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AUG 2 6 2016

Subject: Biological Opinion for 2016 Targhee National Forest Range Allotments Reinitiation, Caribou-Targhee National Forest in Idaho and Wyoming (01EIFW00-2016-F-0980)

Dear Mr. Smelser:

This letter transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (Opinion) on the Caribou-Targhee National Forest's (Forest) proposal to continue the permitting of livestock grazing on the Targhee National Forest Range Allotments. This Opinion analyzes the potential effects to grizzly bear (*Ursus arctos horribilis*), a species listed as threatened under the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 et seq. [Act]).

The Service's Opinion, prepared in accordance with section 7 of the Act, is in response to the Forest's August 4, 2016, letter requesting reinitiation of formal consultation. Your letter, providing new information and incorporating by reference the programmatic biological assessment (Assessment), was received by the Service on August 18, 2016. Through the Assessment and new information, the Forest determined the proposed action was likely to adversely affect grizzly bear. In the attached Opinion, the Service finds the effects of the Forest's proposed livestock grazing are not likely to jeopardize the continued existence of the grizzly bear.

The Service appreciates your continued efforts to ensure the conservation of federally listed species. If you have any questions regarding this consultation, please contact Laura Berglund of our Eastern Idaho Field Office at (208) 237-6975 extension 103.

Sincerely,

Acting for

Dennis Mackey
Acting State Supervisor

Enclosure

cc: CTNF, Idaho Falls (Yorgason)
IDFG, Idaho Falls (Hendricks)

BIOLOGICAL OPINION
FOR
CARIBOU-TARGHEE NATIONAL FOREST
2016 TARGHEE NATIONAL FOREST RANGE ALLOTMENTS REINITIATION

01EIFW00-2016-F-0980

U.S. FISH AND WILDLIFE SERVICE
IDAHO FISH AND WILDLIFE OFFICE
BOISE, IDAHO

ACTING for **Supervisor** _____

Date 8/26/16

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I. INTRODUCTION

This document represents the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) on the effects to the threatened grizzly bear (*Ursus arctos horribilis*) from the Caribou-Targhee National Forest's (Forest) proposed permitting of livestock grazing on the Targhee Range Allotments in Bonneville, Clark, Fremont, Jefferson, Lemhi, Madison, and Teton Counties in Idaho, and Lincoln and Teton Counties in Wyoming. This Opinion was prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.; [Act]). Your August 4, 2016, request for consultation was received on August 18, 2016.

This Opinion is based on new information provided by the Forest in July and August 2016, information presented in the Forest's *Programmatic Biological Assessment for the Targhee National Forest Range Allotments* (USFS 2015, entire), and other sources of information cited herein. The Forest's February 16, 2016, biological assessment (Assessment) is incorporated by reference in this Opinion.

A. Consultation History

In February 2016, the Forest completed a biological assessment for the Targhee Range Allotments; in May 2016, the Service issued a biological opinion that concluded the proposed action was not likely to jeopardize the continued existence of the grizzly bear. Since that time, the Forest has acquired new information regarding grizzly bear activity in these allotments, and has reached, but not exceeded, the level of lethal take identified in the May 2016 biological opinion. On that basis, the Forest requested reinitiation of consultation on this action. This Opinion supersedes the May 2016 biological opinion.

In the February 2016 Assessment, the Forest determined the proposed action may affect and is likely to adversely affect grizzly bear. The Forest found the new information did not change the determination that the proposed action may affect and is likely to adversely affect grizzly bear.

The Service reviewed its May 2016 biological opinion to identify any information or conditions that may have changed due to the new information provided by the Forest. Based on our review, we believe most sections of the May 2016 biological opinion are correct, including the *Description of the Proposed Action*, *Status of the Species*, and *Cumulative Effects*, and our conclusions were appropriate. Minor changes have been made to the *Environmental Baseline* and *Effects of the Action* sections in this Opinion to incorporate the new information provided by the Forest. The *Incidental Take Statement* has been modified to account for the new information. While the original *Incidental Take Statement* was carefully calculated, we underestimated the unknowns and uncertainties and how those translated numerically into an actual amount of take.

A chronology of this consultation is presented below. A complete decision record for this consultation is on file at the Service's Eastern Idaho Field Office in Chubbuck, Idaho.

July 23, 2016	The Forest contacts the Service to provide new information on grizzly bear activity and management actions within the Targhee Range Allotments.

July 25, 2016	The Service advises the Forest that the new information may indicate the extent of effects to grizzly bear from the action may differ from the extent of effects considered in the biological opinion (01EIFW00-2016-F-0385).
August 3, 2016	The Forest informs the Service of their intent to reinitiate consultation on the subject action.
August 9, 2016	The Forest provides the Service with additional new information on grizzly bear activity within the Targhee Range Allotments.
August 18, 2016	The Service receives the Forest's request for reinitiation of consultation.

B. Purpose and Organization of this Biological Opinion

In accordance with the requirements of section 7(a)(2) of the Act and its implementing regulations, the formal consultation process culminates in the Service's issuance of a biological opinion that sets forth the basis for a determination as to whether the proposed Federal action is likely to jeopardize the continued existence of listed species or to destroy or adversely modify critical habitat, as appropriate. No critical habitat has been designated for the grizzly bear, so only jeopardy will be analyzed in this Opinion.

The regulatory definition of jeopardy and a description of the formal consultation process are provided at 50 CFR[1] 402.02 and 402.14, respectively. If the Service finds that a proposed Federal action is not likely to jeopardize a listed species but anticipates that it is likely to cause incidental take of the species, then the Service must identify that take and exempt it from the prohibitions against such take under section 9 of the Act through an Incidental Take Statement.

1. Analytical Framework for the Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analysis for grizzly bear in this Opinion relies on four components:

- *Status of the Species*, which evaluates the range-wide condition of grizzly bear, the factors responsible for that condition, and its survival and recovery needs;
- *Environmental Baseline*, which supplements the findings of the *Status of the Species* analysis by specifically evaluating the condition of grizzly bear in the action area, the factors responsible for that condition, and the role of the action area in the survival and recovery of grizzly bear;
- *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on grizzly bears; and

[1] CFR represents the Code of Federal Regulations which is a codification of the general and permanent rules published in the Federal Register by Executive departments and agencies of the Federal Government. It is published by the Office of the Federal Register National Archives and Records Administration. More information can be found at http://www.gpoaccess.gov/cfr/index.html

- *Cumulative Effects*, which evaluates the effects of future, non-Federal activities reasonably certain to occur in the action area on grizzly bear. Future Federal actions that are unrelated to the propose action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of grizzly bear, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the grizzly bear in the wild, at the rangewide scale.

The jeopardy analysis in this Opinion places an emphasis on consideration of the rangewide survival and recovery needs of grizzly bears and the role of the action area in the survival and recovery of grizzly bears as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

II. DESCRIPTION OF THE PROPOSED ACTION

The term "action" is defined in the implementing regulations for section 7 at 50 CFR 402.02 as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air."

A. Proposed Action

The proposed action is continued permitting of livestock grazing on the Targhee portion of the Forest, contingent on the continued implementation of measures that provide for protection and conservation of grizzly bear and its habitat. The proposed action does not, in itself, issue any permits, but requires that all permits which authorize livestock grazing on the Targhee portion of the Forest, as well as term grazing permits, be modified to include the conservation measures relating to grizzly bear contained within the Assessment. The proposed action will also require selected allotments to become compliant with the Forest's Food Storage Order: Order Number 04-15-117 (Order). This requirement would not alter the Order, but compliance with the Order would be a required clause of these grazing permits. Any additional significant changes to livestock permits would be analyzed and consulted on individually, only tiering to this Opinion when appropriate.

