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Endangered and Threatened Wildlife and Plants; Removing the Greater Yellowstone Ecosystem Population of Grizzly Bears From the Federal List of Endangered and Threatened Wildlife; Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

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[Docket No. FWS–R6–ES–2016–0042; FXES11130900000C6–156–FF09E42000]

RIN 1018–BA41

Endangered and Threatened Wildlife and Plants; Removing the Greater Yellowstone Ecosystem Population of Grizzly Bears From the Federal List of Endangered and Threatened Wildlife

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; availability of draft Grizzly Bear Recovery Plan Supplement: Revised Demographic Criteria and draft 2016 Conservation Strategy, and announcement of public informational meetings and hearings.

SUMMARY: The best available scientific and commercial data indicate that the Greater Yellowstone Ecosystem (GYE) population of grizzly bears (*Ursus arctos horribilis*) has recovered and no longer meets the definition of an endangered or threatened species under the Endangered Species Act, as amended (Act). The United States Fish and Wildlife Service (Service) is also proposing to identify the GYE grizzly bear population as a distinct population segment (DPS). Therefore, we, the Service propose to revise the List of Endangered and Threatened Wildlife, under the authority of the Act, by removing the GYE population. The Service has determined that the GYE grizzly bear population has increased in size and more than tripled its occupied range since being listed as threatened under the Act in 1975 and that threats to the population are sufficiently minimized. The participating States of Idaho, Montana, and Wyoming must adopt the necessary post-delisting management objectives, which adequately ensure that the GYE population of grizzly bears remains recovered, into enforceable regulations before the Service will proceed with a final delisting rule.

DATES:

Written comments: We will accept comments received or postmarked on or before May 10, 2016. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. Eastern Time on the closing date.

Public informational meetings and public hearings: We will hold two public informational meetings and public hearings on the following dates:

○ On April 11, 2016, in Cody, Wyoming. The public informational meeting will run from 2 p.m. to 4 p.m., and the public hearing will run from 5 p.m. to 8 p.m.

○ On April 12, 2016, in Bozeman, Montana. The public informational meeting will run from 2 p.m. to 4 p.m., and the public hearing will run from 5 p.m. to 8 p.m.

ADDRESSES: *Written comments:* You may submit written comments by any one 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–2016–0042, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, 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–2016–0042, U.S. Fish and Wildlife Service, MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

• *At a public informational meeting or public hearing.* We will accept written comments at either of the public informational meetings or public hearings. See details on the dates of the public informational meetings and public hearings in **DATES**; the addresses are listed below.

We request that you submit written 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 Information Requested, below, for more details).

Public informational meetings and public hearings: We will hold two public informational meetings and public hearings at the following locations:

○ Holiday Inn, 5 East Baxter Lane, Bozeman, MT 59715.

○ Holiday Inn, 1701 Sheridan Ave., Cody, WY 82414.

More information on the public informational meetings and public hearings is provided under Public Informational Meetings and Public Hearings, below.

Document availability: This proposed rule and all supporting documents are available on *http://www.regulations.gov.* In addition, certain documents such as the draft 2016 Conservation Strategy, the draft Grizzly Bear Recovery Plan Supplement: Revised Demographic Criteria, and all references cited are available at *http://www.fws.gov/mountain-prairie/es/grizzlyBear.php.*

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, MT 59812; telephone 406–243–4903; facsimile 406–243–3212. For Tribal inquiries, contact Ivy Allen, Native American Liaison, U.S. Fish and Wildlife Service; telephone: 303–236–4575. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

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Executive Summary

(1) Purpose of the Regulatory Action

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for revising the Federal Lists of Endangered and Threatened Wildlife and Plants. Rulemaking is required to remove a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Accordingly, we are issuing this proposed rule to identify the Greater Yellowstone Ecosystem (GYE) grizzly bear DPS and revise the List of Endangered and Threatened Wildlife. The population is stable, threats are sufficiently minimized, and a post-delisting monitoring and management framework has been developed and will be incorporated into regulatory documents. The best scientific and commercial data available, including our detailed evaluation of information related to the population's trend and structure, indicate that the distinct population segment of grizzly bears in the GYE has recovered and threats have been reduced such that this DPS no longer meets the definition of threatened, or endangered, under the Act. 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 draft of the 2016 Conservation Strategy for public comment. If we finalize this proposal to identify the GYE DPS and remove that DPS from the List of Endangered and Threatened Wildlife, 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 proposed action is authorized by the Act. We are proposing to amend § 17.11(h), subchapter B of chapter I, title 50 of the Code of Federal Regulations by revising the listing for ''Bear, grizzly'' under ''Mammals'' in the List of Endangered and Threatened Wildlife to remove the GYE grizzly bear DPS.

(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 and delisting decisions are based solely on the best scientific and commercial information available regarding the status of the subject species.

Greater Yellowstone Ecosystem (GYE)

The Greater Yellowstone Ecosystem (GYE) refers to the larger ecological system containing and surrounding Yellowstone National Park. The GYE includes portions of five National Forests; Yellowstone National Park, Grand Teton National Park, and the John D. Rockefeller Memorial Parkway (administered by Grand Teton National Park); and State, Tribal, and private lands. While there is no distinct boundary to the GYE, it is generally defined as those lands surrounding Yellowstone National Park with elevations greater than 1,500 meters (m) (4,900 feet (ft)) (see USDA Forest Service 2004, p. 46; Schwartz *et al.* 2006*b*, p. 9). While we consider the terms ''Greater Yellowstone Area'' and ''Greater Yellowstone Ecosystem'' to be interchangeable, we use GYE in this proposed rule to be consistent with the draft 2016 Conservation Strategy.

Previous Federal Actions

On July 28, 1975, we published a rule to designate the grizzly bear as threatened in the conterminous (lower 48) United States (40 FR 31734). Accordingly, we developed a Grizzly Bear Recovery Plan (U.S. Fish and Wildlife Service 1982) and updated that plan as necessary (72 FR 11376, March 13, 2007; U.S. Fish and Wildlife Service 1993, 2007*a*, 2007*b*). The designation of the grizzly bear as a threatened species in the conterminous United States and subsequent development of the 1982 and 1993 Recovery Plans occurred before the publication of our DPS policy on February 7, 1996 (61 FR 4722). The 1993 Recovery Plan identifies distinct Recovery Zones and unique demographic parameters for six different grizzly bear populations with the intent that these individual populations would be delisted as they each achieve recovery (U.S. Fish and Wildlife Service 1993, pp. ii, 33–34). On November 17, 2005, we proposed to designate the GYE population of grizzly bears as a DPS and to remove this DPS from the Federal List of Endangered and Threatened Wildlife (70 FR 69854). This proposal had 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, January 25, 2006). On March 29, 2007, we finalized this proposed action, designating the GYE population as a DPS and removing grizzly bears in the GYE from the Federal List of Endangered and Threatened Wildlife (72 FR 14866). This final determination was vacated by the District Court of Montana on September 21, 2009, in *Greater Yellowstone Coalition* v. *Servheen, et al.,* 672 F.Supp.2d 1105 (D. Mont. 2009). The District Court ruled against the Service on two of the four points brought against them, that the Service was arbitrary and capricious in its evaluation of whitebark pine and that

the identified regulatory mechanisms were inadequate because they were not legally enforceable. In compliance with this order, the GYE grizzly bear population was once again made a threatened population under the Act (16 U.S.C. 1531 *et seq.*) (see 75 FR 14496; March 26, 2010), and the Service withdrew the delisting rule. By vacating the Service's rule, the District Court mooted two other lawsuits challenging the rule. Neither of these lawsuits were decided on the merits. The United States appealed the District Court decision, on November 15, 2011, the Ninth Circuit Court of Appeals issued an opinion affirming in part and reversing in part the district court's decision vacating the final rule delisting grizzly bears in the Greater Yellowstone Ecosystem (*Greater Yellowstone Coalition* v. *Servheen, et al.,* 665 F.3d 105 (9th Cir. 2011)). The Ninth Circuit ruled that the Service's final rule did have adequate regulatory mechanisms but did not adequately explain why the loss of whitebark pine was not a threat to the GYE grizzly bear population. In compliance with this order, the GYE population of grizzly bears remained federally listed as ''threatened'' under the Act, and the Interagency Grizzly Bear Study Team (IGBST) initiated more thorough research into the potential impact of whitebark pine decline on GYE grizzly bears.

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, the draft 2016 Conservation Strategy, and the draft Grizzly Bear Recovery Plan Supplement: Revised Demographic Criteria for the Greater Yellowstone Ecosystem. 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.

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

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

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 specialists who are independent of the Service, the States, and the Interagency Grizzly Bear Study Team (IGBST) regarding scientific data and interpretations contained in this proposed rule. Those experts will each submit separate opinions for the Service to consider. We will send copies of this proposed rule, the draft 2016 Conservation Strategy, and the draft Grizzly Bear Recovery Plan Supplement: Revised Demographic Criteria to the peer reviewers immediately following publication of this proposed rule 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 rule and decision may differ from this proposal.

Public Informational Meetings and Public Hearings

We are holding two public informational meetings and public hearings on the dates listed above in **DATES** at the locations listed above in **ADDRESSES**. We are holding the public hearings to provide interested parties an opportunity to present verbal testimony (formal, oral comments) or written comments regarding the proposed rule and its supporting documents. A formal public hearing is not, however, an opportunity for dialogue with the Service; it is only a forum for accepting formal verbal testimony. In contrast to the public hearings, the public informational meetings allow the public the opportunity to interact with Service staff, who will be available to provide information and address questions on the proposed rule and its supporting documents.

We cannot accept verbal testimony at any of the public informational meetings; verbal testimony can only be accepted at the public hearings. Anyone wishing to make an oral statement at a public hearing for the record is encouraged to provide a written copy of their statement to us at the hearing. In the event there is a large attendance, the time allotted for oral statements may be limited. Speakers can sign up at a hearing if they desire to make an oral statement. Oral and written statements receive equal consideration. There are no limits on the length of written comments submitted to us.

Persons with disabilities needing reasonable accommodations to participate in a public informational meeting or public hearing should contact the person listed under **FOR FURTHER INFORMATION CONTACT**. Reasonable accommodation requests should be received at least 3 business days prior to the public informational meeting or public hearing to help ensure availability; American Sign Language or English as a second language interpreter needs should be received at least 2 weeks prior to the public informational meeting or public hearing.

Taxonomy and Species Description

Grizzly bears (*Ursus arctos horribilis*) are a member of the brown bear species (*U. arctos*) that occurs in North America, Europe, and Asia; the subspecies *U. a. horribilis* is limited to North America (Rausch 1963, p. 43; Servheen 1999, pp. 50–53).

Grizzly bears are generally larger than other bears and average 200 to 300 kilograms (kg) (400 to 600 pounds (lb)) for males and 110 to 160 kg (250 to 350 lb) for females in the lower 48 States (Craighead and Mitchell 1982, pp. 517–520; Schwartz *et al.* 2003*b*, p. 558). Although their coloration can vary widely from light brown to nearly black (LeFranc *et al.* 1987, pp. 17–18), they can be distinguished from black bears by longer, curved claws, humped shoulders, and a face that appears to be concave (Craighead and Mitchell 1982, p. 517). Grizzly bears are long-lived mammals, generally living to be around 25 years old (LeFranc *et al.* 1987, pp. 47, 51).

Behavior and 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.* 2003*b*, 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 ranges of adult male grizzly bears in the GYE are approximately 800 square kilometers (sq km) (309 square miles (sq mi)), while female ranges are typically smaller, approximately 210 sq km (81 sq mi) (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.* 2003*b,* 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 9.8 to 14.3 km (6.1 to 8.9 mi) away from the center of their mother's home range, whereas males generally disperse farther, establishing home ranges roughly 29.9 to 42.0 km (18.6 to 26.0 mi) 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.* 2003*b,* 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 implant into the uterus for further development until late fall. Fat stores obtained by female grizzly bears at the end of fall are positively correlated with earlier birth dates and quicker growth rates of their cubs (Robbins *et al.* 2012, p. 543). Additionally, a body fat threshold may exist below which females may not produce cubs, even when bred (Robbins *et al.* 2012, p. 543). Female grizzly bears nurse cubs for 3 to 4 months inside the den. 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 GYE is approximately 6 years old but can vary from 3 to 8 years of age (Schwartz *et al.* 2003*b,* p. 563; Schwartz *et al.* 2006*b,* p. 19). Litter size in the GYE ranges from 1 to 4 cubs (Schwartz *et al.* 2003*b,* p. 563) with a mean litter size of 2.04 cubs during 1983–2001 and 2.12 cubs during 2002–2011 (Schwartz *et al.* 2006*b,* p. 19; IGBST 2012, p. 34). 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 GYE (*i.e.,* the interbirth interval) 2.78 years (Schwartz *et al.* 2003*b,* p. 564; Schwartz *et al.* 2006*b,* 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.* 2003*b,* p. 564). Given the above factors, it may take a female grizzly bear 10 or more years to replace herself in a population (U.S. Fish and Wildlife Service 1993, p. 4). Grizzly bear females cease reproducing some time in their mid-to-late 20s (Schwartz *et al.* 2003*a,* 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 to 6 months each year, beginning in October or November (Linnell *et al.* 2000, p. 401; Haroldson *et al.* 2002, p. 29). Most dens are located above 2,500 m (>8,000 ft) in elevation (Haroldson *et al.* 2002, p. 33) and on slopes ranging from 30 to 60 degrees (Judd *et al.* 1986, p. 115). Approximately 66 percent (1,684,220 acres (ac); 6,815 sq km) of the GYE is potential denning habitat, and it is well distributed, so its availability is not considered a limiting factor for grizzly bears in the GYE (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 relocate 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 GYE, 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 to 4 months prior to den entry (*i.e.,* August through November). During hyperphagia, excess food is converted into fat, and grizzly bears may gain as much as 1.65 kg/day (3.64 lb/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). 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 GYE is a highly diverse landscape containing a wide array of habitat types and bear foods. Plant communities vary from grasslands at lower elevations (<1,900 m (6,230 ft)) to conifer forests at mid-elevations and subalpine and alpine meadows at higher elevations (>2,400 m (7,870 ft)). Grizzly bears are extremely omnivorous, display great diet plasticity—even within a population (Edwards *et al.* 2011, pp. 883–886)—and shift and switch 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.* 2003*b,* 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 GYE, representing 4 of the 5 kingdoms of life. The ability to use whatever food resources 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).

Grizzly bear diets are highly variable among individuals, seasons, and years (Servheen 1983, pp. 1029–1030; Mattson *et al.* 1991*a,* pp. 1625–1626; LeFranc *et al.* 1987, pp. 113–114; Felicetti *et al.* 2003, p. 767; Schwartz *et al.* 2003*b,* pp. 568–569; 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 that they have alternative options in years when preferred foods are scarce (Mattson *et al.* 1991*a,* p. 1625). In the GYE, 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 GYE commonly consume ungulates (bison (*Bison bison*), elk (*Cervus canadensis*), moose (*Alces alces*), and deer (*Odocoileus* species)), cutthroat trout (*Oncorhynchus clarki*), roots and tubers, army cutworm moths (*Euxoa auxiliaris*), grasses, and whitebark pine seeds (*Pinus albicaulis*) (Schwartz *et al.* 2003*b,* 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.* 2014, p. 2013). These foods are 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 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 (grasses, sedges, horsetail, and forbs), colonial insects (ants and wasps), fungi (false-truffles), berries (huckleberry, whortleberry, and gooseberry), and small mammals (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 GYE when they are available (Mattson and Jonkel 1990, p. 223; Mattson *et al.* 1991*a,* 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). Whitebark pine seed availability can influence the reproductive and survival rates of these grizzly bears on an annual basis because of an increased potential for human-caused mortality during years of low whitebark pine availability (Haroldson *et al.* 2006, p. 36; Schwartz *et al.* 2006*b,* pp. 22, 36; IGBST 2013, p. 24). However, there has been no correlation between long-term survival of independent bears with a decline in whitebark pine availability (van Manen *et al.* 2015, p. 11). Nearly one third of grizzly bear home ranges in the GYE 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.

Habitat Management

Grizzly bears use a variety of habitats in the GYE (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 by people and their activities. Human activities are the primary 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 GYE is part of the Middle Rockies ecoregion (Omernik 1987, pp. 120–121; Woods *et al.* 1999, entire; McGrath *et al.* 2002, entire; Chapman *et al.* 2004, entire) 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 m (1,650 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 2016, *Chapter 3*)). 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 grizzly bears. Requiring users and recreationists in grizzly bear habitat to store their food, garbage, and other bear attractants so that they are inaccessible to bears reduces encounters and grizzly bear-human conflicts.

The primary factor affecting grizzly bears 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.,* GYE and Northern Continental Divide Ecosystem). This requires

ongoing monitoring of the grizzly bear population to understand if it is sufficiently resilient to allow for a conservative level of human-caused mortality without causing population decline.

Population Ecology—Background

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 monitor 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.

While population size is a well-known and easily understood metric, it only provides information about a population at a single point in time. Wildlife 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 letter ''lambda''). For grizzly bear populations, lambda estimates the average rate of annual growth, with a value of 1.0 indicating a stable population trend with no net growth or decline. A lambda value of 1.03 means the population size is increasing at 3 percent per year. Conversely, a lambda 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 fundamental 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 aspects of reproduction and survival that cumulatively determine a population's trend (*i.e.,* lambda). Some of the demographic factors influencing population trend for grizzly bears are age-specific survival, sex-specific survival, average number of cubs per litter, the time between litters (*i.e.,* interbirth interval), age ratios, sex ratios, average age of first reproduction, lifespan, transition probabilities (see glossary), 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 because the resources it requires are finite. This understanding led ecologists to develop the concept of carrying capacity (expressed as the symbol ''K''). This is the maximum number of individuals a particular environment can support over the long term without resulting in population declines caused by resource depletion (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. 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 value of approximately 1.0 over the long term) (Colinvaux 1986, pp. 138–139, 142; Krebs 2009, p. 148). 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 (figure 1). However, to obtain a biologically meaningful estimate of average annual population growth rate for a long-lived species like the grizzly bear 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).

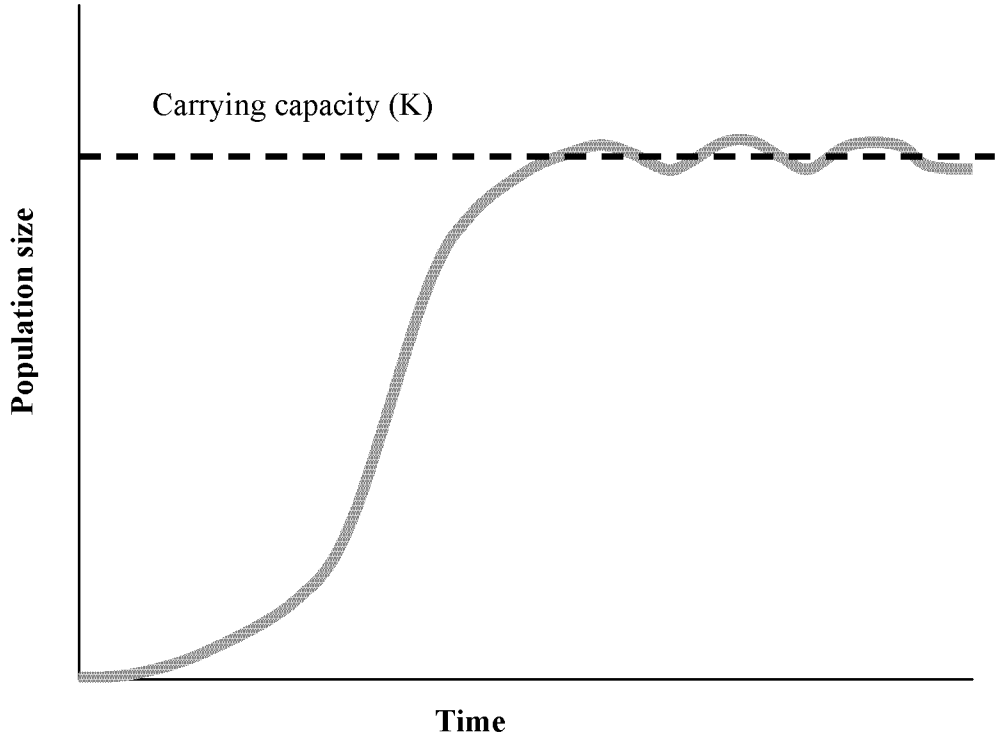

Figure 1.—Typical Population Trend with Respect to Carrying Capacity (K). When the population is low, growth rate is rapid. When the population is at or near K, growth rates decelerate and may temporarily decrease as population size fluctuates around K.

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 or a long-term equilibrium) 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 yearling and cub survival due to increases in intraspecific killing (*i.e.,* bears killing other bears), (2) decreases in home-range size, (3) increases in generation time, (4) increases in age of first reproduction, and (5) decreased reproduction (McLellan 1994, entire; Eberhardt 2002, pp. 2851–2852; Kamath *et al.* 2015, p. 10; van Manen *et al.* 2015, pp.8–9). 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) (McLoughlin *et al.* 2000, pp. 49–51), (2) decreased cub and yearling survival due to starvation, (3) increases in age of first reproduction due to limited food resources, and (4) 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 density-independent effects can be a complex undertaking. For long-lived mammals such as grizzly bears, extensive data collected over decades are needed to understand if and how these factors are operating in a population. We have these data for the GYE grizzly bear population, and the IGBST has been able to tease apart some of these confounding effects to find that density-dependent effects are the likely cause of the recent slow in population growth (see *Changes in Food Resources* under Factor E, below, for more detailed information).

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 GYE 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 GYE 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, pp. 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 (low mortality risk) was the key to grizzly bear survival. Schwartz *et al.* (2010, p. 661) created a similar mortality risk model for the GYE with similar results. Both studies suggest that managing for secure habitat is one of the most effective management actions to ensure population persistence.

Recovery Planning and Implementation

Background

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 have been 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 grizzly bears 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 bear populations present within the lower 48 States 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 GYE 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.* 2003*b,* 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 bear 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 (40 FR 31734; July 28, 1975). When the grizzly bear was listed in 1975, the population estimate in the GYE 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 GYE. The Interagency Grizzly Bear Study Team (IGBST), created in 1973, provides the scientific information necessary to make informed management decisions about grizzly bear habitat and conservation in the GYE. Since its formation in 1973, the published work of the IGBST has made the GYE grizzly bear population the most studied in the world. The wealth of biological information produced by the IGBST over the years includes 30 annual reports, hundreds of articles in peer-reviewed journals, dozens of theses, and other technical reports (see: *http://www.nrmsc.usgs.gov/science/igbst/detailedpubs*). Members of the IGBST include scientists and wildlife managers from the Service, U.S. Geological Survey, National Park Service, Forest Service, academia, and each State 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 USDOI 1983, entire). The objective of the IGBC is to change land management practices to more effectively provide security and maintain or improve habitat conditions for the grizzly bear (USDA and USDOI 1983, entire). IGBC members include upper level managers from all affected State and Federal agencies (USDA and USDOI 1983, entire).

