

--INTERNAL DELIBERATIVE MATERIAL --Not for Distribution --

Billing Code 4310-55-P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R6-ES-2014-XXXX]

[FXES1113090000C6-145-FF09E42000]

RIN 1018-BA41

**Endangered and Threatened Wildlife and Plants; Removing the Greater
Yellowstone Area Population of Grizzly Bears From the Federal List of Endangered
and Threatened Wildlife; Availability of Draft Revised Demographic Criteria and a
Draft Revised Conservation Strategy for this Population.**

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; Notice of Document Availability

SUMMARY: The best available scientific and commercial data indicate that the Greater Yellowstone Area (GYA) Population of Grizzly Bears, which qualifies as a distinct population segment, has recovered. Based on a thorough review of all available information, the Service has determined that the GYA grizzly bear population has increased in size and more than tripled its occupied range since being list~~ing~~ed in 1975, threats to the population are sufficiently minimized, and post-delisting monitoring plans adequately ensure population stability by prescribing management responses based on objective and reliable data. Therefore, under the authority of the Endangered Species Act of 1973, as amended (Act), we, the U.S. Fish and Wildlife Service (Service), propose to remove (delist) this population of grizzly bears from the Federal List of Endangered and Threatened Wildlife. In this proposed rule, we focus on updating and supplementing our previous Final Rule Removing the Yellowstone Distinct Population of Grizzly Bears From the Federal List of Endangered and Threatened Wildlife (hereafter referred to as “the 2007 Delisting Rule”) (72 FR 14866, March 29, 2007) in response to new biological information and Court direction. We are also seeking public review and comment on two supporting documents to this proposed action: the Conservation Strategy and Revised Demographic Criteria. The proposed action, if finalized, would not change the threatened status of the remaining grizzly bears in the lower 48 States.

Comment [FtvM1]: Mention scientific name first time?

DATES: We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES** section, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for additional public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You may submit comments by any of the following methods:

- **Electronically:** Go to the Federal eRulemaking Portal: <http://www.regulations.gov>. In the Search box, enter Docket No. FWS-R6-ES-2014-XXXX, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on the blue “Comment Now!” box. If your comments will fit in the provided comment box, please use this feature of <http://www.regulations.gov>, as it is most compatible with our comment review procedures. If you attach your comments as a separate document, our preferred file format is Microsoft Word. If you attach multiple comments (such as form letters), our preferred format is a spreadsheet in Microsoft Excel.
- **By hard copy:** Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: Docket No. FWS-R6-ES-2014-XXXX; U.S. Fish & Wildlife Headquarters, MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041-3803.

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- Public Meetings: Submit written comments at one of the following four open-house style, information meetings being held across the Greater Yellowstone Area GYA region.
 - [INSERT DATE, LOCATION, & TIME] Cody, Wyoming.
 - [INSERT DATE, LOCATION, & TIME] Bozeman, Montana
 - [INSERT DATE, LOCATION, & TIME] Jackson, Wyoming
 - [INSERT DATE, LOCATION, & TIME] Idaho Falls, Idaho
- Public Hearings: Submit written or oral comments at one of the following two public hearings.
 - [INSERT DATE, LOCATION, & TIME] Bozeman, Montana
 - [INSERT DATE, LOCATION, & TIME] Cody, Wyoming

We request that you submit comments only by the methods described above. We will post all comments on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see the “Information Requested” section below for more details).

Document availability: The proposed rule is available on <http://www.regulations.gov>. In addition, certain documents such as the draft revised Conservation Strategy, the draft revised Demographic Criteria to be appended to the recovery plan, and all References Cited are available at <http://mountain-prairie.fws.gov/species/mammals/grizzly/yellowstone.htm>.

Information Requested

We intend that any final action resulting from this proposal will be based on the best available scientific and commercial data and will be as accurate and as effective as possible. Therefore, we invite Tribal and governmental agencies, the scientific community, industry, and other interested parties to submit comments or recommendations concerning any aspect of this proposed rule and the draft post-delisting monitoring plan. Comments should be as specific as possible.

To issue a final rule to implement this proposed action, we will take into consideration all comments and any additional information we receive. Such communications may lead to a final rule that differs from this proposal. All comments, including commenters' names and addresses, if provided to us, will become part of the supporting record.

You may submit your comments and materials concerning the proposed rule by one of the methods listed in the **ADDRESSES** section. Comments must be submitted to <http://www.regulations.gov> before 11:59 p.m. (Eastern Time) on the date specified in the **DATES** section. We will consider any and all comments received, or mailed comments that are postmarked, by the date specified in the **DATES** section.

We will post your entire comment—including your personal identifying information—on <http://www.regulations.gov>. If you provide personal identifying

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information in your comment, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <http://www.regulations.gov>, or by appointment, during normal business hours at our Missoula office (see **FOR FURTHER INFORMATION CONTACT**).

Additional Public Hearings

We must receive requests for additional public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section within 45 days after the date of this **Federal Register** publication (see **DATES**). We will consider scheduling additional public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** at least 15 days prior to any additional hearings.

Peer Review

In accordance with our policy, “Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities,” which was published on July 1, 1994 (59

FR 34270), we will seek the expert opinion of at least three appropriate independent specialists regarding scientific data and interpretations contained in this proposed rule. We will send copies of this proposed rule to the peer reviewers immediately following publication in the **Federal Register**. The purpose of such review is to ensure that our decisions are based on scientifically sound data, assumptions, and analysis. Accordingly, the final decision may differ from this proposal.

FOR FURTHER INFORMATION CONTACT: Dr. Christopher Servheen, Grizzly Bear Recovery Coordinator, U.S. Fish and Wildlife Service, University Hall, Room #309, University of Montana, Missoula, Montana 59812; telephone 406-243-4903; facsimile 406-243-XXXX. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800-877-8339.

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Comment [FTvM2]: Remove the “?”

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SUPPLEMENTARY INFORMATION:

Executive Summary

(1) Purpose of the Regulatory Action

This rulemaking process is necessary to remove the GYA grizzly bear population from the Federal List of Endangered and Threatened Wildlife. Prior to publishing this proposed rule, the Interagency Grizzly Bear Study Team conducted an extensive demographic review of the population and the potential effects the loss of whitebark pine may have on it. We are proposing to delist the GYA grizzly bear population because it is recovered and no longer in need of protection as an endangered or threatened species under the Endangered Species Act of 1973 as amended (Act). The population is stable, threats are sufficiently minimized, and a long-term monitoring and management framework has been developed and will be incorporated into regulatory documents. To ensure consistency in management approaches regardless of listed status, concurrent with

publication of this proposed rule, we are releasing a draft supplement to the 1993 Recovery Plan's demographic recovery criteria for this population of grizzly bears and a revised draft of the Conservation Strategy for public comment. If we finalize this proposal and delist the Yellowstone population of grizzly bears there would be no change to the threatened status of the remaining grizzly bears in the lower 48 States, which would remain protected by the Act.

(2) Major Provision of the Regulatory Action

This action is authorized by the Act. We are amending § 17

(3) Costs and Benefits

We have not analyzed the costs or benefits of this rulemaking action because the Act precludes consideration of such impacts on listing and delisting determinations. Instead, listing decisions are based solely on the best scientific and commercial information available regarding the status of the subject species.

Greater Yellowstone Area (GYA)

The Greater Yellowstone Area (GYA) refers to the larger ecological system containing and surrounding Yellowstone National Park. The GYA includes portions of

~~six~~-five National Forests, Yellowstone and Grand Teton National Parks, State, Tribal, and private lands. While there is no distinct boundary to the GYA, it is generally defined as those lands surrounding Yellowstone National Park with elevations greater than 4,900 feet (1,500 m) (see USDA Forest Service 2004, p. 46 and Schwartz *et al.* 2006b, p. 9). While we consider the terms “Greater Yellowstone Area” and “Greater Yellowstone Ecosystem” to be interchangeable, we use GYA in this proposed action to be consistent with the Forest Plan Amendment and the Conservation Strategy (USDA Forest Service 2006b; Conservation Strategy Team 2014).

Comment [FTvM3]: Technically, this is now 5 because Gallatin and Custer are now officially under 1 administration. See also page 28. We tried to edit this throughout.

Previous Federal Actions

On July 28, 1975, the grizzly bear was designated as threatened in the conterminous (lower 48) United States (40 FR 31734–31736). On November 17, 2005, we proposed to designate the GYA population of grizzly bears as a DPS and to remove this DPS from the Federal List of Endangered and Threatened Wildlife. This notice was followed by a 120-day comment period (70 FR 69854, November 17, 2005; 71 FR 8251, February 16, 2006), during which we held two public hearings and four open houses (70 FR 69854, November 17, 2005; 71 FR 4097–4098, January 25, 2006). On March 29, 2007, we finalized this proposed action and removed grizzly bears in the GYA from the Federal List of Endangered and Threatened Wildlife (72 FR 14866). On November 22, 2005 (70 FR 70632), we released a draft supplement to the 1993 Grizzly Bear Recovery Plan for public and peer review before revising and finalizing this supplement on March 13, 2007 (72 FR 11376). In March 2013, we released another draft supplement to the

1993 Grizzly Bear Recovery Plan for public and peer review. Please refer to the 2007 Delisting Rule for more information on previous Federal actions (70 FR 69861, November 17, 2005).

Taxonomy & Species Description

For detailed information about the taxonomy and species description of grizzly bears in the GYA, please refer to pages 14,866–14,867 of the 2007 Delisting Rule (72 FR 14866, March 27, 2007, available online at: <http://www.fws.gov/mountain-prairie/species/mammals/grizzly/72FR14866.pdf>)

Behavior & Life History

Adult grizzly bears are normally solitary except when females have dependent young (Nowak and Paradiso 1983, p. 971) but they are not territorial and home ranges of adult bears frequently overlap (Schwartz *et al.* 2003b, pp. 565–566). Home range size is affected by resource availability, sex, age, and reproductive status (LeFranc *et al.* 1987, p.31; Blanchard and Knight 1991, pp. 48–51; Mace and Waller 1997, p. 48). Generally, females with cubs-of-the-year or yearlings have the smallest home range sizes (Aune and Kasworm 1989; Blanchard and Knight 1991, pp. 48–49; Mace and Roberts 2011, pp. 27–28). The annual home range of adult male grizzly bears in the GYA is approximately 309 square miles (sq mi) (800 square kilometers (sq km)), while female ranges are typically smaller, approximately 81 sq mi (210 sq km) (Bjornlie *et al.* 2014, p. 3). The

large home ranges of grizzly bears, particularly males, enhance maintenance of genetic diversity in the population by enabling males to mate with numerous females (Blanchard and Knight 1991, pp. 46–51; Craighead *et al.* 1998, p. 326).

Young, female grizzly bears establish home ranges within or overlapping their mother's (Waser and Jones 1983, p. 361; Schwartz *et al.* 2003b, p. 566). This pattern of home range establishment can make dispersal of females across landscapes a slow process. Radio-telemetry and genetic data suggest females establish home ranges an average of 6.1 to 8.9 mi (9.8 to 14.3 km) away from the center of their mother's home range, whereas males generally disperse further, establishing home ranges roughly 18.6 to 26.0 mi (29.9 to 42.0 km) away from the center of their mother's (McLellan and Hovey 2001, p. 842; Proctor *et al.* 2004, p. 1108).

Grizzly bears have a promiscuous mating system (Hornocker 1962, p. 70; Craighead and Mitchell 1982, p. 522; Schwartz *et al.* 2003b, p. 563). Mating occurs from May through July with a peak in mid-June (Craighead and Mitchell 1982, p. 522; Nowak and Paradiso 1983, p. 971). Although females mate in spring and early summer, their fertilized embryos do not move-implant into the uterus for further development until late fall. Fat stores obtained by female grizzly bears at the end of fall are correlated with the birth date and growth rate of their cubs and a body fat threshold may exists below which females may not produce any cubs, even when bred (Robbins *et al.* 2012, p. 543).
~~Implantation into the uterus and further development only occur if the f~~Female grizzly bears ~~obtains enough fat over the summer and fall to survive the winter and~~ nurse cubs

Comment [FTvM4]: I don't think Robbins *et al.* stated that implantation is contingent on fat stores.

Also, in black bears, Mike Vaughan found that implantation may still occur in poor-condition females but simply results in immediate mortality after birth.

for 2–3 months inside the den (~~Robbins *et al.* 2012, p. 543~~). Age of first reproduction and litter size may be related to nutritional state (Stringham 1990, p. 433; McLellan 1994, p. 20; Hilderbrand *et al.* 1999, pp. 135–136). Average age of first reproduction in the GYA is approximately 6 years old but can vary from 3–8 years of age (Schwartz *et al.* 2003b, p. 563; Schwartz *et al.* 2006b, p. 19). ~~Mean-litter size in the GYA is 1.98 with a~~ ranges from one to four cubs (Schwartz *et al.* 2003b, p. 563) ~~with a mean of 2.04 cubs/litter during 1983–2001 and 2.12 cubs/litter during 2002–2011~~(Schwartz *et al.* 2006b, p. 19; Interagency Grizzly Bear Study Team 2012, p. 34; ~~Haroldson *et al.* 2013, p. 14~~). Cubs are born in the den in late January or early February and remain with the female for 1.5 to 2.5 years, making the average time between litters in the GYA (i.e., the interbirth interval) 2.78 years (Schwartz *et al.* 2003b, p. 564; Schwartz *et al.* 2006b, p. 20). Grizzly bears have one of the slowest reproductive rates among terrestrial mammals, resulting primarily from the reproductive factors described above: late age of first reproduction, small average litter size, and the long interval between litters (Nowak and Paradiso 1983, p. 971; Schwartz *et al.* 2003b, p. 564). Given the above factors, it may take a female grizzly bear 10 or more years to replace herself in a population (USFWS 1993, p. 4). Grizzly bear females cease reproducing some time in their mid-to-late 20s (Schwartz *et al.* 2003a, pp. 109–110).

Grizzly bears usually dig dens on steep slopes where wind and topography cause an accumulation of deep snow and where the snow is unlikely to melt during warm periods. Grizzly bears in the lower 48 States occupy dens for 4–6 months each year, beginning in October or November (Linnell *et al.* 2000, p. 401; Haroldson *et al.* 2002,

Comment [FTvM5]:

MAH: If we use updated vital rates including the Censored or Known Dead female survival rates provided in the IGBST 2012 Demographic review generation time is estimated to be 12.92, or round to about 13 years for a female to replace herself in the population.

Using GYE vital rates from the monograph or Harris *et al.* 2007 generation time is 10.6.

p.29). Most dens are located above 8,000 feet (> 2,500 m) in elevation (Haroldson *et al.* 2002, p. 33) and on slopes ranging from 30–60 degrees (Judd *et al.* 1986, p. 115). Approximately 66 percent (1,684,220 acres; 6,815 sq km) of the GYA is potential denning habitat and it is well distributed so its availability is not considered a limiting factor for grizzly bears in the GYA (Podruzny *et al.* 2002, p. 22). Denning increases survival during periods of low food availability, deep snow, and low air temperature (Craighead and Craighead 1972, pp. 33–34). During this period, bears do not eat, drink, urinate, or defecate (Folk *et al.* 1976, pp. 376–377; Nelson 1980, p. 2955). Hibernating grizzly bears exhibit a marked decline in heart and respiration rate, but only a slight drop in body temperature (Nowak and Paradiso 1983, p. 971). Due to their relatively constant body temperature in the den, hibernating grizzly bears may be easily aroused and have been known to exit or re-locate dens when disturbed by seismic or mining activity (Harding and Nagy 1980, p. 278) or other human activities (Swenson *et al.* 1997, p. 37). Dens are rarely used twice by an individual although the same general area may be used multiple times (Schoen *et al.* 1987, p. 300; Miller 1990, p. 285; Linnell *et al.* 2000, p. 403). Females display stronger area fidelity than males and generally stay in their dens longer, depending on reproductive status (Judd *et al.* 1986, pp. 113–114; Schoen *et al.* 1987, p. 300; Miller 1990, p. 283; Linnell *et al.* 2000, p. 403). In the GYA, females with new cubs typically emerge from their dens from early April to early May (Haroldson *et al.* 2002, p. 29).

In preparation for hibernation, bears increase their food intake dramatically during a stage called hyperphagia (Craighead and Mitchell 1982, p. 544). Hyperphagia occurs

throughout the 2–4 months prior to den entry (i.e., August – November). During hyperphagia, excess food is converted into fat, and grizzly bears may gain as much as 3.64 lb/day (1.65 kg/day) (Craighead and Mitchell 1982, p. 544). Grizzly bears must consume foods rich in protein and carbohydrates in order to build up fat reserves to survive denning and post denning periods (Rode and Robbins 2000, pp. 1643–1644).

~~These layers of f~~ Fat stores are crucial to the hibernating bear as they provide a source of energy and insulate the bear from cold temperatures, and are equally important in providing energy to the bear upon emergence from the den when food is still sparse relative to metabolic requirements (Craighead and Mitchell 1982, p. 544).

Nutritional Ecology

The GYA is a highly diverse landscape containing a wide array of habitat types and bear foods. Plant communities vary from grasslands at lower elevations (< 6,230 feet; (1,900 m)) to conifer forests at mid-elevations and sub alpine and alpine meadows at higher elevations (> 7,870 feet (2,400 m)). Grizzly bears are extremely omnivorous, display great diet plasticity, even within a population (Edwards *et al.* 2011, pp. 883–886). and switch shift food habits according to their availability (Servheen 1983, pp. 1029–1030; Mace and Jonkel 1986, p. 108; LeFranc *et al.* 1987, pp. 113–114; Aune and Kasworm 1989, pp. 63–71; Schwartz *et al.* 2003b, pp. 568–569; Gunther *et al.* 2014, p. 65). Gunther *et al.* (2014, p. 65) conducted an extensive literature review and documented over 260 species of foods consumed by grizzly bears in the GYA, representing four of the five kingdoms of life. The ability to use whatever food resources

Comment [FTvM6]: Just a suggestion; this is critical point to make and a reference from outside of GYA should strengthen the arguments presented below.

Edwards, M. A., A. E. Derocher, K. A. Hobson, M. Branigan, and J. A. Nagy. 2011. Fast carnivores and slow herbivores: differential foraging strategies among grizzly bears in the Canadian Arctic. *Oecologia* 165:877–889.

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are available is one reason grizzly bears are the most widely distributed bear species in the world, occupying habitats from deserts to alpine mountains and everything in between. This ability to live in a variety of habitats and eat a wide array of foods makes grizzly bears a generalist species. In contrast, specialist species eat only a few specific foods or live in only one or two specific habitat types (Krebs 2009, p. 100). An example of a specialist species is the lynx (*Lynx canadensis*) with 60–97 percent of its diet consisting of a single prey species, snowshoe hare (*Lepus americanus*) (Wilson and Mittermeier 2009, p. 150).

Grizzly bear diets are highly variable among individuals, seasons, and years (Servheen 1983, pp. 1029–1030; Mattson *et al.* 1991a, pp. 1625–1626; LeFranc *et al.* 1987, pp. 113–114; Felicetti *et al.* 2003, p. 767; Schwartz *et al.* 2003b; Felicetti *et al.* 2004, p. 499; Fortin *et al.* 2013, p. 278; Costello *et al.* 2014, p. 2013; Gunther *et al.* 2014, p. 65). They opportunistically seek and consume whatever plant and animal foods are available to them. Grizzly bears are always sampling new foods so they have alternative options in years when preferred foods are scarce (Mattson *et al.* 1991a, p. 1625). In the GYA, Blanchard and Knight (1991, p. 61) noted that, “After 10 years of food habits data collection, new feeding strategies continued to appear annually in this population.”

Grizzly bears in the GYA commonly consume high-calorie foods such as ungulates (bison, elk, moose, and deer), cutthroat trout, roots and tubers, army cutworm moths, grasses, and whitebark pine seeds (Schwartz *et al.* 2003b, p. 568). Bears make seasonal movements within their home ranges to locations where these foods are abundant (e.g., ungulate winter ranges, calving areas, spawning streams, talus slopes) (Costello *et al.*

Comment [FTvM7]: Important to make this distinction here first, as you use this term a few sentences down.

Comment [FTvM8]: Not sure grasses fit in this category of high-calorie foods.

Comment [FTvM9]: Add scientific names to all these?

2014, p. 2013). ~~Many of these~~ ~~These~~ foods are also subject to seasonal and annual variation in availability and therefore are not abundant or available during all seasons or every year (Craighead *et al.* 1995, p. 265; Gunther *et al.* 2014, pp. 64-65). When these high-calorie foods are not readily available, grizzly bears supplement their diet with items of lower caloric value that tend to be widely distributed across the landscape and readily available most years (Gunther *et al.* 2014, p. 66). These widely distributed and abundant foods include a wide variety of plants (e.g., grasses, sedges, horsetail, ~~and~~ forbs), colonial insects (e.g., ants, ~~and~~ wasps), fungi (e.g., false truffles), berries (e.g., huckleberry, whortleberry, ~~and~~ gooseberry), and small mammals (e.g., voles, ground squirrels, ~~and~~ pocket gophers). Spatial and temporal abundance and annual predictability of these foods compensates for their lower caloric value and, consequently, these foods can comprise a large proportion of grizzly bear annual diets (Craighead *et al.* 1995, p. 253; Gunther *et al.* 2014, p. 66). Grizzly bears also supplement their diet with many foods consumed opportunistically. Some opportunistic foods are consumed for only a short period each year (e.g., earthworms in meadows during spring snowmelt), others are available only in small localized areas (e.g., pondweed rhizomes from small ephemeral ponds within the Yellowstone caldera), and others are available only during sporadic periods of abundance (e.g., midges). Many opportunistic foods are eaten during periods with shortages of more preferred foods or when randomly encountered while foraging for other species (Gunther *et al.* 2014, p. 66).

Due to their high fat content, whitebark pine seeds can be an important fall food for bears in the GYA when they are available (Mattson and Jonkel 1990, p. 223; Mattson

et al. 1991a, p. 1623). Bears that have whitebark pine in their home range may feed predominantly on whitebark pine seeds when production exceeds 20 cones per tree (Blanchard 1990, p. 362) and whitebark pine seed availability can influence the reproductive and survival rates of these grizzly bears (Schwartz *et al.* 2006b, pp. 22, 36). Nearly one third of grizzly bear home ranges do not contain any whitebark pine (Costello *et al.* 2014, p. 2013). Bears in these areas consume other foods, even during years of good whitebark pine production and exhibit no significant differences in reproductive or survival rates than bears that live in areas with whitebark pine and consume whitebark pine seeds.

Comment [RS10]: Placeholder: Study Team review for accuracy. Citation?

Comment [FTvM11]:

MAH: We did not make these specific comparisons of survival or reproductive rates between bears with versus without WBP in their ranges.

Habitat & Population Management – Background

Grizzly bears use a variety of habitats in the GYA (LeFranc *et al.* 1987, p. 120). In general, a grizzly bear's individual habitat needs and daily movements are largely driven by the search for food, mates, cover, security, or den sites. The available habitat for bears is ~~also influenced~~~~determined largely~~ by people and their activities. Human activities are ~~the primary factor~~~~an important factor~~ impacting habitat security and the ability of bears to find and access foods, mates, cover, and den sites. Other factors influencing habitat use and function for grizzly bears include overall habitat productivity (e.g., food distribution and abundance), the availability of habitat components (e.g., denning areas, cover types), grizzly bear social dynamics, learned behavior and preferences of individual grizzly bears, grizzly bear population density, and random variation.

The Greater Yellowstone Area is part of the Middle Rockies ecoregion (Omernik 1987, pp. 120–121; Woods *et al.* 1999; McGrath *et al.* 2002; Chapman *et al.* 2004) and provides the habitat heterogeneity necessary for adequate food, denning, and cover resources. Because there are limited opportunities to increase or control these habitat components, the objective for grizzly bear habitat management is to reduce or mitigate the risk of human-caused mortality. The most effective habitat management tool for reducing grizzly bear mortality risk is managing motorized access to ensure bears have secure areas away from humans (Nielsen *et al.* 2006, p. 225; Schwartz *et al.* 2010, p. 661). We define secure habitat as areas more than 500 meters (m) (1650 feet (ft)) from a motorized access route and greater than or equal to 4 hectares (ha) (10 acres (ac)) in size (U.S. Fish and Wildlife Service 2007, pp. 41)). Unmanaged motorized access—

- (1) increases human interaction and potential grizzly bear mortality risk;
- (2) increases displacement from important habitat;
- (3) increases habituation to humans; and
- (4) decreases habitat where energetic requirements can be met with limited disturbance from humans (Mattson *et al.* 1987, pp. 269-271; McLellan and Shackleton 1988, pp. 458-459; McLellan 1989, pp. 1862-1864; Mace *et al.* 1996, pp. 1402-1403; Schwartz *et al.* 2010, p.661).

Managing motorized access helps ameliorate these impacts. Other habitat management tools that minimize displacement and reduce grizzly bear mortality risk include regulating livestock allotments and developed sites on public lands. Implementing food storage orders on public lands also reduces mortality risk for both humans and grizzlies. Requiring users and recreationists in grizzly habitat to store their

food, garbage, and other bear attractants so they are inaccessible to bears reduces encounters and grizzly bear/human conflicts.

The single ~~biggest-primary~~ factor affecting grizzlies at both the individual and population level is excessive human-caused mortality. Regulating human-caused mortality through habitat management is an effective approach, as evidenced by increasing grizzly bear populations in the lower 48 states where motorized access standards exist (e.g., GYA and Northern Continental Divide Ecosystem). This requires ongoing monitoring of the population to understand if it is sufficiently resilient ~~enough~~ to allow for a conservative level of human-caused mortality without causing population decline.

Comment [FTvM12]:

MAH: Big sweeping statement not necessarily true. Are humans the cause for increases in cub mortality? No, it is most likely high bear densities. This has more of an impact on the change in population trajectory than human-caused mortality. Human-caused mortality is important but might not be the single biggest factor, especially at the individual level.

The scientific discipline that informs decisions about most wildlife population management is population ecology: the study of how populations change over time and space and interact with their environment (Vandermeer and Goldberg 2003, p. 2; Snider and Brimlow 2013, p. 1). Ultimately, the goal of population ecology is to understand why and how populations change over time. Wildlife managers and population ecologists are interested in a number of factors to gauge the status of a population and make scientifically informed decisions. These measures include population size, population trend, density, and occupied range.

Population size is a well-known and easy to understand metric, but it only provides information about a population at a single point in time. However, wildlife

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managers often want to know how a population is changing over time and why. Population trend is determined by births, deaths, and how many animals move into or out of the population (i.e., disperse) and is typically expressed as the population growth rate (represented by the symbol λ , the Greek symbol of “lambda”). For wildlife populations, this is typically expressed as an average rate of annual growth, with 1.0 indicating a stable population trend and zero net growth. A λ value of, for example, -1.03 means the population size is increasing at 3 percent per year. Conversely, a λ value of 0.98 means the population size is decreasing at 2 percent per year.

In its simplest form, population trend is driven by births and deaths. Survival and reproduction are the two demographic vital rates driving whether the grizzly bear population increases, decreases, or remains stable. When wildlife biologists refer to demographic vital rates, they are referring to all of the different measures of reproduction and survival that cumulatively determine a population’s trend (i.e., lambda (λ)). Other demographic vital rates influencing trend include age-specific survival, age of first reproduction, average number of cubs per litter, the time between litters, age ratios, sex ratios, average age of first reproduction, lifespan, reproductive transition probabilities, immigration, and emigration. These data are all used to determine if and why a population is increasing or decreasing (Anderson 2002, p. 53; Mills 2007, p. 59; Mace *et al.* 2012, p. 124).

No population can grow forever, since-because the resources it requires are finite. This understanding led ecologists to develop the concept of carrying capacity (expressed

Comment [FTvM13]: It is fairly standard to also mention immigration and emigration. Of course, this is not relevant to GYA but maybe that should be mentioned and clarified?

Comment [FTvM14]:

MAH: Not vital rates. All these reproductive parameters together produce age specific fecundity, which is the vital rate of interest.

Suggest a little revising here.

Comment [FTvM15]: If you mention these in the first sentence of the paragraph and explain they don’t apply to GYA, you could leave these off in this list (also, I don’t think of these as vital rates).

as the symbol “K”). This is the maximum number of individuals a particular environment can support before resources are depleted (Vandermeer and Goldberg 2003, p. 261; Krebs 2009, p. 148). Classical studies of population growth occurred under controlled laboratory conditions where populations of a single organism, often an insect species or single-celled organism, were allowed to grow in a confined space with a constant supply of food (Vandermeer and Goldberg 2003, pp. 14-17). Under these conditions, K is a constant value that is approached in a predictable way that can be described by a mathematical equation (Figure 1; Colinvaux 1986, pp. 138–139; Krebs 2009, p. 148). However, few studies of wild populations have demonstrated the stability and constant population size suggested by this equation. Instead, many factors affect carrying capacity of animal populations in the wild and populations usually fluctuate above and below carrying capacity, resulting in relative population stability over time (i.e., $\lambda = 1.0$) (Colinvaux 1986, p. 142). For populations at or near carrying capacity, population size fluctuates just above and below carrying capacity, sometimes resulting in annual estimates of lambda showing a declining population. However, to obtain a biologically meaningful estimate of average annual population growth rate for a long-lived species that reproduces only once every 3 years and does not start reproducing until at least 4 years old, we must examine lambda over a longer period of time to see what the average trend is over that specified time. This is not an easy task: for grizzly bears, it takes at least 6 years of monitoring as many as 30 females with radio-collars to accurately estimate average annual population growth (Harris *et al.* 2011, p. 29).

When a population is at or near carrying capacity, mechanisms that regulate or control population size fall into two broad categories: density-dependent effects and density-independent effects. Generally, factors that limit population growth more strongly as population size increases are density-dependent effects, or intrinsic factors, usually expressed through individual behaviors, physiology, or genetic potential (McLellan 1994, p. 15). Extrinsic factors such as drought or fire that kill individuals regardless of how many individuals are in a population are considered density-independent effects (Colinvaux 1986, p. 172). These extrinsic factors may include changes in resources, predators, or human impacts. Population stability (i.e., fluctuation around carrying capacity) is often influenced by a combination of density-dependent and density-independent effects. Among grizzly bears, indicators of density-dependent population regulation can include: (1) decreased cub and yearling ~~and cub~~ survival due to increases in intraspecific ~~predation-killing~~ (i.e., bears killing other bears), (2) decreases in home-range size, (3) increases in generation time, ~~or~~ (4) increase in age of first reproduction, and (5) decreased reproduction. Indicators that density-independent effects are influencing population growth can include: (1) larger home-range sizes (because bears are roaming more widely in search of foods), (2) decreased cub and yearling survival due to starvation, (3) increases in age of first reproduction due limited food resources, and (34) decreased reproduction due to limited food resources. As a result of these sometimes similar indicators, determining whether a population is affected more strongly by density-dependent or independent effects can be a complex undertaking. For long-lived mammals such as grizzly bears, a lot of data collected over decades are needed to understand if and how these factors are operating in a population.

Comment [FTvM16]: You can have population stability but not fluctuating around carrying capacity (e.g., due to harvest). One alternative may be “around a long-term equilibrium”....

Comment [FTvM17]: This statement should probably be backed up by references; Eberhardt et al. 1994 (Can. J. Zoology 72) and Eberhardt 2002 (Ecology 83) is a good starting point.

You may also want to check this reference to see if this list of indicators may need some modification.

Comment [FTvM18]:

MAH: Predation implies consumption, subadults killed are often not consumed

Comment [rs19]: placeholder: 10/30/14 study team meeting – Haroldson said the known-fate analyses demonstrate this but I need a citation for it.

Comment [FTvM20]:

MAH: See earlier comment about generation time.

Comment [FTvM21]: McLoughlin et al. 2000 (Evol. Ecol. 14)

Comment [FTvM22]: However, we have been able to unravel much of this in our demographics paper that is currently in review (van Manen et al.); I have attached the paper.