The proposed action would make no changes to the current maximum allowable permitted use on the Targhee portion of the Forest, which includes 122 term grazing permits being managed as permitted livestock allotments. Within these 122 allotments, the proposed action will continue to permit approximately 118,236 Animal Unit Months (AUMs), for domestic cattle, sheep, goat,

and horse grazing as the maximum allowable permitted use (Assessment, pp. 5-15). These 122 allotments include:

- 45 sheep allotments (sheep and goat [S&G])
- 76 cattle allotments (cattle and horse [C&H])
- 1 vacant allotment

These allotments encompass 1,208,665 acres in nine counties within Idaho and Wyoming. The allotments are distributed by ranger district as follows:

- 22 allotments on Ashton/Island Park Ranger District (16 cattle, 5 sheep, 1 vacant)
- 43 allotments on Dubois Ranger District (29 cattle, 14 sheep)
- 42 allotments on Palisades Ranger District (17 cattle, 25 sheep)
- 15 allotments on Teton Basin Ranger District (13 cattle, 2 sheep)

Grazing seasons on these allotments are between June and October, with higher elevation ranges having grazing seasons limited to July through September (Assessment, p. 5). Allotment Management Plans are prepared for each of the allotments and designed with specific objectives and management practices needed to move resource conditions toward goals and Desired Future Conditions described in the 1997 Targhee Revised Forest Plan (RFP; USFS 1997; Assessment, p. 4). The allotments and the maximum allowable permitted use can be found listed and described in the Assessment (pp. 4-15).

B. Proposed Conservation Measures

The Forest has identified specific management actions to reduce the degree of impact from livestock grazing on grizzly bear. The Service considers these measures essential to limit impacts to grizzly bear. If any of these measures are not implemented, there may be effects of the action that were not considered in this Opinion, and reinitiation of consultation may be required.

The Forest proposes to implement the measures listed below (and in the Assessment, pp. 22-26). These conservation measures and required permit clauses are designed to minimize grizzly bear conflicts, associated management control actions, and opportunities for habituation, and include moving livestock from areas with conflicts if necessary. No trapping, transportation, or lethal removal of grizzly bears is proposed as part of this action (Assessment, p. 22). Permittees are prohibited from taking grizzly bears, even if a bear is preying on livestock or damaging property (Assessment, Appendix A).

The following goals have been identified by the Forest as essential to minimize the adverse effects to grizzly bear, and to meet the intent of the Act relative to conservation of the grizzly bear:

- Minimize opportunities for habituation of grizzly bears and associated grizzly bear/human conflicts[2].
- Minimize grizzly bear/livestock[3] conflicts and associated management control actions.

1. Grazing Permit Conditions

The Forest proposes to implement the following conservation measures by adding these measures to the term grazing permits for the 122 allotments. The conservation measures are consistent with the RFP, the standards in the 2007 Final Conservation Strategy for the Grizzly Bear (2007 Conservation Strategy; USFWS 2007b), and other conservation measures identified in applicable biological assessments (Assessment, p. 22).

1. The Forest will request reinitiation of consultation in the event of changes to the Forest's Allotment Management Plans. Annual Operating Instructions are presented to permittees prior to turn out each year. Annual Operating Instructions may include minor year-to-year changes in grazing practices, such as changes in turn-on or turn-off dates, pasture rotation, or intensity of riding required. However, the Annual Operating Instructions are consistent with the parameters set in the Allotment Management Plans, meaning they comply with permitted season of use and maximum allowable AUM use described in the Allotment Management Plans. Changes initiated to avoid or reduce situations likely to result in grizzly bear/livestock conflicts or habituation are not considered a change to Allotment Management Plans.
2. Grizzly bear trapping, transportation, or lethal removal is outside the scope of this project. All livestock predation will be reported to the Service, Forest, and relevant State fish and game departments.
3. Inside of the Greater Yellowstone Area[4] (GYA) Primary Conservation Area[5] (PCA; Figure 1), no new active permitted grazing allotments will be created beyond the identified 1998 baseline described in the 2007 Conservation Strategy (USFWS 2007b). No new allotments are proposed inside or outside the PCA. If in the future, a new allotment is proposed, then future analysis would be required.

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[2] Grizzly bear/human conflicts are defined as incidents in which grizzly bears injure people, damage property, kill or injure livestock, damage beehives, obtain anthropogenic (unnatural) foods, or damage or obtain garden and orchard fruits and vegetables. In this Opinion, grizzly bear/human conflicts are inclusive of conflicts between livestock and grizzly bears unless described otherwise (e.g., hunting, food resource, non-hunting injury).

[3] Grizzly bear/livestock conflicts are specific to incidents between livestock and grizzly bears.

[4] Various literature sources, the 1993 Grizzly Bear Recovery Plan (USFWS 1993), and other documents including the 2007 Conservation Strategy (USFWS 2007b) use three different ecosystem terms related to the grizzly bear population in northwestern Wyoming, southwestern Montana, and southeastern Idaho. These include: Greater Yellowstone Area (GYA), Greater Yellowstone Ecosystem, and Yellowstone Grizzly Bear Ecosystem. These terms all describe the Yellowstone ecosystem within Wyoming, Montana, and Idaho. For this Opinion, we consider them synonymous because the geographic scale at which any distinctions occur does not affect project analyses or potential impacts.

[5] PCA and the GYA Recovery Zone (GYA RZ) are the same area and are addressed in more detail through a footnote in the *Status of the Species* section.

4. To ensure there is no increase from the 1998 baseline, numbers of permitted livestock grazing allotments and numbers of AUMs within the PCA will be monitored and reported to the Interagency Grizzly Bear Study Team (IGBST) annually by the Forest.
5. During the Annual Operating Instruction meetings with the permittees, conservation measures will be discussed.
6. The Forest will educate livestock grazing permittees and their employees about their responsibilities relating to conservation of grizzly bears, the potential occurrence of grizzly bears on grazing allotments, the risks of working in bear country, the protected status of the grizzly bear, the need for heightened awareness of grizzly bears, appropriate personal safety measures, and proper behavior in bear country.
7. Any grizzly bear sightings need to be reported to the Forest as soon as possible.
8. All grazing permits include a clause providing for adaptive management strategies (grazing management options) if needed to resolve a grizzly bear/human conflict situation. Permittees' full cooperation in meeting grizzly management goals and objectives will be a condition of receiving and holding permits.
9. Within the grizzly bear PCA, the Allotment Management Plan will specify feasible measures to protect, in time and space, food production areas important to grizzly bears (i.e., wet alpine and subalpine meadows, stream bottoms, aspen groves, and other riparian areas) from conflicting and competing use by domestic livestock. These measures will be reflected in grazing permits. Degrees of protection could range from partial to full protection as indicated by the Forest's evaluation. Measures could include, but are not limited to, closing grazing units either temporarily or permanently, exclusion fencing, changing on and off dates, and setting livestock utilization rates at levels compatible with grizzly bear needs. When conflicts occur, the permittee and appropriate agency personnel will work cooperatively to resolve the conflicts.
10. Sheepherders, working dogs, and guard dogs are kept with sheep full-time when on rangelands to reduce the likelihood of grizzly bear encounters, and to assist in efficient and prompt movement of animals when necessary.
11. Allotment Management Plans will specify measures for the timely removal, destruction, or treatment of livestock carcasses to avoid positive conditioning of grizzly bear to livestock carrion as food (example: All carcasses will be removed from the Forest if within 0.5 mile of Forest designated roads or developments). Herders and riders are required to watch livestock closely for sick, injured, or stray animals. The intent is to reduce the likelihood of food association with domestic herds and reduce opportunities for depredation.
12. Additionally, all dead livestock posing a health or human safety hazard will be removed when the area is deemed safe for entry and removal. Reasonable efforts will be made to remove dead livestock when within 0.25 mile of live streams, springs, lakes, water, riparian areas, system roads and trails, developed recreation areas, dispersed camping and picnic areas. When it is not reasonable to remove dead livestock due to human safety concerns, permittees will promptly report carcass locations to the Forest. The Forest, working with the permittee, will jointly determine the appropriate action.
13. Where food storage is required under the Order and the proposed action, unnatural attractants to bears are to be minimized. This includes treatment or removal of

