as campgrounds or picnic grounds, will not be constructed.
- In MAs 16, 17, 18, 21, 22, 23, 24, 25, 26, and 27, a variety of dispersed recreation activities are permitted and may be supported by construction of trails and trail head facilities. Developed campgrounds and similar facilities would not be constructed.
- In MAs 19, 20, and 21, developed recreation facilities will not be constructed.

Current use and trends

There is a national visitor monitoring program across the NFS lands where forests monitor their use every five years through exit surveys. Table 36 shows visitation results by forest, the year it was sampled, recreation visits, wilderness visits and percentage of visitors living within 100 miles of the forest (NVUM 2011, 2012, 2013). Table 36 indicates that a majority of users live within the 100 miles – the Helena National Forest at 88 percent, the Lolo National Forest at 83 percent, the Kootenai National Forest at 72 percent, while the Lewis and Clark National Forest is lower at 49 percent.

Table 36. Recreation visits, wilderness visits and percentage of visitors living within100 miles by amendment forest

National Forest	Year Sampled	Recreation Visits	Wilderness Visits and Percentage of Total Recreation Visits	Visitors Living within 100 miles of Forest (%)
Helena	2013	322,000	4,000 (1%)	88
Kootenai	2012	468,000	12,000 (3%)	72
Lewis and Clark	2012	269,000	23,000 (9%)	49
Lolo	2011	1,266,000	16,000 (1%)	83

Visitor use

Main recreation activities

Table 37 shows that walking or hiking and hunting are in the top five main activities for all four forests, followed by driving for pleasure as a top five main activity for three forests. Viewing natural features and cross-country skiing were in the top five main activities for two forests. Hunting is the top main activity for both the Helena and Lewis and Clark National Forests while hiking or walking is the top main activity for the Lolo and Kootenai National Forests. Hunting is a significant use in the NCDE and holds high potential for grizzly bear-human conflicts as bears are attracted to the kills and gut piles (see Wildlife section for more detail on hunter-grizzly bear conflict). Hunters may use the services of an outfitter and guide.

Table 37. Top five recreational activities by Amendment forest

Activities	Helena (%)	Kootenai (%)	Lewis and Clark (%)	Lolo (%)
Hunting	20	16	28	15
Hiking or Walking	15	20	7	16
Driving for pleasure	–	5	10	6
Viewing natural features	13	14	–	–
Cross country skiing	7	–	–	15
General relaxing	–	–	11	–
Downhill skiing	–	–	14	–
Fishing	–	9	–	–
Other activity	16	–	–	–
Other non-motorized	–	–	–	12

6.13.6 Environmental consequences

Helena National Forest

Alternative 1 — no action

There would be very little change to developed recreation sites (3 campgrounds with capacity at 35 and 17 trailheads), on the Helena National Forest. The current forestwide standard states that new campgrounds and other developed recreation facilities (excluding trailheads) will generally not be constructed, existing ones will be maintained, and emphasis is given to dispersed recreation opportunities. Recreation use is expected to increase in the analysis area over time. Use may be affected by bear use of the area, grizzly bear/human conflicts, and restrictions on new developed recreation facilities. With this standard restricting new developed recreation facilities such as campgrounds, picnic areas, boat ramps, these areas may reach capacity with limited ability to expand to meet increased demand. Popular dispersed camping areas may become less available to visitors during peak times of the year. Resource issues such as the presence of human waste, and soil compaction in heavily used dispersed sites may appear as use increases in dispersed sites.

Under the no-action alternative, the Forest Service would continue to implement the standard limiting open road density in management situations 1 and 2 to less than or equal to 0.55 mi/mi^2, to

minimize human-caused grizzly bear mortality. The forest must implement terms and conditions of the 2006 biological opinion within the recovery area. Within the recovery area (primary conservation area), the forest cannot increase open and total motorized access routes densities and no net decrease be allowed in secure core in all three grizzly bear subunits. Generally, in the recovery area (primary conservation area) the miles of open roads and trails would stay the same. However, it is difficult to have direct correlations between miles and how implementation of a route standard would affect road mileage.

There would be no change to motorized over-snow vehicle use under the no action alternative.

Effects common to alternatives 2 and 3

Recreation use is expected to increase in the analysis area over time. Although the current forestwide standard does not generally allow construction of new developed recreation facilities, the standard does not include trailheads. Under alternatives 2 and 3, recreational use may be affected by grizzly bear use in the area, grizzly bear-human conflicts, and restrictions on new recreation developments, in this case trailheads managed for overnight use by the public.

Standard NCDE-STD-AR-05 limits the increase in developed recreation sites to one per bear management unit per decade. There are three bear management units within the primary conservation area on the Helena National Forest. Thus, the forest has the ability to increase three developed recreation sites (in this case trailheads) designed and managed for overnight use within the primary conservation area in the next 10 years. In addition, this standard includes the following exemptions that may allow for additional increase in developed recreation sites:

- allowing a change in the number or overnight capacity of developed recreation sites that is necessary to comply with Federal laws (e.g., Federal Rehabilitation Act);
- allowing a change in the number or overnight capacity of developed recreation sites that is necessary to address grizzly bear-human conflicts, resource damage, or human safety concerns;
- allowing an increase in the number of developed recreation sites due to the Forest Service acquiring lands with developed recreation sites.

It is unknown how many additional new developed recreation sites may be increased with these exemptions but given the current forest plan standard limiting new recreation facilities development, it is likely very low, although the number of new trailheads may be increased. In addition, if the forest proposes any further increase in the number or capacity of developed recreation sites that are designed and managed for overnight use in the bear management unit (i.e., more than one per decade), such an increase must be offset by reduction of an equal amount at another recreation site(s) in the same bear management unit, so that there is no net increase in overnight capacity in the bear management unit. This allows some flexibility to increase developed recreation sites that have reached capacity while decreasing sites that may be less used and not meeting capacity.

As grizzly bear populations remain stable or increase, some people may shift their uses to areas not occupied by grizzlies or rely upon uses where they have an increased sense of security such as using a hard-sided camper, developed campgrounds, day hiking on heavily used trails, or relying upon guided services. For other people, recreating in bear country would be an added attraction and an allure of wild country.

As recreation use increases while increases in develop recreation sites are restricted, users may use different strategies as developed recreation sites reach capacity. Potential outcomes with restricting developed site capacity include the following:

- Change in use from developed recreation sites to dispersed sites, e.g., camping in undesignated areas.
- Change in the time visitors use the areas to a different time of year such as spring or fall, when use is lower.
- Change in uses to other areas on the amendment forests or off-forest where use is lower.
- Use of the national reservation system at campgrounds that have reached capacity to assist users to be successful in camping at specific campgrounds that have reached capacity.
- Private enterprise may create new developed recreation sites on private land to accommodate increasing use.

Alternative 2 — proposed action modified

The amendment standard NCDE-STD-AR-02 requires no net increase from the baseline for total motorized route density and open motorized route density within bear management unit subunits, and no net decrease from the baseline for the percent of secure core in bear management unit subunits. Therefore, the existing motorized access is maintained in the primary conservation area.

The standard NCDE-STD-AR permits restricted roads within the primary conservation area to be temporarily opened for public motorized use to allow authorized uses such as firewood gathering, provided the period of use does not exceed 30 consecutive days and occurs outside of spring and fall bear hunting seasons. This allows for increased public access on a temporary basis.

The proposed action would not add any forest plan direction specific to motorized over-snow vehicle use during the den emergence time period. Existing forest plan direction would continue to be followed, with the same effects as under the no-action alternative.

Alternative 3

Standard NCDE-STD-AR-02 is the same under this alternative as alternative 2, retaining existing motorized access. Standard NCDE-STD-AR-04 under alternative 3 does not allow roads to be temporarily open within secure core. Thus, this alternative does not allow as much temporary access as found under alternative 2. Under this alternative, standard NCDE-STD-07 requires new or re-authorized permits for ski areas on NFS lands that operate during the non-denning season to include mitigation measures that reduce the risk of grizzly bear-human conflicts within the primary conservation area. The Helena National Forest does not have any existing ski areas within the primary conservation area. Any new developments would require mitigation measures. However, the potential for new ski area developments in this area is low. Under this alternative, NCDE-STD-AR-08 would not allow any increase above the baseline acreage of areas and miles of routes open to use by motorized over-snow vehicle use in the primary conservation area during the den emergence time period (i.e., late spring). This would maintain the existing (baseline) opportunities for motorized over-snow vehicle use in the den emergence (i.e. late spring) period within the primary conservation area.

Kootenai National Forest

Alternative 1 — no action

There would be little change to developed recreation sites within the primary conservation area (19 campgrounds, 40 trailheads, 20 day-use sites, and 5 cabins) on the Kootenai National Forest.

The Kootenai Forest Plan was revised in 2015. The revised plan includes the 2011 record of decision that amended the forest plan for motorized access management within the Selkirk and Cabinet-Yaak

grizzly bear recovery zones. This decision included some direction applicable to the NCDE and to areas occupied by bears that are outside the recovery zones, and was carried forward into the revised forest plan.

Under the Kootenai Forest Plan, road densities are limited to no more than the existing baseline of open and total motorized route density in its two bear management units within the NCDE and within the "bears outside the recovery zone (BORZ)." Thus, there would be no change in wheeled motorized access under the no action alternative.

Forestwide standard FW-STD-WL-05 prohibits grooming of snowmobile routes in grizzly bear core habitat in the spring after April 1 of each year. The biological opinion on the forest plan includes a requirement for the Kootenai National Forest and the USFWS to cooperatively develop a plan to monitor the scope and magnitude of late-season snowmobiling (post April 15) in the Cabinet-Yaak and NCDE recovery zones. Under the no action alternative, with the exception of limiting the grooming of routes after April 1, there is no effect to over-snow vehicle use.

Effects common to alternatives 2 and 3

Recreation use is expected to increase in the analysis area over time. Use may be affected by grizzly bear use of the area, grizzly bear-human conflicts, and restrictions on new recreation developments, in this case, trailheads.

Standard NCDE-STD-AR-05 limits the increase in developed recreation sites designed and managed for overnight use to one per bear management unit per decade. There are two bear management units within the primary conservation area on the Kootenai National Forest. Thus, the forest has the ability to increase two developed recreation sites in the primary conservation area in the next 10 years. In addition, this standard includes the following exemptions that may allow for additional increase in developed recreation sites:

- allowing a change in the number or overnight capacity of developed recreation sites that is necessary to comply with Federal laws (e.g., Federal Rehabilitation Act);
- allowing a change in the number or overnight capacity of developed recreation sites that is necessary to address grizzly bear-human conflicts, resource damage, or human safety concerns;
- allowing an increase in the number of developed recreation sites due to the Forest Service acquiring lands with developed recreation sites.

It is unknown how many additional new developed recreation sites may be increased with these exemptions. In addition, if the forest proposes any further increase in the number or capacity of developed recreation sites that are designed and managed for overnight use in the bear management unit (i.e., more than one per decade), such an increase must be offset by reduction of an equal amount at another recreation site(s) in the same bear management unit, so that there is no net increase in overnight capacity in the bear management unit. This allows some flexibility to increase developed recreation sites that have reached capacity while decreasing sites that may be less used and not meeting capacity.

As grizzly bear populations remain stable or increase, some people may shift their uses to areas not occupied by grizzlies or rely upon uses where they have an increased sense of security such as using a hard-sided camper, developed campgrounds, day hiking on heavily used trails, or relying upon guided services. For other people, recreating in bear country would be an added attraction and an allure of wild country.

As recreation use increases while increases in develop recreation sites are restricted, users may use different strategies as developed recreation sites reach capacity. Potential outcomes with restricting developed site capacity are:

- Change in use from developed recreation sites to dispersed sites, e.g., camping in undesignated areas.
- Change in the time visitors use the areas to a different time of year such as spring or fall, when use is lower.
- Change in uses to other areas on the amendment forests or off-forest where use is lower.
- Use of the national reservation system at campgrounds that have reached capacity to assist users to be successful in camping at specific campgrounds that have reached capacity.
- Private enterprise may create new developed recreation sites on private land to accommodate increasing use.

Alternative 2 — proposed action modified

Under alternative 2, standard NCDE-STD-AR-02 requires no net increase from the baseline for total motorized route density and open motorized route density within bear management unit subunits, and no net decrease from the baseline for the percent of secure core in bear management unit subunits. Kootenai Forest Plan standard FW-WL-STD-03 is to maintain or improve open motorized route density, total motorized route density, and secure core in bear management unit subunits in the NCDE. Thus, there is no change in wheeled motorized access under this alternative.

Under alternative 2, standard NCDE-KNF Zone 1-STD-01 states that the Kootenai National Forest portion of zone 1 and the Salish demographic connectivity area would be managed according to FW-STD-WL-02. Thus, there is no change in wheeled motorized access for zone 1 and the Salish demographic connectivity area under this alternative.

Under alternative 2, no additional management direction would be proposed for over-snow vehicle use during the den emergence period. Existing forest plan direction would be retained. The effects would be the same as under alternative 1.

Under alternative 2, standard NCDE-STD-AR-04 permits restricted roads within the primary conservation area to be temporarily opened for public motorized use to allow authorized uses such as firewood gathering, provided the period of use does not exceed 30 consecutive days and occurs outside of spring and fall bear hunting seasons. This allows for increased public access on a temporary basis.

Alternative 3

Standards NCDE-STD-AR-02 and NCDE-KNF Zone 1-STD-01 are the same under this alternative as alternative 2, retaining existing motorized access. Standard NCDE-STD-AR-04 under alternative 3 does not allow roads to be temporarily open within secure core. Thus, this alternative does not allow as much temporary access as found under alternative 2. Under this alternative, standard NCDE-KNF Zone 1-STD-02 requires there shall be no net increase in the miles of roads open to public motorized use during the non-denning season in the portion of zone 1 that is outside the “bears outside the recovery zone” polygon. This would limit access to current levels in this area.

Under this alternative, standard NCDE-STD-07 requires new or re-authorized permits for ski areas on NFS lands that operate during the non-denning season to include mitigation measures that reduce the risk of grizzly bear-human conflicts within the primary conservation area. The Kootenai National

Forest does not have any existing ski areas within the primary conservation area. Any new developments would require mitigation measures. However, the potential for new ski area developments in this area is low. Under this alternative, standard NCDE-STD-AR-08 would be added, which would not allow any increase above the baseline in the acreage of areas and miles of routes open to use by over-snow vehicles in the den emergence time period (i.e., late spring) within the primary conservation area. This would limit acres and miles to current levels (see the affected environment section above), with no additional opportunities to expand over-snow vehicle use in the den emergence time period.

Lewis and Clark National Forest

Alternative 1 — no action

There would be little change to developed recreation sites within the primary conservation area (14 campgrounds, 52 trailheads, 7 day-use sites, 6 cabins and 1 over-night site) on the Lewis and Clark National Forest.

The Lewis and Clark Forest Plan does not contain a road density standard for the NCDE recovery zone. There would be no change in wheeled motorized vehicle access under the no action alternative.

Within the NCDE recovery area, no snowmobiling is allowed after April 1, except on three main access roads, where it is allowed as long as snow conditions permit. Snowmobiles are not allowed to leave these roads. There would be no change to motorized over-snow vehicle use under the no action alternative.

Effects common to alternatives 2 and 3

Recreation use is expected to increase in the analysis area over time. Although the current forestwide standard of generally not allowing developed recreation facilities, does not include trailheads. Use may be affected by grizzly bear use of the area, grizzly bear-human conflicts, and restrictions on new recreation developments, in this case, trailheads.

Standard NCDE-STD-AR-05 limits the increase in developed recreation sites designed and managed for overnight use to one per bear management unit per decade. There are six bear management units with one bear management unit shared with the Helena National Forest, within the primary conservation area on the Lewis and Clark National Forest. Thus, the forest has the ability to increase five to six developed recreation sites in the primary conservation area in the next 10 years. In addition, this standard includes the following exemptions that may allow for additional increase in developed recreation sites:

- allowing a change in the number or overnight capacity of developed recreation sites that is necessary to comply with federal laws (e.g., Federal Rehabilitation Act);
- allowing a change in the number or overnight capacity of developed recreation sites that is necessary to address grizzly bear–human conflicts, resource damage, or human safety concerns;
- allowing an increase in the number of developed recreation sites due to the Forest Service acquiring lands with developed recreation sites.

It is unknown how many additional new developed recreation sites may be increased with these exemptions. In addition, if the forest proposes any further increase in the number or capacity of developed recreation sites that are designed and managed for overnight use in the bear management unit (i.e., more than one per decade), such an increase must be offset by reduction of an equal amount at another recreation site(s) in the same bear management unit, so that there is no net

increase in overnight capacity in the bear management unit. This allows some flexibility to increase developed recreation sites that have reached capacity while decreasing sites that may be less used and not meeting capacity.

As grizzly bear populations remain stable or increase, some people may shift their uses to areas not occupied by grizzlies or rely upon uses where they have an increased sense of security such as using a hard-sided camper, developed campgrounds, day hiking on heavily used trails, or relying upon guided services. For other people, recreating in bear country would be an added attraction and an allure of wild country.

As recreation use increases while increases in develop recreation sites are restricted, users may use different strategies as developed recreation sites reach capacity. Potential outcomes with restricting developed site capacity include the following:

- Change in use from developed recreation sites to dispersed sites, e.g., camping in undesignated areas.
- Change in the time visitors use the areas to a different time of year such as spring or fall, when use is lower.
- Change in uses to other areas on the amendment forests or off-forest where use is lower.
- Use of the national reservation system at campgrounds that have reached capacity to assist users to be successful in camping at specific campgrounds that have reached capacity.
- Private enterprise may create new developed recreation sites on private land to accommodate increasing use.

Alternative 2 — proposed action modified

The standard NCDE-STD-AR-02 requires no net increase from the baseline for total motorized route density and open motorized route density within bear management unit subunits, and no net decrease from the baseline for the percent of secure core in bear management unit subunits. Although there could be no increase in motorized access, the forest has the ability to decrease access in one area to increase access in another area within the bear management unit.

The standard NCDE-STD-AR-04 permits restricted roads within the primary conservation area to be temporarily opened for public motorized use to allow authorized uses such as firewood gathering, provided the period of use does not exceed 30 consecutive days and occurs outside of spring and fall bear hunting seasons. This allows for continued public access on a temporary basis. There would be no change in motorized over-snow vehicle use in this alternative.

Alternative 3

Standard NCDE-STD-AR-02 is the same under this alternative as alternative 2, retaining existing motorized access with no increase in motorized access. Standard NCDE-STD-AR-04 under alternative 3 does not allow roads to be temporarily open within secure core. Thus, this alternative does not allow as much temporary access as found under alternative 2, thus restricting public access.

Under this alternative, standard NCDE-STD-07 requires new or re-authorized permits for ski areas on NFS lands that operate during the non-denning season to include mitigation measures that reduce the risk of grizzly bear-human conflicts within the primary conservation area. The Teton Pass ski area on the forest would require mitigation measures upon re-authorizing of their permit.

Under this alternative, standard NCDE-STD-08 would not allow any increase above the baseline in areas or routes open to use by motorized over-snow vehicle use in the non-denning (i.e., late spring). This would not change snowmobiling opportunity during the den emergence time period, since no snowmobiling has been allowed within the recovery area after April 1, except on three main access roads, where it is allowed as long as snow conditions permit.

Lolo National Forest

Alternative 1 — no action

Under the current forest plan there is a forest-wide standard that the Forest would not significantly expand the capacity of developed recreation sites on the Forest during the next 10-year period. There would be no change to developed recreation sites within the primary conservation area (3 campgrounds, 24 trailheads, 7 day-use sites, 3 over-night site) on the Lolo National Forest with this alternative.

The current Lolo Forest Plan does not require management for grizzly bears or their habitat outside of the recovery zone. The forest plan restricts open road densities to 1.1 mi/mi^2 in highly productive big game summer range and requires that management of roads be coordinated with other resource objectives including grizzly bear habitat. In 1996, USFWS administratively amended the 1982 biological opinion on the Lolo Forest Plan and also provided an incidental take statement regarding access management and grizzly bears within the recovery area. The terms and conditions included, in part, a requirement that no more than 19 percent of a subunit exceed 1 mi/mi^2 of open motorized route density, no more than 19 percent of a subunit exceed 2 mi/mi^2 of total motorized route density, and minimum secure core of 68 percent or greater of a subunit, all to be achieved within 5 years. Five of the seven bear management unit subunits on the Lolo National Forest fully meet the criteria. The Mission subunit does not, but the Forest Service manages less than 75 percent of the land in this subunit; therefore this subunit has been managed for no net loss. The Swan subunit also does not meet all of the criteria, and in 2011, the Lolo National Forest reinitiated consultation for this subunit. In recognition of its unique characteristics, the requirements were modified to: no more than 17 percent total motorized route density, no more than 31 percent open motorized route density with no more than 22 percent open motorized route density during the spring, and at least 55 percent secure core. Under this alternative, these requirements would remain in place.

The USFWS issued a biological opinion and incidental take statement on August 30, 2004, for areas outside the recovery area, where grizzly bears were now present. The biological opinion required the Lolo National Forest to contact the USFWS if a net increase in permanent system roads exceeds 2 linear miles in the distribution area outside the recovery zone during the subsequent 4-year period. Since 2004, no new permanent roads have been constructed in the grizzly bear distribution area outside of the NCDE recovery zone, and 5.14 miles have been decommissioned in the distribution area. The 2004 biological opinion and incidental take statement was extended in 2012. The term and condition was administratively amended as follows: The Forest will contact the USFWS if more than 2 miles of new permanent road over the 2004 baseline, or 7.14 miles total, will be constructed over the next 10 years in the distribution area outside of the NCDE recovery zone. Although increased access is limited, there is no change in current wheeled motorized access outside of the recovery zones.

The Lolo Forest Plan does not restrict over-snow vehicle use during the den emergence period However, groomed snowmobile routes and snowmobile play areas are concentrated outside the recovery zone, except for the large block of former Plum Creek Timber land in the Mission Subunit, and on NFS lands in the lower elevation areas in the Swan Subunit and in the Dun Creek drainage in

the Mor-Dun Subunit. Spring road closures are in place around Morrell Falls, Richmond Peak, and Clearwater Lake to specifically protect grizzly bear from snowmobile and other motorized disturbance during the non-denning period from April 1-June 30. There would be no change in motorized over-snow vehicle use in this alternative.

Effects common to alternatives 2 and 3

Recreation use is expected to increase in the analysis area over time. Although the current forestwide standard generally does not allow increasing developed recreation facilities, this standard does not include trailheads. Use may be affected by grizzly bear use of the area, grizzly bear/human conflicts, and restrictions on new developed recreation sites.

Standard NCDE-STD-AR-05 limits the increase in developed recreation sites designed and managed for overnight use to one per bear management unit per decade. There are three bear management units with one bear management unit shared with the Flathead National Forest, within the primary conservation area on the Lolo National Forest. Thus, the forest has the ability to increase 1 to 3 developed recreation sites in the primary conservation area in the next 10 years. In addition, this standard includes the following exemptions that may allow for additional increase in developed recreation sites:

- allowing a change in the number or overnight capacity of developed recreation sites that is necessary to comply with Federal laws (e.g., Federal Rehabilitation Act);
- allowing a change in the number or overnight capacity of developed recreation sites that is necessary to address grizzly bear–human conflicts, resource damage, or human safety concerns;
- allowing an increase in the number of developed recreation sites due to the Forest Service acquiring lands with developed recreation sites.

It is unknown how many additional new developed recreation sites may be increased with these exemptions. In addition, if the forest proposes any further increase in the number or capacity of developed recreation sites **THAT** are designed and managed for overnight use in the bear management unit (i.e., more than one per decade), such an increase must be offset by reduction of an equal amount at another recreation site(s) in the same bear management unit, so that there is no net increase in overnight capacity in the bear management unit. This allows some flexibility to increase developed recreation sites that have reached capacity while decreasing sites that may be less used and not meeting capacity.

As grizzly bear populations remain stable or increase, some people may shift their uses to areas not occupied by grizzlies or rely upon uses where they have an increased sense of security such as using a hard-sided camper, developed campgrounds, day hiking on heavily used trails, or relying upon guided services. For other people, recreating in bear country would be an added attraction and an allure of wild country.

As recreation use increases while increases in develop recreation sites are restricted, users may use different strategies as developed recreation sites reach capacity. Potential outcomes with restricting developed site capacity are:

- Change in use from developed recreation sites to dispersed sites, e.g., camping in undesignated areas.
- Change in the time visitors use the areas to a different time of year such as spring or fall, when use is lower.

- Change in uses to other areas on the amendment forests or off-forest where use is lower.
- Use of the national reservation system at campgrounds that have reached capacity to assist users to be successful in camping at specific campgrounds that have reached capacity.
- Private enterprise may create new developed recreation sites on private land to accommodate increasing use.

Alternative 2 — proposed action modified

The standard NCDE-STD-AR-02 requires no net increase from the baseline for total motorized route density and open motorized route density within bear management unit subunits, and no net decrease from the baseline for the percent of secure core in bear management unit subunits. Therefore, the existing motorized access is maintained.

The standard NCDE-STD-AR-04 permits restricted roads within the primary conservation area to be temporarily opened for public motorized use to allow authorized uses such as firewood gathering, provided the period of use does not exceed 30 consecutive days and occurs outside of spring and fall bear hunting seasons. This allows for continued public access on a temporary basis.

Under alternative 2, a standard (NCDE-LNF Zone 1-STD-01) would be added to the Lolo National Forest portion of zone 1 including the Ninemile demographic connectivity area requiring no net increase from the baseline in miles of roads open to public motorized use on NFS lands. This does not affect existing motorized use, but continues to restrict future increases similar to alternative 1.

There would be no change in motorized over-snow vehicle use in this alternative.

Alternative 3

Standard NCDE-STD-AR-02 is the same under this alternative as alternative 2, retaining existing motorized access with no increase in motorized access. Standard NCDE-STD-AR-04 under alternative 3 does not allow roads to be temporarily open within secure core. Thus, this alternative does not allow as much temporary access as found under alternative 2, thus restricting public access.

In this alternative, on lands outside of the Ninemile demographic connectivity area but within the Lolo National Forest portion of zone 1, there shall be no net increase in miles of roads open to public motorized use on NFS lands above the baseline (NCDE-LNF-Zone 1-STD-01). Within the Ninemile demographic connectivity area, there will be no net increase in roads or trails open to public motorized use during the non-denning season (NCDE-LNF-Zone 1-STD-02). This does not affect existing motorized use, but continues to restrict future increases similar to alternative 2, with the addition of restricted future miles of trails within the Ninemile demographic connectivity area.

Under this alternative, standard NCDE-STD-07 requires new or re-authorized permits for ski areas on NFS lands that operate during the non-denning season to include mitigation measures that reduce the risk of grizzly bear-human conflicts within the primary conservation area. The Lolo National Forest does not have any existing ski areas within the primary conservation area. Any new developments would require mitigation measures. However, the potential for new ski area developments in this area is low.

This alternative would add standard NCDE-STD-AR-08, which would not allow any increase above the baseline in the acreage of areas or miles of routes open to use by motorized over-snow vehicle use in the den emergence time period (i.e. late spring) within the primary conservation area. This would limit acres and miles to current levels (see the affected environment section above).

Cumulative effects

The analysis area for cumulative effects includes the amendment forests and adjacent public lands including the Flathead National Forest, Glacier National Park, Montana State lands, and county and local parks. These public lands provide a wide range of recreation opportunities in addition to the amendment forests.

The amendment forests have experienced many changes in recreation since they were established. Initially, recreation was light and concentrated in only a few popular areas. There were few campgrounds or other sites developed until the Civilian Conservation Corps era, when many developed sites and trails were constructed. Another major boom in recreation occurred after World War II through the early to mid-1960s, as post-war populations started heading to the national forests, demanding more and better recreation facilities.

Since the 1970s, interest in and appreciation of, the environment has increased national forest recreation visitation and has shifted activities and expectations. As temperatures increase during the summer and a majority of the Forest is free from snow cover, many people venture out onto the national forests for relief from the heat and to pursue traditional outdoor recreational opportunities.

Technical advancements in over-snow vehicles now allow the average visitor to travel many places where only skilled riders traveled as recently as 5 years ago. The development of the all-terrain vehicle has added a new motor vehicle use in the summer and allows many people to travel on routes into areas that they may not have been able to travel into previously. Lastly, the development of the mountain bike in the 1980s has added a summer, non-motorized use.

All of these issues, along with several others, have led to more crowded recreation experiences during peak use times, increasing levels and range of demands on natural resources and resource managers, and more conflicts among the users themselves.

Continuing changes in equipment technology used for recreational purposes on the Forest will have impacts as new uses, or existing uses, and the manner of how and where people recreate. These changes in uses may alter the recreational experience in some areas. Those who pursue recreation opportunities, such as hiking or back-country skiing in remote settings, are likely to be more affected than other users.

As populations in Montana increases, the demand for recreational opportunities and open space will grow. Land management agencies will continue to provide a variety of recreation opportunities, but are not likely to be able to meet all the demand for every activity desired. In the context of recreation-related decisions in and around the forest, alternative 2 provides the most opportunities for meeting the increasing demands for additional and varied recreation opportunities while alternative 3 would result in more limits on motorized access.

6.14 Energy and Mineral Resources

6.14.1 Introduction

Energy and mineral resources are an important part of the nation’s resource base. Minerals are resources of the national forests and are important to the nation’s welfare. The national forests contain much of the country’s remaining stores of mineral resources. Prime examples include: the national forests of the Rocky Mountains, the Basin and Range Province, the Cascade-Sierra Nevada Ranges, and the Alaska Coast range.

Geologically, NFS lands contain some of the most favorable host rocks for mineral deposits. Approximately 6.5 million acres are known to be underlain by coal. Approximately 45 million acres, or one-quarter of NFS lands, have potential for oil and gas; while about 300,000 acres within the Pacific Coast and Great Basin States have potential for geothermal resource development.

The USFS classifies minerals into three management categories:

- Locatable minerals: Includes commodities such as gold, silver, copper, zinc, nickel, lead, platinum, etc. and some nonmetallic minerals such as asbestos, gypsum, and gemstones. Lands that are open to location under the Mining Law of 1872 guarantees US citizens the right to prospect and explore lands reserved from the public domain and open to mineral entry. The right of access for exploration and development of locatable mineral is guaranteed.
- Salable minerals: Includes common varieties of sand, stone, gravel, cinders, clay, pumice and pumicite. The Forest Service has the authority to dispose of these materials on public lands through a variety of methods. The disposal of these materials is discretionary.
- Leasable minerals: Includes commodities such as oil, gas, coal, geothermal, potassium, sodium phosphates, oil shale, sulfur, and solid leasable minerals on acquired lands. Currently there are 341 suspended oil and gas leases covering approximately 641,500 acres on the Forest. No activity can take place on the leases until an EIS is completed. A leasing decision will not be a part of this Forest Plan Revision.