Population viability analyses (PVAs) are another tool population ecologists often use to assess the status of a population by estimating its likelihood of persistence in the future. Boyce *et al.* (2001, pp. 1–11) reviewed the existing published PVAs for GYA grizzly bears and updated these previous analyses using data collected since the original analyses were completed. They also conducted new PVAs using two software packages that had not been available to previous investigators. They found that the GYA grizzly bear population had a 1 percent chance of going extinct within the next 100 years and a 4 percent chance of going extinct in the next 500 years (Boyce *et al.* 2001, pp. 1, 10–11). The authors cautioned that their analyses were not entirely sufficient because they were not able to consider possible changes in habitat and how these may affect population vital rates (Boyce *et al.* 2001, p. 31–32). Based on this recommendation, Boyce worked with other researchers to develop a habitat-based framework for evaluating mortality risk of a grizzly bear population in Alberta, Canada (Nielsen *et al.* 2006, p. 225). They concluded that secure habitat was the key to grizzly bear survival. Schwartz *et al.* (2010, p.661) created a similar mortality risk model for the GYA with similar results. Both studies suggest that managing for secure habitat is one of the most effective management actions to ensure population persistence.

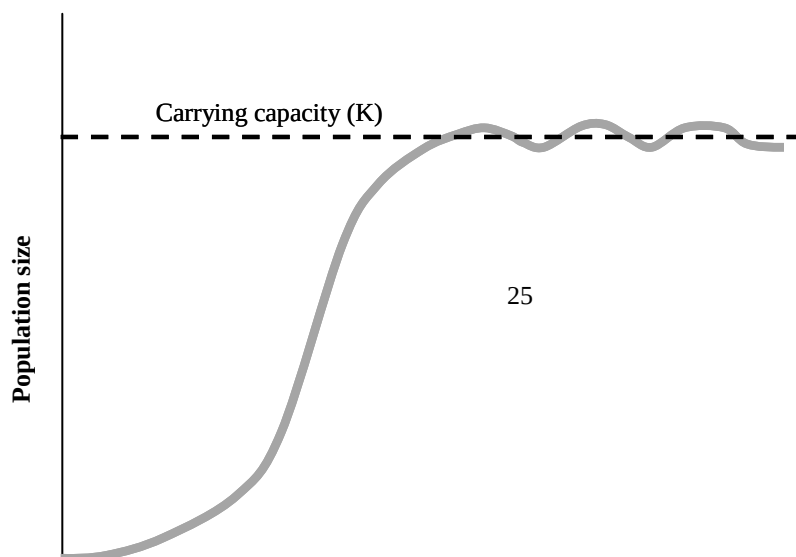


FIGURE 1.—Typical Population Trend with Respect to Carrying Capacity (K).

Population ecologists ~~call~~ refer to this as a logistic growth curve. When the population is at or near K, growth rates decelerate and stabilize as population size fluctuates around K.

Grizzly Bear Decline & Recovery

Prior to the arrival of Europeans, the grizzly bear occurred throughout the western half of the contiguous United States, central Mexico, western Canada, and most of Alaska (Roosevelt 1907, pp. 27–28; Wright 1909, pp. vii, 3, 185–186; Merriam 1922, p. 1; Storer and Tevis 1955, p. 18; Rausch 1963, p. 35; Herrero 1972, pp. 224–227; Schwartz *et al.* 2003b, pp. 557–558). Pre-settlement population levels for the western contiguous United States are believed to be in the range of 50,000 animals (Servheen 1999, p. 50). With European settlement of the American West and government-funded bounty programs aimed at eradication, grizzly bears were shot, poisoned, and trapped wherever they were found, and the resulting range and population declines were dramatic (Roosevelt 1907,

pp. 27–28; Wright 1909, p. vii; Storer and Tevis 1955, pp. 26–27; Leopold 1967, p. 30; Koford 1969, p. 95; Craighead and Mitchell 1982, p. 516, Servheen 1999, pp. 50–51). The range and numbers of grizzlies were reduced to less than 2 percent of their former range and numbers by the 1930s, approximately 125 years after first contact (U.S. Fish and Wildlife Service 1993, p. 9; Servheen 1999, p. 51). Of 37 grizzly populations present in 1922, 31 were extirpated by 1975 (Servheen 1999, p. 51).

By the 1950s, with little or no conservation effort or management directed at maintaining grizzly bears anywhere in their range, the GYA population had been reduced in numbers and was restricted largely to the confines of Yellowstone National Park and some surrounding areas (Craighead *et al.* 1995, pp. 41–42; Schwartz *et al.* 2003b, pp. 575–579). High grizzly bear mortality in 1970 and 1971, following closure of the open-pit garbage dumps in Yellowstone National Park (Gunther 1994, p. 550; Craighead *et al.* 1995, pp. 34–36), and concern about grizzly population status throughout its remaining range prompted the 1975 listing of the grizzly bear as a threatened species in the lower 48 States under the Act (16 U.S.C. 1531 *et seq.*) (40 FR 31734–31736, July 28, 1975). When the grizzly bear was listed in 1975, the population estimate in the GYA ranged from 136 to 312 individuals (Cowan *et al.* 1974, pp. 32, 36; Craighead *et al.* 1974, p. 16; McCullough 1981, p. 175).

Grizzly bear recovery has required—and will continue to require—cooperation among numerous government agencies and the public for a unified management approach. To this end, there are three interagency groups that help guide grizzly bear

management in the GYA. The Interagency Grizzly Bear Study Team (hereafter referred to as the Study Team), created in 1973, provides the scientific information necessary to make informed management decisions about grizzly bear habitat and conservation in the GYA. Since their formation in 1973, the published work of the Study Team has made the GYA grizzly bear population the most studied in the world. The wealth of biological information produced by the Study Team over the years includes 30 annual reports, 100s of articles in peer-reviewed journals, dozens of theses, and other technical reports.

Members of the Study Team include scientists and wildlife managers from the Service, U.S. Geological Survey, National Park Service, USDA Forest Service, academia, and each State and Tribal wildlife agency involved in grizzly bear recovery.

The second interagency group guiding grizzly bear conservation efforts is the Interagency Grizzly Bear Committee (hereafter referred to as the IGBC). Created in 1983, its members coordinate management efforts and research actions across multiple Federal lands and States to recover the grizzly bear in the lower 48 States (USDA and U.S. Department of the Interior 1983). Its objective was to change land management practices to more effectively provide security and maintain or improve habitat conditions for the grizzly bear (USDA and U.S. Department of the Interior 1983). The IGBC is made up of upper level managers from all affected State and Federal agencies (USDA and U.S. Department of the Interior 1983). The third interagency group guiding management of the GYA grizzly bear population is a subcommittee of the IGBC: the Yellowstone Ecosystem Subcommittee. Formed in 1983 to coordinate recovery efforts specific to the GYA, the Yellowstone Ecosystem Subcommittee includes mid-level

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managers and representatives from the Service; the ~~six~~five GYA National Forests (the Shoshone, ~~Custer~~, Beaverhead-Deerlodge, Bridger-Teton, ~~Custer~~-Gallatin, and ~~Caribou~~-Targhee); Yellowstone National Park; Grand Teton National Park; the Wyoming Game and Fish Department (WGFD); the Montana Department of Fish, Wildlife, and Parks (MTFWP); the Idaho Department of Fish and Game (IDFG); the Bureau of Land Management (BLM); county governments from each affected State; ~~and~~ the Northern Arapahoe Tribe; and the Eastern Shoshone Tribe (USDA and U.S. Department of the Interior 1983). The Study Team is an advisor to the subcommittee providing all the scientific information on the population and its habitat.

As per Section 4(f)(1) of the Act, the Service completed a Grizzly Bear Recovery Plan (Recovery Plan) in 1982 (U.S. Fish and Wildlife Service 1982, p. ii). Recovery plans serve as road maps for species recovery – they lay out where we need to go and how to get there through specific actions. Recovery plans are discretionary guidance documents that provide a central organizing tool to guide the recovery process and measureable criteria to assess progress towards recovery.

The Recovery Plan identified six recovery ecosystems within the conterminous United States thought to support grizzly bears. Today, grizzly bear distribution is primarily within, but not limited to, the areas identified as Recovery Zones (U.S. Fish and Wildlife Service 1993, pp. 10–13, 17–18), including: the GYA in northwest Wyoming, eastern Idaho, and southwest Montana (9,200 sq mi (24,000 sq km)) at more than

Comment [FTvM23]: This number applies to Recovery Zone only; distribution based on Bjornlie et al. (2014) is 50,000 sq km (rounded).

700 bears (Haroldson *et al.* 2014, p. 17); the Northern Continental Divide Ecosystem (NCDE) of north central Montana (9,600 sq mi (25,000 sq km)) at more than 900 bears (Kendall *et al.* 2009, p. 9; Mace *et al.* 2012, p. 124); the North Cascades area of north central Washington (9,500 sq mi (25,000 sq km)) at less than 20 bears (Almack *et al.* 1993, p. 4); the Selkirk Mountains area of north Idaho, northeast Washington, and southeast British Columbia (2,200 sq mi (5,700 sq km)) at approximately 88 bears (U.S. Fish and Wildlife Service 2011, p. 26); and the Cabinet-Yaak area of northwest Montana and northern Idaho (2,600 sq mi (6,700 sq km)) at approximately 45 bears (Kendall 2014, in litt.). The Bitterroot Recovery Zone in the Bitterroot Mountains of central Idaho and western Montana (5,600 sq mi (14,500 sq km)) is not known to contain a population of grizzly bears at this time (U.S. Fish and Wildlife Service 1996, p. 1; 65 FR 69624, November 17, 2000; U.S. Fish and Wildlife Service 2000, p. ix). The San Juan Mountains of Colorado also were identified as an area of possible grizzly bear occurrence (40 FR 31734–31736, July 28, 1975; U.S. Fish and Wildlife Service 1982, p. 12; U.S. Fish and Wildlife Service 1993, p. 11), but no confirmed sightings of grizzly bears have occurred there since a grizzly bear mortality in 1979 (U.S. Fish and Wildlife Service 1993, p. 11).

In 1993, the Service completed revisions to the Recovery Plan to include additional tasks and new information that increased the focus and effectiveness of recovery efforts (U.S. Fish and Wildlife Service 1993, pp. 41–58). In 1996 and 1997, we released supplemental chapters to the Recovery Plan to direct recovery in the Bitterroot and North Cascades Recovery Zones, respectively (U.S. Fish and Wildlife Service 1996;

U.S. Fish and Wildlife Service 1997). In the GYA, we updated both the habitat and demographic recovery criteria in 2007 (72 FR 11376, March 13, 2007). Then, in 2013, we proposed additional revisions to the demographic recovery criteria to reflect the best available science (78 FR 17708, March 21, 2013). Below, we report the status of both the habitat and demographic recovery criteria in the GYA.

In 1979, the Study Team developed the first comprehensive Guidelines for Management Involving Grizzly Bears in the GYA (hereafter referred to as the Guidelines) (Mealey 1979, pp. 1–4). We determined in a biological opinion that implementation of the Guidelines by Federal land management agencies would promote conservation of the grizzly bear (U.S. Fish and Wildlife Service 1979, p. 1). Beginning in 1979, the six affected National Forests (Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer, Gallatin (now the Custer-Gallatin National Forest), and Shoshone), Yellowstone and Grand Teton National Parks, and the BLM in the GYA began managing habitats for grizzly bears under direction specified in the Guidelines.

In 1986, the IGBC modified the Guidelines to more effectively manage habitat by mapping and managing according to three different management situations (USDA Forest Service 1986, pp. 35–39). In areas governed by “Management Situation One,” grizzly habitat maintenance and improvement and grizzly bear/human conflict minimization received the highest management priority. In areas governed by “Management Situation Two,” grizzly bear use was important, but not the primary use of

the area. In areas governed by “Management Situation Three,” grizzly habitat maintenance and improvement were not management considerations.

The National Forests and National Parks delineated 18 different bear management units within the Recovery Zone to aid in managing habitat and monitoring population trends. Each bear management unit was further subdivided into subunits, resulting in a total of 40 subunits contained within the 18 bear management units (see map at <http://mountain-prairie.fws.gov/species/mammals/grizzly/yellowstone.htm>). The bear management units are analysis areas that approximate the lifetime size of a female’s home range, while subunits are analysis areas that approximate the annual home range size of adult females. Subunits provide the optimal scale for evaluation of seasonal feeding opportunities and landscape patterns of food availability for grizzly bears (Weaver *et al.* 1986, p. 236). The bear management units and subunits were identified to provide enough quality habitat and to ensure that grizzly bears were well distributed across the recovery zone as per the Recovery Plan (U.S. Fish and Wildlife Service 2007, pp. 20, 41, 44–46). Management improvements made as a result of these Guidelines are discussed under Factor A below.

Habitat-Based Recovery Criteria

On June 17, 1997, we held a public workshop in Bozeman, Montana, to develop and refine habitat-based recovery criteria for the grizzly bear. A Federal Register notice notified the public of this workshop and provided interested parties an opportunity to

participate and submit comments (62 FR 19777, April 23, 1997). After considering 1,167 written comments, we developed biologically-based habitat recovery criteria with the overall goal of maintaining or improving habitat conditions at levels that existed in 1998.

There is no published method to deductively calculate minimum habitat values required for a healthy and recovered population. Grizzly bears are long-lived opportunistic omnivores whose food and space requirements vary depending on a multitude of environmental and behavioral factors and on variation in the experience and knowledge of each individual bear. Grizzly bear home ranges overlap and change seasonally, annually, and with reproductive status. While these factors make the development of threshold habitat criteria difficult, habitat criteria may be established by assessing what habitat factors in the past were compatible with a stable to increasing grizzly population, and then using these habitat conditions as threshold values to be maintained to ensure a healthy population (i.e., a “no net loss” approach), as suggested by Nielsen *et al.* (2006, p. 227). We selected 1998 levels as our baseline year because it was known that habitat values at this time were compatible with an increasing grizzly bear population throughout the 1990s (Eberhardt *et al.* 1994, p. 362; Knight and Blanchard 1995, pp. 5, 9; Knight *et al.* 1995, p. 247; Boyce *et al.* 2001, pp. 10–11) and that the levels of both secure habitat and the number and capacity of developed sites had changed little from 1988 to 1998 (USDA Forest Service 2004, pp. 140–141, 159–162).

Comment [FTvM24]: Add Schwartz et al. 2006?

The habitat-based recovery criteria established objective, measurable values for levels of motorized access, secure habitat, developed sites, and livestock allotments (i.e., “the 1998 baseline”). The 1998 values will not change through time, unless improvements benefit bears. As each of these management objectives are central to potential present or threatened destruction, modification, or curtailment of habitat or range, each of these criteria are discussed in detail under Factor A below. These habitat-based recovery criteria have been met.

Additionally, we developed monitoring items relevant to these habitat criteria: (1) trends in the location and availability of whitebark pine, cutthroat trout, army cutworm moths, and winter-killed ungulate carcasses; (2) grizzly bear mortality numbers, locations, and causes; grizzly bear/human conflicts; nuisance bear management actions; bear/hunter conflicts; and bear/livestock conflicts; and (3) development on private lands (U.S. Fish and Wildlife Service 2007, pp. 25–60). The agencies monitor these items and the Study Team produces an annual report with their results. This information is used to examine relationships between food availability, human activity, and demographic parameters of the population such as survival, population growth, or reproduction. The current habitat-based recovery criteria have been appended to the Recovery Plan and are included in the Strategy.

Comment [FTvM25]: This has not been monitored annually.

Population & Demographic Recovery Criteria

In the 1993 Recovery Plan, we identified three demographic parameters that should be measured to assess recovery in GYA. The first criterion established a minimum population size. The second criterion ensured reproductive females were distributed across the Recovery Zone and the third criterion created mortality limits that would allow the population to achieve recovery. Since the 1993 Recovery Plan was released, we have evaluated and updated how we assess those recovery criteria as newer, better science becomes available. These revisions include implementing new scientific methods to determine the status of the GYA grizzly bear population, estimate population size, and determine what levels of mortality the population could withstand without causing population decline (i.e., the sustainable mortality rate). The Wildlife Monograph: “Temporal, Spatial, and Environmental Influences on The Demographics of Grizzly Bears in The Greater Yellowstone Ecosystem” (Schwartz *et al.* 2006b, entire); the report: “Reassessing Methods to Estimate Population Size and Sustainable Mortality Limits for the Yellowstone Grizzly Bear” (Interagency Grizzly Bear Study Team 2005, entire); and the report: “Reassessing Methods to Estimate Population Size and Sustainable Mortality Limits for the Yellowstone Grizzly Bear Workshop Document Supplement 19–21 June, 2006” (Interagency Grizzly Bear Study Team 2006, entire) provided the scientific basis for revising the demographic recovery criteria in the GYA in 2007 (72 FR 11376, March 13, 2007). Similarly, the revisions we proposed to implement in 2013 (78 FR 17708, March 22, 2013) are based on updated demographic analyses using the same methods as before (Schwartz *et al.* 2006, pp. 9–16) and reported in the Interagency Grizzly Bear Study Team’s 2012 report: “Updating and Evaluating Approaches to Estimate Population Size and Sustainable Mortality Limits for

Grizzly Bears in the Greater Yellowstone Ecosystem” (hereafter referred to as the 2012 Study Team report). This 2012 Study Team report provides the scientific basis for the changes we proposed to the GYA demographic recovery criteria in 2013.

In 2013, we proposed to change the first and third criteria because they no longer represented the best scientific data or the best technique to assess recovery of the GYA grizzly bear population (78 FR 17708, March 21, 2013). Specifically, these criteria warrant revision because: (1) updated demographic analyses for 2002–2011 indicate that the rate of growth seen during the 1983–2001 period has slowed and sex ratios have changed; (2) there is consensus among scientists and statisticians that the area within which we apply mortality limits should be the same area we use to estimate population size; and (3) the need exists to make the demographic criteria dynamic so the Study Team can incorporate results from updated demographic analyses and implement new scientific methods based on peer-reviewed, scientific literature as they become available.

Comment [FTvM26]:

MAH: Suggest alternate wording:

“period has slowed and the composition of the estimated standing population has changed”

We released these proposed revisions related to population size and mortality limits for public comment in 2013 but did not finalize them so we could consider if and how they would relate to a Proposed Rule to delist this population of grizzly bears. We made appropriate revisions to the criteria in response to public comments and peer reviews and are now re-releasing these draft criteria concurrent with this Proposed Rule so that the public has the opportunity to comment again, as the criteria are directly related to assessing the status of the population. After review and incorporation of appropriate public comments, we plan to append revised criteria to

the Yellowstone chapter of the Grizzly Bear Recovery Plan (U.S. Fish and Wildlife Service 1993, p. 44) and the Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area. We expect to release a final supplement to the Recovery Plan concurrent with a final determination on this proposal.

Below, we summarize relevant portions of the demographic analyses contained in the Study Team's most recent report (Interagency Grizzly Bear Study Team 2012, entire) and compare them with the previous results of Schwartz *et al.* (2006b, entire) to draw conclusions concerning grizzly bear trends in the GYA using their collective results. These analyses provide the scientific basis for our proposed revisions. While Schwartz *et al.* (2006b, p. 11) used data from 1983 through 2001, the 2012 Study Team report examined a more recent time period: 2002 through 2011 (IGBST 2012, p. 33). The Study Team found that population growth had slowed since the previous time period but was still stable to slightly increasing, meaning the population had not declined. Because the fates of some radio-collared bears are unknown, Schwartz *et al.* (2006b, p. 48) and the Study Team (2012, p. 34) calculated two separate estimates of population growth rate, one based on the assumption that every bear with an unknown fate had died (i.e., a conservative estimate) and the other simply removing bears with an unknown fate from the sample. The true population growth rate is assumed to be somewhere in between these two estimates because we know from 30 years of tracking grizzly bears with radio-collars that not every lost collar is a dead bear. While Schwartz *et al.* (2006b, p. 48) found the GYA grizzly bear population increased at a rate between 4.2 and 7.6 percent per year between 1983 and 2002, the Study Team (2012, p. 34) found this growth had

leveled off and was between 0.3 percent and 2.2 percent per year ~~between-during~~ 2002-
~~and~~ 2011.

Schwartz *et al.* (2006b, p. 29) analyzed survivorship of cubs, yearlings, and independent bears based on whether they lived inside Yellowstone National Park, outside the Park but inside the Primary Conservation Area (PCA), or outside the PCA entirely. They concluded that grizzly bears are approaching carrying capacity inside Yellowstone National Park. The Study Team (2012, p. 33) documented results consistent with this conclusion and ~~even~~-lower cub and yearling survival than in the previous time period. Importantly, ~~annual survival of~~ independent females ~~survival~~ (the most influential age/sex cohort on population trend) remained the same while independent male survival increased (IGBST 2012, p. 33). Collectively, these two studies indicate that the growth rate of the GYA grizzly bear population ~~has slowed is stabilizing~~ as ~~bear densities may have it nears or exceeds~~ approached carrying capacity, particularly in the core area of occupied range.

Mortality control is a key part of any successful management effort for grizzly bears; however, some mortality, including human-caused mortality, is unavoidable in a dynamic system where hundreds of bears inhabit large areas of diverse habitat with several million human visitors and residents. Adult female mortality influences the population trajectory more than mortality of males or dependent young (Eberhardt 1977, p. 210; Knight and Eberhardt 1985, p. 331; Schwartz *et al.* 2006b, p. 48). Low adult female survival was the critical factor causing decline in the GYA population prior to the

Comment [FTvM27]: This should probably refer to RZ instead; it is the terminology that Schwartz *et al.* 2006 used and this was prior to 2007 delisting.

Comment [FTvM28]: Our paper on density dependence that we submitted to JWM may be cited here if it is accepted. ("Density Dependence, Whitebark Pine Decline, and Changing Vital Rates of Yellowstone Grizzly Bears")

Comment [FTvM29]:

Mark suggested: "Mortality reduction is an important part of any..."

mid-1980s (Knight and Eberhardt 1985, p. 331). In the early 1980s, with the development of the first Recovery Plan (U.S. Fish and Wildlife Service 1982, pp. 21–24), agencies began to address mortality and increase adult female survivorship (USDA Forest Service 1986, pp. 1–2; Knight *et al.* 1999, pp. 56–57).

The Recovery Plan and subsequent Supplements to it (U.S. Fish and Wildlife Service 1982, pp. 33–34; U.S. Fish and Wildlife Service 1993, pp. 20–21; U.S. Fish and Wildlife Service 2007, p. 2) established three demographic criteria to objectively measure and monitor recovery of the GYA grizzly bear population. The three parameters that are measured have remained the same since the 1993 plan: (1) population size; (2) population distribution; and (3) mortality limits that allow a stable to increasing population. The most current demographic criteria were appended to the 1993 Recovery Plan in 2007, and proposed revisions to those were released for public comment in 2013. Below, we report the status of each of these recovery criteria for the updated demographic criteria proposed in 2013 because they represent the best available science:

Demographic Recovery Criterion 1

Within the Demographic Monitoring Area (DMA), maintain a minimum population size of at least 500 animals, as indicated by methods established in published, peer-reviewed scientific literature and calculated by the Study Team using the most updated Protocol, as posted on their website. The annual estimate of total population size cannot drop below 500. Status: This recovery criterion has been met since at least 2007

(see Study Team annual reports from 2008–2013 available at <http://www.nrmc.usgs.gov/products/IGBST>).

Demographic Recovery Criterion 2

Sixteen of 18 bear management units within the Recovery Zone (see map at <http://mountain-prairie.fws.gov/species/mammals/grizzly/yellowstone.htm>) must be occupied by females with young, with no 2 adjacent bear management units unoccupied, during a 6-year sum of observations. Status: This criterion is important as it ensures that reproductive females occupy the majority of the Recovery Zone and are not concentrated in one portion of the ecosystem. Status: This recovery criterion has been met since at least 2001.

Demographic Recovery Criterion 3

Within the DMA, establish annual mortality limits for independent females (at least 2 years old), independent males (at least 2 years old), and dependent young (less than 2 years old) that correspond to a lambda value (i.e., population growth rate) of at least 1.0. Annual mortality limits are calculated using sustainable mortality rates and the estimated population size for that year, as reported by the Study Team using peer reviewed scientific methods such as known-fate analyses (see Schwartz *et al.* 2006, pp. 9–16). For example, the sustainable mortality rate using data from 2002–2011 is 7.6 percent for independent females while the rates for independent males and dependent

young are 15 percent and 7.6 percent, respectively. These rates for independent females and dependent young are lower than what was calculated using data from 1983–2002. Mortalities are tracked and reported annually using data obtained within the DMA shown in Figure 1. Status: This criterion was met for all age and sex classes in 2012 and 2013. The Study Team has not retrospectively calculated what the sustainable mortality limits would have been for earlier years and whether they were met because this is not necessary considering other independent data (i.e., survival rates and estimates of annual population growth) indicate mortality has been within limits that result in population increase since 1983 (Schwartz et al. 2006, p. 48; Interagency Grizzly Bear Study Team 2012, p. 34).

The Conservation Strategy

The Conservation Strategy is the continuation of a long-running implementation program with a demonstrated track record of success. Recovery of the GYA grizzly bear population is the result of ongoing partnerships between Federal, ~~and State~~, and Tribal agencies, the governors of these States, county and city governments, educational institutions, numerous non-government organizations, private landowners, and the public who live, work, and recreate in the GYA. Just as recovery of the GYA grizzly bear population could not have occurred without these excellent working relationships, maintenance of a recovered grizzly population will be the result of the continuation of these partnerships. Grizzly bears are a “conservation-reliant” species (Scott et al. 2005, p. 384) because of their low resiliency to excessive human-caused mortality and the

Comment [FTvM30]:

MAH: I think this is reasonable logic. That said steps required to complete a retrospective look back to 2002 would be to identify and exclude sightings of FCOY occurring outside the DMA, iteratively rerun annual Chao2 estimates using only those FCOY seen within the DMA, iteratively rerun the annual model averaged Chao2 and produce annual population estimates, finally assess annual sustainable mortality limits excluded mortalities that occur outside the DMA

Comment [FTvM31]: My edits are only meant to help clarify this important point....

~~manageable nature of this threat. Consequently, the~~ Strategy will remain in effect ~~indefinitely, i.e., beyond recovery, delisting, and the five year monitoring period required~~ by the Act; ~~as grizzly bears are a “conservation-reliant” species (Scott *et al.* 2005, p. 384) because of their low resiliency to excessive human-caused mortality and the manageable nature of this threat.~~ Therefore, the need to coordinate management of the population across multiple land ownerships and jurisdictions will always remain.

Comment [RS32]: this is a critical component of our approach. The Strategy is not just a 5-year monitoring plan. It is por vida.

In order to document the regulatory mechanisms and coordinated management approach necessary to ensure the long-term maintenance of a recovered population, the Recovery Plan calls for the development of “a conservation strategy to outline habitat and population monitoring that will continue in force after recovery” (Recovery Plan Task Y426) (U.S. Fish and Wildlife Service 1993, p. 55). To accomplish this goal, ~~in 1993,~~ a Conservation Strategy Team was formed ~~in 1993.~~ This team included biologists from the Service, ~~the~~ National Park Service, the USDA Forest Service, the IDFG, the WGFD, and ~~the~~ MTFWP.

Comment [FTvM33]: Add USGS

In March 2000, a draft Conservation Strategy for the GYA was released for public review and comment (65 FR 11340, March 2, 2000). Also in 2000, a Governors’ Roundtable was organized to provide recommendations from the perspectives of the three States that would be involved with grizzly bear management after delisting. In 2003, the draft Final Conservation Strategy for the Grizzly Bear in the GYA was released, along with drafts of State grizzly bear management plans (all accessible at <http://mountain-prairie.fws.gov/species/mammals/grizzly/yellowstone.htm>). We responded to all public

comments and peer reviews received on the Strategy and finalized the Strategy in 2007 (72 FR 11376).

The purposes of the Strategy and associated State and Federal implementation plans are to: (1) describe, summarize, and implement the coordinated efforts to manage the grizzly bear population and its habitat to ensure continued conservation of the GYA grizzly bear population; (2) specify and implement the population, habitat, and nuisance bear standards to maintain a recovered grizzly bear population for the foreseeable future; (3) document the regulatory mechanisms and legal authorities, policies, management, and monitoring programs that exist to maintain the recovered grizzly bear population; and (4) document the actions that participating agencies have agreed to implement (U.S. Fish and Wildlife Service 2007, pp. 5–6).

Comment [FTvM34]: I'm curious about this term. Is this ESA language? I'm asking because "foreseeable" is used frequently but seems to imply a shorter time frame than what the Conservation Strategy seems to be designed for...at least it seems that way to me.

The Strategy will coordinate ~~the~~ management and monitoring of the GYA grizzly bear population and its habitat after delisting. It establishes a regulatory framework and authority for Federal and State agencies to take over management of the GYA grizzly bear population from the Service. The Strategy also identifies, defines, and requires adequate post-delisting monitoring to maintain a healthy GYA grizzly bear population (U.S. Fish and Wildlife Service 2007, pp. 25–56). The Strategy has objective, measurable habitat and population standards, with clear management responses if deviations occur (U.S. Fish and Wildlife Service 2007, pp. 63–67). It represents 20 years of a collaborative, interagency effort among the members of the Yellowstone Ecosystem Subcommittee. State grizzly bear management plans were developed and completed in

all three affected States (Idaho, Montana, and Wyoming) and then incorporated into the Strategy to ensure that the plans and the Strategy are consistent and complementary (accessible at <http://mountain-prairie.fws.gov/species/mammals/grizzly/yellowstone.htm>). All the State and Federal agencies party to the agreement have signed a memorandum of understanding agreeing to implement the Strategy.

The Strategy identifies and provides a framework for managing habitat within a Primary Conservation Area (PCA) and managing demographic parameters within the DMA. The PCA boundaries (containing 23,853 sq km (9,210 sq mi)) correspond to those of the Yellowstone Recovery Zone (U.S. Fish and Wildlife Service 1993, p. 41) and will replace the Recovery Zone boundary (see Figure 2 below). The PCA contains adequate seasonal habitat components needed to support the recovered GYA grizzly bear population for the foreseeable future and to allow bears to continue to expand outside the PCA. The PCA includes approximately 51 percent of suitable grizzly bear habitat within the Greater Yellowstone Area and approximately 75 percent of the population of female grizzly bears with cubs (Haroldson 2014, in litt.).

Comment [FTvM35]: Probably need to indicate what this is based on. "FWS suitable habitat"?

The Strategy will be implemented and funded by Federal, Tribal, and State agencies within the GYA. The signatories to the Strategy have a demonstrated track record of funding measures to ensure recovery of this grizzly bear population for over three decades. The Service intends to continue to contribute to funding to the implementation of the Strategy. In general, the USDA Forest Service and National Park

Service will be responsible for habitat management to reduce the risk of human-caused mortality to grizzly bears while the National Park Service ~~and~~; State and Tribal wildlife agencies will be responsible for managing the population within sustainable mortality limits. The USDA Forest Service and National Park Service collectively manage approximately 98 percent of lands inside the PCA. Specifically, Yellowstone National Park, Grand Teton National Park, and the Shoshone, Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer, ~~and~~ Gallatin National Forests are the Federal entities responsible for implementing the Strategy. Affected National Forests and National Parks have incorporated or will incorporate the habitat standards and criteria into their Forest Plans and National Park management plans via appropriate amendment processes so that they are legally applied to these public lands within the GYA (see Grand Teton National Park 2006, p. 1; USDA Forest Service 2006b, p. 4; Yellowstone National Park 2006, p. 12). Outside of the PCA, grizzly bear habitat is well protected via Wilderness Area designation or Forest Plan direction and demographic standards will protect the population throughout the Demographic Monitoring Area.