The third interagency group guiding management of the GYE grizzly bear population is a subcommittee of the IGBC: The Yellowstone Ecosystem Subcommittee. Formed in 1983 to coordinate recovery efforts specific to the GYE, the Yellowstone Ecosystem Subcommittee includes mid-level managers and representatives from the Service; the five GYE National Forests (the Shoshone, 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; the Northern Arapahoe Tribe; and the Eastern Shoshone Tribe (USDA and USDOI 1983). The IGBST is an advisor to the subcommittee providing all the scientific information on the GYE grizzly bear population and its habitat.

Recovery Planning

In accordance with 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 not regulatory documents and are instead intended to provide guidance to the Service, States, and other partners on methods of minimizing threats to listed species and on criteria that may be used to determine when recovery is achieved.

The Recovery Plan identified six recovery ecosystems within the conterminous United States thought to support grizzly bears. Today, grizzly bear distribution is primarily within and around the areas identified as Recovery Zones (U.S. Fish and Wildlife Service 1993, pp. 10–13, 17–18), including: (1) The GYE in northwest Wyoming, eastern Idaho, and southwest Montana (24,000 sq km (9,200 sq mi)) at more than 700 bears (Haroldson *et al.* 2014, p. 17); (2) the Northern Continental Divide Ecosystem (NCDE) of north-central Montana (25,000 sq km (9,600 sq mi)) at more than 900 bears (Kendall *et al.* 2009, p. 9; Mace *et al.* 2012, p. 124); (3) the North Cascades area of north-central Washington (25,000 sq km (9,500 sq mi)) at fewer than 20 bears (last documented sighting in 1996) (Almack *et al.* 1993, p. 4; National Park Service and U.S. Fish and Wildlife Service 2015, p. 3); (4) the Selkirk Mountains area of north Idaho, northeast

Washington, and southeast British Columbia (5,700 sq km (2,200 sq mi)) at approximately 88 bears (U.S. Fish and Wildlife Service 2011, p. 26); and (5) the Cabinet-Yaak area of northwest Montana and northern Idaho (6,700 sq km (2,600 sq mi)) at approximately 48 bears (Kendall *et al.* 2015, p. 1). The Bitterroot Recovery Zone in the Bitterroot Mountains of central Idaho and western Montana (14,500 sq km (5,600 sq mi)) 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. 1–3). The San Juan Mountains of Colorado also were identified as an area of possible grizzly bear occurrence (40 FR 31734, 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 GYE, we updated both the habitat and demographic recovery criteria in 2007 (72 FR 11376, March 13, 2007). We proposed revisions to the demographic recovery criteria in 2013 (78 FR 17708, March 22, 2013) and are proposing additional revisions concurrent with this proposed rule to reflect the best available science. Below, we report the status of both the habitat and demographic recovery criteria in the GYE.

In 1979, the IGBST developed the first comprehensive ''Guidelines for Management Involving Grizzly Bears in the Greater Yellowstone Area'' (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 five affected National Forests (Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer-Gallatin, and Shoshone), Yellowstone and Grand Teton National Parks, and the BLM in the GYE 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 bear 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 bear habitat maintenance and improvement were not management considerations.

The National Forests and National Parks delineated 18 different bear management units (BMUs) within the GYE Recovery Zone to aid in managing habitat and monitoring population trends. Each BMU was further subdivided into subunits, resulting in a total of 40 subunits contained within the 18 BMUs (see map at *http://www.fws.gov/mountain-prairie/es/species/mammals/grizzly/Yellowstone_Recovery_Zone_map.pdf*). The BMUs 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 BMUs and subunits were identified to provide enough quality habitat and to ensure that grizzly bears were well distributed across the GYE Recovery Zone as per the Recovery Plan (U.S. Fish and Wildlife Service 2007*c,* 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, with an emphasis on the GYE. This workshop was held as part of the settlement agreement in *Fund for Animals* v. *Babbitt,* 967 F.Supp.6 (D. DC 1997). 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 bear 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; Schwartz *et al.* 2006*b,* p. 48) 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). The 1998 baseline is also described in detail in Factor A, below.

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'') for the GYE. 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 since their incorporation into the Recovery Plan (U.S. Fish and Wildlife Service 2007*b,* entire).

Additionally, we developed several monitoring items that may help inform management decisions or explain population trends: (1) Trends in the location and availability of whitebark pine, cutthroat trout, army cutworm moths, and winter-killed ungulate carcasses; and (2) grizzly bear mortality numbers, locations, and causes; grizzly bear-human conflicts; nuisance bear

management actions; bear-hunter conflicts; and bear-livestock conflicts (U.S. Fish and Wildlife Service 2007*c,* pp. 25–60). Federal and State agencies monitor these items, and the IGBST 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 draft 2016 Conservation Strategy, which is the comprehensive post-delisting management plan for a recovered population as called for in the Recovery Plan.

Suitable Habitat

Because we used easily recognized boundaries to delineate the boundaries of the proposed GYE grizzly bear DPS, it includes both suitable and unsuitable habitat (figure 2). For the purposes of this proposed rule, ''suitable habitat'' is considered the area within the DPS boundaries capable of supporting grizzly bear reproduction and survival now and 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) being contiguous with the current distribution of GYE grizzly bears such that natural recolonization is possible; and (3) having low mortality risk as indicated through reasonable and manageable levels of grizzly bear mortality.

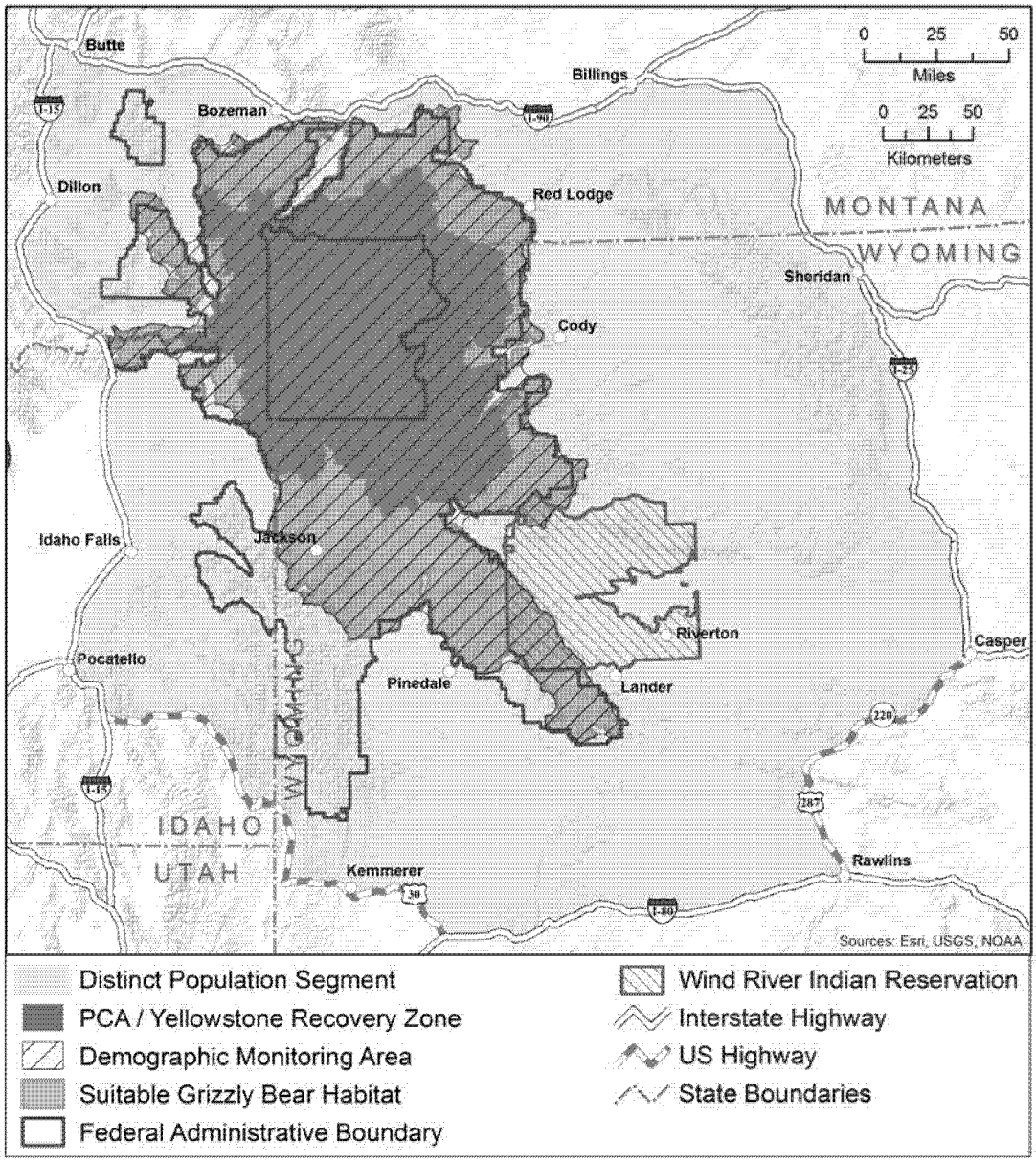

Figure 2. Map of the Greater Yellowstone Ecosystem (GYE). Boundaries are shown for: (1) the GYE grizzly bear distinct population segment (DPS); (2) the primary conservation area (PCA); (3) the demographic monitoring area (DMA); (4) biologically suitable habitat (as defined in Factor A, below); and (5) the Federal administrative boundary.

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 GYE (Omernik 1987, pp. 118–125; Omernik 1995, pp. 49–62; Woods *et al.* 1999, entire; McGrath *et al.* 2002, entire; Chapman *et al.* 2004, entire) contain high-energy foods such as whitebark pine seeds (Mattson and Jonkel 1990, p. 223; Mattson *et al.* 1991*a,* p. 1623) and army cutworm moths (Mattson *et al.* 1991*b,* 2434; French *et al.* 1994, p. 391).

For our analysis of suitable habitat, we considered the Middle Rockies ecoregion, within which the GYE is contained (Omernik 1987, pp. 120–121; Woods *et al.* 1999, entire; McGrath *et al.* 2002, entire; Chapman *et al.* 2004, entire) to meet grizzly bear biological needs providing food, seasonal foraging opportunities, cover, and denning areas (Mattson and Merrill 2002, p. 1125). Although grizzly bears historically occurred throughout the area of the proposed GYE grizzly bear 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 grizzly bears 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). Most of the short-grass prairie on the east side of the Rocky Mountains has been converted into agricultural land (Woods *et al.* 1999, entire), and high densities of traditional food sources are no longer available due to land conversion and human occupancy of urban and rural lands. Traditional food sources such as bison and elk have been dramatically reduced and replaced with domestic livestock attractants such as cattle, sheep, chickens, goats, pigs, and bee hives, which can become anthropogenic sources of prey for grizzly bears. While food sources such as grasses and berries are abundant in some years in the riparian zones within which the bears travel, these are not reliable every year and can only support a small number of bears. These nutritional constraints and the potential for human-bear conflicts limit the potential for a self-sustaining population of grizzly bears to develop in the prairies, although we expect some grizzly bears to live in these areas. 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 GYE grizzly bear 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 GYE grizzly bear 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 50 people per sq km (129 people per sq mi) (U.S. Census Bureau 2005, entire). 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 bear range, our analysis did not classify linear strips and isolated patches of habitat as suitable habitat.

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 6,341 sq km (2,448 sq mi) of habitat that is classified as part of the Middle

Rockies ecoregion, but are separated from the current grizzly bear distribution by approximately 100 km (60 mi) of a mosaic of private and BLM lands primarily used for agriculture, livestock grazing, and oil and gas production (Chapman *et al.* 2004, entire). Although there is a possibility that individual bears may emigrate from the GYE to the Bighorn Mountains occasionally, this dispersal distance exceeds the average dispersal distance for both males (30 to 42 km (19 to 26 mi)) and females (10 to 14 km (6 to 9 mi)) (McLellan and Hovey 2001, p. 842; Proctor *et al.* 2004, p. 1108). Without constant emigrants from suitable habitat, the Bighorn Mountains 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 Bighorn Mountains as suitable habitat within the GYE grizzly bear DPS boundaries.

Some areas that do not meet our definition of suitable habitat may still be used by grizzly bears (4,635 sq km (1,787 sq mi)) (Schwartz *et al.* 2002, p. 209; Schwartz *et al.* 2006*b,* 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 (*i.e.,* euthanized or placed in an approved American Zoological Association facility) from these areas.

According to the habitat suitability criteria described above, the GYE contains approximately 46,035 sq km (17,774 sq mi) 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 90 percent of that suitable habitat (42,180 sq km (16,286 sq mi)) (Haroldson 2015, *in litt.*). It is important to note that the current grizzly bear occupancy 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.* 2006*a,* 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). We expect grizzly bears to naturally recolonize much, if not all, suitable habitat (Pyare *et al.* 2004, pp. 5–6).

Population and Demographic Recovery Criteria

The 1993 Recovery Plan identified three demographic parameters that should be measured to assess recovery in the GYE. 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 total 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 became available. These revisions include implementing new scientific methods to determine the status of the GYE grizzly bear demographic monitoring area (DMA) 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 DMA is the area within which the population is annually surveyed and estimated and within which the total mortality limits apply, and is based on the suitable habitat area (see figure 2, above). The Wildlife Monograph: ''Temporal, Spatial, and Environmental Influences on The Demographics of Grizzly Bears in The Greater Yellowstone Ecosystem'' (Schwartz *et al.* 2006*b,* entire); the report: ''Reassessing Methods to Estimate Population Size and Sustainable Mortality Limits for the Yellowstone Grizzly Bear'' (IGBST 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'' (IGBST 2006, entire) provided the scientific basis for revising the demographic recovery criteria in the GYE 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*b,* pp. 9–16) and reported in the IGBST'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 IGBST report). This 2012 IGBST report informed the scientific basis for the changes we proposed to the GYE demographic recovery criteria in 2013.

In 2013, we proposed to change two of the recovery criteria for the Yellowstone Ecosystem in the Grizzly Bear Recovery Plan (78 FR 17708; March 22, 2013). Changes were proposed for the demographic goal of maintaining a minimum population of 500 animals and at least 48 females with cubs, and to eliminate this criterion's dependence on a specific counting method; and to revise the area where the population would be counted and where total mortality limits would apply. We chose to revise the criteria because they no longer represented the best scientific data or the best technique to assess recovery of the GYE grizzly bear DMA population (78 FR 17708; March 22, 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 total mortality limits should be the same area we use to estimate population size; and (3) the population has basically stabilized inside the DMA since 2002, with an average population size between 2002–2014 of 674 using the model-averaged Chao2 population estimation method (95% Confidence Interval (CI) = 600–747). This stabilization is evidence that the population is close to its carrying capacity as evidenced by density dependent regulation occurring inside the DMA (van Manen *et al.* 2015, entire). Also, there is a need to allow the IGBST to update the method used to measure population size demographic criteria so that they can incorporate results from new scientific methods based on peer-reviewed, scientific literature as they become available.

We released these proposed revisions related to population size and total mortality limits for public comment in 2013 (78 FR 17708; March 22, 2013) but did not finalize them so that we could consider another round of public comments on these revisions in association with the comments on this proposed rule. Further proposed revisions to the Recovery Plan Supplement: Revised Demographic Criteria and the draft 2016 Conservation

Strategy for the Grizzly Bear in the GYE are being made available for public review and comment concurrent with this proposed rule. After review and incorporation of appropriate public comments, we plan to release a final Grizzly Bear Recovery Plan Supplement: Revised Demographic Criteria (U.S. Fish and Wildlife Service 1993, p. 44) and the 2016 Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Ecosystem concurrent with release of a final determination on this proposed rule.

Below, we summarize relevant portions of the demographic analyses contained in the IGBST's 2012 report (IGBST 2012, entire) and compare them with the previous results of Schwartz *et al.* (2006*b,* entire) to draw conclusions concerning the grizzly bear population in the GYE DMA using these collective results. These analyses inform the scientific basis for our proposed revisions. While Schwartz *et al.* (2006*b,* p. 11) used data from 1983 through 2001; the 2012 IGBST report examined a more recent time period, 2002 through 2011 (IGBST 2012, p. 33). The IGBST 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.* (2006*b,* p. 48) and the IGBST (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 every lost collar does not indicate a dead bear. While Schwartz *et al.* (2006*b,* p. 48) found the GYE grizzly bear DMA population increased at a rate between 4.2 and 7.6 percent per year between 1983 and 2002, the IGBST (2012, p. 34) found this growth had slowed and leveled off and was between 0.3 percent and 2.2 percent per year during 2002–2011.

Schwartz *et al.* (2006*b,* 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 Recovery Zone or PCA, or outside the PCA entirely. 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, above). They concluded that grizzly bears were approaching carrying capacity inside Yellowstone National Park. The IGBST (2012, p. 33) documented lower cub and yearling survival than in the previous time period, results consistent with the conclusion by Schwartz *et al.* (2006*b*). Importantly, annual survival of independent females (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 GYE grizzly bear DMA population has slowed as bear densities have approached carrying capacity, particularly in the core area of occupied range.

Mortality reduction is a key part of any successful management effort for grizzly bears; however, some mortality, including most 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.* 2006*b,* p. 48). Low adult female survival was the critical factor that caused decline in the GYE population prior to the 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*b,* p. 2) established three demographic criteria to objectively measure and monitor recovery of the GYE grizzly bear DMA population. The three parameters that are measured have remained the same since the 1993 plan: (1) Minimum population size for maintaining genetic integrity; (2) population distribution; and (3) total mortality limits that allow continued population health and occupancy of the recovery area. 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, though not finalized, as explained above. Further revisions to the demographic criteria are being released for public comment concurrent with this proposed rule. Below, we detail each recovery criterion currently proposed.

Demographic Recovery Criterion 1—Maintain a population size of at least 500 bears and at least 48 females with cubs in the demographic monitoiring area (DMA) as indicated by methods established in published, peer-reviewed scientific literature and calculated by the IGBST using the most updated protocol as posted on their Web site. The current method (2016) used to estimate population size is the model-averaged Chao2 method. If the estimate of total population size drops below 500 or counts of females with cubs go below 48 unduplicated females with cubs in 3 consecutive years, this criterion will not be met. The population estimate and counts of unduplicated females with cubs will be calculated by the IGBST using data obtained within the DMA.

A minimum population size of at least 500 animals within the DMA will assure genetic health. Population size will be quantified by methods established in published, peer-reviewed scientific literature and calculated by the IGBST using the most updated protocol, as posted on their Web site. This number will ensure the short-term fitness of the population is not threatened by losses in genetic diversity in such an isolated population. Five hundred is a minimum population threshold. The goal is to maintain the population well above this threshold to ensure that genetic issues are not a detriment to the short-term genetic fitness of the GYE grizzly bear population. If the population declined to 500, more than one third of the suitable habitat in the DMA would be unoccupied (van Manen 2015, *in litt.*), and, therefore, the grizzly bear population could not be considered demographically recovered.

The model-averaged Chao2 method is currently the best available science to estimate the total population size in the GYE. The IGBST has been calculating population size on an annual basis using the model-averaged Chao2 (see glossary) estimate since 2002, and this method has been published in the peer-reviewed scientific literature. The model-averaged Chao2 method is the population estimate method that has the lowest amount of annual variation, and it is the most sensitive method to detect increasing or decreasing population trends over time. As the grizzly bear population has increased, model-averaged Chao2 estimates have become increasingly conservative (*i.e.,* prone to underestimation). As a conservative approach to population estimation, the model-averaged Chao2 method will

continue to be the method used to assess Criterion 1 (see U.S. Fish and Wildlife Service 2016, Appendix C, for the application protocol for annual population estimation using the Chao2 method) until a new population estimator is approved. If new methods become available, these will be considered for application in the GYE as long as they represent the best available science. However, until possible new methods are developed, the model-averaged Chao2 method will continue to be used. *Status:* This recovery criterion has been met since 2003 (see IGBST annual reports available at *http://www.nrmsc.usgs.gov/products/IGBST*).

Demographic Recovery Criterion 2—Sixteen of 18 bear management units within the PCA (see map at *http://www.fws.gov/mountain-prairie/es/grizzlyBear.php*) must be occupied by females with young, with no two adjacent bear management units unoccupied, during a 6-year sum of observations. This criterion is important as it ensures that reproductive females occupy the majority of the PCA 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—Maintain the population around the 2002–2014 Chao2 modeled average (average = 674; 95% CI = 600–757; 90% CI = 612–735) by maintaining annual mortality limits for independent females, independent males, and dependent young as shown in table 1 in this proposed rule. (These adjustable mortality rates were calculated as those necessary to manage the population to the modeled average of 674 bears which occurred during the time period that this population's growth stabilized.) If mortality limits are exceeded for any sex/age class for 3 consecutive years and any annual population estimate falls below 612 (the lower bound of the 90% confidence interval), the IGBST will produce a Biology and Monitoring Review to inform the appropriate management response. If any annual population estimate falls below 600 (the lower bound of the 95% confidence interval), this criterion will not be met and there will be no discretionary mortality, except as necessary for human safety.

The population had stabilized 2002–2014 at a mean model-averaged Chao2 population size of 674 (95% CI = 600–757), which is very similar to the population size of 683 when the Yellowstone population was previously delisted in 2007 (72 FR 14866; March 29, 2007). The population has now naturally stabilized because of density-dependent population effects that resulted in reduced survival of subadults. The existence of lower subadult survival and occupancy by grizzly bears in almost all suitable habitat inside the DMA has been demonstrated by van Manen *et al.* (2015, entire). *Status:* This criterion has been met for all age and sex classes since 2004.

TABLE 1—TOTAL MORTALITY RATE LIMITS INSIDE THE DMA. THESE MORTALITY RATES WERE CALCULATED AS THOSE LIMITS NECESSARY TO MANAGE TOWARD THE LONG-TERM AVERAGE POPULATION SIZE THAT OCCURRED FROM 2002 TO 2014 USING THE MODEL-AVERAGED CHAO2 POPULATION ESTIMATE METHOD (674, 95% CI = 600–747). IF POPULATION SIZE IS ESTIMATED AS FEWER THAN OR EQUAL TO 600 IN ANY YEAR, NO DISCRETIONARY MORTALITY WILL OCCUR UNLESS NECESSARY FOR HUMAN SAFETY

	Total grizzly bear population estimate		
	≤674	675–747	>747
Mortality limit % for independent FEMALES (using model-averaged Chao2 method)	≤7.6%	9%	10%
Mortality limit % for independent MALES (using model-averaged Chao2 method)	15%	20%	22%
Mortality limit for % of DEPENDENT YOUNG (using model-averaged Chao2 method)	≤7.6%	9%	10%

Consistent with USFWS Director Dan Ashe's letter of September 25, 2015, to the state directors, if the model-averaged Chao2 population estimate is less than 674, the total mortality rate for independent females and dependent young will be less than 7.6%.

Total mortality: Documented known and probable grizzly bear mortalities from all causes including but are not limited to: management removals, illegal kills, mistaken identity kills, self-defense kills, vehicle kills, natural mortalities, undetermined-cause mortalities, grizzly bear hunting, and a statistical estimate of the number of unknown/unreported mortalities.