6.14.2 Legal and administrative framework

Law and executive orders

Surface management authority

Organic Administration Act of June 4, 1897 (30 Stat. 11, as amended; 16 U.S.C. § 473 et seq.): This act provides the Secretary of Agriculture the authority to regulate the occupancy and use of NFS lands. It provides for the continuing right to conduct mining activities under the general mining laws if the rules and regulations covering NFS lands are complied with. This act recognizes the rights of miners and prospectors to access NFS lands for all proper and lawful purposes, including prospecting, locating, and developing mineral resources.

Multiple-Use Sustained-Yield Act of June 12, 1960 (P.L. 86-517, 74 Stat. 215; 16 U.S.C. 528 et seq.): This act requires that NFS lands be administered in a manner that considers the values of the various resources when making management decisions and specifically provides that nothing in the act be construed to affect the use or administration of the mineral resources on NFS lands.

Wilderness Act of September 3, 1964 (P.L. 88-577, 78 Stat. 890; 16 U.S.C. § 1121, et seq.): This act provides that, subject to valid rights existing prior to January 1, 1984, wilderness areas are withdrawn from all forms of appropriation and disposition under the mining and mineral leasing laws. Subsequent acts designating additional NFS lands as wilderness may contain specific provisions concerning mineral activities. Patents issued under the mining laws for mining claims staked after passage of this act within wilderness areas shall reserve the surface rights to the United States. The act provides for reasonable access to valid mining claims and other valid occupancies inside wilderness areas. The act also requires the survey of wilderness areas by the U.S. Geological Survey on a planned, recurring basis consistent with the concept of wilderness preservation to determine the mineral values that may be present.

National Environmental Policy Act (NEPA) of 1969, January 1, 1970 (P.L.91-190, 83 Stat. 852; 42 U.S.C. § 4331 et seq.): This act requires federal agencies to use a systematic interdisciplinary approach to ensure the integrated use of natural and social sciences in planning and decision making. It also requires an analysis of probable environmental effects of proposed federal actions. Generally, decisions on mineral and energy development are subject to this law.

Forest and Rangeland Renewable Resources Planning Act of August 17, 1974 (P.L. 93-378, 88 Stat. 476; 16 U.S.C. § 1600 et seq.): This act directs the assessment of all resources on NFS lands to determine the desired level of future production from Forest Service programs. Once approved, the policy statement and recommended program serve as a guide to future Forest Service planning and a basis for future budget proposals.

National Forest Management Act (NFMA) of October 22, 1976 (P.L. 94-588, 90 Stat. 2949; 16 U.S.C. § 1600 et seq.): The act requires the Forest Service to establish a comprehensive system of land and resource planning, including the development and maintenance of a comprehensive and detailed inventory of lands and resources. The act also specifies the use of a systematic interdisciplinary approach to achieve integrated consideration of the physical sciences into planning for the management and use of NFS lands and resources.

Mineral management authorities

U.S. Mining Laws Act of May 10, 1872 (17 Stat. 91, as amended, 30 U.S.C. § 22 et seq): This act (often referred to as the General Mining Act of 1872) sets forth the principles of discovery, right of possession, assessment work, and patent for hard-rock minerals on lands reserved from the public domain. The law applies to lode, placer, mill-site claims, and tunnel sites. Except as otherwise provided, all valuable mineral deposits, and the lands in which they are found, are free and open to exploration, occupation, and purchase under regulations prescribed by law.

Organic Administration Act of 1897 (30 Stat. 11, as amended, 16 U.S.C. § 473 et seq): Reserved lands for national forests purposes and opened them to the operations under U.S. mining laws, provided individuals/operators comply with the rules and regulations of the Secretary of Agriculture. This act authorizes the Secretary of Agriculture to regulate occupancy and use of the national forests. The act permits access to national forests for all lawful purposes, including prospecting and locating and developing mineral resources.

Weeks Law Act of March 1, 1911 (P.L. 61-435, 72 Stat. 1571, as amended, 16 U.S.C. § 480 et seq): This act authorized the federal government to purchase lands for stream-flow protection, and maintain the acquired lands as national forests.

Mineral Resources on Weeks Law Lands Act of March 4, 1917 (P.L. 64-390, 39 Stat. 1149, 16 U.S.C. § 520): This act authorizes the Secretary of Agriculture to issue permits and leases for prospecting, developing, and utilizing hard-rock minerals on lands acquired under the authority of the act. This authority was later transferred to the Secretary of the Interior.

Mineral Leasing Act of February 25, 1920 (P.L. 66-146, 41 Stat. 437 as amended, 30 U.S.C. § 181 et seq.): This act authorizes the Secretary of the Interior to issue leases for the disposal of certain minerals (coal, phosphate, sodium, potassium, oil, oil shale, gilsonite, and gas). The act applies to NFS lands reserved from the public domain, including lands received in exchange for timber or other public domain lands, and lands with minerals reserved under special authority.

Clarke-McNary Act of June 7, 1924 (P.L. 68-270, 43 Stat. 653 as amended, 16 U.S.C. § 505 et seq.): All lands to which title is accepted under section 7 of this act become national forest lands, subject to all laws applicable to the lands acquired under the Weeks Act of March 1, 1911.

Mineral Materials Act of July 31, 1947 (P.L. 80-291, 61 Stat. 681, as amended, 30 U.S.C. § 601 et seq.): This act provides for the disposal of mineral materials on the public lands through bidding, negotiated contracts, and free use.

Mineral Leasing Act for Acquired Lands of August 7, 1947 (P.L. 80-382, 61 Stat. 913, as amended, 30 U.S.C. § 351 et seq.): This act extends the provisions of the mineral leasing laws to federally owned mineral deposits on acquired NFS lands and requires the consent of the Secretary of Agriculture prior to leasing.

Multiple Use Mining Act of July 23, 1955 (P.L. 84-167, 69 Stat. 368, as amended, 30 U.S.C § 601 et seq.): This act requires the disposal of common varieties of sand, stone, gravel, pumice, pumicite, and cinders under the provisions of the Materials Act of July 31, 1947, and gives to the Secretary of Agriculture the authority to dispose of these materials. It also provides that rights under any mining claim located under the mining laws are subject to the right of the United States to manage and dispose of surface resources.

Geothermal Steam Act of December 24, 1970 (P.L. 91-581, 84 Stat. 1566, 30 U.S.C. § 1001-1025): This act provides the Secretary of the Interior the authority to lease NFS lands for geothermal steam development, subject to the consent and conditions the Secretary of Agriculture may prescribe.

Mining and Minerals Policy Act of December 31, 1970 (P.L. 91-631, 84 Stat.1876, 30 U.S.C. § 21a): This act states that the continuing policy of the federal government is to foster and encourage private enterprise in the development of economically sound and stable domestic mining and minerals industries and the orderly and economic development of domestic mineral resources.

Federal Coal Leasing Amendments Act of August 4, 1976 (90 Stat. 1083; 30 U.S.C. § 201 et seq.): This act amended the Mineral Lands Leasing Act of February 25, 1920 (para. 3) by specifying that coal leases on NFS lands may be issued only after the consent of the Secretary of Agriculture and adherence to conditions the Secretary may prescribe. The act also provides that no lease shall be issued unless the lands involved in the lease have been included in a comprehensive forest land and resource management plan and the sale is compatible with the Plan. The act authorizes the issuance of a license to conduct exploration for coal.

Federal Land Policy and Management Act of October 21, 1976 (P.L. 94-579, 90 Stat. 2713, 43 U.S.C. § 1701 et seq., 7 U.S.C. § 1212a, 16 U.S.C. § 478a, 1338a): This act defines procedures for the withdrawal of lands from mineral entry. It reserves to the United States the rights to prospect for, mine, and remove the minerals in lands conveyed to others and requires the recordation of claims with the BLM.

Surface Mining Control and Reclamation Act of August 3, 1977 (P.L. 95-87, 91 Stat. 445, 30 U.S.C. § 1201-1328): This act provides for cooperation between the Secretary of the Interior and states in the regulation of surface coal mining. It also restricts or prohibits surface coal mining operations on NFS lands, subject to valid existing rights and compatibility determinations.

Energy Security Act of June 30, 1980 (P.L. 96-294, 94 Stat. 611, 42 U.S.C. § 8855): This act directs the Secretary of Agriculture to process applications for leases and permits to explore, drill,

and develop resources on NFS lands, notwithstanding the current status of the forest land and resource management plan.

National Materials and Minerals Policy, Research and Development Act of October 2, 1980 (94 Stat. 2305; 30 U.S.C. §1601-1605): This act restates congressional intent to promote policies that provide for an adequate and stable supply of materials while considering long-term needs, a healthy environment, and natural resource conservation. The act also requires the Secretary of the Interior to improve the availability and analysis of mineral data in federal land use decision making.

Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. § 181 et seq.): This act expands the authority of the Secretary of Agriculture in the management of oil and gas resources on NFS lands. The BLM cannot issue leases for oil and gas on NFS lands over the objection of the Forest Service. The Forest Service must approve all surface disturbing activities on NFS lands before operations commence.

Federal Cave Resources Protection Act of 1988 (102 Stat. 4546; 16 U.S.C. § 4301-4309): Provides for protection and preservation of caves on federal lands.

Omnibus Parks and Public Lands Management Act of 1996 (P.L. 104-333, 110 Stat. 4093, 16 U.S.C. § 497c): This act automatically withdraws from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral and geothermal leasing all lands located within the boundaries of ski area permits.

Energy Policy Act of 2005 (PL 109-58): Directs federal agencies to undertake efforts to ensure energy efficiency; and the production of secure, affordable, and reliable domestic energy.

Tax Relief and Health Care Act of 2006 Title IV-Sec. 403 (P.L. 109-432: Division C, Title IV, Sec. 403): This act withdraws federal land on the Rocky Mountain Front portion of the Lewis and Clark NF and a small area of the Flathead NF from future location, entry, and patent under the mining laws and disposition under the mineral and geothermal leasing laws.

Omnibus Public Land Management Act of 2009, **Subtitle D Paleontological Resources Preservation Act** (P.L.111-11, 123 STAT. 1172; 16 U.S.C.470aaa to aaa–11): This act provides for the management, collection, protection of paleontological resources. The act authorizes the Secretary to issue such regulations as appropriate to carry out the act.

McKeon National Defense Authorization Act for Fiscal Year 2015 – Sec. 3063 North Fork Watershed Protection Act of Dec. 19, 2014 (P. L. 113-291: 128 Stat. 3828): Subject to valid existing rights, this act withdraws certain Federal Lands in the North Fork withdrawal area from all forms of location, entry, and patent under the mining laws; and disposition under all laws relating to mineral leasing and geothermal leasing.

Executive Orders and Reorganization Plan

Executive Order 13211 issued May 18, 2001: This executive order titled “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use” requires federal agencies to prepare and submit a Statement of Energy Effects to the Office of Management and Budget describing the effects of certain regulatory actions on energy supply distribution, or use.

Executive Order 13212 issued May 18, 2001: This executive order titled “Actions to Expedite Energy-Related Projects” requires federal agencies to take actions, to the extent consistent with

applicable law, to expedite projects that will increase the production, transmission, or conservation of energy.

The Reorganization Plan No. 3 of 1946 (60 Stat. 1097; 5 U.S.C. Appendix): This transferred the functions of the Secretary of Agriculture with respect to permits and leases for hard-rock minerals on acquired Weeks Law land to the Secretary of the Interior. However, Secretary of Agriculture Consent to the issuance of permits or leases is required.

Code of Federal Regulations

36 CFR 228 – Minerals: These regulations set forth rules and procedures governing use of the surface of NFS lands in conjunction with operations authorized by the general mining laws, oil and gas leasing, and mineral material disposal laws.

- Subpart A: Locatable Minerals
- Subpart B: Leasable Minerals (reserved)
- Subpart C: Disposal of Salable Minerals (Mineral Materials)
- Subpart D: Miscellaneous Minerals Provisions
- Subpart E: Oil and Gas Resources

36 CFR 251 – Land Uses

36 CFR Part 290 – Cave Resources Management

36 CFR Part 291 – Paleontological Resources Preservation

43 CFR 2300 – Land Withdrawals

Other regulation, policy, and guidance

Interagency agreements

The Forest Service has entered into interagency agreements with agencies within the U.S. Department of Interior to cooperate and coordinate in the management of federally owned minerals within NFS lands. The principal agreements include the following:

- A November 8, 1946, agreement with the Bureau of Land Management detailing procedures for mineral leases and permits administered under section 402 of the President's Reorganization Plan No. 3 of 1946.
- A May 18, 1957, memorandum of understanding with the Bureau of Land Management describing work procedures for land applications, mining claims, and patents.
- A May 20, 1980, memorandum of understanding with the Bureau of Land Management describing the coordination of activities under the federal coal management program.
- A November 26, 1980, cooperative agreement with the U.S. Geological Survey for operations under solid mineral leases and permits.
- A December 3, 1981, memorandum of understanding with the U.S. Geological Survey and the Bureau of Land Management for the geothermal steam leasing program.

- A December 11, 1989 memorandum of understanding with the Montana Department of Environmental Quality (formerly Department of State Lands) to promote efficiency and effectiveness in administration and regulation of mineral resources.
- A July 31, 1990, memorandum of understanding with the Office of Surface Mining Reclamation and Enforcement describing the management of surface coal mining operations on NFS lands.
- An April 14, 2006 memorandum of understanding between the Department of Interior (Bureau of Land Management) and Department of Agriculture (Forest Service) to establish joint BLM and Forest Service policies and procedures for managing oil and gas leasing and operational activities pursuant to oil and gas leases on NFS lands.
- A February 24, 2012 memorandum of understanding with the Department of Interior for cooperation and coordination in cave and karst resources management.

6.14.3 Key indicators for analysis

The key indicators for energy and mineral resources are the following:

- Locatable minerals – acres available for mineral entry (not withdrawn);
- Leasable minerals – acres available for leasing proposals and proposed no surface occupancy acreages; and
- Salable minerals – acres available for disposal of mineral materials.
- Timing and access restrictions could affect all mineral development.

6.14.4 Methodology and analysis process

The acres that are available for locatable mineral resource development are determined by subtracting the number of acres that are withdrawn from the total number of acres for the affected Forests.

The number of acres that are withdrawn from mineral entry is a matter of record. By law, the Bureau of Land Management keeps official records in the General Land Office.

The number of acres that are available for leasing proposals is determined by subtracting the number of acres that are legally unavailable from the total number of acres on the affected Forests.

Lands which are legally unavailable for leasing include the following:

- Lands withdrawn from mineral leasing by an act of Congress or by an order of the Secretary of the Interior;
- Lands recommended for wilderness allocation by the Secretary of Agriculture;
- Lands designated by statute as wilderness study areas, unless oil and gas leasing is specifically allowed by the statute designating the study area; and
- Lands within areas allocated for wilderness or further planning in Executive Communication 1504.

The number of acres that are available for disposal of mineral materials is determined by subtracting from the total number of acres on the Forests, the number of acres where the Forest Service has proposed closing areas to disposal of mineral materials.

Information sources

The Bureau of Land Management keeps official records on active and closed mining claims on public lands. Current records are kept in the LR2000 database. These records are the source for the documentation of mining claims on the Forests. Published and unpublished mineral resource assessments and maps produced by the Forest Service, Bureau of Land Management, United States Geological Survey and the Montana Bureau of Mines and Geology were reviewed to determine the occurrence potential for minerals, oil and gas, and geothermal resources.

Incomplete and unavailable information

There is no incomplete or unavailable information pertinent to energy and minerals.

Analysis area

The analysis area is the NFS lands within the Kootenai, Helena, Lewis and Clark, and Lolo National Forests.

6.14.5 Affected environment

Helena and Lewis and Clark National Forests

Approximately 850,000 acres (about 86 percent) of the Helena National Forest are open to the locatable mineral development, and about 1 million acres (about 58 percent) of the Lewis and Clark National Forest are open to the location of mining claims. The Helena National Forest has had substantially more mining claim and mining activity than the Lewis and Clark National Forest, because of the differences in geology and occurrence of locatable mineral resources. However, both of the Forests have had historic placer and lode deposit mining, and continue to have this kind of mining activity. Primary mineral deposits that have been developed to date include placer gold, as well as lode deposits of gold, silver, copper, lead, zinc and sapphires.

Most of the current operations are small scale, conducted by 1-2 individuals on a part-time basis. These operations are at a hand scale, small equipment scale, or a mixture of both. Generally these operations individually result in much less than an acre of disturbance on an annual basis. Annually the Forests administer 25-40 small-scale placer mining projects which range from hand scale work to small scale equipment work.

There are eight pending oil and gas leases on the Helena National Forest and 18 suspended oil and gas leases on the Lewis and Clark National Forest. There are 17 current leases on the Helena National Forest totaling about 56,000 acres that are set to expire by 2018 (figure 1-69). There’s been no activity on these leases. Currently, oil and gas leases in the Badger-Two Medicine area are all in suspension or have been withdrawn. There are two applications for permit to drill in the Badger-Two Medicine area. One of the applications for permit to drill was approved after an environmental assessment was completed in 1985 and an environmental impact statement was completed on the same project in 1991.

The agency was subsequently sued on the applications for permit to drill approval decision. The drilling approval and lawsuit were suspended while the Forest Service gathered information and conducted additional analysis. That situation is ongoing although the agency is currently being sued by the lease owner to be able move forward on his applications for permit to drill approval. Figure 1-70 shows the oil and gas occurrence potential for the two forests. The Lewis and Clark National Forest ranges from very low to moderate potential for the occurrence of oil and gas. Most of the Helena National Forest is rated as having a very low potential for the occurrence of oil and gas, but does have moderate potential for about 20 percent of the Forest (Long 1989a-b, 1990a-d). A final

environmental impact statement for oil and gas leasing on the Helena National Forest completed in April of 1995 predicted that any wells drilled on the Forest would not produce any oil or gas (p. E-23).

There is a low potential for the occurrence of geothermal resources on both the Helena National Forest and Lewis and Clark National Forest (Sonderegger and Bergantino (1981)). There is a very low potential for the occurrence of coal or other solid leasable minerals in the two-forest area. Figure 1-71 shows areas of each forest that have moderate to high potential for locatable mineral deposits. Most of the Helena National Forest has moderate to high occurrence potential areas, while only about 25 percent of the Lewis and Clark National Forest has moderate to high occurrence potential.

Salable mineral uses and developed pits are very common on the Jefferson Division of the Lewis and Clark National Forest portion of the plan area. They are largely pits related to road development and maintenance. This is due to the extensive, level 3 road network on the division and distance from commercial sources. The Helena National Forest portion of the plan area has recurring salable minerals uses, but at a much lower level and with very few developed pits.

The plan area has several desirable landscaping stone varieties, including rounded boulders in the Helena area, and red, slabby, quartzite of the Flathead Sandstone in the Little Belts, and in the south Big Belts. So far these sources have not been extensively developed. Annually the plan area issues about 10-20 free use mineral material permits and has about 10 in-service project uses. The average yearly in-service use is about 3,000-5,000 cubic yards combined of mineral material of all types per year. Primary materials used include crushed aggregate, pit run and rip rap.

Salable mineral resources development in the plan area is usually connected to road development activities conducted by the agency. In particular, the Jefferson Division (Little Belts, Castles, Crazies, Highwoods, and Snowies Geographic Areas) has about 80 inventoried material sites that were developed for road base and surfacing materials for the forests' system roads. Inventory results indicate that the pit areas collectively are about 75 acres of disturbance.

Kootenai National Forest (Kootenai National Forest)

A variety of mineral deposit types and mineral resources, including gold, silver, and copper, occur within the boundaries of the Kootenai National Forest. On the Kootenai National Forest, there are about 150,100 acres currently withdrawn from mineral entry, leaving approximately 2,069,900 acres available for locatable mineral resource development.

There are three large scale locatable mineral mining operations at different stages of development and/or permitting.

- Troy Mine — Shut down and moving into reclamation phase.
- Rock Creek Mine — Forest Service in the process of completing a supplemental final environmental impact statement.
- Montanore — Federal and state agencies in the process of completing a supplemental draft environmental impact statement.

Across the Kootenai National Forest there are approximately 27 approved mine plans for various small scale locatable, lode and placer mining operations. The Kootenai National Forest annually receives around 10 to 15 notices of intent per year, which often lead to mining operations requiring plans. Much of the forest is rated as having moderate to high potential for locatable mineral occurrence (see figure 1-71).

No leasable minerals are presently being produced on the Kootenai National Forest, and the anticipated demand for leases is expected to remain low. There is no potential for the occurrence of geothermal resources on the Kootenai National Forest (Sonderegger and Bergantino (1981)). There is low potential for the occurrence of oil and gas on most of the Forest, and moderate potential on a small, eastern portion of the Forest (Long 1997) (see figure 1-70).

About 37,300 acres are under lease(s) on the Kootenai National Forest at this time (see figure 1-69). All leases are currently suspended in accordance with the 1985 court decision of Conner vs. Burford. There are about 127,800 acres that are legally unavailable for mineral leasing, leaving approximately 2,091,200 acres available for mineral leasing.

The primary salable material mined on the Forest is crushed rock used for road surfacing. The demand for quality rock sources is often dependent upon the locations of active management operations and the needs for resource protection. Presently there is an adequate supply of rock sources of suitable quality across the Forest for in-service construction uses. There is a public demand for salable materials predominantly used for construction and landscaping purposes. On average, there are approximately 175 contracts administered annually on the Kootenai National Forest for personal use, public works, or commercial uses. About 1,998,000 acres on the Kootenai National Forest currently allow for the disposal of mineral materials, leaving approximately 221,000 acres closed to mineral material disposal.

Lolo National Forest

There are 158,945 acres withdrawn from mineral entry, leaving 2,237,961 acres open for locatable mineral development. Areas withdrawn from mineral entry include designated wilderness areas and administrative and recreation sites with an investment in facilities. The bulk of the production from small to moderate-sized mines in or near the Lolo National Forest (especially near Superior) has been from lead, silver, and zinc. The recovery of gold constituted only a minor amount of the production from any of these mines. Some areas on the Lolo National Forest have a moderate to high potential for occurrence of locatable minerals (see figure 1-71).

The Lolo National Forest currently administers six active mine plans, two pending mine plans, one pending notice of intent, and five notices of intent sites located on the Missoula, Superior and Ninemile Ranger Districts. Locatable mining activities on the Lolo National Forest are typically small-scale, part-time operations. Gold extraction is the primary aim of operations on Ninemile and Superior Ranger Districts, while finding crystals is the objective on Missoula Ranger District.

The number of recreational forest users who prospect with hand tools is unknown, but judging from the associated surface disturbance, the crystal digging areas on Missoula Ranger District by Lolo Pass seem to get the greatest number of users. On average four notices of intent are received by the Forest each year. There are typically five or fewer authorized mine plans authorized on any given year. There are 33 mineral material sites that are mostly used for road maintenance.

The Lolo National Forest has four leases covering 8,396 acres which were suspended in 1985 following the Connor vs. Burford lawsuit. Most of the Lolo National Forest has low to very low potential for the occurrence of oil and gas, but there is moderate potential on the southeastern part of the forest adjacent to the southern end of the Flathead National Forest (Long 1991, 1997) (see figure 1-70).

Coal bearing units do occur, either at the surface or at depth, west of Missoula near Frenchtown and in the Ninemile valley area. However, there is no potential for development, because the deposits are

not large enough to be economic. There is no potential for the occurrence of coal bed methane. There is no potential for geothermal development (Sonderegger and Bergantino (1981)).

6.14.6 Environmental consequences

Alternative 1 — no action, and alternative 2 — proposed action modified

There would be no further impacts to exploration or development of locatable, leasable and salable minerals, since existing access and acres open to minerals would remain the same under these alternatives, with one exception described below. Grizzly bear conservation measures are already in place and would continue to make any mineral exploration or mining project (including oil and gas) more expensive or costly due to required mitigation actions and monitoring.

Under alternative 1 on the Helena National Forest, no surface occupancy is allowed in management situation 1 within the grizzly bear recovery zone on the Lincoln Ranger District. In management situation 2, no surface occupancy would also applied to overlapping occupied denning and summer habitat. Timing limitations would apply to grizzly bear denning areas in management situation 2 (October 15 to April 15) and spring habitat in management situation (April 1 to June 30). Under alternative 2, there would be no requirements for no surface occupancy, since that was not included in the draft NCDE grizzly bear conservation strategy. Thus alternative 2 may offer more flexibility and lower cost in that portion of the primary conservation area, as compared with alternative 1.

Alternative 3

This alternative would only impact future oil and gas activity in the primary conservation area and management zone 1 areas of the Forests. A no surface occupancy stipulation would be applied in these areas, and make it more difficult and expensive to explore and develop oil and gas resources by prohibiting road and drill pad construction within the primary conservation areas and zone 1 areas on all of the Forests. Oil and gas exploration would become infeasible over much of the primary conservation area and zone 1 acreage on the Helena, Kootenai, Lewis and Clark and Lolo National Forests, which as described above have mostly low to very low potential for occurrence of oil and gas. Exploration and development of locatable and salable minerals would not be affected by a no surface occupancy stipulation applied to leasable minerals.

Only a northwestern portion of the Helena National Forest lies within the proposed primary conservation area and management zone 1 area, most of the Forest would be within management zone 2, so oil and gas leases on most of the Forest would not be affected by the proposed no surface occupancy stipulations for those management areas. The Lewis and Clark National Forest would not be affected by the proposed no surface occupancy stipulations, because the area that’s open for leasing on Forest would be within management zone 3. Most of the Flathead National Forest would be within the primary conservation area, and the remainder within management zone 1. Most of the Kootenai National Forest would be outside of the primary conservation area and management zone 1, but a small area of the Forest adjacent to the Flathead National Forest would be within the primary conservation area. The Lolo National Forest where it’s adjacent to the Flathead National Forest and Helena National Forest would be within the primary conservation area, and a small area south and west of that would be within management zone 1, with the remaining Forest outside of these conservation management areas.

Cumulative effects

Cumulative effects evaluate the potential impacts to mineral resources from the proposed action when combined with past, present, and reasonably foreseeable actions. All lands within the

amendment Forests geographic area boundaries form the geographic scope for cumulative effects. The temporal bound would be the life of the Forest Plans which is estimated to be a 15-year time span.

In order to integrate the contribution of past actions to the cumulative effects of the proposed action and alternatives, existing conditions are used as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior actions that have affected access and might contribute to cumulative effects.

Mineral resources across the Forests are likely to be influenced by a variety of factors, and as described in the affected environment section, there are a number of actions that may occur over the life of the Plan. Requests for approval of small lode and placer mining operations can be expected to continue, but it is not possible to predict how many may be submitted in any given year or how many might be approved. Across the amendment forests, a reduction in access results in a decrease in opportunities to access lands open for mineral development. Past, present, and reasonably foreseeable project level activities within the NCDE are expected to include actions which would improve other resource conditions through road storage and decommissioning activities. This could result in a reduction in opportunities for future mineral exploration and mining projects. No surface occupancy stipulations applied to future oil and gas leases in the primary conservation area and zone 1 areas would increase drilling costs, and in many areas make oil and gas exploration and development infeasible.

6.15 Livestock Grazing

6.15.1 Introduction

Livestock grazing on NFS land is a valuable resource to livestock owners and has been a legitimate use of public lands since the inception of the NFS and has become an import part of the culture of the rural west of the United States. The objectives for Forest Service management of rangelands include managing range vegetation to provide ecosystem diversity, ecosystem and environmental quality while maintaining relationships with livestock owners; meeting the public’s needs for rangeland uses; providing for livestock forage; maintaining wildlife food and habitat; and providing opportunities for economic diversity.

Rangeland management is an essential part of the multiple use strategy used by the Forest Service. Rangelands are primarily managed for forage. Forage is a provisionary service in that, it is a tangible product from an ecosystem that humans use for nutrition, materials, or energy. As a tangible product, forage is managed by the Forest Service to be sustainable, by ensuring that it will be available for future generations while still providing the rangeland’s ecosystem services. To accomplish this, the Forest Service divides rangelands into allotments to monitor, inventory, manage livestock herds and the available forage, and maintain the overall rangeland health. Additionally, the Forest Service manages forage in transitory ranges. Transitory range is defined as forested lands that are suitable for grazing for a limited time following a timber harvest, fire, or other landscape events (Spreitzer (1985)).

Grazing permits are issued to eligible commercial livestock owners to graze livestock within designated allotments. To determine the correct livestock numbers per allotment, or stocking rate, rangeland management uses animal unit months. An animal unit month is the amount of dry forage required by one mature cow of approximately 1,000 pounds or its equivalent, for one month, based on a forage allowance of 26 pounds per day. An animal unit month is also used to help calculate

grazing fees. Recreation visitor livestock and permitted outfitter and guide pack and saddle livestock are not included as commercial livestock.

Livestock grazing management is established through forest plans, allotment management plans, and the Forest Service grazing guidelines. These plans are developed to be comprehensive and utilize public involvement and sound science. Plans are revised and updated to ensure that livestock grazing management decisions are based on existing and future ecological, social, cultural and economic conditions.

6.15.2 Legal and administrative framework

Law and executive orders

Federal law

These federal acts and executive orders, along with other land use laws, executive orders, and polices guide management of rangeland resource and commercial livestock grazing on NFS lands. Other laws pertinent to rangeland management and livestock grazing on NFS lands can be found in Forest Service Manual 2200.

The **Organic Administration Act of 1897** authorizes the President to modify or revoke any instrument creating a National Forest; states that no national forest may be established except to improve and protect the forest within its boundaries, for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States. Authorizes the Secretary of Agriculture to promulgate rules and regulations to regulate the use and occupancy of the national forests.

The **Bankhead-Jones Farm Tenant Act of 1937** directs the Secretary of Agriculture to develop a program of land conservation and utilization to correct maladjustments in land use and thus assist such things as control of soil erosion, reforestation, preservation of natural resources and protection of fish and wildlife.