If this proposed rule is finalized, the Yellowstone Grizzly Bear Coordinating Committee (hereafter referred to as the Coordinating Committee) will replace the Yellowstone Ecosystem Subcommittee as the interagency group coordinating implementation of the Strategy's habitat and population standards, and monitoring (U.S. Fish and Wildlife Service 2007, p. 63). Similar to the Yellowstone Ecosystem Subcommittee, the Coordinating Committee members include representatives from Yellowstone and Grand Teton National Parks, the ~~six~~-five affected National Forests,

BLM, U.S. Geological Survey, IDFG, MTFWP, WGFD, one member from local county governments within each State, and one member from each Native American Tribe within the GYA. All meetings will be open to the public. Besides coordinating management, research, and financial needs for successful conservation of the GYA grizzly bear population, the Coordinating Committee will review the Study Team's Annual Reports and review and respond to any deviations from habitat or population standards. The Coordinating Committee will decide on management recommendations to be implemented by appropriate member agencies to rectify problems and to assure that the habitat and population standards will be met and maintained.

The Strategy is an adaptive, dynamic document that establishes a framework to incorporate new and better scientific information as it becomes available or as necessary in response to environmental changes. Public comments will be sought on all updates to the Strategy (U.S. Fish and Wildlife Service 2007, p. 14).

Distinct Vertebrate Population Segment Policy Overview and Analysis

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing species, reclassifying species, or removing species from listed status. "Species" is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). We, along with the National Marine Fisheries Service (now the National Oceanic and Atmospheric Administration—

--INTERNAL DELIBERATIVE MATERIAL —Not for Distribution —

Fisheries), developed the Policy Regarding the Recognition of Distinct Vertebrate Population Segments (DPS policy) (61 FR 4722; February 7, 1996), to help us in determining what constitutes a Distinct Population Segment (DPS). The policy identifies three elements that are to be considered in a decision regarding the status of a possible DPS. These elements are: (1) the discreteness of the population in relation to the remainder of the species to which it belongs; (2) the significance of the population segment to the species to which it belongs; and (3) the population segment's conservation status in relation to the Act's standards for listing. Our policy further recognizes it may be appropriate to assign different classifications (i.e., threatened or endangered) to different DPSs of the same vertebrate taxon (61 FR 4725; February 7, 1996).

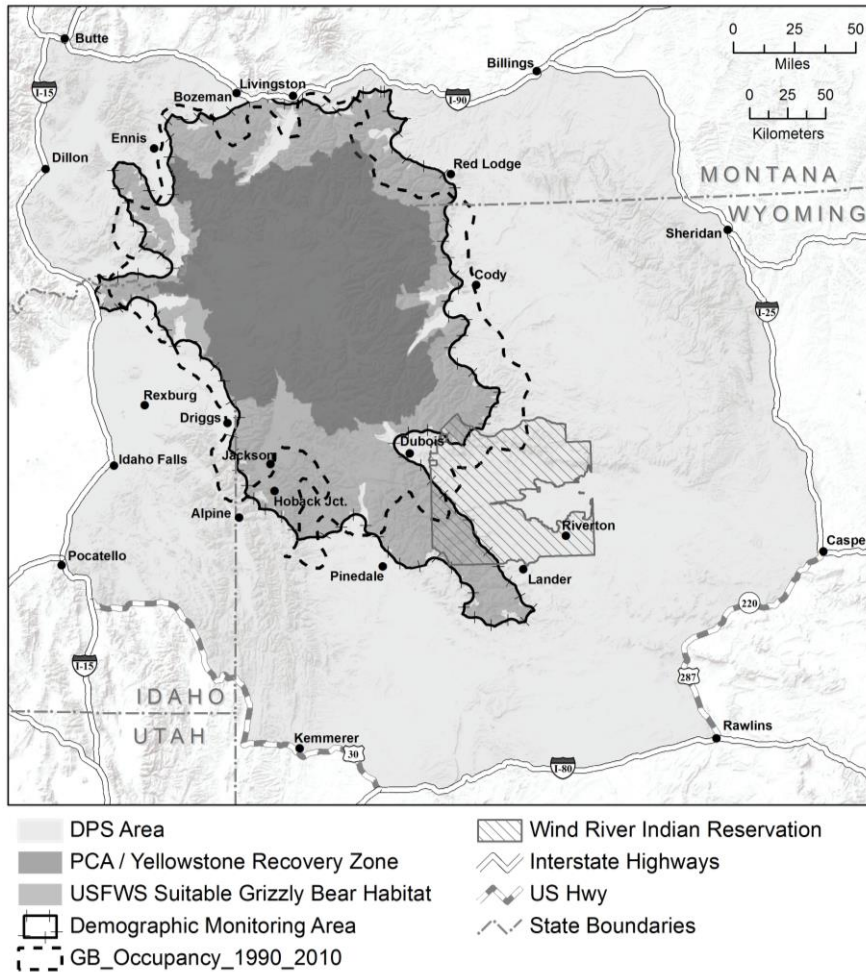


FIGURE 2.—Map of the Greater Yellowstone Area. Boundaries are shown for: (1) the GYA grizzly bear Distinct Population Segment (DPS); (2) the Primary Conservation Area (PCA); (3) the Demographic Monitoring Area (DMA); (4) the 2010 distribution of grizzly bears; and (5) biologically Suitable Habitat (as defined in Factor A below).

Analysis of Discreteness in Relation to Remainder of Taxon

Under our DPS Policy, a population of a vertebrate species may be considered discrete if it satisfies either one of the following conditions — (1) It is markedly separated from other populations of the same taxon (i.e., *Ursus arctos horribilis*) as a consequence of physical, physiological, ecological, or behavioral factors (quantitative measures of genetic or morphological discontinuity may provide evidence of this separation); or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) (“the inadequacy of existing regulatory mechanisms”) of the Act. The DPS Policy does not require complete separation of one DPS from another, and occasional interchange does not undermine the discreteness of potential DPSs. The DPS policy only requires that populations be “markedly separated” from each other. Thus, if occasional individual grizzly bears move between populations, the population could still display the required level of discreteness per the DPS Policy.

The GYA grizzly bear population is the southernmost population remaining in the conterminous States and has been physically separated from other areas where grizzly bears occur for at least 100 years (Merriam 1922, pp. 1–2; Miller and Waits 2003, p. 4334). The nearest population of grizzly bears is found in the NCDE approximately 100 miles (160 km) away. Although their range continues to expand north (Bjornlie et al. 2013, p. 185), grizzly bears from the GYA have not been documented north of

Comment [FTvM36]:

MAH: Not consistent with below

--INTERNAL DELIBERATIVE MATERIAL --Not for Distribution --

Interstate 90 outside the DPS boundaries (Frey 2014, in litt.). Over the last few decades, the NCDE grizzly bear population has been slowly expanding to the south and there have been several confirmed grizzly bears from the NCDE within 20—50 miles (32—80 km) of the Yellowstone grizzly bear DPS boundaries near Butte, Deerlodge, and Anaconda, Montana (Jonkel 2014, in litt.). However, there is currently no known connectivity between these two grizzly bear populations.

Genetic data also support the conclusion that grizzly bears from the GYA are separated from other grizzly bears. Genetic studies involving heterozygosity (which provides a measure of genetic diversity) estimates at 8 microsatellite loci show 57 percent heterozygosity in the GYA grizzly bears compared to 67 percent in the NCDE bears (Proctor *et al.* 2012, p. 12). Heterozygosity is a useful measure of genetic diversity, with higher values indicative of greater genetic variation and evolutionary potential. High levels of genetic variation are indicative of high levels of connectivity among populations or high numbers of breeding animals. By comparing heterozygosity of extant bears to samples from Yellowstone grizzlies of the early 1900s, Miller and Waits (2003, p. 4338) concluded that gene flow and, therefore, population connectivity between the GYA grizzly population and populations to the north was low even 100 years ago. The reasons for this historic limitation of gene flow are unclear but we do know increasing levels of human activity and settlement in this intervening area over the last century further limited grizzly bear movements into and out of the GYA, likely resulting in the current lack of connectivity (Proctor *et al.* 2012, p. 35).

Comment [FTvM37]:

MAH: Haroldson et al 2010 estimates $H_o = 0.60$ using 15 sites.

Based on the best available scientific data about grizzly bear locations and movements, we find that the GYA grizzly population and other remaining grizzly bear populations are markedly, physically separated from each other. Therefore, the Yellowstone DPS meets the criterion of discreteness under our DPS Policy. Occasional movement of bears from other grizzly bear populations into the GYA grizzly bear population would be beneficial to its long-term persistence (Boyce *et al.* 2001, pp. 25, 26). While future connectivity is desirable and will be actively managed for, this would not undermine discreteness as all that is required is “marked separation” not absolute separation. Even if occasional individual grizzly bears disperse among populations, the GYA grizzly bear DPS would still display the required level of discreteness per the DPS Policy. And, as stated in the 1993 Recovery Plan, we recognize that natural connectivity is important to long-term grizzly bear conservation and we will continue efforts to work toward this goal independent of the delisting of the Yellowstone DPS (U.S. Fish and Wildlife Service 1993, p. 53). This issue is discussed further under Factor E below.

Analysis of Significance of Population Segment to Taxon

If we determine a population segment is discrete, its biological and ecological significance will then be considered in light of congressional guidance that the authority to list DPS's be used sparingly while encouraging the conservation of genetic diversity. In carrying out this examination, we consider available scientific evidence of the population's importance to the taxon (i.e., *Ursus arctos horribilis*) to which it belongs. Our DPS policy states that this consideration may include, but is not limited to, the

following: (1) Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon; (2) Evidence that loss of the discrete population segment would result in a significant gap in the range of the taxon; (3) Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; or (4) Evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics. A discrete population may be significant if it meets any of these four factors. It need not meet multiple factors. Below we address Factors 1, 2, and 4. Factor 3 does not apply to the GYA grizzly bear population because there are several other extant populations of grizzly bears in North America.

Factor 1: Unusual or Unique Ecological Setting

New information since the publication of the 2007 delisting rule (72 FR 14866, March 29, 2007) and the 2011 status review (U.S. Fish and Wildlife Service 2011) calls into question whether the GYA is truly a unique ecological setting. Previously, we concluded that the GYA was a unique ecological setting because grizzly bears were more carnivorous there than in other ecosystems in the lower 48 States and that they still used whitebark pine seeds extensively while other populations no longer did.

Based on previous research, we found that meat constitutes 45 percent and 79 percent of the annual diet for females and males in the GYA, respectively (Jacoby *et*

al. 1999, p. 925). These high percentages of meat in GYA grizzly bears' diet appeared to be in contrast with the 0 to 33 percent of meat in the diet of bears in the NCDE and 0 to 17 percent of meat in the diet of bears from the Cabinet-Yaak Ecosystem (Jacoby *et al.* 1999, p. 925). However, these analyses were recently re-visited and supplemented with larger sample sizes with ~~very~~ different results. First, Schwartz *et al.* 2014, p. 75) found that meat constitutes 44 percent of the annual diet among grizzly bears in the GYA, with no statistical difference among sex and age groups. For the Yellowstone Lake area, Fortin *et al.* (2013, p. 275) found that meat constitutes 38 percent and 45 percent of the annual diet for females and males ~~in the GYA~~, respectively. These levels are very similar to those in the NCDE, where meat constitutes 38 percent and 56 percent of the annual diet for females and males, respectively (Teisberg *et al.* 2014, p. 7). Previous information also indicated that bison, a species endemic to North America, accounted for 24 percent of ungulate meat in GYA grizzly bear diets (Mattson 1997, p. 167) whereas Fortin *et al.* (2013, p. 275) found bison comprise only about 9 percent of grizzly bear diets in the GYA.

We also previously concluded the GYA grizzly bear population exists in a unique ecological setting because it is able to use whitebark pine seeds as a major food source (see 72 FR 14866, March 29, 2007). We considered the use of whitebark pine seeds by GYA grizzly bears unique because in most areas of its range, whitebark pine has been significantly reduced in numbers and distribution due to the introduced pathogen white pine blister rust (*Cronartium ribicola*) (Kendall and Keane 2001, pp. 228–232). New information indicates that whitebark pine has also been reduced in the GYA since 2002

Comment [FTvM38]:

MAH: Fortin et al. 2013 data was centered around Yellowstone Lake. Results do not represent an ecosystem wide sample. I do not think this is an appropriate comparison

Comment [FTvM39]: I made edits to address Mark's point by first citing Schwartz et al. 2014, which was based on GYA-wide sampling; see above.

Comment [FTvM40]: But this is only in the Yellowstone Lake area, so could be misleading unless you provide that context.

Not sure if this is relevant: nitrogen stable isotope has remained constant (hair, serum) or increasing (blood clots) GYA-wide during 2000-2010 based on Schwartz et al. This does not suggest lower consumption of meat, presumably including bison. I speculate that the low 9% from Fortin et al. is due to location, not trend.

due to a mountain pine beetle epidemic. Since this time, bears have been documented using whitebark pine less. A recent study using ~~and~~ GPS data indicate nearly one third of sampled grizzly bears in the GYA ~~did~~ ~~e~~ not even have whitebark pine within their home ranges (Costello *et al.* 2014, p. 2009). Grizzly bears in the GYA do not seek out whitebark pine in years of poor seed production but make use of other foods within their home ranges instead (Costello *et al.* 2014, p. 2013). Additionally, methods used by Felicetti *et al.* (2003, entire) to assess whitebark pine use in the GYA may not be as reliable as previously thought because other foods in the GYA could be mistakenly identified as whitebark pine, indicating more use than is actually occurring (Schwartz *et al.* 2014, p. 6).

In light of these new data indicating grizzly bears in the GYA do not consume more meat than other populations in the lower 48 States and their use of whitebark pine has waned, we no longer consider the GYA to meet the DPS policy standard for significance based on its unique ecological setting.

Factor 2: Significant Gap in the Range of the Taxon

Given the grizzly bear's historic occupancy of the conterminous States and the portion of the historic range the conterminous States represent, recovery in the lower 48 States where the grizzly bear existed in 1975 when it was listed has long been viewed as important to the taxon (40 FR 31734–31736, July 28, 1975). The Yellowstone DPS is significant in achieving this objective, as it is one of only five known occupied areas and

constitutes approximately half of the remaining grizzly bears in the conterminous 48 States. As noted above, grizzly bears once lived throughout the North American Rockies from Alaska and Canada, and south into central Mexico. Grizzly bears have been extirpated from most of the southern portions of their historic range. Today, the Yellowstone DPS represents the southernmost reach of the grizzly bear. The loss of this population would be significant because it would substantially curtail the range of the grizzly bear in North America by moving the range approximately 3 degrees of latitude to the north (i.e., 200 mi; 350 km). Therefore, we find that the GYA population of grizzly bears meets the significance criterion under our DPS policy because there is evidence that its loss would represent a significant gap in the range of its taxon.

Factor 4: *Marked Genetic Differences*

Several genetics studies have documented some level of genetic differences between grizzly bears in the GYA and other populations in North America (Paetkau *et al.* 1998, pp. 421–424; Waits *et al.* 1998, p. 310; Proctor *et al.* 2012, p. 12). The GYA population has been isolated from other grizzly bear populations for 100 years or more (Miller and Waits 2003, p. 4334). However, Miller and Waits (2003, p. 4334) could only speculate as to the reasons behind this historical separation or how long it had been occurring. Proctor *et al.* (2012, p. 35) concluded that observed differences in heterozygosity among grizzly bear populations in southern Canada and U.S. were an artifact of human-caused habitat fragmentation, not the result of different evolutionary pressures selecting for specific traits. We do not know whether these differences in

heterozygosity levels are biologically meaningful and we have no data indicating they are. Because we do not know the biological significance (if any) of the observed differences, we cannot say with certainty that the GYA grizzly population's genetics differ "markedly" from other grizzly bear populations. Therefore, we do not consider these genetic differences to meet the DPS policy's standard for significance. While this is a different conclusion about the significance of these genetic differences than we reached in our previous DPS analysis (72 FR 14866, March 29, 2007), it is a result of our re-consideration of the term "markedly", which is subjective in this case.

In summary, while we no longer consider the GYA grizzly bear population to be significant due to unique ecological conditions or marked genetic differences, we still conclude that the GYA grizzly population is significant because the loss of this population would result in a significant gap in the range of the taxon.

Conclusion of Distinct Population Segment Review

Based on the best scientific and commercial data available, as described above, we find that the GYA grizzly bear population is discrete from other grizzly populations and significant to the remainder of the taxon (i.e., *Ursus arctos horribilis*). Because the GYA grizzly bear population is discrete and significant, it meets the definition of a DPS under the Act.

Legal Description of the Proposed Distinct Population Segment Boundaries

Although the DPS Policy does not allow State or other intra-national governmental boundaries to be used as the basis for determining the discreteness of a potential DPS, an artificial or human-made boundary may be used to clearly identify the geographic area included within a DPS designation. Easily identifiable human-made objects, such as the center line of interstate highways, Federal highways, and State highways are useful for delimiting DPS boundaries. Thus, the Yellowstone DPS consists of – that portion of Idaho that is east of Interstate Highway 15 and north of U.S. Highway 30; that portion of Montana that is east of Interstate Highway 15 and south of Interstate Highway 90; and that portion of Wyoming south of Interstate Highway 90, west of Interstate Highway 25, Wyoming State Highway 220, and U.S. Highway 287 south of Three Forks (at the 220 and 287 intersection), and north of Interstate Highway 80 and U.S. Highway 30 (see Figure 2 below). Due to the use of highways as easily described boundaries, large areas of unsuitable habitat were included in the DPS boundaries.

The core of the GYA grizzly bear DPS is the Yellowstone Recovery Zone (24,000 sq km (9,200 sq mi)) (U.S. Fish and Wildlife Service 1993, p. 39). The Yellowstone Recovery Zone includes Yellowstone National Park; a portion of Grand Teton National Park; John D. Rockefeller Memorial Parkway; sizable contiguous portions of the Shoshone, Bridger-Teton, Targhee, ~~Custer~~-Gallatin, ~~and~~ Beaverhead-Deerlodge, ~~and Custer~~ National Forests; BLM lands; and surrounding State and private lands (U.S. Fish and Wildlife Service 1993, p. 39). As grizzly bear populations have rebounded and densities have increased, bears have expanded their

range beyond the Recovery Zone, into other Suitable Habitat. Grizzly bears in this area now occupy about 50,280 sq km (19,413 sq mi) in and around the Yellowstone Recovery Zone (Bjornlie *et al.* ~~2013~~2014, p. 184). No grizzly bears originating from the Yellowstone Recovery Zone have been suspected or confirmed beyond the borders of the Yellowstone DPS described above. Similarly, no grizzly bears originating from other Recovery Zones have been detected inside the borders of the Yellowstone DPS.

Comment [FTvM41]:

MAH: Could add “with occasional occurrences well beyond the estimate of occupied range.

Comment [FTvM42]:

MAH: We recently received the 2013 results from WGI which indicated that thru 2013 and over 850 genotyped bears, there is no evidence of recent immigration into the GYE from other extant populations. Could probably cite that official letter if you wanted to.

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing species, reclassifying species, or removing species from listed status. “Species” is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We must consider these same five factors in delisting a species. We may delist a species according to 50 CFR 424.11(d) if the best available scientific and commercial data indicate that the species is neither endangered nor threatened for the following reasons: (1) the species is extinct; (2) the species has recovered and is no

longer endangered or threatened (as is the case with the GYA grizzly bear DPS); and/or
(3) the original scientific data used at the time the species was classified were in error.

A recovered species is one that no longer meets the Act's definition of threatened or endangered. A species is "endangered" for purposes of the Act if it is in danger of extinction throughout all or a "significant portion of its range" and is "threatened" if it is likely to become endangered within the foreseeable future throughout all or a "significant portion of its range." Determining whether a species is recovered requires consideration of the same five categories of threats specified in section 4(a)(1) of the Act. For species that are already listed as threatened or endangered, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the removal of the Act's protections.

In considering what factors might constitute threats, we must look beyond the exposure of the species to a particular factor to evaluate whether the species may respond to the factor in a way that causes actual impacts to the species. If there is exposure to a factor and the species responds negatively, the factor may be a threat, and during the five-factor threats analysis, we attempt to determine how significant a threat it is. The threat is significant if it drives or contributes to the risk of extinction of the species such that the species warrants listing as endangered or threatened as those terms are defined by the Act. However, the identification of factors that could affect a species negatively may not be sufficient to justify a finding that the species warrants listing. The information must include evidence sufficient to suggest that the potential threat is likely to materialize and

that it has the capacity (i.e., it should be of sufficient magnitude and extent) to affect the species' status such that it meets the definition of endangered or threatened under the Act.

The following analysis examines the five factors affecting, or likely to affect, the GYA grizzly bear DPS within the foreseeable future. We previously concluded GYA grizzly bears are recovered and warranted delisting (72 FR 14866, March 29, 2007). In this proposed rule, we focus on updating and supplementing our previous Final Rule Removing the Yellowstone Distinct Population of Grizzly Bears From the Federal List of Endangered and Threatened Wildlife (hereafter referred to as "the 2007 Delisting Rule") (72 FR 14866, March 29, 2007) in response to new biological information and Court direction.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.

Habitat destruction and modification were contributing factors leading to the listing of the grizzly bear as a threatened species under the Act in 1975 (40 FR 31734–31736, July 28, 1975). Both the dramatic decreases in historical range and land management practices in formerly secure grizzly bear habitat lead to the 1975 listing (40 FR 31734–31736, July 28, 1975). To address this source of population decline, the Study Team was created in 1973 to collect, manage, analyze, and distribute science-based information regarding habitat and demographic parameters upon which to base management and recovery. Then, in 1983, the Interagency Grizzly Bear Committee was created to coordinate management efforts across multiple Federal lands and different

States within the various Recovery Zones ultimately working to achieve recovery of the grizzly bear in the lower 48 States. Its objective was to change land management practices on Federal lands that supported grizzly bear populations at the time of listing to provide security and maintain or improve habitat conditions for the grizzly bear. Since 1986, National Forest and National Park plans have incorporated the Guidelines (USDA Forest Service 1986, pp. 1–2) to manage grizzly bear habitat in the Yellowstone Recovery Zone.

Management improvements made as a result of the Guidelines include, but are not limited to: (1) Federal and State agency coordination to produce nuisance bear guidelines that allow a quick response to resolve and minimize grizzly bear/human confrontations; (2) reduced motorized access route densities through restrictions, decommissioning, and closures; (3) highway design considerations to facilitate population connectivity; (4) ~~seasonal~~ closure of some ~~important~~ habitat areas to all human access in National Parks ~~during certain seasons~~ that are particularly important to grizzlies; (5) closure of many areas in the GYA to oil and gas leasing, or implementing restrictions such as no surface occupancy; (6) elimination of two sheep allotments on the Caribou-Targhee National Forest in 1998, resulting in a 46 percent decrease in total sheep animal months inside the Yellowstone Recovery Zone; and (7) expanded ~~information~~ Information and ~~e~~Education (I & E) programs in the Yellowstone Recovery Zone to help reduce the number of grizzly mortalities caused by big-game hunters. Overall, adherence to the Guidelines has changed land management practices on Federal lands to provide security and to maintain or improve habitat conditions for the grizzly bear. Implementation of

these Guidelines has led to the successful rebound of the GYA grizzly bear population, allowing it to significantly increase in size and distribution since its listing in 1975.

In 2003, an interagency group representing pertinent State and Federal parties released the draft Final Conservation Strategy for the Grizzly Bear in the GYA to guide management and monitoring of the habitat and population of GYA grizzly bears after delisting. The Strategy identifies and provides a framework for managing two areas, the PCA and adjacent areas of Suitable Habitat where occupancy by grizzly bears is anticipated in the foreseeable future. What follows is an assessment of present or threatened destruction, modification, or curtailment of the grizzly bear's habitat and range. More specifically, this analysis evaluates all areas capable of supporting grizzly bears including the PCA and all Suitable Habitat within the DPS boundaries. These terms and areas are defined below.

Suitable Habitat

Because we used easily recognized boundaries to delineate the Yellowstone DPS, the DPS includes both suitable and unsuitable habitat (see Figure 2 above). For the purposes of this final rule, Suitable Habitat is considered the area within the DPS boundaries capable of supporting grizzly bear reproduction and survival now or in the foreseeable future. We have defined Suitable Habitat for grizzly bears as areas having three characteristics: (1) being of adequate habitat quality and quantity to support grizzly bear reproduction and survival; (2) contiguous with the current distribution of GYA

grizzly bears such that natural re-colonization is possible; and (3) having low mortality risk as indicated through reasonable and manageable levels of grizzly bear mortality.

Our definition and delineation of Suitable Habitat is built on the widely accepted conclusions of extensive research (Craighead 1980, pp. 8–11; Knight 1980, pp. 1–3; Peek *et al.* 1987, pp. 160–161; Merrill *et al.* 1999, pp. 233–235; Schwartz *et al.* 2010, p. 661) that grizzly bear reproduction and survival is a function of both the biological needs of grizzly bears and remoteness from human activities, which minimizes mortality risk for grizzly bears. Mountainous areas provide hiding cover, the topographic variation necessary to ensure a wide variety of seasonal foods, and the steep slopes used for denning (Judd *et al.* 1986, pp. 114–115; Aune and Kasworm 1989, pp. 29–58; Linnell *et al.* 2000, pp. 403–405). Higher elevation, mountainous regions in the GYA (Omernik 1987, pp. 118–125; Omernik 1995, pp. 49–62; Woods *et al.* 1999; McGrath *et al.* 2002; Chapman *et al.* 2004) contain high-energy foods such as whitebark pine seeds (Mattson and Jonkel 1990, p. 223; Mattson *et al.* 1991a, p. 1623) and army cutworm moths (Mattson *et al.* 1991b, 2434; French *et al.* 1994, p. 391).

For our analysis of Suitable Habitat, we considered the Middle Rockies ecoregion, within which the Greater Yellowstone Area is contained (Omernik 1987, pp. 120–121; Woods *et al.* 1999; McGrath *et al.* 2002; Chapman *et al.* 2004) to meet grizzly bear biological needs providing food, seasonal foraging opportunities, cover, and denning areas (Mattson and Merrill 2002, p. 1125). Forests can be open. Foothills are partly wooded or shrub- and grass-covered. Intermontane valleys are grass- and/or shrub-

Comment [FTvM43]: Needs more context.

covered and contain a mosaic of terrestrial and aquatic fauna that is distinct from the nearby mountains. Many mountain-fed, perennial streams occur and differentiate the intermontane valleys from the Northwestern Great Plains. Recreation, logging, mining, and summer livestock grazing are common land uses in this ecoregion.

Although grizzly bears historically occurred throughout the area of the Yellowstone DPS (Stebler 1972, pp. 297–298), many of these habitats are not, today, biologically suitable for grizzly bears. While there are records of grizzly bears in eastern Wyoming near present-day Sheridan, Casper, and Wheatland, even in the early 19th century, indirect evidence suggests that grizzly bears were less common in these eastern prairie habitats than in mountainous areas to the west (Rollins 1935, p. 191; Wade 1947, p. 444). Grizzly bear presence in these drier, grassland habitats was associated with rivers and streams where grizzlies used bison carcasses as a major food source (Burroughs 1961, pp. 57–60; Herrero 1972, pp. 224–227; Stebler 1972, pp. 297–298; Mattson and Merrill 2002, pp. 1128–1129). Because wild bison herds no longer exist in these areas, they are no longer capable of contributing in a meaningful way to the overall status of the Yellowstone DPS. Thus, we did not include drier sagebrush, prairie, or agricultural lands within our definition of Suitable Habitat because these land types no longer contain adequate food resources (i.e., bison) to support grizzly bears. Figure 2 above illustrates Suitable Habitat within the Yellowstone DPS.

Human-caused mortality risk also can impact which habitat might be considered suitable. Some human-caused mortality is unavoidable in a dynamic system where

hundreds of bears inhabit large areas of diverse habitat with several million human visitors and residents. The negative impacts of humans on grizzly bear survival and habitat use are well documented (Harding and Nagy 1980, p. 278; McLellan and Shackleton 1988, pp. 458–459; Aune and Kasworm 1989, pp. 83–103; McLellan 1989, pp. 1862–1864; McLellan and Shackleton 1989, pp. 377–378; Mattson 1990, pp. 41–44; Mattson and Knight 1991, pp. 9–11; Mace *et al.* 1996, p. 1403; McLellan *et al.* 1999, pp. 914–916; White *et al.* 1999, p. 150; Woodroffe 2000, pp. 166–168; Boyce *et al.* 2001, p. 34; Johnson *et al.* 2004, p. 976; Schwartz *et al.* 2010, p. 661). These effects range from temporary displacement to actual mortality. Grizzly bear persistence in the contiguous United States between 1920 and 2000 was negatively associated with human and livestock densities (Mattson and Merrill 2002, pp. 1129–1134). As human population densities increase, the frequency of encounters between humans and grizzly bears also increases, resulting in more human-caused grizzly bear mortalities due to a perceived or real threat to human life or property (Mattson *et al.* 1996, pp. 1014–1015). Similarly, as livestock densities increase in habitat occupied by grizzly bears, depredations follow. Although grizzly bears frequently coexist with cattle without depredating them, when grizzly bears encounter domestic sheep, they usually are attracted to such flocks and depredate the sheep (Jonkel 1980, p. 12; Knight and Judd 1983, pp. 188–189; Orme and Williams 1986, pp. 199–202; Anderson *et al.* 2002, pp. 252–253). If repeated depredations occur, managers either relocate the bear or remove it from the population, resulting in such domestic sheep areas becoming population sinks (Knight *et al.* 1988, pp. 122–123).

Because urban sites and sheep allotments possess high mortality risks for grizzly bears, we did not include these areas as Suitable Habitat (Knight *et al.* 1988, pp. 122–123). Based on 2000 Census data, we defined urban areas as census blocks with human population densities of more than 129 people per sq mi (50 people per sq km). Cities within the Middle Rockies ecoregion such as West Yellowstone, Gardiner, Big Sky, and Cooke City, Montana, and Jackson, Wyoming, were not included as Suitable Habitat. There are large, contiguous blocks of sheep allotments in peripheral areas of the ecosystem in the Wyoming Mountain Range, the Salt River Mountain Range, and portions of the Wind River Mountain Range on the Bridger-Teton and the Targhee National Forests (see Figure 2 above). This spatial distribution of sheep allotments on the periphery of Suitable Habitat results in areas of high mortality risk to bears within these allotments and a few small, isolated patches or strips of Suitable Habitat adjacent to or within sheep allotments. These strips and patches of land possess higher mortality risks for grizzly bears because of their enclosure by and proximity to areas of high mortality risk. This phenomenon in which the quantity and quality of Suitable Habitat is diminished because of interactions with surrounding less suitable habitat is known as an “edge effect” (Lande 1988, pp. 3–4; Yahner 1988, pp. 335–337; Mills 1995, p. 396). Edge effects are exacerbated in small habitat patches with high perimeter-to-area ratios (i.e., those that are longer and narrower) and in wide-ranging species such as grizzly bears because they are more likely to encounter surrounding, unsuitable habitat (Woodroffe and Ginsberg 1998, p. 2126). Due to the negative edge effects of this distribution of sheep allotments on the periphery of grizzly range, our analysis did not classify linear strips and isolated patches of habitat as Suitable Habitat.

Comment [FTvM44]: Were these defined in any quantitative way?

Finally, dispersal capabilities of grizzly bears were considered in our determination of which potential habitat areas might be considered suitable. Although the Bighorn Mountains west of I-90 near Sheridan, Wyoming, are grouped within the Middle Rockies ecoregion, they are not connected to the current distribution of grizzly bears via Suitable Habitat or linkage zones, nor are there opportunities for such linkage. The Bighorn Mountains are comprised of 2,448 sq mi (6,341 sq km) of habitat that is classified as part of the Middle Rockies ecoregion, but are separated from the current grizzly bear distribution by approximately 60 mi (100 km) of a mosaic of private and BLM lands primarily used for agriculture, livestock grazing, and oil and gas production (Chapman *et al.* 2004). Although there is a possibility that individual bears may emigrate from the GYA to the Bighorns occasionally, this dispersal distance exceeds the average dispersal distance for both males (19 to 26 mi (30 to 42 km)) and females (6 to 9 mi (10 to 14 km)) (McLellan and Hovey 2001, p. 842, Proctor *et al.* 2004, p. 1108). Without constant emigrants from Suitable Habitat, the Bighorns will not support a self-sustaining grizzly bear population. Therefore, due to the fact that this mountain range is disjunct from other Suitable Habitat and current grizzly bear distribution, our analysis did not classify the Bighorns as Suitable Habitat within the Yellowstone DPS boundaries.