The Conservation Strategy

The Conservation Strategy is the management plan that institutionalizes the successful program that resulted in the recovery of the GYE population. The Conservation Strategy will guide post-delisting management, just as it has guided management in the GYE since 2007. Recovery of the GYE grizzly bear population is the result of ongoing partnerships between Federal, Tribal, and State agencies; the governors of these States; county and city governments; educational institutions; numerous nongovernmental organizations; private landowners; and the public who live, work, and recreate in the GYE. Just as recovery of the GYE grizzly bear population could not have occurred without these excellent working relationships, maintenance of a recovered grizzly bear population requires continued application of the management actions and partnerships that resulted in the recovery of the grizzly bears and their habitat, and this is what the Conservation Strategy does. Grizzly bears are a ''conservation-reliant'' species because of their low resiliency to excessive human-caused mortality and the manageable nature of this threat (Scott *et al.* 2005, p. 384). This means that for grizzly bears in the GYE to remain recovered there will always need to be careful and cautious management of mortalities and habitat. Consequently, the 2016 Conservation Strategy will remain in effect indefinitely—beyond the 5-year post-delisting monitoring period required by the Act—to facilitate and assure continued successful management of the population and its habitat across multiple land ownerships and jurisdictions.

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, a Conservation Strategy Team was formed in 1993. This team included biologists and managers from the Service, National Park Service,

Forest Service, U.S. Geological Survey (USGS), IDFG, WGFD, and MTFWP.

In March 2000, a draft Conservation Strategy for the GYE 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 GYE was released, along with drafts of State grizzly bear management plans (all accessible at *http://www.fws.gov/mountain-prairie/es/grizzlyBear.php*). We responded to all public comments and peer reviews received on the Conservation Strategy and finalized the Conservation Strategy in 2007 (72 FR 11376; March 13, 2007). Revisions have been made to the Conservation Strategy and a draft 2016 Conservation Strategy is presented for public comment concurrent with this proposed rule (accessible at *http://www.fws.gov/mountain-prairie/es/grizzlyBear.php*).

The purposes of the Conservation 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 GYE grizzly bear population; (2) specify and implement the population/mortality management, habitat, and nuisance bear standards to maintain a recovered grizzly bear population for the future; (3) document specific State and Federal 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 2016, Executive Summary).

Implementation of the Conservation Strategy by all agency partners will coordinate management and monitoring of the GYE grizzly bear population and its habitat after delisting. The draft 2016 Conservation Strategy establishes and details a regulatory framework and authority for Federal and State agencies to take over management of the GYE grizzly bear population from the Service. The draft 2016 Conservation Strategy also identifies, defines, and requires adequate post-delisting monitoring to maintain a healthy GYE grizzly bear population (U.S. Fish and Wildlife Service 2016, Chapters 2 and 3). The draft 2016 Conservation Strategy has objective, measurable habitat and population standards, with clear State and Federal management responses if deviations occur (U.S. Fish and Wildlife Service 2016, Chapter 6). It represents 20 years of a collaborative, interagency effort among the members of the Yellowstone Ecosystem Subcommittee. State grizzly bear management plans were developed in all three affected States (Idaho, Montana, and Wyoming). Revised state plans will be incorporated into the final 2016 Conservation Strategy as appendices to ensure that the plans and the Conservation Strategy are consistent and complementary (accessible at *http://www.fws.gov/mountain-prairie/es/grizzlyBear.php*). If the State plans change from those available for comment appended to this draft Strategy, these revised State plans will be available for public comment and finalized prior to a final determination on this proposed rule. All the State and Federal agencies party to the draft 2016 Conservation Strategy will need to sign a memorandum of understanding agreeing to implement the revised 2016 Conservation Strategy prior to a final rule.

The draft 2016 Conservation Strategy identifies and provides a framework for managing habitat within the PCA and managing demographic parameters within the DMA (see figure 2, above). The PCA contains adequate seasonal habitat components for a portion of the recovered GYE grizzly bear population for the 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 GYE and approximately 75 percent of the population of female grizzly bears with cubs (Haroldson 2014, *in litt.*) (For more information about what constitutes ''suitable habitat,'' see the suitable habitat discussion under Factor A, below).

The 2016 Conservation Strategy will be implemented and funded by Federal, Tribal, and State agencies within the GYE. The signatories to the final 2016 Conservation Strategy have a demonstrated track record of funding measures to ensure recovery of this grizzly bear population for more than 3 decades. The Service intends to continue contributing funding to the implementation of the 2016 Conservation Strategy. In general, the 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 specific total mortality limits. The 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, and Custer-Gallatin National Forests are the Federal entities responsible for implementing the 2016 Conservation Strategy. Affected National Forests and National Parks have incorporated, or will incorporate before a final rule is issued, the habitat standards and criteria into their Forest Plans and National Park management plans and/or Superintendent's Compendia via appropriate amendment processes so that they are legally applied to these public lands within the GYE (see Grand Teton National Park 2006, p. 1; USDA Forest Service 2006*b,* p. 4; Yellowstone National Park 2006, p. 12). Outside of the PCA, grizzly bear habitat is well protected via Wilderness Area designation (Wilderness or Wilderness Study Area) or Forest Plan direction, and demographic standards will protect the population throughout the DMA.

If this proposed rule is made final, the Yellowstone Grizzly Bear Coordinating Committee (hereafter referred to as the YGCC) will replace the Yellowstone Ecosystem Subcommittee as the interagency group coordinating implementation of the 2016 Conservation Strategy's habitat and population standards, and monitoring (U.S. Fish and Wildlife Service 2016, Chapter 6). Similar to the Yellowstone Ecosystem Subcommittee, the YGCC members include representatives from Yellowstone and Grand Teton National Parks, the five affected National Forests, BLM, USGS, IDFG, MTFWP, WGFD, one member from local county governments within each State, and one member from the Shoshone Bannock, Northern Arapahoe, and Eastern Shoshone Tribes. All meetings will be open to the public. Besides coordinating management, research, and financial needs for successful conservation of the GYE grizzly bear population, the YGCC will review the IGBST Annual Reports and review and respond to any deviations from habitat or population standards. As per the implementation section of the 2016 Conservation Strategy, the YGCC will coordinate management and implementation of the 2016 Conservation Strategy and work together to rectify problems and to assure that the habitat and population standards and total mortality limits will be met and maintained.

The draft 2016 Conservation 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. Any changes and updates to the 2016 Conservation Strategy must meet the following two criteria: (1) Be based on the best available science; and (2) be subject to public comment before being implemented by the YGCC (U.S. Fish and Wildlife Service 2016, Chapter 1).

Distinct Vertebrate Population Segment Policy Overview

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—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). Under this policy, the Service considers two factors to determine whether the population segment is a valid DPS: (1) Discreteness of the population segment in relation to the remainder of the taxon to which it belongs; and (2) the significance of the population segment to the taxon to which it belongs. If a population meets both tests, it is a DPS, and the Service then evaluates the population segment's conservation status according to the standards in section 4 of the Act for listing, delisting, or reclassification (*i.e.,* is the DPS endangered or threatened). Our policy further recognizes it may be appropriate to assign different classifications (*i.e.,* endangered or threatened) to different DPSs of the same vertebrate taxon (61 FR 4725; February 7, 1996).

Past Practice and History of Using DPSs

As of February 9, 2016, of the 436 native vertebrate listings, 89 are listed as less than an entire taxonomic species or subspecies (henceforth referred to in this discussion as populations) under one of several authorities, including the ''distinct population segment'' language in the Act's definition of species (section 3(16)). Twenty-three of these 89 populations, which span 5 different taxa, predate the 1996 DPS Policy; as such, the final listing determinations for these populations did not include formal policy-based analyses or expressly designate the listed entity as a DPS. In several instances, however, the Service and National Marine Fisheries Service (NMFS) have established a DPS and revised the List of Endangered and Threatened Wildlife in a single action, as shown in the following examples.

In February 1985, the Service delisted the brown pelican (*Pelecanus occidentalis*) in the southeastern United States and continued to identify it as endangered throughout the remainder of its range (50 FR 4938; February 4, 1985). The Service later went on to delist the brown pelican in the remainder of its range (74 FR 59444; November 17, 2009). In June 1994, NMFS revised the entry for the gray whale (*Eschrichtius robustus*) to remove the eastern North Pacific population from the List of Endangered and Threatened Wildlife while retaining the western North Pacific population as endangered (59 FR 31094; June 16, 1994). In May 1997, NMFS identified the western and eastern DPSs of the Steller sea lion (*Eumetopias jubatus*), which had been listed as threatened, and listed the western DPS as endangered (62 FR 24345; May 5, 1997). In July 2003, the Service established two DPSs of the Columbian white-tailed deer (*Odocoileus virginianus leucurus*)—the Douglas County DPS and the Columbia River DPS—and delisted only the Douglas County DPS, while retaining listed status for the Columbia River DPS (68 FR 43647; July 24, 2003). The Columbia River DPS was recently proposed for reclassification to threatened (October 8, 2015; 80 FR 60850). In March 2007, the Service identified the American crocodile (*Crocodylus acutus*) in Florida as a DPS within the existing endangered listing of the American crocodile and reclassified the Florida DPS from endangered to threatened (72 FR 13027; March 20, 2007). In September 2011, the Service and NMFS jointly determined the loggerhead sea turtle (*Caretta caretta*) is composed of nine DPSs and replaced the species-wide listing with four DPSs as threatened and five DPSs as endangered (76 FR 58868; September 22, 2011). The Service and NMFS have jointly proposed to make similar revisions to the species-wide listing for the green sea turtle (*Chelonia mydas*), and NMFS has also recently proposed to revise the global listing for humpback whale (*Megaptera novaeangliae*) (80 FR 15272; March 23, 2015, and 80 FR 22304; April 21, 2015, respectively). Revising the lower 48 State listing for grizzly bear by removing the GYE DPS is consistent with the Service's past and practice.

Our authority to make these determinations and to revise the list accordingly is a reasonable interpretation of the language of the Act, and our ability to do so is an important component of the Service's program for the conservation of endangered and threatened species. Our authority to revise the existing listing of a species (the grizzly bear in the lower 48 States) to identify a GYE DPS and determine that it is healthy enough that it no longer needs the Act's protections is found in the precise language of the Act. Moreover, even if that authority were not clear, our interpretation of this authority to make determinations under section 4(a)(1) of the Act and to revise the endangered and threatened species list to reflect those determinations under section 4(c)(1) of the Act is reasonable and fully consistent with the Act's text, structure, legislative history, relevant judicial interpretations, and policy objectives.

On December 12, 2008, a formal opinion was issued by the Solicitor, ''U.S. Fish and Wildlife Service Authority Under Section 4(c)(1) of the Endangered Species Act to Revise Lists of Endangered and Threatened Species to 'Reflect Recent Determinations' '' (U.S. DOI 2008). The Service fully agrees with the analysis and conclusions set out in the Solicitor's opinion. This proposed action is consistent with the opinion. The complete text of the Solicitor's opinion can be found at *https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/M-37018.pdf*.

We recognize that our interpretation and use of the DPS policy to revise and delist distinct population segments has been challenged in *Humane Society of the United States* v. *Jewell,* 76 F.Supp.3d 69 (D. D.C. 2014). Partly at issue in that case was our application of the DPS policy to Western Great Lakes wolves in a delisting rule (76 FR 81666; December 28, 2011). Our rule was vacated by the district court's decision. We respectfully disagree with the district court's interpretation of the DPS policy, and the United States has appealed that decision.

In the 1993 Grizzly Bear Recovery Plan, the Service identifies six grizzly bear Recovery Zones and identifies unique demographic recovery criteria for each one. The 1993 Recovery Plan states that it is the intent of the Service to delist individual populations as they achieve recovery (U.S. Fish and Wildlife Service 1993, p. ii). The Service has proceeded in a manner consistent with the Recovery Plan with respect to

individual population treatment. For example, grizzly bears in the Cabinet-Yaak, Selkirk, and North Cascades Recovery Zones, all included in the original threatened grizzly bear listing, were petitioned for reclassification from threatened to endangered. Although already listed as threatened, we determined that reclassifying those grizzly bears to endangered was warranted but precluded by higher priorities. After 2014, the Service determined that the Cabinet-Yaak and Selkirk populations had recovered to the point that they were no longer warranted but precluded from listing as endangered; they remain listed as threatened. Grizzly bears in the North Cascades Recovery Zone are still warranted but precluded for reclassification from threatened to endangered. The Bitterroot Recovery Zone now has status under section 10(j) of the Act, which authorizes the Service to release an experimental population of grizzly bears in that Recovery Zone.

Distinct Vertebrate Population Segment Analysis

Analysis of Discreteness in Relation to Remainder of Taxon

Under our DPS Policy, a population of a vertebrate taxon 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. If complete separation is required, the loss of the population has little significance to other populations (61 FR 4722, 4724). 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 standard adopted allows for some limited interchange among population segments considered to be discrete, so that loss of an interstitial population could well have consequences for gene flow and demographic suitability of a species as a whole.

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 identified human-made objects, such as the center line of interstate highways, Federal highways, and State highways are useful for delimiting DPS boundaries. Thus, the proposed GYE grizzly bear 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 that is south of Interstate Highway 90, west of Interstate Highway 25, west of Wyoming State Highway 220, and west of 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 DPS boundary in figure 2, above). Due to the use of highways as easily described boundaries, large areas of unsuitable habitat are included in the proposed DPS boundaries.

The core of the proposed GYE grizzly bear DPS is the Yellowstone PCA (24,000 sq km (9,200 sq mi)) (U.S. Fish and Wildlife Service 1993, p. 39). The Yellowstone PCA includes Yellowstone National Park; a portion of Grand Teton National Park; John D. Rockefeller Memorial Parkway; sizable contiguous portions of the Shoshone, Bridger-Teton, Caribou-Targhee, Custer-Gallatin, and Beaverhead-Deerlodge 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 PCA, into other suitable habitat in the DMA. Grizzly bears now occupy about 44,624 sq km (17,229 sq mi) or 89 percent of the GYE DMA (Haroldson 2015, *in litt.*), with occasional occurrences well beyond this estimate of occupied range. No grizzly bears originating from the Yellowstone PCA have been suspected or confirmed beyond the borders of the GYE grizzly bear DPS described above. Similarly, no grizzly bears originating from other Recovery Zones have been detected inside the borders of the GYE grizzly bear DPS (Wildlife Genetics International 2015, *in litt.*).

The GYE grizzly bear population is the southernmost population remaining in the conterminous United 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 160 km (100 mi) to the north. Although their range continues to expand north (Bjornlie *et al.* 2013, p. 185), grizzly bears from the GYE have not been documented north of Interstate 90 outside the proposed 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 32 to 80 km (20 to 50 mi) of the GYE 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 GYE are separated from other grizzly bears. Genetic studies estimating heterozygosity (which provides a measure of genetic diversity) show 60 percent heterozygosity in the GYE grizzly bears compared to 67 percent in the NCDE grizzly bears (Haroldson *et al.* 2010, p. 7). 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 grizzly bears of the early 1900s, Miller and Waits (2003, p. 4338) concluded that gene flow and, therefore, population connectivity between the GYE 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 GYE, likely resulting in the current lack of connectivity (Proctor *et al.* 2012, p. 35).

Based on the best available scientific data about grizzly bear locations and movements, we find that the GYE grizzly bear population and other remaining grizzly bear populations are markedly, physically separated from each other. Therefore, the GYE grizzly bear population meets the criterion of discreteness under our DPS Policy. Occasional movement of bears from

other grizzly bear populations into the GYE 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 GYE grizzly bear population 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 GYE grizzly bear 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 under one or more of the conditions described in the Service's DPS policy, 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 (see Senate Report 151, 96th Congress, 1st Session). 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. Since precise circumstances are likely to vary considerably from case to case, the DPS policy does not describe all the classes of information that might be used in determining the biological and ecological importance of a discrete population. However, the DPS policy describes four possible classes of information that provide evidence of a population segment's biological and ecological importance to the taxon to which it belongs. As specified in the DPS policy (61 FR 4722; February 7, 1996), this consideration of the population segment's significance 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. To be considered significant, a population segment needs to satisfy only one of these conditions, or other classes of information that might bear on the biological and ecological importance of a discrete population segment, as described in the DPS policy (61 FR 4722; February 7, 1996). Below we address Factors 1, 2, and 4. Factor 3 does not apply to the GYE grizzly bear population because there are several other extant populations of grizzly bears in North America.

Unusual or Unique Ecological Setting

New information since the publication of the March 29, 2007, final rule (72 FR 14866) and the 2011 status review (U.S. Fish and Wildlife Service 2011) calls into question whether the GYE is truly a unique ecological setting. Previously, we concluded that the GYE 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 GYE, respectively (Jacoby *et al.* 1999, p. 925). These high percentages of meat in GYE 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 revisited 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 GYE, 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 GYE, 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 up to 24 percent of ungulate meat in GYE grizzly bear diets (Mattson 1997, p. 167). However, Fortin *et al.* (2013, p. 275) found bison comprise only about 9 percent of grizzly bear diets around the Yellowstone Lake area, possibly indicating grizzly bears do not use this endemic food source as much as previously thought in the GYE.

We also previously concluded the GYE 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 GYE 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 GYE since 2002 due to a mountain pine beetle epidemic. Since this time, bears have been documented using whitebark pine less frequently. A recent study using GPS data indicated nearly one third of sampled grizzly bears in the GYE did not even have whitebark pine within their home ranges (Costello *et al.* 2014, p. 2009). Grizzly bears in the GYE 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 GYE may not be as reliable as previously thought because other foods in the GYE 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 GYE 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 GYE grizzly bear population to meet the DPS policy standard for significance based on its persistence in an ecological setting unusual or unique for the taxon.

Significant Gap in the Range of the Taxon

Given the grizzly bear's historic occupancy of the conterminous United States and the portion of the historic range the conterminous United 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; July 28, 1975). The GYE grizzly bear population is significant in achieving this objective, as it is one of only five known occupied areas and one unoccupied area and constitutes approximately half of the estimated number of grizzly bears remaining 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 GYE grizzly bear population represents the southernmost reach of the taxon. The loss of this population would significantly impact representation of the species because it would substantially curtail the range of the grizzly bear in North America by moving the range approximately 3 degrees of latitude or 200 mi (350 km) to the north. Therefore, we find that the GYE population of grizzly bears meets the significance criterion under our DPS policy because its loss would represent a significant gap in the range of the taxon.

Marked Genetic Differences

Several studies have documented some level of genetic differences between grizzly bears in the GYE 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 GYE 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 the United States 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 GYE grizzly bear 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.

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

Summary of Distinct Population Segment Analysis

Based on the best scientific and commercial data available, as described above, we find that the GYE grizzly bear population is discrete from other grizzly bear populations and significant to the remainder of the taxon (*i.e., Ursus arctos horribilis*). Because the GYE grizzly bear population is discrete and significant, it meets the definition of a DPS under the Act. Therefore, the GYE grizzly bear DPS is a listable entity under the Act, and we now assess this DPS's conservation status in relation to the Act's standards for listing, delisting, or reclassification (*i.e.,* whether this DPS meets the definition of an endangered or threatened species under the Act).

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; 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 endangered or threatened. 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 (SPR) and is threatened if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The word ''range'' in these definitions refers to the range in which the species currently exists. 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 endangered or threatened, 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 GYE grizzly bear population within the foreseeable future. We previously concluded GYE grizzly bears are recovered and warranted delisting (72 FR 14866; March 29, 2007). In this proposed rule, we make a determination as to whether the distinct population segment of GYE grizzly bears is an endangered or threatened species, based on the best scientific and commercial information available. In so doing, we address the issues raised by the Ninth Circuit in *Greater Yellowstone Coalition* v. *Servheen,* 665 F.3d 1015 (9th Cir. 2011), which were briefly discussed above.

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

Factor A requires the Service to consider present or threatened destruction, modification, or curtailment of grizzly bear habitat or its range. Here, the following

considerations warrant discussion regarding the GYE grizzly bear population: (1) Motorized access management, (2) developed sites, (3) livestock allotments, (4) mineral and energy development, (5) recreation, (6) snowmobiling, (7) vegetation management, (8) climate change, and (9) habitat fragmentation.

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; July 28, 1975). Both the dramatic decreases in historical range and land management practices in formerly secure grizzly bear habitat led to the 1975 listing (40 FR 31734; July 28, 1975). For consideration under the Act, the word range applies to where the species currently exists. To address this source of population decline, the IGBST 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 (IGBC) 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 Interagency Grizzly Bear Guidelines (USDA Forest Service 1986, pp. 1–2) to manage grizzly bear habitat in the Yellowstone PCA.

Management improvements made as a result of the Interagency Grizzly Bear 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 areas to all human access in National Parks that are particularly important to grizzly bears; (5) closure of many areas in the GYE to oil and gas leasing, or implementing restrictions such as no surface occupancy; (6) elimination of six active and four vacant sheep allotments on the Caribou-Targhee National Forest since 1998, resulting in an 86 percent decrease in total sheep animal months inside the Yellowstone PCA; and (7) expanded information and education programs in the Yellowstone PCA to help reduce the number of grizzly bear mortalities caused by big-game hunters (outside National Parks). Overall, adherence to the Interagency Grizzly Bear 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 GYE grizzly bear population, allowing it to significantly increase in size and distribution since its listing in 1975.

Concurrent with this proposed rule, an interagency group representing pertinent State and Federal parties is releasing a draft 2016 Conservation Strategy for the grizzly bear in the GYE to guide management and monitoring of the habitat and population of GYE grizzly bears after delisting. The draft 2016 Conservation Strategy will be the most recent iteration of the Conservation Strategy, which was first published in final form in 2007 (see our notice of availability published on March 13, 2007, at 72 FR 11376). The draft 2016 Conservation Strategy incorporates the explicit and measurable habitat criteria established in the ''Recovery Plan Supplement: Habitat-based Recovery Criteria for the Greater Yellowstone Ecosystem'' (U.S. Fish and Wildlife Service 2007*b*). Whereas the Interagency Grizzly Bear Guidelines helped to guide successful recovery efforts, the 2016 Conservation Strategy will help guide the recovered GYE population post-delisting. The draft 2016 Conservation Strategy identifies and provides a framework for managing two areas, the PCA and adjacent areas of the DMA, 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 within the PCA and adjacent areas of the DMA.

Habitat Management Inside the Primary Conservation Area

As per the draft 2016 Conservation Strategy and the habitat-based recovery criteria discussed above, the PCA will be a core secure area for grizzly bears where human impacts on habitat conditions will be maintained at or below levels that existed in 1998 (U.S. Fish and Wildlife Service 2016, chapter 3). Specifically, the amount of secure habitat will not decrease below 1998 levels 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 existing at a time when the population was increasing at a rate of 4 to 7 percent per year (Schwartz *et al.* 2006*b,* 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; 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 impacts grizzly bears by: (1) Increasing human interaction and potential grizzly bear mortality risk; (2) increasing displacement from important habitat; (3) increasing habituation to humans; and (4) decreasing 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 human-caused mortality risk (Schwartz *et al.* 2010, p. 661). Secondarily, motorized access may affect grizzly bears through temporary or permanent habitat loss due to human disturbance. 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 2016, Appendix E). These levels of secure habitat have been successfully maintained and will continue to be maintained or improved, as directed by the draft 2016 Conservation Strategy and the memorandum of understanding (MOU) signed by all State and Federal partner agencies (U.S. Fish and Wildlife Service 2016, MOU). Three subunits were identified as in need of improvement from 1998 levels. These subunits have shown on average a 7.5 percent increase in secure habitat and these improved levels will serve as the new baseline for these three subunits with the implementation of the 2006 Gallatin National Forest Travel Management Plan (*in prep.*). Because of the positive effect that secure habitat has on grizzly bear survival and reproduction, one of the draft 2016 Conservation Strategy objectives is no net decrease in these levels of secure habitat inside the PCA so that the PCA can continue to function as a source area for grizzly bears in the GYE. Therefore, we do not foresee that decreases in secure habitat inside the PCA will pose a threat to the GYE grizzly bear DPS now, or in the future.