The **Wild Horse Protection Act of 1959** prohibited the use of a motor vehicle to hunt, for the purpose of capturing or killing, any wild horse, mare, colt, or burro running at large on the public lands. The act also prohibits the pollution of watering holes on public lands for the purposes of trapping, killing, wounding, or maiming any of these animals.

The **Granger-Thye Act of 1950** provides for issuance of term grazing permits for up to 10 years. It also provides for the use of grazing receipts for range improvement work.

The **Multiple-Use Sustained-Yield Act of 1960** provides that national forests are established and administered for several purposes, including livestock grazing. This act also authorizes the Secretary of Agriculture to develop the surface renewable resources of national forests for multiple use and sustained yield of the services and products to be obtained from these lands, without impairment of the productivity of the land.

The **Wilderness Act of 1964** provides that livestock grazing, and the activities and facilities needed to support it, are allowed to continue in wilderness areas when such grazing was established before designation.

The **National Historic Preservation Act of 1966** secures protection of archaeological resources and sites on public and Native American Indian lands.

The **National Environmental Policy Act of January 1, 1970,** directs all federal agencies to consider and report the potential environmental impacts of proposed federal actions. The act also, and established the Council on Environmental Quality.

The **Clean Water Act of 1972** sets the basic structure for regulating discharges of pollutants to waters of the United States.

The **Endangered Species Act of 1973** protects animal and plant species currently in danger of extinction (endangered) and those that may become endangered in the foreseeable future (threatened). The act provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend, both through federal action and by encouraging the establishment of state programs.

The **Forest and Rangeland Renewable Resource Planning Act of 1974** directs the Secretary of Agriculture to develop a process for the revision of NFS land and resource management plans, including the identification of the suitability of lands for resource management.

The **Federal Land Policy and Management Act of 1976** states that public lands will be managed in a manner that will provide food and habitat for fish, wildlife, and domestic animals.

The **Public Rangelands Improvement Act of 1978** recognizes the need to correct unsatisfactory conditions on public rangelands by increasing funding for maintenance and management of these lands.

The **Rescission Act of 1995** directs the Forest Service to complete site-specific National Environmental Policy Act analyses and decisions on allotments on a scheduled basis.

Executive orders

The **Secretary's Administrative Order of August 1963** provides the administration of Lands under Title III of the Bankhead-Jones Farm Tenant Act; establishment of national grasslands.

Other regulation, policy, and guidance

The following regulations and policies have been passed in support of these laws previously presented:

Departmental Regulation, Number 9500-5, dated December 15, 1983, subject: Policy on Range.

National Grasslands Management - A Primer (1997) identifies and interprets the laws and regulations applicable to the administration of the national grasslands.

36 CFR Chapter II, Forest Service, Department of Agriculture:

- 219 Planning
- 222 Range Management
- 241 Fish and Wildlife

Forest Service Rangeland Management Directives, including the following Rangeland Management manuals and handbooks:

- Forest Service Manual 2200 – this manual summarizes laws and regulations governing rangeland management and forest planning.

- Forest Service Handbook 2209.13 – Grazing Permit Administration Handbook
- Forest Service Manual 2600 – this manual summarizes laws and regulations governing fish and wildlife.
- Forest Service Handbook 2609.13 – Wildlife and Fisheries Program Management Handbook

Other agreements and plans

The following agreements and plans also support the Forest Service's rangeland management program:

Memoranda of understanding for forage reserves. Forage reserves are allotments under a term grazing permit but may be utilized by other permittees that have been temporarily displaced due to wild or prescribed fire, drought, or other situations that have made forage available.

Non-use for resource protection agreements. These agreements may be entered into to provide long-term non-use needed to address recovery of rangeland resource conditions, provide forage on a temporary basis to allow resource recovery on other grazing units, provide temporary resolution of conflicts created by predation on livestock, or provide supplemental forage in times of drought to assist area livestock operators and lessen the resource impacts of grazing.

Allotment management plans. Developed through site-specific environmental analysis, an allotment management plan uses forest plan direction and current issues to determine desired conditions and a broad strategy on how to meet desired conditions. These plans describe site-specific grazing strategies, stocking, structural and non-structural range improvement needs, and coordination with other resources.

6.15.3 Key indicators for analysis

The key indicators for livestock grazing are shown in the following list:

- Indicators for livestock grazing within the national forest are listed below permitted use; measured as the acres of NFS land in active grazing allotments.
- Forage, via suitability and utilization for cattle; measured as animal unit months of cattle grazing.
- Forage via suitability and utilization for sheep; measured as animal unit months of sheep grazing.

Methodology and analysis process

All alternatives include management standards and guidelines that describe actions that may, or may not, impact the management of grazing livestock within the forest. For the purpose of this analysis each proposed action is evaluated using one or more of the key indicators to determine the overall impact to livestock grazing within NFS land. The impact from each action will be compared to the current conditions to develop a baseline to which the alternative will be compared.

The analysis area for rangelands and allotments will vary by alternative, but includes the NFS lands in the grizzly bear primary conservation area and zone 1.

The National Forest Management Act of 1976 requires the identification of the suitability of lands for resource management. An analysis to determine lands capable of producing forage and suitable for grazing livestock was completed as part of the forest plan revision. Although an area may be

deemed capable and suitable for use by livestock in the revised forest plan, a project-level analysis evaluating the site-specific impacts of the grazing activity, is required to authorize and dictate the management of livestock grazing in a specific allotment.

When possible, using GIS acres from a respective management area is used to quantify the impact. For example, if there are less acres available in a management zone for sheep grazing under alternative 2 than the defined baseline, than it is assumed livestock grazing would be more negatively impacted in that alternative than the baseline.

For analysis purposes, when the degree of impact cannot be quantified, a qualitative assessment is used based on professional judgment and when possible in conjunction with available acreage data.

Assumptions

With all quantitative and qualitative analysis, the following assumptions are used to determine the degree of impacts to livestock grazing. These assumptions are based on previous assessments, professional judgment, and Forest Service Range Management Directives.

- Livestock and native herbivores that use rangelands can remove plant material, trample soils, and alter water flow patterns. However, with proper management these impacts are insignificant when compared with the natural resilience of ecosystems (Holling 1973). Therefore, for the purpose of this analysis, livestock grazing is not considered a surface-disturbing activity.
- Livestock grazing would be managed to meet specific standards and guidelines for rangeland health, including riparian standards and guidelines. In addition, range improvements would be used to meet standards and guidelines for rangeland health and achieve rangeland management goals.
- The type of grazing in each allotment would remain the same. Additionally, the animal unit months for each allotment is not expected to increase, and remain at relatively the current levels.
- Impacts on livestock grazing are generally the result of activities that affect forage levels or the limiting of access to designated allotments such that livestock could no longer use rangelands.
- Effects are expected to be consistent among alternatives.
- Grazing allotments would remain open as long as there continues to be demand. If there is a permittee willing to vacate their allotment it can be closed and the permit can be terminated, to reduce the potential risk of grizzly bear-humans conflicts. The decision to close an allotment and terminate a permit may be based on the demand for permitted use and utilization of forage, or if the land is dedicated to another purpose.

Limitations

The livestock grazing analysis is limited to the active allotments within the primary conservation area and zone 1; that is, allotments within the Kootenai National Forest, Helena National Forest, Lolo National Forest, and Lewis and Clark National Forest. Livestock grazing outside existing allotments, including rangelands available to pack stock and transitory range, is included in the analysis; however, this is discussed as a qualitative assessment.

Information sources

Information sources include literature, records, and documentation review and information from Forest Service range program assessments and information from Forest Service range program managers.

Incomplete and unavailable information

Information sources used contained sufficient information to complete this analysis. Project-level analysis may require site-specific data to conduct an impact analysis.

Analysis area

The analysis area includes rangeland within active allotments on Forest Service land within the Kootenai National Forest, Helena National Forest, Lolo National Forest, Lolo National Forest, and Lewis and Clark National Forest (overview, figure 1-56). For the purposes of the cumulative effects analysis, properties adjacent to the Flathead National Forest are considered in respect to the associated permit-holding ranch operations and potential impacts to open space.

6.15.4 Affected environment

Historically, livestock grazing has occurred on the many range allotments on Forest lands within the primary conservation area and associated zones. However, because of the decline in livestock grazing industry in the area and a decrease in areas of suitable range, the overall range allotment use has decreased from historical highs. With a decline in grazing, active allotments are administratively closed when they are no longer being used by the user.

Active allotments represent the current grazing activity within the forests. Grazing allotments that are not active, are considered closed as livestock grazing in these allotments are not likely to continue because of the lack of demand for their use. Currently there are 65 active livestock grazing allotments inside the primary conservation area and zone 1 (65 cattle and 3 sheep) (acres shown in table 28; animal unit months shown in table 29). The Helena, Kootenai, Lewis and Clark, and Lolo National Forests currently have 58 range allotments within the primary conservation area and zone 1. Allotments in zones 2 and 3 are not analyzed because there will be no change in management direction for those zones. The primary conservation area contains 32 active allotments consisting of 219,235 acres that support approximately 156,493 animal unit months. Figure 1-55b shows the livestock grazing allotments inside the primary conservation area and zone 1.

Allotment acres were calculated by GIS and may not exactly match actual allotment acres or those acres within the allotment that are suitable for grazing. Even though some allotments contain very small amounts of suitable acres, grazing may still be occurring based on site-specific conditions not covered in this analysis. Changes to suitability may occur at the project-scale, using site-specific data.

Based on the definition of the primary conservation area, grazing allotments within the primary conservation area are more likely to experience higher densities of grizzly bears. Zone 1 allotments are expected to currently have lower densities of bears than inside the primary conservation area. Zones 2 and 3 are adjacent to zone 1 and are expected to have the lowest density of grizzly bears.

Grizzly bear-livestock conflicts

There is a potential for grizzly bear-livestock conflicts to occur with grizzly bear habitat and livestock operations on or adjacent to forest lands. Many reported conflicts are associated with livestock operations, either with sheep or young cattle (Wilson et al. 2005). Most livestock related grizzly bear/livestock conflicts occur on private lands or on the Blackfeet Indian Reservation along the Rocky Mountain Front, east of the Continental Divide. Of the 290 human-caused grizzly bear mortalities in the NCDE between 1998 and 2011, 21 of them (7 percent) were from livestock predations. The low incidence of grizzly bear mortalities due to livestock conflicts on NFS lands can be attributed to regulations and practices used to minimize grizzly bear-livestock conflicts.

Grizzly bear-sheep conflicts

There are 33 active allotments within the primary conservation area. Of these allotments, one is stocked with sheep, the Keep Cool Liverpool. There are 35 active allotments within zone 1; of these allotments, two are stocked with sheep, the Canyon Creek Sandborn, and the Horsefly. All of the sheep allotments are located on the Helena National Forest.

To mitigate for potential grizzly bear-livestock conflicts, as they relate to sheep grazing, a number of practices and regulations are used to minimize conflicts. Practices include the reduction of possible bear attractants near grazing sheep herds and an allotment/pasture as a whole. These measures include the reporting and removal of livestock carcasses immediately upon discovery, the removal of boneyards within allotments, use of bear-resistant food storage for all livestock food. The sheep on the Keep Cool Liverpool allotment are never bedded down at night on the national forest, but return to private land at night. Further practices include the reduction and minimization of poor or inadequate livestock management practices that would attract bears or cause a conflict.

Current condition, resource indicators, for permitted use

There are 463,452 acres of NFS land identified as part of active grazing allotments within the primary conservation area and zone 1 within the Kootenai National Forest, Lolo National Forest, Lewis and Clark National Forest, and Helena National Forest (table 38).

Table 38. Livestock grazing, allotments and acreage within each national forest, the primary conservation area, and zone 1

Forest	Active Allotments	Acres of Active Allotments	Acres of Active Cattle Allotments (# of Allotments)	Acres of Active Sheep Allotments (# of Allotments)	Acres of Active Cattle Allotments in PCA (# of Allotments)	Acres of Active Sheep Allotments in PCA (# of Allotments	Acres of Active Cattle Allotments in Zone 1 (# of Allotments)	Acres of Active Sheep Allotments in Zone 1 (# of Allotments
Flathead[1]	7	72,540	72,540 (7)	0	33,460 (3)	0 (0)	39,080 (4)	0 (0)
Helena	77	473,107	456,741 (74)	16,336 (3)	16,000 (3)	8,534 (1)	55,349 (11)	7,800 (2)
Kootenai	17	245,373	245,373 (17)	0 (0)	5,400 (1)	0 (0)	187,942 (12)	0 (0)
Lewis and Clark	148	746,313	746,313 (148)	0 (0)	153,801 (23)	0 (0)	0 (0)	0 (0)
Lolo	13	127,297	127,297 (13)	0 (0)	2,040 (1)	0 (0)	26,586 (4)	0 (0)
Total Amendment forests	255	1,592,090	1,575724 (252)	16,336 (3)	177,241 (28)	8543 (1)	269,877 (27)	7,800 (2)
Total all forests	262	1,664,630	1,648,264 (259)	16,336 (3)	210,701 (31)	8,534 (1)	308,957 (31)	7,800 (2)

1 Inclusion of the Flathead National Forest is for cumulative effects discussion. See Volume 1 for a detailed discussion of livestock grazing on the Flathead National Forest.

Table 39. Total animal unit months of active permits for each national forest, the primary conservation area, and zone 1

Forest	Active Allotments	Sheep Animal Unit Months (AUM) of Active Allotments	Total Cattle AUMs of Active Allotments	Total Cattle Animal Unit Months of Active Allotments in PCA	Total Sheep AUM Months of Active Allotments in PCA	Total Cattle AUM of Active Allotments in Zone 1	Total Sheep AUM of Active Allotments in Zone 1
Flathead[1]	7	0	1,078	497	0	587	0
Helena	77	820	41,906	1585	133	3,031	687
Kootenai	17	0	4,887	442	0	3,097	0
Lewis and Clark	148	0	79,270	153,801	0	0	0
Lolo	13	0	3,018	35	0	331	0
Total Amendment forests	255	820	129,081	155,863	133	6,459	687
Total all forests	262	820	130,159	156,360	133	7,046	687

1. Inclusion of the Flathead National Forest is for cumulative effects discussion. See Volume 1 for a detailed discussion of livestock grazing on the Flathead National Forest.

Table 40. Current conditions for permitted use and suitability and utilization

Resource Element	Resource Indicator	Measure	Existing Condition (Alternative 1)
Use	Permitted use	Acres and percentage of active allotments in the PCA and zone 1	463,452 acres
Forage	Suitability and utilization	Sheep animal unit months/available forage in the PCA and zone 1	820 sheep animal unit months
Forage	Suitability and utilization	Cattle animal unit months/available forage in the PCA and zone 1	162,322 cattle animal unit months

There are 58 active allotments within the four forests. The majority of livestock grazing occurs on the Lewis and Clark and Helena National Forests (table 38, figure 1-55b). Within the primary conservation area, these forests represent the majority of grazing livestock. Within zone 1, the Kootenai National Forest has the majority of acres that are grazed.

Current condition, resource indicators, for suitability and utilization

There are 163,122 animal unit months on all active grazing allotments within the primary conservation area and zone 1 within the Kootenai National Forest, Lolo National Forest, Lewis and Clark National Forest, and Helena National Forest (table 39). Table 40 provides a summary of the sheep and cattle animal unit months in active allotments.

The majority of cattle animal unit months occur on the Lewis and Clark National Forest (table 39). Within the primary conservation area, these forests represent the majority of grazing cattle. Within zone 1, the Kootenai National Forest has the majority of available cattle animal unit months.

The majority of sheep animal unit months occur on the Helena National Forest (table 39). Within the primary conservation area and zone 1, the Helena National Forest is the only forest with active sheep allotments.

6.15.5 Environmental consequences

These sections describe the effects of implementation of the action alternatives to livestock grazing. The action alternatives are described in chapter 4. Effects are analyzed in relation to the no action alternative. Each alternative would have a varying effect on livestock grazing. Grazing use is managed similarly in all alternatives. The standards and guidelines are designed to protect upland and riparian resources, manage noxious weeds, and manage grazing allotments in accordance with the NCDE GBCS in all action alternatives. A discussion of the social and economic impacts to livestock grazing can be found in the social and economic sections.

Alternative 1 — no action

Helena National Forest

The Helena National Forest would continue to graze livestock on the permitted 77 allotments. Rangeland management would continue to issuing permits and managing allotments per the current forest plans and allotment plans.

There are three active sheep allotments and animal unit months within the primary conservation area and zone 1. The Interagency Grizzly Bear Committee guidelines that reduce livestock impacts to important grizzly bear habitats and assist in the management of grizzly bear-livestock conflict

situations. Finally, to reduce potential conflicts into the future, there will be no increases in the number of sheep allotments within the primary conservation area or increases in permitted sheep animal unit months.

Special provisions may be included in existing livestock grazing permits, including the three active sheep allotments, that requires proper storage of food, carcass removal, and bringing in livestock at night, all to limit grizzly bear-livestock conflicts.

The potential for impacts associated with livestock grazing on the Helena National Forest is expected to be moderate to low because of the existing regulations and guidance to reduce potential grizzly bear-livestock conflicts. Continued implementation of management direction under the no-action alternative regarding livestock grazing is expected to be compatible with sustaining a recovered population of grizzly bears in the NCDE. However, the risk of conflicts is higher on the Helena National Forest because of the existing sheep allotments.

Lewis and Clark National Forest

The Lewis and Clark National Forest would continue to graze livestock on the permitted 148 allotments. Rangeland management would continue to issuing permits and managing allotments per the current forest plans and allotment plans.

The Forest's existing Forest Plan includes a forestwide standard that requires that grazing, which affects grizzly bears and/or their habitat, will be made compatible with grizzly needs or such uses will be disallowed or eliminated. In addition, Forest Plan appendix I, Interagency Wildlife Management Guidelines, provides the following grizzly bear management guide1ines specifically oriented toward 1ivestock grazing:

- Livestock grazing on important spring habitat for grizzly bears should be deferred until after July 1.
- Boneyards and livestock dumps are prevalent along the east front and are frequented by grizzly bears. Ranchers and landowners should be encouraged to place carcasses of dead livestock and garbage on remote areas of their land. Dead cows and calves should be hauled a considerable distance from calving grounds to discourage bears from feeding on carrion and newborn calves.
- Sheep grazing allotments in management situation 1, as defined in the Yellowstone Guidelines, on lands administered by government agencies should be eliminated.
- In riparian habits that receive high amounts of bear use, fencing to exclude livestock grazing and trampling may be necessary where livestock turn-out dates-prior to July 1 are allowed.

There are 21 cattle grazing allotments, but no sheep grazing allotments, within the recovery zone on the Lewis and Clark National Forest. Current grazing allotments and intensity of use would continue under the no-action alternative.

Under the no-action alternative, livestock grazing would not be anticipated to displace grizzly bears or negatively impact important bear food production areas. Based on the lack of sheep allotments and no recent history of conflicts, the potential for impacts associated with livestock grazing on the Lewis and Clark National Forest is expected to be low. Continued implementation of management direction under the no-action alternative regarding livestock grazing is expected to be compatible with sustaining a recovered population of grizzly bears in the NCDE.

Kootenai National Forest

The Kootenai National Forest would continue to graze livestock on the permitted 17 allotments. Rangeland management would continue to issuing permits and managing allotments in accordance with the current forest plans and allotment plans.

There is one cattle grazing allotment on 4,880 acres in in the NCDE recovery zone. Eleven allotments overlap the area outside the recovery zone in the Tobacco bears-outside-the-recovery-zone polygon. There have been no grizzly bear-livestock conflicts associated with allotments on the Kootenai National Forest.

The revised forest plan includes measures to address potential mortality risks to bears associated with livestock grazing. Few acres are subject to livestock grazing, existing allotments are not expected to increase, and there is no history of grizzly bear-human conflicts and management actions in these subunits related to grazing. Food storage and sanitation orders in effect on the Kootenai National Forest also help to minimize the potential for attractant-related human-caused grizzly bear mortality. In its biological opinion, USFWS (2013) concluded that implementation of the revised forest plan direction related to livestock grazing would not be expected to result in habituation of grizzly bears leading to conflicts in the NCDE subunits.

Based on the few acres subject to livestock grazing in the primary conservation area and the lack of history of grizzly bear and livestock conflicts, the potential for impacts associated with livestock grazing on the Kootenai National Forest appears to be low. Continued implementation of management direction under the no-action alternative regarding livestock grazing is expected to be compatible with sustaining a recovered population of grizzly bears in the NCDE.

Lolo National Forest

The Lolo National Forest would continue to graze livestock on the permitted 13 allotments. Rangeland management would continue to issuing permits and managing allotments per the current forest plans and allotment plans.

There is one cattle grazing allotment in the NCDE recovery zone and no sheep grazing allotments. There have been no grizzly bear-livestock conflicts associated with allotments on the Lolo National Forest.

Based on the few acres subject to livestock grazing in the primary conservation area and the lack of history of grizzly bear and livestock conflicts, the potential for impacts associated with livestock grazing on the Lolo National Forest appears to be low. Continued implementation of management direction under the no-action alternative regarding livestock grazing is expected to be compatible with sustaining a recovered population of grizzly bears in the NCDE.

Alternatives 2 — proposed action modified

Helena National Forest

The Helena National Forest would continue to graze livestock on the permitted allotments inside the recovery zone. Rangeland management would continue to issue permits and manage allotments in a way to minimize the risk of grizzly bear-livestock conflicts. To minimize the risk of grizzly bear-livestock conflicts, allotments that are no longer in use would be closed, and there would be requirements to immediately report and remove livestock carcasses, keep livestock out of bear food production areas, and minimize bear attractants from livestock grazing operations.

Potential impacts associated with livestock grazing on the Helena National Forest are expected to be moderate to low because of the standards and guidelines aimed at avoiding or minimizing potential grizzly bear-livestock conflicts.

This management direction is expected to reduce grazing opportunities within the primary conservation area because:

- grazing permits in non-use status would not be able to increase animal unit months when returning to use (NCDE-STD-GRZ-02),
- there would be no increase in the number of active sheep or cattle allotments above the current condition (NCDE-STD-GRZ-04, NCDE-STD-GRZ-05),
- sheep and cattle grazing allotments would be closed if an opportunity arises with willing permittees (NCDE-GDL-GRZ-01, NCDE-GDL-GRZ-02), and
- allotment management plans would limit access of livestock in bear food production areas (NCDE-GDL-GRZ-03).

Under this alternative, management direction would reduce permitted use of grazing sheep and cattle within the primary conservation area more than the no-action alternative. Furthermore, under this alternative, sheep grazing animal unit months would not increase beyond the existing levels.

Lewis and Clark, Kootenai, and Lolo National Forests

The Lewis and Clark National Forest would continue to graze livestock on the permitted allotments in the primary conservation area. Rangeland management would continue to issuing permits and managing allotments in a way to minimize the risk of grizzly bear-livestock conflicts. To minimize the risk of grizzly bear-livestock conflicts range management would close allotments that are no longer in use, immediately report and remove livestock carcasses, keep livestock out of bear food production areas, and minimize bear attractants from livestock grazing operations.

Potential impacts associated with livestock grazing on the Lewis and Clark National Forest is expected to be moderate to low.

Under alternative 2, the management direction is expected to reduce grazing opportunities within the primary conservation area because:

- grazing permits in non-use status would not be able to increase animal unit months when returning to use (NCDE-STD-GRZ-02),
- there would be no increase in the number of active cattle allotments above the current condition (NCDE-STD-GRZ-05),
- cattle grazing allotments would be closed if an opportunity arises with willing permittees (NCDE-GDL-GRZ-01), and
- allotment management plans would limit access of livestock in bear food production areas (NCDE-GDL-GRZ-03).

Under this alternative management direction would reduce permitted use of grazing cattle within the primary conservation area more than the no-action alternative. On these national forests, there are no active sheep grazing allotments within the primary conservation area to be affected.

Alternative 3

Helena National Forest

The management direction under this alternative is the same as alternative 2, except that most of the standards and guidelines would apply not only to the primary conservation area, but also to zone 1 including the demographic connectivity area. Within the primary conservation area, sheep grazing allotments would be closed if the opportunity arises, with a willing permittee, to reduce grizzly bear/livestock conflicts (NCDE-STD-GRZ-07). The effects of implementation of this alternative would be the same as alternative 2 in the primary conservation area, but also would allow no net increase above the baseline in the number of cattle allotments in zone 1. Additionally, no increase in animal unit months of sheep would be allowed.

Lewis and Clark National Forest

The management direction under this alternative is the same as alternative 2, with the exception that management actions would also be extended to zone 1, of which there are only 8 acres on the Lewis and Clark NF. The effects of implementation of this alternative would be the same as alternative 2 in the primary conservation area, with no measurable difference in zone 1 as compared to both the no-action alternative and alternative 2.

Kootenai National Forest

The management direction under this alternative is the same as alternative 2 in the primary conservation area, with additional restrictions in zone 1.

Lolo National Forest

The management direction under this alternative is the same as alternative 2 in the primary conservation area, with additional restrictions in zone 1. The effects of implementation of this alternative would be the same as alternative 2 in the primary conservation area and zone 1 would be more than the no-action alternative.

Cumulative effects

Spatial and temporal context for effects analysis

The spatial boundaries for analyzing the cumulative effects to livestock grazing are the active grazing allotments within the NCDE, and all the amendment forests, including the Flathead National Forest, because these are the most likely locations for potential grizzly bear-livestock conflicts on public land. Grizzly bear-livestock conflicts may occur outside of these areas for a variety of reasons, including livestock attractants, such as carcasses. These conflicts would not limit permitted use of grazing allotments or the suitability and utilization of available forage. The temporal boundaries begin at the baseline year (2011) to the present because it establishes a reference point from which to establish animal unit months and permitted use for grazing allotments that can be used in implementation of proposed standards and guidelines.

Past, present, and reasonably foreseeable activities relevant to cumulative effects analysis

Approximately 7 percent (21 of 290) of all human-caused grizzly bear mortalities in the NCDE between 1998 and 2011 were attributed to management removal actions associated with livestock depredations. This type of human-caused mortality is the main impact to grizzly bears in the NCDE associated with livestock. Most livestock-related grizzly bear mortalities occur on private lands or on the Blackfeet Indian Reservation along the Rocky Mountain Front, east of the Continental Divide. The primary conservation area in this area extends up to 18.5 miles east of federal management

boundaries and includes large areas of private ranchlands and tribal grazing allotments. Indirect impacts on grizzly bears attributed to attractants can be effectively minimized with requirements to securely store and/or promptly remove attractants associated with livestock operations (e.g., livestock carcasses, livestock feed). Current levels of grazing intensity in forested environments are not displacing grizzly bears in significant ways and are not likely to affect vegetation structure enough to result in direct competition for forage species on public lands within the NCDE, as evidenced by the increasing population trend in the NCDE.

In the NCDE, most livestock depredations by grizzly bears occur on sheep or young cattle. While grizzly bears frequently coexist with large livestock (i.e., adult cattle) without preying on them, when grizzly bears encounter smaller animals such as calves, domestic sheep, goats, or chickens, they will often attack and kill them (Orme and Williams 1986, Northrup et al. 2012). Honeybees, which are classified as livestock in Montana (Montana Code Annotated 15-24-921), can also be attractants to some grizzly bears. If repeated depredations occur, managers may relocate bears or remove them from the population. As such, areas with domestic livestock have the potential to become population sinks (Knight et al. 1988). Because of the increased risk to grizzly bears posed by actions taken to protect sheep and other small livestock, these types of allotments are placed outside of grizzly bear habitat where possible.

In contrast, there are a number of permitted grazing operations for horses and mules in the NCDE, primarily on NFS land and generally associated with outfitter and guide operations or Forest Service administrative use. There is no evidence of conflict with bears resulting from attractants, depredation, or forage competition related to horse and mule use under these permits.

Furthermore, it would be illegal for a member of the public to kill a grizzly bear to protect livestock unless it is “in the act” of attacking or killing livestock, as evidenced by an injured or dead animal.

Effects determination

Technically, there likely would be an effect to sheep and cattle grazing operations for the length of the proposed amendment within the primary conservation area and zone 1 of the NCDE because of the formal acceptance and implementation of the proposed standards and guidelines (e.g., removal of carcasses, bringing in livestock at night, food storage orders) designed to reduce potential grizzly bear-livestock conflicts. The substantial change is that these standards and guidelines also would address closing allotments that are no longer in use, not permit new livestock grazing allotments, and not increase permitted animal unit months within current sheep grazing allotments. However, current livestock grazing practices within the NCDE (e.g., removal of carcasses, bringing livestock in at night, food storage orders) are already in place via previously applied orders and are already compatible with NCDE habitat standards and mitigation for reducing grizzly bear-livestock conflicts. It is likely that effects would only adversely impact livestock grazing when increased permitted use is desired. Overall, effects beneficially impact livestock grazing through the reduction of grizzly bear-livestock (and indirectly grizzly bear-human) conflicts.

6.16 Heritage Resources

6.16.1 Introduction

Heritage resources include Cultural Resource and American Indian Rights and Interests. Both topics are presented within the Heritage section.

6.16.2 Cultural resources

Cultural resources are defined by the National Historic Preservation Act and by Forest Service Manual 2200, section 2360 as: an object or definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, or archaeological sites, structures, places, or objects and traditional cultural properties.

Historic properties include cultural sites that reflect past use of the area, having value as defined by the National Register of Historic Places (also known as National Register and Register) Criteria for Eligibility for their: association with important events, association with important people in our history, distinctive historical or architectural style, and potential to provide information about the past. A property can be eligible under one or more of these criteria, and generally are at least 50 years old.

The process includes identifying historic properties through field inventory, evaluating sites for potential inclusion to the Register, and then selecting sites to formally nominate to the Register. Through this process, current and potential impacts to eligible properties are identified and protection measures designed and implemented.

Cultural resources include the entire spectrum of resources for which the Forest Service's Heritage Program is responsible for from artifacts to cultural landscapes without regard to eligibility for listing in the National Register of Historic Places (Forest Service Manual 2360).

6.16.3 Legal and administrative framework

National Historic Preservation Act of 1966 (public laws 89-665, as amended, 91-423, 94-422, 94-458 and 96-515)

Section 106: Requires each agency to take into account the effects of its actions on historic properties, prior to approving expenditure of federal funds on an undertaking or prior to issuing any license. Furthermore, an agency must afford the Advisory Council on Historic Preservation (an independent federal agency created by the National Historic Preservation Act) an opportunity to comment on any of the agency's undertaking that could affect historic properties.

36 CFR 800: Provides explicit direction for the identification of sites, the determination of project effects on sites, requirements for consultation with state historic preservation officers, and the Advisory Council on Historic Preservation; and how to develop agreements.