livestock carcasses, and proper storage of human foods, garbage, and dog food. Interagency Grizzly Bear Committee (IGBC) approved bear-resistant containers are required and damaged containers are repaired or replaced so that they work as designed. Where required, all people involved with grazing on allotments must comply with the Order, which will prevent the availability of human-related food sources or attractants for grizzly bears. Camp tenders and managers make periodic visits (approximately every 3 days) to remove trash and dead animal carcasses to eliminate potential bear attractants. In some locations, it is not feasible to remove carcasses (due to degree of decomposition and access to get them out). In such cases, a carcass is left in place and where possible decomposition expedited with the approved means, like explosives or proven chemicals[6].

14. Forest personnel, as part of the administration of the proposed action, will monitor compliance of the required permit clauses, conservation measures, and conditions of the grazing permits, with special emphasis being given to conditions relative to grizzly bear protection and management.
15. Herders are instructed to avoid an encounter with grizzly bears. Moving the sheep to other areas of the pasture may occur to avoid an immediate threat, and moving sheep to other pastures/locations would occur if encounters persist.

[6] Proven chemicals do not include the use of lye. Burying of carcasses is prohibited on Forest lands.

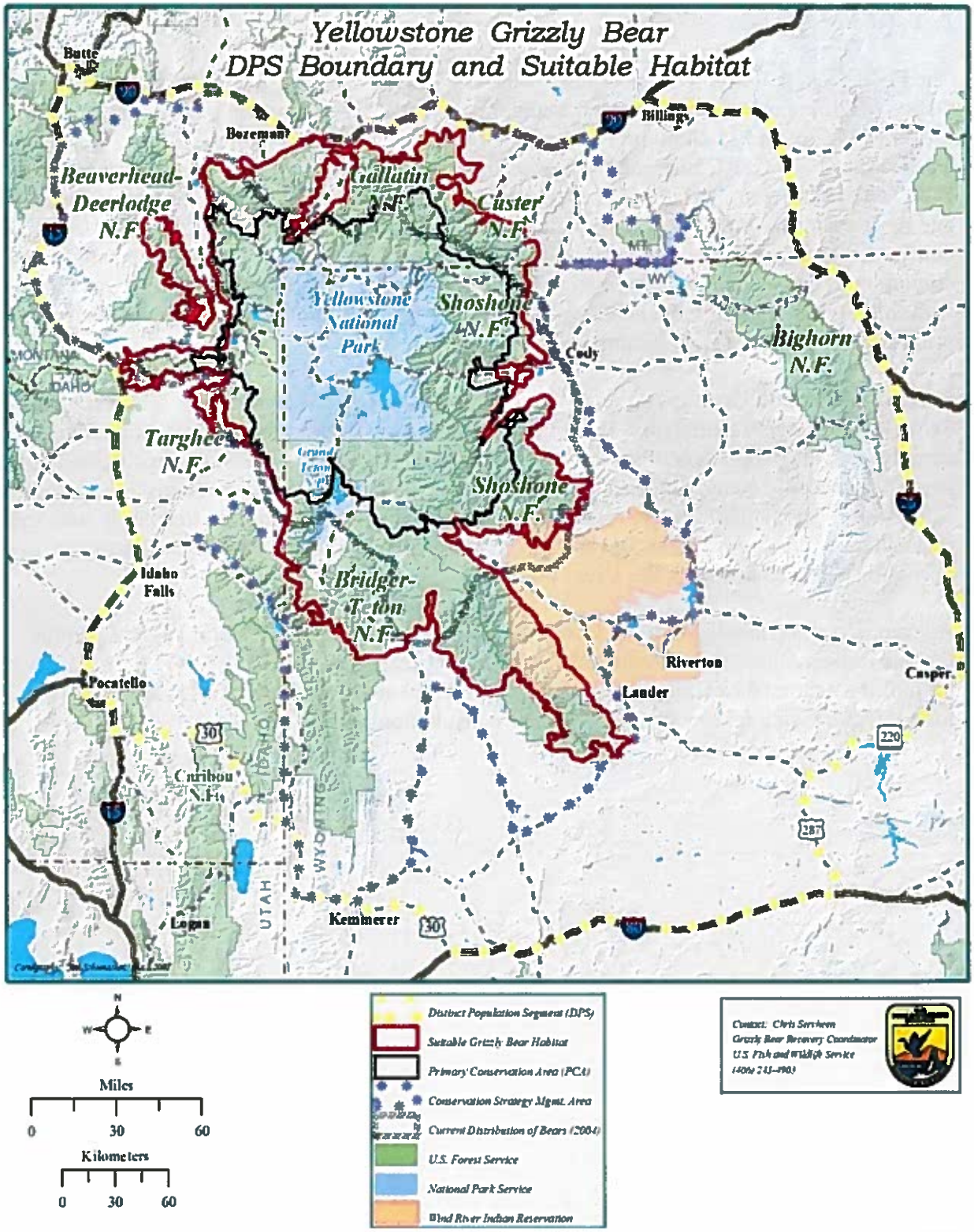

Figure 1. Yellowstone Grizzly Bear Distinct Population Segment (DPS) Boundary and Suitable Habitat

2. Food Storage Order

The Food Storage Order: Order Number 04-15-117 in Title 36 CFR 261[7] is currently required for 40 active allotments within the Order boundaries (Figure 2; Assessment, p. 16). The proposed action would require 11 additional allotments to become compliant with the Order: Westside C&H, Pine Creek C&H, Burbank S&G, Austin Canyon S&G, Rainey Creek C&H, Palisades-Elk C&H, Grand Blowout S&G, Indian Creek C&H, South Elk S&G, Dry Canyon-Pine Creek C&H, and portions of Elk Flat S&G (Assessment, p. 17). Although the boundary for the Order is not being altered as part of the proposed action, the 11 additional allotments will be required to comply with the parameters described in the Order within 3 years of the signing of this Opinion. Currently, the Forest recommends the permittees for these 11 allotments follow the Order, but immediate compliance is not required.