Some areas that do not meet our definition of Suitable Habitat may still be used by grizzly bears (1,787 sq mi (4,635 sq km)) (see Figure 1 above) (Schwartz *et al.* 2002, p. 209; Schwartz *et al.* 2006b, pp. 64–66). The records of grizzly bears in these unsuitable habitat areas are generally due to recorded grizzly bear/human conflicts or to

transient animals. These areas are defined as unsuitable due to the high risk of mortality resulting from these grizzly bear/human conflicts. These unsuitable habitat areas do not support grizzly bear reproduction or survival because bears that repeatedly come into conflict with humans or livestock are usually either relocated or removed from these areas.

According to the habitat suitability criteria described above, the GYA contains approximately 17,774 sq mi (46,035 sq km) of suitable grizzly bear habitat within the DPS boundaries; or roughly 24 percent of the total area within the DPS boundaries (see Figure 2 above). This amount of Suitable Habitat is sufficient to meet all habitat needs of a recovered grizzly bear population and provide ecological resiliency to the population through the availability of widely distributed, high-quality habitat that will allow the population to respond to environmental changes. Grizzly bears currently occupy about 84 percent of that Suitable Habitat (12,155 sq mi (31,481 sq km)) (Bjornlie *et al.* 20132014, p. 184; Haroldson 2014, in litt.). It is important to note that the current grizzly bear distribution shown in Figure 2 does not mean that equal densities of grizzly bears are found throughout the region. Instead, most grizzly bears (approximately 75 percent of females with cubs-of-the-year) are within the PCA for most or part of each year (Schwartz *et al.* 2006a, pp. 64–66; Haroldson 2014, in litt.). Grizzly bear use of Suitable Habitat may vary seasonally and annually with different areas being more important than others in some seasons or years (Aune and Kasworm 1989, pp. 48–62). An additional 2,832 sq mi (7,366 sq km) of Suitable Habitat is currently unoccupied by grizzly bears

Comment [FTvM45]: If there is 46,035 sq km Suitable Habitat within the GYA, 84% would be 38,669 sq km; looks like this should be the number. See also below

Comment [FTvM46]: Unclear what Bjornlie *et al.* is referencing here; unless you mention total occupied range (50,280 km²) these estimates are not provided in their article.

Comment [FTvM47]: Maybe state this differently:

“Of all Suitable Habitat, 84% is currently occupied by grizzly bears (.....)”.

Comment [FTvM48]: See above:

7,366 sq km + 31,481 sq km does **not** equal 46,035 sq km

However,

7,366 sq km + 38,669 sq km. **does** equal 46,035 sq km

So 38,669 appears to be the correct number for the 84%.

Same correction needed for the sq mi numbers.....

(see Figure 2 above) (Haroldson 2014, in litt.). We expect natural re-colonization of much, if not all, Suitable Habitat in the next few decades (Pyare *et al.* 2004, pp. 5–6).

Suitable Habitat Management Inside the Primary Conservation Area

As per the Strategy and the habitat-based recovery criteria discussed above, the PCA will be a core secure area for grizzlies where human impacts on habitat conditions will be maintained at or below levels that existed in 1998 (U.S. Fish and Wildlife Service 2007, p. 38). Specifically, the amount of secure habitat will not decrease while the number of developed sites and livestock allotments will not increase above 1998 levels. The 1998 baseline for habitat standards was chosen because the levels of secure habitat and developed sites on public lands remained relatively constant in the 10 years preceding 1998 (USDA Forest Service 2004, pp. 140–141), and the selection of 1998 assured that habitat conditions existed at a time when the population was increasing at a rate of 4 to 7 percent per year (Schwartz *et al.* 2006b, p. 48) would be maintained. For each of the 40 bear management subunits, the 1998 baseline was determined through a GIS analysis of the amount of secure habitat, open and closed road densities, the number and capacity of livestock allotments, and the number of developed sites on public lands.

Motorized Access Management

When we listed the grizzly bear in 1975, we identified land management practices that create new ways for humans to access formerly secure grizzly bear habitat as the

mechanism that resulted in bears being more susceptible to the threat of human-caused mortality and human-bear conflicts (40 FR 31734-31736, July 28, 1975). We recognized early on that managing this human access to grizzly bears would be the key to effective habitat management and an extensive body of literature supports this approach. Specifically, unmanaged motorized access— (1) increases human interaction and potential grizzly bear mortality risk; (2) increases displacement from important habitat; (3) increases habituation to humans; and (4) decreases habitat where energetic requirements can be met with limited disturbance from humans (Mattson et al. 1987, pp. 269–271; McLellan and Shackleton 1988, pp. 458–459; McLellan 1989, pp. 1862–1864; Mace et al. 1996, pp. 1402-1403; Schwartz et al. 2010, p.661).

Motorized access affects grizzly bears primarily through increased mortality risk (Interagency Grizzly Bear Committee 1998; Schwartz *et al.* 2010, p. 661). Managing motorized access by providing large proportions of secure habitat helps ameliorate the impacts of displacement and increased human-caused mortality risk in grizzly bear habitat. Secure habitat refers to those areas with no motorized access that are at least 4 ha (10 ac) in size and more than 500 m (1,650 ft) from a motorized access route or recurring helicopter flight line (USDA Forest Service 2004, pp. 160–161). In the 1998 baseline, secure habitat comprised 45.4 to 100 percent of the total area within a given subunit with an average of 85.6 percent throughout the entire PCA (U.S. Fish and Wildlife Service 2007, pp 133–144, Appendix F). These levels of secure habitat have been successfully maintained and will continue to be maintained or improved, as directed by the Strategy (U.S. Fish and Wildlife Service 2007, p. 135, Table 2 in Appendix F). Because of the

Comment [FTvM49]: Elsewhere, metric is in parentheses. Should be consistent.

positive effect that secure habitat has on grizzly bear survival and reproduction, it is especially important to maintain these levels of secure habitat inside the PCA so it can continue to function as a source area for grizzly bears in the GYA.

Developed Sites

The National Parks and National Forests within the PCA will manage developed sites at 1998 levels within each bear management subunit, with some exceptions for administrative and maintenance needs (U.S. Fish and Wildlife Service 2007, pp. 38–56). “Developed sites” refer to those sites or facilities on public land with features intended to accommodate public use or recreation. Such sites are typically identified or advertised via visitor maps or information displays as identifiable destination sites promoted by the agency. Examples of developed sites include, but are not limited to: campgrounds, picnic areas, trailheads, boat launches, rental cabins, summer homes, lodges, service stations, restaurants, visitor centers, administrative sites, and permitted resource exploration or extraction sites such as oil and gas exploratory wells, production wells, plans of operation for mining activities, and work camps. “Administrative sites” are those sites or facilities constructed for use primarily by government employees to facilitate the administration and management of public lands. Administrative sites are counted toward developed sites and examples include headquarters, ranger stations, patrol cabins, park entrances, federal employee housing and other facilities supporting government operations. In contrast to developed or administrative sites, “Dispersed sites” are those not associated with a developed site such as a front-country campground.

These sites are typically characterized as having no permanent agency-constructed features, are temporary in nature, have minimal to no site modifications, have informal spacing and possibly include primitive road access. Dispersed sites are not counted toward developed sites. Developed sites on public lands are currently inventoried and tracked in GIS databases. As of 1998, there were 592 developed sites on public land within the PCA. As of 2014, the number of developed sites on public lands had decreased to 579 (Landenburger 2014, in litt.).

The primary concern related to developed sites is direct mortality from bear/human encounters and unsecured attractants. Secondary concerns include temporary or permanent habitat loss and displacement due to increased length of time of human use and increased human disturbance to surrounding areas. In areas of Suitable Habitat inside the PCA, the National Park Service and the USDA Forest Service enforce food storage rules aimed at decreasing grizzly bear access to human foods (U.S. Fish and Wildlife Service 2007, pp. 23–24). These regulations will continue to be enforced and are in effect for nearly all currently occupied grizzly bear habitat within the Yellowstone DPS boundaries (U.S. Fish and Wildlife Service 2007, pp. 23–24).

Comment [RS50]: Placeholder: There are still a couple of pockets of suitable habitat that do not contain food storage orders. Specifically, there are small areas at the southern end of Wind Rivers (Shoshone & BT NF's), & northern end of B-T NF (Wyoming Range). We are working to get this changed.

Livestock Allotments

When grizzlies were listed in 1975, the Service 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: (1) direct mortality from control actions resulting from livestock depredation; (2) direct mortality due to control actions resulting from grizzly bear habituation and/or learned use of bear attractants such as livestock carcasses and feed; (3) increasing the chance of a grizzly bear livestock conflict; (4) displacement due to livestock or related management activity; and (5) direct competition for preferred forage species.

Approximately 14 percent (40/292) of all human-caused grizzly bear mortalities in the GYA between 2002 and 2013 were due to management removal actions associated with livestock depredations. This human-caused mortality is the main impact to grizzly bears in the GYA associated with livestock. Increased chances of grizzly bear conflict related to livestock have been minimized through requirements to securely store and/or promptly remove attractants associated with livestock operations (e.g., livestock carcasses, livestock feed, etc.). The effects of displacement and direct competition with livestock for forage are considered negligible to grizzly bear population dynamics because even with direct grizzly bear mortality, current levels of livestock allotments have not precluded grizzly bear population growth and expansion.

The Strategy and Record of Decision established habitat standards regarding livestock allotments. The number of active livestock allotments, total acres affected, and permitted sheep animal months within the PCA shall not increase above 1998 levels (U.S. Fish and Wildlife Service 2007, p. 43; USDA Forest Service 2006b, p. 5). Due to the higher prevalence of grizzly bear conflicts associated with sheep grazing, existing

Comment [RS51]: Placeholder: Should cite revised CS page number since acres is being added as clarification.

sheep allotments will be phased out as the opportunity arises with willing permittees (USDA Forest Service 2006b, p. 6; U.S. Fish and Wildlife Service 2007, p. 43).

A total of 101 livestock allotments existed inside the PCA in 1998. Of these allotments, there were: 71 active and 12 vacant cattle allotments; and 11 active and 7 vacant sheep allotments with a total of 23,090 animal months (Conservation Strategy Team 2014, Appendix X, p.). Sheep animal months are calculated by multiplying the permitted number of animals by the permitted number of months. Any use of vacant allotments will only be permitted after an analysis is completed to evaluate impacts on grizzly bears. Since 1998, the Caribou-Targhee National Forest has closed five sheep allotments within the PCA while the Shoshone National Forest has closed two sheep allotments (USDA Forest Service 2005, p. 50). This has resulted in a reduction of 7,889 sheep animal months under the total calculated for 1998 within the PCA, and is a testament to the commitment land management agencies have to the ongoing success of the grizzly bear population in the GYA. As of 2006, there are a total of two active sheep allotments within the PCA, both on the Targhee National Forest. The permittee of the two allotments on the Gallatin National Forest that were active in 2005 when the Proposed rule was published, agreed to waive the grazing permit back to the Gallatin National Forest without preference and these two sheep allotments were closed in 2006. The Gallatin National Forest plans to close three other vacant allotments when they revise their current Forest Plan. This Forest Plan revision process is scheduled to be completed by 2010 (USDA Forest Service 2005, p. 11). The mandatory restriction on creating new livestock allotments and the voluntary phasing out of livestock allotments

with recurring conflicts further ensure that the PCA will continue to function as source habitat.

Comment [RS52]: Lisa L. will update this entire paragraph by early october

Other Potential Stressors to Grizzly Bear Habitat

Mineral and Energy Development—Management of oil, gas, and mining are tracked as part of the developed site standard (U.S. Fish and Wildlife Service 2007, p. 44). There were no active oil and gas leases inside the PCA as of 1998 (USDA Forest Service 2006a, p. 209). Based on Forest Plan direction, there are approximately 94 sq mi (243 sq km) of secure habitat that could allow surface occupancy for oil and gas projects within the PCA (USDA Forest Service 2006a, Figures 48, 96). This comprises less than 4 percent of all Suitable Habitat within the PCA. Additionally, 1,354 mining claims existed in 10 of the subunits inside the PCA (U.S. Fish and Wildlife Service 2007, p.134, Appendix F), but only 27 of these mining claims had operating plans. These operating plans are included in the 1998 developed site baseline. Under the conditions of the Strategy, any new project will be approved only if it conforms to secure habitat and developed site standards (U.S. Fish and Wildlife Service 2007, pp. 44–45). For instance, any project that reduces the amount of secure habitat permanently will have to provide replacement secure habitat of similar habitat quality (based on our scientific understanding of grizzly bear habitat) and any change in developed sites will require mitigation equivalent to the type and extent of the impact, and such mitigation must be in place before project initiation or be provided concurrently with project development as an integral part of the project plan (U.S. Fish and Wildlife Service 2007, p. 40–41). For

projects that temporarily change the amount of secure habitat, only one project is allowed in any subunit at any time (U.S. Fish and Wildlife Service 2007, pp. 40–41). Mitigation of any project will occur within the same subunit and will be proportional to the type and extent of the project (U.S. Fish and Wildlife Service 2007, p. 40–41).

Recreation—At least 3 million people visit and recreate in the National Parks and National Forests of the GYA annually (USDA Forest Service 2006a, pp. 176, 184; Cain 2014, p. 46; Gunther 2014, p. 47). Based on past trends, visitation and recreation are expected to increase in the future. For instance, Yellowstone National Park has shown an approximate 15 percent annual increase in the number of people visiting each decade since the 1930s (USDA Forest Service 2006a, p. 183); however, the number of people recreating in the backcountry there has remained relatively constant from the 1970s through 2010s (Gunther 2014, p. 47). The concern related to increased recreation is that it ~~will may~~ increase the ~~chances-probability~~ of ~~grizzly encountering a bear/human encounters~~, with subsequent increases in human-caused mortality (Mattson et al. 1996, p. 1014).

Comment [FTvM53]: Delete; 15% is per decade...

Recreation in the GYA can be divided into 6 basic categories based on season of use (winter or all other seasons), mode of access (motorized or non-motorized), and level of development (developed or dispersed) (USDA Forest Service 2006a, p. 187). Inside the PCA, the vast majority of lands available for recreation are accessible through non-motorized travel only (USDA Forest Service 2006a, p. 179). Motorized recreation during the summer, spring, and fall inside the PCA will be limited to existing roads as per the

standards in the Strategy that restrict increases in roads or motorized trails. Similarly, recreation at developed sites such as lodges, downhill ski areas, and campgrounds will be limited by the developed sites habitat standard described in the Strategy. The number and capacity of existing developed sites on public lands will not increase once delisting occurs. For a more complete discussion of projected increases in recreation in the GYA National Forests, see the Final Environmental Impact Statement for the Forest Plan Amendment for Grizzly Bear Habitat Conservation for the GYA National Forests (USDA Forest Service 2006a, pp. 176–189).

This potential stressor on the GYA grizzly bear population would exist regardless of listed status and will be addressed in the same way whether this population is listed or delisted: through ongoing information and education (I & E) campaigns. These outreach efforts are an important contributing factor to successful grizzly bear conservation and would continue under the Strategy.

Snowmobiling—Snowmobiling has the potential to disturb bears while in their dens and after emergence from their dens in the spring. Because grizzly bears are easily awakened in the den (Schwartz *et al.* 2003b, p. 567) and have been documented abandoning den sites after seismic disturbance (Reynolds *et al.* 1986, p. 174), the potential impact from snowmobiling should be considered. We found no studies in the peer-reviewed literature documenting the effects of snowmobile use on any denning bear species and the information that is available is anecdotal in nature (U.S. Fish and Wildlife Service 2002, entire; Hegg *et al.* 2010, entire).

Disturbance in the den could result in energetic costs (increased activity and heart rate inside the den) and possibly den abandonment which, in theory, could ultimately lead to a decline in physical condition of the individual or even cub mortality (Swenson *et al.* 1997, p. 37; Graves and Reams 2001, p. 41). Although the potential for this type of disturbance while in the den certainly exists, Reynolds *et al.* (1986, p. 174) found that grizzly bears denning within 1.4-1.6 km (0.9-1.0 mi) of active seismic exploration and detonations moved around inside their dens but did not leave them. Harding and Nagy (1980, p. 278) documented two instances of den abandonment during fossil fuel extraction operations. One bear abandoned its den when a seismic vehicle drove directly over the den (Harding and Nagy 1980, p. 278). The other bear abandoned its den when a gravel mining operation literally destroyed the den (Harding and Nagy 1980, p. 278). Reynolds *et al.* (1986, entire) also examined the effects of tracked vehicles and tractors pulling sledges. In 1978, there was a route for tractors and tracked vehicles within 100 meters (m) (328 feet (ft)) of a den inhabited by a female with three yearlings. This family group did not abandon their den at any point (Reynolds *et al.* 1986, p. 174). Reynolds *et al.* (1986, p. 174) documented one instance of possible den abandonment due to detonations for seismic testing within 200 m of a den (Reynolds *et al.* 1986, p. 174). This bear was not marked but an empty den was reported by seismic crews.

Swenson *et al.* (1997, entire) monitored 13 different grizzly bears for at least 5 winters each and documented 18 instances of den abandonment, 12 of which were related to human activities. Although many of these instances ($n = 4$) were hunting

related (i.e., gunshots fired within 100 m (328 ft) of the den), two occurred after “forestry activity at the den site,” one had moose and dog tracks within 10 m of a den, one had dog tracks at the den site, one had ski tracks within 80–90 m (262–295 ft) from a den, one had an excavation machine working within 75 m (246 ft) of a den, and two were categorized as “human related” without further details (Swenson *et al.* 1997⁷). Swenson *et al.* (1997) found that 72% (13 of 18) of dens were abandoned between November and early January, before pregnant females give birth. After abandoning a den, bears moved an average of 5.1 km (3.2 mi) before establishing another den site, although 56% of bears moved ≤ 2 km (1.2 mi) (Swenson *et al.* 1997). Despite these relatively short distances, Swenson *et al.* (1997) found that 60% ($n = 5$) of female bears that abandoned a den site before giving birth (i.e., in November or December) lost at least one cub in or near their new den site whereas only 6% ($n = 36$) of pregnant females that did not abandon their dens during the season lost a cub in or near their den. In summary, the available data about the potential for disturbance while denning and den abandonment from nearby snowmobile use is extrapolated from studies examining the impacts of other human activities and is identified as “anecdotal” in nature (Swenson *et al.* 1997, p. 37) with sample sizes so small they cannot be legitimately applied to assess population-level impacts (Harding and Nagy 1980, Reynolds *et al.* 1986; Hegg *et al.* 2010). The one documented observation of snowmobile use at a known den site in the lower 48 States found the bear did not abandon its den, even though snowmobiles were operating directly on top of it (Hegg *et al.* 2010, p. 26). Again though, this is only an anecdotal observation because it is based on a sample size of one. We found no records of litter abandonment by grizzlies in the lower 48 States due to snowmobiling activity. Additionally, monitoring of den

occupancy for three years on the Gallatin National Forest in Montana did not document any den abandonment (Gallatin National Forest 2006, entire).

We have no data or information suggesting snowmobile use in the GYA is affecting the survival or recovery of the grizzly bear population, or even individual bears. Yet, because the potential for disturbance exists, monitoring will continue to support adaptive management decisions about snowmobile use in areas where disturbance is documented or likely to occur.

Vegetation Management—Vegetation management occurs throughout the GYA on lands managed by the US Forest Service and National Park Service. Vegetation management projects typically include timber harvest, thinning, prescribed fire, and salvage of burned, diseased, or insect-infested stands. If not implemented properly, vegetation management programs can negatively affect grizzly bears by (1) removing hiding cover; (2) disturbing or displacing bears from habitat during the logging period; (3) increasing ~~grizzly bear/human human/grizzly bear~~ conflicts or mortalities as a result of unsecured attractants; and (4) increasing mortality risk or displacement due to new roads into previously roadless areas and/or increased vehicular use on existing restricted roads, especially if roads remain open to the public after vegetation management is complete.

Conversely, vegetation management may result in positive effects on grizzly bear habitat once the project is complete, provided key habitats such as riparian areas and

known food production areas are maintained or enhanced. For instance, tree removal for thinning or timber harvest and prescribed burning can result in localized increases in bear foods through increased growth of grasses, forbs, and berry-producing shrubs (Zager et al. 1983, p. 124; Kerns et al. 2004, p. 675). Vegetation management may also benefit grizzly bear habitat by controlling undesirable invasive species, improving riparian management, and limiting livestock grazing in important food production areas.

Changes in the distribution, quantity, and quality of cover are not necessarily detrimental to grizzly bears as long as they are coordinated on a grizzly BMU or subunit scale to ensure that grizzly bear needs are addressed throughout the various projects occurring on multiple jurisdictions at any given time. Although there are known, usually temporary, impacts to individual bears from timber management activities, these impacts have been managed acceptably using the IGBC Guidelines in place since 1986.

Climate Change—Climate change may result in a number of changes to grizzly bear habitat, including a reduction in snowpack levels, shifts in denning times, shifts in the abundance and distribution of some natural food sources, and changes in fire regimes. 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, p. 4). 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, p.

4) and are discussed under Factor E – Other Natural or Manmade Factors Affecting Its Continued Existence.

Habitat Fragmentation—The GYA grizzly bear population is currently a contiguous population across its range and there are no data to indicate habitat fragmentation within this population is occurring. To prevent habitat fragmentation and degradation, all road construction projects in Suitable Habitat on Federal lands throughout the entire GYA (both inside and outside of the PCA) will evaluate the impacts of the project on grizzly habitat connectivity through an open and public planning process (U.S. Fish and Wildlife Service 2007, pp. 38–39). By identifying areas used by grizzly bears, officials can mitigate potential impacts from road construction both during and after a project. Federal agencies will identify important crossing areas by collecting information about known bear crossings, bear sightings, ungulate road mortality data, bear home range analyses, and locations of game trails. Potential advantages of this requirement include reduction of grizzly bear mortality due to vehicle collisions, access to seasonal habitats, maintenance of traditional dispersal routes, and decreased fragmentation of individual home ranges. For example, work crews will place temporary work camps in areas with lower risk of displacing grizzly bears, and food and garbage will be kept in bear-resistant containers. Highway planners will incorporate warning signs and crossing structures such as culverts or underpasses into projects when possible to facilitate safe highway crossings by wildlife. Additionally, the conflict prevention, response, and outreach elements of the Strategy play an important role in preventing

habitat fragmentation by keeping valleys that are predominately privately owned permeable to grizzly bears.

Suitable Habitat Management Outside the Primary Conservation Area

In Suitable Habitat outside of the PCA within the DPS, the USDA Forest Service, BLM, and State wildlife agencies will monitor habitat and population criteria to prevent potential threats to habitat, ensuring that the measures of the Act continue to be unnecessary (Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002, pp. 2–3; MTFWP 2002, p. 2; WGFD 2005, p. 1; USDA Forest Service 2006a, pp. 44–45; U.S. Fish and Wildlife Service 2007, p. 5). Factors impacting Suitable Habitat outside of the PCA in the future are similar to those inside the PCA and may include projects that involve road construction, livestock allotments, developed sites, and increased human-caused grizzly bear mortality risk.

Of the 8,797 sq mi (22,783 sq km or 5.6 million acres) of Suitable Habitat outside of the PCA within the DPS boundaries, the USFS manages 6,676 sq mi (17,292 sq km) or 76 percent. Of the 76 percent of Suitable Habitat outside of the PCA that the USFS manages, nearly 80 percent (5,284 sq mi or 13,685 sq km) is Designated Wilderness Area (2,625 sq mi (6,799 sq km)), Wilderness Study Area (273 sq mi (708 sq km)), or Inventoried Roadless Area (2,386 sq mi (6,179 sq km)). These designations provide regulatory mechanisms outside of the Act and the Conservation Strategy that protect grizzly habitat from increases in motorized use, oil and gas development, livestock

allotments, and timber harvest. This large area of widely distributed habitat allows for continued population expansion and provides additional resiliency to environmental change.

Wilderness areas outside of the PCA are protected from new road construction, livestock allotments, developed sites, and mining claims by the Wilderness Act of 1964 (Pub. L. 88-577). If pre-existing mining claims are pursued, the plans of operation are subject to Wilderness Act restrictions on road construction, permanent human habitation, and developed sites.

Wilderness study areas are designated by Federal land management agencies (e.g., USDA Forest Service) as those having wilderness characteristics and being worthy of congressional designation as a wilderness area. Individual National Forests that designate wilderness study areas manage these areas to maintain their wilderness characteristics until Congress decides whether to designate them as permanent wilderness areas. This means that individual wilderness study areas are protected from new road construction by Forest Plans and activities such as timber harvest, mining, and oil and gas development are much less likely to occur because the road networks required for these activities do not presently exist and are not likely to be approved in the future.

Inventoried Roadless Areas currently provide 1,888 sq mi (4,891 sq km) of secure habitat for grizzly bears outside of the PCA within the DPS boundaries. This amount of secure habitat is less than the total area contained within Inventoried Roadless Areas

(2,386 sq mi (6,179 sq km)) because some motorized use is allowed due to roads that existed before the area was designated roadless being grandfathered in or other motorized use on trails being allowed. The 2001 Roadless Areas Conservation Rule (hereafter referred to as the “Roadless Rule”) prohibits new road construction, road re-construction, and timber harvest in Inventoried Roadless Areas (66 FR 3244–3273, January 12, 2001). This restriction on road building makes mining activities and oil and gas production much less likely because access to these resources becomes cost-prohibitive or impossible without new roads. Potential changes in the management of these areas are not anticipated because the Roadless Rule was upheld by the Tenth Circuit Court of Appeals in 2011. *Wyoming v. USDA*, 661 F.3d 1209 (10th Cir. 2011).

Based on the amount of Wilderness, Wilderness Study Area, and Inventoried Roadless Area, an estimated 71 percent (4,786 of 6,676 sq mi) of Suitable Habitat outside the PCA on USDA Forest Service lands within the DPS is currently secure habitat and is likely to remain secure habitat. Because grizzly bears will remain on the USDA Forest Service Sensitive Species list after delisting (USDA Forest Service 2006b, p. 26), any increases in roads on National Forests would have to comply with the National Forest Management Act and would be subject to the National Environmental Policy Act (NEPA) process considering potential impacts to grizzly bears. This management designation—“sensitive species” under the 1982 Forest Service Planning Regulations or “species of conservation concern” under the 2012 Forest Service Planning Regulations— ensures that components of land management plans will provide

appropriate ecological conditions (i.e., habitats) necessary to continue to provide for a recovered population. (USDA Forest Service 2006b, p. 26).

Both Federal and State agencies are committed to managing habitat so that the GYA grizzly bear DPS is not likely to become endangered in all or a significant portion of its range in the foreseeable future (U.S. Fish and Wildlife Service 2007, pp. 12–85; Idaho’s Yellowstone Grizzly Bear Delisting Advisory Team 2002, pp. 2–3; MTFWP 2002, p. 2; WGFD 2005, p. 1) (see Factor D below). In Suitable Habitat outside of the PCA, restrictions on human activities are more flexible but still the USDA Forest Service, BLM, and State wildlife agencies will carefully manage these lands, monitor bear/human conflicts in these areas, and respond with management as necessary to reduce such conflicts to account for the complex needs of both grizzly bears and humans (U.S. Fish and Wildlife Service 2007, p. 58; Idaho’s Yellowstone Grizzly Bear Delisting Advisory Team 2002, pp. 16–17; MTFWP 2002, pp. 55–56; WGFD 2005, pp. 25–26; USDA Forest Service 2006b, pp. A1–A27).

By and large, habitat management on public lands is directed by Federal land management plans, not State management plans. However, the three State grizzly bear management plans recognize the importance of areas that provide security for grizzly bears in Suitable Habitat outside of the PCA within the DPS boundaries on Federal lands. For example, the Montana and Wyoming plans recommend limiting average road densities to 1.6 km/2.6 sq km (1 mi/sq mi) or less in these areas (MTFWP 2002, pp. 32–34; WGFD 2005, pp. 22–25). Both States have similar standards for elk habitat on State

lands and note that these levels of motorized access benefit a variety of wildlife species while maintaining reasonable public access. Similarly, the Idaho State plan recognizes that management of motorized access outside the PCA should focus on areas that have road densities of 1.6 km/2.6 sq km (1 mi/sq mi) or less. The area most likely to be occupied by grizzly bears outside the PCA in Idaho is on the Caribou-Targhee National Forest. The 1997 Targhee Forest Plan includes motorized access standards and management prescriptions outside the PCA that provide for long-term security in 59 percent of existing secure habitat outside of the PCA (USDA Forest Service 2006a, pp. 78, 109).

In 2004, there were roughly 150 active cattle allotments and 12 active sheep allotments in Suitable Habitat outside the PCA within the DPS boundaries (USDA Forest Service 2004, p. 129). The Targhee Forest closed two of these sheep allotments in 2004 and there have not been any new allotments created since then (USDA Forest Service 2006a, p. 168; Landenburger 2014, in litt.). The Forest Service is committed to working with willing permittees to retire allotments with recurring conflicts that cannot be resolved by modifying grazing practices (USDA Forest Service 2006b, p. 6). Although conflicts with livestock have the potential to result in mortality for grizzly bears, the Strategy's mortality limits will preclude population level impacts. The Strategy directs the Study Team to monitor and spatially map all grizzly bear mortalities (both inside and outside the PCA), causes of death, the source of the problem, and alter management to maintain a recovered population and prevent the need to relist the population under the Act (U.S. Fish and Wildlife Service 2007, pp. 31–34).

There are over 500 developed sites on the 6 National Forests in the areas identified as Suitable Habitat outside the PCA within the DPS boundaries (USDA Forest Service 2004, p. 138). While grizzly bear/human conflicts at developed sites on public lands do occur, the most frequent reason for management removals are conflicts on private lands (Servheen *et al.* 2004, p. 21). Existing USDA Forest Service food storage regulations for these areas will continue to minimize the potential for grizzly bear/human conflicts through food storage requirements, outreach, and education. The number and capacity of developed sites will be subject to management direction established in Forest Plans. Should the Study Team determine developed sites on public lands are related to increases in mortality beyond the sustainable limits discussed above, managers may choose to they may recommend closing specific developed sites or otherwise altering management in the area in order to maintain a recovered population and prevent the need to relist the population under the Act. Due to the USDA Forest Service's commitment to manage National Forest lands in the GYA such that a viable grizzly bear population is maintained (U.S. Fish and Wildlife Service 2007, pp. 42–43; USDA Forest Service 2006b, pp. iii, A–6), we do not expect livestock allotments or developed sites in Suitable Habitat outside of the PCA to reach densities that are likely to be a substantial threat to the GYA grizzly bear population in the foreseeable future.

Comment [FTvM54]: five

According to current Forest Plan direction, less than 19 percent (3,213 sq km (1,240 sq mi)) of Suitable Habitat outside the PCA within the DPS boundaries on USDA Forest Service land allows surface occupancy for oil and gas development and 11 percent

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(1,926 sq km (744 sq mi)) has both suitable timber and a management prescription that allows scheduled timber harvest. The primary impacts to grizzly bears associated with timber harvest and oil and gas development are increases in road densities, with subsequent increases in human access, grizzly bear/human encounters, and human-caused grizzly bear mortalities (McLellan and Shackleton 1988, pp. 458–459; McLellan and Shackleton 1989, pp. 377–379; Mace *et al.* 1996, pp. 1402–1403). Although seismic exploration associated with oil and gas development or mining may disturb denning grizzly bears (Harding and Nagy 1980, p. 278; Reynolds *et al.* 1986, pp. 174–175), actual den abandonment is rarely observed, and there has been no documentation of such abandonment by grizzly bears in the GYA. Additionally, only a small portion of this total land area will contain active projects at any given time, if at all. For example, among the roughly 744 sq mi (1,926 sq km) identified as having both suitable timber and a management prescription that allows timber harvest, from 2000 to 2002, an average of only 2 sq mi (5 sq km) was actually logged annually (USDA Forest Service 2004, p. 118). Similarly, although nearly 1,240 sq mi (3,213 sq km) of Suitable Habitat on National Forest lands inside the DPS boundaries allow surface occupancy for oil and gas development, there currently are no active wells inside these areas (USDA Forest Service 2004, pp. 170–171).