Section 101(a) (8): Gives the Secretary of Interior the responsibility and authority to assess "significant threats" to properties included in, or eligible for inclusion on, the National Register in order to: determine the kinds of properties that may be threatened; ascertain the causes of the threats; and develop and submit to the President and Congress recommendations for appropriate action.

Section 110 (a) (2) (A): Directs federal agencies to establish "a preservation program for the identification, evaluation, and nomination to the National Register of Historic Places, and protection of historic properties" to "ensure that such properties under the jurisdiction or control of the agency are identified, evaluated, and nominated to the National Register." This would require development of a schedule for the identification, evaluation, and nomination of unrecorded sites.

36 CFR 79: Establishes standards, procedures, and guidelines to be followed by federal agencies to preserve collections of prehistoric and historic material remains and associated records that are

recovered in conjunction with federal projects and programs under certain federal statutes. This action should ensure that federally-owned and administered collections of prehistoric and historic materials remains and associated records are deposited in repositories that have the capability to provide adequate long-term curatorial services.

36 CFR 60: Sets forth basic procedures of evaluation and nomination of sites to the National Register of Historic Places, procedures for the operations of state historic preservation officers, and minimum qualification standards for cultural resource professionals.

36 CFR 219.24: Provides guidance for addressing cultural and historic sites in forest plans. Forest planning shall provide for the identification, protection, interpretation, and management of significant cultural resources on NFS lands. Forest planning shall provide an overview of known data relevant to history, ethnography, and prehistory of the area under consideration: including known cultural resource sites; identify areas requiring more intensive inventory; providing for evaluation and identification of appropriate sites for the National Register of Historic Places; providing for establishing measures for the protection of significant cultural resources from vandalism and other human depredation, and natural destruction; identifying the need for maintenance of historic sites on, or eligible for inclusion in the National Register; and identifying opportunities for interpretation of cultural resources for the education and enjoyment of the American Public.

Executive Order 11593 of 1971, Protection and Enhancement of the Cultural Environment, states that the federal government will provide leadership on preserving, restoring, and maintaining the historic and cultural environment of the Nation. Directs federal agencies through federal plans and programs to preserve cultural resources, contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historic, architectural, or archaeological significance. It orders federal agencies to locate, inventory, and nominate to the National Register all properties under their control or jurisdiction that meets the criteria for nomination. It also directs federal agencies to exercise caution during the interim period to ensure cultural resources under their control are not inadvertently damaged, destroyed, or transferred.

Archaeological Resources Protection Act of 1979 (public laws 96-95 and 36 CFR Part 7 Section 2a): The Congress finds:

- Archaeological resources on public lands and Indian lands are an accessible and irreplaceable part of the Nation's heritage;
- These resources are increasingly endangered because of their commercial attractiveness;
- Existing federal laws do not provide adequate protection to prevent the loss and destruction of these archaeological resources and sites resulting from uncontrolled excavations and pillage; and
- There is a wealth of archaeological information which has been legally obtained by private individuals for noncommercial purposes and which could voluntarily be made available to professional archaeologists and institutions.

Section 470ii (c): States that "Each federal land manager shall establish a program to increase public awareness of the significance of the archaeological resources located on public lands and Indian lands and the need to protect such resources." It further directs that an annual report of such progress will be submitted to Congress. Section 470mm: Directs federal agencies to:

- ♦ Develop plans for surveying lands under their control to determine the nature and extent of archaeological resources on those lands;

- Prepare a schedule for surveying lands that are likely to contain the most scientifically valuable archaeological resources; and
- Develop documents for the report of suspected violations of this act and establish when and how those documents are to be completed by officers, employees, and agents of their respective agencies.

Native American Graves Protection and Repatriation Act of 1990 (public law 101-601, 25 United States Code 3001-3013) and Regulations 43 CFR Part 10: Addresses the rights of lineal descendants and members of Indian tribes, Alaska Native and native Hawaiian organizations to certain human remains and precisely defined cultural items. It covers items currently in federal repositories as well as future discoveries. The law requires federal agencies and museums to provide an inventory and summary of human remains and associative funerary objects. The law also provides for criminal penalties in the illegal trafficking in Native American human remains and cultural items.

Executive Order 13287 of 2000, Preserve America: Reinforces the federal government policy for "protection and enhancement of America's historic treasures, and to recognize and treat cultural resources as assets. Federal agencies shall advance this policy through the protection of, continued use of, and reinvestment in, the federal government's historic buildings and sites and by conforming to the highest standards of care for, and consideration of, the unique cultural heritage of communities, and of the Nation." Each agency is directed to: (a) review its regulations, management policies, and general operating procedures for compliance with Section 110 of the National Historic Preservation Act, and (b) develop annual goals and measures as part of their compliance with the Government Performance and Results Act (P.L. 103-62) and report annually on the protection of historic and archeological properties within its care. The order also encourages the formation of partnerships with Indian tribes, state and local governments, and the private sector to promote public understanding of the preservation and use of historic properties.

Executive Order 13007, 1996 (Indian Sacred Sites): Directs federal agencies to the extent practicable, accommodate access to and ceremonial use of, sacred sites by Indian religious practitioners while avoiding adversely affecting the sites and maintaining the confidentiality of the sites.

6.16.4 Key indicators for analysis

Ground disturbance is a key consideration when determining impacts to cultural resources as ground disturbance may totally or partially expose properties. Adverse impacts to cultural resources can be further exacerbated by interactions with fire, weather events, human actions, and environmental change. The following key indicators were used to measure differences among the alternatives for cultural resources:

- Ground disturbance: Degree of activity or natural condition that poses potential threat to cultural resources
- Access to sacred sites: Degree of activity that changes access to sacred sites

6.16.5 Methodology and analysis process

Analysis methods used for historic properties include a review and synthesis of all pertinent literature, records, and documentation available on the history and prehistory of the forests. This information includes not only that which is available from a variety of generalized sources, but also information resulting from several years' worth of Forest Service cultural resource inventories.

Information of previously documented sites can be an indicator of the type, frequency, and location of sites likely to be found within the analysis area.

Information sources

Information sources include literature, records, and documentation review and information from Forest Service cultural resource inventories and information from Forest Service archaeologists.

Incomplete and unavailable information

No Forest has been fully assessed for cultural resources; however, many acres have been inventoried. These inventories have occurred generally in areas where there have been management activities in association with vegetation and fuels treatment, recreation development, special uses, and engineering projects. Information is continuously updated in conjunction with completed surveys and research.

Analysis area

The geographic scope of the analysis for cultural resources is the NFS lands of the amendment forests that lie within the Grizzly Bear Conservation Strategy primary conservation area, zones 1 through 3, the Salish and Ninemile demographic connectivity areas. This area represents the NFS lands where changes may occur from activities that result from the proposed action.

For cumulative effects, the analysis area also includes the NFS lands in the primary conservation area, zone 1, and Salish demographic connectivity area and other areas as may be identified for cumulative impact consideration.

6.16.6 Affected environment

Historic properties reflect the prehistoric and historic past. The prehistoric period is that time which predates written history of ‘a people.’ Through the use of geological, biological, sociological, and archaeological evidence the prehistory of people within the NCDE goes back since at least the Middle Paleoindian period (8–10,000 years B.P.) as defined in North American archaeology (McLeod and Melton 1986). These people were mobile hunters and gatherers who took advantage of the area’s plant, animal, and aquatic life and mineral resources. Tribal uses of these lands from the earliest times included travel routes and occupation sites occurring along major rivers and connecting across the divides and continuing onto the Plains to the east.

Prehistoric sites can take the form of camps, trails, rock art, cambium-peeled trees, quarries, burial grounds, and others. Most of the sites represent campsites of small, transient groups moving into or through the mountains and were located in areas accessible to high country and ample game and fish sources. Native American Tribes, such as the Bitterroot Salish, Kootenai, Pend O’reille and Blackfeet Tribes were some of the last prehistoric groups to inhabit the area. Confederated Salish and Kootenai Tribes have reserved treaty rights to use these lands for traditional uses. Certain sites are still in use by Native Americans exercising their rights under the American Indian Religious Freedom Act.

The written history in the area began with the trapper’s and explorer’s journals written in the early 1800s. The early traders were sent throughout the region by Hudson’s Bay and the Northwest Fur Trade companies. The remainder of the historic period is marked by the coming of the railroads, which opened land to miners scouring the forests for gold and silver. Mining camps turned into towns and the demand for lumber ushered in the early loggers. The Homestead Act of 1862 provided opportunities for anyone willing to apply, file for deed of title, and improve their 160 acres to become landowners. Fur trade missionaries, mining, homesteading and agriculture, transportation,

logging, and public management of the resources are activities represented by recorded sites on the Forests.

The prehistoric and historic periods left marks on the landscape that is visible today as cultural sites. Overviews of the identified sites are presented by forest below. Information on cultural sites is kept on file as hard copy site and inventory forms, as well as on geographic information system and within the Forest Services' National Heritage Infra database.

Information concerning the nature and location of any cultural resource is confidential and not subject to public disclosure as per public law 94-456, [16 U.S.C. 470 hh Section 9 (a and b)].

Helena and Lewis and Clark National Forests

The most recent information available for cultural resources is from the combined Helena and Lewis and Clark assessment (USDA (2015a)).

Approximately 1,851 cultural resource sites are currently identified on the Helena and Lewis and Clark forests. In accordance with criteria in 36 CFR 60.4, eight cultural resources are listed on the National Register of Historic Places. In addition to the listed sites, one traditional cultural district (Badger-Two Medicine), related to tribal cultural values, is identified as well as two National Historic Trails (Cokahlarishkit/Lewis and Clark Trail and the Continental Divide National Scenic Trail). Another 944 cultural resources have been formally determined to be eligible for listing on the National Register by the Forest Service and the Montana State Historic Preservation Officer but are not yet formally nominated to the Register. There are 1,507 cultural resource sites not yet evaluated and, therefore, are considered to be significant, or National Register-eligible, and require management consideration by the Helena and Lewis and Clark forests. To date, 344 cultural resource sites have been formally determined to be historically insignificant and not eligible for listing on the National Register and may fall outside of management concern. This site total is a small fraction of what exists on the Helena and Lewis and Clark NFs because a significant area of each forest has not been surveyed for cultural resources. Additionally an untold number of potential traditional cultural properties exist across the forests.

On the both forests, 120 sites have been identified as priority heritage assets. These are a subset of cultural resources that receive special agency designation and management in accordance with criteria in Forest Service Manual 2360.5. Priority heritage assets are resources of distinct value that are, or should be, actively maintained and meet one or more specific criterion. Priority heritage assets represent a cross-section of significant cultural resources reflecting multiple historic themes across the two forests. More detailed information about the Helena and Lewis and Clark's cultural resources can be found in their assessment (USDA (2015a)).

Kootenai National Forest

The Kootenai National Forest has conducted cultural resources inventories in areas of planned projects and to date has completed 3,242 investigations, covering 1,709,332 acres of surveyed land. Through cultural resource survey 1,759 cultural sites have been identified within the Forest, including 1,138 historic sites and 624 prehistoric sites. Of the historic sites, 353 have been determined as not eligible and 151 have been determined as not eligible to the National Register of Historic Places. Another 634 historic sites have not yet been evaluated. Of the prehistoric sites, 54 have been determined as not eligible and 306 have been determined as eligible to the National Register, with 261 prehistoric sites not yet evaluated. If the artifacts present at a location do not warrant formal recording as a formal site, then they are recorded as "isolated finds." There are 48 historic and 44 prehistoric isolated finds on the Kootenai National Forest. In addition to the known

historic and prehistoric sites, it is likely that many more will be uncovered as projects are planned for areas previously unexamined. Detailed information about the Kootenai's cultural resources can be found in the Kootenai Forest Plan Final Environmental Impact Statement (USDA (2013a)).

Lolo National Forest

Approximately 744 cultural resource sites are currently identified on the Lolo National Forest. In accordance with criteria in 36 CFR 60.4, there are seven cultural resources listed on the National Register of Historic Places. In addition to the National Register-listed sites, one traditional cultural property site related to tribal cultural values is identified as well as three National Historic Trails. Another 136 cultural resources have been formally determined to be eligible for listing on the Register by the Forest Service and the Montana State Historic Preservation Officer but are not yet formally nominated to the National Register. There are 460 cultural resource sites not yet evaluated and, therefore, are considered to be significant, or National Register-eligible, and require management consideration by the Lolo National Forest. To date, 140 cultural resource sites have been formally determined to be historically insignificant and not eligible for listing on the Register and may fall outside of management concern. This site total is a small fraction of what exists on the Lolo because a significant portion of the forest has not been surveyed for cultural resources. Additionally an untold number of potential traditional cultural properties may exist across the forest (S. Bacon, Lolo National Forest, personal communication, project file exhibit # 00121).

The Lolo National Forest has surveyed over 42,000 acres in the GBCS amendment area. In that area, there are 291 cultural resource sites including 197 historic sites, 91 prehistoric sites, and 3 historic and prehistoric multicomponent sites. Of these sites, 2 (historic) are listed on the National Register; 60 are eligible (54 historic, 5 prehistoric, and 1 multicomponent); 187 are unevaluated (105 historic, 80 prehistoric, and 2 multicomponent sites); and 42 are not eligible (36 historic and 6 prehistoric sites) (E. Karuzas, Lolo National Forest, personal communication, project file exhibit # 00121).

6.16.7 Environmental consequences

Compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800 regulations is required for Forest Service activities and is fulfilled by a process to establish the presence of historic properties within the area of potential effect for each alternative; through background research, State Historic Preservation Officer consultation, and an appropriate level of field investigation. When consultation is conducted, the magnitude of the undertaking, its likely effects, and any alternatives, are taken into account as well as the views of the State Historic Preservation Officer, the Tribal Historic Preservation Office and other interested parties.

Each forest is require to consult with Native American traditional religious leaders on any project having the potential to affect Native American cultural sites, including burial and ceremonial sites, and practices. Consultation requirements would still apply to any chosen alternative.

Effects to eligible historic properties can be either "no adverse" or "adverse."

- No adverse could include stabilizing a historic property such as controlling erosion of an archaeological site, restoring and maintaining a historic building, or reducing fuels concentrations around a historic property. This kind of treatment is designed and agreed upon through consultation conducted under Section 106 of the National Historic Preservation Act with the State Historic Preservation Officer.
- Adverse effects are impacts to the integrity of the property that destroy a portion of, or the entire, property. A direct adverse impact occurs during the activity itself; such as when a road is built

through a historic property and the construction process destroys the site. Indirect adverse impacts are a side effect of the activity or occur after the activity is complete; an example is runoff from a road that eventually erodes a historic property adjacent to it. Adverse impacts can be mitigated or avoided altogether through project design. These mitigation or avoidance measures are agreed to in consultation conducted under Section 106 of the National Historic Preservation Act with the State Historic Preservation Officer and the Advisory Council on Historic Preservation.

Effects to cultural resources are caused by implementing the proposed amendment as well as, and largely uncontrollable, secondary effects such as from public use, potential vandalism, and natural causes (e.g., wind and water erosion). Direct project actions of the proposed action that are of threat to cultural resources include those activities that include surface disturbing activities and are conducted and controlled by the Forest Service or authorized by Forest Service permits, including timber and silvicultural management, prescribed fire, wildlife and fisheries management, road and trail construction, facilities construction and maintenance, recreation use and management, and special uses authorization to third parties.

Cultural resources were considered during effects evaluations as known, not known but suspected, and unknown. Known cultural resources are those that have been evaluated through field survey and reported to the State Historic Preservation Officer. Not known but suspected cultural resources are those within unsurvyed areas that lie within locations that are known, or suspected, to have had historic presence. Unknown cultural resources are unknown both by direct survey and involve areas where no historic presence is suspected, the errant “find.” Even though field surveys are required for cultural resources prior to implementation of ground disturbing project activities under *all* alternatives, qualitatively, the effects analysis assumed that cultural resources existed in the areas discussed, but had not been discovered.

Alternative 1 — no action

Existing forest plans and amendment management direction, with permit and/or contract-specific terms and conditions, is the current management being used by the amendment forests to address cultural resources. This current direction includes forest-wide goals, objectives, desired conditions, standards and guidelines pertaining to cultural resources. This direction represents the no-action alternative and is the baseline to which the proposed action and alternatives are compared. Thus, it is important to understand what actions would continue under the no-action alternative.

Management direction

Under current Forest Plans for the amendment forests, management direction requires identification, evaluation, nomination, protection, and interpretation of cultural resources. The management direction includes forest-wide goals, objectives, desired conditions, standards and guidelines pertaining to sensitive species. Coordination and consultation with the State Office of Historic Preservation is also required. Sites eligible for listing on the National Register of Historic Places must be evaluated and formally nominated. Protection protocols and mitigation measures are used if cultural resources or sacred sites are inadvertently discovered during project activities. Amendment forests’ heritage programs address known and unknown cultural resources and properties and locations of historic significance via management direction in current plans.

Indirect effects of the no-action alternative, amendment forests

Under the no-action alternative for the amendment forests, identification, evaluation, nomination, protection, and interpretation of cultural resources would continue. Coordination and consultation with the State Office of Historic Preservation would continue. Sites eligible for listing on the

National Register of Historic Places would continue to be evaluated and formally nominated to the Register. Protection protocols and mitigation measures would still be used if cultural resources are inadvertently discovered.

Impacts to known and unknown cultural resources and sacred sites under the no-action alternative were considered in reference to the disturbance associated with continuing management and the proposed implementation of the GBCS and are summarized below.

Grizzly bear habitat, motorized use and access, recreation developments
Under the no-action alternative, ground disturbance with management activities associated with grizzly bear habitat; road management, maintenance and, as applicable, closure activities; and use, maintenance and construction of recreation developments may result in inadvertent discovery of and/or damage to cultural resources or sacred sites. If encountered, protection protocols are required and implemented under the no-action alternative to protect and mitigate any impacts to these resources. No impacts to known cultural resources or sacred sites were identified.

Alternative 2 — proposed action modified

Management direction

No management direction specific to the heritage program and cultural resources is being proposed with the proposed amendment for any of the amendment forests. Thus, no management direction for cultural resources is being revised, augmented or removed, and current management direction for each of the amendment forests would be retained.

Indirect effects of the proposed action modified

The effects to cultural resources as a result of the proposed action are determined and defined by survey and consultation requirements at the project level. However, to estimate effects prior to consultation, the proposed action is contrasted to the no-action alternative to estimate if the alternative increases, decreases, or results in no change to the potential for adverse effects to cultural resources.

There are no direct effects to cultural resources from the proposed GBCS. Effects to cultural resources are indirect by virtue of other programs within the amendment forests (and the Flathead National Forest) that implement the GBCS. These effects are similar across the amendment forests and are summarized below.

Grizzly bear habitat
Ground disturbance with management activities could result in inadvertent discovery of and potential damage to cultural resources or sacred sites within grizzly bear habitat. However, unlike the no-action alternative, some activities (e.g., logging operations) may be temporarily restricted during the spring to avoid grizzly bear disturbance and displacement. These temporary restrictions may reduce the potential for ground disturbance that results in inadvertent discovery and damage to cultural resources during the restricted time. However, this reduction may be negligible in contrast to no-action because restrictions are short-term under the proposed action. Regardless, if encountered, protection protocols are still applicable under the proposed action to mitigate impacts to these cultural resources and sacred sites.

Motorized use and access
To decrease the potential for grizzly bear-human conflicts, the GBSC has requirements to manage road densities to the 2011 baseline and to limit management activities (that may require access

and/or motorized use) within the primary conservation area and zone 1 during the non-denning season. In spring, when grizzly bears emerge from their dens, which is generally the time where over-snow vehicle use may still be occurring, proposed action restrictions would lessen the potential, over the no-action alternative, for ground disturbance that could affect cultural resources. While the potential for surface disturbance could still exist should over-snow vehicle operators choose to drive over thin snowpack or through bare ground areas where cultural resources may exist, generally over-snow vehicle operators choose to operate on snowpack that is sufficient to avoid damage to their vehicles. Thus, ground disturbance to cultural resources is not anticipated with the protections proposed under the proposed action.

Recreation

Ground disturbance may result with construction, use, and maintenance of new recreation developments. Under the proposed action alternative the number of new recreation developments in the primary conservation area is restricted. In contrast to the no-action alternative, this restriction results in a reduction for ground disturbance and associated reduction in potential for inadvertent discovery of and damage to cultural resources. Regardless, if encountered, protection protocols are still applicable under the proposed action to mitigate impacts to these cultural resources and sacred sites.

Alternative 3

Management direction

Alternative 3 does not propose management direction specific to cultural resources.

Indirect effects of alternative 3

The effects to cultural resources under alternative 3 are primarily the same as those presented under the proposed action. The only difference is that alternative 3 proposes a no surface occupancy stipulation for new oil and gas leases, which may decrease ground disturbance in this alternative in areas where surface occupancy could still occur under alternative 2 (see Energy and Minerals section for discussion of applicable areas). Thus, the additional protections under alternative 3 are somewhat more beneficial to cultural resources than the proposed action.

Cumulative effects

The effects that past activities have had on cultural resources were discussed in the “Affected Environment” section and are reflected in the current condition. Therefore, past activities are not carried forward into the cumulative effects analysis. Cumulative effects include the effects of implementing the GBCS on the amendment forests and the Flathead National Forest.

Under the proposed action, the GBCS is implemented the same across the five forests. No impacts to known cultural resources or sacred sites are currently identified. Ground disturbance could result in inadvertent discovery of and potential damage to cultural resources. The Forest Service has site-specific requirements, including cultural resource surveys, the National Environmental Policy Act process, consultation protocols and protective measures to address these discoveries.

Effects determination

No changes to current management for cultural resources for any of the amendment forests are proposed. No known cultural resources or sacred sites are affected. Ground disturbance associated with implementing the proposed action may result in inadvertent discovery of and potential damage

to cultural resources or sacred sites. Protection protocols are in place under all alternatives to mitigate impacts to inadvertent discoveries of cultural resources and sacred sites.

The proposed action is anticipated to result in less potential for ground disturbance because of limitations for new recreation developments and restrictions to motorized use/project activities associated with certain roads in the primary conservation area and zone 1. However temporary spatial and temporal restrictions may potentially adversely impact access to sites of cultural importance. Project-level evaluation, and consultation, as applicable, would be required to determine the exact extent and magnitude of adverse effects.

6.17 American Indian Rights and Interests

6.17.1 Introduction

The Forest Service has obligations under the American Indian Religious Freedom Act of 1978 to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian [public law 95-442]. Executive Order 13007 of 1996 further directs federal agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting such sites. Consultation with recognized tribal governments is further defined and required by the Native American Graves Protection and Repatriation Act of 1990 [public law 101-106], the 1992 amendments to the National Historic Preservation Act, and the 1999 revisions to the implementing regulations in 36 CFR Part 800; Protection of Historic Properties. These obligations are applicable to all management actions no matter where they occur on the forest.

6.17.2 Legal and administrative framework

The **Hellgate Treaty of 1855**: The Flathead, Kootenai, and Upper Pend d'Oreille Indian Tribes reserved rights under the Hellgate Treaty of 1855 (July 16, 1855). These rights include the "right of taking fish at all usual and accustomed places, in common with citizens of the Territory, and of erecting temporary buildings for curing; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land." The federal government has trust responsibilities to Tribes under a government-to-government relationship to ensure that the Tribes reserved rights are protected. Consultation with the Tribes in early phases of project planning helps the Forest Service meet their trust responsibilities.

The **National Historic Preservation Act of 1966** (public laws 89-665, as amended, 91-423, 94-422, 94-458 and 96-515) Regulations 36 CFR Part 800 and 36 CFR 36 CFR Part 7: This act pertains only to tangible properties (buildings, structures, sites, or objects) which are important in history and prehistory. It requires agencies to consider the effects of undertakings on properties eligible to or listed in the National Register of Historic Places by following the regulatory process specified in 36 CFR 800. The portions of that act that relate specifically to coordination with Indian tribes were added in the 1992 amendments. These additions reflect the increased importance placed on tribal relations. A section of the act directs state and federal governments to assist in the establishment of preservation programs on Indian lands. These sections include:

- Section 2: It shall be the policy of the federal government, in cooperation with other nations and in partnership with the state, local governments, Indian tribes, and private organizations and individuals to:

- (2) Provide leadership in the preservation of the prehistoric and historic resources of the United States and of the international community of nations and in the administration of the national preservation program.
- (6) Assist state and local governments, Indian tribes and Native Hawaiian organizations and the National Trust for Historic Preservation in the United States to expand and accelerate their historic preservation programs and activities.

The **National Environmental Policy Act of 1969** (public law 91-190) and regulations 40 CFR 1500–1508: Federal agencies began to invite Indian tribes to participate in forest management projects and activities that may affect them.

The **National Forest Management Act of 1976** (public law 4-588): Directs consultation and coordination of NFS planning with Indian tribes.

The **American Indian Religious Freedom Act of 1978** (public laws 95-341 as amended, and 103-344): The Act states that "...it shall be the policy of the United States to protect and preserve for American Indians their inherent right for freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to site, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites."

Agencies must make a good faith effort to understand how Indian religious practices may come into conflict with other forest uses and consider any adverse impacts on these practices in their decision-making practices. The consideration of intangible, religious, ceremonial, or traditional cultural values and concerns which cannot be tied to specific cultural sites/properties could be considered under American Indian Religious Freedom Act.

The **Archaeological Resources Protection Act of 1979** (public law 96-95) and regulations 43 CFR part 7: Establishes a permit process for the management of cultural sites on federal lands which provides for consultation with affected tribal governments.

The **Native American Graves Protection and Repatriation Act of 1990** (public law 101-601, 25 United States Code 3001-3013) and Regulations 43 CFR Part 10: Addresses the rights of lineal descendants and members of Indian tribes, Alaska Native, and native Hawaiian organizations to certain human remains and precisely defined cultural items. It covers items currently in federal repositories as well as future discoveries. The law requires federal agencies and museums to provide an inventory and summary of human remains and associated funerary objects. The law also provides for criminal penalties in the illegal trafficking in Native American human remains and cultural items.

Interior Secretarial Order 3175 of 1993: Establishes responsibility of all agencies to carry out trust responsibilities of the federal government and assess the impacts of their actions on Indian trust resources. It requires consultation with tribes when impacts are identified.

Executive Order 12866 of 1993, Regulatory Planning and Review: Enhances planning and coordination with respect to both new and existing regulations. Makes process more accessible and open to the public. Agencies shall seek views of tribal officials before imposing regulatory requirements that might affect them.

The **Religious Freedom Restoration Act of 1993** (public law 103-141): Established a higher standard for justifying government actions that may impact religious liberties.

Executive Order 12898 of 1994: Environmental Justice in Minority Populations and Low- Income Populations directs federal agencies to focus on the human health and environmental conditions in minority and low-income communities, especially in instances where decisions may adversely impact these populations.

Executive Order 13007 of 1996: Indian Sacred Sites: This order acknowledges the role of federal agencies to protect and preserve the religious practices and places of federally-recognized tribes and enrolled tribal members. It also requires agencies to consult with federally-recognized tribe to address tribal concerns for sacred sites on public land and to ensure access to religious places and avoidance of adverse effects to sacred sites in accordance with existing legislation.

Executive Order 13175 of 2000: Consultation and Coordination with Indian Tribal Governments: Provides direction for consultation with tribal governments for formulating or implementing policies that have tribal implications. Also provides direction regarding consultation and coordination with Indian Tribes relative to fee waivers. Calls upon agencies to use a flexible policy with tribes in cases where proposed waivers are consistent with applicable federal policy objectives. It directs agencies to grant waivers in areas where the agency has the discretion to do so, when a tribal government makes a request. When a request is denied, the agency must respond to the tribe in writing with the rationale for denial1[2].

36 CFR 261 Prohibitions in Areas Designated by Order; Closure of National Forest System Lands to Protect Privacy of Tribal Activities (2011): "provides regulations regarding special closures to provide for closure of NFS lands to protect the privacy of tribal activities for traditional and cultural purposes to ensure access to NFS land, to the maximum extent practicable, by Indian and Indian tribes for traditional and cultural purposes".

36 CFR 223.239 and .240 Sale and Disposal of National Forest System Timber, Special Forest Products, and Forest Botanical Products: Section 223.239 provides regulations for free-use without a permit for members of Tribes with treaty or other reserved rights related to special forest products and also free-use without a permit upon the request of the governing body of a Tribe. Section 223.240 provides regulations regarding harvest of special forest products by Tribes with treaty or other reserved rights.

6.17.3 Key indicators for analysis

The measurement indicator for American Indian Rights and Interests are identified and defined by Tribes through consultation with the Forest Service on proposed actions. Consultation provides the

[2] Section 2 of this Executive Order states "In formulating or implementing policies that have tribal implications, agencies shall be guided by the following fundamental principles:

- The United States has a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. Since the formation of the Union, the United States has recognized Indian tribes as domestic dependent nations under its protection. The Federal Government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with the United States.
- Our Nation, under the law of the United States, in accordance with treaties, statutes, Executive Orders, and judicial decisions, has recognized the right of Indian tribes to self-government. As domestic dependent nations, Indian tribes exercise inherent sovereign powers over their members and territory. The United States continues to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, tribal trust resources, and Indian treaty and other rights.
- The United States recognizes the right of Indian tribes to self-government and supports tribal sovereignty and self-determination."

opportunity for Tribes to identify potential effects to tribal interests, including to native knowledge, tribally affiliated cultural resources, sacred sites, treaty rights, and religious freedom.

Ground disturbance is a key consideration for effects, as ground disturbance may negatively impact sacred sites and areas. These impacts can be further exacerbated by interactions with fire, weather events, human actions, and environmental change. Access to sacred areas to exercise religious ceremonies and freedoms is another key consideration for effects. Management actions that change access could either beneficially or negatively impact the exercise of treaty rights and expression of religious freedom. The following key indicator were be used to measure differences among the alternatives:

- Disturbance: Degree of activity or natural condition that poses potential threat to sacred sites
- Access: Degree of activity or condition that poses potential change to access to areas of Native American interest

6.17.4 Methodology and analysis process

Effects to tribal interests are known only through direct tribal consultation between the Forest Service and affected Tribes. Prior to consultation, effects can only be estimated qualitatively.

Information sources

Land use management plans, heritage reports and information from Forest Service heritage resource specialists, who consult with Tribe members directly are the primary sources of information used for the analysis.