Outside the Order boundaries there are 33 allotments on the Palisades Ranger District, 3 on the Teton Basin Ranger District, and 33 on the Dubois Ranger District that are not required to comply with the parameters of the Order (Assessment, p. 15). The Forest will recommend those permittees become compliant with the Order. However, if a grizzly bear obtains a food reward at a permittee's camp on these allotments, then the permittee will be required to comply with the parameters of the Order within 3 years; the Forest will encourage and assist the permittees in becoming compliant prior to the 3 year deadline.

Additionally, food storage will not be required on the west side of Interstate 15 (I-15) on the Dubois Ranger District, due to the low potential of grizzly bears crossing I-15 within the 10-year term of the action (Assessment, p. 15). If grizzly bears are found west of I-15, and receive a food reward, then the Forest would reinitiate consultation.

[7] Food Storage Order: Order Number 04-15-117: Special orders are put into effect to address particular management problems. Special orders are signed by Regional Foresters or Forest Supervisors and vary in duration. Some of the reasons for implementation of special orders are to protect public safety, prevent resource damage, preserve a particular areas setting (such as non-motorized), protect wildlife populations, and many other reasons. Special orders may prohibit a specific activity or impose permit requirements.

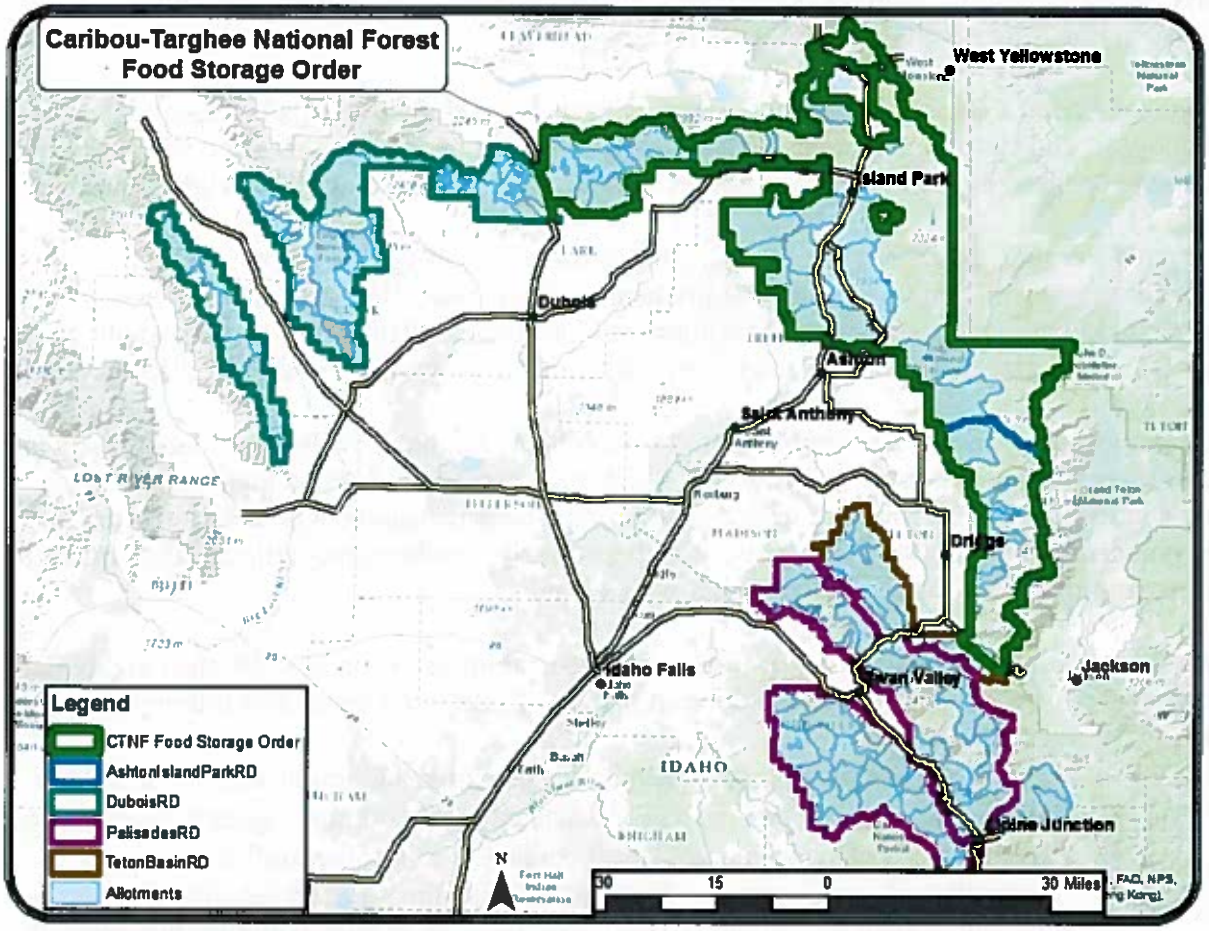

Figure 2. CTNF Food Storage Order Area

3. Required Permit Clauses

Livestock grazing permits would also have the following required permit clauses to minimize grizzly bear/livestock and grizzly bear/human conflicts and reduce overall impacts to grizzly bear. Required permit clauses may overlap with conservation measures listed above.

Required Permit Clause: In the event of a grizzly bear/human conflict, or in order to avoid an imminent potential conflict, the Forest officer in charge may order an immediate temporary cessation of all grazing activity in the immediate area of the conflict or potential conflict if such is needed to resolve a grizzly bear/human conflict situation. Such actions will be preceded by meetings with the permittee to consider all possible options, effects, and alternatives to the action. The timeframe allowed for livestock removal will consider, but is not limited to, such items as: public safety, distances involved, topography, vegetation, fencing, and grizzly bear/livestock conflict history. After all options have been identified, the permittee shall immediately comply with such actions. If cessation is required, it will be in effect until such time as the appropriate authorities have been contacted and any risks to humans and grizzly bears

have been successfully resolved according to the Interagency Grizzly Bear Guidelines and 2007 Conservation Strategy (IGBC 1986, USFWS 2007b).

Required Permit Clause: Intentional or negligent acts by the permittee, his/her agents, employees, and subcontractors that result in injury or death of a grizzly bear will be cause for action to be taken against the perpetrator, as well as the permittee, under provisions of the Act.

Required Permit Clause: The livestock grazing permittee, their agents, employees, and subcontractors will comply with the requirements of the Grizzly Bear Management and Protection Plan (which is a part of the Allotment Management Plan) in the conduct of all activities authorized. The authorized Forest officer may review and revise those plans as needed.

The proposed action requires permittees to be compliant with the Grizzly Bear Management and Protection Plan (Assessment, Appendix A) which addresses the actions, guidelines, and procedures to ensure compliance with regulations and best management practices in order to prevent grizzly bear/livestock conflicts, as well as grizzly bear/human conflicts, and to minimize human injuries if involved in an encounter with a bear.

Permittees and their employees obligations and responsibilities to comply with the Grizzly Bear Management and Protection Plan include completion of safety and awareness training regarding grizzly bear which addresses:

- The protected status of grizzly bear and explanation and implications of a taking;
- Grizzly bear behavior and the risks associated with working in grizzly bear country;
- Proper human behavior in grizzly bear country to minimize conflicts;
- Grizzly bear attractant storage, facilities, and handling procedures, including attractant storage regulations (Order), bear-resistant storage facilities, human food and storage procedures, garbage and refuse handling, and disposal schedules and procedures. The Order applies to all allotments within the current food storage area. Those that are outside the Order area, but within the 2014 grizzly bear occupied area, will have 3 years to comply with the Orders requirements[8];
- Maintaining a safe distance;
- Grizzly bear/human conflict avoidance and prevention procedures;
- Assessment of risks and probabilities;
- Encounter procedures and the use of bear pepper spray;
- Carcass handling and disposal procedures;
- Bear activity reporting, including grizzly bear encounters, livestock deaths and actions taken relative to carcass disposal/removal, suspected depredation by grizzly bears, and existing or potential bear conflict situations.
- Management of cow camps, working facilities, and corral areas in grizzly bear country; and
- Protection of habitat.