Comment [RS55]: Placeholder: need to make sure this is still correct

Ultimately, the ~~six~~ affected National Forests (the Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer-Gallatin, and Shoshone) will manage the number of roads, livestock allotments, developed sites, timber harvest projects, and oil and gas wells outside of the PCA in Suitable Habitat to allow for a viable grizzly bear

Comment [FTvM56]: five

population. Because the grizzly bear will be classified as a “species of conservation concern”—or the equivalent management designation—if this proposal is finalized, components of land management plans and individual projects must provide appropriate ecological conditions and habitats necessary to continue to provide for a recovered population (USDA Forest Service 2006b, p. 26). The USFS will consider all potential impacts of projects to the GYA grizzly bear population in the NEPA planning process and then ensure that activities will provide appropriate habitat to maintain the population’s recovered status (National Forest Management Act of 1976).

Rapidly accelerating growth of human populations in some areas outside of the PCA continues to define the limits of grizzly bear range, and will likely limit the expansion of the GYA grizzly bear population onto private lands in some areas outside the PCA. Urban and rural sprawl (low-density housing and associated businesses) has resulted in increasing numbers of grizzly bear/human conflicts with subsequent increases in grizzly bear mortality rates. Private lands account for a disproportionate number of bear deaths and conflicts (see Figures 15 and 16 in the Strategy). Nearly 9 percent of all Suitable Habitat outside of the PCA is privately owned. As private lands are developed and as secure habitat on private lands declines, State and Federal agencies will work together to balance impacts from private land development (U.S. Fish and Wildlife Service 2007, p. 54). Outside the PCA, State agencies will assist non-government organizations and other entities to identify and prioritize potential lands suitable for permanent conservation through easements and other means as possible (U.S. Fish and Wildlife Service 2007, p. 54). Due to the large areas of widely distributed Suitable

Comment [RS57]: Placeholder

Habitat on public lands that are protected by Federal legislation and managed by agencies committed to the maintenance of a recovered grizzly bear population, human population growth on private lands is not likely to endanger the GYA grizzly bear population in the foreseeable future.

Summary of Factor A

In summary, the primary factors related to past habitat destruction and modification have been reduced through changes in management practices that will be formally incorporated into regulatory documents. Within Suitable Habitat, differential levels of management and protection are applied to areas based on their level of importance. Within the PCA, the portion of the range, where 75 percent of the females with cubs live (Schwartz *et al.* 2006a, p. 66), habitat protections are in place specifically for grizzly bear conservation. For this area, the Service developed objective and measurable habitat-based recovery criteria to limit habitat degradation and human-caused mortality risk related to motorized access, developed sites, and livestock allotments (i.e., the 1998 baseline). If and when delisting occurs, the GYA National Forests and National Parks will continue their 15-year history of implementation by legally incorporating the 1998 baseline values as habitat standards into appropriate planning documents (USDA Forest Service 2006b, p. 26). Together, these two Federal agencies manage 98 percent of lands within the PCA and 88 percent of all Suitable Habitat within the DPS boundaries. As it has done for the last decade, the Study Team will continue to monitor compliance with the 1998 baseline values and will also continue to monitor grizzly bear body

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condition, fat levels, and diet composition. Accordingly, the PCA, which comprises 51 percent of the Suitable Habitat within the DPS boundaries and contains 75 percent of all females with cubs (Schwartz *et al.* 2006a, p. 64, Haroldson 2014, in litt.), will remain a highly secure area for grizzlies, with habitat conditions maintained at or above levels documented in 1998. Maintenance of the 1998 baseline values inside the PCA will adequately ameliorate the multitude of stressors on grizzly bear habitat such that they do not become substantial threats to the GYA grizzly bear population in the foreseeable future.

Comment [FTvM58]: Somewhat repetitive; mentioned earlier in paragraph.

Suitable Habitat outside the PCA provides additional ecological resiliency and habitat redundancy to allow the population to respond to environmental changes. Habitat protections specifically for grizzly bear conservation are not necessary here because other binding regulatory mechanisms are in place for nearly 60 percent of the area outside the PCA. In these areas, the Wilderness Act, the Roadless Areas Conservation Rule, and National Forest Land Management Plans limit development and motorized use. Management of individual projects on public land outside the PCA will continue to consider and minimize impacts on grizzly bear habitat. Efforts by non-government organizations and State and county agencies will seek to minimize bear/human conflicts on private lands (U.S. Fish and Wildlife Service 2007, pp. 54, 57–59). These and other conservation measures discussed in the USDA Forest Service’s Record of Decision (2006b) ensure threats to the GYA grizzly bear population’s habitat outside the PCA will not become substantial enough to threaten this population’s long-term persistence.

In summary, the factors discussed under Factor A continue to occur across the range of the GYA grizzly bear population but are sufficiently ameliorated so they only affect a small proportion of the population. Despite these factors related to habitat, the population has increased and stabilized while its range has expanded. The threat of habitat loss and degradation has been reduced by restrictions on motorized access, developed sites, and livestock allotments. Therefore, based on the best available information and expectation that current management practices will continue into the future, we conclude that the present or threatened destruction, modification, or curtailment of its habitat or range does not constitute a substantial threat to the GYA grizzly bear population and is not expected to in the future.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes.

When grizzly bears were listed in 1975, we identified “indiscriminate illegal killing,” and management removals as primary threats to the population. We now consider both management removals and illegal killings in Factor C, under the Human-Caused Mortality section. This section evaluates legal grizzly bear hunting for commercial and recreational purposes in the GYA if this population were no longer protected from this type of take by the Act. No grizzly bears have been removed from the GYA since 1975 for commercial, recreational, scientific, or educational purposes. While there have been some mortalities related to research trapping since 1975, these were accidental and they are also discussed in Factor C below. The only commercial or recreational take anticipated post-delisting is a limited, controlled hunt. Mortality due to

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illegal poaching, defense of life and property, mistaken identity or other accidental take, and management removals are discussed in the “Human-Caused Mortality” section of Factor C. In this section, we describe expected conditions that would be compatible with a recovered GYA grizzly bear population.

Grizzly bears will be classified as a game species throughout the DPS boundaries in the States of Wyoming, Montana, ~~and~~ Idaho, and the Wind River Indian Reservation. While we anticipate a carefully regulated hunt within ecosystem-wide coordinated mortality limits, we do not expect grizzly bear trapping to occur due to public safety considerations and precedent. Meaning, the States of Montana, Idaho, and Wyoming do not permit public trapping of any bears currently and there is no information to indicate they will begin. Public trapping is not identified as a possible management tool in any of their state management plans. Hunting on the Wind River Indian Reservation will only be available to Tribal members (Title XVI Fish and Game Code, p. 9). The National Park Service will not allow grizzly bear hunting within its boundaries. Within the Demographic Monitoring Area (DMA) (Figure 2), the National Park Service, the MFWP, the WGFD, the IDFG, and the Tribes of the Wind River Reservation will manage all forms of mortality within sustainable limits and coordinate hunting seasons with each other. The Study Team developed the DMA using our definition of Suitable Habitat (see 72 FR 14866, March 29, 2007) as a base layer then adding areas that could serve as mortality sinks (e.g., primarily areas with cities, developments and agriculture) because these areas could have disproportionate effects on the population generally contained within Suitable Habitat (Interagency Grizzly Bear Study Team 2012).

Within the DMA, the Study Team will continue to estimate annual population size and establish mortality limits for independent (at least 2 years old) femalesmales, independent malesfemales, and dependent young (cubs-of-the-year and yearlings) based on that year's population estimate just as they have been doing for the last three decades.

Comment [FTvM59]: Technically, the protocol we use now has actually *not* been in place for 3 decades.

Within the DMA, mortality limits will be based on rates that allow long-term population stability. If agencies decide to establish hunting seasons, they will determine the number of available hunting mortalities outside the National Parks and Parkway based on achievement of the population criteria. Total allowable mortalities for each jurisdiction will be allocated to the States and Tribes annually based on their proportion of

geographic area in the DMA. These geographic proportions are 7.8% for Idaho, 34.1% for Montana, 54.3% for Wyoming, and 3.8% for the Wind River Reservation. If the sustainable mortality limit is not exceeded in the DMA, discretionary hunting mortality would be allocated among the jurisdictions named above. As a hypothetical example for male bears using real-world data and mortality rates that correspond to a stable population trend, between 2004 and 2013, the average number of independent males available for hunting in a given year inside the DMA would have been 15. These would have been available for hunting because this is, on average, how many independent males under the mortality limit we were each year. Using mortality rates that correspond to a stable population trend and estimates of total mortality calculated by the Study Team between 2004 and 2013, the hypothetical 15 independent males available each year for hunting would translate into 11.9 available bears outside of National Park Service lands to be allocated among Wyoming, Montana, Idaho, and the Wind River Indian

Comment [FTvM60]: We suggest deleting the hypothetical example; it seems this could only lead to confusion and having a very specific example could get readers locked onto a certain scenario and start using it as a benchmark. We do suggest mentioning the allocation proportions for the states and tribes (see edits)

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Reservation. Based on the geographic area of each of these jurisdictions, this would mean 6.5 male bears for Wyoming, 4.1 male bears for Montana, 0.9 male bears for Idaho, and 0.5 male bears for the Wind River Indian Reservation. Regulations will would be implemented to minimize and protect female grizzlies with dependent young; other regulations, such as timing of seasons, would be devised to ensure that mortality limits of independent females are not exceeded within the DMA and minimize their harvest (Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002, p. 20; WGFD 2004, p. 20; MFWP 2013, p. 61).

Comment [FTvM61]:

Mark and I made some changes here to be more specific. "Minimizing" harvest of females (zero would be minimizing!) seems illogical when there would be specific female hunting allocations.

We note the Study Team in 2012 recommended a change in management objective from one of population growth for recovery to maintenance of a stable grizzly bear population (i.e., $\lambda \approx 1.0$), which was deemed biologically logical and desirable given the status of the population (Interagency Grizzly Bear Study Team 2012, p. 37). We also note that the Study Team previously recommended using the point estimate and not intervals of uncertainty to establish overall mortality limits because statistically they represent the best approximation of reality (Interagency Grizzly Bear Study Team 2006, p. 15). These recommendations are justified given the multifaceted monitoring protocols established in the Strategy, which provide a reasonable understanding of the current health and status of the population (Interagency Grizzly Bear Study Team 2006, p. 15). However, uncertainty is inherent in wildlife management (Beissinger and Westphal 1998, p. 836) and managing under uncertainty is a nuanced craft and requires managers to adapt as new information is obtained, particularly to ensure the long-term objectives of population stability are met (Schwartz *et al.* 2006, p. 63). Hence, trigger mechanisms

Comment [FTvM62]: I added this paragraph to address issues of uncertainty now that we are managing for population stability and may be moving to the new mark-resight estimator. These factors combined leave less room for management error. This paragraph still needs some work but I wanted to get the basic ideas on paper first. We can discuss more details by phone.

I also found a way to tie this in (i.e., justify) with the "trigger mechanisms" discussed next.

See what you think.

Comment [FTvM63]: Workshop Supplement

Comment [FTvM64]: Workshop Supplement

Comment [FTvM65]: JWM 62:821-841.

ted to specific management actions are essential to implement adaptive management in light of this uncertainty.

If ecosystem-wide mortality limits within the DMA are exceeded, there will be no grizzly bear hunting within the DMA in any management jurisdiction the following year.

In areas of the Yellowstone DPS outside the DMA boundaries, respective States and Tribes may establish hunting seasons independently of the mortality limits and other population criteria. Within the DMA boundaries, managing agencies will collaboratively allocate discretionary mortality based on achievement of population standards. Grizzly bear hunting inside and outside the DMA boundaries boundary will not threaten the GYA grizzly bear population because hunting will not occur if mortality limits are exceeded.

In areas of the Yellowstone DPS outside the DMA boundaries, respective States and Tribes may establish hunting seasons independently of the mortality limits and other population criteria established for the DMA. Hunting mortality outside the DMA boundary will not threaten the GYA grizzly bear population because mortality limits are in place for the source population (i.e., within the DMA boundary). To increase the likelihood of genetic interchange between the GYA grizzly bear population and the NCDE grizzly bear population, the State of Montana will likely not institute hunting seasons in areas where bear density is low and removal of bears would negatively impact the potential for movement of grizzlies between ecosystems.” To ensure mortality rates remain consistent with population objectives, the Study Team will conduct a demographic review of population vital rates 5 years after any final delisting rule is published and at least every 10 years thereafter to make appropriate adjustments to them.

Comment [FTvM66]: We deleted “Ecosystem-wide” as it does not equate to DMA.

Comment [RS67]: Placeholder: We changed this at the Aug.2014 Study Team meeting but I need to see clarifying language from the States before I can tell if or how I should edit this sentence. Right off-hand, I feel this is pretty critical to leave as-is.

Comment [FTvM68]: Given the importance of this issue, this term should be clearly defined here. Should it be “discretionary hunting mortality”?

Comment [FTvM69]: Unclear what this refers to; is this referring to “annual grizzly bear population estimates”?

Comment [FTvM70]: We wanted to address this to make sure there is clarity on hunting in vs. outside the DMA. Maybe the zonal approach used for gray wolves in the Great Lakes area would be a good reference here.

Comment [FTvM71]: Is there a reference for this? If not, the quotation marks should probably not be used.

Comment [CS72]: This word directly relates to the recent ruling in the WY wolf case.

Comment [RS73]: Thompson is working on some draft language for these and a definition of “stability.” These would be included in the revised Conservation Strategy and possibly in the Commission Regs.

The 10-year time interval was selected based on life history characteristics of bears and methodologies in order to obtain estimates with acceptable levels of uncertainty and statistical rigor (Harris et al. 2011, p. 29).

~~The~~We consider a regulatory commitment to coordinate management of grizzly bear mortality ~~management~~ in the DMA based on ~~within~~ DMA-wide mortality limits is designed to that do not produce maintain long-term population ~~decline stability~~. We consider this regulatory commitment to reasonably ensures conservation of the GYA grizzly bear population.

C. Disease or Predation.

Disease

Although grizzly bears have been documented with a variety of bacteria and other pathogens, parasites, and disease, fatalities are uncommon (LeFranc *et al.* 1987, p. 61) and do not appear to have population-level impacts on grizzly bears (Jonkel and Cowan 1971, pp. 31–32; Mundy and Flook 1973, p. 13; Rogers and Rogers 1976, p. 423). Researchers have demonstrated grizzly bears with brucellosis (type 4), clostridium, toxoplasmosis, canine distemper, canine parvovirus, canine hepatitis, and rabies (LeFranc *et al.* 1987, p. 61; Zarnke and Evans 1989, p. 586; Marsilio *et al.* 1997, p. 304; Zarnke *et al.* 1997, p. 474). However, based on nearly 40 years of research by the Study Team,

natural mortalities in the wild due to disease have never been documented (Interagency Grizzly Bear Study Team 2005, pp. 34–35; Craighead *et al.* 1988, pp. 24–84). Based on this absence in more than 50 years of data, we conclude mortalities due to bacteria, pathogens, or disease are negligible components of total mortality in the GYA and are likely to remain an insignificant factor in population dynamics into the foreseeable future.

Natural Predation

Grizzly bears are occasionally killed by other wildlife. Adult grizzly bears kill cubs, sub-adults, or other adults (Stringham 1980, p. 337; Dean *et al.* 1986, pp. 208–211; Hessing and Aumiller 1994, pp. 332–335; McLellan 1994, p. 15; Schwartz *et al.* 2003b, pp. 571–572). This type of intraspecific killing seems to occur rarely (Stringham 1980, p. 337) and has only been observed among grizzly bears in the GYA 28 times between 1986 and 2012 (Haroldson 2014, in litt.). Wolves and grizzly bears often scavenge similar types of carrion and, sometimes, will interact with each other in an aggressive manner. Since wolves were re-introduced into the GYA in 1995, we know of 339 wolf-grizzly bear interactions with 6 incidents in which wolf packs likely killed grizzly bear cubs and 2 incidents in which wolves likely killed adult female grizzly bears (Gunther and Smith 2004, pp. 233-236; Gunther 2014, in litt.). Overall, these types of aggressive interactions among grizzly bears or with other wildlife are rare and are likely to remain an insignificant factor in population dynamics into the foreseeable future.

Human-Caused Mortality

This section discusses all sources of human-caused mortality except legal hunting, which is discussed above under factor B. Excessive human-caused mortality was the primary factor contributing to grizzly bear decline during the nineteenth and twentieth centuries (Leopold 1967, p. 30; Koford 1969, p. 95; Servheen 1990, p. 1; Servheen 1999, pp. 50–52; Mattson and Merrill 2002, pp. 1129, 1132; Schwartz *et al.* 2003b, p. 571), eventually leading to their listing as a threatened species in 1975 (40 FR 31734, July 28, 1975). Grizzlies were seen as a threat to livestock and to human safety and, therefore, an impediment to westward expansion. Both the Federal government and most early settlers were dedicated to eradicating large predators. Grizzly bears were shot, poisoned, trapped, and killed wherever humans encountered them (Servheen 1999, p. 50). By the time grizzlies were listed under the Act in 1975, there were only a few hundred grizzly bears remaining in the lower 48 States in less than 2 percent of their former range (U.S. Fish and Wildlife Service 1993, pp. 8–12).

In our 2007 Delisting Rule, we reported the human causes of grizzly bear mortality for 1980–2002, which roughly corresponded to the time period for which we had estimates of population growth and range expansion at that time. Since then, the Study Team has updated these demographic analyses using data from 2002–2011 ([Interagency Grizzly Bear Study Team 2012](#)). Below, we evaluate human-caused grizzly bear mortality for 2002–2013 as it represents the most recent and best available information on this subject. For a summary of grizzly bear mortalities between 1980 and 2002, please see pp. 14920–14922 of the 2007 Delisting Rule (72 FR 14866, March 29,

Comment [FTvM74]: Used full reference previously (which seems appropriate for citation). I changed this throughout...

2007). For more information on the demographic vital rates for 2002–2011, please see the “Population and Demographic Management” in the “Recovery” section above. From 2002–2013, 76 percent of known or probable grizzly bear mortalities in the GYA (292/382) were human-caused (Haroldson 2014). While the number of grizzly bears killed by humans each year has increased gradually, human-caused mortality as a proportion of the estimated population size has remained relatively constant, particularly for females (Haroldson *et al.*, in prep.). Overall, human-caused mortality rates have been low enough to allow the GYA grizzly bear population to increase in numbers and range (Schwartz *et al.* 2006a, pp. 64–66; Schwartz *et al.* 2006b, p. 48; Bjornlie *et al.* 2014, p. 184). Mortality limits that correspond to a stable population trajectory ensure that mortality will continue to be managed at sustainable levels that do not result in long-term population decline. In this section, we discuss human predation impacts including illegal poaching, defense of life and property, accidental mortality, and management removals.

We define poaching as intentional, illegal killing of grizzly bears. People may kill grizzly bears for several reasons, including a general perception that grizzly bears in the area may be dangerous, frustration over depredations of livestock, or to protest land use and road use restrictions associated with grizzly bear habitat management (Servheen *et al.* 2004, p. 21). Regardless of the reason, poaching continues to occur. We are aware of at least 21 such killings in the GYA between 2002 and 2013 (Haroldson 2014, in litt). This constituted 7 percent of known grizzly bear mortalities from 2002 to 2013. — This level of take occurred during a period when poaching was enforceable by Federal prosecution. We do not expect poaching to significantly increase if this proposed action

Comment [FTvM75]: We’re assuming this will remain in the paper but if you’d like, Mark could send an email so you can cite as *in litt*.

Comment [RS76]: Placeholder. Emailed Frank & Mark 9/22/14 to see what I could cite for this statement. It’s technically “unpub. Data” from the Study Team...and it varies based on the estimator, the rates, and if unk/unreported is included. So...does the Study Team think this is a fair statement? If so, what should we cite for it?

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is finalized because State and Tribal designation as a game animal means poaching will remain ~~illegal and prosecutable.~~

State and Federal law enforcement agents have cooperated to ensure consistent enforcement of laws protecting grizzly bears. Currently, State and Federal prosecutors and enforcement personnel from each State and Federal jurisdiction work together to make recommendations to all jurisdictions, counties, and States, on uniform enforcement, prosecution, and sentencing relating to illegal grizzly bear kills. Even with the Act's protections, this cooperation means illegal grizzly bear mortalities are often currently prosecuted under State statutes instead of the Act. We have a long record of this enforcement approach being effective, and no reason to doubt it would be effective in the absence of the Act's additional layer of Federal protections. Upon delisting, all three affected States and the Wind River Reservation will classify grizzly bears of the Yellowstone population as game animals, which cannot be taken without authorization by State and Tribal wildlife agencies (U.S. Fish and Wildlife Service 2007, pp. 72–75; Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002, pp. 18–21; MTFWP 2002, p. 2; WGFD 2005, p. 20). In other words, it will still be illegal for private citizens to kill grizzly bears unless it is in self-defense (as is allowed under the Act's protections), they have a hunting license issued by State or Tribal wildlife agencies; or, in the Montana portion of the DPS, if a grizzly bear is caught in the act of attacking or killing livestock (87-6-106 MCA). With respect to the last exception, there must be injured or dead livestock associated with any grizzly bear killed in defense of livestock in Montana. There are no documented cases of livestock owners or herders actually observing a

Comment [FTvM77]: Correct?

Comment [FTvM78]: Add Tribal reference?

grizzly bear depredating on livestock since records began being kept in 1975. Before that time, it would have been legal for a livestock operator to kill a grizzly bear just for being present. Details surrounding these mortalities are scant. States will continue to enforce, prosecute, and sentence poachers just as they do for any game animal such as elk, black bears, and cougars. Although it is widely recognized that poaching still occurs, this illegal source of mortality is not significant enough to hinder population stability for the GYA grizzly bear population (Interagency Grizzly Bear Study Team 2012, p. 34) or range expansion (Pyare *et al.* 2004, pp. 5–6; Bjornlie *et al.* 2013, p. 184).

Information and Education (I & E) programs, with a long record of implementation expected to continue after delisting, have helped minimize the potential threat of poaching. More specifically, these programs address illegal killing by working to change human values, perceptions, and beliefs about grizzly bears and Federal regulation of public lands (Servheen *et al.* 2004, p. 27). To address the concerns of user groups who have objections to land use restrictions that accommodate grizzly bears, Federal and State agencies market the benefits of restricting motorized access to multiple species. For example, both Montana and Wyoming have recommendations for elk habitat security similar to those for grizzly bears (less than 1 mi/sq mi (1.6 km/2.6 sq km)). This level of motorized access meets the needs of a variety of wildlife species, while maintaining reasonable opportunities for public access. I & E programs also reduce the threat of poaching by teaching people about bear behavior and ecology so they can avoid encounters and conflicts or respond appropriately if encounters do occur. In this way, we can correct common misconceptions and lessen the perceived threat grizzly

bears pose. Additionally, I & E programs foster relationships and build trust between the general public and the government agencies implementing them by initiating communication and dialogue.

From 2002 to 2013, humans killed 86 grizzly bears in self-defense or defense of others in the GYA. This constituted nearly 31 percent of known grizzly bear mortalities during this time period (Haroldson 2014, in litt.). This type of grizzly bear mortality is currently allowed under the provisions of the Act through a 4(d) rule (CFR § 17.40). These grizzly bear mortalities occurred primarily with elk hunters on public lands during the fall, but also at other times and locations (Interagency Grizzly Bear Study Team 2009, p. 18). These self-defense situations with elk hunters occur during surprise encounters, at hunter-killed carcasses or gut piles, or when packing out carcasses. Federal and State agencies have many options to potentially reduce conflicts with hunters (Interagency Grizzly Bear Study Team 2009, pp. 21–31) but self-defense mortalities will always be a reality when conserving a species that is capable of killing humans. By promoting the use of bear spray and continuing I & E programs pertaining to food and carcass storage and retrieval, many of these grizzly bear deaths can be avoided. Through its enabling legislation, the National Park Service authorizes an elk reduction program in both Grand Teton National Park and the John D. Rockefeller Memorial Parkway. Elk hunters in Grand Teton National Park and John D. Rockefeller Memorial Parkway are required to carry bear spray in an accessible location, thus reducing the potential for an encounter that results in grizzly bear mortality. Outside of these National Parks, carrying bear spray is strongly encouraged through hunter education programs and other I & E materials.

Another primary source of human-caused mortality is agency removal of nuisance bears following grizzly bear/human conflicts. Between 2002 and 2013, agency removals resulted in 126 mortalities, accounting for 43 percent of human-caused mortalities. This type of grizzly bear mortality is allowed under the Act through a 4(d) rule (CFR § 17.40). While lethal to the individual grizzly bears involved, these removals promote conservation of the GYA grizzly bear population by minimizing illegal killing of bears, providing an opportunity to educate the public about how to avoid conflicts, and promoting tolerance of grizzly bears by responding promptly and effectively when bears pose a threat to public safety.

Conflicts at developed sites (on either public or private lands) were responsible for 86 of these agency removals between 2002 and 2013. These conflicts usually involve attractants such as garbage, human foods, pet/livestock/wildlife foods, livestock carcasses, and wildlife carcasses, but also are related to attitudes, understanding, and tolerance toward grizzly bears. Mandatory food storage orders on public lands decrease the chances of conflicts while State and Federal I & E programs reduce grizzly bear/human conflicts on both private and public lands by educating the public about potential grizzly bear attractants and how to store them properly. Accordingly, roughly 68 percent of the total budgets of the agencies responsible for implementing the Strategy and managing the GYA grizzly bear population post-delisting is for grizzly bear/human conflict management, outreach, and education (U.S. Fish and Wildlife Service 2007, Appendix H, p. 154). To address public attitudes and knowledge levels, I & E programs

present grizzly bears as a valuable public resource while acknowledging the potential dangers associated with them and ways to avoid conflicts (for a detailed discussion of I & E programs, see Factor E below). These outreach programs have been successful, as evidenced by a stable to increasing grizzly bear population despite large increases in people living and recreating in the GYA over the last three decades. I & E programs are an integral component of the Conservation Strategy and will continue to be implemented whether the GYA grizzly bear is listed or not.

Agency removals due to grizzly bear conflicts with livestock accounted for nearly 14 percent (40/-292) of known mortalities between 2002 and 2013, only 1 inside the PCA (Haroldson 2014). Several steps to reduce livestock conflicts are currently underway. The USDA Forest Service phases out sheep allotments within the PCA as opportunities arise and, currently, only one active sheep allotment remains inside the PCA (USDA Forest Service 2006a, p. 167; Landenburger 2014, in litt.). The USDA Forest Service also has closed sheep allotments outside the PCA to resolve conflicts with species such as bighorn sheep as well as grizzly bears. Additionally, the alternative chosen by the USDA Forest Service during their Environmental Impact Statement process to amend the six national forest plans for grizzly bear habitat conservation includes direction to resolve recurring conflicts on livestock allotments through retirement of those allotments with willing permittees (USDA Forest Service 2006b, pp. 16–17). Livestock grazing permits include special provisions regarding reporting of conflicts, proper food and attractant storage procedures, and carcass removal. The USDA Forest Service monitors compliance with these special provisions associated with

Comment [RS79]: Placeholder – Study Team: how many of these occurred inside the PCA?

Comment [FTvM80]: Do you need correspondence from Mark for *in litt* citation?

Comment [FTvM81]: Five

Comment [SLW82]: But have they been effective?

livestock allotments annually (Servheen *et al.* 2004, p. 28). We consider these measures effective at reducing this threat, as evidenced by the rarity of livestock depredation removals inside the PCA. Upon delisting, the USDA Forest Service will continue to implement these measures that minimize grizzly bear conflicts with livestock. The Strategy also recognizes that active management of individual nuisance bears is required. Removal of repeat depredators of livestock has been an effective tool for managing grizzly bear/livestock conflicts as most depredations are done by a few individuals (Jonkel 1980, p. 12; Knight and Judd 1983, p.188; Anderson *et al.* 2002, pp. 252–253).

Comment [RS83]: Placeholder Study Team: Your thoughts on whether special provisions in USFS grazing permits have reduced livestock conflicts? Anything quantitative?

Comment [FTvM84]: What *has* been effective is closure of allotments with conflicts.

However, whether these special provisions have been effective seems speculative; we have no data or analyses to support this statement.

Comment [FTvM85]: Effective at a particular time and place; conflicts are likely to continue wherever free-ranging livestock and grizzly bears co-occur.

The Strategy and State grizzly bear management plans will guide decisions about agency removals of nuisance bears post-delisting and keep this source of human-caused mortality within sustainable mortality limits. The Strategy is consistent with current protocols (USDA Forest Service 1986, pp. 53–54), emphasizing the individual's importance to the entire population. Females will continue to receive a higher level of protection than males. Location, cause of incident, severity of incident, history of the bear, health, age, and sex of the bear, and demographic characteristics are all considered in any relocation or removal action. Upon delisting, State, Tribal, and National Park Service bear managers would continue to coordinate and consult with each other and other relevant Federal agencies (i.e., USDA Forest Service, BLM) about nuisance bear relocation and removal decisions, but coordination with the Service during each incident would no longer be required. The Strategy emphasizes removal of the human cause of the conflict when possible, or management and education actions to limit such conflicts (U.S. Fish and Wildlife Service 2007, pp. 57–60). In addition, an I & E team will

continue to coordinate the development, implementation, and dissemination of programs and materials to aid in preventative management of human/bear conflicts. The Strategy recognizes that successful management of grizzly bear/human conflicts requires an integrated, multiple-agency approach to continue to keep human-caused grizzly bear mortality within sustainable levels.

Overall, we consider agency management removals a necessary component of grizzly bear conservation. Nuisance bears can become a threat to human safety and erode public support if they are not addressed. Without the support of the people that live, work, and recreate in grizzly bear country, conservation will not be successful. Therefore, we do not consider management removals a threat to the GYA grizzly bear population now or in the foreseeable future. However, we recognize the importance of managing these sanctioned removals within sustainable levels, and ~~both Federal, and~~ State, and Tribal management agencies are committed to working with citizens, landowners, and visitors to address unsecured attractants to reduce the need for removals.

Humans kill grizzly bears unintentionally in a number of ways. From 2002 to 2013, there were 34 accidental mortalities and 21 mortalities associated with mistaken identification (totaling 19 percent of known mortality for this time period) (Haroldson 2014). Accidental sources of mortality during this time included roadkills, electrocution, and mortalities associated with research trapping by the Study Team. For the first time since 1982, there were grizzly bear mortalities possibly associated with scientific research capture and handling in 2006. That year, four different bears died within 4 days of being

captured, most likely from clostridium infections but the degraded nature of the carcasses made the exact cause of death impossible to determine. Then in 2008, two more grizzly bear mortalities suspected of being related to research capture and handling occurred. A necropsy was able to confirm the cause of death for one of these bears as a clostridial infection at the anesthesia injection site. Once the cause of death was confirmed, the Study Team changed its handling protocol to include antibiotics for each capture (Haroldson and Frey 2009, p. 21). There has not been a research-related capture mortality since. Because of the Study Team's rigorous protocols and adaptive approach dictating proper bear capture, handling, and drugging techniques, this type of human-caused mortality is not a threat to the GYA grizzly bear population. Measures to reduce vehicle collisions with grizzly bears include removing roadkill carcasses from the road so that grizzly bears are not attracted to the roadside (Servheen *et al.* 2004, p. 28). Cost-effective mitigation efforts to facilitate safe crossings by wildlife will be voluntarily incorporated in road construction or reconstruction projects on Federal lands within suitable grizzly bear habitat.

Mistaken identification of grizzly bears by black bear hunters is a manageable source of mortality. The Strategy identifies I & E programs targeted at hunters that emphasize patience, awareness, and correct identification of targets to help reduce grizzly bear mortalities from inexperienced black bear and ungulate hunters (U.S. Fish and Wildlife Service 2007, pp. 61–62). Beginning in license year 2002, the State of Montana required that all black bear hunters pass a Bear Identification Test before receiving a black bear hunting license (see <http://fwp.state.mt.us/bearid/> for more information and

details). Idaho and Wyoming provide a voluntary bear identification test online. In addition, all 3 States include grizzly bear encounter management as a core subject in basic hunter education courses (WGFD 2005, p. 34; MTFWP 2002, p. 63).