Incomplete and unavailable information

The Forest Service is not aware of all sites and interests of tribal importance. The Forest Service relies on its relationship and consultation with tribes to be informed as to where and what interests may be impacted by Forest Service proposed actions. The consultation process affords both Tribes and the Forest Service opportunities to identify sites, interests and values of tribal importance as well as to identify mitigations and avoidance and protective measures to preserve Tribal interests.

Analysis area

The geographic scope of the analysis for American Indian Rights and Interests is the NFS lands of the amendment forests that lie within the GBCS primary conservation area, zones 1 and 2, the Salish and Ninemile demographic connectivity areas. This area represents the NFS lands where changes may occur from activities that result from the proposed action.

For cumulative effects, the analysis area also includes the Flathead NFS lands in the GBCS management zones and may extend spatially beyond these areas.

6.17.5 Affected environment

Information shared by Tribes through consultation, at formal meetings, and via correspondence and conversations with individuals provides a rich source of information on tribal perspectives, resource uses, topics of interest, and the unique relationships Tribes have with federal agencies. As a recent example, writing to the Forest Service on behalf of the Nez Perce Tribe, Tribal Executive Committee Chairman, Anthony Johnson, states:

The grizzly bear is a species of great cultural and treaty-reserved significance to the [Nez Perce] *Tribe. Grizzly bear were common across much of the aboriginal Nez Perce homeland for millennia. The grizzly bear was extirpated from our region in recent memory, and today, despite population gains in the NCDE, Greater Yellowstone Ecosystem, and elsewhere in the northern Rockies, the grizzly remains largely absent from the Bitterroot Mountains and areas to the west. The restoration of this once common species across the region, and particularly within the Nez Perce homeland, is very important to the Tribe.*

Consultation with Tribes on proposed actions provides an important opportunity for the Tribes to express information and concerns and the opportunity for the Forest Service to consider these during evaluation of proposed actions.

For this analysis, Native Americans associated with the plan area, existing tribal rights, known concerns, and areas of known tribal importance are discussed in this section. Existing information was used to assess the condition and trend of resources that affect tribal rights and areas of tribal importance.

Helena and Lewis and Clark National Forests

Historically, the Helena and Lewis and Clark national forests were the ancestral homeland and travel way of native bands now referred to as the Assiniboine, Blackfeet, Chippewa Cree, Confederated Salish and Kootenai, Crow, Eastern Shoshone, Gros Ventre, Sioux, Nez Perce, Northern Arapahoe, Northern Cheyenne, Shoshone-Bannock, and the Little Shell Tribes (USDA (2015a)). Most prominent among these groups were those historically known as the Blackfeet, Gros Ventre, Salish, Shoshone, and Kootenai.

Culturally important plant and fungi species that have been used historically or presently for ceremonies, rituals, nutrition, or medicinal purposes occur on both forests. These include: small camas (*Camassia quamash*), thinleaf huckleberry (*Vaccinium membranaceum*), chokecherry (*Prunus virginiana*), common beargrass (*Xerophyllum tenax*), and bitterroot (*Lewisia rediviva*) are all culturally important plant species that occur on both forests.

Key features of the area important to Native Americans include the Cokahlarishkit/Lewis and Clark Trail (24LC1210), which extended through the upper Blackfoot Valley and over the Continental Divide into central Montana; and various geographical areas and landmarks within the upper Blackfoot River drainage that are culturally important to the Salish Tribe. These have Salish place-names that are associated with families and events in traditional Salish life. This place-name information is highly regarded and confidential but may come to bear in future consultations.

Additionally, the Badger-Two Medicine Traditional Cultural District is a watershed area on the Rocky Mountain Front, which lies within part of the Lewis and Clark National Forest, and embodies the history and life for the Blackfeet Nation. More information on this topic can be found in the Helena and Lewis and Clark Assessment (USDA (2015a)).

Kootenai National Forest

There are five federally-recognized American Indian nations with cultural affiliation on the Kootenai National Forest: the Kootenai Tribe of Idaho, the Kalispel Tribe, the Coeur d'Alene Tribe, the Spokane Tribe, and the Confederated Salish and Kootenai Tribes. Forest Service administered lands today occupies lands that were in traditional aboriginal territory. The aboriginal territory of the Kalispel, Coeur d'Alene, and Spokane Tribes overlap with the territory now managed by the Kootenai National Forest along the Clark Fork Valley with the territory used by the Kootenai Tribe

of Idaho and the Confederated Salish and Kootenai Tribes. The entire Forest is within aboriginal territory for the Confederated Salish and Kootenai Tribes and the Kootenai Tribe of Idaho.

The Kootenai National Forest meets its treaty responsibilities with assistance from a Tribal liaison from the Confederated Salish and Kootenai Tribes, a position that has been in place since 1981. The liaison is informed of planned projects on the Forest and coordinates with the appropriate tribal departments and Tribal Council, as well as with members of the Kootenai Tribe of Idaho to identify issues. These issues are discussed with Forest Service line officers, who take these issues into consideration in making management decisions. Additional information on this topic can be found in the Final Environmental Impact Statement for the Revised Land Management Plan (USDA (2013a)).

Lolo National Forest

The Lolo National Forest is the traditional homeland of the Kootenai and Salish peoples as well as the Coeur d'Alene and Nez Perce people. Roughly 10,000 years of hunter-gatherer land use has resulted in numerous occupational sites, lithic scatters, rock cairns, burials, game drives/traps, and culturally modified trees throughout the Lolo National Forest. Occupational sites are usually limited to the major river drainages such as the Blackfoot and Clark Fork Rivers. In addition, hunter-gatherers frequented higher elevation mountainous areas during the summer months, such as those along the Idaho/Montana State line or the Cabinet/Coeur d'Alene divide. Prehistoric travel routes were developed, and usually were restricted to major creek drainages as well as saddle and ridge systems. These higher elevation areas provided hunter-gatherers with a wide range of resources, from roots, seeds and berries, to deer, elk and mountain sheep.

The Confederated Salish and Kootenai Tribes of Montana, which includes the Kootenai, the Bitterroot Salish, and the Pend d'Oreille Salish peoples, have reserved treaty rights in the plan area under the Hellgate Treaty of 1855. The Coeur d'Alene Tribe has stated that the area west of the St. Regis confluence of the Clark Fork River is traditional lands, which is adjacent to the GBCS amendment area. The Nez Perce Tribe also has adjacent lands next to the GBCS amendment area.

The Nez Perce and Confederated Salish and Kootenai Tribes have a strong working relationship with each other as well as with the Lolo National Forest. While both tribes reserve the right to consult with any action proposed by the Lolo, generally, the Nez Perce Tribe has assumed consultation lead for proposed actions anywhere along Highway 12 and areas south of I-90. The Confederated Salish and Kootenai Tribes' have assumed consultation lead for actions proposed in areas north of the I-90 corridor as well as other parts of the Lolo National Forest.

The Confederated Salish and Kootenai Tribes manage the Tribal Mission Mountains Wilderness that is adjacent to the federally designated Mission Mountains Wilderness on the Forest. The Tribes offer recreation use on some of the tribal lands (recreation permit required) but some tribal lands are reserved for tribal members only. On the Lolo National Forest, the Tribes are concerned with major ridge systems including but limited to the Reservation Divide between the Ninemile Ranger District and the Flathead Indian Reservation, the Ninemile Divide between Ninemile Creek and the Clark Fork River, the divide between Jocko River and Gold Creek and the Rattlesnake Wilderness, all areas along the Clark Fork River, the Jocko River, and Blackfoot River travel corridors (E. Karuzas, Lolo National Forest, personal communication, July 1 2015, project file exhibit # 00121). Additional information on this topic can be inquired through the Lolo National Forest Heritage Program.

6.17.6 Environmental consequences

This section discusses the effects to American Indian Rights and Interests of implementing the no-action and action alternatives.

Alternative 1 — no action, Helena, Kootenai, Lewis and Clark, and Lolo National Forests

Management direction for alternative 1 — no action

Under current Forest Plans for the amendment forests, management direction requires coordination with Native American Tribes on rights and interest issues and concerns. This current direction includes forest-wide goals, objectives, desired conditions, standards and guidelines pertaining to American Indian rights and interests. Specific issues addressed via direction and consultation in the current plan include marked and unmarked burial sites, areas of sacred or religious significance, and the accuracy of portrayals of Native Americans in displays and interpretive sites.

Indirect effects of the no-action alternative

Effects to tribal interests, including native knowledge, tribally affiliated cultural resources, sacred sites, treaty rights, and religious freedom are identified and defined by Tribes through consultation on proposed actions. Under the no-action alternative, the amendment forests would continue to meet their obligations to Tribes via consultation requirements. The proposed action is anticipated to impact Native American rights and interests associated with grizzly bear habitat, access and motorized use and recreation. The effects of the no-action alternative are presented in the context of these resources and uses for comparison to the action alternatives.

Grizzly bear habitat
Ground disturbance in conjunction with management activities may occur in grizzly bear habitat and sites of Native American interest may be potentially encountered in these areas. Consultation is required and implemented under the no-action alternative prior to project implementation to identify, discuss, protect, and mitigate potential impacts to Native American sites as well as to address conservation concerns associated with the grizzly bear and its habitat associated with project areas.

Access and motorized use
Each of the forest plans and associated biological opinions contain road density requirements within the recovery area and areas outside the recovery area that are occupied by grizzly bears. Ground disturbance in conjunction with road management, maintenance and/or closure activities and public use of roads may occur and Native American sites may be encountered. Consultation requirements are implemented under the no-action alternative during road-related activities to protect and mitigate impacts to Native American sites and access to these sites.

Recreation
Ground disturbance may occur in conjunction with recreation use and facilities and Native American sites may be encountered in these areas with these activities. Consultation requirements are implemented under the no-action alternative to protect and mitigate impacts to Native American sites.

Alternative 2 — proposed action modified, Helena, Kootenai, Lewis and Clark, and Lolo national forests

Management direction for alternative 2

The proposed action does not propose changes in management direction specific to American Indian Rights and Interests.

Indirect effects of the proposed action modified

The effects to tribal interests are defined by Tribes and disclosed by the Tribes to the Forest Service during consultation. For purposes of this analysis, effects of the proposed action are contrasted to the no-action alternative to estimate if the proposed alternative increases, decreases, or results in no change to the potential for adverse effects to American Indian Rights and Interests.

Under the proposed action alternative, there is no change proposed to current management direction related to American Indian Rights and Interests for any of the amendment forests. The following consequences of implementing the GBCS may have potential impacts to other resource areas and may indirectly impact American Indian Rights and Interests.

Grizzly bear habitat

Ground disturbance in conjunction with management activities may impact grizzly bear habitat, which may also be located in areas with Native American interests on amendment forest NFS lands.

Consultation is required and implemented under the proposed action alternative prior to project implementation to identify, discuss, protect, and mitigate potential impacts to Native American sites as well as to address conservation concerns associated with the grizzly bear and its habitat associated with project areas.

Access and motorized use

To decrease the potential for grizzly bear-human conflicts, this alternatives would limit road densities to the 2011 baseline and limiting certain management activities within the primary conservation area and zone 1, such as management of vegetation, livestock grazing and minerals and energy development. These restrictions may result in less overall ground disturbance and less potential for impacts to physical sites of Native American interest. However, the same temporary restrictions to use of roads may make certain areas temporarily more difficult to reach and require non-motorized travel methods, which may vary travel times by minutes (feet) to hours (miles) depending on the specific locality.

Recreation

Ground disturbance may still occur in conjunction with recreation use and facilities and Native American sites may still be encountered in these areas with these activities. Implementing this alternative would allow only one increase in the number or capacity of developed recreation sites with overnight use per bear management unit per decade. These restrictions may decrease the potential for impacts over the no-action alternative to American Indian Rights and Interests. Consultation requirements would still be required and implemented under the proposed action alternative to identify, protect and mitigate impacts to Native American sites and interests.

Alternative 3 — Helena, Kootenai, Lewis and Clark, and Lolo National Forests

Management direction

Alternative 3 does not propose management direction specific to American Indian Rights and Interests.

Indirect effects of alternative 3

The effects to Tribal interests under alternative 3 are the same as those presented under the proposed action.

Cumulative effects

The effects that past activities have had on American Indian Rights and Interests were discussed in the affected environment section and are reflected in the current condition. Therefore, past activities are not carried forward into the cumulative effects analysis.

Consultation requirements would still be required and implemented under all alternatives. Concerns regarding cumulative effects would also be discussed at this time to identify, protect and mitigate impacts to Native American sites and interests.

Effects determination

No changes to current management for American Indian Rights and Interests for any of the amendment forests are proposed. The proposed action is anticipated to result in less potential for ground disturbance because of certain limitations for new recreation developments and motorized roads and trails. Consultation would still be required to determine the extent of adverse effects.

6.18 Social and Economic

6.18.1 Introduction

The analysis of the impacts on the proposed action and alternatives on the social and economic environment is conducted by employing a key ecosystem services framework (Olander et al. 2015), which identifies how ecosystem services and/or multiple uses contribute, either directly or indirectly, to economic and social sustainability. In this analytical context, key ecosystem services are defined as those societal benefits the forests and forest management activities support. These benefits can be either direct or indirect, but must meet the following criteria:

- They are of value to people, either to those living in the analysis area and/or to the general public.
- They are likely to be affected by the proposed action and alternatives.

6.18.2 Legal and administrative framework

The following is a select set of statutory authorities that govern the evaluation of social and economic resources. They are briefly identified/described below to provide context to the management and evaluation of the resource. There are multiple other laws and regulations and policies not described below that also guide the management of this resource.

Multiple-Use Sustained Yield Act of 1960: Identifies principles for managing the resources of the NFS. The direction to manage these resources for the greatest good over time includes the use of economic and social analysis to determine management of the NFS.

National Environmental Policy Act of 1969: Mandates consideration of the consequences to the quality of the human environment from proposed management actions. The agency must examine the potential impacts to physical and biological resources as well as potential socioeconomic impacts (40 CFR 1508.14).

Forest and Rangeland Renewable Resources Planning Act of 1974: As amended by the National Forest Management Act of 1976, requires consideration of potential economic consequences of land management planning.

Executive Order No. 12898 on Environmental Justice (issued February 11, 1994): Mandates federal agencies to make achieving environmental justice part of their mission. This includes identification and response to disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

National Forest Revenue Act (amended 1908): Requires 25 percent of revenues generated by NFS lands to be paid to the States for use by the counties in which the lands are situated for the benefit of public schools and roads.

Secure Rural Schools and Community Self-Determination Act of 2000: Was designed to stabilize annual payments to state and counties containing NFS lands and public domain lands managed by the BLM. Funds distributed under the provisions of this act are for the benefit of public schools, roads, and related purposes.

6.18.3 Indicators and methodology

The forests and the Forest Service provide many societal benefits including clean air, carbon sequestration, clean water and fire suppression. The focus of this analysis are those key benefits which are most likely to be affected by the proposed action and alternatives. The subset of key societal benefits the forests and the Forest Service provide, which may be affected by the proposed action and alternatives, fall under the categories of traditional, cultural, and spiritual values, and health and safety. These benefits contribute to social sustainability by enhancing the quality of life of beneficiaries. Specifically, the benefits under traditional, cultural and spiritual values include recreation, cultural and heritage values, and inspirational values. The health and safety benefit most likely to be affected by the proposed action and alternatives is: minimizing bear-human conflict. These social benefits are described in following sections.

Traditional, cultural and spiritual values

- Recreation: access to outdoor recreation activities and opportunities to connect with nature
- Inspirational/existence values: ability to be inspired by wild places and appreciate the existence of wild places and wildlife (for this generation and subsequent generations)
- Other traditional/cultural/heritage values: ability to access cultural and traditional sites, ability to engage in traditional and cultural activities including ranching, grazing, hunting and wildlife viewing, ability to engage in rural lifestyles

Health and safety

- Minimizing bear-human conflict: reducing the risk of conflict between bears and humans (and human interests such as livestock)

These benefits were identified through public comments and in consultation with resource specialists. The key social benefits listed above are the indicators that are used to determine whether, and/or to what extent, the proposed action and alternatives may impact the social environment and contribute to social sustainability.

These societal benefits are used and/or valued differently by different groups and communities. In the affected environment section, the local beneficiaries are described in detail. In the environmental consequences section, the proposed action and alternatives are assessed to determine whether, and/or to what extent, these social benefits will be affected.

6.18.4 Social affected environment

The NCDE social and economic analysis area includes the 12 counties of Montana that have land within the primary conservation area and zone 1. These counties are shown in table 41. The other 16 counties with NFS land in zones 2 and 3 are not included in the social and economic analysis area because the only standard that affects the NFS lands in zone 2 is application of food storage orders. No additional direction is proposed under any alternative for zone 3. Because social and economic effects may extend beyond the boundaries of the 12-county social and economic analysis area, regional and national attachments to the NCDE are also presented in this discussion.

The NCDE is part of a larger system, the Crown of the Continent, which contains the counties included in this analysis. A 2011 report by Headwaters Economics found that, “the Crown region is closely tied to both the amenity qualities and productive values of its wild lands and working landscapes” (Headwaters-Economics (2011)).

Table 41. Counties of the social and economic analysis area and location in the NCDE Grizzly Bear Conservation Strategy area

County	Location in Grizzly Bear Conservation Strategy Area
Flathead	PCA and zone 1
Glacier	PCA and zone 1
Granite	Small section of zone 1
Lake	PCA and zone 1
Lewis and Clark	PCA and zone 1
Lincoln	PCA and zone 1
Mineral	Zone 1 only
Missoula	PCA and zone 1
Pondera	PCA and zone 1
Powell	PCA and zone 1
Sanders	Zone 1 only
Teton	PCA and zone 1

Population and demographics

Land ownership, land settlement, and land uses

The NCDE encompasses about 9,600 square miles of northwestern Montana, and includes Glacier National Park, parts of the Flathead and Blackfeet Indian Reservations, parts of five national forests (Flathead, Helena, Kootenai, Lewis and Clark and Lolo), public lands managed by the Bureau of Land Management, and a significant amount of state and private lands. Also within this region are four wilderness areas (Bob Marshall, Mission Mountains, Great Bear and Scapegoat), one wilderness study area (Deep Creek north), and one scenic area (Ten Lakes).

Within the basins and valleys of the NCDE, farms and ranches and small rural communities reflect the historical settlement since Europeans moved westward after Lewis and Clark explored in the early 1800s (information on the Native American tribes in the region is found in a following subsection, “Treaties and Tribal Uses”). Some remnants of logging and mining and associated settlements are also interspersed throughout the area. Metal ore mining is still active in Lincoln County and was active in Lewis and Clark County prior to the shutdown of the Drumlummon Mine

in 2013. Oil and gas development is also important in Glacier County. Many rural towns got their starts, and are still supported to some extent, by ranching, logging, mining, and western culture (see section 6.15.7, Economic Environment, for more information on the economic dependency of these counties on wildland-related industries).

As shown in table 42 and figure 3, the 12 counties in the social and economic analysis area include more than 19.8 million acres, of which approximately 31 percent are private lands, nearly 50 percent of lands are under federal management, and 13 percent are tribal lands. The majority (86 percent) of the federal land is managed by the Forest Service and another 10 percent is administered by the National Park Service, mainly in Flathead and Glacier counties.

Table 42. Land ownership and percent of total in social and economic analysis area

County	Private (acre)	Federal (acre)	State (acre)	Tribal (acre)	Other (acre)	Total (acre)
Flathead	739,690	2,419,670	131,472	27,310	n/a[1]	3,318,142
Glacier	161,511	402,508	8,280	1,369,886	–	1,942,186
Granite	372,244	703,838	20,476	–	72	1,096,630
Lake	124,580	172,005	64,058	678,824	n/a	1,039,469
Lewis and Clark	884,980	1,069,522	177,490	–	1627	2,133,617
Lincoln	487,513	1,726,388	75,341	–	–	2,289,242
Mineral	78,079	641,343	63,299	–	–	782,721
Missoula	653,805	716,196	173,944	99,045	1873	1,644,863
Pondera	711,734	108,791	57,160	161,651	–	1,039,336
Powell	542,322	727,599	130,517	–	–	1,400,438
Sanders	279,950	925,504	66,814	427,761	–	1,700,028
Teton	1,053,930	254,496	130,416	–	10	1,438,852
Analysis area total	6,090,338	9,867,860	1,099,267	2,764,477	3,582	19,825,524

1 n/a = not applicable

Data source: U.S. Geological Survey, Gap Analysis Program. 2012. Protected Areas Database of the United States version 1.3 (Accessed via Economic Profile System – Human Dimensions Tool Kit)

The primary conservation area and zone 1 of the NCDE within the 12-county area encompass about 10.5 million acres (53 percent) of the 12-county area, which is mainly under public ownership. As grizzly bears extend their range beyond these areas, increasingly more private lands may be affected. The proposed action and alternatives apply direction only for public lands, managed by the Forest Service (i.e., NFS lands).

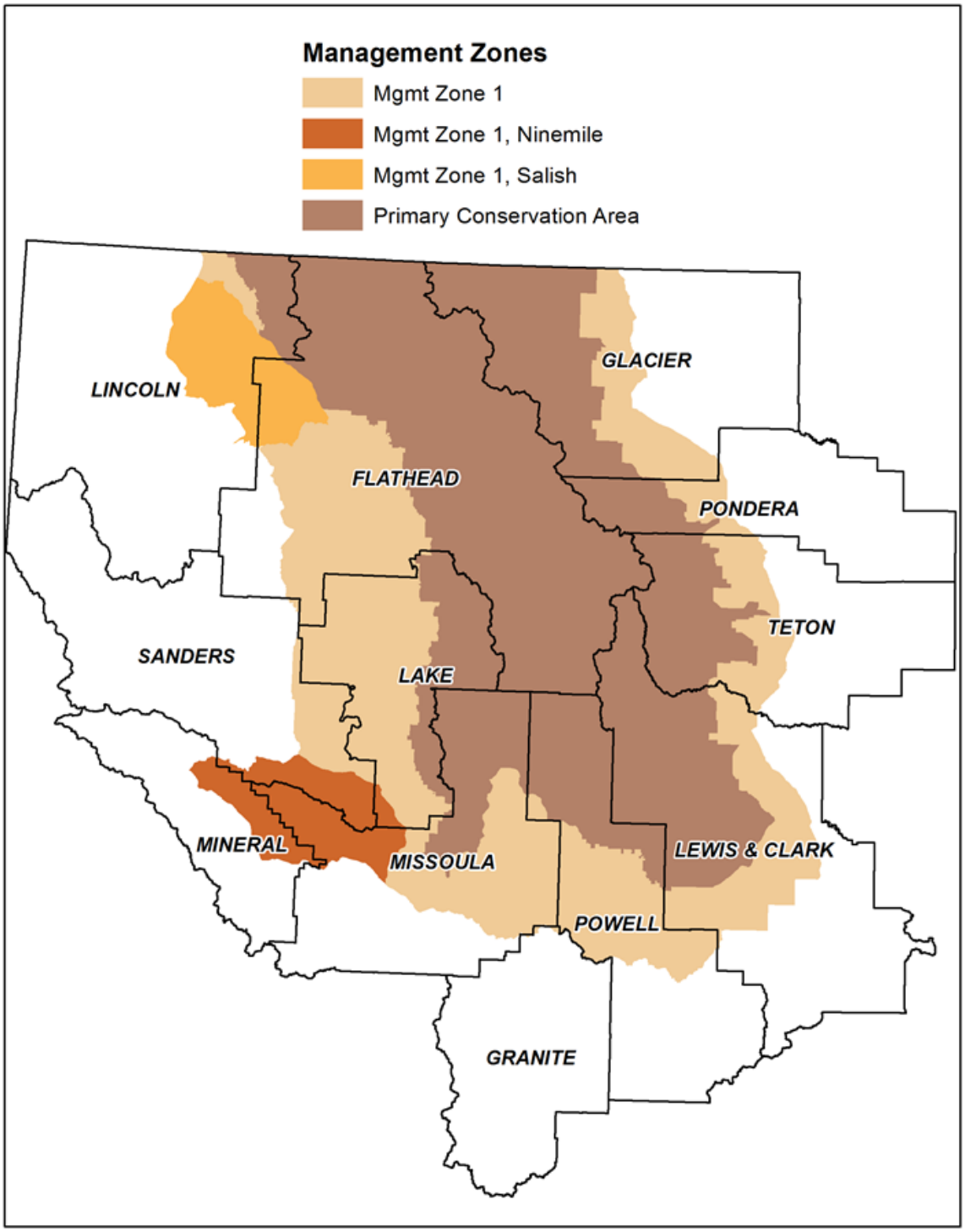

Figure 2. The twelve counties in the social and economic analysis area

Map Source: US Forest Service, Region 1. 2015

Data Source: County data from US Census, GIS Management Area data from USFS Region 1, Flathead NF, spatial data library, T:\FS\NFS\Flathead\Project\SO\Planning\ForestPLanRevision

Population trends

As shown in table 43, approximately 363,614 people resided within the 12-county area in 2012. The population in the analysis area increased 77.4 percent from 1970 to 2012; however, some counties saw large increases in population, while others lost population during this time. The county with the largest percent increase in population was Flathead County, at 130.7 percent, while Teton and Pondera counties saw a decrease in population. From 2000 to 2012, the population of the 12-county area increased 13.1 percent, a higher rate of growth than for either the state or the nation, which both grew in population by about 9.8 percent. Population projections done as part of the Resource Planning Act assessment (Zarnoch et al. 2010) indicates (based upon three scenarios: low population change, current trend, high population change) that the population of the 12-county area will increase from 40 to 67 percent from 2010 to 2050. Table 43 shows the projected population change, based on current trends, and shows the counties of Flathead and Missoula with the largest projected population growth during this time (90.2 and 75.5 percent, respectively), and the counties of Granite and Pondera showing the lowest projected growth (4.5 and 0.6 percent, respectively).

Table 43. Historical and projected population (based on current growth trends) by county

Forest/County	Population 1970[1]	Population 2000[1]	Population 2012[1]	Change 1970-2012[1] (percent)	Change 2000-2012[1] (percent)	Projected Population Change 2010-2050[2] (percent)
Flathead	39,716	74,471	90,967	130.7	22.2	90.2
Glacier	10,823	13,247	13,422	26.7	1.3	27.7
Granite	2,729	2,830	3,083	13.9	8.9	4.5
Lake	14,592	26,507	28,794	98.6	8.6	54.4
Lewis and Clark	33,455	55,716	63,432	93.9	13.8	36
Lincoln	18,065	18,837	19,594	7.9	4.0	8.1
Mineral	2,965	3,884	4,203	40.5	8.2	38.7
Missoula	58,472	95,802	109,402	89.8	14.2	64.4
Pondera	6,707	6,424	6,147	-8.1	-4.3	-0.6
Powell	6,666	7,180	7,067	6.5	-1.6	16
Sanders	7,112	10,227	11,421	60.4	11.7	18.2
Teton	6,131	6,445	6,082	-1.3	-5.6	23.1
Analysis area total	207,433	321,570	363,614	77.2	13.1	56.7

1. Data source: Economic Profile System – Human Dimensions Tool Kit
2. 2010-2050 Projections: (Zarnoch et al. 2010).

Similar to many areas in the western United States, population growth is due mostly to the influx of natural amenity migrants—people who migrate to the NCDE area for its amenities (such as scenic beauty, outdoor recreational pursuits, and less crowding/congestion). The area has diversified from a historical dependency upon agriculture, mining, and logging to increases in service sectors and other occupations. According to a 2011 report by Headwaters Economics, the region is relatively urban compared to the eastern part of Montana. The area contains two micropolitan statistical areas (Kalispell and Helena), which is defined by the United States Census Bureau as having one urban cluster of at least 10,000 but less than 50,000 people. Missoula is defined as a metropolitan statistical area (having at least one urbanized area of 50,000 or more inhabitants), one of only three in the state

(the other two being Great Falls and the Billings areas). As Headwaters Economics states in their report, “despite the many small towns scattered throughout the region, three-quarters of the residents do not live in a rural area.”

In the past several decades, the conversion of open space and agricultural land to residential development has occurred at a rapid pace in many parts of the United States. The popularity of exurban lot sizes (lots between 1.7 and 40 acres) in much of the country has exacerbated this trend (i.e., low density development resulting in a larger area of land converted to residential development). This pattern of development reflects a number of factors, including demographic trends, the increasingly “footloose” nature of economic activity (i.e., the economic activity can be conducted virtually and is not tied to a specific geographical location or employment site), the availability and price of land, and preferences for homes on larger lots. These factors can place new demands on public land managers as development increasingly pushes up against public land boundaries. For example, human–wildlife conflicts and wildfire threats may become more serious issues for public land managers where development occurs adjacent to public lands. In addition, there may be new demands for recreation opportunities and concern about the commodity use of the landscape (e.g., timber, agriculture, and mining) [excerpted from the Economic Profile System – Human Dimensions Tool Kit (EPS-HDT)].

Population growth is often a key metric used to describe human effects on natural resources. However in most geographies, land consumption (the area of land used for residential development) is outpacing population growth. In these areas, land consumption is strongly related to wildlife habitat loss and the degree to which public lands are bordered by residential development.

The impact of residential development on ecological processes and biodiversity on surrounding lands is widely recognized. They include changes in ecosystem size, with implications for minimum dynamic area, species–area effect, and trophic structure; altered flows of materials and disturbances into and out of surrounding areas; effects on crucial habitats for seasonal and migration movements and population source/sink dynamics; and exposure to humans through hunting, exotics species, and disease (Hansen and DeFries 2007, Hansen et al. 2005).

Residential acreage in the social and economic analysis area increased by 151,115 acres (44.4 percent) from 2000 to 2010 (see table 44). Flathead County had the greatest increase in residential acres, where residential acres increased by 47,980 acres (a 37.7 percent increase). However, the largest percent increase occurred in Lincoln County, where the amount of residential land increased 75.5 percent, which amounted to an increase of 22,974 acres. Most of the counties in the analysis area also saw increases in lot sizes, with a change in residential acres per person of about a third of an acre. The largest changes in average lot size occurred in Lincoln and Sanders counties, where lot sizes increased by approximately one acre.

The types of settlement and land uses that occur on private lands affect grizzly bears. Managing food and garbage (e.g., bear resistant garbage containers) and other bear attractants (e.g., domestic animal foods and bird feeders) has become a more common practice in rural areas and towns. The security of the bear and the bear’s use of natural food sources can be compromised as rural lands are developed and even sparsely settled. These changes in land use are impacts on the bear regardless of this proposed action and are considered as cumulative impacts.