[8] The Order would not apply to the allotments west of I-15 on the Dubois Ranger District. On the Palisades and Teton Basin Ranger Districts, food storage is not required unless a grizzly bear is confirmed to have received a food reward from a permitted camp. At that time, the allotment will be required to implement food storage within 3 years of the grizzly bear/food reward conflict. Until grizzly bears are confirmed in these areas or the food storage order is expanded, the Order would not be included in those permits.

As part of the proposed action, the Forest will also provide permittees with recommended conservation measures. While these measures are strongly encouraged, they are not required by the Forest.

1. It is recommended that permittees make bear pepper spray, and proper training on its use, available to field-going employees in areas of bear occurrence.
2. It is recommended that in cooperation with the Service, State Fish and Game Department, and the permittee, levels of livestock losses to grizzly bears are identified that would prompt cattle relocation within the allotment or to another grazing area.
3. It is recommended that with a willing permittee, cattle allotments with a chronic grizzly bear depredation problem, within the PCA, be converted to forage reserve or closed as opportunities arise.

C. Term of the Proposed Action

The Forest proposes authorizing livestock grazing on the Targhee portion of the Forest for a term of 10 years following issuance of this Opinion (Assessment, p. 4). On that basis, the Service considers the term of the action to extend to December 31, 2026. During the 10 year period, grazing permits for allotments included in this proposed action may be reissued following expiration or waiver as long as 1) grazing activities on the allotment are consistent with those described in the Assessment and this Opinion; 2) reissuance of permits would be identical to or more conservative than the grazing management described in this document as to not trigger the need to reinitiate consultation at that time; and 3) other triggers requiring reinitiation (See Section X) of consultation are not met.

D. Action Area

The term "action area" is defined in the implementing regulations for section 7 at 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." An action includes activities or programs "directly or indirectly causing modifications to the land, water, or air". For this action, the area where land, water, or air is likely to be affected is the 122 allotments administered by the Forest where grazing, trailing, and associated actions authorized by the Forest would occur (Assessment, pp. 18-21). In addition to the 122 allotments, we also include the surrounding area where the scent of livestock and above-ambient noise levels caused by the proposed action are likely to extend.

Ambient noise levels may be exceeded as a result of the proposed action by the sounds of livestock, herders, riders, and dogs. The spatial extent of livestock scent and noise on adjacent lands is anticipated to be highly variable, depending on topographic and weather conditions, and the species (e.g., humans or grizzly bears) detecting those factors. The research by Guo et al. (2005) on more concentrated livestock operations (in Minnesota) identified an odor detection distance of up to approximately 4.8 km (3 miles) by humans, but this information is difficult to extrapolate to livestock grazing on open range and the distance livestock scent and sounds would be detectable by a grizzly bear. Further, the open range grazing the Forest proposes is of a lower livestock density and shorter duration than concentrated livestock operations. Therefore, it is

assumed the odor associated with Forest grazing operations will be appreciably reduced in comparison.

The distance grizzly bear would detect livestock grazing-related odors and noise outside of the allotments is unknown because grizzly bear are suspected to have a keen sense of smell (Craighead 1976), much greater than that of humans. Craighead (1976) documented grizzly bear movements of approximately 28.9 km (18 miles) to feed on a carcass, but did not explain how or when the carcass was detected, or how researchers attributed the grizzly bears' movement to carcass presence. Another grizzly took 60 hours to locate a carcass 2.7 km (1.7 miles) away when wind conditions were unfavorable (Craighead 1976). These studies of wild prey carcasses suggest that grizzly bear movement towards the scent of such carcasses is highly variable, and depends on the individual bear, the prey item, weather and topographic conditions, or other factors such as available food resources. Craighead and Mitchell (1982) reported that many grizzly bears moved distances of 5 to12 km (3.1 to 7.5 miles) to carcasses in Yellowstone National Park, and one adult male moved 30 km (18.6 miles). The scent emanating from carcasses is different from that of live animals, and both may be present on the allotments.

For purposes of defining the action area, we selected a distance of 12 km (7.5 miles) beyond the perimeter of the allotment boundaries. We based this distance on the maximum distance many of the grizzly bears traveled to carcasses in Craighead and Mitchell's (1982) study. Because not all areas within the allotment boundaries are used by livestock, there are some areas not affected by the proposed action. In these cases, the 12 km margin around the allotment boundary used to delineate the action area will represent an overestimate of the area affected. In contrast, adjoining or nearby allotments (those within 12 km) with active grazing not associated with the proposed action may contribute odors and noises to allotments associated with the proposed action. Without more detailed information on livestock patterns of use to inform an adjustment to the action area boundary, we believe the best available science indicates that the 122 allotments and the adjacent 12 km is the most reasonable representation of the action area.

Figure 3 is a general representation of the action area within the GYA. The 13 km buffered area, illustrated in pink, extends from the Forest boundary, while the action area is a 12 km buffer from the perimeter of the 122 allotments. While Figure 3 is inclusive of the action area, the action area as described above is smaller by 1 km than the 13 km buffer. Therefore, Figure 3 is provided as an approximation of the action area within the GYA.