The Study Team prepares annual reports analyzing the causes of conflicts, known and probable mortalities, and proposed management solutions (Servheen *et al.* 2004, pp. 1–29). The Study Team would continue to use these data to identify where problems occur and compare trends in locations, sources, land ownership, and types of conflicts to inform proactive management of grizzly/human conflicts. As directed by the Strategy (U.S. Fish and Wildlife Service 2007, p. 60), upon delisting, the Study Team would continue to summarize nuisance bear control actions in annual reports and the Coordinating Committee would continue the Yellowstone Ecosystem Subcommittee’s role reviewing and implementing management responses (*see* Interagency Grizzly Bear Study Team 2009; Yellowstone Grizzly Bear Coordinating Committee 2009). The Study Team and Coordinating Committee implemented this adaptive management approach when the GYA grizzly bear population was delisted between 2007 and 2009. After high levels of mortality in 2008, the Study Team provided management recommendations options to the Coordinating Committee about ways to reduce human-caused mortality. In fall 2009, the Coordinating Committee provided updates on what measures they had implemented since the report was released the previous spring. These efforts included increased outreach on the value of bear spray, development of a comprehensive encounter, conflict, and mortality database, and increased agency presence on Forest Service lands during hunting season. For a complete summary of agency responses to the

Comment [FTvM86]: I’d rather use this term than “recommendations”, better represents our science role.

Study Team's recommendations, see pages 9–18 of the fall 2009 meeting minutes (Yellowstone Grizzly Bear Coordinating Committee 2009).

Summary of Factor C

When grizzly bears were listed in 1975, we identified “indiscriminate illegal killing,” and management removals as threats to the population. By defining a recovered population as one that “can sustain the existing level of known and estimated unknown, unreported human-caused mortality that exists within the ecosystem” the 1993 Recovery Plan recognized eliminating all human-caused mortality was not possible or necessary (U.S. Fish and Wildlife Service 1993, p. 41). Documentation of a stable to increasing population trend (Schwartz *et al.* 2006b, p. 48; Interagency Grizzly Bear Study Team 2012, p. 34) indicates mortality levels have allowed the GYA grizzly bear population to meet this definition of recovered.

Overall, from 2002 to 2013, the GYA grizzly bear population incurred an average of 24.3 human-caused grizzly bear mortalities per year (Haroldson 2014, in litt.). Despite these mortalities, the GYA grizzly bear population has continued to increase in size and expand its distribution (Eberhardt *et al.* 1994, pp. 361–362; Knight and Blanchard 1995, pp. 2–11; Boyce *et al.* 2001, pp. 1–11; Pyare *et al.* 2004, pp. 5–6; Schwartz *et al.* 2006a, pp. 64–66; Schwartz *et al.* 2006b, p.48; Interagency Grizzly Bear Study Team 2012, p. 34; Bjornlie *et al.* 2013, p. 184). Although humans are still directly or indirectly responsible for the majority of grizzly bear deaths, this source of mortality is effectively

mitigated through science-based management, monitoring, and outreach efforts. It is our intent to institutionalize the careful management and monitoring of human-caused mortality through the Strategy, National Forest and National Park management plans, State grizzly bear management plans, and wildlife commission rules and regulations (see Factor D below). Because a 4(d) rule currently allows grizzly bears to be killed in self-defense, defense of others, or by agency removal of nuisance bears, management of human-caused mortality post-delisting would not differ significantly if the protections of the Act were no longer in place. Although grizzly bear hunting is anticipated to occur, it would be within levels that do not result in long-term population decline and would not occur if other sources of human-caused mortality were excessive. Therefore, based on the best available information and expectation that current management practices will continue into the future, we conclude that disease and predation do not constitute substantial threats now or in the future.

Comment [RS87]: Placeholder. States still considering options and language

Comment [RS88]: Placeholder. Partners need to review this language.

D. The Inadequacy of Existing Regulatory Mechanisms.

Grizzly bear populations declined in part because there were inadequate regulatory mechanisms in place to protect habitat. (40 FR 31734–31736, July 28, 1975). Once grizzly bears were listed under the Act, they immediately benefited from its regulatory framework that included prohibition of take—broadly defined under the Act to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct—and requires federal agencies to consult with the Service to ensure any project funded, authorized, or carried out by them does not

jeopardize the continuing existence of a listed species. Grizzly bears benefitted from the requirement that Federal agencies ensure their actions will not likely jeopardize the continued existence or recovery of the species. They also benefitted from the development and implementation of recovery plans. The regulatory framework and tools provided by the Act have improved the status of the GYA grizzly bear population to the point where delisting is now appropriate. Below, we consider the adequacy of existing regulatory mechanisms that would remain in place if this grizzly bear population is delisted and the Act no longer applies.

The laws and regulations of the Federal, Tribal, and State governments provide the legal authority for grizzly bear population and habitat management, monitoring, I&E programs, and conflict response. Grizzly bear habitat management is done primarily by the USDA Forest Service and NPS. Ninety-eight percent of lands within the PCA and 88 percent of lands within all Suitable Habitat are managed by one of these agencies. While the USFS and NPS are responsible for habitat management, the NPS, States, and Tribes share responsibility for population management (i.e., monitoring, mortality management, conflict response, and hunting regulations)..

The Strategy and the State plans describe and summarize the coordinated efforts required to manage the GYA grizzly bear population and its habitat such that its continued conservation is ensured. These documents specify the population, habitat, and nuisance bear standards needed to manage human-caused mortality risk and maintain a recovered grizzly bear population. The plans also document the regulatory mechanisms

and legal authorities, policies, management, and post-delisting monitoring plans that exist to maintain the recovered grizzly bear population. The primary components of habitat and population management committed to in the Strategy have been or will be incorporated into legally binding frameworks such as National Forest Land Resource Management Plans, National Park Superintendent Compendiums, Tribal ordinances, and State regulations. The Strategy will remain in effect beyond recovery, delisting, and the five year monitoring period required by the Act as grizzly bears, like many other species, will always be “conservation-reliant” (Scott *et al.* 2005, p. 384) because of their low resiliency to excessive human-caused mortality. The need to coordinate management of the population across multiple land ownerships and jurisdictions will always remain.

Forest Service

The USFS manages nearly 68 percent (31,234 of 46,035 sq km) of suitable grizzly bear habitat within the GYA. Because the USFS does not manage direct take of grizzly bears, they amended their Land Management Plans to include legally binding habitat standards only. These amendments required levels of secure habitat, developed sites, and livestock allotments inside the PCA to be maintained at or improved upon 1998 levels to minimize human-caused mortality risk (USDA Forest Service 2006b, p. iii). In addition to the habitat standards inside the PCA, these amendments provide guidance and direction for habitat management outside the PCA, including but not limited to: a goal for accommodating grizzly bears outside the PCA; direction on managing livestock allotments with recurring conflicts through retirement of such allotments with willing

permittees; direction emphasizing the use of food storage orders to minimize grizzly bear/human conflicts; a guideline to maintain, to the extent feasible, important grizzly bear food resources; and several monitoring items that will enhance habitat management outside of the PCA (USDA Forest Service 2006a, pp. 34–37). These amendments to the GYA National Forest Land Management Plans become effective if and when delisting is finalized. They were in effect for two and a half years when GYA grizzly bears were delisted between March 2007 and September 2009 but were no longer applicable after the 2007 Final Rule was vacated by the District Court of Montana. Importantly, the National Forests continued to manage according to the agreements reached in the Strategy and their Forest Plan amendments even though delisting was overturned and they were not legally required to. Because of this commitment, there is now a seven-year demonstrated track record of implementation by the signatories of the Conservation Strategy.

While the habitat standards in the Strategy incorporated into Forest Plans assure secure habitat and minimal human-caused mortality risk inside the PCA, other regulatory mechanisms ensure sufficient habitat protections outside the PCA. Of the 8,797 sq mi (22,783 sq km) of Suitable Habitat outside the PCA, the USFS manages 6,676 sq mi (17,292 sq km), or 76 percent. Of this 76 percent of Suitable Habitat outside of the PCA that the USFS manages, nearly 80 percent is already Designated Wilderness Area, Wilderness Study Area, or Inventoried Roadless Area. These designations provide regulatory mechanisms that protect grizzly habitat from increases in motorized use, oil and gas development, livestock allotments, and timber harvest.

Specifically, the Wilderness Act of 1964 does not allow road construction, new livestock allotments, or new oil, gas, and mining developments in designated Wilderness Areas. This means the 2,625 sq mi (6,799 sq km) of secure habitat outside of the PCA in Wilderness Areas is protected by an existing regulatory mechanism. This secure Suitable Habitat is biologically significant to the Yellowstone DPS because it will allow population expansion into these areas that are minimally affected by humans. Wilderness study areas are designated by Federal land management agencies (e.g., USDA Forest Service) as those having wilderness characteristics and being worthy of congressional designation as a wilderness area. Individual National Forests that designate wilderness study areas manage these areas to maintain their wilderness characteristics until Congress decides whether to designate them as permanent wilderness areas. This means that individual wilderness study areas are protected from new road construction by Forest Plans and activities such as timber harvest, mining, and oil and gas development. These development activities are much less likely to occur because the road networks required for these activities either do not exist or are unlikely to be approved in the future.

Inventoried Roadless Areas currently provide 1,888 sq mi (4,891 sq km) of secure habitat for grizzly bears outside of the PCA within the DPS boundaries. The 2001 Roadless Areas Conservation Rule (hereafter referred to as the "Roadless Rule") prohibits road construction, road re-construction, and timber harvest in Inventoried Roadless Areas (66 FR 3244–3273, January 12, 2001). This restriction on road building makes mining activities and oil and gas production much less likely because access to these resources becomes cost-prohibitive or impossible without new roads.

If delisting occurs, the USDA Forest Service will classify grizzly bears in the GYA as a “species of conservation concern”—or the equivalent management designation—and will manage activities to provide for the needs of a recovered population (USDA Forest Service 2006b, p. 26). This classification means the Forest Service will consider all potential impacts to the GYA grizzly bear population from proposed activities as part of its NEPA compliance obligations. Then, under the National Forest Management Act of 1976 (15 U.S.C. 1600), the USFS will ensure that land management activities provide for the needs of a recovered population and maintain viable populations of species of conservation concern.

National Park Service

The National Park Service manages 20 percent (3,632 / 17,774 sq mi (9,407 / 46,035 sq km)) of Suitable Habitat within the DPS boundaries, all of which is in the PCA. Yellowstone National Park incorporated the habitat, population, monitoring, and nuisance bear standards described in the Strategy into their Superintendent’s Compendium (Yellowstone National Park 2014, p. 18) and Grand Teton National Park would do the same before this proposed action could be finalized. There will not be any grizzly bear hunting inside either National Park.(36 CFR 2.2) .

Tribal Lands

Together, the Eastern Shoshone Tribe and the Northern Arapaho Tribe manage wildlife and its habitat within the boundaries of the Wind River Reservation (see Figure 2 above). Less than 3 percent of Suitable Habitat (1,360 sq km (525 sq mi)) is potentially affected by Tribal decisions, so their management would never constitute a threat to the GYA grizzly bear population. The Tribes' Grizzly Bear management plan will facilitate grizzly bear occupancy in areas of Suitable Habitat on the Wind River Reservation and allows grizzly bears access to high-elevation whitebark pine and army cutworm moth aggregation sites, thus allowing for additional resiliency of the Yellowstone DPS in response to changing environmental conditions. The Wind River Reservation Forest Management Plan calls for no net increase in roads in the Wind River Roadless Area and the Monument Peak area of the Owl Creek Mountains. In the remaining portion of Tribal lands occupied by grizzly bears, open road densities of 1 mi⁻/sq mi or less will be maintained (Eastern Shoshone and Northern Arapaho Tribes 2009, p. 11). These Tribes do not allow hunting by non-tribal members. If a limited hunt is approved by their Joint Business Council, it would be consistent with the demographic standards in the Strategy (Eastern Shoshone and Northern Arapaho Tribes 2009, pp. 2, 9).

State Regulatory Mechanisms

If delisting is finalized, the States of Wyoming, Montana, and Idaho will classify grizzly bears as game animals throughout the DPS boundaries. This status provides legal protection to grizzly bears by prohibiting unlimited or unwarranted killing of grizzly bears by the public. Take of grizzly bears will therefore be strictly limited by hunting

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seasons and quotas and legally enforceable through existing laws about the protections game animals receive in each State. State wildlife commissions would also promulgate regulations with commitments to coordinate hunting limits within the DMA among jurisdictions and within the mortality limits calculated annually by the Study Team. These regulations would constitute legally enforceable regulatory mechanisms.

Comment [RS89]: Placeholder, make sure this is still true after receiving language from the States

Comment [FTvM90]: Should you explain what makes it legally enforceable?

The three State grizzly bear management plans direct State land management agencies to maintain or improve habitats that are important to grizzly bears and to monitor population parameters outside the PCA. Idaho, Montana, and Wyoming have developed management plans for areas outside the PCA to – (1) assure that the GYA grizzly bear population no longer needs the protections of the Act; (2) support expansion of grizzly bears beyond the PCA, into areas of biologically and socially acceptable suitable habitat; and (3) manage grizzly bears as a game animal, including allowing regulated hunting when and where appropriate. Any grizzly bear hunting within the DMA would only occur if annual mortality limits specified for the GYA grizzly bear population are not exceeded. The killing of grizzly bears in self-defense by humans will continue to be allowed under both Federal and State law. State management plans do not allow for legal take of grizzly bears by humans unless it is within the designated seasons and limits for grizzly mortality or, in the Montana portion of the DPS, if a grizzly bear is caught “in the act” of attacking or killing livestock (87–3–130 MCA). A law enforcement investigation would have to verify an injured or dead livestock animal.

Comment [RS91]: Placeholder: review after receiving language back from States

The management of nuisance bears within the Yellowstone DPS boundaries will be based upon existing laws and authorities of State wildlife agencies and Federal land management agencies, and directed by protocols established in the Strategy and State management plans. Inside the National Parks, Yellowstone or Grand Teton National Park grizzly bear biologists will continue to respond to grizzly bear/human conflicts. In all areas outside of the National Parks, State and Tribal wildlife agencies will continue responding to grizzly bear/human conflicts. The focus and intent of nuisance grizzly bear management inside and outside the PCA will be predicated on strategies and actions to prevent grizzly bear/human conflicts. State and Tribal management plans provide the necessary regulatory framework and guidelines to State wildlife agencies for managing and maintaining a recovered GYA grizzly bear population in significant portions of the range outside of the PCA. By identifying the agencies responsible for nuisance bear management and responding to grizzly bear/human conflicts using a clearly orchestrated protocol, these State and Tribal plans create a framework within which grizzly bears and people can both flourish.

Summary of Factor D

Legally enforceable mechanisms that would be in place if this proposed rule is finalized include National Park Superintendent's Compendiums, the USDA Forest Service Amendment for Grizzly Bear Habitat Conservation for the GYA National Forests, and State and Tribal commission regulations. These mechanisms would provide an adequate regulatory framework within which the GYA grizzly bear population would

continue to experience long-term population stability and appropriate distribution throughout the GYA. Based on this information, it is reasonable to conclude existing regulatory mechanisms, and those that would be in place before this proposed rule was finalized, are adequate to protect the GYA grizzly bear population if the protections of the Act were no longer in place.

Comment [FTvM92]: Unclear what this refers to.

E. Other Natural or Manmade Factors Affecting Its Continued Existence.

Factor E requires the Service to consider other natural or manmade factors affecting the continued existence of a species. Here, four other considerations warrant additional discussion regarding the GYA grizzly bear population: (1) genetic issues; (2) changes in food resources; (3) climate change; and (4) human attitudes toward grizzly bear conservation.

Genetic Management

The isolated nature of the GYA grizzly bear population was identified as a potential threat when listed in 1975 because declines in genetic diversity are expected in isolated populations (Allendorf *et al.* 1991, p. 651; Burgman *et al.* 1993, p. 220). For the GYA grizzly bear population, decreases in genetic diversity would occur gradually over decades due to long generational time and relatively large population size (Miller and Waits 2003, p. 4338). Indicators of fitness in the Yellowstone population demonstrate that the current levels of genetic diversity are capable of supporting healthy reproductive

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and survival rates, as evidenced by normal litter size, no evidence of disease, high survivorship, an equal sex ratio, normal body size and physical characteristics, and an increasing population (see Schwartz *et al.* (2006b, entire) and Interagency Grizzly Bear Study Team 2012, entire). These indicators of fitness will be monitored annually, in perpetuity. Because current levels of genetic diversity are adequate and heterozygosity values have increased slightly over the last few decades from 0.55 (Paetkau *et al.* 1998, p. 421), to 0.56 (Miller and Waits 2003, p. 4337), to 0.57 using more recent data and larger sample sizes (Proctor *et al.* 2012, p. 12), we know there is no immediate need for new genetic material (Miller and Waits 2003, p. 4338).

Comment [FTvM93]: Add Haroldson et al. 2010
Ursus 21:1-13

Heterozygosity = 0.60; 424 individual GBs sampled
during 1983-2007

Effective population size is a metric used by geneticists to distinguish between total population size and the actual number of individuals available to reproduce at any given time. For example, many individuals in a population may be too young to reproduce and, therefore, are not part of the “effective population size.” Short-term fitness (i.e., survival and reproduction rates) can be attained by maintaining an effective population size of at least 50 individuals (Frankel and Soulé 1981, p. 74). For long-term fitness (i.e., evolutionary response), the effective population size of the GYA grizzly bear population should remain above 100 animals (Miller and Waits 2003, p. 4338). In grizzlies, effective population size is roughly approximately 25–27% of total population size (Allendorf et al. 1991, p. 650; Miller and Waits 2003; Groom *et al.* 2006, p. 405) so an effective population size of 100 corresponds to a total population size of about 400 animals. To further ensure this minimum is always maintained, the Strategy established a standard to maintain the total population size at or above 500 animals (U.S. Fish and

Comment [FTvM94]: Based on Pauline’s investigations and her examination of recent papers, this may not be correct anymore. We can help address this as we prepare the manuscript based on the analysis results from Pauline. She should be getting a draft to us any day.

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Wildlife Service 2007, p. 26). Based on the most recent estimates of total population size in the GYA, the effective population size in this ecosystem is at least 185 (741×0.25), nearly double the minimum suggested by the literature (Miller and Waits 2003, p. 4338).

Comment [rs95]: placeholder: could we cite preliminary results indicating Ne about 300? (presented by Pauline @ 10/30/14 meeting)

Comment [FTvM96]: This presents a bit of a conundrum; the results of Pauline's analysis are really relevant here but we don't have a peer-reviewed citation yet. On the other hand, given what recent literature is indicating about the relationship between N_e and total population size, the information presented here may not be appropriate either.

While an effective population size of approximately 100 individuals is adequate in the near-term (next several decades), 1–2 effective migrants from other grizzly bear populations every 10 years would maintain or enhance this level of genetic diversity in the long-term (Mills and Allendorf 1996, pp. 1510, 1516; Newman and Tallmon 2001, pp. 1059–1061; Miller and Waits 2003, p. 4338) and benefit its long-term persistence (Boyce *et al.* 2001, pp. 25, 26). We have defined an effective migrant as an individual that ~~emigrates-immigrates~~ into an isolated population from an ~~outside-separate~~ area, survives, breeds, and whose offspring survive. Based on Miller and Waits (2003, p. 4338), the 2007 Conservation Strategy recommended that if no movement or successful genetic interchange was detected by 2020, two effective migrants from the NCDE would be translocated into the GYA grizzly bear population every 10 years (i.e., one generation) to maintain current levels of genetic diversity (U.S. Fish and Wildlife Service 2007, p. 37). In light of new information documenting increased levels of heterozygosity and an effective population size of 185 animals, we have removed the deadline of 2020 for translocation from the Conservation Strategy. Instead, translocation will be a last resort and will only be implemented if there are demonstrated effects of lowered heterozygosity ~~among~~ GYA grizzly bears or ~~additional-other genetic measures that indicate a~~ decreases in genetic diversity. Additionally, we know current levels of genetic diversity are unlikely to have substantial effects on the viability of the GYA grizzly bear

Comment [RS97]: Placeholder: run by the Study Team

Comment [FTvM98]: I agree with this change; there is no point in spending time and funds for translocations when there is no genetic evidence that this is needed to begin with. I made a few minor changes to the language.

population over the next several decades (Miller and Waits 2003, p. 4338) and translocation requires a substantial amount of time, effort, and funding (Kasworm *et al.* 2007, p. 1263) which would be better expended on achieving natural connectivity in the next few decades.

To document natural connectivity, Federal and State agencies will continue to monitor bear movements on the northern periphery of the Yellowstone DPS boundaries and the southern edges of the NCDE using radio-telemetry and will collect genetic samples from all captured or dead bears to document gene flow between these two ecosystems (Revised Conservation Strategy, p.). These genetic samples will detect migrants using an “assignment test” to identify the area from which individuals are most likely to have originated based on their unique genetic signature (Paetkau *et al.* 1995, p. 348; Waser and Strobeck 1998, p. 43; Paetkau *et al.* 2004, p. 56; Proctor *et al.* 2005, pp. 2410–2412). This technique also identifies bears that may be the product of reproduction between Yellowstone and NCDE bears (Dixon *et al.* 2006, p. 158). In addition to monitoring for gene flow and movements, we will continue interagency efforts to provide and maintain movement opportunities for grizzly bears, and reestablish natural connectivity and gene flow between the GYA grizzly bear DPS and other grizzly bear populations. To promote natural connectivity, there are attractant storage rules on public lands between the GYA and the NCDE and the State of Montana “...would likely not institute hunting seasons in areas where bear density is low and removal of bears would negatively impact the potential for movement of grizzlies between ecosystems” (MTFWP 2013, p. 61). We do not consider connectivity to the east, west, or south a relevant issue

Comment [RS99]: placeholder

Comment [CS100]: Here is that wording again from the wolf decision.

to the GYA grizzly bear population's long-term persistence because there are no extant populations in these directions to enhance the genetic diversity of the GYA population.

Genetic concerns are not currently a threat to the GYA grizzly bear population (Miller and Waits 2003, p. 4338). Attractant storage orders on public lands and careful regulation of hunting in certain areas provide adequate measures to promote natural connectivity and prevent reductions in genetic diversity. The Study Team will carefully monitor movements and the presence of alleles from grizzly bear populations outside the Yellowstone DPS boundaries (U.S. Fish and Wildlife Service 2007, p. 37). The Study Team will continue to monitor genetic diversity of the GYA grizzly bear population so that a possible reduction in genetic diversity due to the geographic isolation of the ~~GYA grizzly bear~~ population will be detected and responded to accordingly with translocation of outside grizzly bears into the GYA. This approach ensures "concerns about long-term genetic diversity do not warrant a continued threatened listing for the Yellowstone DPS." (Greater Yellowstone Coalition v. Servheen et al., 2009 District of Montana ruling, p. 36).

Comment [FTvM101]: Adding reference of Haroldson et al. 2010 (Ursus 21:1-13) would strengthen this argument.

Comment [FTvM102]: I suggest this change to make the distinction between 2 types of genetic monitoring:
1) Evidence of genetic exchange with populations outside GYA
2) Evidence of decrease in genetic diversity

Changes in Food Resources

The Study Team currently monitors the productivity of four common grizzly bear foods in the GYA: whitebark pine seeds, army cutworm moths, winter-killed ungulates, and spawning cutthroat trout. While these are some of the highest calorie food sources available to grizzly bears in the GYA (Mealey 1975, pp. 84–86; Pritchard and Robbins

1990, p. 1647; Craighead *et al.* 1995, pp. 247–252), only whitebark pine seeds are known to have an influence on grizzly bear mortality risk and reproduction. There is no known relationship between grizzly bear mortality risk or reproduction and any other individual food (Schwartz *et al.* 2010, p. 662). The specific ways in which changes in ungulates, cutthroat trout, and army cutworm moths could affect the GYA grizzly bear population are discussed in detail in the 2007 Delisting Rule (72 FR 14866, March 29, 2007, pp. 14,928–14,930). Our analysis therefore focuses on the potential impacts that the loss of whitebark pine could have on the GYA grizzly bear population. While we discussed notable declines in whitebark pine due to mountain pine beetle in the 2007 Delisting Rule, the data used to estimate population growth only went through 2002. The Ninth Circuit Court of Appeals questioned our conclusions about future population viability based on data gathered before the sharp decline in whitebark pine began.⁷ Greater Yellowstone Coalition, Inc. v. Servheen, *et al.*, 665 F.3d 1015, (9th Cir. 2011). To assess the population's vital rates since 2002, the Study Team completed a comprehensive demographic review using data from 2002–~~2012~~2011 ([Interagency Grizzly Bear Study Team 2012](#), p. 7) and extensive analyses to determine if the decline in whitebark pine is driving observed changes in population vital rates ([Interagency Grizzly Bear Study Team 2013](#)).

Whitebark pine still faces the same threats reported in our 2007 Delisting Rule and re-iterated in our 12-month finding for whitebark pine (76 FR 42631, July 19, 2011). Whitebark pine is currently warranted for protected status under the Act but precluded by higher priority actions. This status is primarily the result of direct mortality due to

whitepine blister rust and mountain pine beetles but also less obvious impacts from climate change and fire suppression. For more details on the status of whitebark pine, please see the 2013 CNOR (77 FR 70103, November 22, 2013).

During years of low whitebark pine seed availability, we know grizzly bear human conflicts may increase as bears use lower elevation, less secure habitat within their home ranges (Gunther *et al.* 2004, pp. 13–15; Schwartz *et al.* 2010, pp. 661–662). Approximately 6 more independent females and 6 more independent males die across the ecosystem in poor whitebark pine years (Interagency Grizzly Bear Study Team 2013, p. 25, Fig. 5). These mortalities are primarily due to defense of life encounters and wildlife management agency removals of nuisance-conflict bears (Gunther *et al.* 2004, pp. 13–14; Interagency Grizzly Bear Study Team 2009, p. 4). Additionally, both litter size and the likelihood of producing a litter may decrease in years following poor whitebark pine years (Schwartz *et al.* 2006, p. 21; Interagency Grizzly Bear Study Team 2012, p. 34). Despite these effects on survival and reproduction, using data from 2002–2012, the Study Team documented an average annual population growth rate for the GYA grizzly bear population between 0.3 and 2.2 percent (Interagency Grizzly Bear Study Team 2012, p. 34). Although the population was still increasing in this more recent time period, it was increasing at a slower rate than in the previous time period (1983–2002). Next, Therefore, the Study Team examined the potential influence whitebark pine was having on this population growth rate. Because extrinsic, density-independent factors (e.g., whitebark pine availability) and intrinsic, density-dependent factors (i.e., a population at or near carrying capacity) can produce similar changes in population vital

Comment [RS103]: Placeholder: Mark H. confirming this statement is accurate

Comment [FTvM104]: These numbers would need to be based on Fig. 5; they are not explicitly provided in the text.

Comment [RS105]: Placeholder: check w/ Study Team for citation. I thought this was one of the things that came out of the 2012 demographics review but I couldn't find it in there

Comment [FTvM106]: this was not covered in the report. Citing Schwartz et al. 2006, however, should suffice here.

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rates, the Study Team conducted several analyses to clarify and tease apart these two similar effects. The results of these analyses were summarized in a single report titled “Response of Yellowstone grizzly bears to changes in food resources: a synthesis” (hereafter referred to as “the **Food** Synthesis Report”) (Interagency Grizzly Bear Study Team 2013). Regardless of whether these changes are being driven by declines in whitebark pine or are simply an indication of the population reaching carrying capacity, our management response would be the same: to carefully manage human-caused mortality based on scientific monitoring of the population.

Comment [FTvM107]: I suggest adding “Food”, to better reflect the report contents.

For the **Food** Synthesis Report, the Study Team developed a comprehensive set of research questions and hypotheses to evaluate **grizzly bear responses to potential impacts of changes in food resources** ~~versus density dependent effects on population growth~~.

Specifically, the Study Team asked these 6 questions: (1) Has grizzly bear selection of whitebark pine habitat decreased as tree mortality increased? (2) Has grizzly bear body condition decreased as whitebark pine declined? (3) Has animal matter provided grizzly bears with an alternative food resource to declining whitebark pine? (4) Have grizzly bear movements increased during the period of whitebark pine decline (2000 – 2011)? (5) Has home range size increased as grizzly bears sought alternative foods or has home range size decreased as grizzly bear density increased? (6) Has the number of human-caused grizzly bear mortalities increased as whitebark pine decreased? The preliminary answers to these questions are contained in the **Food** Synthesis Report and the final results ~~will be (or~~ have been ~~(or will be)~~ published in peer-reviewed journals (Schwartz *et al.* 2013; Bjornlie *et al.* 2013; Costello *et al.* 2014; Gunther *et al.* 2014; Schwartz *et al.*

Comment [FTvM108]: We actually developed 8 research questions and only 2 were directly related to sorting out WBP vs. density dependence. The one research question that most directly addressed this is not listed (Question 8): “Are changes in vital rates during the last decade associated more with decline in whitebark pine resources than increases in grizzly bear density?”

I imagine you have a reason to list these 6 questions specifically but I suggest you consider the full set of questions and address all of those here, otherwise it might be seen as cherry-picking the results?

2014; ~~Ebinger-van Manen~~ *et al. in review*; Haroldson *et al. in prep.*, ~~Ebinger *et al. in prep.*~~)

Key findings of the Synthesis Report are summarized below. Regarding the first research question, if whitebark pine was a preferred food or if individual grizzly bears were dependent on this food source, we would expect movement rates and grizzly bear selection of whitebark pine to increase as its availability decreased and bears had to search further and longer to find this food source. However, Costello *et al.* (2014, p. 2013) found that grizzly bear selection of whitebark pine seeds had actually decreased between 2000 and 2011. They also found that movement rates had not changed over the study period, further supporting the notion that grizzly bears were simply finding alternative foods within their home ranges as whitebark pine seeds became less available over the past decade (Costello *et al.* 2014, p. 2013). Regarding the second research question, if grizzly bears were dependent on whitebark pine to meet their nutritional requirements, we would expect body condition to have decreased since 2002. Instead, Schwartz *et al.* (2013, p. 75) and the Study Team (2013, p. 18) found body mass and percent body fat in the fall had not changed significantly ~~since 2002~~ from 2000 to 2010.

In response to the third research question, the Study Team found that ungulate carcass use had increased since 2002 and that bears used more meat in poor whitebark pine production years. These results were expected and are consistent with previous findings (see Felicetti *et al.* 2003). To answer the fourth and fifth research questions identified in the previous paragraph, the Study Team examined ~~daily~~ movement rates and home range sizes ~~before and after 2002~~. They found that ~~fall-daily and fall~~ bear movements had not

Comment [FTvM109]: I suggest you address the issue here of the apparent decline in **female** fall body fat after 2006 identified by Schwartz *et al.* 2013. I have received a number of inquiries about that. As Schwartz *et al.* (2013) suggested, small sample sizes for female fall body fat may have influenced the apparent decline and they recommended further investigation. In the Food Synthesis Report, the study team addressed this issue and did not find support for the notion that percent body fat of females in fall had declined. Additionally, fall data for 2011-2014 do not suggest a continuing decline but no peer-review reference to cite for that.

increased ~~since 2002~~ from 2000 to 2011 (Costello *et al.* 2014, p. 2011, 2013). ~~Additionally, they documented that -and-~~ home ranges ~~size had~~ actually decreased significantly for females ~~and that this decrease was greater in areas with higher grizzly bear densities (Bjornlie *et al.* 2014, p. 4–6).~~ The Study Team compared pre- (1989–1999) and post-whitebark pine impact (2007–2012) periods and did not find a relationship between home range size and amount of live whitebark pine in the home range (Bjornlie *et al.* 2014, p. 4–6). Because we would expect daily ~~and fall~~ movements and home range size to increase if ~~food~~ resources were ~~declining~~ ~~dwindling~~ and bears were roaming more widely in search of foods, these findings offer strong support that changes in population vital rates since ~~2002-the early 2000s~~ are more likely a ~~result~~ ~~indicative~~ of the population approaching carrying capacity than a shortage of resources.