Table 44. Residential development, 2000–2010

County	2000 (acres)	2010 (acres)	Change 2000 to 2010 (acres)	Change 2000 to 2010 (percent)	Acres per person in 2000	Acres per person in 2010	Acres per person 2000 to 2010
Flathead	127,381	175,361	47,980	37.7	1.7	1.9	0.2
Glacier	3,815	4,564	749	19.6	0.3	0.3	0.0
Granite	4,079	6,384	2,305	56.5	1.4	2.1	0.6
Lake	35,413	51,236	15,823	44.7	1.3	1.8	0.4
Lewis and Clark	47,120	65,553	18,433	39.1	0.8	1.0	0.2
Lincoln	30,414	53,388	22,974	75.5	1.6	2.7	1.1
Mineral	5,591	7,419	1,828	32.7	1.4	1.8	0.3
Missoula	61,236	86,864	25,628	41.9	0.6	0.8	0.2
Pondera	1,306	1,420	114	8.7	0.2	0.2	0.0
Powell	3,656	6,103	2,447	66.9	0.5	0.9	0.4
Sanders	17,434	29,666	12,232	70.2	1.7	2.6	0.9
Teton	2,550	3,152	602	23.6	0.4	0.5	0.1
Analysis area (acres)	339,995	491,110	151,115	44.4	1.1	1.3	0.3

Recreation

The spectacular scenery and the outdoor recreational opportunities of the area draw many tourists to the area. The current density of motorized routes across the forests provide ample opportunities for recreation during both winter and summer seasons. For more details on recreation access and facilities across the forests, please see the Recreation section.

According to the National Park Service, in 2013 Glacier National Park alone attracted 2.2 million visitors who spent $178 million and supported 2,824 jobs in the gateway communities surrounding the park (National Park Service 2013). Information on recreation use on the national forests is only available at the forest level and so cannot be directly associated with the lands encompassed by the NCDE. However, the most recent National Visitor Use Monitoring surveys estimate the following annual visitation for the forests connected with the NCDE:

- Flathead National Forest: 885,000 visitors (data collected in 2010)
- Helena National Forest: 454,000 visitors (data collected in 2008
- Kootenai National Forest: 468,000 visitors (data collected in 2012)
- Lewis and Clark National Forest: 269,000 visitors (data collected in 2012)
- Lolo National Forest: 1,266 million visitors (data collected in 2011)

Inspirational and existence values

Perceptions of grizzly bears and bear management

The values that people hold for wildlife have important implications for management of wildlife in Montana, including the grizzly bear. Some people hold existence values for natural resources in general, and for grizzly bears, in particular (Brookshire et. al 1983). Existence value is the notion that the resource has an inherent value, even if it is never “used” or consumed. While it is not

possible to determine, with existing data, what percentage of the population in the Affected Environment (or the general public) holds existence values toward grizzly bears, there have been studies which indicate that Montana residents are likely to hold these values.

A 2009 Montana Fish Wildlife and Parks research summary (Teal and McCoy 2009) describes the types of values that people hold for wildlife and their implications for management. The summary cites a 2005 study entitled "Wildlife Values in the West" (Teal et al. 2005), which describes four types of people associated with these values:

- Utilitarian. These individuals believe that wildlife should be used and managed primarily for human benefit. Individuals with a strong utilitarian orientation are more likely to prioritize human well-being over wildlife in their attitudes and behaviors. They are also more likely to find justification for treatment of wildlife in utilitarian terms and to rate actions that result in death or harm to wildlife as being acceptable.
- Mutualist. These individuals view wildlife as capable of living in relationships of trust with humans, as if part of an extended family, and as deserving of rights and caring. Those with a strong mutualism orientation are less likely to support actions resulting in death or harm to wildlife, more likely to engage in welfare-enhancing behaviors for individual wildlife (e.g., feeding), and more likely to view wildlife in human terms (e.g., Bambi).
- Pluralist. These individuals hold both a mutualism and a utilitarian value orientation toward wildlife. Which of the orientations plays a role is dependent upon the given situation. For certain issues, pluralists are likely to respond in a manner similar to that of utilitarians, whereas for other issues they may behave more like mutualists.
- Distanced. These individuals do not hold either a utilitarian or a mutualism orientation. As their label suggests, they tend to be less interested in wildlife and wildlife-related issues. The distanced individual is also more likely than the other value types to express fear, or concern for safety, while in the outdoors due to the possibility of negative encounters with wildlife (e.g., risk of being attacked or contracting a disease).

The 2005 study showed that three quarters of Montanans held utilitarian or pluralistic values (47 percent utilitarian and 27 percent pluralist). The numbers were slightly higher for landowners (61 percent utilitarian and 16 percent pluralist) as compared to the general public. The smallest group was Montanans classified as distanced. However, the study states that as Montana continues to grow and develop, that the views may change to more of a mutualist view as has occurred in many other areas of the west. Those with a mutualist view are most likely to hold existence values toward grizzly bears.

Opinion surveys on grizzly bears

People's acceptance of changing bear distribution and bear management contributes to the ultimate success in perpetuating the bear's recovery, public safety, and ease to which agencies can effectively manage for the bear. Public views regarding the grizzly bear and its management have been expressed through the development of the draft grizzly bear conservation strategy, state grizzly bear management plans, public scoping activities on proposed actions, and many other local and regional efforts. Generally, public comments on grizzly bear management efforts diverge in their tolerance for increasing and expanding bear populations and with their acceptance of protection measures. These divergent views are discussed as environmental views and multiple-use views later in this section. Divergent views tend to be held by narrow segments of the public at opposing ends of the opinion spectrum while more moderate views tend to be embraced by a broader segment of the public.

Opinion surveys conducted with statistical reliability can help to understand public sentiment and its distribution.

A survey of Lincoln and Sanders county residents was conducted in 2007 (Canepa, Annis, and Kasworm (2008)). The survey was designed to measure public understanding of grizzly bears and management in the Cabinet Mountains and Yaak Valley of Montana (hereafter referred to as the Cabinet-Yaak Ecosystem). The survey focused primarily on knowledge, opinions, and informational sources about grizzly bears in the Cabinet-Yaak Ecosystem, knowledge and support of grizzly bear recovery, and opinions about management activities and recreation. Some of the survey results are summarized below:

- Although 54 percent of respondents believed that grizzly bears can be dangerous to humans, more than 70 percent indicated that grizzly bears belong in the Cabinet-Yaak Ecosystem and should be preserved as a symbol of our national heritage.
- Ninety percent of respondents felt that humans can prevent most conflicts with grizzly bears and the majority stated that they would even accept changes to current garbage disposal methods if it would help prevent problems with grizzly bears.
- While the survey revealed that 57 percent of respondents supported grizzly bear recovery in the Cabinet-Yaak Ecosystem, the level of support decreased to 44 percent when respondents were asked about achieving a grizzly bear population goal of 100 bears.
- One third of respondents stated that they were unaware of the current road restrictions on National Forest lands. In addition, 69 percent stated that grizzly bear recovery efforts had not negatively affected their employment or recreation opportunities.
- When asked about support for current (2007) road restrictions, 49 percent supported and 42 percent were opposed to them. Fifty-eight percent were opposed to any additional road restrictions in the future and 31 percent were in support of them.

Thought not specific to the NCDE area, a survey of Wyoming residents, conducted in 2001 for the Wyoming Game and Fish Department, examined attitudes toward grizzly bears and opinions on the possible removal of the grizzly bear from listing under the Endangered Species Act. Duda and others Duda et al. (2001) found that a supermajority (74 percent) of Wyoming residents believed that grizzly bears were a benefit to Wyoming and an important component of the ecosystems that they occupy. The researchers also found that opinions regarding efforts to increase the populations of grizzly bears in Wyoming were divided between support and opposition. Slightly more Wyoming residents (42 percent) supported efforts to increase the grizzly bear population than opposed (39 percent) such efforts. Support for efforts to increase the grizzly bear population increased considerably (from 42 to 61 percent) when efforts to increase the grizzly bear population were coupled with the idea that groups of wildlife managers would be stationed locally to help track bears, inform and educate people, and resolve conflicts. Two of the top three reasons given for opposing efforts to increase the grizzly bear population dealt with the danger grizzly bears can pose to humans (36 percent) and livestock (18 percent) (Duda et al. 2001).

The researchers also found an equal division between Wyoming residents who think they would continue to use (48 percent) and those residents who would discontinue using (44 percent) the outdoor areas where they currently recreate if those areas were occupied by grizzly bears (Duda et al. 2001).

Another opinion survey examined the political and social viability of predator compensation programs in the west and offers insights from ranchers and the public in Idaho, Montana, and

Wyoming (Montag, Patterson, and Sutton (2003)). The survey found large disparities in the social acceptability of grizzly bears between livestock owners and the public at large. With regard to views that grizzly bears "are an important part of the ecosystems they occupy" the survey found the following:

- Nineteen percent, 45 percent, and 25 percent of the livestock owners sampled from 12 community zones in Idaho, Montana, and Wyoming, respectively, agreed with the statement.
- Fifty-one percent, 63 percent, and 65 percent of the public randomly sampled from Idaho, Montana, and Wyoming, respectively, agreed with the statement.

With regard to the statement, "I would like to see populations of grizzly bears increase in my area" the survey found the following:

- Ninety-two percent, 81 percent, and 91 percent of the livestock owners sampled from 12 community zones in Idaho, Montana, and Wyoming, respectively, resoundingly disagreed with the statement.
- Sixty-six percent, 57 percent, and 60 percent of the public randomly sampled across Idaho, Montana, and Wyoming, respectively, disagreed with the statement.

The division between support of efforts to increase grizzly bear populations and opposition (as shown in the opinion polls) is also reflected in the differing viewpoints expressed during the public involvement activities associated with the proposed amendments.

Public scoping comments

Public scoping comments were reviewed to identify the values, beliefs, and attitudes of forest stakeholders related to the draft NCDE grizzly bear conservation strategy, and more specifically to ascertain whether or not communities hold existence values around grizzly bears.

Values are "relatively general, yet enduring, conceptions of what is good or bad, right or wrong, desirable or undesirable."

Beliefs are "judgments about what is true or false – judgments about what attributes are linked to a given object. Beliefs can also link actions to effects."

Attitudes are "tendencies to react favorably or unfavorably to a situation, individual, object, or concept. They arise in part from a person's values and beliefs regarding the attitude object" (Allen et al 2009).

The public comments are largely consistent with the survey findings, discussed above, on views toward grizzly bears. Most comments are accepting of grizzly bears on the landscape and highlight the existence value of wildlife. However, they differ in their views on the type and extent of access and use restrictions that are necessary to protect grizzly bear habitat. The public comments also reflect diverse values related to human uses of forest lands.

Commenters differ in their beliefs on the relationship between human uses and grizzly bear habitat. Some commenters argue that "Motorcycles do not belong in a location where grizzlies will then become accustomed to human noises and will make them more comfortable moving further into the populated valley. Additionally, noise from motorcycles is unwanted in an otherwise peaceful location" (comment 296-3). This, and related comments, reflect attitudes that motorized use imposes costs on both wildlife habitat and quiet recreation users.

In contrast, other commenters question the necessity of restrictions on motorized access to protect grizzly habitat. For instance, one commenter notes that "The Forest Service has taken the approach that motorized use and human activity has been the biggest threat to bear populations when in reality it has been a simple ban on hunting grizzlies that has brought about the large rebound in grizzly populations…The Forest Service is still pushing for minimum road and motorized trail densities claiming that high motorized use in critical habit is the equivalent to the taking of a grizzly. How is it possible that restrictive motorized use is still needed when the recovery has already taken place?" (comment 357-1). Similarly, another commenter expressed concern that the Forest Service's grizzly bear management activities may outlive their usefulness, noting that the Forest Service should develop "provisions for removing unneeded restrictions on some of the motorized travel once the grizzly is delisted" (comment 382-4).

Some commenters believe that the conflict between motorized uses and grizzly bear habitat are overestimated: "I fail to see how these restrictions are warranted regarding snowmobile use in the wilderness study area and the Ten Lakes area. If the Forest Service is placing these snowmobile restrictions for the purpose of limiting conflict between snowmobilers and grizzly bears in the area, then I have to say that there is no conflict. It is well known that black bears and grizzly bears hibernate in November and usually emerge in late March or April. If they are denning during this time then there is no conflict. Furthermore it is rare to see any wildlife be it mountain goats, elk, moose, deer or wolves. The high elevation areas are covered in deep mountain snow during this time so the wildlife is at lower elevations. I am alert to wildlife and enjoy viewing wildlife at all times of the year. It is safe to say that for 10 trips into the backcountry, we might cut a rabbit track, magpie or crow track only once. If the wildlife was there we would see them or evidence of them" (comment 381-2).

A number of these concerns are based on the perceived economic cost of access restrictions: "We need fewer gates and more access to our forest for recreational opportunities such as hiking, camping, boating, fishing, huckleberry picking, hunting, snowmobiling, bicycling, horseback riding, etc. all adding economic value in our community. Having more access also helps with fire suppression when needed in remote areas" (comment 421-7). Grizzly bear habitat protection is seen, by some commenters, as the origin of these restrictions, with one comment letter arguing that, "Grizzly bear management has been the primary driver for road closures, trail closures and logging cancellations" (comment 357-1).

However, proponents of management actions that protect grizzly bear habitat also frequently cite economic considerations and the tourism value of wildlife habitat. For instance, one commenter noted that "Wildlife viewing is one of the top two reasons people decide their travel destination will be Montana. Expenditures for travel/tourism in Montana are greatest around Glacier National Park, the Flathead National Forest and Yellowstone National Park, but this is true throughout the west and central Rocky Mountain front, and non-resident expenditures are very significant" (comment 388-19).

Other commenters argue that the existing NFS road system is excessive, financially unsustainable, and a threat to wildlife-related values. For example, one commenter argued that, "The proposal weakens protections for [water quality, fish, wildlife, and visual quality], retaining the bloated 3,500-mile road system needed to log the inflated timber base rather than removing roads to protect resources and ease the burden on taxpayers" (comment 167-4). Furthermore, another commenter noted, the size of the current road system makes it infeasible to maintain: "Many Forests have bloated road networks of 1,000-3,000 miles, but budgets to maintain only a fraction of them. Closing

many of these roads and restoring the habitat is both fiscally and ecologically wise" (comment 318-1).

Cultural and heritage values

Cultural and heritage values are described as the activities, values, preferences, and ways of living in a particular place and time. For more details on historic and tribal uses, please see the Heritage Resources section and American Indian Rights and Interests section.

Rural lifestyles

The U.S. Census Bureau's urban-rural classification is fundamentally a delineation of geographical areas, identifying individual urban areas and then defining "rural" as encompassing all population, housing and territory not included in a defined urban area. The Census Bureau delineates urban areas after each 10-year census by applying specified criteria to the census and other data. In 2010, the Census Bureau identified two types of urban areas:

- Urbanized areas of 50,000 or more people
- Urban clusters of at least 2,500 and less than 50,000 people.

Thus in the affected environment, "rural" encompasses all population, housing, and territory not included within these definitions (U.S. Census 2014).

The USDA Economic Research Service classifies rural counties in a number of ways. One way is by the Urban Influence Codes (Economic Research Service 2013). The 2013 Urban Influence Codes form a classification scheme (shown in table 45) that distinguishes metropolitan counties by the population size of their metro area (codes 1 and 2), and nonmetropolitan counties (codes 3 through 12) by the size of the largest city or town and proximity to metro and micropolitan areas. Noncore counties are those counties not classified as a metropolitan or micropolitan statistical area.

Table 45. Economic Research Service urban influence code classification scheme

Code	Classification
1	In large metro area of 1+ million residents
2	In small metro area of less than 1 million residents
3	Micropolitan area adjacent to large metro area
4	Noncore adjacent to large metro area
5	Micropolitan area adjacent to small metro area
6	Noncore adjacent to small metro area and contains a town of at least 2,500 residents
7	Noncore adjacent to small metro area and does not contain a town of at least 2,500 residents
8	Micropolitan area not adjacent to a metro area
9	Noncore adjacent to micro area and contains a town of at least 2,500 residents
10	Noncore adjacent to micro area and does not contain a town of at least 2,500 residents
11	Noncore not adjacent to metro or micro area and contains a town of at least 2,500 residents
12	Noncore not adjacent to metro or micro area and does not contain a town of at least 2,500 residents

Table 46 shows the urban influence rating for the counties in the social and economic analysis area, sorted in ascending order. Missoula County is considered a small metropolitan county. Lake and Powell counties, with a ranking of 6, are classified as noncore, adjacent to a small metro area, and

containing a town of at least 2,500 residents. Four of the counties have a ranking of 7 (Granite, Mineral, Sanders, and Teton) and are considered noncore, but adjacent to a small metro area and not containing a town of at least 2,500 residents. Flathead and Lewis and Clark counties (classified as 8) are micropolitan areas not adjacent to a metro area. Lincoln (with a classification of 11) is noncore, adjacent to a micropolitan area, and contains a town of at least 2,500 residents. Finally, the last two counties (Glacier and Pondera) shown in table 38, with a score of 11, are classified as noncore, not adjacent to a metro or micro area and containing a town of at least 2,500 residents.

Table 46. Amendment forest counties, by Economic Research Service rural-urban continuum code

County	Urban Influence Code[1]
Missoula County	2
Lake County	6
Powell County	6
Granite County	7
Mineral County	7
Sanders County	7
Teton County	7
Flathead County	8
Lewis and Clark County	8
Lincoln County	9
Glacier County	11
Pondera County	11

1 See table 45 for description of codes.

Social assessments completed for some of the forests in the area (Kootenai and Nez Perce Clearwater) discuss how most of these communities and residents have a close relationship with the forests through recreational pursuits, reliance upon products such as firewood and wild game, or as a part of living in a scenic, rural landscape (Russell and Adams-Russell (2004a), (2004b)). While many residents of local communities value their small town atmosphere and values, they are also aware of the pressures of change. Community and county planning have been more on the forefront in recent years although community members desire to maintain local control.

Examples from county growth policies in the social and economic analysis area highlight some of the values held by residents of the area. These examples are drawn from the growth policies for Flathead, Powell, Granite, and Mineral counties.

- Flathead County: Maintaining the identity of rural communities is one of the Flathead County Growth Policy's objectives. This objective states, "Preserving the rural lifestyle is a primary goal identified by many Flathead County residents. The ability to live 'the simple life' and own land in a safe, quiet, and environmentally pristine neighborhood away from cities is a characteristic many residents value." Other objectives are to properly manage and protect the natural and human environment and promoting the cultural resources and heritage of Flathead County, while limiting interference with private land management opportunities (FBOCC (2012)).
- Powell County: This county's growth policy includes goals to foster and preserve the identity of the rural agricultural areas and rural communities and the continuance of the small town and rural lifestyles of the county (Powell County 2006)

- Granite County: This county's growth policy includes goals to encourage new growth to locate near existing communities where services can be efficiently provided and the loss of agricultural and forest land is minimized; promote the protection of the rivers and streams and flood areas, riparian areas, and wetlands in the county; and suggests policies to retain or promote public access to recreational and cultural areas such as forests, lakes, rivers, streams and geologic scenic and historic sites (Michnevich et al. (2013)).
- Mineral County: This county's growth policy includes establishing land use patterns which accommodate growth, preserve the identity and character of existing communities, and minimize conflicts with agriculture and existing businesses and industries and protecting and conserving the natural resources, clean air and water, and environment. The policy also promotes land use patterns which balance economic benefits and environmental stewardship and preserves the quality of life for all residents of the county, including residents in towns and unincorporated communities (Mineral County 2008).

Resource values and uses

Consumptive uses of natural resources, particularly ranching and logging, continue to be part of the livelihoods and lifestyles in the NCDE area.

Ranchers graze cattle, horses, sheep, and goats on the five forests in the NCDE area. The majority of use occurs on the Helena and Lewis and Clark National Forests. Grizzly bear predation on livestock can reduce support for grizzly bear conservation measures among livestock permittees. The opinion survey results, discussed above, reveal that support for grizzly bears on the landscape are meaningfully lower among livestock operators. Therefore, social aversion of grizzly bears and associated conservation measures are more likely to occur in the parts of the primary conservation area that overlap with the Helena and Lewis and Clark National Forests.

Timber is removed from the forests for both commercial and personal use. Fuelwood is used for home-heating throughout the social and economic analysis area. Granite, Lincoln, Mineral, and Sanders counties are particularly reliant on wood for home-heating, where more than 30 percent of households in each country report wood as their primary heating fuel (U.S. Census 2013). Fuelwood collection is part of both livelihoods and lifestyles in the analysis area. In addition to serving as an affordable home-heating source, fuelwood collection is tied to western heritage values. Restrictions on motorized access can affect the ability of people to harvest timber.

The economic contribution analysis, in section 6.3.12, provides more detail on the role of public land grazing and timber harvesting in local communities and economies.

Health and Safety

Minimizing bear-human conflicts

Through educational campaigns, food storage regulations and restrictions on access to areas where grizzly bears are likely to be active, the Forest Service and other state and local agencies work to minimize bear-human conflicts.

Environmental justice

Environmental justice is the fair treatment and meaningful involvement of people of all races, cultures, and incomes, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The goal of environmental justice is for Federal agency decision-makers to identify impacts that are disproportionately high and adverse with respect

to minority and low-income populations and identify alternatives that will avoid or mitigate those impacts.

The emphasis of environmental justice is on health effects and/or the benefits of a healthy environment. The Council of Environmental Quality has interpreted health effects with a broad definition: “Such effects may include ecological, cultural, human health, economic or social impacts on minority communities, low-income communities or Indian Tribes …when those impacts are interrelated to impacts on the natural or physical environment” (CEQ 1997).

Table 47 displays the share of the population by race and ethnicity in the analysis area. Most counties are predominantly white and have a similar racial and ethnic composition as the state overall. However, Glacier, Lake, and Pondera counties have large shares of Native American residents.

Table 47. Race and ethnicity by county

Location (County)	Two or More Races	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Hispanic or Latino (Any Race)
Flathead	1.9	95.5	0.2	1.6	0.5	0	0.3	2.4
Glacier	1.6	32.1	0.1	65.2	0.5	0.1	0.5	2
Granite	1.6	97.4	0.1	0.9	0	0	0	1.6
Lake	6.6	69.7	0.2	22.7	0.5	0	0.4	3.8
Lewis and Clark	2.2	93.6	0.4	2.8	0.5	0.1	0.4	2.6
Lincoln	0.8	95.9	0.1	2.1	0.8	0.1	0.1	2.4
Mineral	0.1	98.1	0.6	0.9	0.1	0	0.1	1.8
Missoula	2.7	92.7	0.4	2.7	1.1	0.1	0.3	2.8
Pondera	2	82.5	0.6	14.2	0.3	0	0.4	1.6
Powell	1.6	92.4	0.4	4.2	0.6	0.3	0.5	2.6
Sanders	1.9	91.9	0.1	5.6	0.1	0	0.3	2.2
Teton	1.3	95.6	0.1	2	0.3	0	0.7	1.4
Montana (State)	2.4	89.4	0.4	6.5	0.6	0.1	0.6	3.1

Data source: U.S. Census Bureau 2013

Table 48 displays the share of people living below the poverty level in each analysis area county and the state. Most counties have similar rates of poverty to the state overall. However, in Glacier, Lake, and Sanders counties more than one-fifth of residents are in poverty. These data reveal substantial overlap between minority status and poverty rates. Glacier County has the highest rates of poverty, with one-third of residents living below the poverty level. Glacier County also has the largest minority population, with approximately two-thirds of residents identifying as Native Americans.

The four counties identified in this section (Glacier, Lake, Pondera, and Sanders) meet environmental justice standards. Management actions that have the potential to disproportionately and adversely affect low-income and minority populations will be scrutinized in the environmental consequences section.

Table 48. Poverty rates by county

Location (County)	Percent of People Below Poverty Level
Flathead	14.2
Glacier	33.7
Granite	15.1
Lake	22.4
Lewis and Clark	10.4
Lincoln	17.9
Mineral	18.4
Missoula	16.5
Pondera	17.5
Powell	15.3
Sanders	22
Teton	15.1
Montana (State)	15.2

Data source: U.S. Census Bureau 2013

6.18.5 Social environmental consequences

Effects common to all alternatives

Under all three alternatives, land ownership, land settlements, and land uses trends will continue to influence natural resource management. Population trends for the affected environment are upward sloping, particularly in Flathead and Missoula counties. As such, it is likely that there will be increased visitation to forest lands, and in turn, increased likelihood of human-bear interaction. These future conditions underscore the need to provide comprehensive policies that both protect bear habitat and minimize the likelihood of bear-human conflict.

Alternative 1 — no action alternative

Recreation

Access to recreation under the No action alternative will continue at the current levels across the forests (see Recreation section for detail by forest). See the recreation section for details on each forest.

Inspirational and existence values

The existing forest plans, together with food storage orders, travel plans and biological opinions that provided mandatory terms and conditions to avoid or minimize incidental take, have been effective in contributing to the improved status of the NCDE grizzly bear population. Continued implementation of the no-action alternative would be compatible with contributing to a recovered grizzly bear population. However, the existing forest plans lack some of the components that are needed to provide the regulatory mechanisms that would support de-listing of the NCDE population, and most do not provide specific management direction for areas outside the recovery zone that are now occupied by bears. Therefore under this alternative, it is expected that the grizzly bear have would to remain under the protection of the Endangered Species Act.

Cultural and heritage values

Under the no-action alternative, grazing allotments will remain unchanged and communities in the Affected Environment will continue to enjoy a mix of urban and rural lifestyles. Access to forest lands for cultural and heritage activities such as collection of firewood, visiting cultural sites and wildlife viewing will continue.

Health and safety: minimizing grizzly bear-human conflict

Measures that make food, garbage and livestock carcasses inaccessible to bears through proper storage or disposal are very effective in reducing grizzly bear-human conflicts and the potential for injuries or mortalities. Efforts by the Forest Service to keep these attractants unavailable to bears, including the food storage orders as shown in table 5, will continue under this alternative. However, some portions of national forests that are outside the recovery zone but are now occupied by grizzly bears are not covered by food/attractant storage orders or by specific management direction to coordinate grizzly bear habitat and human uses. There may be a higher risk of grizzly bear-human conflicts developing in those areas.

Alternative 2 — proposed action modified

Recreation

Under alternative 2, new developed recreation sites or expansion of existing sites with overnight use would be limited within the primary conservation area to no more than one per bear management unit per decade. This limits the availability of developed sites in response to increased use. See the environmental consequences section for recreation for a detailed description of this limitation.

Under this alternative, restricted roads both within and outside the secure core of the primary conservation area may be temporarily open for public motorized use. Therefore, under this alternative, the public has more opportunity for motorized access to recreate and connect with nature, compared to alternative 3.

Inspirational and existence values

Under alternative 2, a consistent set of forest plan components would be incorporated into the forest plans that would contribute to sustaining the recovered grizzly bear population and provide for adequate regulatory mechanisms to support delisting. Successful recovery and delisting of the grizzly bear could provide for greater inspiration and existence values, as compared to the no-action alternative.

Cultural and heritage values

Under alternative 2, restricted roads within the secure core of the primary conservation area may be temporarily open for public motorized use. This allows for more opportunities for the public to participate in cultural and heritage activities such as collecting firewood and visiting cultural sites. Refer to the grazing section for alternative 2 effects on grazing.

Health and safety: minimizing grizzly bear-human conflict

Under alternative 2, a consistent set of forest plan components (desired conditions, standards and guidelines) would be incorporated across the NCDE aimed at reducing the risk of grizzly bear-human conflicts associated with motorized access, recreation, vegetation management, livestock grazing, and minerals and energy development. As a result, efforts to minimize bear-human conflict may be more effective, as compared to alternative 1. This could result in fewer conflicts between bears and humans, as well as between bears and livestock.

Alternative 3

Recreation

Under alternative 3, new developed recreation sites or expansion of existing sites would be limited within the primary conservation area to no more than one per bear management unit per decade. This limits the availability of developed sites in response to increased use. Under this alternative, restricted roads within the secure core of the primary conservation area are not allowed to be temporarily open for public motorized use as under alternative 2. Therefore, alternative 3 has less opportunity for motorized access to recreate and connect with nature, compared to alternative 2. This alternative also adds NCDE-STD-AR-07, which requires ski areas that operate in the non-denning season to include mitigation measures to reduce the risk of grizzly bear-human conflicts, and NCDE-STD-AR-08 which allows no increase above the baseline in acreage of areas and miles of routes open to over-snow use during the den emergence period. See the environmental consequences section for recreation for a detailed description of these limitation.

Inspirational/existence values

Under alternative 3, some forest plan components in addition to those under alternative 2 would be incorporated into the forest plans. For example, no temporary use of roads by the public would be allowed in secure core. Most of the standards and guidelines pertaining to livestock grazing would be extended to zone 1. New or re-authorized permits for ski areas on NFS lands that operate during the non-denning season will require mitigation measures to reduce the risk of grizzly bear-human conflicts. Within the primary conservation area and zone 1, new oil and gas leases shall include a no surface occupancy stipulation. These measures would be more protective of grizzly bear habitats and populations, compared to alternatives 1 and 2. As a result, this alternative provides for the greatest inspiration and existence values, as compared to all other alternatives.

Cultural/heritage values

Under alternative 3, restricted roads within the secure core of the primary conservation area will not be temporarily open for public motorized use. This allows the public fewer opportunities to participate in traditional and cultural activities such as collecting firewood and visiting cultural sites, compared to alternative 2.

Health and safety: minimizing grizzly bear-human conflict

Under alternative 3, vegetation guidelines would be extended to the demographic connectivity areas as well as the primary conservation area, and most of the livestock grazing standards and guidelines would be extended to zone 1. As a result, efforts to minimize bear-human conflict may be more effective, compared to alternatives 1 and 2. Additionally, restricted roads within the secure core of the primary conservation area will not be temporarily open for public motorized use. This could result in fewer conflicts between grizzly bears and humans, compared to alternatives 1 and 2.

Cumulative Effects

Climate change is predicted to increase the number of hot days in the region, leading to increased summer recreation and cultural visits to the forests (Northern Rockies Adaptation Partnership, chapter 10, Effects of Climate Change on Recreation). As such, there may be added demand for recreation facilities in summer months.