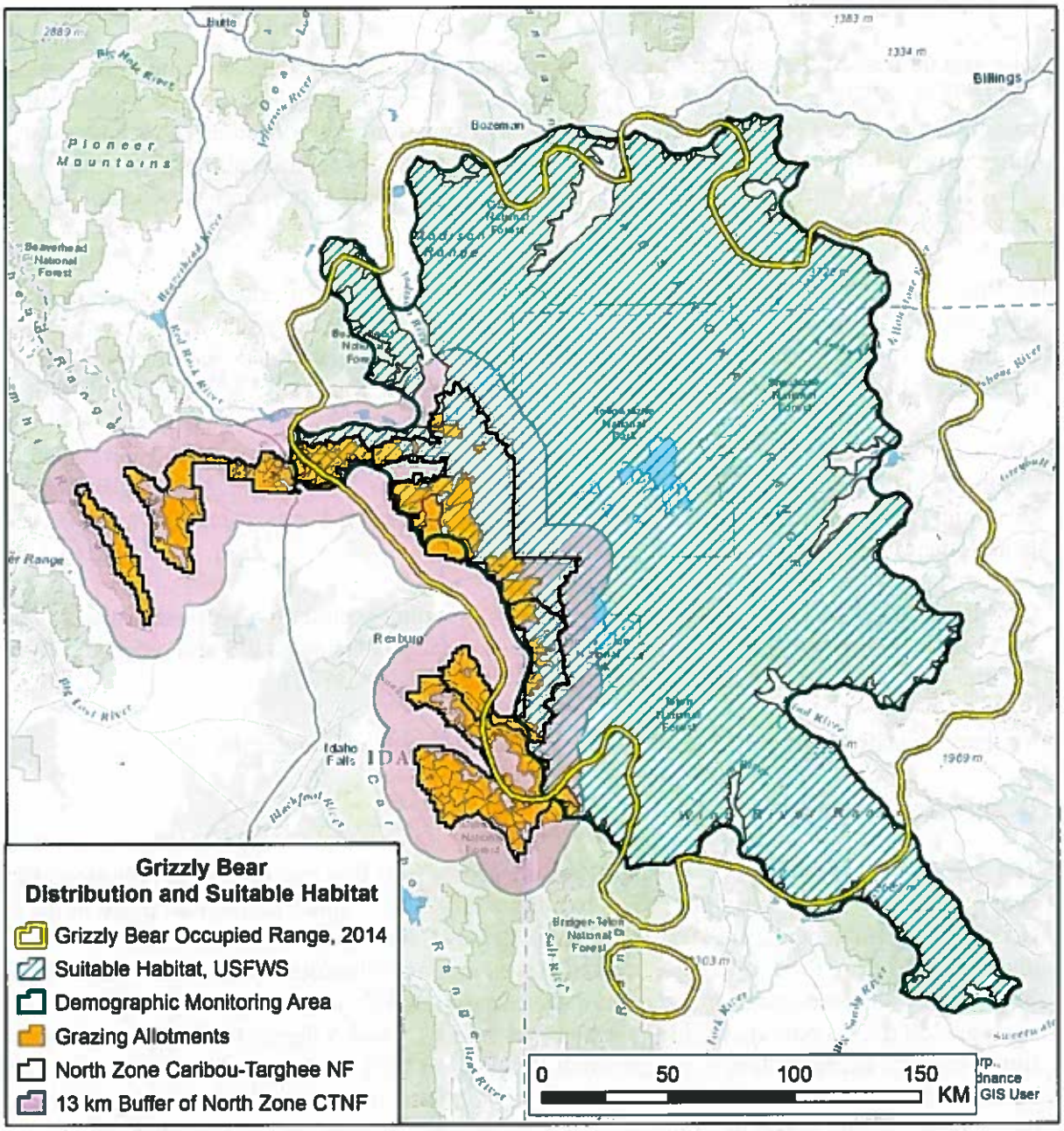

Figure 3. Relationship of the allotments to the Forest, GYA, Demographic Monitoring Area (DMA), occupied range, and suitable habitat. Also, depicted here is the Forest's 13 km buffer, which is buffered from the edge of the Forest and is inclusive of the action area (122 allotments and adjacent 12 km).

III. STATUS OF THE SPECIES

This section presents information about the regulatory, biological, and ecological status of the grizzly bear at a rangewide scale that provides context for evaluating the significance of probable effects caused by the proposed action.

A. Regulatory Status

The grizzly bear of the conterminous United States was listed as threatened under the Act on July 28, 1975 (USFWS 1975, p. 31736). Threatened status was deemed appropriate for the following reasons: the present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, sporting, scientific, or educational purposes; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence.

On March 29, 2007, the Service designated the GYA population of grizzly bears, which inhabits the Greater Yellowstone Area Recovery Zone[9] (RZ), as a distinct population segment (DPS) (Figure 1), and removed the GYA DPS from the List of Threatened and Endangered Wildlife under the Act. The delisting became effective on April 30, 2007 (USFWS 2007a, p. 14866).

On September 21, 2009, the Federal District Court in Missoula, Montana, issued an order enjoining and vacating the delisting of the GYA DPS of the grizzly bear. In compliance with this order, the grizzly bear population in the GYA is again listed as threatened under the Act and is no longer considered a DPS.

On March 11, 2016, the Service opened a 60 day comment period on a proposed rule to identify the Greater Yellowstone Ecosystem population of grizzly bears as a DPS and remove it from the Federal List of Endangered and Threatened Wildlife (81 FR 13173).

To date, no critical habitat for grizzly bears has been designated under the Act.

B. Species Description

The grizzly bear is one of two subspecies of the brown bear that occupy North America. Grizzly bear coloration varies from light brown to almost black, with guard hairs often paled at the tips. Grizzly bears, in general, are larger than black bears (*Ursus americanus*) and can be distinguished from them by longer, curved claws, humped shoulders, and a more concave face. In the lower 48 States, male grizzly bears average 400 to 600 pounds and female grizzly bears average 250 to 350 pounds. Adult grizzly bears stand 3.5 to 4.5 feet at the hump when on all fours, and can exceed 8 feet in height when standing on their hind legs. The Yellowstone grizzly bear population is discrete from other grizzly populations, has markedly different genetic characteristics, and exists in a unique ecological setting where bears use terrestrial mammals as their primary source of nutrition (Mattson 1997b). A complete discussion of the biology and ecology of this species may be found in the Grizzly Bear Recovery Plan (USFWS 1993).

[9] The 1993 Recovery Plan described the Greater Yellowstone Ecosystem Recovery Zone as the Yellowstone Grizzly Bear Ecosystem Recovery Zone; it is now referred to as the GYA RZ (USFWS 1993). The GYA RZ covers the same geographic area and is synonymous with the PCA, a term used in the 2007 Final Conservation Strategy (USFWS 2007b) and Draft 2016 Conservation Strategy (USFWS 2016a) for the grizzly bear in the Greater Yellowstone Area. The GYA RZ is used in conjunction and interchangeably with PCA in this Opinion.

C. Life History

1. Home Range and Dispersal

Most areas currently inhabited by the species are in contiguous, relatively undisturbed mountainous habitat exhibiting high topographic and vegetative diversity. Grizzly bear home ranges average 130 to 1,300 square kilometers (sq km) (50 to 500 square miles). The home ranges of adult male grizzly bears, in general, are 2 to 4 times larger than that of females, averaging 884 sq km (341 square miles) for females and 3,757 sq km (1,450 square miles) for males (Assessment, p. 30). Home range sizes of grizzly bears vary in relation to food availability, weather conditions, and interactions with other bears. The home ranges of grizzly bear females appear to be smaller while they are with cubs, but ranges expand when the young are yearlings, to meet increased foraging demands. In addition, individual grizzly bears may extend their range seasonally or from one year to the next. The home ranges of adult bears frequently overlap, and there is little evidence that they are territorial (USFWS 1993).

Grizzly bears exhibit a high degree of home range fidelity (Schwartz et al. 2003). Within its home range, a grizzly bear uses a diverse mixture of forests, moist meadows, grasslands, and riparian habitats to complete its life cycle. Grizzly bears, in general, prefer large, remote areas of habitat isolated from human development for feeding, denning, and reproduction (USFWS 1993). They require dense forest cover for hiding and security. In the GYA, lodgepole pine (*Pinus contorta*) forests are a large and dynamic part of grizzly bear habitat (Mattson 1997b). Long distance movements of some grizzly bears increase the risk of contact with highway crossings, hunters, recreationists, and a variety of developments associated with human use. The search for food has a primary influence on grizzly bear movements. Upon emergence from the den, they seek lower elevations, drainage bottoms, avalanche chutes, and ungulate winter ranges where their food requirements can be met (Assessment, p. 30).