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 2016, Chapter 3). ''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 593 developed sites on public land within the PCA (U.S. Fish and Wildlife Service 2016, Appendix E). As of 2014, the number of developed sites on public lands had decreased to 578 (Greater Yellowstone Area Grizzly Bear Habitat Modeling Team 2015, p. 90).

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 Forest Service enforce food storage rules aimed at decreasing grizzly bear access to human foods (U.S. Fish and Wildlife Service 2016, Chapter 1). These regulations will continue to be enforced and are in effect for nearly all currently occupied grizzly bear habitat within the GYE grizzly bear DPS boundaries (U.S. Fish and Wildlife Service 2016, Chapter 1). In conclusion, because the National Parks and National Forests within the PCA will continue to manage developed sites at 1998 levels within each bear management subunit and because food storage rules will be enforced on these public lands, we do not foresee that the existing number of, nor an increase in the number of, developed sites inside the PCA will pose a threat to the GYE grizzly bear DPS now, or in the future.

Livestock Allotments: When grizzly bears 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 FR 31734; July 28, 1975). 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) increased chances 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 (45/311) of all human-caused grizzly bear mortalities in the GYE between 2002 and 2014 were due to management removal actions associated with livestock depredations. This human-caused mortality is the main impact to grizzly bears in the GYE 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 2007 Conservation Strategy and Forest Service Record of Decision implementing their forest plan amendments (USDA Forest Service 2006*b,* entire) established habitat standards regarding livestock allotments. The number of active livestock allotments, total acres affected, and permitted sheep animal months within the PCA will not increase above 1998 levels (USDA Forest Service 2006*b,* p. 5; U.S. Fish and Wildlife Service 2016, Chapter 3). Due to the higher prevalence of grizzly bear conflicts associated with sheep grazing, existing sheep allotments will be phased out as the opportunity arises with willing permittees (USDA Forest Service 2006*b,* p. 6; U.S. Fish and Wildlife Service 2016, Chapter 3).

A total of 106 livestock allotments existed inside the PCA in 1998. Of these allotments, there were 72 active and 13 vacant cattle allotments and 11 active and 10 vacant sheep allotments, with a total of 23,090 animal months (U.S. Fish and Wildlife Service 2016, Appendix E). 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 if the number and net acreage of allotments inside the PCA does not increase above the 1998 baseline. Since 1998, the Caribou-Targhee National Forest has closed six sheep allotments within the PCA, while the Shoshone National Forest has closed two sheep allotments and the Gallatin National Forest has closed four (Greater Yellowstone Area Grizzly Bear Habitat Modeling Team, p. 86). This has resulted in a reduction of 21,120 sheep animal months, a 91 percent reduction,

from 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 GYE. As of 2014, there is only one active sheep allotment within the PCA, on the Caribou-Targhee National Forest. 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. Because there will continue to be no net increase in cattle or sheep allotments allowed on public lands inside the PCA, we do not expect that livestock allotments inside the PCA will constitute a threat to the GYE grizzly bear DPS now, or in the future.

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 2016, Chapter 3). There were no active oil and gas leases inside the PCA as of 1998 (USDA Forest Service 2006*a,* p. 209). Based on Forest Plan direction, there are approximately 243 sq km (94 sq mi) of secure habitat that could allow surface occupancy for oil and gas projects within the PCA (USDA Forest Service 2006*a,* figures 48 and 96). This comprises less than 4 percent of all suitable habitat within the PCA. Additionally, 1,354 preexisting mining claims were located in 10 of the subunits inside the PCA (U.S. Fish and Wildlife Service 2016, Appendix E), but only 28 of these mining claims had operating plans. These operating plans are included in the 1998 developed site baseline. Under the conditions of the draft 2016 Conservation Strategy, any new oil, gas or mineral project will be approved only if it conforms to secure habitat and developed site standards (U.S. Fish and Wildlife Service 1993, p. 5–6; U.S. Fish and Wildlife Service 2016, Chapter 3). For instance, any oil, gas or mineral 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 2016, chapter 3). 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 2016, chapter 3). 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 2016, chapter 3). In conclusion, because any new mineral or energy development will continue to be approved only if it conforms to the secure habitat and developed site standards set forth in the draft 2016 Conservation Strategy, we do not expect that such development inside the PCA will constitute a threat to the GYE grizzly bear DPS now, or in the future.

Recreation: At least 3 million people visit and recreate in the National Parks and National Forests of the GYE annually (USDA Forest Service 2006*a,* 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 increase in the number of people visiting each decade since the 1930s (USDA Forest Service 2006*a,* 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 may increase the probability of grizzly bear-human encounters, with subsequent increases in human-caused mortality (Mattson *et al.* 1996, p. 1014).

Recreation in the GYE can be divided into six 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 2006*a,* p. 187). Inside the PCA, the vast majority of lands available for recreation are accessible through non-motorized travel only (USDA Forest Service 2006*a,* 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 draft 2016 Conservation 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 draft 2016 Conservation 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 GYE National Forests, see the Final Environmental Impact Statement for the Forest Plan Amendment for Grizzly Bear Habitat Conservation for the GYE National Forests (USDA Forest Service 2006*a,* pp. 176–189).

This potential stressor on the GYE 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 campaigns. These outreach efforts are an important contributing factor to successful grizzly bear conservation and would continue under the 2016 Conservation Strategy. In conclusion, because the few motorized access routes inside the PCA will not increase, because the number and capacity of developed sites on public lands within the PCA will not increase, and because the National Parks and National Forests within the PCA will continue to educate visitors on its lands about how to recreate safely in bear country and avoid grizzly bear-human conflicts, we do not expect that the current level of recreation, nor increases in recreation, will constitute a threat to the GYE grizzly bear DPS now, or in the future.

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.* 2003*b,* 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 increased 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 to 1.6 km (0.9 to 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 m (328 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. Four of these instances 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 (33 ft) of a den, one had dog tracks *at* the den site, one had ski tracks within 80 to 90 m (262 to 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.* 1997, p. 37). Swenson *et al.* (1997) found that most den abandonment (72 percent) occurred early in the season before pregnant females give birth. However, there still may be a reproductive cost of these early den abandonments: 60 percent (sample size of 5) of female bears that abandoned a den site before giving birth lost at least one cub whereas only 6 percent (sample size of 36) of pregnant females that did not abandon their dens lost a cub in or near their den (Swenson *et al.* 1997, p. 37). In the GYE, the one documented observation of snowmobile use at a known den site found the bear did not abandon its den, even though snowmobiles were operating directly on top of it (Hegg *et al.* 2010, p. 26). This, however, is only an anecdotal observation because it is based on a sample size of one. We found no records of litter abandonment by grizzly bears in the lower 48 States due to snowmobiling activity. Additionally, monitoring of den occupancy for 3 years on the Gallatin National Forest in Montana did not document any den abandonment (Gallatin National Forest 2006, entire).

In summary, the available data about the potential for disturbance while denning and den abandonment from nearby snowmobile use are extrapolated from studies examining the impacts of other human activities and are 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 (in their entirety: Harding and Nagy 1980; Reynolds *et al.* 1986; Hegg *et al.* 2010). Because there are no data or information suggesting snowmobile use in the GYE is negatively affecting grizzly bear population, or even individual bears, we determine that snowmobiling does not constitute a threat to the GYE grizzly bear DPS now, or in the future. Yet, because the potential for disturbance and impacts to reproductive success 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 GYE on lands managed by the 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 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 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 adequately mitigated using the Interagency Grizzly Bear Guidelines in place since 1986, and will continue to be managed at levels acceptable to the grizzly bear population under the 2016 Conservation Strategy. Therefore, we do not expect that vegetation management inside the PCA will constitute a threat to the GYE grizzly bear DPS now, or in the future.

Climate Change: The effects of 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 United States and Canada do not expect habitat changes predicted under climate change scenarios to directly threaten grizzly bears (Servheen and Cross 2010, p. 4). These effects 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 below under Factor E (*Other Natural or Manmade Factors Affecting Its Continued Existence*).

Habitat Fragmentation: The GYE 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. Although currently not occurring, habitat fragmentation can cause loss of connectivity and increase human-caused mortalities, and thus is a potential threat to grizzly bears. To prevent habitat fragmentation and degradation, the evaluation of all road construction projects in suitable habitat on Federal lands throughout the GYE DMA will continue to include the impacts of the project on grizzly bear habitat connectivity. This evaluation would go through an open and public planning process (U.S. Fish and Wildlife Service 2007*a,* pp. 38–41; U.S. Fish and Wildlife Service 2016, Chapter 3). By identifying areas used by grizzly bears, officials can mitigate potential impacts from road construction both during and after a project. Federal agencies will continue to 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 data collection requirement include reduction of grizzly bear mortality due to vehicle collisions, access to seasonal habitats, maintenance of traditional dispersal routes, and decreased risk of 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 draft 2016 Conservation Strategy play an important role in preventing habitat fragmentation by keeping valleys that are mostly privately owned from becoming mortality sinks to grizzly bears attracted to human sources of foods. In conclusion, because these activities that combat habitat fragmentation will continue to occur under the draft 2016 Conservation Strategy, we do not expect that fragmentation within the GYE grizzly bear DPS boundaries will constitute a threat to the GYE grizzly bear DPS now, or in the future.

Habitat Management Outside the Primary Conservation Area

In suitable habitat outside of the PCA within the DPS boundaries, the 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 2006*a,* pp. 44–45; U.S. Fish and Wildlife Service 2016, Executive Summary). 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 22,783 sq km (8,797 sq mi or 5.6 million acres) of suitable habitat outside of the PCA within the DPS boundaries, the Forest Service manages 17,292 sq km (6,676 sq mi), or 76 percent. Of the 76 percent of suitable habitat outside of the PCA that the Forest Service manages, nearly 80 percent (13,685 sq km (5,284 sq mi)) is Designated Wilderness Area (6,799 sq km (2,625 sq mi)), Wilderness Study Area (708 sq km (273 sq mi)), or Inventoried Roadless Area (6,179 sq km (2,386 sq mi)). These designations provide regulatory mechanisms outside of the Act and the draft 2016 Conservation Strategy that protect grizzly bear habitat from increases in motorized use, oil and gas development, livestock allotments, and timber harvest. These designations are further described in Factor D. 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, 16 U.S.C. 1131 *et seq.* 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. The protections provided by the Wilderness Act are further described in Factor D.

Wilderness study areas are designated by Federal land management agencies (*e.g.,* 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 and 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. Wilderness Study Areas are further described in Factor D.

Inventoried Roadless Areas currently provide 4,891 sq km (1,888 sq mi) 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 (6,179 sq km (2,386 sq mi)) because some motorized use is allowed due to roads that existed before the area was designated as roadless. Thus, a certain amount of road use is grandfathered in to the designation of Inventoried Roadless Areas. The 2001 Roadless Areas Conservation Rule (66 FR 3244, January 12, 2001; hereafter referred to as the ''Roadless Rule'') prohibits new road construction, road re-construction, and timber harvest in Inventoried Roadless Areas. Additional information about the Roadless Rule is provided in Factor D. 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. (See *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 (12,396 of 17,291 sq km (4,786 of 6,676 sq mi)) of suitable habitat outside the PCA on Forest Service lands within the DPS is currently secure habitat and is likely to remain secure habitat. Because grizzly bears would remain on the Forest Service Sensitive Species list after delisting (USDA Forest Service 2006*b,* p. 26), any increases in roads on National Forests would have to comply with the National Forest Management Act of 1976 (16 U.S.C. 1600 *et seq.*) and would be subject to the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*) process and analysis of potential impacts to grizzly bears. This management designation—''sensitive species'' under the 1982 Forest Service Planning Regulations (47 FR 43037; September 30, 1982) or ''species of conservation concern'' under the 2012 Forest Service Planning Regulations (77 FR 21162; April 9, 2012)—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 2006*b,* p. 26).

Both Federal and State agencies are committed to managing habitat so that the GYE grizzly bear DPS remains recovered and 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 2016, entire; Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002, pp. 2–3; MTFWP 2002, p. 2; WGFD 2005, p. 1) (see Factor D discussion, below). In suitable habitat outside of the PCA, restrictions on human activities are more flexible, but the Forest Service, BLM, and State wildlife agencies will still 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 2016, Chapter 4; 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 2006*b,* pp. A1–A27).

By and large, habitat management on Federal 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 2006*a,* 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 2006*a,* 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 2006*b,* p. 6). Although conflicts with livestock have the potential to result in mortality for grizzly bears, the draft 2016 Conservation Strategy's specific total mortality limits will preclude population-level impacts. The draft 2016 Conservation Strategy directs the IGBST 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 2016, chapter 2).

There are over 500 developed sites on the five 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 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 IGBST determine developed sites on public lands are related to increases in mortality beyond the sustainable limits discussed above, managers may choose to close specific developed sites or otherwise alter 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 Forest Service's commitment to manage National Forest lands in the GYE to maintain a recovered population (U.S. Fish and Wildlife Service 2016, chapter 3; USDA Forest Service 2006*b,* 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 threat to the GYE grizzly bear DPS in the future.

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 Forest Service land allows surface occupancy for oil and gas development, and 11 percent (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 GYE. 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 1,926 sq km (744 sq mi) identified as having both suitable timber and a management prescription that allows timber harvest, from 2000 to 2002, an average of only 5 sq km (2 sq mi) was actually logged annually (USDA Forest Service 2004, p. 118). Similarly, although nearly 3,213 sq km (1,240 sq mi) 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).

Ultimately, the five 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 the DMA to allow for a recovered grizzly bear population. The National Forest plans that provide for this management are further described below in the discussion of Factor D, below. Because the grizzly bear will be classified as a ''species of conservation concern''—or the equivalent management designation—on Forest Service lands if this proposal is made final, 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 2006*b,* p. 26). Under the National Forest Management Act of 1976, the Forest Service will consider all potential impacts of projects to the GYE grizzly bear population in the NEPA planning process and then ensure that activities will provide appropriate habitat to maintain the population's recovered status.

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 GYE 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 (U.S. Fish and Wildlife Service 2007*c,* figures 15 and 16). 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*c,* p. 54). Outside the PCA, State agencies will assist nongovernmental organizations and other entities to identify and prioritize potential lands suitable for permanent conservation through easements and other means as much as possible (U.S. Fish and Wildlife Service 2007*c,* p. 54). Due to the large areas of widely distributed suitable habitat on public lands that are protected by Federal legislation and managed by agencies committed to the maintenance of a recovered grizzly bear population, we do not consider human population growth on private lands to constitute a threat to the GYE grizzly bear DPS now or, in the future.

Summary of Factor A

In summary, the following factors warranted consideration as possible threats to the Greater Yellowstone Ecosystem grizzly bear DPS under Factor A: (1) Motorized access management, (2) developed sites, (3) livestock allotments, (4) mineral and energy development, (5) recreation, (6) snowmobiling, (7) vegetation management, (8) climate change, and (9) habitat fragmentation. Restrictions on motorized access, developed sites, and livestock allotments ensure that they will be maintained at or below 1998 levels, a time when the population was increasing at a rate of 4 to 7 percent per year (Schwartz *et al.* 2006*b,* p. 48). Additionally, secure habitat will be maintained at or above 1998 levels. The primary factors related to past habitat destruction and modification have been reduced through changes in management practices that have already or will be formally incorporated into regulatory documents.

Within suitable habitat, different 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.* 2006*a,* 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 GYE National Forests and National Parks will continue their 15-year history of implementation by legally implementing the appropriate planning documents that incorporate the 1998 baseline values as habitat standards (USDA Forest Service 2006*b,* 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 IGSBT will continue to monitor compliance with the 1998 baseline values and will also continue to monitor grizzly bear body 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.* 2006*a,* p. 64; Haroldson 2014, *in litt.*), will remain a highly secure area for grizzly bears, with habitat conditions maintained at or above levels documented in 1998. Maintenance of the 1998 baseline values inside the PCA will continue to adequately ameliorate the multitude of stressors on grizzly bear habitat such that they do not become threats to the GYE grizzly bear DPS in the future.

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, as is further described in Factor D. Management of individual projects on public land outside the PCA will continue to consider and minimize impacts on grizzly bear habitat. Efforts by nongovernmental organizations and State and county agencies will seek to minimize bear-human conflicts on private lands (U.S. Fish and Wildlife Service 2016, Chapter 4). These and other conservation measures discussed in the ''*Forest Service's Forest plan amendment for grizzly bear habitat conservation for the Greater Yellowstone Area National Forests final environmental impact statement, Record of Decision''* (USDA Forest Service 2006*b*) ensure threats to the GYE grizzly bear population's suitable habitat outside the PCA will continue to be ameliorated and will not be a threat to this population's long-term persistence.

Other management practices on Federal lands have been changed to provide security and to maintain or improve habitat conditions for grizzly bears. All operating plans for oil and gas leases must conform to secure habitat and developed site standards, which require mitigation for any change in secure habitat. Recreation inside the GYE is limited through existing road and developed site standards. Additionally, information and education campaigns educate visitors about how to recreate safely in bear country and avoid bear-human conflicts. There are no data available on the impacts of snowmobiling on grizzly bears to suggest an effect on grizzly bear survival or recovery of the population. Although vegetation management may temporarily impact individual grizzly bears, these activities are coordinated on a BMU or subunit scale according to the Interagency Grizzly Bear Guidelines to mitigate for any potentially negative effect. As a result of vegetation management, there may also be positive effects on grizzly bears where key habitats are maintained or enhanced. The habitat changes that are predicted under climate change scenarios are not expected by most grizzly bear biologists to directly threaten grizzly bears. The potential for changes in the frequency and timing of grizzly bear-human interactions is discussed below under Factor E. Finally, there are no data to indicate that habitat fragmentation is occurring within the GYE.

In summary, the factors discussed under Factor A continue to occur across the range of the GYE 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. Therefore, based on the best available information and on continuation of current regulatory commitment, we do not consider the present or threatened destruction, modification, or curtailment of its habitat or range to constitute a threat to the GYE grizzly bear DPS now, or 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 mortalities including management removals and illegal killings under Factor C, under the ''Human-Caused Mortality'' section. This section evaluates legal grizzly bear hunting for commercial and recreational purposes in the GYE if this population were no longer protected from this type of take by the Act. No grizzly bears have been removed from the GYE 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 under Factor C, below. The only commercial or recreational take anticipated post-delisting is a limited, controlled hunt. Mortality due to illegal poaching, defense of life and property, mistaken identity or other accidental take, and management removals are discussed in the ''Human-Caused Mortality'' section under Factor C. In this section, we describe expected conditions that would be compatible with a recovered GYE grizzly bear population.

To achieve mortality management in the area appropriate to the long-term conservation of the GYE population and to assure that the area of mortality management was the same as the area where the population estimates are made, the Service, based on recommendations in an IGBST report (2012), has proposed to modify the area where mortalities are counted against the total mortality limits to be the same area that is monitored to annually estimate population size. The basis for this area, called the demographic monitoring area (DMA), was the boundary developed in 2007 by the Service (2007*b*) for what was termed ''suitable habitat.'' This suitable habitat boundary (enclosing a total area of 46,035 sq km (17,774 sq mi)) is sufficiently large to support a viable population in the long term, so that mortalities outside of it and inside the DPS could be excluded from consideration. Importantly, the area closely resembles the area in which unique adult female grizzly bears with cubs-of-the-year (less than 1 year old) (see glossary) are surveyed and counted and for which population size is estimated. This DMA area is thus most appropriate for applying total mortality limits. The IGBST's 2012 report noted, however, that because the suitable habitat boundary was drawn using mountainous ecoregions, there were narrow, linear areas along valley floors that did not meet the definition of suitable habitat and where population sinks may be created. 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'' (in their entirety: Lande 1998; Yahner 1988; Mills 1995). Edge effects are exacerbated in small habitat patches with high perimeter-to-area ratios (*i.e.,* those that are long and narrow) 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). Mortalities in these areas would be outside suitable habitat but could have disproportionate effects on the population generally contained within the suitable habitat zone, potentially acting as mortality sinks. The Service accepted the recommendation of the IGBST in the 2012 report for an alternative boundary that includes these narrow areas outside suitable habitat, but is largely bounded by it (see figure 2). The final designation of the DMA includes suitable habitat plus the potential sink areas for a total area of approximately 49,928 sq km (19,279 sq mi) (see figure 2). The DMA contains 100 percent of the PCA and 100 percent of the suitable habitat, as shown in figure 2.

The population has basically stabilized inside the DMA since 2002, with the model-averaged Chao2 population estimate for 2002–2014 being 674 (95% CI = 600–747). This stabilization over 13 years is strong evidence that the population is exhibiting density-dependent population regulation inside the DMA, and this has recently been documented (van Manen *et al.* 2015, entire). The fact that the population inside the DMA has stabilized due to density-dependent effects is strong support that, at this population size, the population has achieved recovery within the DMA.

Accordingly, the agencies implementing the draft 2016 Conservation Strategy have decided that the population in the DMA will be managed around the long-term average population size for 2002–2014 of 674 (95% CI = 600–747)(using the model-averaged Chao2 estimate). The population inside the DMA has stabilized itself at this population size through density-dependent regulation. The model-averaged Chao2 method will be used by the IGBST to annually estimate population size inside the DMA (in their entirety: Keating *et al.* 2002; Cherry *et al.* 2007), as this currently represents the best available science. To achieve a population in the DMA around the long-term average of 674, the total mortality limits for independent females will be set at 7.6 percent when the population is at 674, less than 7.6 percent when the population is lower, and more than 7.6 percent when the population is higher (as per table 1, above, and tables 2 and 3, below). A total mortality limit of 7.6 percent for independent females is the mortality level that the best available science shows results in population stability (IGBST 2012, entire). Annual estimates of population size in the DMA will be made each fall by the IGBST using the model-averaged Chao2 method. These annual estimates will normally vary as in any wild animal population. The annual model-averaged Chao2 population estimate for a given year within the DMA will be used to set the total mortality limits from all causes for the DMA for the following year as per table 1, above, and tables 2 and 3, below. Mortalities will be managed on a sliding scale within the DMA as follows (see table 1, above, for more information):

- Below 600: No discretionary mortality would be allowed unless necessary to address human safety issues.
- Between 600 and 673: Total mortality limits would be less than 7.6 percent for independent females (>2 years old), 15 percent for independent males (>2 years old), and less than 7.6 percent for dependent young.
- At 674: Total mortality limits would be 7.6 percent for independent females, 15 percent for independent males, and 7.6 percent for dependent young.
- Between 675 and 747: Total mortality limits would not exceed 9 percent for independent females, 20 percent for independent males, and 9 percent for dependent young.
- Greater than 747: Total mortality limits would not exceed 10 percent for independent females, 22 percent for independent males, and 10 percent for dependent young.