Under all alternatives, provisions to manage for grizzly bear habitat and bear-human conflict on forest lands will continue. These policies include food storage orders, bear-resistant containers, information/education campaigns, maintaining and improving grizzly habitat and minimizing bear-

human conflict. A portion of the NCDE area is located on private lands and these landowners are under no obligation to manage for grizzly bears or their habitat, except for the Endangered Species Act prohibitions against unauthorized take. This could provide greater economic opportunity for private recreation in the region.

Recreation, cultural/heritage values, inspirational/existence values and measures to minimize bear-human conflict are provided for under all alternatives, but to varying degrees. As natural amenity migration increases, the demand for outdoor recreation and the cultural value of wildlife viewing may increase. The new wave of natural amenity migrants, who are moving to urban areas, will not be as likely to own livestock, and thus, may be more likely to hold existence values around wildlife and favor conservation of grizzly bear habitat over grazing and timber harvest (Montag, Patterson, and Sutton (2003)).

6.18.6 Economic affected environment

Rural areas surrounding forests are often dependent upon forest resources for much of their economic well-being. Understanding the economic context of the area surrounding the five forests in the NCDE area provides important information to land managers as the economy of the local area influences and is influenced by the management of the forest. Long-term, steady growth of population, employment, and real personal income is generally an indication of a healthy, prosperous economy. Conversely erratic growth, no-growth, or long-term decline in these indicators generally indicate a struggling economy. Growth can benefit the general population of a community, especially by providing economic opportunities, but it can also stress a community, and lead to income stratification.

The following subsections provide information on: sectors of the economy particularly influenced by national forest management; employment and income trends by type of industries; and federal land payments and their importance to county revenue for the counties in the analysis area.

Commodity sectors

Public lands can play a key role in stimulating local employment by providing opportunities for commodity extraction. In this report, timber, mining, and agriculture are together referred to as commodity sectors because they have the potential for using public lands for the extraction of commodities. For example, timber may be harvested from Forest Service lands, and oil and gas development and cattle grazing may occur on federal lands. The exact number of jobs that rely on the commodity use of public lands cannot be measured; however, the relative size of the commodity sectors is important to understand, in order to put the economy related to commodity extraction in perspective. For example, a county with 90 percent of its employment in the commodity sectors has a higher chance of being impacted by decisions that permit (or restrict) timber, mining, and grazing activities on public lands than a county where only 10 percent of the workforce is in these sectors.

Table 49 shows the percent of total employment in 2012 accounted for by the commodity sectors (timber, mining, and agriculture) in the analysis area, by commodity type. Agriculture supports more employment than either mining or timber, though for the analysis area as a whole, the amount of employment is still very small (3 percent of the total). This is a lower percentage than the state (4.6 percent) but a higher percentage than the national average (1.5 percent). However, the amount of agricultural employment varies widely by county, from a high of 20 percent in Teton County to a low of less than 1 percent in Missoula County. Counties with more than 10 percent of their employment in the agricultural sector include Teton (20 percent), Pondera (15 percent), and Sanders (10.6 percent).

However, agriculture is more important to the 12-county area than the employment numbers suggest. The percentage of land area in farms is very high in some instances. Several counties have more than 50 percent of their land area in farms including Lake County (58.3 percent), Teton County (67.1 percent), Glacier County (81.9 percent), and Pondera County (92.1 percent). The largest number of farms are associated with other crop farming (which includes other crops not listed in the table or farms where no one crop or family of crop(s) account for one-half or more of the establishment's agricultural production) and beef cattle ranch and farms, which each account for around 25 percent of the farms in the area.

Information from the Bureau of Business and Economic Research (McIver et al. 2013) indicates that timber harvest in the 12-county area dropped from 1,010 MMBF (million board feet) to 305 MMBF in 2009. During this same period, timber processing facilities fell from 96 to 75. By 2012, timber employment accounted for 2.1 percent of total private employment in the analysis area and ranged from a low of zero in Glacier and Pondera counties up to a high of nearly 26 percent in Mineral County. The only other county with more than 10 percent of its employment in timber-related sectors in 2012 was Powell County at 23.7 percent. In 1998, timber employment accounted for 5.8 percent of the employment in the analysis area.

Table 49. Commodity sectors and percent of total employment

County	Timber[1] (percent)	Mining[1] (percent)	Agriculture[2] (percent)
Flathead	3.1	0.1	1.8
Glacier	0.0	4.7	9.3
Granite County	9.8	1.2	8.4
Lake County	2.3	0.0	9.5
Lewis and Clark County	0.2	0.8	1.5
Lincoln	5.1	4.3	3.7
Mineral County	25.8	0.0	3.9
Missoula County	1.2	0.2	0.9
Pondera County	0.0	0.8	15.0
Powell County	23.7	0.6	9.1
Sanders County	6.4	2.2	10.6
Teton County	0.4	0.0	20.0
Analysis Area	2.1	0.5	3.0

1 Data for timber and mining are from County Business Patterns, which excludes proprietors, government, and railroad.

2 Data for agriculture are from Bureau of Economic Analysis (Accessed via Economic Profile System-Human Dimensions Toolkit)

Mining employment accounted for a very small percentage of employment in the area in 2012, 0.5 percent, compared to 2.2 percent for the state and 0.6 percent for the nation. The two counties with the largest amount of employment in mining include Glacier (4.7 percent) and Lincoln (4.3 percent). Mining employment has increased somewhat since 1998 when mining employment accounted for 0.19 percent of employment in the area.

Travel and tourism

Public lands can also play an important role in stimulating local employment by providing opportunities for recreation. Communities adjacent to public lands can benefit economically from visitors who spend money in hotels, restaurants, ski resorts, gift shops, and elsewhere. The information in this section is drawn from Economic Profile System-Human Dimensions Toolkit.

As defined by Toolkit, travel and tourism consists of sectors that provide goods and services to visitors to the local economy, as well as to the local population. These industries are: retail trade; passenger transportation; arts, entertainment, and recreation; and accommodation and food. Therefore, it is not known what proportion of the jobs in these sectors is attributable to expenditures by visitors, including business and pleasure travelers, versus by local residents. Some researchers refer to these sectors as "tourism-sensitive." They could also be called "travel and tourism-potential sectors" because they have the potential of being influenced by expenditures by non-residents. This information is useful for explaining whether sectors that are likely to be associated with travel or tourism exist, and whether there are differences between areas. However, this information is less useful as a measure of the absolute size of employment in travel and tourism. To know the later would require detailed knowledge, obtained through surveys and other means, of the proportion of a sector's employment that is directly attributable to travelers.

Table 50 shows the percent of total private employment in industries that include travel and tourism for the primary analysis area. Total private employment as shown here does not include employment in government, agriculture, railroads, or the self-employed because these are not reported by County Business Patterns. From 15.1 to 30.6 percent of total private employment in the social and economic analysis area is associated with industries connected to travel and tourism with most of that associated with the accommodation and food sector. From 1998 to 2012, travel and tourism employment grew from 18,801 to 23,327 jobs, a 24.1 percent increase. In 2012, Granite County had the largest percent of total travel and tourism employment (30.6 percent) and Teton County had the smallest (15.1 percent). In comparison, travel and tourism employment accounted for about 20 percent of employment in the state of Montana and 15.2 percent for the nation.

Table 50. Percent of total employment in industries that include travel and tourism, 2012

County	Accommodation and Food Services (percent)	Arts, Entertainment, and Recreation (percent)	Passenger Transportation (percent)	Retail Trade (percent)	Total Travel and Tourism (percent)
Flathead	13.8	3.4	0.3	3.1	20.5
Glacier	14.9	1.1	0.0	5.1	21.2
Granite	16.2	0.6	0.0	13.7	30.6
Lake	12.4	1.1	0.0	3.4	16.9
Lewis and Clark	12.8	2.7	0.2	2.2	17.9
Lincoln	11.9	2.6	0.0	3.3	17.7
Mineral	10.8	2.6	0.0	16.0	29.4
Missoula	12.8	2.7	0.5	3.3	19.3
Pondera	10.7	2.4	0.0	4.1	17.2
Powell	12.2	4.9	0.1	2.8	20.0
Sanders	15.1	1.0	0.0	5.9	22.0
Teton	9.4	1.0	0.3	4.4	15.1

County	Accommodation and Food Services (percent)	Arts, Entertainment, and Recreation (percent)	Passenger Transportation (percent)	Retail Trade (percent)	Total Travel and Tourism (percent)
Analysis Area	13.0	2.7	0.3	3.3	19.3

Source: County Business Patterns 2012 (Accessed via Economic Profile System-Human Dimensions Toolkit ()

Employment

The economy in the social and economic analysis area is growing rapidly, outpacing the state of Montana as well as the nation as a whole. From 1970 to 2012, more than 140,026 new jobs were created. Employment growth in Flathead, Lake, Lewis and Clark and Missoula Counties accounted for the majority of the change.

Table 51 shows from 2001 to 2012, jobs in services related industries grew from 131,587 to 154,693, an 18 percent increase, while jobs in non-services related industries shrank from 36,862 to 32,968, an 11 percent decrease. During this same period, jobs in government grew from 33,604 to 37,581, a 12 percent increase.

Table 51 also shows that in 2012, the three industry sectors with the largest number of jobs were government (37,581 jobs); retail trade (26,398 jobs); and health care, social assistance (26,355 jobs). From 2001 to 2012, the three industry sectors that added the most new jobs were health care, social assistance (5,943 new jobs); real estate, rental, leasing (4,215 new jobs); and government (3,977 new jobs). The sectors losing the most employment from 2001 to 2012 were non-services sectors, such as construction and manufacturing, which together lost nearly 4,000 jobs.

Table 51. Employment by industry, 2001–2012

Industry	2000 Employment [a]	2012 Employment [a]	Change (2000-2012)
Total Employment (number of jobs)	203,444	227,236	23,792
Non-services related	36,862 [b]	32,968[b]	-3,894
Farm	7,342	6,923	-419
Forestry, fishing, & related activities	3,075 [b]	2,615 [b]	-460
Mining (including fossil fuels)	904 [b]	1,862 [b]	958
Construction	14,588 [b]	13,574 [b]	-1,014
Manufacturing	10,953 [b]	7,994 [b]	-2,959
Services related	131,587 [b]	154,693 [b]	23,106
Utilities	753 [b]	821 [b]	68
Wholesale trade	4,762 [b]	4,793 [b]	31
Retail trade	25,096	26,398	1,302
Transportation and warehousing	6,202 [b]	5,815 [b]	-387
Information	4,106 [b]	3,485 [b]	-621
Finance and insurance	7,435 [b]	8,853 [b]	1,418
Real estate and rental and leasing	6,929 [b]	11,144 [b]	4,215

Industry	2000 Employment [a]	2012 Employment [a]	Change (2000-2012)
Professional and technical services	11,340 [b]	13,018 [b]	1,678
Management of companies and enterprises	638 [b]	919 [b]	281
Administrative and waste services	8,233 [b]	11,193 [b]	2,960
Educational services	2,182 [b]	3,383 [b]	1,201
Health care and social assistance	20,412 [b]	26,355 [b]	5,943
Arts, entertainment, and recreation	5,435 [b]	7,162 [b]	1,727
Accommodation and food services	16,427 [b]	18,528 [b]	2,101
Other services, except public administration	11,637 [b]	12,826 [b]	1,189
Government	33,604	37,581	3,977

a Source: U.S. Department of Commerce. 2014. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C. Table CA25N.

b Estimated data from Headwaters Economics for data that was not provided by the Bureau of Economic Analysis. [Accessed via Economic Profile System-Human Dimensions Toolkit]

Income

Total personal income has grown in recent years in the social and economic analysis area, with more than $8,925 million in new income earned between 1970 and 2012. This was a higher rate of growth than for either the state or the nation. As with employment, the major contributors to this growth were the counties of Flathead, Lake, Lewis and Clark, and Missoula.

Non-labor income is a combination of dividends, interest and rent, and transfer payments. In 2012, dividends, interest, and rent was the largest source of non-labor income in the analysis area (22.7 percent), and transfer payments was the smallest (20.3 percent percent). However, the greatest growth, in percentage terms, was in hardship-related transfer payments such as Medicaid and welfare, which grew from $67 million to $755 million from 1970 to 2012, an increase of 1,034 percent (all dollar values have been adjusted for the impact of inflation). Age-related transfer payments grew from $232 million in 1970 to $1,578 million in 2012, an increase of 581 percent. Dividends, interest, and rent grew from $750 million to $3,057 million, an increase of 308 percent.

From 2001 to 2012, personal income from services related industries grew from $4,316 million to $5,439 million (in real terms), a 26 percent increase. During this same time, however, personal income from non-services related industries shrank from $1,378 million to $1,279 million (in real terms), a 7 percent decrease. Personal income from government jobs grew from $1,750 million to $2,224 million (in real terms), a 27 percent increase.

Wildland dependency

Wildland dependency is a measure of a community's reliance on industries tied to natural resource-based industries. Wildland dependency is calculated as the percentage of county total labor income (employee compensation and proprietor income) earned in five wildland resource areas (timber, mining, grazing, recreation and wildlife) and Federal wildland-related employment (e.g., Forest Service, Department of Interior agencies, etc.) (Gebert and Odell 2007). The National Forest-

Dependent Rural Communities Economic Diversification Act of 1990 (Public Law 101-624) defined a county as being wildland dependent if 15 percent or more of their total county labor income (primary and secondary income) came from industries associated with forest resources. Primary income is income derived directly from the industrial sectors constituting the primary wildland industries and secondary income is that derived from indirect and induced effects associated with primary income (also known as the multiplier effect) (Gebert and Odell 2007). Indirect effects are felt by the producers of materials used by the directly affected industries. Induced effects occur when employees of the directly and indirectly affected industries spend the wages they receive.

Wildland dependency calculations for the social and economic analysis area are provided in table 52 by county. In 2010, half of the counties met the 15 percent criterion for wildland dependency: Glacier, Granite, Lincoln, Mineral, Powell, and Sanders Counties. Counties that had been wildland dependent in 2000 but no longer met the criterion in 2010 included Flathead and Teton Counties. The remaining four counties (Lake, Lewis and Clark, Missoula, and Pondera) did not meet the 15 percent criterion for dependency in either year. All counties, with the exception of Lewis and Clark and Pondera Counties, saw a substantial drop in wildland dependency over the 10-year period.

Table 52. Wildland dependency (percent of total county labor income derived from wildland-based industries) for the analysis area counties, 2010, and change from 2000

County	Grazing (%)	Timber (%)	Mining (%)	Govt. (%)	Rec. (%)	Total Primary (%)	Secondary (%)	Total (%)
Flathead	0.1	3.7	1.4	1.9	1.3	8.4	4.7	13.1
Change	0.0	-2.0	0.9	0.5	-3.8	-4.5	-2.6	-7.1
Glacier	0.5	0.1	4.7	4.0	4.1	13.4	2.4	15.8[a]
Change	-0.5	-0.3	3.3	-0.5	-6.5	-4.6	-6.8	-11.4
Granite	0.3	9.5	1.8	4.8	4.7	21.1	7.3	28.4 [a]
Change	-2,4	-3.2	-1.4	2.0	-3.2	-8.2	-9.6	-17.8
Lake	0.2	0.7	0.8	0.8	0.1	2.7	1.5	4.2
Change	-0.8	-3.5	0.1	0.0	-0.4	-4.7	-3.3	-8.0
Lewis and Clark	1.0	0.1	0.9	0.2	0.2	2.3	0.9	3.2
Change	0.8	-0.1	-0.6	-0.4	-0.8	-1.0	-0.6	-1.6
Lincoln	0.1	4.9	6.8	9.8	2.2	23.8	8.0	31.8 [a]
Change	-0.1	-21.3	6.7	3.7	-2.5	-13.4	-11.6	-25.0
Mineral	<0.1	11.4	0.9	5.8	3.6	21.7	6.9	28.6 [a]
Change	-0.2	-1.4	-2.5	1.2	-6.5	-9.4	-11.7	-21.1
Missoula	<0.1	1.7	0.3	3.2	0.1	5.3	2.5	7.8
Change	-0.1	-3.8	0	1.0	-0.3	-3.2	-3.7	-6.9
Pondera	1.4	0.0	2.9	0.7	0.4	5.4	2.4	7.8
Change	-0.3	-1.1	1.4	0.3	-0.6	-0.3	-2.9	-3.3
Powell	2.0	8.1	0.1	2.0	2.3	13.4	5.9	19.3 [a]
Change	-0.3	-7.1	-0.6	0.3	-3.2	-12.1	-12.1	-24.2
Sanders	0.2	4.1	3.2	4.2	2.1	13.9	4.8	18.7 [a]
Change	-1.1	-4.0	2.8	0.9	-2.6	-4.1	-5.2	-9.3
Teton	1.6	0.1	3.5	2.6	0.9	8.7	3.0	11.7

County	Grazing (%)	Timber (%)	Mining (%)	Govt. (%)	Rec. (%)	Total Primary (%)	Secondary (%)	Total (%)
Change	-2.4	-0.9	2.9	1.3	-2.8	-1.9	-6.1	-7.9

a Wildland dependent: met or exceeded the 15 percent criterion for wildland dependency

Economic contribution of national forest management

Management of national forests contributes to the local economies by the products (e.g., timber and minerals) that are produced on the national forests and processed in the local economy; by uses (e.g., recreation visits) that occur on the national forests; and by the service provided by employees of the national forests.

Current national forest contributions to employment and income were estimated with input-output analysis using the Impact Analysis for Planning (IMPLAN) modeling system (MIG (2004)) and the Forest Economic Analysis Spreadsheet Tool (FEAST) (Alward et al. 2010). The IMPLAN modeling system allows the user to build regional economic models of one or more counties for a particular year. The model for this analysis used the 2012 IMPLAN data. FEAST is a spreadsheet-based modeling tool that serves as an interface between user inputs and imported data from an existing IMPLAN model.

Input-output analysis is a means of examining relationships within an economy, both among businesses and between businesses and final consumers. The analysis captures monetary market transactions for consumption in a given time period. Economic contribution analysis is defined as “the gross change in economic activity associated with an industry, event, or policy in an existing regional economy (Watson et al. 2007). By using Forest Service expenditure data, resource output data, and other economic information, the IMPLAN model can describe, among other things, the jobs and income that are supported by NFS management activities. The jobs and income contributed by the NFS can be divided into three types:

- Direct contributions: The contributions accruing to the original or “direct” industries providing goods and services connected to management activities.
- Indirect contributions: The contributions accruing to the local sectors/industries providing inputs of goods and services to the directly affected industries.
- Induced contributions: The contributions arising from employees in the direct and indirect industries spending their earnings in the local economy.

The following subsections describe the jobs and income associated with management activities that have the potential to be affected by the conservation strategy. The payments to states associated with some of these industries are also discussed.

Livestock Grazing

Domestic livestock grazing has been, and continues to be, an important use of national forest lands within the social and economic analysis area, particularly on the Lewis and Clark National Forest. In 2014, there were 32 grazing allotments (31 active, and one vacant) on the lands contained within the primary conservation area. Permits associated with allotments allow for a certain number of cattle to be grazed for a particular period of time. The number of animal unit months (also known as “AUMs,” the amount of dry forage required by one mature cow for one month) is calculated using both the period of time and the number of animals. For example, a permit that allows 100 cows to graze for a period of 3 months would equate to 300 animal unit months. The grazing permits

associated with the allotments within the primary conservation area equate to approximately 12,324 animal unit months for cattle and 133 for sheep. More than 83 percent of the cattle grazing occurs on the Lewis and Clark National Forest, and 100 percent of the sheep grazing occurs on the Helena National Forest. Table 53 shows the breakdown of animal unit months in the primary conservation area by forest.

Table 53. Animal unit months of grazing occurring in the primary conservation area by national forest

National Forest	Cattle (animal unit months)	Sheep (animal unit months)
Flathead	497	--
Helena	1,029	133
Kootenai	442	--
Lewis and Clark	10,315	--
Lolo	41	--
Total	12,324	133

Oil, gas, and minerals

There is no locatable mineral or leasable mineral production currently or in the last three years off of any of the affected lands. There is a minor amount of common variety mineral production, but that production is used for internal Forest Service use and in some cases used by counties in the maintenance of shared use roads.

Recreation and tourism

The national forests in the NCDE provide a variety of recreational experiences, ranging from day visits to destination recreational trips. Lodging, food, services, outfitting and guiding, and retail trade all are dependent to varying degrees on people visiting and recreating on the national forests. However, forest visitation numbers are collected and compiled at the forest scale through the National Visitor Use Monitoring survey. Since the primary conservation area does not encompass all of the national forest land in the five affected forests, describing the economic contribution of these lands, as was done for grazing and timber, is not possible. Therefore, we describe the economic contributions of recreation activities in social and economic analysis area in terms of employment impacts per 1,000 recreation visits.

Table 54 and table 55 show employment response to 1,000 recreation visits for both wildlife and non-wildlife related activities. The table differentiates between wildlife-related visits, such as hunting, fishing, and wildlife viewing; and non-wildlife related visits such as camping and hiking. Visits that include an overnight stay off of the forest have the greatest impact, regardless of whether the visit is wildlife or non-wildlife related. Non-local visitation also creates/supports more jobs per 1,000 visits than non-local visitation. However, it is important to note that impacts from forest visitation depend upon the mix of local versus non-local use and overnight versus day use. In some instances, non-local visitation may create the largest economic impacts, in total, while in other cases the sheer number of local visits may create more impacts even though the per-visit impacts may be lower.

Labor income impacts associated with 1,000 recreation visits are shown in table 56 and table 57. The same pattern (local versus non-local and day use versus overnight use) is evident. The greatest impact per 1,000 recreation visits is from wildlife-related non-local visits that include an overnight stay off of the national forest ($94,453 in labor income for each 1,000 visits). This amounts to an

average labor income of approximately $28,622 per job (dividing the $94,453 in labor income shown in table 56 by the 3.3 jobs shown in table 54).

Table 54. Employment per 1,000 wildlife-related (hunting, fishing, viewing) and non-wildlife related forest visits (2012 Impact Analysis for Planning data)

Type of visitor	Type of visit	Direct jobs	Indirect jobs	Induced jobs	Total
Local	Day use	0.2	0.0	0.0	0.2
Local	Overnight off-forest	0.8	0.2	0.2	1.2
Local	Overnight on-forest	0.7	0.2	0.2	1.0
Non-local	Day use	0.2	0.0	0.1	0.3
Non-local	Overnight off-forest	2.3	0.5	0.5	3.3
Non-local	Overnight on-forest	1.2	0.3	0.3	1.8

Table 55. Employment per 1,000 non-wildlife related (camping, hiking, etc.) forest visits (2012 Impact analysis for Planning data

Type of visitor	Type of visit	Direct jobs	Indirect jobs	Induced jobs	Total
Local	Day use	0.1	0.0	0.0	0.2
Local	Overnight off-forest	0.9	0.2	0.2	1.3
Local	Overnight on-forest	0.4	0.1	0.1	0.7
Non-local	Day use	0.3	0.0	0.1	0.4
Non-local	Overnight off-forest	2.4	0.5	0.5	3.4
Non-local	Overnight on-forest	0.8	0.2	0.2	1.1

Table 56. Labor income ($2012 dollars) per 1,000 wildlife-related (hunting, fishing, viewing) forest visits

Type of visitor	Type of visit	Direct jobs	Indirect jobs	Induced jobs	Total
Local	Day use	4,904	1,196	1,380	7,480
Local	Overnight off-forest	25,480	6,037	7,125	38,642
Local	Overnight on-forest	22,341	5,387	6,271	33,999
Non-local	Day use	6,713	1,661	1,895	10,269
Non-local	Overnight off-forest	59,867	17,173	17,413	94,453
Non-local	Overnight on-forest	35,305	9,197	10,062	54,564

Table 57. Labor income ($2012 dollars) per 1,000 non-wildlife-related (camping, hiking, etc.) forest visits

Type of visitor	Type of visit	Direct jobs	Indirect jobs	Induced jobs	Total
Local	Day use	3,793	925	1,067	5,785
Local	Overnight off-forest	23,517	6,457	6,776	36,749
Local	Overnight on-forest	15,051	3,518	4,199	22,768
Non-local	Day use	6,689	1,599	1,874	10,161
Non-local	Overnight off-forest	57,242	17,437	16,877	91,556
Non-local	Overnight on-forest	22,001	5,785	6,281	34,066

Timber

The original mission of the Forest Service focused on protecting water and timber, and timber harvest continues to be an important use of many national forests, including those in the NCDE. Table 58 provides an estimate of the amount of timber from the lands in the primary conservation area from 2011 to 2013, which amounted to approximately 77,919 CCF (hundreds of cubic feet) in total or around 26,000 CCF annually. These numbers were arrived at through a combination of geographic information system analysis and FACTS (Forest Service Activities Tracking System) data, which provided acres of commercial timber harvest, and estimates of volume per acre from the Region 1 regional office.

Table 58. Acres of commercial harvest and associated volume from lands within the primary conservation area from years 2011-2013

National Forest	Acres	Volume/Acre (CCF)	Volume 2011-2013	Annual Volume
Flathead	3,917	19 CCF*	74,423	24,808
Helena	153	14	2,907	969
Kootenai	0	–	0	0
Lewis and Clark	0	–	0	0
Lolo	31	16	589	196
All Forests (Total)	4,101	49–	77,919	25,973

Sources: Acres Volume per acre (RO, R1); Volume 2011-2013 (FACTS)
*Ranged from 18-20 CCF depending upon Ranger District so the mid-point was used

Summary of economic contributions

For grazing resources, approximately 25 jobs, $364,500 in total labor income and $826,000 in value-added (gross regional product) are associated with the animal unit months of forage shown in table 53. These jobs account for a little over 2 percent of the 1,209 total cattle ranching and farming jobs in the 12-county analysis area. Total jobs may include part-time positions and, as calculated, includes the unpaid labor of family members; therefore, income per job tends to be low when compared to other industrial sectors.

For timber resources, the 26,000 CCF harvested annually (3-yr average) contribute to the local economy approximately 204 jobs, $8.8 million in labor income and $13 million in value-added. The estimates of jobs and income attributable to timber harvest and processing are highly dependent upon how the wood is being processed. To determine this estimate, the timber harvest was split into sectors as shown in table 59. The sector breakdown came from a recent analysis done for the Flathead and Helena and Lewis and Clark national forests plan revision efforts and recent timber projects on the Lolo National Forest. Around 97 of these jobs, $4.2 million of labor income and $5.8 million in value-added are directly associated with the harvesting and processing of timber within the analysis area. The remainder comes from the indirect and induced impacts.

Table 59. Processing sectors used for timber impact calculations

Harvest-Softwood Sawtimber	53.4 (%)
Harvest-Softwood Pulp	3.7
Posts	0.4
Fuelwood	19.3
Non-saw and other products*	23.2

For recreation, both local and non-local visitor expenditures contribute to the regional economy (12-county study area). Approximately 20 jobs are supported or sustained for every 1,000 visits to the forests, along with $580,000 in labor income and $943,000 in value added (gross regional product).

Table 60, table 61, table 62, and table 63 summarize the estimated annual economic contributions, in terms of employment, employee compensation, labor income, and value added, respectively, associated with management activities that have the potential to be affected by the conservation strategy. As previously discussed, those resource areas include timber, grazing and recreation.

Table 60. Estimated annual average economic contribution (employment) by resource area

Resource Area	Direct[1]	Indirect + Induced[1]	Total[1]
Grazing	18	7	25
Timber	97	108	204
Recreation (per 1,000 visits, local and non-local)	14	6	20

1 Number of full and part-time jobs

Table 61. Estimated annual average economic contribution (employee compensation) by resource area

Resource Area	Direct[1]	Indirect + Induced[1]	Total[1]
Grazing	137,972	141,609	279,581
Timber	3,839,026	3,659,141	7,498,167
Recreation (per 1,000 visits, local and non-local)	337,371	174,214	511,585

1 Compensation in 2012 dollars

Table 62. Estimated annual average economic contribution (labor income) by resource area

Resource Area	Direct[1]	Indirect + Induced[1]	Total[1]
Grazing	178,641	185,920	364,561
Timber	4,246,725	4,596,906	8,843,631
Recreation (per 1,000 visits, local and non-local)	371,182	209,484	580,666

1 Labor income in 2012 dollars

Table 63. Estimated annual average economic contribution (value added/gross regional product) by resource area

Resource Area	Direct[1]	Indirect + Induced[1]	Total[1]
Grazing	474,559	351,161	825,720
Timber	5,868,412	7,172,696	13,041,108
Recreation (per 1,000 visits, local and non-local)	571,966	371,301	943,267

1 Value added in 2012 dollars

Employments reported here represent the average annual full and part time, seasonal and temporary jobs that can be attributed to agency managements such as animal unit month authorized and timber sales. These jobs (as with other subsequent contributions such as labor income and gross regional

product) stemmed from private sector activities, including visitor spending, cattle and sheep grazing, and timber harvesting and processing, and associated commodities entering the local economy. It is important to note that this analysis used IMPLAN to estimate employment response coefficients; therefore, jobs as reported here are expressed in annual averages of both full and part time total wage and salary employees, as well as self-employed jobs. This method of counting employment is a standard convention and consistent with methods used by the U.S. Bureau of Labor Statistics. One cannot discern the number of hours worked or the proportion that is full time versus part time. The impacts include both full time and part time employment, so a person with more than one job could show up more than once in the data. This prohibits comparisons to population data and inferences about the effect on unemployment rates.

Labor income, as reported here, is interpreted as the value of wages, benefits and proprietor's income. Value-added or gross regional product, consist of four measures:

- Employee compensation, wages and salaries plus benefits paid by local industries
- Proprietor income, income from self-employment
- Other property income, corporate income, rental income, interest and corporate transfer payments
- Indirect business taxes, sales, excise, fees, licenses and other taxes paid, including non-income based payments to the government.

Gross regional product (or "value-added" in IMPLAN) is a popular and widely used measure of economic growth, taking into account the incremental value added to a product or service at each step of the production process.

Payments to States

As the Federal Government began reserving more and more of the public domain in the late 1800s, the question arose about whether or not state and local governments could tax these publicly held lands. Early in the 19th century, the United States Supreme Court answered "no," holding that local governments could not tax federal lands within their jurisdictions. Local governments then had a reason to be concerned about Federal retention of the public domain. Federal actions could affect local revenues. Reservation of public domain for forest reserves in 1891 led to a change in the relationship between the Federal Government and local jurisdictions. The Federal Government began providing local governments with payments in lieu of (i.e., instead of) property taxes (PILT). The forests reserves of 1891 became the National Forests of 1905, and legislation passed in 1908 provided that the Forest Service share 25 percent of its revenues (known as the 25-Percent Fund) with local governments. This legislation was followed by legislation providing for additional revenue-sharing arrangements between other Federal agencies and local governments, including the Taylor Grazing Act of 1934, revenue sharing on wildlife refuges, and so on.