2. Diet

Grizzly bear are opportunistic omnivores that use a wide variety of plant and animal food sources (Bjornlie et al. 2013a). The literature provides comprehensive information on food items that grizzly bears consume. A recent synthesis of this information summarized that grizzly bears in the GYA consume up to 234 different foods, 75 of which are eaten on a regular basis, with the higher caloric foods being army cutworm moths (*Euxoa auxiliaris*), various ungulate species such as elk (*Cervus elaphus*) and moose (*Alces americanus*), cutthroat trout (*Oncorhynchus clarkia*), and whitebark pine seeds (*Pinus albicaulis;* IGBST 2013). In areas where animal matter is less available, roots, bulbs, tubers, fungi, and tree cambium may be important in meeting nutrient requirements. High-quality foods such as berries, nuts, and fish are important in some areas. Combined food habit studies from the GYA show that grizzly bear display dietary plasticity among individuals and in different portions of the ecosystem, and also across seasonal, annual, and decadal time periods (IGBST 2013).

Grizzly bears in the GYA have the highest percentage of meat consumption in their diet of any inland grizzly bear population (Assessment, p. 30). About 40 to 80 percent of grizzly bear diet in the GYA is from some form of animal matter, including ungulates, fish, army cutworm moths,

other insects, and small mammals. Adult males eat the greatest proportion of meat. Meat in a grizzly bear's diet varies by season and available forage. Small mammals, such as pika (*Ochotona princeps*), make up a relatively minor portion of the grizzly bear's diet, while ungulates are an especially important food source during spring after emergence from dens and through the calving/fawning seasons (Assessment, p. 30). Recent research has demonstrated that grizzly bear seek hunter-killed carcasses and gut-piles (Assessment, p. 31). Grizzly bears make use of domestic ungulates to varying degrees in some portions of the GYA, either in the form of carrion or as prey. Grizzly bear feed on spawning cutthroat trout along the tributaries of Yellowstone Lake during the spawning season from May 1 to July 15 (Assessment, p. 31).

Army cutworm moths are also an important food source for bears in the GYA (Assessment, p. 31) and are a preferred source of nutrition for many grizzly bears, representing a high quality food that is available during the summer and early fall (July to September; Assessment, p. 31; Haroldson et al. 2015). These moths provide important dietary fat in the early fall, when grizzly bears are preparing for hibernation, and their abundance is positively correlated with bear reproductive success (Assessment, p. 31). During times of great moth abundance, Robison et al. 2006, estimated a grizzly bear may eat up to 40,000 moths per day and more than one million per month, representing 47 percent of its annual caloric budget. Army cutworm moth congregation sites are in remote high altitude alpine talus areas and potentially reduce grizzly bear/human encounters by isolating the bears.

Whitebark pine seeds are an important fall source of food for grizzly bears in the GYA when they are available (Mattson and Reinhart 1997). Bears consume whitebark pine seeds contained in red squirrel (*Tamiasciurus hudsonicus*) cone caches (Mattson and Reinhart 1997). Whitebark pine seeds are the most important fall food of Yellowstone grizzly bears, and the availability of seeds influences annual feeding strategies and movement patterns (Assessment, p. 31).

Grizzly bears also make use of a variety of other vegetative food sources. Grizzly bear seasonal food includes roots (Mattson 1997a), graminoids, horsetail (*Equistum spp.*), forbs, fruits, and limited amounts of mushrooms (Knight et al. 1984; Mattson et al. 1991). Plant materials that have low levels of carbohydrates or protein are eaten as plants emerge and crude protein levels are highest. Throughout late spring and early summer, grizzly bear follow plant maturity back to higher elevations. In late summer and fall, there is a transition to fruit and nut sources. The grizzly bear movements described are a generalized pattern; however, bears are individuals and will go where they can best meet their food requirements.

3. Den Site Selection

Grizzly bears generally construct dens in areas far from human disturbance at elevations of approximately 2,000 to 3,050 meters (m; 6,500 to 10,000 feet). Grizzly bears den from the end of September to late April or early May, with entrance and emergence dates affected by the gender and reproductive status of the bears. Known pregnant females tended to den at higher elevations and, following emergence, remained at higher elevations until late May. Females with cubs remained relatively close (less than 3 km) to den sites until the last two weeks in May. Denning periods differed among classes and averaged 171 days for females that emerged from dens with cubs, 151 days for females without cubs, and 131 days for males. Denning bears can

be disturbed by winter sports activities, such as snowmobiling. Current studies are focused on minimizing such disturbance by controlling human access to important denning areas (Haroldson et al. 2002; Podruzny et al. 2002). If pregnant female bears are disturbed in their dens and this disturbance causes them to relocate to a new den before parturition, negative consequences can occur in the form of reduced cub fitness and survival (Linnell et al. 2000; Swenson et al. 1997).

Denning habitat has been described as follows (Judd et al. 1986; Haroldson et al. 2002):

- Den sites are associated with moderate tree cover (26 to 75 percent canopy cover).
- Den sites are usually on 30 to 60 degree slopes.
- Den sites occurred on all aspects, although northerly exposures were most common.
- Grizzly bears usually dig new dens, but occasionally used natural cavities or a den from a previous year.
- Mean elevation at den sites for females with cubs that emerged from dens was 8,845 feet. Mean elevation for other females was 8,467 feet, and for males was 8,444 feet.

D. Current Rangewide Condition of the Grizzly Bear and Factors Influencing that Condition

1. Recovery Zones/Ecosystems

Historically, grizzly bear ranged from the Great Plains to the Pacific Ocean and from the northern United States border with Canada to the southern border with Mexico. The current distribution of grizzly bears in the contiguous United States is reduced to roughly 2 percent of its former range. Grizzly bear currently occupy parts of British Columbia and Alberta in Canada, and Montana, Idaho, Wyoming, Washington, and Alaska in the United States. Within the contiguous United States, six recovery zones/ecosystems have been identified in the 1993 Grizzly Bear Recovery Plan (USFWS 1993): (1) GYA; (2) Northern Continental Divide; (3) Cabinet-Yaak; (4) Selkirk; (5) North Cascades; and (6) Bitterroot. The Bitterroot Ecosystem is not currently occupied by grizzly bears (Figure 4, Table 1).