Comment [FTvM110]: If the van Manen et al. (in review) paper is accepted, it would be important to cite it here.

While whitebark pine seed production can influence reproductive rates the following year, the Study Team found that overall fecundity rates during the last decade (2002–2011) did not decline when compared with data from 1983–2001 (*Interagency Grizzly Bear* Study Team 2013, p. 32). This is important because fecundity rates are a function of both litter size and the likelihood of producing a litter, the two ways in which whitebark pine seed production may affect reproduction. Although Schwartz *et al.* (2006, p. 21) found 1-cub litters were more common in years following poor whitebark pine seed production, 1-cub litters are still adequate for population growth. Furthermore, 1-cub litters are still relatively uncommon following poor whitebark pine years, as evidenced by a very consistent average litter size around ~~two-2~~ since the Study Team

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began reporting this metric. ~~Fecundity and Mean~~ litter size did not change between the two monitoring periods (1983–2001 vs. 2002–2011) examined by the Study Team even though the availability of whitebark pine seeds in the ecosystem presumably declined (Interagency Grizzly Bear Study Team ~~2013~~2012, p. 33, 34). While poor whitebark pine seed production in the fall may at least partially explain slightly smaller litter sizes observed the following spring, it appears to be negligible to population dynamics because its effect is small and the grizzly bear population can absorb these impacts without declining. ||

Comment [RS111]: Placeholder: Study team review for accuracy

Comment [FTvM112]: I suggest delete this last sentence; not sure what analysis supports this statement and too speculative anyhow.

Also, this potentially confuses 2 issues:
1) Litter size as it may relate to 'normal' cycles of good and poor WBP production
2) Litter size changes over time as it relates to WBP decline

While land managers have little influence on how calories are spread across the landscape, we have much more influence on human-caused mortality risk. Consistent with findings from earlier studies, Haroldson *et al.* (in prep.) found that grizzly bear mortalities were greater increase in poor vs. good whitebark pine years. Assuming the poorest observed whitebark pine cone production, Haroldson *et al.* (in prep.) predicted an increase of 10 annual mortalities ecosystem-wide of independent females comparing 2000 with 2012, encompassing the period that coincided with whitebark pine decline (Interagency Grizzly Bear Study Team 2013, p. 25). The greatest increase in predicted mortality occurred outside the Recovery Zone, which may be partially attributable to range expansion and continued population increase (Haroldson *et al.* in prep.).

Comment [FTvM113]: OK to cite in prep.? One option is to also cite Food Synthesis Report, which I have done in my edits.

NOTE: Haroldson *et al.* results may change somewhat as we add the last 2 years to this analysis.

However, increased mortality numbers have not lead to a declining population trend (Interagency Grizzly Bear Study Team 2012, p. 34) ~~and its impact is notably smaller than reported in previous literature (see Mattson *et al.* 1992; Pease and Mattson 1999). Previous flawed studies estimated that 2.3 times more adult female mortalities and 3.3~~

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~~times more adult male mortalities occur in poor whitebark pine years (Mattson *et al.* 1992, p. 436) and that this translates into a declining population trend in these years (Pease and Mattson 1999, p. 964). While mortality does increase in poor whitebark pine years, it results in about 6 more female and 6 more male mortalities throughout the ecosystem in those years (Haroldson *et al.* in prep.), nothing near double or triple the average, as suggested by Mattson *et al.* (1992, p. 436).~~

Comment [RS114]: Placeholder: checking w/ study Team

Comment [RS115]: Placeholder: please read for accuracy

Comment [FTvM116]: We have deleted this because the results of Mattson *et al.* 1992 are actually NOT that different from Mark's recent mortality analyses; still about 2 times higher in poor WBP years (but keep in mind numbers are small). The fact that these differences between poor and good years are still similar actually supports the notion that WBP in good years still serves to reduce mortality.

The conclusions of Pease and Mattson (1999, p. 964) are similarly flawed. First and foremost, estimating population growth for individual, non-consecutive years, as Pease and Mattson (1999, p. 962) did, is “not legitimate” and results in an “incorrect estimate” (Eberhardt and Cherry 2000, p. 3257). Even assuming their methods of separating out individual, non-consecutive years of data for a species whose reproduction and survival are inextricably linked to multiple, consecutive years (e.g., reproductive status in one year affects status in the following year), many other aspects of their analysis do not reflect the best available science. An important difference between Pease and Mattson (1999, p. 964) and other population growth rate estimates (Eberhardt *et al.* 1994, p. 362, Boyce 1995, Schwartz *et al.* 2006, p. 48, [Interagency Grizzly Bear Study Team 2012, p. 34](#)) is related to their treatment of conflict bears. Pease and Mattson (1999, p. 967) assumed that grizzly bears with any history of conflict would experience lower survival rates associated with conflict bears for the rest of their lives. The findings of Schwartz *et al.* (2006, p.42) challenge this assumption, finding that while survival of conflict bears decreases during the year of the conflict and the next year, survival returns to approximately normal within two years. Meaning, ~~management-trapped~~ bears

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captured because of conflicts often return to foraging on non-human food sources and away from human developments. Another assumption made by Pease and Mattson (1999, p. 967) was that 73 percent of the GYA grizzly bear population were conflict bears, with correspondingly lower survival rates. However, Schwartz *et al.* (2006, p. 39) found only about 28 percent of the GYA grizzly bear population were ever involved in conflicts. Together, these two erroneous assumptions by Pease and Mattson (1996, p. 967) resulted in ~~their conclusions being a~~ gross underestimation of population trend. As a result, Pease and Mattson (1996) is not considered the best available science.

Comment [FTvM117]: Given what we changed above, this now seems out of context. We're not sure where it best fits now, but do see value in addressing these issues.

Earlier studies suggested that increased grizzly bear mortalities in poor whitebark pine years are a result of bears roaming more widely in search of foods and exposing themselves to higher mortality risk in roaded habitats at lower elevations. However, Costello et al. (2014, p. 2014) showed that grizzly bears did not roam over larger areas or canvass more area within their fall ranges as whitebark pine declined rapidly starting in the early 2000s and suggested bears found alternative foods within their fall ranges. Furthermore, Bjornlie *et al.* (2014, p. 4) found that home range size has not increased after since whitebark pine ~~decline began declining rapidly in 2002~~ and Schwartz *et al.* (2010, p. 662) found that when bears use lower elevations in ~~bad-poor~~ whitebark pine seed production years, it is the amount of secure habitat that determines mortality risk. Meaning, in both good and ~~bad-poor~~ whitebark pine seed years, survival is determined primarily by levels of secure habitat. Therefore, our approach of maintaining these levels of secure habitat on 98 percent of lands within the PCA and 60 percent of Suitable Habitat outside the PCA provides strong mitigation against any impacts the ~~loss-decline~~

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of whitebark pine may have on this grizzly bear population because the mechanism driving the increased mortality risk is secure habitat, not the presence or absence of whitebark pine.

We recognize that changes in food resources ~~must~~can have some influence on population vital rates. These research questions and results do not refute that possibility but the preponderance of evidence supports the conclusion that bears are finding sufficient alternative food resources to maintain body condition (Schwartz et al. 2012, Interagency Grizzly Bear Study Team 2013). Evidence suggests that the observed changes in population vital rates since the rapid decline of whitebark pine that began in ~~2002~~the early 2000s are being driven by density-dependent effects and have resulted in a stable to slightly increasing population trend. In other words, the population ~~is~~seems to be approaching carrying capacity (van Manen et al. in review). This evidence further supports the recovered status of the GYA grizzly bear population. We now know that although there have been significant changes in food resources in the GYA ~~since 2002~~in the last 15 years, the grizzly bear population has continued to increase and expand during this time.

Comment [FTvM118]: "must" is not necessarily true; competition for space or social interactions could affect vital rates well before food resources.

Comment [FTvM119]: or: "...limited by population density (space) more than being limited by food resources."

While there was some concern that the rapid loss of whitebark pine could result in mortality rates similar to those experienced after the open-pit garbage dumps were closed in the early 1970s (Schwartz *et al.* 2006, p. 42), we now know this has not been the case. This is most likely due to the fact that whitebark pine has never been a spatially or temporally predictable food source on the landscape like the open-pit garbage dumps

were. The dumps were open year round and ~~full-provided of~~ high-calorie foods the entire time. They were in the exact same location every year ~~and,~~ for the entire season. Grizzlies congregated at these known locations in large numbers and in very close proximity to each other and to people. None of these circumstances are true for grizzly bears foraging on whitebark pine seeds.

Greater Yellowstone Area grizzly bears have high diet diversity (Gunther *et al.* 2014, p. 65) and use alternate foods ~~within their home range~~ in years of low whitebark pine seed production. ~~(Costello-Schwartz *et al.* 2014, p. 2013, 2014, pp. 75, 76).~~ Nearly one third of grizzlies in the GYA do not have whitebark pine in their home range, so they do not use this food (Costello *et al.* 2014, p. 2013). Grizzly bears in the GYA that do use whitebark pine are accustomed to successfully finding alternative natural foods in years when whitebark pine seeds are not available and body mass and body fat are not different for good or poor whitebark pine seed years (Schwartz *et al.* 2014, pp. 72–73, 75).

The Study Team will continue to monitor annual production of common foods, grizzly bear/human conflicts, survival rates, reproductive rates, and the causes and locations of grizzly bear mortality, as detailed in the Strategy (U.S. Fish and Wildlife Service 2007, pp. 43–56, 60). These data provide the Strategy's signatory agencies with the scientific information necessary to inform and implement adaptive management (Holling 1978, pp. 11–16) actions in response to ecological changes that may impact the future of the GYA grizzly bear population. These management responses may involve increased habitat protection, increased mortality management, or a status review and

emergency delisting of the population if management actions are unable to address the problems.

In summary, the best scientific and commercial data available regarding grizzly bear responses to food losses suggest this issue is not a substantial threat to the GYA grizzly bear population and is not an impediment to long-term population persistence. Grizzly bears are resourceful omnivores that will make behavioral adaptations regarding food acquisition (Schwartz *et al.* 2013~~34~~, p. 75). Diets of grizzly bears vary among individuals, seasons, ~~and~~ years, and where they reside within the GYA (Mealey 1980, pp. 284–287; Mattson *et al.* 1991a, pp. 1625–1626; Felicetti *et al.* 2003, p. 767; Felicetti *et al.* 2004, p. 499; Koel *et al.* 2005, p. 14; Costello *et al.* 2014, p. 2013; Gunther *et al.* 2014, pp. 66–67), reflecting their ability to find adequate food resources across a diverse and changing landscape. In other nearby areas such as the NCDE (100 miles north of the GYA) whitebark pine has been functionally extinct as a bear food for at least 40 years (Kendall and Keane 2001, pp. 228–232) yet the NCDE grizzly bear population has continued to increase and thrive with an estimated ~~1000~~765 bears in 2013~~04~~ and a subsequent average -3% annual rate of growth (Kendall *et al.* 2009, p. 9; Mace *et al.* 2012, p. 124). Similarly, although whitebark pine seed production and availability of grizzly bear use of cutthroat trout in the Yellowstone Lake area varied dramatically in the GYA over the last three decades due to both natural and human-introduced causes (Reinhart and Mattson 1990, pp. 345–349; Podruzny *et al.* 1999, p. 134–137; Felicetti *et al.* 2004, p. 499; Haroldson *et al.* 2005, pp. 175–178; Haroldson 2014, p. 45; Teisberg *et al.* 2014, pp. 375–376), the GYA grizzly bear population has continued to increase and

Comment [FTvM120]: Actual publication date was 2014.

Comment [FTvM121]: Ursus 11:131-138

Comment [FTvM122]: Ursus 16

Comment [FTvM123]: JWM 78

expand during this time period (Schwartz *et al.* 2006a, p. 66; Interagency Grizzly Bear Study Team 2012, p. 34; Bjornlie *et al.* ~~2013~~2014, p. 184). The GYA grizzly bear population has been coping with the unpredictable nature of whitebark pine seed production for millennia. Grizzly bears are not dependent upon whitebark pine seeds for survival nor are they a species that is specialized on consumption of these seeds. While we know whitebark pine seed production can influence reproductive and survival rates, ~~it does not affect enough individuals it has not to~~ caused a negative population trend, as evidenced by stable to slightly increasing trend between 2002 and 2011 (Interagency Grizzly Bear Study Team 2012, p. 34). As articulated in the Food Synthesis Report by the Study Team (Interagency Grizzly Bear Study Team 2013, pp. 32–35) and supporting studies (Bjornlie *et al.* 2014, Costello *et al.* 2014; Gunther *et al.* 2014), Because of this the demonstrated resiliency to declines in whitebark pine seed production and other high-calorie foods such as cutthroat trout shows that, we conclude changes in food resources are not likely to become substantial impediments to the long-term persistence of the GYA grizzly bear population.

Comment [FTvM124]: Do we really know that? “at least the 20th century” maybe...

Comment [FTvM125]: Of course, this is based on what we know so far; may be different 10 years from now (although probably not very likely).

Climate Change

Our analyses under the Act include consideration of observed or likely environmental changes resulting from ongoing and projected changes in climate. As defined by the Intergovernmental Panel on Climate Change (IPCC), the term “climate” refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods

also may be used (IPCC 2013a, p. 1450). The term “climate change” thus refers to a change in the state of the climate that can be identified by changes in the mean or the variability of relevant properties, which persists for an extended period, typically decades or longer, due to natural conditions (e.g., solar cycles), or human-caused changes in the composition of the atmosphere or in land use (IPCC 2013a, p. 1450).

Scientific measurements spanning several decades demonstrate that changes in climate are occurring. In particular, warming of the climate system is unequivocal, and many of the observed changes in the last 60 years are unprecedented over decades to millennia (IPCC 2013b, p. 4). The current rate of climate change may be as fast as any extended warming period over the past 65 million years and is projected to accelerate in the next 30 to 80 years (National Research Council 2013, p. 5). Thus, rapid climate change is adding to other sources of extinction pressures, such as land use and human-caused mortality, which will likely place extinction rates in this era among just a handful of the severe biodiversity crises observed in Earth’s geological record (AAAS 2014, p. 17).

Comment [FTvM126]: Spell out

Examples of various other observed and projected changes in climate and associated effects and risks, and the bases for them, are provided for global and regional scales in recent reports issued by the IPCC (2013c, 2014), and similar types of information for the US and regions within it are available via the National Climate Assessment (Melillo *et al.* 2014). Results of scientific analyses presented by the IPCC show that most of the observed increase in global average temperature since the mid-20th

century cannot be explained by natural variability in climate and is “extremely likely” (defined by the IPCC as 95–100 percent likelihood) due to the observed increase in greenhouse gas concentrations in the atmosphere as a result of human activities, particularly carbon dioxide emissions from fossil fuel use (IPCC 2013b, p. 17 and related citations).

Scientists use a variety of climate models, which include consideration of natural processes and variability, as well as various scenarios of potential levels and timing of greenhouse gas emissions, to evaluate the causes of changes already observed and to project future changes in temperature and other climate conditions. Model results yield very similar projections of average global warming until about 2030, and thereafter the magnitude and rate of warming vary through the end of the Century depending on the assumptions about population levels, emissions of greenhouse gases, and other factors that influence climate change. Thus, absent extremely rapid stabilization of greenhouse gas emissions at a global level, there is strong scientific support for projections that warming will continue through the 21st century, and that the magnitude and rate of change will be influenced substantially by human actions regarding greenhouse gas emissions (IPCC 2013b, 2014).

Global climate projections are informative, and, in some cases, the only or the best scientific information available for us to use. However, projected changes in climate and related impacts can vary substantially across and within different regions of the world (e.g., IPCC 2013c, 2014), and within the US (Melillo *et al.* 2014). Therefore, we

use “downscaled” projections when they are available and have been developed through appropriate scientific procedures, because such projections provide higher resolution information that is more relevant to spatial scales used for analyses of a given species (see Glick *et al.* 2011, pp. 58–61, for a discussion of downscaling).

The hydrologic regime in the Rocky Mountains has changed and is projected to change further (Bartlein *et al.* 1997, p. 786; Cayan *et al.* 2001, p. 411; Leung *et al.* 2004, p. 75; Stewart *et al.* 2004, pp. 223–224; Pederson *et al.* 2011, p. 1666). The western U.S. may experience milder, wetter winters with warmer, drier summers and an overall decrease in snowpack (Leung *et al.* 2004, pp. 93–94). While some climate models do not demonstrate significant changes in total annual precipitation for the western U.S. (Duffy *et al.* 2006), an increase in “rain on snow” events is expected (Leung *et al.* 2004, p. 93; McWethy *et al.* 2010, p. 55). The amount of snowpack and the timing of snowmelt may also change, with an earlier peak stream flow each spring (Cayan *et al.* 2001, p. 410; Leung *et al.* 2004, p. 75; Stewart *et al.* 2004, pp. 223–224). Although there is some disagreement about changes in the water content of snow under varying climate scenarios (Duffy *et al.* 2006, p. 893), reduced runoff from decreased snowpack could translate into decreased soil moisture in the summer (Leung *et al.* 2004, p. 75). However, Pederson *et al.* (2011, p. 1682) found that increased spring precipitation in the northern Rocky Mountains is offsetting these impacts to total annual stream flow from expected declines in snowpack thus far.

Climate change may result in a number of changes to grizzly bear habitat, including a reduction in snowpack levels, shifts in denning times, shifts in the abundance and distribution of some natural food sources, and changes in fire regimes. 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, p. 4). 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, p. 4).

Because timing of den entry and emergence is at least partially influenced by food availability and weather (Craighead and Craighead 1972, pp. 33–34; Van Daele *et al.* 1990, p. 264), less snowpack would likely shorten the denning season as foods become available later in the fall and earlier in the spring. In the GYA, Haroldson *et al.* (2002, pp. 34–35) reported later den entry times for male grizzlies corresponding with increasing November temperatures from 1975 to 1999. This increased time outside of the den could increase the potential for conflicts with humans (Servheen and Cross 2010).

Climate change could create temporal and spatial shifts in grizzly bear food sources (Rodriguez *et al.* 2007). Changes in plant community distributions have already been documented, with species' ranges shifting further north and higher in elevation due to environmental constraints (Walther *et al.* 2002; Walther 2003; Walther *et al.* 2005) or outbreaks of insects or disease (Bentz *et al.* 2010). Decreased snowpack could lead to fewer avalanches thereby reducing avalanche chutes, an important habitat component to

--INTERNAL DELIBERATIVE MATERIAL --Not for Distribution --

grizzlies, across the landscape. However, increases in “rain on snow” events may decrease the stability of snowpack resulting in increases in avalanches. Changes in vegetative food distributions also may influence other mammal distributions, including potential prey species like ungulates. While the extent and rate to which individual plant species will be impacted is difficult to foresee with any level of confidence (Walther *et al.* 2002; Fagre *et al.* 2003), there is general consensus that grizzly bears are flexible enough in their dietary needs and niche that they will not be impacted directly by ecological constraints such as shifts in food distributions and abundance (Servheen and Cross 2010, p. 4).

Fire regimes can affect the abundance and distribution of some vegetative bear foods (e.g., grasses, berry-producing shrubs) (LeFranc *et al.* 1987, p. 150). For instance, fires can reduce canopy cover which usually increases berry production. However, on steep south or west slopes, excessive canopy removal due to fires or vegetation management may decrease berry production through subsequent moisture stress and exposure to sun, wind, and frost (Simonin 2000). Fire frequency and severity may increase with late summer droughts predicted under climate change scenarios (Nitschke and Innes 2008, p. 853; McWethy *et al.* 2010, p. 55). Increased fire frequency has the potential to improve grizzly bear habitat, with low to moderate severity fires being the best. For example, fire treatment most beneficial to huckleberry shrubs is that which results in damage to stems, but does little damage to rhizomes (Simonin 2000). High intensity fires may reduce grizzly bear habitat quality immediately afterwards by decreasing hiding cover and delaying regrowth of vegetation ~~but~~ although Blanchard and

Comment [FTvM127]: The Food Synthesis Report also provides strong support for the **general** notion (not related to climate change per se) of dietary plasticity (p. 35), which seems relevant here:

“..... evidence from the analyses presented here suggests that whitebark pine decline has had no profound negative effects on grizzly bears at the individual or population level. The findings of analyses presented here indicate that the Yellowstone grizzly bear population has shown notable resilience in the face of decline of whitebark pine and natural stochasticity of other food resources within the GYE. Grizzly bears obtained sufficient alternative foods through diet shifts and have maintained body mass and percent body fat over time.”

Knight (1996, p. 121) found that increased production of forbs and root crops in the years following the high intensity, widespread Yellowstone fires of 1988 benefited grizzly bears. We do not anticipate altered fire regimes will have significant negative impacts on grizzly bear survival or reproduction, despite its potential effects on vegetation.

Comment [FTvM128]: Need to clarify link with the data presented previously.

Public Support & Human Attitudes

Public support is paramount to any successful large carnivore conservation program (Servheen 1998, p. 67). Historically, human attitudes played a primary role in grizzly bear population declines by promoting a culture and government framework that encouraged excessive, unregulated human-caused mortality. Through government-endorsed eradication programs and perceived threats to human life and economic livelihood, humans settling the West were able to effectively eliminate most known grizzly populations after only 100 years of westward expansion.

We have seen a change in public perceptions and attitudes toward the grizzly bear in the last several decades. The same government that once financially supported active extermination of the bear now uses its resources to protect the great symbol of American wildness. This change in government policy and practice is a product of changing public attitudes about the grizzly bear. Although attitudes about grizzlies vary geographically and demographically, there has been a revival of positive attitudes toward the grizzly bear and its conservation (Kellert *et al.* 1996, pp. 983–986).

Public outreach presents a unique opportunity to effectively integrate human and ecological concerns into comprehensive programs that can modify societal beliefs about, perceptions of, and behaviors toward grizzly bears. Attitudes toward wildlife are shaped by numerous factors including basic wildlife values, biological and ecological understanding of species, perceptions about individual species, and specific interactions or experiences with species (Kellert 1994, pp. 44–48; Kellert *et al.* 1996, pp. 983–986). I & E programs teach visitors and residents about grizzly bear biology, ecology, and behavior, and enhance appreciation for this large predator while dispelling myths about its temperament and feeding habits. Effective I & E programs have been an essential factor contributing to the recovery of the GYA grizzly bear population since its listing in 1975. By identifying values common to certain user groups, the I & E working group can disseminate appropriate materials and provide workshops catered to these values. By providing general information to visitors and targeting specific user groups about living and working in grizzly country, we believe continued coexistence between grizzly bears and humans will be accomplished.

Traditionally, residents of the GYA involved in resource extraction industries such as loggers, miners, livestock operators, and hunting guides, are opposed to land-use restrictions ~~which that~~ place the needs of the grizzly bear above human needs (Kellert 1994, p. 48; Kellert *et al.* 1996, p. 984). Surveys of these user groups have shown that they tolerate large predators when they are not seen as direct threats to their economic stability or personal freedoms (Kellert *et al.* 1996, p. 985). Delisting could increase acceptance of grizzly bears by giving local government and private citizens more

discretion in decisions that affect them. Increased flexibility regarding depredating bears in areas outside of the PCA may increase tolerance for the grizzly bear by landowners and livestock operators.

Ultimately, the future of the grizzly bear will be based on the people who live, work, and recreate in grizzly habitat and the willingness and ability of these people to learn to coexist with the grizzly and to accept this animal as a cohabitant of the land.

Other management strategies are unlikely to succeed without ~~useful-effective~~ and innovative public I & E programs. The objective of the public outreach program is to proactively address ~~grizzly bear/human grizzly/human~~ conflicts by informing the public about the root causes of these conflicts and providing suggestions on how to prevent them. By increasing awareness of grizzly bear behavior and biology, we hope to enhance public involvement and appreciation of the grizzly bear.

Comment [FTvM129]: I think it would be important to also point out additional programs the states have established to prevent conflict: carcass removal (in WY); electric fencing subsidies or construction support for apiaries, orchards, cattle feed, etc.; subsidies for bear-proof garbage management in GYA communities. These programs can be very effective because they are targeted towards key constituents directly affected by grizzly bears.

Although ~~many-some~~ human-caused grizzly bear mortalities are unintentional (e.g., vehicle collisions, trap mortality), intentional deaths in response to grizzly bear/human conflicts are responsible for the majority of known and probable human-caused mortalities. Fortunately, this source of mortality can be reduced significantly if adequate I & E is provided to people who live, work, and recreate in occupied grizzly bear habitat and proper management infrastructure is in place (Linnell *et al.* 2001, p. 345). For example, even though more than three million people visit the National Parks and National Forests of the GYA each year, (USDA Forest Service 2006a, pp. 176, 183, 184; Cain 2014, p. 46; Gunther 2014, p. 47), the average number of

conflicts per year between 1992 and 2010 was only 150 (Gunther *et al.* 2012, p. 51). The current I & E working group has been a major component contributing to the successful recovery of the GYA grizzly bear population over the last 30 years. Both Federal and State management agencies are committed to continuing to work with citizens, landowners, and visitors within the Yellowstone DPS boundaries to address the human sources of conflicts.

From 1980 through 2002, at least 36 percent (72 out of 196) of human-caused grizzly bear mortalities could have been avoided if adequate I & E materials had been presented, understood, and used by involved parties (Servheen *et al.* 2004, p. 15).

Educating back-country and front-country users about the importance of securing potential bear attractants can reduce grizzly bear mortality risk. Similarly, adhering to hiking recommendations, such as making noise, hiking with other people, and hiking during daylight hours, can further reduce grizzly bear mortalities by decreasing the likelihood that hikers will encounter bears. Hunter-related mortalities may involve hunters defending their life because of carcasses that are left unattended or stored improperly. Grizzly bear mortalities also occur when hunters mistake grizzly bears for black bears. All of these circumstances can be further reduced through I & E programs.

Outside the PCA, State wildlife agencies recognize that the key to preventing grizzly bear/human conflicts is providing I & E to the public. State grizzly bear management plans also acknowledge that this is the most effective long-term solution to grizzly bear/human conflicts and that adequate public outreach programs are paramount

Comment [FTvM130]: Can you really make this claim? They had the *potential* to be avoided, correct?

Comment [FTvM131]: Is "appropriate" a more accurate term here?

to ongoing grizzly bear survival and successful coexistence with humans in the GYA so that the measures of the Act continue to not be necessary. All three States have been actively involved in I & E outreach for over a decade and their respective management plans contain chapters detailing efforts to continue current programs and expand them when possible. For example, WGFD created a formal ~~grizzly bear/human~~~~human/grizzly bear~~ conflict management program in July 1990 and has coordinated an extensive I & E program since then. Similarly, since 1993, the MTFWP has implemented countless public outreach efforts to minimize bear/human conflicts, and the IDFG has organized and implemented education programs and workshops focused on private and public lands on the western ~~edge-periphery~~ of grizzly bear ~~habitat~~~~range~~.

Compensating ranchers for losses caused by grizzly bears is another approach to build support for coexistence between livestock operators and grizzly bears. In cases of grizzly bear livestock depredation that have been verified by USDA Animal and Plant Health Inspection Service Wildlife Services, IDFG, MTFWP, or WGFD, affected livestock owners are compensated. Since 1997, compensation in Montana and Idaho has been provided primarily by private organizations, principally Defenders of Wildlife. Since the program's inception in 1997, the Defenders of Wildlife Grizzly Bear Compensation Trust paid over \$400,000 to livestock operators in the northern Rockies for confirmed and probable livestock losses to grizzly bears (Edge 2013). In 2013, the State of Montana passed legislation establishing a compensation program for direct livestock losses caused by grizzly bears (MCA 2-15-3113). In light of this legislation, Defenders of Wildlife stopped their compensation program in Montana and redirected

funds to other conflict prevention programs. Defenders continues to compensate livestock producers in Idaho. In Wyoming, compensation has always been paid directly by the State. Upon delisting, both Idaho and Wyoming's grizzly bear management plans call for State funding of compensation programs (Idaho's Grizzly Bear Delisting Advisory Team 2002, p. 16; WGFD 2005, p. 30). In Idaho, compensation funds will come from the secondary depredation account, and the program will be administered by the appropriate IDFG Regional Landowner Sportsman Coordinators and Regional Supervisors (Idaho's Grizzly Bear Delisting Advisory Team 2002, p. 16). In Wyoming, the WGFD will pay for all compensable damage to agricultural products as provided by State law and regulation (WGFD 2005, p. 30). The WGFD will continue efforts to establish a long-term funding mechanism to compensate property owners for livestock and apiary losses caused by grizzly bears. In Montana, long-term funding to compensate livestock owners for direct kills has been secured through the general fund. A long-term funding source has not been identified for conflict prevention projects but is being actively pursued.

Summary of Factor E

The following factors warranted consideration as possible threats to the GYA grizzly bear population: (1) genetic concerns, (2) potential changes in food resources, (3) climate change, and (4) human attitudes toward grizzly bear recovery. We do not consider genetic concerns to be a substantial threat for the following reasons: we have an effective population size nearly double that recommended by the literature; we know

--INTERNAL DELIBERATIVE MATERIAL --Not for Distribution --

levels of genetic diversity have not declined in the last century; we know current levels of genetic diversity are sufficient to support healthy reproduction and survival; and we know ~~novel~~ genetic material from individual bears outside of the GYA will not be necessary for the next several decades (Miller and Waits 2003, p. 4338). We do not anticipate that genetic issues will affect grizzly bears in the foreseeable future because of ongoing efforts to restore natural connectivity and a commitment to translocate animals in the future, if needed, as provided in the Conservation Strategy. Changing climate conditions have the potential to affect grizzly bear habitat with subsequent implications for grizzly bear/human~~grizzly bear/human~~ conflicts. While we do not consider climate change a direct threat to grizzly bear habitat in the GYA, it could influence the timing and frequency of some grizzly bear/human conflicts with possible increases in grizzly bear mortality. This possible increase in grizzly bear mortality risk should not be a substantial threat because of the coordinated, ecosystem-wide population standards and mortality limits within the DMA. Because of the resiliency the GYA grizzly bear population has shown to declines in whitebark pine seed production and other high-calorie foods since the early 1990s, we do not expect changes in food resources to become substantial impediments to the long-term persistence of the GYA grizzly bear population. Finally, we do not anticipate human attitudes becoming a substantial threat to the GYA grizzly bear population because of effective outreach programs and established regulatory frameworks. Essentially, the management response to all of these potential threats would be to limit human-caused mortality through conflict prevention and management or limit discretionary mortality. Because of the manageable nature of these potential threats through conflict prevention and response efforts and the large ~~amount~~area of suitable,

Comment [FTvM132]: May be helpful to be specific.

secure habitat within the GYA, we do not expect these to become substantial threats to the GYA grizzly bear population.

Cumulative Effects of Factors A Through E

Many of the threats faced by grizzlies are interrelated and could be synergistic. Principal threats discussed above include habitat loss through road building and the resulting increased human access to grizzly bear habitat, human-caused mortality of grizzly bears, and the legal mechanisms that direct habitat and population management. The principal threats assessed in previous sections may cumulatively impact the GYA grizzly bear population beyond the scope of each individual threat. For example, the loss of whitebark pine could lead to lower survival rates at the same time of the year when grizzlies are vulnerable to human-caused mortality from elk hunting. Alternatively, expected increases in human populations across the West and climate change both have the potential to increase grizzly bear conflicts and human-caused mortality. Historically, each of these factors impacted grizzly bears in the GYA and cumulatively acted to reduce their range and abundance over time. Today, these stressors have been adequately mitigated and do not impact the GYA grizzly bear population with the same intensity.