If this proposed rule is made final, grizzly bears will be classified as a game species throughout the GYE DPS boundaries outside National Parks and the Wind River Indian Reservation in the States of Wyoming, Montana, and Idaho. While we anticipate the States will desire to institute a carefully regulated hunt with ecosystem-wide coordinated total mortality limits, we do not expect grizzly bear trapping to occur due to public safety considerations and the precedent that there has never been public grizzly bear trapping in the modern era. 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 Reservation will be at the discretion of the Tribes and only be available to Tribal members (Title XVI Fish and Game Code, Eastern Shoshone and Northern Arapaho Tribes 2009, p. 9). The National Park Service will not allow grizzly bear hunting within

National Park boundaries. Within the DMA (see figure 2, above), the National Park Service, the MFWP, the WGFD, the IDFG, and the Tribes of the Wind River Reservation (WRR) will manage total mortality to ensure all recovery criteria continue to be met.

TABLE 2—FRAMEWORK TO MANAGE INSIDE THE DMA FOR THE POPULATION GOAL OF THE AVERAGE POPULATION FOR 2002–2014 USING THE MODEL-AVERAGED CHAO2 METHOD. THESE TOTAL MORTALITY RATES WILL RESULT IN POPULATION STABILITY AROUND THE LONG-TERM AVERAGE POPULATION SIZE OF 674 (95% CI = 600–747) THAT EXISTED DURING 2002–2014 AS CALCULATED USING THE MODEL-AVERAGED CHAO2 POPULATION ESTIMATE METHOD. IF THE POPULATION IS FEWER THAN 674, THE TOTAL MORTALITY RATE FOR INDEPENDENT FEMALES AND DEPENDENT YOUNG MUST BE LESS THAN 7.6 PERCENT. IF POPULATION SIZE IS FEWER THAN OR EQUAL TO 600 IN ANY YEAR, NO DISCRETIONARY MORTALITY WILL OCCUR UNLESS NECESSARY FOR HUMAN SAFETY

Management framework	Background and application protocol			
1. Area within which mortality limits apply	49,928 sq km (19,279 sq mi) demographic monitoring area (DMA) (see figure 2, above).			
2. Goal of the draft 2016 Conservation Strategy	To maintain the population around the average population estimate for 2002–2014 of 674 (95% CI = 600–757) during a period of population stability using the model-averaged Chao2 methodology (Keating *et al.* 2002; Cherry *et al.* 2007; Harris *et al.* 2007). This will ensure the continuation of a recovered grizzly bear population in accordance with the three demographic recovery criteria as described in the Recovery Plan and the draft 2016 Conservation Strategy.			
3. Population estimator	The model-averaged Chao2 population estimator will be used as the population measurement tool unless another scientifically sound method becomes available. The model-averaged Chao2 population estimate for 2002–2014 was 674 (95% CI = 600–747).			
4. Mortality limit setting protocol	Each fall, the IGBST will annually produce a model-averaged Chao2 population estimate for the DMA. That population estimate will be used to establish the total mortality limit percentages for each age/sex class for the following year as per #8, #9, and #10 (below).			
5. Allocation process for managed mortalities	The States will meet annually in the month of January to review population monitoring data supplied by IGBST and collectively establish discretionary mortality within the total mortality limits per age/sex class available for regulated harvest for each jurisdiction (MT, ID, WY) in the DMA so that DMA thresholds are not exceeded. If requested, the WRR will receive a portion of the available mortality limit based on the percentage of the WRR geographic area within the DMA. Mortalities outside the DMA are the responsibility of each State and do not count against total mortality limits.			
6. Management of hunting mortalities	Per State regulations and MOA, hunting seasons will be closed within 24 hours of meeting total mortality limits for any age/sex class as per this table. Any mortality exceeding total mortality limits in any year will be subtracted from that age/sex class total mortality limit for the following year.			
7. Management review by the IGBST	A management review will be conducted by the IGBST every 5 to 10 years at the direction of the YGCC. This management review will assess if the management system is achieving the desired goal of ensuring a recovered grizzly bear population in accordance with recovery criteria. The management review is a science-based process that will be led by the IGBST (which includes all State and Federal agencies and the WRR Tribes) using all recent available scientific data to assess population numbers and trend against the management objective and recovery criteria. Age/sex-specific survival and reproductive rates will also be reevaluated using the most recent data to adjust total mortality levels as necessary.			
8. Mortality limit % for all causes for independent FEMALES based on the results of the model-averaged Chao2 method.	Pop. size	≤674	675–747	>747
	Mort. %	≤7.6%	9%	10%
9. Mortality limit % for all causes for independent MALES based on the results of the model-averaged Chao2 method.	Pop. size	≤674	675–747	>747
	Mort. %	15%	20%	22%
10. Mortality limit for % for all causes for dependent young based on the results of the model-averaged Chao2 method.	Pop. Size	≤674	675–747	>747
	Mort. %	≤7.6%	9%	10%

Consistent with USFWS Director Dan Ashe's letter of September 25, 2015, to the state directors, if the model-averaged Chao2 population estimate is less than 674, the total mortality rate for independent females and dependent young will be less than 7.6%.

If State agencies decide to establish hunting seasons, the following regulatory mechanisms must be in place by law and regulation for delisting to occur. The States will enact specific regulations that will serve as adequate

regulatory mechanisms over human-caused mortality, including mortality from sport hunting. These regulations must include:

- Suspending all discretionary mortality inside the DMA, except if required for human safety, if the model-averaged Chao2 population estimate falls below 600;
- Suspending grizzly bear hunting inside the DMA if total mortality limits for any sex/age class (as per tables 1 and 2, above, and table 3, below) are met at any time during the year;
- Female grizzly bear with young will not be available for recreational harvest; and
- In a given year, discretionary mortality will only be allowed if non-discretionary mortality (see Factor C discussion, below) does not meet or exceed total mortality limits for that year.
- Any mortality that exceeds total mortality limits in any year will be subtracted from that age/sex class total mortality limit for the following year to assure that long-term mortality levels remain within prescribed limits inside the DMA.

In addition to the regulatory mechanism above, if total mortality limits for independent females, or independent males, or dependent young are exceeded for 3 consecutive years, and the model-averaged population estimate falls below 612 (the lower limit of the 90% CI), the IGBST will complete a biology and monitoring review to evaluate the impacts of these total mortality levels on the population and present it to the YGCC and the public. The States will coordinate via a signed MOU to manage total mortalities within the DMA to be within the age/sex mortality limits as per tables 1 and 2, above, and table 3, below.

TABLE 3—ALLOWABLE NUMBER OF TOTAL MORTALITIES FROM ALL CAUSES INSIDE THE DMA UNDER THE TOTAL MORTALITY LIMITS FOR INDEPENDENT FEMALES AND INDEPENDENT MALES AT DIFFERENT POPULATION SIZES

	Population size			
	600 to 673	674	675 to 747	>747
1. Total annual mortality limit from all causes for independent FEMALES (≥2 years).	At <7.6% mortality = 16 to 17.	At 7.6% mortality = 18.	At 9% mortality = 21 to 23.	At 10% mortality = >26.
2. Total annual mortality limit from all causes for independent MALES (≥2 years).	At 15% mortality = 31 to 34.	At 15% mortality = 35.	At 20% mortality = 47 to 52.	At 22% mortality = >57.
Total mortality: Documented known and probable grizzly bear mortalities from all causes including but are not limited to: Management removals, illegal kills, mistaken identity kills, self-defense kills, vehicle kills, natural mortalities, undetermined-cause mortalities, grizzly bear hunting, and a statistical estimate of the number of unknown/unreported mortalities.				

The mortalities in table 3 are the total number of allowable mortalities inside the DMA from all causes for different population sizes. Total mortality limits in table 3 for each sex/age class are based on the size of each sex/age cohort, which changes with population size.

There are mortalities that occur every year due to multiple sources including management removals, illegal kills, self-defense, calculated unknown/unreported mortalities, natural mortalities, and other causes such as vehicle collisions. These are considered background levels of mortality and must be taken into account in any calculation and allocation of additional mortality available for hunting in order to remain within the total mortality limits. The expected numbers of background mortalities inside the DMA are calculated by taking the average number of mortalities from the most recent 4-year period from all sources, other than grizzly bear hunting, including calculated unknown/unreported numbers. Because background mortality levels vary from year to year, averaging these over several years is a reasonable predictor of these numbers. This average number of expected background mortalities for independent females and males is then subtracted from the total number of allowable mortalities for the most recent population estimate as per table 3. The resulting number is the expected number of independent female and male bears available for hunting allocation.

As an example, the average background mortality from 2012 to 2015 was 37 (15 females and 22 males) independent bear deaths/year due to management removals, illegal kills, calculated unknown/unreported, natural causes, and other deaths. These are from inside the DMA only. In this example, with an average background mortality of 37 (15 females and 22 males), if the DMA population in a given year was at 674 bears as calculated by the modeled-averaged Chao 2 method, using table 3 there would be 3 female bears and 13 male bears available for discretionary hunting mortality (18 − 15 = 3 independent females and 35 − 22 = 13 independent males). Once either one of these mortality limits was met in any year, the state regulatory mechanisms closing hunting seasons would apply. For the 2015 DMA population estimate of 717, the total allowable mortality for independent females is 22 and for independent males is 50. Applying the average background mortality of 15 and 22 for independent females and independent males, respectively, that would allow for a discretionary mortality inside the DMA of 22 − 15 = 7 independent females and 50 − ;22 = 28 independent males. If the average background mortality was higher than the 2012–2015 average of 37, there may not be any discretionary mortality in a given year. Concurrently, if the average background mortality declined, there may be additional discretionary mortality available.

These examples serve to explain the process that will be used to determine discretionary mortality. Within these mortality limits, state fish and wildlife agencies have discretion to determine whether they intend to propose a grizzly bear hunting season and/or how much discretionary mortality (within allowable limits) to allocate to hunting.

This proposed rule is based on these anticipated changes to Wyoming,

Montana, and Idaho State laws and regulations necessary to implement mortality management inside the GYE DMA described in this section and in tables 1, 2, and 3. It is our expectation that these adequate regulatory mechanisms as described above will be finalized prior to the publication of any final rule resulting from this proposal.

Other regulations, such as timing and location of hunting seasons, should seasons be implemented, would be devised by the States to minimize the possibility that total mortality limits of independent females are exceeded within the DMA (Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002, p. 20; WGFD 2004, p. 20; MFWP 2013, p. 61).

To assure that the distribution criterion (16 of 18 bear management units within the Recovery Zone must be occupied by females with young, with no 2 adjacent bear management units unoccupied, during a 6-year sum of observations) is maintained, the IGBST will annually monitor and report the distribution of reproducing females. If the necessary distribution of reproducing females is not met for three consecutive years, the IGBST will complete a biology and monitoring review to evaluate the impacts of reduced distribution of reproducing females on the population and present it to the YGCC. This biology and monitoring review will consider the significance of the reduced distribution of reproducing females and make recommendations to increase their distribution as necessary.

If this proposed rule is made final, the Service may initiate a formal status review and could emergency relist the GYE grizzly population until the formal status review is complete under the following conditions: (1) If there are any changes in Federal, State, or Tribal laws, rules, regulations, or management plans that depart significantly from the specifics of population or habitat management detailed in this proposed rule and significantly increase the threat to the population; or (2) if the population falls below 500 in any year using the model-averaged Chao2 method, or counts of females with cubs fall below 48 for 3 consecutive years; or (3) if independent female total mortality limits as per tables 1, 2, and 3, above, are exceeded for 3 consecutive years and the population is fewer than 600; or (4) if fewer than 16 of 18 bear management units are occupied by females with young for 3 consecutive 6-year sums of observations. Such a status review would be necessary for relisting the grizzly population should that be warranted.

In areas of the GYE grizzly bear DPS outside the DMA boundaries, respective States and Tribes may establish hunting seasons independent of the total mortality limits inside the DMA. Hunting mortality outside the DMA boundary would not threaten the GYE grizzly bear DPS because total mortality limits are in place as per tables 1, 2, and 3, above, for the source population within the DMA boundary.

To increase the likelihood of occasional genetic interchange between the GYE grizzly bear population and the NCDE grizzly bear population, the State of Montana has indicated they will manage discretionary mortality in this area in order to retain the opportunity for natural movements of bears between ecosystems. Maintaining the presence of non-conflict grizzly bears in areas between the NCDE management area and the DMA of the GYE, such as the Tobacco Root and Highland Mountains, would likely facilitate periodic grizzly bear movements between the NCDE and GYE.

To ensure total mortality rates remain consistent with population objectives after delisting, the IGBST will conduct a demographic review of population vital rates (table 2, item #7) at least every 5 to 10 years in perpetuity. The results of these reviews will be used to make appropriate adjustments to assure adherence to the population objective to maintain the average population from 2002–2014 inside the DMA and to maintain a recovered population in accordance with the recovery criteria. The 5- to 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).

Summary of Factor B

In summary, commercial and recreational hunting warranted consideration as possible threats to the GYE grizzly bear DPS under Factor B. These three regulatory commitments will need to be in place exist prior to issuance of a final rule:

(1) The States will ensure the application of the details in tables 1, 2, and 3, above, regarding annual total mortality levels for each age/sex class are based on annual IGBST model-averaged Chao2 population estimates; and

(2) The States will implement and maintain by law and regulation, as detailed above and in tables 1, 2, and 3, management responses to any departures from total mortality limits for independent females, independent males, and dependent young to maintain the population inside the DMA around the average population size from 2002–2014; and

(3) The State of Montana will manage discretionary mortality in the area between the GYE and the NCDE in order to retain the opportunity for natural movements of bears between ecosystems.

In addition, the Service may initiate a status review with possible emergency relisting act if: (1) There are any changes in Federal, State, or Tribal laws, rules, regulations, or management plans that depart significantly from the specifics of population or habitat management detailed in this proposed rule and significantly increase the threat to the population; or (2) the population falls below 500 in any year using the model-averaged Chao2 method or counts of females with cubs fall below 48 for 3 consecutive years; or (3) independent female total mortality limits as per tables 1, 2, and 3, above, are exceeded for 3 consecutive years and the population is fewer than 600; or (4) fewer than 16 of 18 bear management units are occupied by females with young for 3 consecutive 6-year sums of observations.

If these commitments are implemented into regulations, they would ameliorate impacts related to commercial and recreational hunting such that hunting would not threatehn the the GYE grizzly bear DPS in the future. Should Wyoming, Montana, and/or Idaho fail to make the changes necessary detailed above to support a recovered grizzly bear population, or deviate significantly from the changes in law and regulation described above and in tables 1, 2, and 3, above, delisting could not occur. In addition to State laws and regulations, the IGBST will conduct a demographic review of the population vital rates every 5 to 10 years on which allowable total mortality limits are based to assure adherence to the population objective. We consider the regulatory commitment outlined in this section by State and Federal agencies to reasonably ensure conservation of the GYE grizzly bear DPS. Because of these detailed State and Federal regulatory commitments, we conclude that commercial and recreational hunting will not constitute a substantial threat to the GYE grizzly bear DPS now, or in the future.

C. Disease or Predation

Factor C requires the Service to consider disease or predation affecting the continued existence of a species. In addition to natural disease and predation, we consider here human-

caused mortality other than legal hunting to include illegal poaching, defense of life and property mortality, accidental mortality, and management removals.

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 IGBST, natural mortalities in the wild due to disease have never been documented (IGBST 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 GYE and are likely to remain an insignificant factor in population dynamics into the future. Therefore, we conclude this source of mortality does not constitute a threat to the GYE grizzly bear DPS now, or in the 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.* 2003*b,* 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 GYE 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 reintroduced into the GYE 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 future. Therefore, we conclude this source of mortality does not constitute a threat to the GYE grizzly bear DPS now, or in the 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 19th and 20th 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.* 2003*b,* p. 571), eventually leading to their listing as a threatened species in 1975 (40 FR 31734; July 28, 1975). Grizzly bears 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 grizzly bears 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).

From 1980 to 2002, 66 percent (191) of the 290 known grizzly bear mortalities were human-caused (Servheen *et al.* 2004, p. 21). The main causes of human-caused mortality were human site conflicts, self-defense, vandal killings, and hunting-related, all of which can be partially mitigated for through management actions (Servheen *et al.* 2004, p. 21). In our March 29, 2007, final rule (72 FR 14866), we report that despite these mortalities, this time period corresponds to one during which the Yellowstone grizzly bear population saw population growth and range expansion. Since then, the IGBST has updated these demographic analyses using data from 2002–2011 (IGBST 2012, entire). Below, we evaluate human-caused grizzly bear mortality for 2002–2014, as it represents the most recent and best available information on this subject. For more information on the demographic vital rates for 2002–2011, please see *Population and Demographic Recovery Criteria* in the Recovery Planning and Implementation section, above. From 2002–2014, 76 percent of known or probable grizzly bear mortalities in the GYE DMA (311/410) were human-caused (Haroldson 2014, *in litt.;* Haroldson *et al.* 2015, p. 26). While the number of independent female grizzly bears killed by humans each year has increased gradually, human-caused mortality occurring in the fall, when bears are at an increased risk of conflicts involving hunters, as a proportion of the estimated population size has remained relatively constant, particularly for females (Haroldson 2015, *in litt.*). Overall, human-caused mortality rates have been low enough to allow the GYE 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). Total mortality limits and anticipated State regulations to manage within agreed-upon morality limits as per tables 1, 2, and 3, above, will ensure that mortality will continue to be managed at levels that do not result in long-term population decline. In this section, we discuss impacts from human-caused mortality, 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 22 such killings in the GYE between 2002 and 2014 (Haroldson 2014, *in litt.;* Haroldson *et al.* 2015, p. 26). This constituted 7 percent of known grizzly bear mortalities from 2002 to 2014. 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 is finalized because State and Tribal designation as a game animal means poaching will remain illegal and prosecutable. Please see Factor D for discussion about State and Tribal designation of grizzly bears as a game animal. If anything, authorized hunting through designating the grizzly bear as a game animal may reduce the amount of illegal poaching.

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. This cooperation means illegal

grizzly bear mortalities are often prosecuted under State statutes instead of the Act. We have a long record of this enforcement approach being effective, and no reason to doubt its effectiveness in the absence of the Act's additional layer of Federal protections.

If we delist the GYE DPS, all three affected States and the Eastern Shoshone and Northern Arapaho Tribes of the Wind River Reservation will classify grizzly bears in the GYE as game animals, which cannot be taken without authorization by State or Tribal wildlife agencies (U.S. Fish and Wildlife Service 2016, Chapter 7; Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002, pp. 18–21; MTFWP 2002, p. 2; WGFD 2005, p. 20; Eastern Shoshone and Northern Arapaho Tribes 2009, p. 9). In other words, it will still be illegal for private citizens to kill grizzly bears unless it is in self-defense (as is currently allowed under the Act's protections), or if 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 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 GYE grizzly bear population (IGBST 2012, p. 34) or range expansion (Pyare *et al.* 2004, pp. 5–6; Bjornlie *et al.* 2013, p. 184).

Information and education programs, (which are described in detail in Factor E), with a long record of implementation and will continue under the draft 2016 Conservation Strategy 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 1.6 km/2.6 sq km (1 mi/sq mi)). This level of motorized access meets the needs of a variety of wildlife species, while maintaining reasonable opportunities for public access. Information and education programs also reduce the threat of poaching by teaching people about bear behavior and ecology so that 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, information and education programs foster relationships and build trust between the general public and the government agencies implementing them by initiating communication and dialogue.

From 2002 to 2014, humans killed 97 grizzly bears in self-defense or defense of others in the GYE. This constituted nearly 31 percent of known grizzly bear mortalities during this time period (Haroldson 2014, *in litt.;* Haroldson *et al.* 2015, p. 26). This type of grizzly bear mortality is currently allowed under the provisions of the Act through a 4(d) rule (50 CFR 17.40(b)). These grizzly bear mortalities occurred primarily with elk hunters on public lands during the fall, but also at other times and locations (IGBST 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 (IGBST 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 information and education 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 information and education materials.

Another primary source of human-caused mortality is agency removal of nuisance bears following grizzly bear-human conflicts. Between 2002 and 2014, agency removals resulted in 135 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 (50 CFR 17.40(b)). While lethal to the individual grizzly bears involved, these removals promote conservation of the GYE 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 90 of the 135 agency removals between 2002 and 2014. 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 information and education 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 draft 2016 Conservation Strategy and managing the GYE grizzly bear population post-delisting is for grizzly bear-human conflict management, outreach, and education (U.S. Fish and Wildlife Service 2016, Appendix F). To address public attitudes and knowledge levels, information and education 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 information and education programs, see Factor E discussion, 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 GYE over the last 3 decades. Information and education programs are an integral component of the draft 2016 Conservation Strategy and will continue to be implemented by all partners whether the GYE grizzly bear is listed or not.

Agency removals due to grizzly bear conflicts with livestock accounted for nearly 15 percent (45 out of 311) of known mortalities between 2002 and 2014, and 33 percent of management removals (45 out of 135) (Haroldson 2014, *in litt.;* Haroldson *et al.* 2015, p. 26). Several measures to reduce livestock conflicts are in place inside the PCA, and only one of these 45 mortalities occurred inside the PCA. The 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 2006*a,* p. 167; Landenburger 2014, *in litt.*). The 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 Forest Service during its NEPA process to amend the five 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 2006*b,* pp. 16–17; U.S. Fish and Wildlife Service 2016, Chapter 3). Livestock grazing permits include special provisions regarding reporting of conflicts, proper food and attractant storage procedures, and carcass removal. The Forest Service monitors compliance with these special provisions associated with 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 Forest Service will continue to implement these measures that minimize grizzly bear conflicts with livestock. The draft 2016 Conservation Strategy also recognizes that removal of individual nuisance bears is sometimes required, 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).

The draft 2016 Conservation 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 the total mortality limits for each age/sex class as per table 2, above. The draft 2016 Conservation 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.,* Forest Service, BLM) about nuisance bear relocation and removal decisions, but coordination with the Service during each incident would no longer be required (50 CFR 17.40). The draft 2016 Conservation 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 2016, chapter 4). In addition, an information and education team will continue to coordinate the development, implementation, and dissemination of programs and materials to aid in preventative management of bear-human conflicts. The draft 2016 Conservation 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 GYE grizzly bear population now, or in the future. However, we recognize the importance of managing these sanctioned removals within sustainable levels, and Federal, Tribal, State management agencies are committed to working with citizens, landowners, and visitors to address unsecured attractants to reduce the need for grizzly bear removals.

Humans kill grizzly bears unintentionally in a number of ways. From 2002 to 2014, there were 34 accidental mortalities and 23 mortalities associated with mistaken identification (totaling 18 percent of known mortality for this time period) (Haroldson 2014, *in litt.;* Haroldson *et al.* 2015, p. 26). Accidental sources of mortality during this time included roadkills, electrocution, and mortalities associated with research trapping by the IGBST. 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 IGBST 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 IGBST'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 GYE 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 draft 2016 Conservation Strategy identifies information and education 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 2016, Chapter 5). 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.mt.gov/education/hunter/bearID/* for more information and details). Idaho and Wyoming provide a voluntary bear identification test online (WGFD 2005, p. 34; MTFWP 2002, p. 63). In addition, all three States include grizzly bear encounter management as a core subject in basic hunter education courses.