Prior to 1976, all federal payments were linked directly to receipts generated on public lands. Congress funded payments in lieu of property taxes with appropriations beginning in 1977 in recognition of the volatility and inadequacy of federal revenue sharing programs. Payments in lieu of property taxes was intended to stabilize and increase federal land payments to county governments as the payments were based largely on the amount of federal acreage in an area, rather than the amount of revenue coming from those lands. More recently, the Secure Rural Schools and Community Self-Determination Act of 2000 (Secure Rural Schools Act) decoupled Forest Service payments from commercial receipts. The Secure Rural Schools Act received broad support because it addressed several major concerns around receipt-based programs—volatility, the payment level, and

the incentives provided to counties by linking federal land payments directly to extractive uses of public lands. The new law allowed counties the option of continuing to receive the 25-Percent Fund Act amount or to elect to receive a fixed amount based on the average of the highest three years between 1986 and 1999. On October 3, 2008, the Secure Rural Schools Act was amended and reauthorized in public law 110-343. The amended Secure Rural Schools Act gives counties the option between two payment methods. The payment options were (1) a newly modified 25-Percent Fund Act payment, 7 year rolling average payment of receipts from NFS lands or (2) a share of the State payment as calculated under the new Secure Rural Schools Act. The new formula uses multiple factors, including acres of federal land within an eligible county, average three highest 25-Percent Fund Act payments, and an income adjustment based on the per capita personal income for each county. However, as of the early in 2015, the Secure Rural Schools Act had not been reauthorized and payments to states will revert back to the 25-Percent Fund Act, with substantially lower payments to states and counties.

Figure 3 shows the different types of federal land payments received by the counties in the analysis area in 2013. Counties where the majority of their payment comes from the Forest Service, such as Granite, Lincoln, Mineral, and Sanders Counties, would be most affected if the Secure Rural Schools Act is not reauthorized causing them to revert back to 25-Percent Fund Act payments. Flathead and Powell Counties also receive a substantial amount of Forest Service payments. For Glacier, Lake, Lewis and Clark, Missoula, Pondera and Teton Counties, the majority of their federal land payments come from payments in lieu of property taxes.

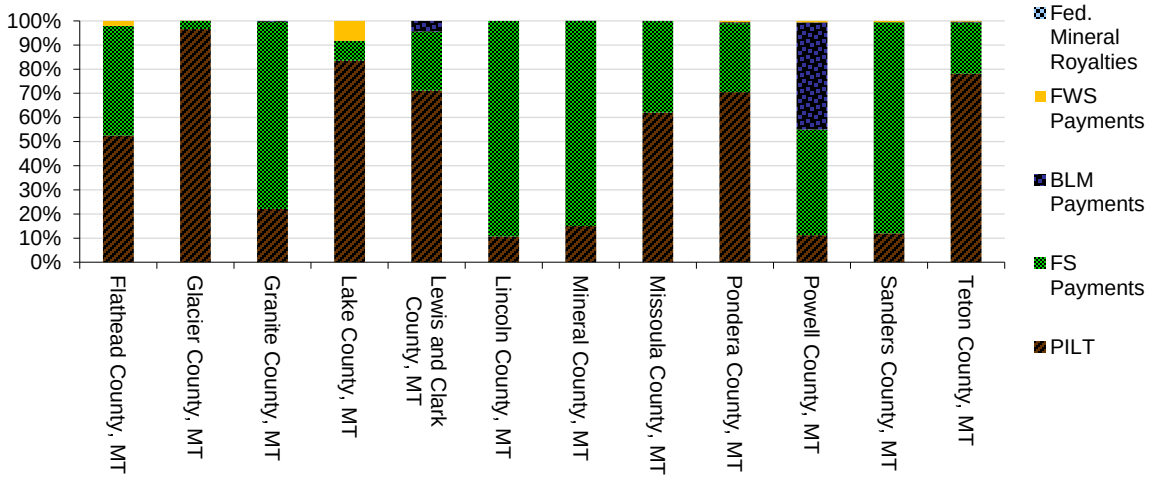

Figure 3. Components of Federal Land Payments to state and local governments by Geography of Origin, fiscal year 2013 [accessed via Economic Profile System – Human Dimensions Tool Kit]

Figure 4 shows the 25-Percent Fund Act payments received by each of the counties from 1986 to 2000 and the Secure Rural Schools Act payments they received from 2001 to 2013. The decrease in 25-Percent Fund Act payments starting around 1993 as timber harvests started to fall on NFS lands is readily apparent, particularly for those counties receiving the highest payments, such as Lincoln, Sanders, Flathead, Mineral, and Powell. Also apparent is the rise in payments that occurred in 2008.

The Secure Rural Schools Act program expired on September 30, 2014. However, the Secure Rural Schools Act was not reauthorized until April 16, 2015. During that interim [between September 2014 and April 2015], the 1908 Act, as amended, required payment distribution to states based on a 25-

percent rolling average. The 25-Percent Fund Act payments were made based on a 7-year rolling average of receipts from national forests located in states in February. Since the Act was reauthorized by section 524 of public law 114-10 and signed into law by the President on April 16, 2015, section 524(a)(2) requires that Secure Rural Schools Act payments for fiscal year 2014 be made not later than 45 days after enactment (by May 31, 2015). Note that the amount paid to a State for a county that will receive a share of the State (formula) payment will be reduced by the county's share of the 25-Percent Fund Act payment already made in February of 2015. Table 64 shows both Secure Rural Schools Act payments from 2013 and 2014, as well as the 25-Percent Fund Act distribution.

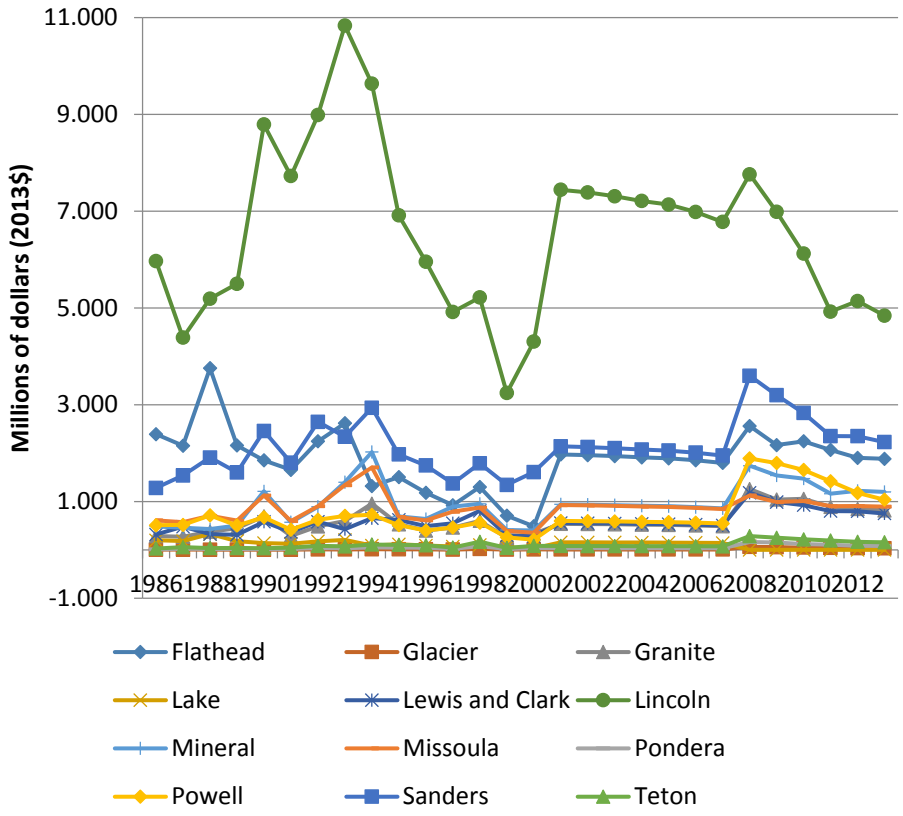

Figure 4. Forest Service Payments to States: 25-Percent Fund Act payments (1986-2000) and Secure Rural School Act Payments (2001-2013) [accessed via Economic Profile System – Human Dimensions Tool Kit]

Table 64. 2013-2014 Secure Rural Schools Act and 2014 25-Percent Fund payments (paid in fiscal year 2015)

County	Fiscal Year 2013 Secure Rural Schools Act Payment	Fiscal Year 2014 Secure Rural Schools Act Payment	2014 25-Percent Fund Distributions
Flathead	$1,882,558	$1,735,744	$366,748
Glacier	$32,289	$33,934	$1,425
Granite	$817,747	$756,797	$89,666
Lake	$0	$0	$34,408
Lewis and Clark	$752,595	$734,372	$96,589
Lincoln	$4,841,614	$4,708,280	$471,261

County	Fiscal Year 2013 Secure Rural Schools Act Payment	Fiscal Year 2014 Secure Rural Schools Act Payment	2014 25-Percent Fund Distributions
Mineral	$1,197,171	$1,173,758	$70,271
Missoula	$895,944	$891,500	$103,415
Pondera	$79,699	$83,789	$5,298
Powell	$1,036,725	$947,068	$101,250
Sanders	$2,226,995	$2,086,541	$241,491
Teton	$158,236	$129,804	$11,648

Sources: http://www.fs.usda.gov/main/pts/securepayments/projectedpayments and http://www.fs.usda.gov/main/pts/home

Figure 5 shows the percentage of total county general revenue that comes from federal land payments for each county in the analysis area. The amount to which the counties rely on these funds for revenue varies widely by county and is dependent upon not only the amount of the payment, but also the size of the overall economy and the size of their tax base. Counties with a large amount of federal land have a smaller tax base upon which to generate revenue. Likewise, larger economies, with more economic diversity, tend to rely less heavily on these payments as a source of revenue, as is the case with Flathead and Missoula Counties, even though under the Secure Rural Schools Act they received fairly high payments. Lincoln County, which received the largest amount of Secure Rural Schools Act payments in the State, relies heavily upon these payments due to both the fact that the amount of money is large, the size of the economy is small, and the county is made up primarily of federal lands.

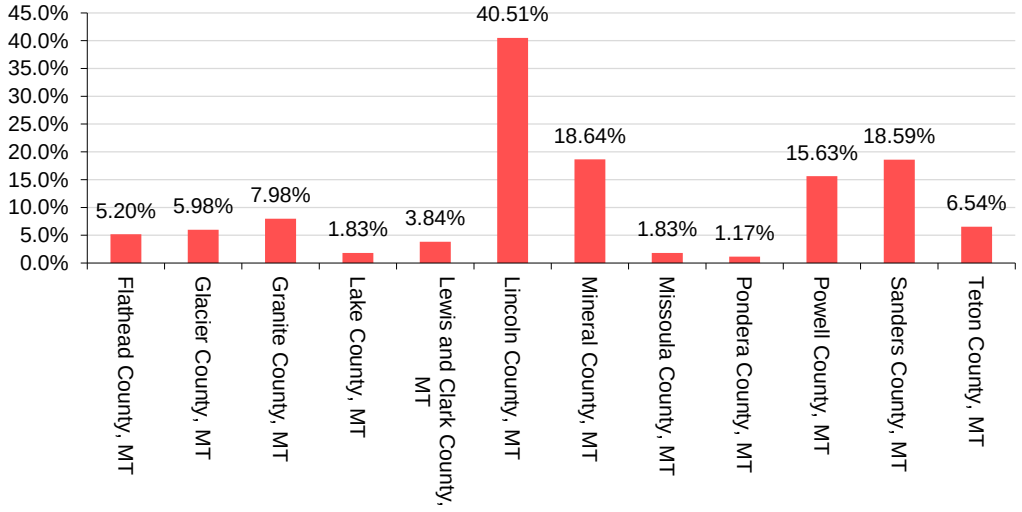

Figure 5. Federal land payments as a percentage of total county general revenue, 2007 [Accessed via Economic Profile System – Human Dimensions Tool Kit]

6.18.7 Economic environmental consequences

Changes to the supply of ecosystem services and value of multiple use resources, will potentially alter economic activity connected to those services or resources. Overall, the plausible economic consequences relating to the NCDE amendment action alternatives are limited in scale because the impacts to supply of services and value of resources is either limited, or only qualitatively understood across alternatives. Considering key policy changes between alternatives, a transparent and possible consequence stems from changes to the availability and feasibility of future timber harvest opportunities in the primary conservation area, zone 1, and demographic connectivity areas. To a lesser extent, other possibilities include changes to recreation activity zoning (seasonally and spatially). And perhaps least transparent are the consequential connections between ecosystems (biodiversity and popular species) and long-term travel and migration patterns.

Within the NCDE multi-county analysis area, as detailed above, there is evidence of shrinking forest-related and manufacturing sectors. Across this Northern Rockies, these sectors are losing significance relative to growing service sectors (i.e. a diversification of employment and income away from agriculture and natural resources). While most rural counties and communities remain largely dependent on the aforementioned primary sectors, a vast majority of the area population, employment, and income activity does not tangibly depend on public forest resources or policy. For those employment and income sources that do depend on public forest policy, and for those rural counties and communities, the following environmental consequences are considered, by alternative.

Alternative 1 — no action

Timber sales

For all amendment forests, access to lands suitable for timber production within grizzly bear habitat is allowed within specified limits under the forest plans or the Interagency Grizzly Bear Committee vegetation management guidelines. Space and time considerations for grizzly bears limits access for commercial timber harvest, as well as for stand tending needs. To the extent that the NCDE improves transparency for sale prep, administration, and timber purchasers, some efficiencies may be gained with the action alternatives as compared to alternative 1. Quantifiable, significant economic impacts across alternatives were not determined.

Recreation

The most important recreation patterns to follow in terms of economic influence are those from non-local visitors. When non-local visitors travel to-and-fro, their consumption of goods and services represent an important incremental increase, or decrease, to an area economy. To gauge non-local visitation patterns, trend observations (NVUM) are made from recreation data across national forests. Where policy decisions and non-local visitation patterns can most clearly be connected, so too can the recreation related economic consequences of those policy decisions.

As covered in section 6.13, across all amended forests, under the no-action alternative the existing recreation capacity and infrastructure (e.g., miles over-snow in the Lolo) would remain relatively static over time, however, status-quo restrictions on recreation site development may be in conflict with population trends and demand for overall recreation opportunities.

Alternative 2 — proposed action modified

Timber sales

For the amendment forests, there is no substantive difference between alternatives 1 and 2 within the primary conservation areas to access for timber harvest or stand-tending needs. For all amendment forests, both alternatives 1 and 2 require no net increase in motorized route densities and no net decrease in secure core. There is some flexibility in accessing core through NCDE-STD-AR-03, which would allow for some timber harvest within these areas and access to stands for stand-tending needs. On the other amendment forests, access to core has been allowed through site-specific project consultation. Thus, little change in access for timber harvest or stand-tending needs in primary core areas on the amendment forests is expected under alternative 2. Again, in terms of the aggregate supply of timber resources, or opportunities for timber sales, no significant consequences are anticipated between alternative selections.

Recreation

Under alternative 2, recreation patterns, especially non-local visitation into an area would not likely be influenced by the alternative policy directions. For more information on direct recreation affects see the recreation section affects analysis.

Alternative 3

Timber sales

Under this alternative, the most important considerations are the expansion of vegetation management guidelines and additional standards limiting motorized access on the Kootenai and Lolo. The expansion of existing vegetation guidelines to these demographic connectivity areas would not limit access for vegetation management on the Kootenai and Lolo. However, the additional standard limiting motorized routes may affect access to areas suitable for timber production or forest tending in the demographic connectivity areas (Kootenai and Lolo) and the expanded grizzly bear distribution zone (Helena).

In terms of economic consequences, the additional standard limiting motorized access routes, may impact the feasibility and hence success of future timber sale activities. In a more limiting situation the standard may isolate or close off certain lands for management. This possibility carries with potential impacts to forestry and forest products income and jobs. The connectivity area where this will be most significant in terms of acreage is likely the Nine Mile District of the Lolo National Forest. This District provides timber for Missoula and Sanders County primarily, but merchantable timber may potentially travel further. Missoula County has limited remaining forest product manufacturing, however Sanders County would be more sensitive to changes in timber supply due to its more rural and resource dependent economy. Sanders County maintains 6.5 percent of its private employment in forestry and forest products sectors (U.S. Department of Commerce. 2015. Census Bureau, County Business Patterns, Washington, D.C). A more accurate account of a potential impact would need to consider how much merchantable log volume would be removed from the market by the new standard relative to the all-ownership timber supply chain in this multi-county area.

Recreation

Reviewed in section 6.13, alternative 3 enforces permitted ski-areas work towards mitigation of grizzly bear-human conflicts within the primary conservation area. These regulatory changes would likely increase potential cost of operations for ski-areas, but these additional costs on ski-area balance sheets are difficult to measure. Considering economic consequences it is worth noting that

very few ski areas exist within the primary conservation area, and to actually affect the economy through non-local visitation, policy direction would need to increase ski ticket prices substantially or close a ski area, deterring recreation travel. Both of these impacts are unlikely, limiting the risks associated with alternative 3.

Cumulative effects

There are many factors that influence and affect the local social and economic environment. National, state, and county policies affect population growth, demographics, and land uses. Following is a brief description of some items that are changing or may change in the future, adding to the effects on local communities from the alternatives.

Population growth and climate change

The West has been the fastest growing region in the country, and this trend is expected to continue for the next 20 years (U.S. Census 2010 data and projections). With this increased growth rate comes an increased diversification of the population. More new residents are migrating in, while the adult children of families living in the region are moving out of the area to find employment. This change in population composition has added to the diversity of attitudes, lifestyles, and values of the population within the NCDE area. The social assessment found there is a concern among some stakeholders that new residents are changing the nature of their communities. As natural amenity migration increases, the demand for outdoor recreation and the cultural value of wildlife viewing may increase. The new wave of natural amenity migrants, who are moving to urban areas, may be more likely to hold existence values around wildlife and favor conservation of grizzly bear habitat over grazing and timber harvest (Montag, Patterson and Sutton 2003).

Climate change is predicted to increase the number of hot days in the region, leading to increased summer recreation and cultural visits to the forests (Northern Rockies Adaptation Partnership, Ch. 10, Effects of Climate Change on Recreation). As such, there may be added demand for recreation facilities in summer months.

Development of forestlands and subdivision of private timberlands

There has also been increased housing density adjacent to and within national forest boundaries, and this trend is expected to continue over the next several decades. Moderate and high increases in residential development are projected around national forests located in Montana (Stein et al. 2007). While local urban, county, and regional planners and the public are making progress in defining desirable development and recognizing the inherent costs and effects associated with subdivision sprawl, growth will continue in some form and overall density will increase. This development would likely add pressure on adjacent Forest Service lands. Pressure would include increased demand for potentially conflicting recreation opportunities, services such as road maintenance, demand for undeveloped and semi-primitive settings, and increased fire management problems.

Montana, like many states across the West, is experiencing a massive divestiture of commercial timberlands for development and subdivisions (Montana Department of Natural Resource Conservation 2010). Corporate timberland has become more valuable for recreational or residential real estate than for timber production. This development results in increased fragmentation of forested landscapes with increasing ex-urban migration and greater desire for recreational properties and other amenity values. Impacts of fragmentation include wildlife habitat degradation, public access issues, and increased challenges of providing public services and fire protection for new housing developments. Divestiture of corporate timberlands adds to the current trends for increased housing density within and adjacent to the national forest.

Resource development

Diversification of wood product manufacturing has historically allowed Montana mills to be more resilient in changing markets (Montana Department of Natural Resource Conservation 2010). The majority of timber harvested in Montana comes off state and private lands, with one-third from non-industrial private lands. The Montana Statewide Forest Resource Strategy (Montana Department of Natural Resource Conservation 2010) recognizes the need to foster responsible management of private lands that integrates harvest of traditional and non-traditional forest products as a tool for good land stewardship. The amount of timber harvest on state and private lands and adjacent national forests will affect the local economy. Additional harvest from these lands would help to stabilize local jobs and income. Any decrease in harvest would add to a decrease in associated jobs and income.

6.18.8 Environmental justice

As noted in the affected environment section, minority and low income populations (also known as environmental justice populations) are present in the analysis area. There are no significant effects to any populations across alternatives as each alternative provides for the social benefits of recreation, cultural/heritage values, inspirational/existence values, and health and safety by minimizing grizzly bear-human conflict. As such, there are no disproportionately high and adverse impacts to minority and low-income populations.

Alternative 3, which maximizes inspirational/existence values is likely to provide greater benefit to some environmental justice populations, as compared to alternative 1, as the American Indian populations are known to hold strong existence values around grizzly bear (Kellert et al. (1996)).

Alternative 2, which maximizes cultural/heritage values and recreation opportunities, is likely to provide greater benefit to environmental justice populations, as compared to alternative 1. Under alternative 2, environmental justice populations are afforded more access to collect firewood or other permitted activities within the primary conservation area.

6.19 Other Required Disclosures

The National Environmental Policy Act at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders.”

6.19.1 American Indian Religious Freedom Act

Agencies must make a good faith effort to understand how Indian religious practices may come into conflict with other forest uses and consider any adverse impacts on these practices in their decision-making practices. There are five federally-recognized American Indian nations with cultural affiliation on the NFS lands within the NCDE affected by the Plan Revision and Plan Amendments: the Kootenai Tribe of Idaho, the Kalispel Tribe, the Coeur d’Alene Tribe, the Spokane Tribe, and the Confederated Salish and Kootenai Tribes. The aboriginal territory of the Kalispel, Coeur d’Alene, and Spokane Tribes, overlap with the territory now along the Clark Fork Valley with the territory used by the Kootenai Tribe of Idaho and the Confederated Salish and Kootenai Tribes. The entire Forest is within aboriginal territory for the Confederated Salish and Kootenai Tribes and the Kootenai Tribe of Idaho.

No effects on American Indian social, economic, or subsistence rights are anticipated as a result of either the Forest Plan Revision or Amendment effort. No matter which alternative is chosen for implementation, the Forest Service will be required to consult with tribes, according to the

Consultation Protocol, when management activities may impact treaty rights and/or cultural sites and cultural use. Desired conditions for Areas of Tribal Importance, for all action alternatives for the Plan Revision would be for the Flathead National Forest to 1) recognize and maintain culturally significant species and the habitat necessary to support healthy, sustainable, and harvestable plant and animal populations to ensure that rights reserved by Tribes are not significantly impacted or diminished, and 2) to recognize, ensure, and accommodate tribal member access to the Forest for the exercise of treaty rights and to provide opportunities to practice traditional, cultural, and religious activities, such as plant gathering and ceremonial activities that are essential to sustaining their way of life, cultural integrity, social cohesion, and economic well-being.

Likewise, the forest plan amendment, no matter which alternative is chosen, does not propose any changes to current desired conditions in any of the amendment forest's land management plans with respect American Indian Rights and Interests.

6.19.2 Unavoidable adverse effects

No unavoidable adverse effects were identified under any of the alternatives. Ground-disturbing activities cannot occur without further site-specific analyses, section 7 consultation required under the Endangered Species Act, and project decision documents. For a detailed discussion of effects of this decision, see Chapter 3 in volume 1 and chapter 6 in volume 3 of the DEIS.

6.19.3 Relationship of short-term uses and long-term productivity

The National Environmental Policy Act requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

6.19.4 Irreversible and Irretrievable commitments of resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

None of the alternatives would result in an irreversible or irretrievable commitment of resources. Ground-disturbing activities cannot occur without further site-specific analyses, section 7 consultation required under the Endangered Species Act, and project decision documents. For a detailed discussion of effects of this decision, see Chapter 3 in volume 1 and chapter 6 in volume 3 of the DEIS.

6.19.5 Endangered Species Act

Potential effects to species listed under the Endangered Species Act are displayed in chapters 3 and 6 of this draft EIS. Forest plan components were developed under each alternative that would protect threatened, endangered, proposed and candidate species, and designated critical habitat. A biological assessment and biological evaluation will be prepared for the selected alternative in the final environmental impact statement, and section 7 consultation will be completed prior to issuing a decision for the revised Forest Plan and the Amendment.

6.19.6 Energy requirements and conservation potential

Energy is consumed in the administration of natural resources from the national forests. The main activities that consume energy are timber harvest, recreation use, road construction and reconstruction, minerals and energy exploration and development, transporting and managing livestock, and administrative activities of the Forest Service and other regulatory agencies. Energy consumption is expected to vary only slightly by alternative.

6.19.7 Wetlands and floodplains

The Forest Plan revision and Amendment does not directly implement any management activities that would result in loss of wetland or floodplains. Revised forestwide management direction identifies the need to restore currently degraded wetlands and floodplains, and provides a broad spectrum of standards and guidelines designed to protect soil, water, riparian, and aquatic resources. The goals and intent of Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) would be met through compliance with this direction. Documentation for this conclusion can be found in this draft EIS, chapter 3, “Watersheds, Soil, Riparian, and Aquatic Resources,” and in the revised Forest Plan (desired condition, standards, and guidelines), and in section 6.8, “Watershed, Soils, Riparian, and Aquatic Habitat” and in the revised Amendment.

6.19.8 Conflicts with other agency or government goals or objectives

Contact, review, and public involvement with other federal and state agencies indicates no major conflicts between the revised Forest Plan and the Amendment and the goals and objectives of other governmental entities.

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Chapter 7. Preparers and Contributors, and Distribution of the DEIS

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and other organization and individuals during the development of this environmental impact statement:

7.1.1 Preparers and contributors

The list of preparers, shown in table 65, is limited to those people who were members of the interdisciplinary team working on the final documents or who made significant contributions during the draft environmental impact statement. Preparation of these documents could not have been completed without the support and assistance of numerous employees on the Flathead, Helena, Kootenai, Lewis and Clark, and Lolo National Forests, past employees on these national forests who have retired or moved to other positions, and colleagues in the regional office. We also recognize the regional and forest leadership teams as providing guidance during this process.

Table 65. Preparers and contributors to the DEIS

Name	Title, Unit	Contribution
Ake, Kathy	Geographic Information System (GIS) Specialist, Flathead NF	GIS, data analysis
Allen, Anastasia	Writer/Editor, Flathead NF	writing and editing
Benton, Travis	Contractor-Ecosystem Research Group	Wildlife modeling
Chew, Jimmy	Contractor	Vegetation modeling
Connell, Rick	Forest FMO, Flathead NF	fire management, air quality
Frament, Ellen	Contractor	forest vegetation and timber
Hillis, Mike	Contractor-Ecosystem Research Group	Wildlife modeling
Gebert, Krista	Regional Economist, R1 (retired)	social sciences
Gerwe, Scott	Regional Geologist and Minerals Program Lead, R1	minerals and energy resources
Greer, Kendrick	Contractor-Mason, Bruce and Girard	Spectrum Model
Helser, Micah	Flathead NF, currently with BLM	writing and editing
Henderson, Eric	Regional Analyst	natural range of variation and vegetation modeling
Jackson, James	Ecologist, Contractor	livestock grazing
Jensen, Holger	Range Program Leader	livestock grazing
Krueger, Joe	Forest Plan Revision Team Leader, Flathead NF	planning team lead
Kuennen, M. Reed	Wildlife Biologist, Flathead NF	wildlife
Larson, Jordan	Regional Economist, Region 1	economics
Mandella, Margo	Ecologist, Contractor	writing and editing/resource assistant for nonnative invasive species, sensitive plants, heritage
Manning, Cynthia	Regional Office, retired	economics

Name	Title, Unit	Contribution
McCarthy, Dennis	Geospatial Program Manager, Flathead NF	GIS, mapping
Moore, Marsha	Recreation/Wilderness Planner, Flathead NF	recreation, wilderness, recommended wilderness, infrastructure, wild and scenic rivers
Nauertz, Elizabeth	Writer/Editor, Flathead NF	writing and editing
Ng, Kawa	Regional Economist, R2	economics
Rasch, Rebecca	Regional Social Scientist, R1	social sciences
Rusho, Nancy	Regional Geologist, R1, currently with Washington Office	mineral and energy resources
Trechsel, Heidi	Vegetation Specialist, Flathead NF	terrestrial ecosystems, forest vegetation, native plants, non-native plants
Van Eimeren, Pat	Fisheries Biologist, Flathead NF	watershed, soil, riparian, aquatic species
Warren, Nancy	Wildlife Biologist, Contractor	wildlife, threatened and endangered plants

7.1.2 Distribution of the environmental impact statement

The following agencies, organizations, and individuals have been sent copies of the draft environmental impact statement or have been directed to the Flathead National Forest Plan Revision internet page (www.usda.gov/goto/flathead/fpr) where the document has been posted. They are either required by regulation to be sent the environmental impact statement, or have asked to be sent the document. The draft environmental impact statement will also be sent to anyone else who requests it.

Federal government

- Advisory Council on Historic Preservation
- Department of Energy, National Environmental Policy Act Policy and Compliance
- Federal Aviation Administration, Northwest Mountain Region
- Federal Highway Administration (Montana Office, Helena)
- Glacier National Park
- U.S. Army Corps of Engineers, Northwestern Division
- USDA Animal and Plant Health Inspection Service, Policy and Program Development/ Environmental Analysis and Documentation
- U.S. Department of Agriculture - National Agricultural Library
- U.S. Department of Agriculture, Natural Resources Conservation Service, National Environmental Coordinator
- U.S. Department of the Interior, Office of Environmental Policy and Compliance
- U.S. Environmental Protection Agency, Region 8 (Denver, Colorado)
- U.S. Environmental Protection Agency, Missoula, Montana

- U.S. Environmental Protection Agency, Helena, Montana
- Northwest Power Planning Council

State government

- Montana Department of Environmental Quality, Helena, Montana
- Montana Department of Fish, Wildlife and Parks, Missoula, Montana
- Montana Department of Fish, Wildlife and Parks, Kalispell, Montana
- Montana Department of Natural Resources and Conservation, Kalispell, Montana

Local government and others

- Flathead County Commissioners, Kalispell, Montana
- Missoula County, Planning, Montana

Tribal government

- Confederated Salish and Kootenai Tribes, Pablo and Polson, Montana
- Blackfeet Tribe
- Nez Perce

Individuals

Individuals who registered for updates on-line on the Flathead National Forest Plan Revision website (www.usda.gov/goto/flathead/fpr) were notified of the availability of the draft environmental impact statement.

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