While these numerous stressors on grizzly bear persistence are challenging to conservation, our experience demonstrates it is possible for large carnivore conservation to be compatible with them (Linnell *et al.* 2001, p. 48). Despite these risks, the **best available information** indicates the GYA grizzly bear population's trend and range has

Comment [FTvM133]:

Note: I made this comment but realize this IS covered on page 153 ...so you can mostly ignore my comment here

One thing that may need to be emphasized (but probably earlier) is that there are essentially 3 methods that show similar patterns of population trend, and none indicating a decline:

- 1) Estimation of trend based on model-averaged Chao2
- 2) Estimation of Lambda based on known-fate analyses
- 3) Estimation of trend based on mark-resight analysis

We could even add (using *in litt.*):

- 4) Population reconstruction

and maybe even:

- 5) Effective population size over time

With these methods showing similar trends, there is a lot of power behind this argument. IF you feel it is warranted to make this argument, we can help with proper citations and wording.

been increasing. We consider estimates of population trend (i.e., “lambda”) to be the ultimate metric to assess cumulative impacts to the population. It reflects all of the various stressors on the population and provides a scientific basis to correct a negative trend. This calculation reflects all sources of mortality, changes in habitat quality, changes in population density, change in range, displacement effects, etc. In other words, there will always be threats to the GYA grizzly bear population that lead to human-caused mortality or displacement but if these are not causing the population to decline, we ~~do~~ can not consider them substantial.

Comment [FTvM134]: I suggest leaving the term lambda off here.

Summary of Factors Affecting the Greater Yellowstone Area Grizzly Bear Population

The primary factors related to past habitat destruction and modification have been reduced through changes in management practices that have been or will be formally incorporated into regulatory documents. Maintenance of the 1998 baseline values for secure habitat, developed sites on public lands, and livestock allotments inside the PCA will adequately ameliorate the multitude of stressors on grizzly bear habitat such that they do not become substantial threats to the GYA grizzly bear population in the foreseeable future. We expect many of the threats discussed under Factor A to continue to occur at some level but they are sufficiently ameliorated so they only affect a small proportion of the population. If and when delisting occurs, the GYA National Forests and National Parks will continue to implement and maintain the 1998 baseline. Together, these two Federal agencies manage 98 percent of lands within the PCA and 88 percent of all Suitable Habitat within the DPS boundaries. Suitable Habitat outside the PCA provides

Comment [FTvM135]: This is put in future tense but I would also argue that the documented status and trend of the population since 1998, despite substantial ecosystem changes, provides strong evidence of the effectiveness of the 1998 baseline.

I see now you essentially mention this on next page, so this is OK.

additional ecological resiliency and habitat redundancy to allow the population to respond to environmental changes. Habitat protections specifically for grizzly bear conservation are not necessary here because other binding regulatory mechanisms that limit development and motorized use are already in place for nearly 60 percent of the area outside the PCA. These and other conservation measures discussed in the USDA Forest Service's Record of Decision (2006b) ensure threats to the GYA grizzly bear population's habitat outside the PCA will not become substantial enough to threaten this population's long-term persistence. Despite these factors related to habitat, the population has increased and stabilized while its occupied range has expanded. Therefore, based on the best available information and expectation that current management practices will continue into the future, we conclude that the present or threatened destruction, modification, or curtailment of its habitat or range does not constitute a substantial threat to the GYA grizzly bear population and is not expected to in the future.

Comment [FTvM136]: Unclear what this refers to.

When grizzly bears were listed in 1975, we identified "indiscriminate illegal killing," and management removals as threats to the population. In response, we implemented demographic recovery criteria to maintain a minimum population size, a well-distributed population, and establish mortality limits based on scientific data and direct monitoring of the population. -Since implementing these criteria, the GYA grizzly bear population has tripled in size and range (Eberhardt *et al.* 1994, pp. 361–362; Knight and Blanchard 1995, pp. 2–11; Boyce *et al.* 2001, pp. 1–11; Schwartz *et al.* 2006, p.48; Pyare *et al.* 2004, pp. 5–6; Schwartz *et al.* 2006a, pp. 64–66; Interagency Grizzly Bear

Study Team 2012, p. 34; Bjornlie *et al.* ~~2013~~2014, p. 184). Although humans are still directly or indirectly responsible for the majority of grizzly bear deaths, this source of mortality is effectively mitigated through science-based management, monitoring, and outreach efforts. Although grizzly bear hunting is anticipated to occur outside of the national parks, it would be within scientifically determined sustainable levels to maintain a stable population that do not result in the long-term population decline and would not occur if other sources of human-caused mortality were excessive. Therefore, based on the best available information and expectation that current management practices will continue into the future, we conclude that disease, human-caused mortality, and hunting do not constitute substantial threats now or in the future.

Comment [RS137]: Placeholder. Partners need to review this language.

The importance of regulatory mechanisms and effective wildlife management infrastructure to large carnivore conservation cannot be understated (see Linnell *et al.* 2001, p. 348). Before delisting could occur, ~~the~~ regulatory mechanisms that would be in place ~~before delisting could occur~~ include National Park Superintendent's Compendiums, the USDA Forest Service Amendment for Grizzly Bear Habitat Conservation for the GYA National Forests, and State and Tribal commission regulations. The management infrastructure is already in place and described in the Strategy. Because the signatory agencies to the Strategy are the same agencies that have been managing grizzly bear habitat, population, and monitoring for the last 30 years, it would be a seamless transition. Existing regulatory mechanisms, and those that would be in place before this proposed rule was finalized, would ensure the GYA grizzly bear population continues to experience long-term population stability

Other factors we considered that could become threats to the GYA grizzly bear population included: (1) genetic concerns, (2) potential changes in food resources, (3) climate change, and (4) human attitudes toward grizzly bear recovery. Essentially, the management response to all of these potential threats would be to limit human-caused mortality through conflict prevention and management or limit discretionary mortality. Because of the manageable nature of these potential threats through conflict prevention and response efforts and the large amount of suitable, secure habitat within the GYA, we do not expect these to become substantial threats to the GYA grizzly bear population.

Many of the threats faced by grizzlies are interrelated and could cumulatively impact the GYA grizzly bear population through excessive grizzly bear mortality. While these numerous stressors on grizzly bear persistence are challenging to conservation, our experience demonstrates it is possible for large carnivore conservation to be compatible with them (Linnell *et al.* 2001, p. 48), particularly given the rigorous scientific monitoring protocols established for the GYA population. There will always be threats to the GYA grizzly bear population that lead to human-caused mortality or displacement but if these are not causing the population to decline, we do not consider them to substantially threaten the long-term persistence of the population. ▸

Finding

An assessment of the need for a species' protection under the Act is based on whether a species is in danger of extinction or likely to become so because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. As required by section 4(a)(1) of the Act, we conducted a review of the status of this species and assessed the five factors to evaluate whether the GYA grizzly bear population is endangered or threatened throughout all of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by the species.

In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the exposure causes actual impacts to the species. If there is exposure to a factor and the species responds negatively, the factor may be a threat and we then attempt to determine how significant the threat is. If the threat is significant, it may drive, or contribute to, the risk of extinction of the species such that the species warrants listing as endangered or threatened as those terms are defined by the Act. Alternatively, some threats may be significant enough to contribute to the risk of extinction but are adequately ameliorated through active conservation and management efforts so that the risk is low enough that it does not mean the species is in danger of extinction or likely to become so.

As demonstrated in our 5-factor analysis, threats to this population and its habitat have been sufficiently minimized and the GYA grizzly bear population is a biologically recovered population. Multiple, independent lines of evidence support this interpretation. Counts of females with cubs-of-the-year have increased. In 2013, the estimate of unique females with cubs-of-the-year within the entire GYA was 58 (Haroldson *et al.* 2014, p. 15). This is the highest count ever recorded. The Recovery Plan target for the number of females with cubs-of-the-year has been exceeded since 1988. Calculations of population trajectory derived from radio-monitored female bears show an increasing population trend at a rate of 4 to 7 percent per year ~~between from~~ 1983 ~~and through~~ 2002¹ (Eberhardt *et al.* 1994, p. 362; Knight and Blanchard 1995, pp. 18–19; Schwartz *et al.* 2006, p. 48) and 0.3 to 2.2 percent ~~between from~~ 2002 ~~and to~~ 2011 (Interagency Grizzly Bear Study Team 2012, p. 34). ~~Occupied G~~grizzly bear range ~~and distribution~~ has more than tripled since 1975 (Basile 1982, pp. 3–10; Blanchard *et al.* 1992, p. 92; Schwartz *et al.* 2002, p. 203; Pyare *et al.* 2004, pp. 5–6; Schwartz *et al.* 2006a, pp. 64–66; Bjornlie *et al.* 2013, p. 184). Independent female survival rates, the single most important cohort to population trajectory, are high (Interagency Grizzly Bear Study Team 2012, p. 33) ~~and have remained unchanged for 3 decades (Interagency Grizzly Bear Study Team 2012, p. 33)~~. In total, this population has increased from estimates ranging between 230 and 312 bears when listed in 1975 (Cowan *et al.* 1974, pp. 32, 36; Craighead *et al.* 1974, p. 16; McCullough 1981, p. 175) to at least 740 animals as of 2013 (Haroldson *et al.* 2013, p. 16, Haroldson *et al.* 2014, p. 17).

Grizzly bears now occupy 84 percent of Suitable Habitat within the DPS boundaries and will likely occupy the remainder of the Suitable Habitat within the foreseeable future. The GYA grizzly bear population has sufficient numbers and distribution of reproductive individuals to maintain its recovered status. The main threat of human-caused mortality has been addressed through carefully monitored and controlled mortality limits established in the Grizzly Bear Recovery Plan and carried over into the Strategy (U.S. Fish and Wildlife Service 2007, p. 126). These mortality limits are calculated to ensure long-term population stability over time.

During our analysis, we did not identify any factors that are likely to reach a magnitude that would threaten the continued existence of the species. ~~S-and~~ significant threats identified at the time of listing that could have resulted in the extirpation of the population have been eliminated or reduced since listing. We conclude that known impacts to the GYA grizzly bear population from the loss of secure habitat and development on public lands (Factor A); unregulated, excessive human-caused mortality (Factors B and C); a lack of regulatory mechanisms to manage habitat and population (Factor D); and genetic isolation, changes to food resources, climate change, or negative public attitudes (Factor E), do not rise to a level of significance, such that the population is in danger of extinction now or in the foreseeable future. Thus, based on the best scientific and commercial information available and our expectation that current management practices will continue into the future, our analysis indicates that the GYA grizzly bear population is not likely to become an endangered species within the

foreseeable future and does not, therefore, meet the definition of a threatened or endangered species.

Significant Portion of Range

Having examined the status of the GYA grizzly bear population throughout all its range, we next examine whether it is in danger of extinction in a significant portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose in analyzing portions of the range that have no reasonable potential to be significant or in analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) the portions may be “significant” *and* (2) the species may be in danger of extinction there or likely to become so within the foreseeable future.

Depending on the biology of the species, its range, and the threats it faces, it might be more efficient to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not “significant,” we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is “significant.” In practice, a key part of the determination that a species is in danger of extinction in a significant portion of its range is whether the

threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats to the species occurs only in portions of the species' range that clearly would not meet the biologically based definition of "significant," such portions will not warrant further consideration.

We considered the "range" of the GYA grizzly bear population to be the most recent estimate of occupied habitat. The range of the GYA grizzly bear population has more than tripled since its listing in 1975, from 15,424 sq km (Schwartz *et al.* 2002, p. 207) to 50,280 sq km (Bjornlie *et al.* ~~2013~~2014, p. 184). Next, we considered whether any portions of this range were significant.

We determined whether a portion of the population's range is significant based on the biological needs of the species and the nature of the threats to the species. After careful examination of the GYA grizzly bear population in the context of our definition of "significant portion of its range," we have determined all Suitable Habitat (as per our definition above) in the DPS boundaries is significant (see Figure 1). We did not consider areas of the population's range outside of Suitable Habitat significant because these areas will likely never contribute meaningfully to the GYA grizzly bear population due to habitat conversion and loss of traditional, natural grizzly bear foods (i.e., bison). Therefore, we did not need to determine if grizzly bears were threatened or endangered in these areas of unsuitable habitat. We conducted our threats analysis in all Suitable

Habitat and determined the GYA grizzly bear population is not threatened or endangered across all of its significant range.

After determining the GYA grizzly bear population was not threatened or endangered in all of its range, we then considered if there were areas within the significant range where threats were geographically concentrated in some way that would indicate the population could be threatened or endangered in that area. We know more grizzly bear mortality occurs toward the periphery of its range, as evidenced by lower population growth rates in these areas (Schwartz *et al.* 2006b, p. 58; Interagency Grizzly Bear Study Team 2012, p. 34) and higher numbers of conflicts (see Gunther *et al.* 2012, p. 50). Because these mortalities have the potential to disproportionately affect the population generally contained within Suitable Habitat, the Study Team recommended adding an additional 1,503 sq mi (3,893 sq km) to the DMA within which we count population size, distribution, and establish mortality limits ([Interagency Grizzly Bear Study Team 2012, pp. 41–43](#)). In response, we included these areas identified by the Study Team in the DMA and do not consider grizzly bears in these areas to be threatened or endangered.

We have carefully assessed the best scientific and commercial data available and determined that the GYA grizzly bear population is no longer in danger of extinction throughout all or a significant portion of its range, nor is it likely to become so in the future. As a result of this determination, we are proposing to remove this population from the list of endangered and threatened species under the Act.

Effects of the Rule

This proposal, if made final, would revise 50 CFR 17.1(B) to remove the GYA grizzly bear DPS from the Federal List of Endangered and Threatened Wildlife. The prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, would no longer apply to this species. Federal agencies would no longer be required to consult with the Service under section 7 of the Act in the event that activities they authorize, fund, or carry out may affect the GYA grizzly bear population. However, actions within the PCA would still be managed by State, Tribal, and Federal laws, regulations, policies, and management plans ensuring enforcement of the Strategy. Delisting the GYA grizzly bear DPS is expected to have positive effects in terms of management flexibility to the States and local governments. The full protections of the Act would still continue to apply to grizzly bears in other portions of the lower 48-States outside the Yellowstone DPS boundaries. Those grizzly bears will remain fully protected by the Act. There is no designated critical habitat for this species.

Post-Delisting Monitoring

Section 4(g)(1) of the Act requires us to implement a system in cooperation with the States, to monitor for at least 5 years -all delisted and recovered species. The primary purpose of this requirement is to ensure that the recovered species does not deteriorate, and if an unanticipated decline is detected, to take measures to halt the decline to avoid

relisting. If data indicate that protective status under the Act should be reinstated, we will initiate listing procedures, including, if appropriate, emergency listing. For the GYA grizzly bear population, the Conservation Strategy serves as the post-delisting monitoring plan. The Strategy will remain in effect beyond the five-year monitoring period required by the Act as grizzly bears are a “conservation-reliant” species (Scott *et al.* 2005, p. 384) because of their low resiliency to excessive human-caused mortality and the manageable nature of this threat. Conservation-reliant species can maintain self-sustaining wild populations with ongoing management actions (Scott *et al.* 2005, p. 383). These management actions are informed by all the habitat and population parameters that will be monitored by the Study Team annually.

Monitoring

To ensure the long-term conservation of grizzly bear habitat and continued recovery of the GYA grizzly bear population, several monitoring programs and protocols have been developed and integrated into land management agency planning documents. The Strategy and appended State grizzly bear management plans satisfy the requirements for having a Post-Delisting Monitoring Plan for the GYA grizzly bear population. Monitoring programs and a coordinated approach to management would continue in perpetuity. Monitoring programs will focus on assessing whether demographic and habitat standards described in the Strategy are being achieved.

Within the Primary Conservation Area, the Study Team will continue to monitor habitat standards and adherence to the 1998 baseline. The Study Team will report on levels of secure habitat, developed sites, and livestock allotments annually and these will not be allowed to deviate from 1998 baseline values (USDA Forest Service 2006b, entire; Yellowstone National Park 2014, p. 18). The Study Team, with participation from Yellowstone National Park, the USDA Forest Service, and State and Tribal wildlife agencies, also will continue to monitor the abundance and distribution of common grizzly bear foods. This allows managers some degree of predictive power to anticipate and avoid grizzly bear/human conflicts related to a shortage of one or more foods in a given season.

Within the DMA, the Study Team will continue to document population trends, distribution, survival and birth rates, and the presence of alleles from grizzly populations outside the Yellowstone DPS boundaries to document gene flow into the population. Throughout the DPS boundaries, locations of grizzly bear mortalities on private lands will be provided to the Study Team for incorporation into their Annual Report. To examine reproductive rates, survival rates, causes of death, and overall population trends, the Study Team will radio collar and monitor a minimum of 25 adult female grizzly bears every year. These bears will be spatially distributed throughout the ecosystem so they provide a representative sample of the entire population inside the DMA.

Outside of the Primary Conservation Area, the GYA National Forests will monitor agreed-upon habitat parameters in Suitable Habitat and will calculate secure

habitat values outside of the PCA every two years and submit these data for inclusion in the Study Team's annual report (USDA Forest Service 2006b, p. 6). The GYA National Forests also will monitor and evaluate livestock allotments for recurring conflicts with grizzly bears in Suitable Habitat outside the PCA (USDA Forest Service 2006b, p. 6). The Greater Yellowstone Whitebark Pine Monitoring Group will continue to monitor whitebark pine occurrence, productivity, and health both inside and outside the PCA (USDA Forest Service 2006b, p. 7). Members of the Study Team will monitor grizzly bear vital rates and population parameters outside of the PCA. Finally, State wildlife agencies will provide known mortality information to the Study Team, which will annually summarize ~~this~~-these data with respect to location, type, date of incident, and the sex and age of the bear for the DPS area.

Comment [FTvM138]: But inside the DMA, correct?

In the 2007 Delisting Rule, we reported habitat quality and effectiveness values for 1998 using the Cumulative Effects Model and associated 1998 habitat data (U.S. Fish and Wildlife Service 2007, pp. 52–53). Since 1998, the value of the Cumulative Effects Model has been questioned (Boyce *et al.* 2001, p. 32). Specifically, the validity of all the coefficients cannot be verified or ground-truthed, calling into question all of the model outputs. Without scientific and statistical defensibility the Cumulative Effects Model will not produce credible results and it cannot be used (Boyce *et al.* 2001, p. 32; Brocowski 2006, pp. 85–87). While the Cumulative Effects Model provided an index of relative change in habitat quality over time, it was never able to predict grizzly bear habitat use or preference or relate habitat to changes in population parameters. Because we no longer consider the Cumulative Effects Model to represent the best available science, we are no

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longer relying on or reporting measures of habitat quality or effectiveness using it.

Instead, the Study Team will assess and report ~~and mitigate~~ human-caused changes to grizzly bear habitat through maintenance of the 1998 baseline values for developed sites, grazing allotments, and secure habitat.

Comment [FTvM139]: IGBST wouldn't mitigate; other than, that this statement is OK with me.

Comment [RS140]: Placeholder: have study team review

While the inverse relationship between whitebark pine cone production and grizzly conflicts in the Yellowstone Ecosystem has been documented (Mattson *et al.* 1992, p. 436; Gunther *et al.* 1997, p. 38; Gunther *et al.* 2004, pp. 13–14), there are no data relating other foods such as spring ungulate carcasses, cutworm moths, and cutthroat trout to the number of grizzly bear/human conflicts. Additionally, Schwartz *et al.* (2010, p.662) found no relationship between the spatial distribution of whitebark pine, cutthroat trout, army cutworm moths, or ungulates and grizzly bear survival. Therefore, while it is important to continue to monitor food abundance, there is no scientific evidence that habitat quality is a limiting factor for grizzly bear survival in the GYA. The Study Team will continue coordinating with the National Forests and National Parks within the PCA to monitor food abundance but will focus management recommendations on regulating the risk of human-caused mortality through the 1998 baseline (i.e., factors the agencies have the authority and ability to regulate). Private land development and the numbers, causes, and spatial distribution of human-bear conflicts will continue to be monitored and reported annually, because this is where habitat quality intersects with grizzly bear mortality risk.

Comment [FTvM141]: Better to be specific; we don't really know how habitat quality might affect reproduction, which could be a limiting factor.

To address the possible “lag effect” associated with slow habitat degradation taking a decade or more to translate into detectable changes in population size (see Doak 1995), the Study Team will monitor a suite of indices simultaneously to provide a highly sensitive system to monitor the health of the population and its habitat and to provide a sound scientific basis to respond to any changes or needs with adaptive management actions (Holling 1978, pp. 11–16). This “lag effect” is only a concern if the sole method to detect changes in habitat is monitoring changes in total population size (see Doak 1995, p. 1376). The monitoring systems in the Strategy (U.S. Fish and Wildlife Service 2007, pp. 25-60) are far more detailed and sophisticated and would detect changes in vital rates in response to habitat changes sooner than the system described by Doak (1995, pp. 1371-1372). Since the Study Team will be monitoring a suite of vital rates including survival of radio-collared bears, mortality of all bears, reproductive success, litter size, litter interval, number of females with cubs, distribution of females with cubs, and overall population trajectory, in addition to the physical condition of bears by monitoring body mass and body fat levels ~~in~~of each bear handled; we feel confident that we will be able to detect the consequences of significant changes in habitat.

Monitoring systems in the Strategy allow for adaptive management (Holling 1978, pp. 11–16) as environmental issues change. The agencies have committed in the Strategy to be responsive to the needs of the grizzly bear through adaptive management (Holling 1978, pp. 11–16) actions based on the results of detailed annual population and habitat monitoring. These monitoring efforts would reflect the best scientific and commercial data and any new information that has become available since this delisting

Comment [RS142]: 9th circuit grizzly case says we can't invoke adaptive mgmt.. if we don't include measurable triggers tied to clear mgmt.. responses. Limiting 100% discretionary mortalities (i.e., hunting) is about the only “concrete” management response to anything. This is what would happen while the Study Team and partners tried to figure out if other habitat measures would be helpful. But the only way to directly limit take is through limiting hunting. (or emergency relisting of course but that would result in the exact same scenario...no hunting)

determination. The entire process would be dynamic so that when new science becomes available it will be incorporated into the management planning and monitoring systems outlined in the Strategy (U.S. Fish and Wildlife Service 2007, pp. 5–6). The results of this extensive monitoring would allow wildlife and land managers to identify and address potential threats preemptively, allowing those managers and the Service to ensure that the GYA grizzly bear population remains a recovered population.

Triggers for a Study Team Biology and Monitoring Review

The Coordinating Committee will use the Study Team’s monitoring results and annual reports to determine if the population and habitat standards are being adhered to. The States, Tribes, and National Parks will use the Study Team’s annual reports to set and establish sustainable mortality limits within the DMA. The Strategy signatories have agreed that if there are deviations from any population or habitat standard, the Study Team will conduct a Biology and Monitoring Review. A Biology and Monitoring Review would be initiated and grizzly bear hunting within the DMA (if it was occurring) would be stopped by any of the following triggers: (1) exceedance of the total mortality limit for independent females for two consecutive years; (2) exceedance of the total mortality limits for independent males or dependent young for three consecutive years; (3) failure to meet the distribution criterion in two consecutive years; (4) failure to meet any of the habitat standards described in the Strategy pertaining to levels of secure habitat, developed sites, and livestock allotments in a given year; or (5) failure to receive adequate funding to fully implement the monitoring and management requirements of the

Comment [FTvM143]: I agree with this; if the distribution criteria are not met in 2 consecutive years, this would really be an indication of a distinct change in reproduction or adult female cohort.

Having said that, you might remind the reader what “distribution criterion” you are referencing here.

Comment [RS144]: Placeholder Study Team: this is a slight change. Previously, failure to meet the distribution criterion would not result in no hunting inside the DMA. BUT, similar to the standard for pop. size, it is so unlikely this would occur that if it did, it would be a big deal...no?

Comment [FTvM145]: This is not truly a measurable criterion. What if we keep getting DOI cuts in our respective budgets? At what point does funding become “inadequate”? You address this somewhat below but, again, this is difficult to measure.

Also, with more triggers in place than we currently have, I can foresee scenarios where the Study Team spends much more time on Biology and Monitoring reviews, on top of the ongoing monitoring. Unclear if that would affect funding needs.

Strategy in a given year. These triggers were established to detect deviations that may occur due to normal variability or chance events and do not necessarily mean the GYA grizzly bear's status is deteriorating. As such, they are more easily activated than those that trigger a Service status review under the Act. These triggers could indicate the need to adjust management approaches and are intended to provide the Coordinating Committee with ample time to respond with management actions before involving the Service.

A Study Team Biology and Monitoring Review examines habitat management, population management, or monitoring efforts of participating agencies with an objective of identifying the source or cause of failing to meet a habitat or demographic goal. This review also will provide management recommendations to correct any such deviations. If the Biology and Monitoring Review is triggered by inadequate funding, the Review would focus on whether this fiscal short-coming was a threat to the implementation of the Strategy to such an extent that it required that it compromised the recovered status of the GYA grizzly bear population. If the Review is triggered by failure to meet a population goal, the Review would involve a comprehensive review of vital rates including survival rates, litter size, litter interval, grizzly bear/human conflicts, and mortalities. The Study Team will attempt to identify the reason behind any variation in vital rates such as habitat conditions, poaching, excessive roadkill, etc., and determine if these compromise the recovered status of the population. Similarly, if the Review was triggered by failure to meet a habitat standard, the Review would examine what caused the failure, whether this requires that the measures of the Act are necessary to assure the recovered status of the

population, and what actions may be taken to correct the problem. The Study Team would complete this Review and release it to the public within 6 months of initiation.

The Coordinating Committee responds to a Biology and Monitoring Review with actions to address deviations from habitat standards or, if the desired population and habitat standards specified in the Strategy cannot be met in the opinion of the Coordinating Committee, then the Coordinating Committee could petition us for relisting (U.S. Fish and Wildlife Service 2007, p. 66). Because the Coordinating Committee possesses the resources, data, and experience to provide us with substantial information about the population's status, it would require us to conduct a full status review to determine if relisting is warranted. The Service also could initiate a status review independent of the Coordinating Committee and emergency relist the population if necessary, in accordance with section 4(g)(2) of the Act, if the threat were severe and immediate (16 U.S.C. § 1533(g)). Such an emergency relisting would be effective the day the regulation is published in the Federal Register and would be effective for 240 days. During this time, a conventional rule regarding the listing of the species based on the five factors of section 4(a)(1) of the Act could be drafted and take effect after the 240-day limit on the emergency relisting has expired.

Comment [FTvM146]: I do not follow this.

Triggers for a USFWS Status Review

Should we finalize this proposal and delist the GYA grizzly bear population, we will use the Study Team's annual reports to determine if a formal status review is

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necessary. Because we anticipate the Coordinating Committee and Study Team are fully committed to maintaining the GYA grizzly bear population through the Strategy and correct any problems through the process established in the Strategy and described in the preceding section, we created a higher threshold for criteria that would trigger a formal Service status review. We consider these extremely unlikely scenarios that would warrant our immediate attention. Specifically, the following scenarios would result in a formal status review by the Service: (1) a total population estimate of less than 500 individuals; (2) exceedance of the total mortality limit for independent females for 3 consecutive years; (3) exceedance of the total mortality limits for independent males or dependent young for 4 consecutive years; (4) changes in Federal, State, or Tribal laws, regulations, rules, or management plans that depart significantly from the agreements and population objectives described in the Conservation Strategy; or (5) if any of the habitat or population criteria are routinely not achieved – an outcome we do not anticipate. For example, if independent female mortality were exceeded in 3 of 4 years, but they were not 3 consecutive years, the Service would conduct a status review. Additionally, if any of these scenarios occur during the mandatory post-delisting monitoring period of at least 5 years, the post-delisting monitoring period will be extended 5 additional years from that point.

Comment [FTvM147]: I realize this is challenging but it seems arbitrary.

Comment [RS148]: Placeholder: these need to be defined

Status reviews and relisting decisions would be based on the best available scientific and commercial data available. If a Service status review is triggered, it will evaluate the status of the GYA grizzly bear population to determine if relisting is warranted. If relisting is ever warranted, as directed by section 4(g)(2) of the Act, we

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will make prompt use of the Act's emergency listing provisions if necessary to prevent a significant risk to the conservation of the GYA grizzly bear population. We have the authority to emergency relist at any time, and a status review would not necessarily have to be completed yet for us to exercise this authority.

TRIGGER	RESPONSE
Exceeding <u>independent (2 years or older)</u> female mortality limits in 2 consecutive years	No grizzly bear hunting inside the DMA the following year. IGBST Biology & Monitoring Review
Exceeding <u>independent</u> female mortality limits in 3 consecutive years	No grizzly bear hunting inside the DMA the following year. USFWS status review and possible relisting.
Exceeding <u>independent</u> male mortality limits in 3 consecutive years	No grizzly bear hunting inside the DMA the following year. IGBST Biology & Monitoring Review
Exceeding <u>independent</u> male mortality limits in 4 consecutive years	No grizzly bear hunting inside of DMA the following year. USFWS status review and possible relisting.
Exceeding dependent young (<u>cubs-of-the-year and yearlings</u>) mortality limits in 3 consecutive years.	IGBST Biology & Monitoring Review
Exceeding dependent young mortality limits in 4 consecutive years	USFWS status review and possible relisting.
Failure to meet the distribution criterion in 2 consecutive years.	No grizzly bear hunting inside the DMA the following year. IGBST Biology & Monitoring Review
Failure to meet any of the habitat standards	IGBST Biology & Monitoring Review
Failure to receive adequate funding to implement the monitoring and management requirements of the Conservation Strategy	IGBST Biology & Monitoring Review
A total population estimate of less than 500 inside the DMA	No grizzly bear hunting inside the DMA the following year. Status review and possible relisting.
Changes in federal, state, or tribal laws.	USFWS status review and possible relisting.

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (a) Be logically organized;
- (b) Use the active voice to address readers directly;
- (c) Use clear language rather than jargon;
- (d) Be divided into short sections and sentences; and
- (e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the names of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain any new collections of information that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act. This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not

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conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), need not be prepared in connection with regulations pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211 on regulations that significantly affect energy supply, distribution, and use. Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. As this final rule is not expected to significantly affect energy supplies, distribution, or use, this action is not a significant energy action and no Statement of Energy Effects is required.

References Cited

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A complete list of all references cited in this proposed rule is available at <http://www.regulations.gov> at Docket No. FWS-R6-ES-2014-XXXX, or is available upon request from the Grizzly Bear Recovery Coordinator (see **ADDRESSES**).

Authors

The primary authors of this proposed rule are staff members of the Service's Grizzly Bear Recovery Office (see **ADDRESSES** and **FOR FURTHER INFORMATION CONTACT**).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we hereby propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245;
Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

§17.11 [Amended]

2. Amend § 17.11(h) by revising the listing for “Bear, grizzly” under
“MAMMALS” in the List of Endangered and Threatened Wildlife to read as follows:

§17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

SPECIES			Vertebrate Population Where	When	Critical	Special
Common Name	Scientific Name	Historic Range	Endangered Or Threatened	Status	Listed	Habitat Rules
MAMMALS						

			U.S.A., conterminous (lower 48)			
			States, except – (1) where listed as			
			an experimental population; and (2)			
			that portion of Idaho that is east of			
			Interstate Highway 15 and north of			
			U.S. Highway 30; that portion of			
			Montana that is east of Interstate			
			Highway 15 and south of Interstate			
Bear, grizzly	<i>Ursus arctos</i>	North America	Highway 90; that portion of	T	1, 2D,	NA 17.40(b)
	<i>horribilis</i>		Wyoming south of Interstate		9, 759	
			Highway 90, west of Interstate			
			Highway 25, Wyoming State			
			Highway 220, and U.S. Highway			
			287 south of Three Forks (at the			
			220 and 287 intersection), and north			
			of Interstate Highway 80 and U.S.			
			Highway 30.			

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Do do do U.S.A. (portions of ID and MT, see XN 706 NA 17.84(l)
17.84(l)).

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Dated: _____

Signed: _____

Director, U.S. Fish and Wildlife Service

~~{Endangered and Threatened Wildlife and Plants; Removing the Greater
Yellowstone Area Population of Grizzly Bears From the Federal List of Endangered
and Threatened Wildlife}~~