The IGBST prepares annual reports analyzing the causes of conflicts, known and probable mortalities, and proposed management solutions (Servheen *et al.* 2004, pp. 1–29). The IGBST 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

bear-human conflicts. As directed by the draft 2016 Conservation Strategy (U.S. Fish and Wildlife Service 2016, chapter 4), upon delisting, the IGBST would continue to summarize nuisance bear control actions in annual reports and the YGCC would continue the Yellowstone Ecosystem Subcommittee's role reviewing and implementing management responses (in their entirety: IGBST 2009; YGCC 2009). The IGBST and YGCC implemented this adaptive management approach when the GYE grizzly bear population was delisted between 2007 and 2009. After high levels of mortality in 2008, the IGBST provided management options to the YGCC about ways to reduce human-caused mortality. In fall 2009, the YGCC 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 IGBST's recommendations, see pages 9–18 of the fall 2009 meeting minutes (YGCC 2009). Because human-caused mortality has been reduced through information and education programs (*e.g.,* bear identification to reduce mistaken identity kills by black bear hunters) and management of bear removals (*e.g.,* reduction in livestock predation), we conclude this source of mortality does not constitute a threat to the GYE grizzly bear DPS now, or in the future.

Summary of Factor C

In summary, the following factors warranted consideration as possible threats to the Greater Yellowstone Ecosystem grizzly bear DPS under Factor C: (1) Natural disease, (2) natural predation, and (3) human-caused mortality, other than legal hunting. Both natural disease and natural predation are rare occurrences and therefore not considered a threat to the GYE grizzly bear population. Human-caused mortality, other than legal hunting, includes illegal poaching, defense of life and property mortality, accidental mortality, and management removals. Information and education programs reduce human-caused mortality by: (1) Changing human perceptions and beliefs about grizzly bears; (2) educating recreationists and hunters on how to avoid encounters and conflicts, how to react during a bear encounter, use of bear spray, and proper food storage; and (3) education of black bear hunters on bear identification.

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 that 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.* 2006*b,* p. 48; IGBST 2012, p. 34) indicates mortality levels have allowed the GYE grizzly bear population to meet this definition of recovered.

Overall, from 2002 to 2014, the GYE grizzly bear population incurred an average of 23.9 human-caused grizzly bear mortalities per year (Haroldson 2014, *in litt.;* Haroldson *et al.* 2015, p. 26). Despite these mortalities, the GYE grizzly bear population has continued to increase in size and expand its distribution (Pyare *et al.* 2004, pp. 5–6; Schwartz *et al.* 2006*a,* pp. 64–66; Schwartz *et al.* 2006*b,* p.48; IGBST 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 the intent of the agencies to institutionalize the careful management and monitoring of human-caused mortality through the draft 2016 Conservation Strategy, National Forest and National Park management plans, State grizzly bear management plans, and State 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 the total mortality limits for independent females and males noted in tables 1, 2, and 3, above, that will ensure the population remains recovered within the DMA as measured by adherence to total mortality limits and annual population estimates (see tables 2 and 3 and Factor B, above). Hunting would not occur if other sources of mortality exceeded the total mortality limits (see tables 2 and 3 and Factor B, above). Therefore, based on the best available scientific and commercial information, application of mortality management detailed in this proposed rule and the draft 2016 Conservation Strategy, and the expectation that these bear management practices will continue into the future, we conclude that disease and predation do not constitute threats to the GYE grizzly bear DPS now and are not anticipated to constitute threats in the future.

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; 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 that 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 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 GYE grizzly bear population to the point where the population has recovered and 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.

Laws and regulations of the Federal, Tribal, and State governments provide the legal authority for grizzly bear population and habitat management, monitoring, information and education programs, and conflict response. Grizzly bear habitat management is accomplished primarily by the 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 Forest Service 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 States are generally responsible for managing resident wildlife but not habitat on

Federal public lands such as Forest Service or Bureau of Land Management. National Park lands are an exception, as they are managed by the National Park Service.

The management of grizzly bears and their habitat draws from the laws and regulations of the Federal, State, and Tribal agencies in the proposed GYE DPS boundaries (U.S. Fish and Wildlife Service 2016, chapter 7). These laws and regulations provide the legal authority for controlling mortality, providing secure habitats, managing grizzly bear-human conflicts, controlling hunters, limiting access where necessary, controlling livestock grazing, maintaining information and education programs to control conflicts, monitoring populations and habitats, and requesting management and petitions for relisting if necessary. Recovery of the Yellowstone grizzly bear population is the result of ongoing partnerships between Federal and State agencies, the governors of these States, county and city governments, educational institutions, numerous nongovernmental organizations, private landowners, and the public who live, work, and recreate in the GYE. Just as recovery of the Yellowstone 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. The State plans and the State regulations describe and summarize the coordinated efforts required to manage the GYE grizzly bear population and its habitat such that its recovery is ensured. These State-based documents specify the general population, habitat, and nuisance bear management protocols necessary to manage human-caused mortality risk and maintain a recovered grizzly bear population. The State plans do not currently include detailed laws or regulations in reference to hunting management as described above under Factor B. The Federal and State plans and regulations document the existing Federal and State 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 draft 2016 Conservation 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 Fish and Game Commission management regulations. The 2016 Conservation Strategy will remain in effect in perpetuity, beyond delisting and the 5-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 carefully manage human-caused bear mortality and to coordinate management of the population across multiple land ownerships and jurisdictions will always remain.

U.S. Forest Service

The Forest Service manages nearly 68 percent (31,234 of 46,035 sq km (12,060 of 17,774 sq mi)) of suitable grizzly bear habitat within the GYE. Because the Forest Service does not manage direct take of grizzly bears, they amended their Land Management Plans in 2006 to include legally binding habitat standards. 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 2006*b,* 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 2006*a,* pp. 34–37). These amendments to the GYE National Forest Land Management Plans would become effective if, and when, delisting is finalized. They were in effect for 2.5 years when GYE grizzly bears were delisted between March 2007 and September 2009, but they were technically not applicable after the March 29, 2007, final rule (72 FR 14866) was vacated by the District Court of Montana. Importantly, even after the Montana District Court's decision, the Forest Service continued to manage according to the agreements reached in the 2007 Conservation Strategy and its Forest Plan amendments even though the delisting rule was vacated and the Forest Service was not legally required to manage under those standards. Because of this commitment and the fact that the plans have been successfully implemented by the Forest Service, there is a 7-year demonstrated track record of implementation by the signatories of the 2007 Conservation Strategy.

While the habitat standards in the draft 2016 Conservation Strategy that were 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 22,783 sq km (8,797 sq mi) of suitable habitat outside the PCA, the Forest Service manages 17,292 sq km (6,676 sq mi), or 76 percent. Of this 76 percent of suitable habitat outside of the PCA but within the DMA that the Forest Service manages, 39 percent is Designated Wilderness Area, 4 percent is Wilderness Study Area, and 36 percent is Inventoried Roadless Area. These designations provide regulatory mechanisms that protect grizzly bear 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 6,799 sq km (2,625 sq mi) 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 GYE grizzly bear 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.,* 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 4,891 sq km (1,888 sq mi) of secure habitat for grizzly bears outside of the PCA within the DPS boundaries. The 2001 Roadless Rule prohibits road

construction, road reconstruction, and timber harvest in Inventoried Roadless Areas (66 FR 3244; 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 Forest Service will classify grizzly bears in the GYE 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 2006*b,* p. 26). This classification means the Forest Service will consider all potential impacts to the GYE grizzly bear population from proposed activities as part of its NEPA compliance obligations. Then, under the National Forest Management Act of 1976 (16 U.S.C. 1600 *et seq.*), the Forest Service 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 (9,407 of 46,035 sq km (3,632 of 17,774 sq mi)) 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 2007 Conservation Strategy into their Superintendent's Compendium in 2014 (Yellowstone National Park 2014, p. 18) and Grand Teton National Park will do the same in their 2016 Compendium, before this proposed action is finalized. Grizzly bear hunting is not allowed in Yellowstone National Park or Grand Teton National Park. Within the John D. Rockefeller Jr. Memorial Parkway, the Secretary of the Interior is required to permit hunting in accordance with applicable Federal and State law, with exceptions for public safety, administration, or public use and enjoyment.

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 habitat management would never constitute a threat to the GYE grizzly bear population. No Tribal managed land occurs within the PCA. The Tribes' Grizzly Bear Management Plan (2009) 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 GYE grizzly bear 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 1.6 km/sq km (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 applicable Tribal mechanisms, it must be consistent with the demographic standards described under Factor B of this proposed rule and in the Tribal Grizzly Bear Management Plan (Eastern Shoshone and Northern Arapaho Tribes 2009, pp. 2, 9).

State Regulatory Mechanisms

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 criteria outside the PCA. Idaho, Montana, and Wyoming have developed management plans for areas outside the PCA to: (1) Assure that the measures of the Act continue to be unnecessary for the grizzly bears in the GYE DPS; (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 (in their entirety: Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002; MTFWP 2002, 2013; WGFD 2005). The plans for all three States were completed in 2002, with Wyoming's plan amedned in 2005 and Montana's plan updated in 2013, and grizzly bears within the GYE DPS will be incorporated into existing game species management plans should we delist them.

If delisting is made final, 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. The regulatory mechanism proposed by States discussed under Factor B and in tables 1, 2, and 3, above, that would govern potential hunting seasons must be in place by law and regulation in each State for delisting to occur. We expect that these State statutory and regulatory changes will be made within the next several months.

Other regulations, such as timing and location of seasons, seasonal closure procedures, and licenses and fees would be devised by the States to minimize the possibility that total mortality limits of independent females are exceeded within the DMA (Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002, p. 20; WGFD 2004, p. 20; MFWP 2013, p. 61).

Any grizzly bear hunting within the DMA would only occur if total annual mortality limits specified for the GYE grizzly bear DMA population are not exceeded as per tables 1, 2, and 3, above. Hunting limits would be regulated by State regulations as described above. The killing of grizzly bears in self-defense or defense of others by humans will continue to be allowed under both Federal (*e.g.,* laws that would apply on Forest Service and National Park Service lands) 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 bear mortality (Idaho's Yellowstone Grizzly Bear Delisting Advisory Team 2002; MTFWP 2002; WGFD 2005) 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 State law enforcement investigation would have to verify an injured or dead livestock animal.

The management of nuisance bears within the GYE grizzly bear DPS boundaries would be based upon existing laws and authorities of State wildlife agencies and Federal land management agencies, and directed by protocols established in the draft 2016 Conservation 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 and State regulations provide the necessary regulatory framework and guidelines to State wildlife agencies for managing and maintaining a recovered GYE grizzly bear DPS inside of the DMA. Any

mortalities due to nuisance bear management or removal will count against the total mortality limit inside the DMA. 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 and regulations create a framework within which the needs of grizzly bears and humans can be balanced.

It is anticipated that take of grizzly bears would therefore would likely be strictly limited by hunting seasons and quotas and legally enforceable through laws and regulations concerning grizzly bears and other game animals in each State. We expect that State wildlife commissions would also promulgate regulations with commitments to coordinate hunting limits within the DMA among jurisdictions and within the total mortality limits calculated annually by the IGBST (see tables 1, 2, and 3, above, for details on these mortality limits) as described under Factor B. These regulations would constitute legally enforceable regulatory mechanisms and these regulations must be adopted and in place before the Service goes forward with a final delisting rule.

Summary of Factor D

In summary, when the listing of the grizzly bear population was finalized in 1975, the inadequacy of existing regulatory mechanisms was identified under Factor D as one of the threats to the population. Legally enforceable regulatory mechanisms that would be in place if this proposed rule is finalized and the GYE grizzly bear DPS is delisted include National Park Superintendent's Compendiums, the Forest Service Amendment for Grizzly Bear Habitat Conservation for the GYE National Forests, the Wind River Reservation regulations, and State Fish and Game Commission laws and regulations as per tables 1, 2, and 3 and as described under Factor B, above.

In addition to these regulatory mechanisms, after delisting, the Service will initiate a status review with possible emergency listing if changes in Federal, State, or Tribal laws, rules, regulations, or management plans depart significantly from the management details described in this section, thereby compromising implementation of the draft 2016 Conservation Strategy. In total, these mechanisms would provide an adequate regulatory framework within which the GYE grizzly bear population would continue to experience long-term population health within the DMA.

Based on this information, it is reasonable to conclude existing regulatory mechanisms, and those that would be enacted before this proposed rule is made final, are adequate to protect the GYE grizzly bear population if the protections of the Act were no longer in place. Therefore, based on the best available information, we conclude that the inadequacy of existing regulatory mechanisms will not constitute a threat to the GYE grizzly bear DPS now or in the future if the appropriate regulatory mechanisms are adopted and maintained by the States in enforceable regulations before this proposed rule becomes final.

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 GYE grizzly bear DPS: (1) Genetic health; (2) changes in food resources; (3) climate change; and (4) human attitudes toward grizzly bear conservation.

Genetic Health

The isolated nature of the GYE grizzly bear population was identified as a potential threat when listed in 1975. Declines in genetic diversity are expected in isolated populations (Allendorf *et al.* 1991, p. 651; Burgman *et al.* 1993, p. 220). For the GYE 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 GYE grizzly bear population demonstrate that the current levels of genetic diversity are capable of supporting healthy reproductive 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 a stable to increasing population (Schwartz *et al.* 2006*b,* entire; IGBST 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 0.60 using more recent data and larger sample sizes (Haroldson *et al.* 2010, p. 7), we know there is no immediate need for new genetic material (Miller and Waits 2003, p. 4338).

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 GYE grizzly bear population should remain above 100 animals (Miller and Waits 2003, p. 4338). In grizzly bears, effective population size is approximately 25 to 27 percent 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 number of animals in the population necessary for genetic health is always maintained, the draft 2016 Conservation Strategy established a standard to maintain the total population size above 500 animals (U.S. Fish and Wildlife Service 2016, Chapter 2). Recent work (Kamath *et al.* 2015, p. 6) demonstrates that the effective population size (N_e) of the GYE population has increased from 102 (95% CI = 64–207) in 1982, to 469 (95% CI = 284–772) in 2010. The current effective population is more than four times the minimum effective population size suggested in the literature (Miller and Waits 2003, p. 4338).

While this current effective population size of approximately 469 animals is adequate to maintain genetic health in this population, 1 to 2 effective migrants from other grizzly bear populations every 10 years would maintain or enhance this level of genetic diversity and therefore assure genetic health 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; Kamath *et al.* 2015, p. 11). We have defined an effective migrant as an individual that immigrates into an isolated population from a 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 GYE grizzly bear population every 10 years (*i.e.,* one generation) to maintain current levels of genetic diversity (U.S. Fish and Wildlife Service 2007*c,* p. 37). In light of new information in Kamath *et al.* (2015) documenting stable levels of heterozygosity and a current effective population size of 469 animals (Kamath *et al.* 2015, p. 6), we have removed the deadline of 2020 for translocation from the draft 2016 Conservation Strategy. As stated by Kamath *et al.* (2015, p. 11), the current effective population size is sufficiently large to avoid substantial accumulation of inbreeding depression, thereby reducing concerns regarding genetic factors affecting the viability of GYE grizzly bears. However, the Service recognizes that the long-term viability of the GYE grizzly bear population will benefit from occasional gene flow from nearby grizzly bear populations like that in the NCDE. Thus, efforts will continue to facilitate occasional movement of male bears between the NCDE and Yellowstone in the intervening areas between the GYE and the NCDE. To increase the likelihood of occasional genetic interchange between the GYE grizzly bear population and the NCDE grizzly bear population, the State of Montana has indicated they will manage discretionary mortality in this area in order to retain the opportunity for natural movements of bears between ecosystems. Translocation of bears between these ecosystems will be a last resort and will only be implemented if there are demonstrated effects of lowered heterozygosity among GYE grizzly bears or other genetic measures that indicate a decrease in genetic diversity.

To document natural connectivity between the GYE and the NCDE, Federal and State agencies will continue to monitor bear movements on the northern periphery of the GYE grizzly bear 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 possible gene flow between these two ecosystems (U.S. Fish and Wildlife Service 2016, Chapter 2). 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 GYE and NCDE grizzly 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 GYE grizzly bear DPS and other grizzly bear populations. To promote natural connectivity, there are attractant storage rules on public lands between the GYE and other grizzly bear recovery zones in the NCDE and Bitterroot. We do not consider connectivity to the east, west, or south a relevant issue to the GYE grizzly bear population's long-term persistence because there are no extant populations in these directions to enhance the genetic diversity of the GYE population. However, we recognize the GYE grizzly bear population could be a possible source population to re-colonize the Bitterroot Ecosystem to the west.

Genetic concerns are not currently a threat to the GYE grizzly bear population (Miller and Waits 2003, p. 4338; Kamath *et al.* 2015, entire). Attractant storage orders on public lands, through a reduction in conflict situations, and careful regulation of hunting in certain areas provide adequate measures to promote natural connectivity and prevent reductions in genetic diversity. The IGBST will carefully monitor movements and the presence of alleles from grizzly bear populations outside the GYE grizzly bear DPS boundaries (U.S. Fish and Wildlife Service 2016, Chapter 2). The IGBST will continue to monitor genetic diversity of the GYE grizzly bear population so that a possible reduction in genetic diversity due to the geographic isolation of the GYE grizzly bear population will be detected and responded to accordingly with translocation of outside grizzly bears into the GYE. This approach ensures that long-term genetic diversity does warrant a continued threatened listing for the GYE DPS. Therefore, based on the best available scientific information, we conclude that genetic diversity does not constitute a threat to the GYE grizzly bear DPS now, nor is it anticipated to in the future.

Changes in Food Resources

The IGBST currently monitors the productivity of four common grizzly bear foods in the GYE: 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 GYE (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).

Grizzly bears primarily consume elk and bison as winter-killed carrion in the early spring, but also kill calves opportunistically and prey upon adults weakened during the fall breeding season. The availability of these ungulates is threatened by brucellosis (*Brucella abortus*) and resulting management practices resulting in bison removal, chronic wasting disease (CWD), competition with other top predators for ungulates, and decreasing winter severity. Brucellosis does not affect bison as a food source for grizzly bears, and the subsequent removal program is managed to ''maintain a wild, free-ranging population of bison'' (USDOI National Park Service and USDA Animal and Plant Health Inspection Service 2000, p. 22). CWD is fatal to deer and elk but has not been detected in the GYE and as transmission is density-dependent (Schauber and Woolf 2003, pp. 611–612); CWD would not result in local extinction of deer or elk populations. The availability of ungulate carcasses is not anticipated to be impacted by either of these diseases such that they are a threat to the GYE grizzly bear population now, or in the future. The reintroduction of gray wolves (*Canis lupus*) to the GYE in 1995 has created competition between grizzly bears and wolves for carrion; however, there has been no documentation of negative influence on the GYE grizzly bear population (Servheen and Knight 1993, p. 36). Decreasing winter severity and length as a result of climate change could reduce spring carrion availability (Wilmers and Getz 2005, p. 574; Wilmers and Post 2006, p. 405). A reduction of winter-killed ungulates may be buffered by an increase of availability of meat to adult grizzly bears during the active season as a result of grizzly bears usually prevailing in usurping wolf-killed ungulate carcasses (Ballard *et al.* 2003, p. 262). Therefore, fluctuations in the availability of ungulates are not a threat to the GYE grizzly bear population now, or in future.

A decline in the Yellowstone cutthroat trout population has resulted from a combination of factors: the introduction of nonnative lake trout (*Salvelinus naymaycush*), a parasite that causes whirling disease (*Myxobolus cerebralis*), and several years of drought conditions in the Intermountain West (Koel *et al.* 2005, p. 10). Although there has been a corresponding decrease in

grizzly bear use of cutthroat trout, only a small portion of the GYE grizzly bear population uses cutthroat trout (Haroldson *et al.* 2005, p. 175), and grizzly bears that fish in spawning streams only consume, on average, between 8 and 55 trout per year (Felicetti *et al.* 2004, p. 499). Therefore, potential declines in cutthroat trout are not currently, nor are they likely, to become a threat in future to the GYE grizzly bear population.

Army cutworm moths aggregate on remote, high-elevation talus slopes where grizzly bears forage on them from mid-summer to late summer. Grizzly bears could potentially be disturbed by backcountry visitors (White *et al.* 1999, p. 150), but this has not been documented in the GYE. The situation is monitored by the IGBST and the WGFD, who will take appropriate management action as necessary. Climate change may affect army cutworm moths by changing the distribution of plants that the moths feed on or the flowering times of the plants (Woiwod 1997, pp. 152–153). However, they GYE plant communities have a wide elevational range that would allow for distributional changes (Romme and Turner 1991, p. 382), and army cutworm moths display foraging plasticity (Burton *et al.* 1980, pp. 12–13). Therefore, potential changes to army cutworm moth availability are not likely to threaten the GYE grizzly bear population in the future.

More details on the specific ways in which changes in ungulates, cutthroat trout, and army cutworm moths could affect the GYE grizzly bear population are discussed in detail in the 2007 final rule (72 FR 14866, March 29, 2007, pp. 14,928–14,933). Our analysis focuses on the potential impacts that the loss of whitebark pine could have on the GYE grizzly bear population. While we discussed notable declines in whitebark pine due to mountain pine beetle in the 2007 final 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 (*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 IGBST completed a comprehensive demographic review using data from 2002–2011 (IGBST 2012, p. 7) and extensive analyses to determine if the decline in whitebark pine is driving observed changes in population vital rates (IGBST 2013, entire).

Whitebark pine still faces the same threats reported in our 2007 final rule and reiterated 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 that action is precluded by higher priority actions. This status is primarily the result of direct mortality due to white pine 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 candidate notice of review (78 FR 70104; 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 six more independent females and six more independent males die across the ecosystem in poor whitebark pine years (IGBST 2013, p. 25, figure 5). These mortalities are primarily due to defense of life encounters and wildlife management agency removals of conflict bears (Gunther *et al.* 2004, pp. 13–14; IGBST 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.* 2006b, p. 21). Despite these effects on survival and reproduction, using data from 2002 to 2011, the IGBST documented an average annual population growth rate for the GYE grizzly bear population between 0.3 and 2.2 percent (IGBST 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 (1983–2001). Therefore, the IGBST 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 rates, the IGBST 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'') (IGBST 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.

For the Food Synthesis Report, the IGBST developed a comprehensive set of research questions and hypotheses to evaluate grizzly bear responses to changes in food resources. Specifically, the IGBST asked eight questions: (1) How diverse is the diet of GYE grizzly bears? (2) Has grizzly bear selection of whitebark pine habitat decreased as tree mortality increased? (3) Has grizzly bear body condition decreased as whitebark pine declined? (4) Has animal matter provided grizzly bears with an alternative food resource to declining whitebark pine? (5) Have grizzly bear movements increased during the period of whitebark pine decline (2000–2011)? (6) Has home range size increased as grizzly bears sought alterative foods, or has home range size decreased as grizzly bear density increased? (7) Has the number of human-caused grizzly bear mortalities increased as whitebark pine decreased? (8) Are changes in vital rates during the last decade associated more with decline in whitebark pine resources than increases in grizzly bear density? The preliminary answers to these questions are contained in the Synthesis Report and the final results have been (or will be) published in peer-reviewed journals (in their entirety: Schwartz *et al.* 2013; Bjornlie *et al.* 2013; Costello *et al.* 2014; Gunther *et al.* 2014; Schwartz *et al.* 2014; van Manen *et al.* 2015; Ebinger *et al. in review;* Haroldson *et al. in prep*.)

Key findings of the Synthesis Report are summarized below. To address the first question about how diverse GYE grizzly bear diets are, Gunther *et al.* (2014, entire) conducted an extensive literature review and documented over 260 species of foods consumed by grizzly bears in the GYE, representing four of the five kingdoms of life (for more information, please see Nutritional Ecology, above). Regarding the second 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 habitat 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 third 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 IGBST (2013, p. 18) found body mass and percent body fat in the fall had not changed significantly from 2000 to 2010. When they examined trends in females only, the data seemed to show a slightly declining trend in female body fat during the fall, starting around 2006 (Schwartz *et al.* 2014, p. 72). However, they suggested it could be the result of very small sample sizes (n = 2.6 bears/year) and noted the data for 2011 (not included in their published paper) showed an increase in fall body fat for females, ultimately cautioning that more data were needed before it could be determined if there was truly a trend (Schwartz *et al.* 2014, p. 76). In the Food Synthesis Report, the IGBST revisited the previous analysis with information since 2010, and found ''body condition is not different between poor and good years of whitebark pine production'' (IGBST 2013, p. 18). In response to the fourth research question, the IGBST found that ungulate carcass use had increased since 2002, and that bears used more meat in years with poor whitebark pine seed production (Schwartz *et al.* 2013, p. 68). These results were expected and are consistent with previous findings (Mattson 1997, p. 169). To answer the fifth and sixth research questions identified in the previous paragraph, the IGBST examined movement rates and home range sizes. They found daily and fall bear movements had not increased from 2000 to 2011 (Costello *et al.* 2014, pp. 2011, 2013). Additionally, they documented that home ranges 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 IGBST 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 and bears were roaming more widely in search of foods, these findings offer strong support that changes in population vital rates since the early 2000s are more indicative of the population approaching carrying capacity than a shortage of resources (van Manen *et al.* 2015, p. 21).

In response to the seventh question, 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 increase in poor compared to 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 (IGBST 2013, p. 25). The greatest increase in predicted mortality occurred outside the PCA, which may be partially attributable to range expansion and continued population increase (Haroldson *et al. in prep.*). However, increased mortality numbers have not led to a declining population trend (IGBST 2012, p. 34).

In response to the eight question, the IGBST found that while whitebark pine seed production can influence reproductive rates the following year, the overall fecundity rates during the last decade (2002–2011) did not decline when compared with data from 1983–2001 (IGBST 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 one-cub litters were more common in years following poor whitebark pine seed production, one-cub litters are still adequate for population growth. Furthermore, one-cub litters are still relatively uncommon following poor whitebark pine years, as evidenced by a very consistent average litter size around two since the IGBST 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 IGBST even though the availability of whitebark pine seeds declined (IGBST 2013, pp. 33–34).

In contrast to previous studies that concluded increased mortality in poor whitebark pine years led to population decline in those years (Pease and Mattson 1999, p. 964), the IGBST found the population did not decline despite increased mortality in poor whitebark pine years. The conclusions of Pease and Mattson (1999, p. 964) are 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 1 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, entire; Schwartz *et al.* 2006b, p. 48; IGBST 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 2 years. In other words, management-trapped bears often return to foraging on naturally occurring food sources, away from human developments. Another assumption made by Pease and Mattson (1999, p. 967) was that 73 percent of the GYE 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 GYE grizzly bear population were ever involved in conflicts. Together, these two erroneous assumptions by Pease and Mattson (1996, p. 967) resulted in a gross underestimation of population trend. As a result, we do not consider Pease and Mattson (1996) to be the best available science.

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 whitebark pine declined, and Schwartz

et al. (2010, p. 662) found that when bears use lower elevations in poor whitebark pine seed production years, it is the amount of secure habitat that determines mortality risk. Meaning, in both good and 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 decline 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 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.* 2013, p. 75; IGBST 2013, p. 20). Evidence suggests that observed changes in population vital rates since the rapid decline of whitebark pine that began in the early 2000s are being driven by density-dependent effects and have resulted in a stable to slightly increasing population trend. Van Manen *et al.* (2015, entire) found cub survival, yearling survival, and reproductive transition from no offspring to cubs all changed from 1983 to 2012, with lower rates evident during the last 10–15 years. Cub survival and reproductive transition were negatively associated with an index of grizzly bear density, indicating greater declines where bear densities were higher. Their analysis did not support a similar relationship for the index of whitebark pine mortality. The results of van Manen *et al.* (2015) support the interpretation that slowing population growth during the last decade was associated more with increasing grizzly bear density than the decline in whitebark pine. In other words, the population is approaching carrying capacity (van Manen *et al.* 2015, entire). This evidence further supports the recovered status of the GYE grizzly bear population. Despite significant changes in food resources in the GYE in the last 15 years, grizzly bear population growth increased or stabilized.

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.* 2006b, 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 provided high-calorie foods the entire time. They were in the exact same location every year and for the entire season. Grizzly bears 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 Ecosystem grizzly bears have high diet diversity (Gunther *et al.* 2014, p. 65) and use alternate foods in years of low whitebark pine seed production (Schwartz *et al.* 2013, pp. 75–76). Nearly one third of grizzly bears in the GYE 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 GYE 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 between good and poor whitebark pine seed years (Schwartz *et al.* 2014, pp. 72–73, 75).

The IGBST 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 draft 2016 Conservation Strategy (U.S. Fish and Wildlife Service 2016, Chapters 3 and 4). These data provide the 2016 Conservation 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 GYE grizzly bear population. These management responses may involve increased habitat protection, increased mortality management, or a status review and emergency relisting of the population if management actions are unable to address the problems.

Grizzly bears are resourceful omnivores that will make behavioral adaptations regarding food acquisition (Schwartz *et al.* 201, p. 75). Diets of grizzly bears vary among individuals, seasons, years, and where they reside within the GYE (Mealey 1980, pp. 284–287; Mattson *et al.* 1991*a,* 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 GYE) 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 765 bears in 2004, and a subsequent average 3 percent 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 cutthroat trout in the Yellowstone Lake area varied dramatically over the last 3 decades due to both natural and human-introduced causes (Reinhart and Mattson 1990, pp. 345–349; Podruzny *et al.* 1999, pp. 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 GYE grizzly bear population has continued to increase and expand during this time period despite these changes in foods (Schwartz *et al.* 2006a, p. 66; IGBST 2012, p. 34; Bjornlie *et al.* 2014, p. 184). The GYE 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 do they have a diet that is specialized on consumption of these seeds. While we know whitebark pine seed production can influence reproductive and survival rates, it has not caused a negative population trend, as evidenced by stable to slightly increasing trend between 2002 and 2011 (IGBST 2012, p. 34). As articulated in the Food Synthesis Report by the IGBST (IGBST 2013, pp. 32–35) and supporting studies (in their entirety: Bjornlie *et al.* 2014; Costello *et al.* 2014; Gunther *et al.* 2014), the demonstrated resiliency to declines in whitebark pine seed production and other high-calorie foods such as cutthroat trout shows that changes in food resources are not likely to become substantial impediments to the long-term persistence of the GYE grizzly bear population.

In *Greater Yellowstone Coalition* v. *Servheen,* 665 F.3d 1015 (9th Cir. 2011), the Ninth Circuit faulted the Service's conclusion that whitebark pine losses did not pose a threat. First, the Ninth Circuit noted that grizzly bears' adaptability and resourcefulness increased the threat from whitebark pine loss because it raised the risk of conflicts with humans as bears looked for other food sources. The Service acknowledges this component of the threat from whitebark pine loss, but despite increased mortality during poor whitebark years, the population trend

has remained stable to increasing (IGBST 2012, p. 34). Additionally, during years of poor whitebark pine seed availability, grizzly bears did not roam over larger areas (Costello *et al.* 2014, p. 2014); rather, the increased risk of mortality was related to the use of lower elevations and less secure habitat within their home range (Schwartz *et al.* 2010, p. 662). Second, the court noted that the Service's data on long-term population growth came from 2002, before the pine beetle epidemic began. New data show that although population growth has slowed from the 4 to 7 percent that occurred from 1983 to 2001 (Eberhardt *et al.* 1994, p. 362; Knight and Blanchard 1995, pp. 18–19; Schwartz *et al.* 2006b, p. 48), it continued to grow at a rate of 0.3 to 2.2 percent from 2002 to 2011 (IGBST 2012, p. 34). Third, the court faulted the Service for using a study of NCDE bears to prove GYE grizzly bears continued to increase despite whitebark pine losses, even though GYE bears were reported to be unique because of their reliance on whitebark pine seeds. Current data show that the GYE bear population has stabilized or increased despite the loss of whitebark pine seeds (IGBST 2012, p. 34). As explained in the DPS analysis, the Service no longer considers the GYE bear population to be significant due to unique ecological conditions, including reliance on whitebark pine seeds. A recent study found that nearly one third of collared grizzly bears in the GYE did not even have whitebark pine within their home ranges and those that did made use of other foods within their home ranges during poor whitebark pine years (Costello *et al.* 2014, pp. 2009, 2013). Fourth, the Ninth Circuit observed that the Service contradicted itself by stating that the entire PCA was necessary to support a recovered population, yet acknowledged that whitebark pine would persist in only a small part of the PCA. New data show that despite the decline in whitebark pine, the GYE population is stable at close to carrying capacity and is exhibiting density-dependent regulation inside the DMA (van Manen *et al.* 2015, entire). Fifth, the court determined it was arbitrary and capricious for the Service to rely on scientific uncertainty about whitebark pine loss in a delisting decision. Any uncertainty about the loss of whitebark pine has been conclusively resolved by GYE population numbers that show stable or increasing populations despite loss of whitebark pine seeds (IGBST 2012, p. 34) and no long-term changes in vital rates (IGBST 2012, pp. 32–34). Furthermore, whitebark pine tree mortality has significantly slowed since 2009, suggesting that the current beetle outbreak may have run its course (Haroldson 2015, p. 47). Finally, the Ninth Circuit faulted the Service for relying on adaptive management and monitoring without describing management responses and specific triggering criteria. The population objectives that will be incorporated into regulations provide specific triggers for management action (see Factor B discussion, above). The Service continues to believe that adaptive management will play a role in future management decisions because new data and new information will require appropriate management responses.

In summary, the best scientific and commercial data available regarding grizzly bear responses to food losses suggest this issue is not a threat to the GYE grizzly bear population and is not an impediment to long-term population persistence. Therefore, we conclude that changes in food resources do not constitute a threat to the GYE grizzly bear DPS now, nor is it anticipated to in the future.

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 2013*a,* 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 2013*a,* 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 2013*b,* 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 (American Association for the Advancement of Sciences 2014, p. 17).

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 (in their entirety: 2013*c,* 2014), and similar types of information for the United States and regions within it are available via the National Climate Assessment (Melillo *et al.* 2014, entire). 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 2013*b,* p. 17).

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 2013*b,* p. 19; IPCC 2014, entire).

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 (in their entirety: IPCC 2013*c,* 2014), and within the US (Melillo *et al.* 2014, entire). 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 United States 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 United States (Duffy *et al.* 2006, p. 893), 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.

The effects related to 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 United States 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 GYE, Haroldson *et al.* (2002, pp. 34–35) reported later den entry dates for male grizzly bears, 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, p. 4).

The effects related to climate change could create temporal and spatial shifts in grizzly bear food sources (Rodriguez *et al.* 2007, pp. 41–42). Changes in plant communities have already been documented, with species' ranges shifting farther north and higher in elevation due to environmental constraints (Walther *et al.* 2002, pp. 390–391; Walther 2003, pp. 172–175; Walther *et al.* 2005, p. 1428) and increases in outbreaks of insects that reduce survival (Bentz *et al.* 2010, entire). Decreased snowpack could lead to fewer avalanches thereby reducing avalanche chutes, an important habitat component to grizzly bears, 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 (in their entirety: Walther *et al.* 2002; Fagre *et al.* 2003), there is general consensus that grizzly bears are flexible enough in their dietary needs that they will not be impacted directly by ecological constraints such as shifts in food distributions and abundance (Servheen and Cross 2010, p. 4; IGBST 2013, p. 35).

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, entire). 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, entire). High-intensity fires may reduce grizzly bear habitat quality immediately afterwards by decreasing hiding cover and delaying regrowth of vegetation, although Blanchard and 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. Because grizzly bears have shown resiliency to changes in vegetation resulting from fires, we do not anticipate altered fire regimes predicted under most climate change scenarios will have significant negative impacts on grizzly bear survival or reproduction, despite its potential effects on vegetation. Therefore, we conclude that the effects of climate change do not constitute a threat to the GYE grizzly bear DPS now, nor are they anticipated to in the future.

Public Support and 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 bear 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 grizzly bears 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). Information and education 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 information and education programs have been an essential factor contributing to the recovery of the GYE grizzly bear population since its listing in 1975. By identifying values common to certain user groups, the information and education 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 bear country, we believe continued coexistence between grizzly bears and humans will be accomplished.

Traditionally, residents of the GYE involved in resource extraction industries, such as loggers, miners, livestock operators, and hunting guides, are opposed to land-use restrictions 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 by potentially reducing the number of conflict situations.

Ultimately, the future of the grizzly bear will be based on the people who live, work, and recreate in grizzly bear habitat and the willingness and ability of these people to learn to coexist with the grizzly bear and to accept this animal as a cohabitant of the land. Other management strategies are unlikely to succeed without effective and innovative public information and education programs. The objective of the public outreach program is to proactively address grizzly bear-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. In addition to public outreach programs, the States have implemented other programs to help reduce conflicts with the people that are directly affected by grizzly bears. These efforts include livestock carcass removal programs, electric fencing subsidies for apiaries and orchards, and sharing costs of bear-resistant garbage bins where appropriate.

Although 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 information and education are 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 3 million people visit the National Parks and National Forests of the GYE each year, (USDA Forest Service 2006*a,* 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 information and education working group has been a major component contributing to the successful recovery of the GYE 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 GYE grizzly bear DPS boundaries to address the human sources of conflicts.

From 1980 through 2002, at least 36 percent (72 out of 196) of human-caused mortalities may have been avoided if relevant information and education materials had been presented, understood, and used by involved parties (Servheen *et al.* 2004, p. 15). Educating back- 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 information and education programs.

Outside the PCA, State wildlife agencies recognize that the key to preventing grizzly bear-human conflicts is providing information and education 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 to ongoing grizzly bear survival and successful coexistence with humans in the GYE so that the measures of the Act continue to not be necessary. All three States have been actively involved in information and education 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, the WGFD created a formal grizzly bear-human conflict management program in July 1990, and has coordinated an extensive information and education program since then. Similarly, since 1993, 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 periphery of the grizzly bear's 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's 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, entire). 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 of Wildlife 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 would come from the secondary depredation account, and the program would 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. Therefore, we conclude that through the positive influence of the information and education program, public support and attitude does not constitute a threat to the GYE grizzly bear DPS now, nor is it anticipated to in the future.

Summary of Factor E

Factor E requires the Service to consider other natural or man-made factors affecting a species' continued existence. The following factors warranted consideration as possible threats to the GYE grizzly bear population: (1) Genetic health, (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 threat for the following reasons: we have an effective population size more than four times that recommended by the best available science; we know 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 that genetic contribution from individual bears outside of the GYE will not be necessary for the next several decades (Miller and Waits 2003, p. 4338; Kamath *et al.,* entire). We do not anticipate that genetic issues will affect grizzly bears in the future because of ongoing efforts to restore natural connectivity and a commitment to translocate animals in the future, if needed, as provided in the draft 2016 Conservation Strategy. Changing climate conditions have the potential to affect grizzly bear habitat with subsequent implications for grizzly bear-human conflicts. While we do not consider the effects of climate change a direct threat to grizzly bear habitat in the GYE, 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 threat because of coordinated total mortality limits within the DMA (see table 2 and Factor B discussion, above). Because the GYE grizzly bear population has increased or remained stable during declines in whitebark pine seed production and other high-calorie foods since the early 1990s, there is no evidence that changes in food resources will become substantial impediments to the long-term persistence of the GYE grizzly bear population. Finally, we do not anticipate human attitudes becoming a threat to the GYE 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 to limit discretionary mortality (see table 2 and Factor B discussion, above). Because of the manageable nature of these potential threats through conflict prevention and response efforts and the large area of suitable, secure habitat within the GYE, we do not consider them to be a threat to the GYE grizzly bear DPS now, or in the future.

Cumulative Effects of Factors A Through E

Many of the threats faced by grizzly bears 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 GYE 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 grizzly bears 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 GYE and cumulatively acted to reduce their range and abundance over time. Today, these stressors have been adequately mitigated and do not impact the GYE grizzly bear population with the same intensity.

While these numerous stressors on grizzly bear persistence are challenging to conservation, our experience demonstrates that 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 GYE grizzly bear population's trend and range has 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 total mortality, changes in habitat quality, changes in population density, change in range, displacement effects, and so forth. In other words, there will always be threats to the GYE grizzly bear population that lead to human-caused mortality or displacement, but if these are not causing the population to decline, we cannot consider them substantial.

Summary of Factors Affecting the Greater Yellowstone Ecosystem 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 threats to the GYE grizzly bear population in the 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 GYE 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 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 Forest Service's Record of Decision (2006*b*) ensure threats to the GYE grizzly bear population's habitat outside the PCA will not become substantial enough to threaten this population's long-term persistence. 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 threat to the GYE grizzly bear DPS and is not expected to in the future.

The resumption of legal grizzly bear hunting for commercial and recreational purposes in the GYE was the primary post-delisting threat to the population under Factor B. Since 1975, no grizzly bears have been removed from the GYE for commercial, recreational, scientific, or education purposes. Inside the DMA, the population has stabilized since 2002 and is exhibiting density dependent population regulation (van Manen *et al.* 2015, entire). Therefore, mortalities from all causes including hunting inside the DMA will be managed by all Federal, State, and Tribal agencies to ensure recovery consistent with the Service's recovery criteria. Annual population estimates will be made by the IGBST each fall and used to set the total mortality limits for the DMA the following year (Tables 1, 2, and 3, above).

When grizzly bears were listed in 1975, we identified ''indiscriminate illegal killing,'' and management removals as threats to the population under Factor C. In response, we implemented demographic recovery criteria to maintain a minimum population size, a well-distributed population, and establish total mortality limits based on scientific data and direct monitoring of the population. Since implementing these criteria, the GYE 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.* 2006b, p. 48; Pyare *et al.* 2004, pp. 5–6; Schwartz *et al.* 2006a, pp. 64–66; IGBST 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, State regulations, careful population 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 the population in the long term and would not occur if other sources of human-caused mortality were excessive. Therefore, based on the best available information and expectation that State regulatory mechanisms (as described under Factor B, above) will limit total mortality levels within the levels detailed in tables 1, 2, and 3, above, and that these regulatory mechanisms will continue into the future, we conclude that disease, human-caused mortality, and hunting do not constitute threats now or in the future.

The importance of regulatory mechanisms and effective wildlife management infrastructure to large carnivore conservation cannot be understated, as stated under Factor D (see Linnell *et al.* 2001, p. 348). Before delisting could occur, the regulatory mechanisms that would be in place include National Park Superintendent's Compendiums, the Forest Service Amendment for Grizzly Bear Habitat Conservation for the GYE National Forests, and State and Tribal commission regulations controlling mortality as described under Factor D. The management infrastructure is already in place and described in the draft 2016 Conservation Strategy. Because the signatory agencies to the 2016 Conservation Strategy are the same agencies that have been managing grizzly bear habitat, population, and monitoring for the last 30 years, the management transition would be minimal. Existing regulatory mechanisms, and additional State regulations that would be in place before this proposed rule is made final, would ensure the GYE grizzly bear population continues to recovery goals. Therefore, we conclude that the existing and anticipated regulatory mechanism are adequate to maintain a healthy and recovered population of grizzly bears into the future and do not pose a threat now, or in the future.

Other factors, under Factor E, we considered that could become threats to the GYE grizzly bear population included: (1) Genetic health, (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 as well as managing 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 GYE we do not expect other natural or manmade factors to become threats to the GYE grizzly bear population.

Many of the threats faced by grizzly bears are interrelated and could cumulatively impact the GYE 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 GYE grizzly bear population. There will always be threats to the GYE grizzly bear population but if these are not causing the population to decline, we do not consider them to threaten the long-term persistence of the population.

Proposed Determination

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 GYE grizzly bear DPS 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 in the future.

As demonstrated in our five-factor analysis, threats to this population and its habitat have been sufficiently minimized and the GYE grizzly bear DPS is a biologically recovered population. Multiple, independent lines of evidence support this interpretation. Counts of females with cubs-of-the-year have increased. Since at least 2001, the demographic recovery criterion that requires 16 of the 18 BMUs to be occupied with females with young has been met. The Recovery Plan target for a minimum population size of 500 animals inside the DMA to assure genetic health has been met since at least 2007, using the conservative model-averaged Chao2 estimate. 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 from 1983 through 2001 (Eberhardt *et al.* 1994, p. 362; Knight and Blanchard 1995, pp. 18–19; Schwartz *et al.* 2006b, p. 48), and 0.3 to 2.2 percent from 2002 to 2011 (IGBST 2012, p. 34). Occupied grizzly bear range has more than doubled 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 and have remained unchanged for 3 decades (IGBST 2012, p. 33). In total, this population has increased from estimates ranging between 136 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 an average population size between 2002–2014 of 674 using the model-averaged Chao2 population estimation method.

Grizzly bears occupied 84 percent of suitable habitat within the DPS boundaries as of 2014 (Haroldson 2014, *in litt.*) and will likely occupy the remainder of the suitable habitat in the future. The GYE 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 total mortality limits established in the Grizzly Bear Recovery Plan and carried over into the draft 2016 Conservation Strategy (U.S. Fish and Wildlife Service 2016, Chapter 2) and into State regulations as per table 2 and Factor B, above. These total mortality limits are calculated to ensure long-term population stability around the average population size for 2002–2014.

During our analysis, we did not identify any factors alone or in combination that are likely to reach a magnitude that would threaten the continued existence of the species. 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 GYE 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 future. Thus, based on our assessment of the best scientific and commercial information available and on our expectation that current management practices will continue into the future, and that State regulations will be in place prior to delisting to regulate total mortality as per table 2 and Factor B, above, we therefore determine that the GYE grizzly bear DPS has recovered to the point at which protection under the Act is no longer required. The best scientific and commercial data available indicate that the GYE grizzly bear DPS is no longer endangered or threatened should appropriate regulatory mechanisms be developed by the States, as described in this proposed rule.

Significant Portion of Range Analysis

Background

Having determined that the GYE grizzly bear DPS is not in danger of extinction or likely to become so in the foreseeable future throughout all of its range, we next consider whether there are any significant portions of its range in which the GYE grizzly bear DPS is in danger of extinction or likely to become so. Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so throughout all or a significant portion of its range. The Act defines ''endangered species'' as any species, which is ''in danger of extinction throughout all or a significant portion of its range,'' and ''threatened species'' as any species which is ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' The term ''species'' includes ''any subspecies of fish or wildlife or plants, and any distinct population segment [DPS] of any species of vertebrate fish or wildlife which interbreeds when mature.'' We published a final policy interpreting the phrase ''significant portion of its range'' (SPR) (79 FR 37578; July 1, 2014). The final policy states that (1) if a species is found to be endangered or threatened throughout a significant portion of its range, the entire species is listed as endangered or threatened, respectively, and the Act's protections apply to all individuals of the species wherever found; (2) a portion of the range of a species is ''significant'' if the species is not currently endangered or threatened throughout all of its range, but the portion's contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range; (3) the range of a species is considered to be the general geographical area within which that species can be found at the time the Service or the National Marine Fisheries Service (NMFS) makes any particular status determination; and (4) if a vertebrate species is endangered or threatened throughout an SPR, and the population in that significant portion is a valid DPS, we will list the DPS rather than the entire taxonomic species or subspecies.

The SPR policy is applied to all status determinations, including analyses for the purposes of making listing, delisting, and reclassification determinations. The procedure for analyzing whether any portion is an SPR is similar, regardless of the type of status determination we are making. The first step in our analysis of the status of a species is to determine its status throughout all of its range. If we determine that the species is in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range, we list the species as an endangered species (or threatened species) and no SPR analysis will be required. If the species is neither in danger of extinction nor likely to become so throughout all of its range, we next determine whether the species is in danger of extinction or likely to become so throughout a significant portion of its range. If it is, we list the species as an endangered species or threatened species, respectively; if it is not, we conclude that listing the species is not warranted.

When we conduct an SPR analysis, we first identify any portions of the species' range that warrant further consideration. The range of a species can theoretically be divided into

portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be both significant and contain populations that are 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 in those portions or likely to become so within the foreseeable future. We emphasize that answering these questions in the affirmative is not a determination that the species is endangered or threatened throughout a significant portion of its range—rather, it is a step in determining whether a more detailed analysis of the issue is required. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are affecting it uniformly throughout its range, no portion is likely to have a greater risk of extinction, and thus would not warrant further consideration. Moreover, if any concentration of threats apply only to portions of the range that clearly do not meet the biologically based definition of ''significant'' (*i.e.,* the loss of that portion clearly would not be expected to increase the vulnerability to extinction of the entire species), those portions will not warrant further consideration.

If we identify any portions or a range that may both (1) be significant and (2) contain populations that are in danger of extinction or likely to become so, we engage in a more detailed analysis to determine whether these standards are indeed met. As discussed above, to determine whether a portion of the range of a species is significant, we consider whether, under a hypothetical scenario, the portion's contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction or likely to become so in the foreseeable future throughout all of its range. This analysis will consider the contribution of that portion to the viability of the species based on principles of conservation biology. Contribution would be evaluated using the concepts of redundancy, resiliency, and representation. (These concepts can similarly be expressed in terms of abundance, spatial distribution, productivity, and diversity.) The identification of an SPR does not create a presumption, prejudgment, or other determination as to whether the species in that identified SPR is endangered or threatened. We must go through a separate analysis to determine whether the species is in danger of extinction or likely to become so in the SPR. To determine whether a species is endangered or threatened throughout an SPR, we will use the same standards and methodology that we use to determine if a species is endangered or threatened throughout its range.

Depending on the biology of the species, its range, and the threats it faces, it may be more efficient to address the ''significant'' 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.''

SPR Analysis for the GYE Grizzly Bear DPS

Applying the process described above, we evaluated the range of the GYE grizzly bear population to determine if any area could be considered a significant portion of its 50,280 sq km (19,413 sq mi) range (Bjornlie *et al.* 2013, p. 184). As mentioned above, one way to identify portions for further analyses is to identify portions that might be of biological or conservation importance, such as any natural, biological divisions within the range that may, for example, provide population redundancy or have unique ecological, genetic, or other characteristics. Based on examination of the best available science (Schwartz *et al.* 2006b, entire; IGBST 2012, entire), we determined the GYE grizzly bear population is a single, contiguous population within the DPS boundaries and that there are no separate areas of the range that are significantly different from others or that are likely to be of greater biological or conservation importance than any other areas due to natural biological reasons alone. Therefore, there is not substantial information that logical, biological divisions exist within the GYE grizzly bear population's range.

After determining there are no natural divisions delineating separate portions of the GYE grizzly bear population, we next examined whether any threats are geographically concentrated in some way that would indicate the species could be in danger of extinction, or likely to become so, in that area. Through our review of potential threats, we identified greater mortality risk in the areas on the periphery of the population's range. 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; IGBST 2012, p. 34) and higher concentrations of conflicts (Gunther *et al.* 2012, p. 50). These areas where greater mortality is likely to occur are outside the DMA boundaries. We do not anticipate declines in relative population size or geographically concentrated threats inside the DMA boundaries due to conservative population objectives, enforceable mortality limits, vast amounts of wilderness and roadless areas, and additional habitat protections specifically in place for grizzly bears on public lands in nearly half of occupied range (*i.e.,* the PCA). With these measures evaluated by a meticulous monitoring program, we are reasonably assured grizzly bears inside the DMA boundaries will continue to flourish. Because it is also reasonable to expect that GYE grizzly bears may not be managed as conservatively outside the DMA boundaries where they could be exposed to more intensive hunting and management pressure, we considered these peripheral areas where known grizzly bear range extends outside the DMA boundaries to warrant further consideration to determine if they are a significant portion of this population's range.

Because we identified areas on the periphery of the range as warranting further consideration due to the geographic concentration of mortality risk there, we then evaluated whether these areas are significant to the GYE grizzly bear population such that, without the members in that portion, the entire population would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range.

These peripheral 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. Bears in these peripheral areas will not establish self-sustaining, year-round populations due to a lack of suitable habitat, land ownership patterns, and the lack of traditional, natural grizzly bear foods (*i.e.,* bison). Instead, bears in these peripheral areas will likely always rely on the GYE grizzly bear population inside the DMA as a source population. Grizzly bears in these peripheral areas are not biologically necessary to the GYE grizzly bear population and a lack of occupancy outside the DMA boundaries in peripheral areas will not impact whether the GYE population is likely to become endangered or threatened in the foreseeable future

throughout all or a significant portion of its range.

The core population inside the DMA is resilient, and its distribution provides the necessary redundancy to offset loss of individual bears in peripheral areas. The areas that may experience higher mortality rates represent a very small proportion of the range, and an even smaller proportion of the total number of animals in the GYE grizzly bear population. Moreover, if bears in these peripheral areas were in fact lost, that would not appreciably reduce the long-term viability of the GYE grizzly bear population, much less cause the population in the remainder of its range to be in danger of extinction or likely to become so. Therefore, there is not substantial information that the peripheral portions of the GYE grizzly bear population's range are significant to the rest of the population.

After careful examination of the GYE grizzly bear population in the context of our definition of ''significant portion of its range,'' we determined areas on the periphery of the range warranted further consideration because human-caused mortality risk threats are geographically concentrated there. After identifying these areas, we evaluated whether they were significant and determined they were not significant because, even without the grizzly bears in these areas, the GYE grizzly bear DPS would not be in danger of extinction, or likely to become so in the foreseeable future. These areas will likely never contribute meaningfully to the GYE grizzly bear population because of lack of suitable habitat and loss of traditional grizzly bear foods (*i.e.,* bison). Therefore, we did not need to determine if grizzly bears were in danger of extinction or likely to become so in these peripheral areas. We have carefully assessed the best scientific and commercial data available and determined that the GYE 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 Wildlife.

Effects of the Rule

This proposal, if made final, would revise 50 CFR 17.11(h) to remove the GYE 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 DPS. 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 GYE grizzly bear population. However, actions within the DPS would still be managed by State, Tribal, and Federal laws, regulations, policies, and management plans ensuring enforcement of the draft 2016 Conservation Strategy. Delisting the GYE 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, including section 4(d)(50 CFR 17.40) would still continue to apply to grizzly bears in other portions of the lower 48-States outside the GYE grizzly bear DPS' boundaries. Those grizzly bears outside the GYE DPS will remain fully protected by the Act.

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 GYE grizzly bear population, the draft 2016 Conservation Strategy serves as the post-delisting monitoring plan. The 2016 Conservation Strategy will remain in effect beyond the 5-year monitoring period required by the Act because 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 recovered, self-sustaining wild populations with ongoing management actions (Scott *et al.* 2005, p. 383). These management actions are detailed in the draft 2016 Conservation Strategy and will be informed and updated as necessary by all the habitat and population parameters that will be annually monitored by the IGBST.

Monitoring

To ensure the long-term conservation of grizzly bear habitat and continued recovery of the GYE grizzly bear population, several monitoring programs and protocols have been developed and integrated into land management agency planning documents. The draft 2016 Conservation Strategy and appended State grizzly bear management plans satisfy the requirements for having a post-delisting monitoring plan for the GYE 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 draft 2016 Conservation Strategy are being achieved and maintained.

Within the PCA, the IGBST will continue to monitor habitat standards and adherence to the 1998 baseline. The IGBST 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 unless changes were to be beneficial to grizzly bears (USDA Forest Service 2006*b,* entire; Yellowstone National Park 2014, p. 18). The IGBST, with participation from Yellowstone National Park, the 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 IGBST will continue to document population trends, distribution, survival and birth rates, and the presence of alleles from grizzly bear populations outside the GYE grizzly bear 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 IGBST for incorporation into their annual report. To examine reproductive rates, survival rates, causes of death, and overall population trends, the IGBST 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. Mortalities will be monitored and reported annually and maintained in accordance with the total mortality limits and population objectives in table 2, above.

Outside of the PCA, the GYE National Forests will monitor agreed-upon habitat parameters in suitable habitat and will calculate secure habitat values outside of the PCA every 2 years and submit these data for inclusion in the IGBST's annual report (USDA Forest Service 2006*b,* p. 6). The GYE National Forests also will monitor and evaluate livestock allotments for recurring conflicts with grizzly bears in suitable habitat outside the PCA (USDA Forest

Service 2006*b,* 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 2006*b,* p. 7). Members of the IGBST will monitor grizzly bear vital rates and population parameters within the entire DMA. Finally, State wildlife agencies will provide known mortality information to the IGBST, which will annually summarize these data with respect to location, type, date of incident, and the sex and age of the bear for the entire DPS area.

In the 2007 final rule (72 FR 14866; March 29, 2007), 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, appendix F). 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 longer relying on or reporting measures of habitat quality or effectiveness using it. Instead, the IGBST will assess and report human-caused changes to grizzly bear habitat through maintenance of the 1998 baseline values for developed sites, grazing allotments, and secure habitat (U.S. Fish and Wildlife Service 2016, appendix E).

While the inverse relationship between whitebark pine cone production and grizzly bear 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, army 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 GYE. The IGBST 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.

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 IGBST 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 draft 2016 Conservation Strategy (U.S. Fish and Wildlife Service 2016, Chapter 2) 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). The IGBST 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 of each bear handled. Because of the scope of monitoring, we feel confident that we will be able to detect the consequences of significant changes in habitat.

Monitoring systems in the draft 2016 Conservation Strategy allow for adaptive management (Holling 1978, pp. 11–16) as environmental issues change. The agencies have committed in the draft 2016 Conservation 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 the delisting 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 draft 2016 Conservation Strategy (U.S. Fish and Wildlife Service 2016, chapters 2, 3, and 4). 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 GYE grizzly bear population remains a recovered population.

Triggers for a Biology and Monitoring Review by the IGBST

The YGCC will use the IGBST'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 IGBST's annually produced model-averaged Chao2 population estimates to set and establish total mortality limits within the DMA as per tables 1, 2, and 3, above. The 2016 Conservation Strategy signatories have agreed that if there are deviations from certain population or habitat standards, the IGBST will conduct a Biology and Monitoring Review as described under Factor B, above. A Biology and Monitoring Review would be initiated if any of the following scenarios occur (as further described under Factor B, above): (1) Exceeding the total mortality limit for independent females for 3 consecutive years; (2) exceeding the total mortality limits for independent males for 3 consecutive years; (3) exceeding the total mortality limit for dependent young for 3 consecutive years; (4) failure to meet the distribution criterion requiring sightings of females with offspring in at least 16 of 18 BMUs in 2 consecutive years. In addition to the scenarios described under Factor B, a Biology and Monitoring Review by the IGBST would be initiated if there were a failure to meet any of the habitat standards described in the draft 2016 Conservation Strategy pertaining to levels of secure habitat, developed sites, and livestock allotments. These IGBST reviews were established to detect deviations that may occur due to normal variability or chance events and do not necessarily mean the GYE 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 YGCC with ample time to respond with

management actions before involving the Service.

An IGBST 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. A Biology and Monitoring Review could occur if funding becomes inadequate to the implementation of the draft 2016 Conservation Strategy to such an extent that it compromised the recovered status of the GYE 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 IGBST 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 IGBST would complete this review and release it to the public within 6 months of initiation and make it available to the YGCC and the public.

The YGCC 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 draft 2016 Conservation Strategy cannot be met in the opinion of the YGCC, the YGCC could petition us for relisting (U.S. Fish and Wildlife Service 2016, Chapter 6). Because the YGCC possesses substantial information about the population's status, the Service would respond by conducting a status review to determine if relisting is warranted.

The Service can also initiate a status review independent of the IGBST or the YGCC should the total mortality limits be exceeded by a significant margin or routinely violated or if substantial management changes occur significant enough to raise concerns about population level impacts. Emergency relisting of the population is an option we can and will use, if necessary, in accordance with section 4(g)(2) of the Act, if the threat(s) were severe and immediate (16 U.S.C. 1533(g)). Such an emergency relisting would be effective the day the rule is published in the **Federal Register** and would be effective for 240 days. During this time, we would conduct our normal notice-and-comment rulemaking regarding the listing of the species based on the five factors of section 4(a)(1) of the Act to take effect when the 240-day limit on the emergency relisting expires.

Triggers for a Service Status Review

Should we finalize this proposal and delist the GYE grizzly bear population, we will use the information in IGBST annual reports and adherence to total mortality limits as per tables 1, 2, and 3, above, to determine if a formal status review is necessary. Because we anticipate the YGCC and IGBST are fully committed to maintaining GYE grizzly bear population management and habitat management through implantation of the draft 2016 Conservation Strategy and State and Federal management plans, and to correct any problems through the process established in the draft 2016 Conservation Strategy and described in the preceding section, we created a higher threshold for criteria that would trigger a formal Service status review. Specifically, the following scenarios would result in a formal status review by the Service: (1) Any changes in Federal, State, or Tribal laws, rules, regulations, or management plans that depart significantly from the specifics of population or habitat management detailed in this proposed rule and significantly increase the threat to the population; or (2) if the population falls below 500 in any year using the model-averaged Chao2 method, or counts of females with cubs fall below 48 for 3 consecutive years; or (3) if independent female total mortality limits as per tables 1, 2, and 3, above, are exceeded for 3 consecutive years and the population is fewer than 600; or (4) if fewer than 16 of 18 bear management units are occupied by females with young for 3 consecutive 6-year sums of observations. For example, if independent female total mortality limits were exceeded in 3 of 4 years, but they were not 3 consecutive years, the Service would conduct a status review.

Status reviews and relisting decisions would be based on the best available scientific and commercial data available. If a status review is triggered, the Service would evaluate the status of the GYE grizzly bear population to determine if relisting is warranted. We would make prompt use of the Act's emergency listing provisions if necessary to prevent a significant risk to the well-being of the GYE grizzly bear population. We have the authority to emergency relist at any time, and a completed status review is not necessary to exercise this emergency relisting authority.

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:

- Be logically organized;
- Use the active voice to address readers directly;
- Use clear language rather than jargon;
- Be divided into short sections and sentences; and
- 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.

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).

Government-to-Government Relationships With Tribes

In accordance with the President's memorandum of April 29, 1994, Government-to-Government Relations with Native American Tribal Governments (59 FR 22951), E.O. 13175, and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for

healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes.

Beginning in April 2014, the Grizzly Bear Recovery Program sent via registered mail consultation invitation letters to the four Tribes having treaty interests in the proposed GYE grizzly bear delisting area: Northern Arapaho, Eastern Shoshone, Northwestern Band of the Shoshone Nation, and Shoshone-Bannock Tribes. Over the next year, the Service was made aware of many more Tribes having an interest in the GYE grizzly bear and expanded our efforts in explaining the status of the bear and offering government-to-government consultation to Tribes. On February 17, 2015, the Service sent letters offering government-to-government consultation to 26 Tribes. On June 15, 2015, the Service sent out a second round of letters to 48 Tribes, offering another opportunity for consultation, followed by personal phone calls or emails from Service leadership to the 48 Tribes, personally inviting them to engage in government-to-government consultation. On August 13, 2015, the Service met with the Rocky Mountain Tribal Leaders Council in Billings, Montana, and invited Tribal representative to engage in consultation concerning the bear. On October 29, 2015, the Service sent letters to 53 Tribes, which included all Tribes, Tribal Councils, and First Nations in Canada that have contacted the Service regarding the GYE grizzly bear population. The letters invited Federal Tribes to engage in government-to-government consultation, and invited all Tribes to participate in a Tribal webinar and conference call. To date, the Service has conducted five Tribal consultations. The Service will conduct two additional Tribal consultation meetings with federally recognized Tribes. The locations for these meetings are not yet available; we will post them on our Web site at *http://www.fws.gov/mountain-prairie/ea/tribal-grizzly.php* as soon as possible. Government-to-Government consultation is not open to the public or media. This is consultation with Tribes speaking on behalf of their Tribe and as a representative of their Tribe (see **FOR FURTHER INFORMATION CONTACT** above, for more information).

References Cited

A complete list of all references cited in this proposed rule is available at *http://www.regulations.gov* at Docket No. FWS–R6–ES–2016–0042, or is available upon request from the Grizzly Bear Recovery Coordinator (see **ADDRESSES**).

Glossary

1998 baseline: The 1998 baseline represents the best available habitat measures representing ground conditions inside the Primary Conservation Area (PCA) as of 1998. Habitat standards identified in the draft 2016 Conservation Strategy pertain to secure habitat, developed sites, and livestock grazing allotments. The standards demand that all three of these habitat parameters are to be maintained at or improved upon conditions that existed in 1998. The 1998 baseline represents the best estimate of what was known to be on the ground at that time and establishes a benchmark against which future improvements and/or impacts can be assessed. It also provides a clear standard for agency managers to follow when considering project effect analysis.

Chao2: The Chao2 estimator is a bias-corrected estimator of the total number of female grizzly bears with cubs-of-the-year, derived from the frequency of single sightings or double sightings of unique females with cubs-of-the-year as identified based on a rule set by Knight *et al.* (1995).

Demographic monitoring area (DMA): The area of suitable habitat plus the potential sink areas within which the Yellowstone grizzly bear population is annually surveyed and estimated and within which the total mortality limits apply. The DMA is 49,928 sq km (19,279 sq mi). See figure 2, above, for a map showing the DMA.

Dependent young: Young grizzly bears less than 2 years old. Dependent young are with their mothers and are dependent upon them for survival.

Discretionary mortality: Mortalities that are the result of hunting or management removals.

Distinct population segment (DPS): The Service defined a DPS in the DPS policy (61 FR 4722; February 7, 1996) that considers two factors to determine whether the population segment is a valid DPS: (1) Discreteness of the population segment in relation to the remainder of the taxon to which it belongs; and (2) the significance of the population segment to the taxon to which it belongs. If a population meets both tests, it is a DPS, and the Service then evaluates the population segment's conservation status according to the standards in section 4 of the Act for listing, delisting, or reclassification.

Greater Yellowstone Ecosystem (GYE): Yellowstone National Park and Grand Teton National Park form the core of the Greater Yellowstone Ecosystem, which includes portions of three States: Wyoming, Montana, and Idaho. At more than 90,000 sq km (34,750 sq mi), it is one of the largest nearly intact temperate-zone ecosystems on Earth.

Independent females: Grizzly bear females more than 2 years old.

Independent males: Grizzly bear males more than 2 years old.

Interagency Grizzly Bear Study Team (IGBST): The Interagency Grizzly Bear Study Team (IGBST) is an interdisciplinary group of scientists and biologists responsible for long-term monitoring and research efforts on grizzly bears in the Greater Yellowstone Ecosystem (GYE). The main objectives of the team are to: (1) Monitor the status and trend of the grizzly bear population in the GYE; and (2) determine patterns of habitat use by bears and the relationship of land management activities to the welfare of the bear population. The IGBST is led by the U.S. Geological Survey (USGS). IGBST members are representatives from the USGS, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, the Eastern Shoshone and Northern Arapaho Tribal Fish and Game Department, and the States of Idaho, Montana, and Wyoming.

Primary Conservation Area (PCA): The name of the recovery zone area post-delisting. The habitat-based recovery criteria apply within the PCA.

Recovery Zone: The area defined in the 1993 Grizzly Bear Recovery Plan within which the recovery efforts would be focused in the Yellowstone Ecosystem. The Recovery Zone is not designed to contain all grizzly bears.

Significant portion of the range (SPR): The Service's SPR policy (79 FR 37578; July 1, 2014) defines a portion of the range of a species as ''significant'' if the species is not currently endangered or threatened throughout all of its range, but the portion's contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range.

Suitable habitat: We define 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) being contiguous with the current distribution of GYE grizzly bears such that natural recolonization is possible; and (3) having low mortality risk as indicated through reasonable and manageable levels of grizzly bear mortality. Suitable habitat is made up of the Middle Rockies ecoregion, within which the Greater Yellowstone

Ecosystem is contained. This area meets grizzly bear biological needs providing food, seasonal foraging opportunities, cover, and denning areas. See the *Suitable Habitat* section of this proposed rule for a more complete explanation.

Total mortality: Documented known and probable grizzly bear mortalities from all causes including but are not limited to: Management removals, illegal kills, mistaken identity kills, self-defense kills, vehicle kills, natural mortalities, undetermined-cause mortalities, grizzly bear hunting, and a statistical estimate of the number of unknown/unreported mortalities.

Transition probability: The probability of a transition for an adult female (greater than 3-years old) among reproductive states. The possible reproductive states are: No young, with cubs, with yearlings, or with 2-year-olds. Ten potential reproductive transitions are biologically feasible.

Yellowstone Grizzly Bear Coordinating Committee (YGCC): The committee of State, Federal, Tribal, and county agencies charged with implementing the draft 2016 Conservation Strategy post-delisting. They will coordinate management and promote the exchange of information about the GYE grizzly bear population. Members include: Yellowstone and Grand Teton National Parks; Five National forests: Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer-Gallatin, and Shoshone; One Bureau of Land Management representative; the Biological Resources Division of the U.S. Geological Survey; one representative each from Idaho, Montana, and Wyoming; and one representative from each native American Tribe with sovereign powers over reservation lands within the ecosystem.

Authors

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

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and record keeping requirements, Transportation.

Proposed 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; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. Amend § 17.11(h) by revising the first entry 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		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
MAMMALS							
*	*	*	*	*	*		*
Bear, grizzly	*Ursus arctos horribilis.*	North America ..	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 Highway 90; 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.	T	1, 2D, 9, 759	NA	17.40(b)
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Dated: March 2, 2016.

James W. Kurth,

Acting Director, U.S. Fish and Wildlife Service.

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