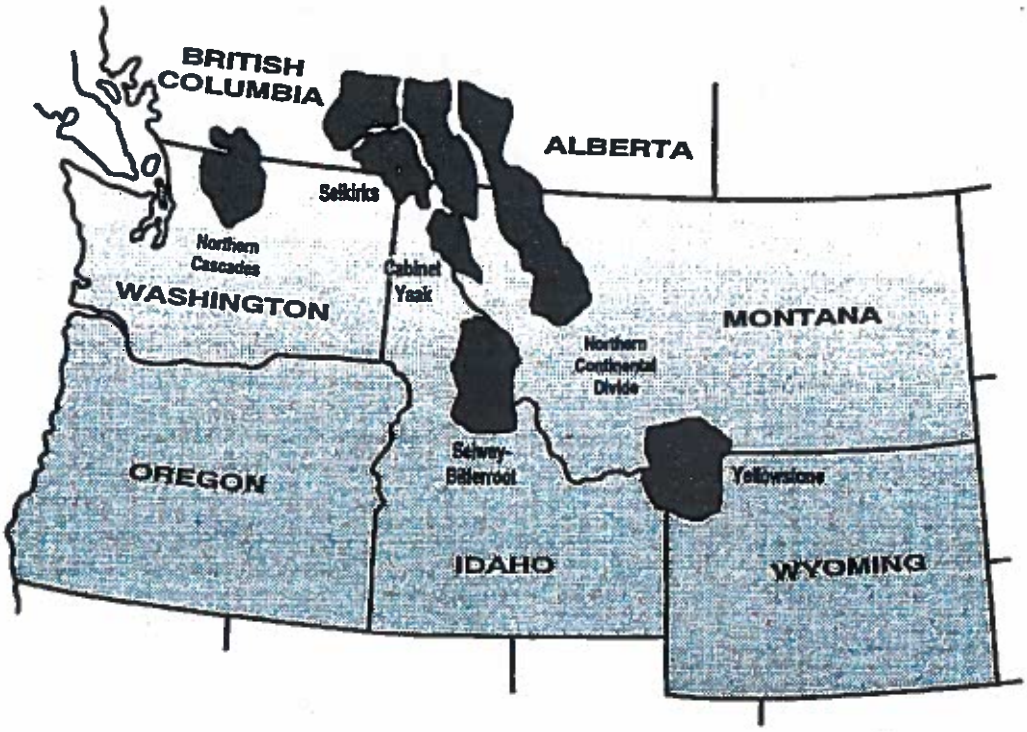

Figure 4. Grizzly Bear Ecosystems in the Conterminous 48 States (USFWS 1993)[10].

Table 1. Estimated grizzly bear population size (in terms of individuals) and population growth rate by recovery zone/ecosystem (USFWS 2011; Haroldson et al. 2015; USFWS 2013a).

Recovery Zone	Estimated Population Size	Trend (Percent change annually)
Greater Yellowstone Area	655 or 757*	+0 to 2 percent
Northern Continental Divide	942	+3 percent
Cabinet-Yaak	42	-3.8 percent
Selkirk	88**	+1.9 percent
North Cascades	<20	Unknown
Bitterroot	0	n/a

*Reflects two methods for estimating population (see Greater Yellowstone Area subsection below). This population estimate covers the entire ecosystem. The GYA includes portions of the action area.
** Estimated population was described in USFWS 2011 as 30 in the U.S, and 58 in Canada.

Northern Continental Divide

The Northern Continental Divide Ecosystem (NCDE) extends from the Rocky Mountains of northern Montana into contiguous areas in Alberta and British Columbia, Canada. Grizzly bears are well distributed throughout the NCDE Recovery Zone, and their range has expanded outside of the NCDE Recovery Zone boundary to the east, and somewhat to the west and south (USFWS

[10] Figure 4 identifies the North Cascades and Greater Yellowstone Area as the Northern Cascades and Yellowstone, respectively. They are referred to in the text of 1993 Grizzly Bear Recovery Plan (USFWS 1993) and this Opinion as North Cascades and GYA.

2013a). The Grizzly Bear Management Plan for Western Montana identifies 37,460 sq km (14,463 square miles) of the NCDE as occupied, including some intervening habitat between the NCDE and the Cabinet-Yaak. The estimate of average annual population growth was calculated in 2012, with a resulting rate of 3.03 percent per year for 2004 to 2011 and a total population estimate of approximately 942 grizzly bears (Table 1). The NCDE population of grizzly bears is contiguous with grizzly bears in Canada, resulting in high genetic diversity (USFWS 2013a). Grizzly bears are well distributed throughout the NCDE Primary Conservation Area and Zone I although density is higher inside the Primary Conservation Area (USFWS 2013a).

Threats to grizzly bears in the NCDE include increasing human use, lack of standards on developed sites, and other issues with human access management. A draft conservation strategy for grizzly bears in the NCDE was released in May 2013 (USFWS 2013a). The purpose of the conservation strategy is to describe the coordinated management and monitoring efforts necessary to maintain a recovered grizzly bear population in the NCDE and document the commitment of participating agencies to this shared goal.

Cabinet-Yaak

The Cabinet-Yaak Ecosystem (CYE) in northwestern Montana and northeastern Idaho has at least 42 grizzly bears (USFWS 2011). Grizzly bear movement between the Cabinet Mountains and the Yaak River drainage is unknown but thought to be minimal (Kasworm et al. 2015); consequently, separate population estimates were made for these two portions of the CYE Recovery Zone. The Cabinet Mountains lie south of the Yaak River drainage and contain about 60 percent of the CYE Recovery Zone. There are approximately 15 individuals in the Cabinet Mountains and 25 to 30 individuals in the Yaak portion of the CYE Recovery Zone (USFWS 2011). These populations are known to be connected to grizzly bear populations to the north of the United States border with Canada based on documented interchanges of radio-collared bears across the border (USFWS 1993). There are another estimated 24 grizzly bears in Canada directly across the border from the Yaak portion of the CYE (Table 1; USFWS 2011).

Population estimates from 2010 were similar to the 1999 estimates of 30 to 40 grizzly bears. Mortality rates and reproductive data suggest the Yaak River portion of the CYE is likely declining (USFWS 2011). The Cabinet Mountains population has been augmented with eight female grizzly bears between 1990 and 2009. The reproductive success of one of the augmentation bears has contributed to the increasing population since 1990 (USFWS 2011).

Threats to grizzly bears in the CYE include motorized access, unsustainable human-caused mortality, small population size, and population fragmentation that resulted in genetic isolation (USFWS 2011). The Service considers this population threatened because of continuing high levels of human-caused mortality, a decreasing population trend, genetic and geographic isolation, and inadequate habitat protections. The grizzly bear population is also threatened by increasing habitat fragmentation within the CYE Recovery Zone (due to mines and private land development), and in intervening habitat with other grizzly bear populations (USFWS 2011). After a 12 month finding, the Service found that grizzly bears within the CYE were warranted for endangered status, but precluded by other listing actions (February 12, 1993; 58 FR 8250-8251).

Selkirk

The Selkirk Ecosystem (SE) of northwestern Idaho, northeastern Washington, and southeastern British Columbia includes about 2797.2 sq km (1,080 square miles) in the U.S. portion and about 2266.2 sq km (875 square miles) in the Canadian portion of the SE Recovery Zone. The SE Recovery Zone is the only defined grizzly bear recovery zone that includes part of Canada because the habitat in the United States portion is not of sufficient size to support a minimum viable population. Grizzly bear habitat is contiguous across the border, and radio-collared bears are known to move back and forth across the border. Therefore, the grizzly bears north and south of the U.S./Canada border are considered one population (USFWS 1993). The population of grizzly bears in the SE is estimated at 30 in the U.S. and 58 in Canada (USFWS 2011). The population is estimated to be increasing at a rate of 1.9 percent annually (Table 1).

Threats to grizzly bears in the SE include motorized access, lack of a food storage order, human-caused mortality, small population size, and population fragmentation that resulted in genetic isolation. Although the population may be slowly increasing and reconnecting with adjacent populations, high levels of human-caused mortality and a lack of regulatory protective mechanisms in British Columbia and the U.S. still threaten this population (USFWS 2011).

Bitterroot

The Bitterroot Ecosystem (BE) is currently unoccupied by grizzly bears (as defined in USFWS 2000), and has been since before the time of listing. Most suitable habitat within the BE is protected under the Wilderness Act. The Service prepared an Environmental Impact Statement and signed a Record of Decision on November 13, 2000, authorizing the reintroduction of 25 grizzly bears over 5 years to the BE. These bears would be classified as an Experimental Population under section 10(j) of the Act. To date, no bears have been released in the BE.

A male grizzly bear that likely originated in the SE of Northern Idaho was shot in the BE in 2007 (Bitterroot Ecosystem Subcommittee 2007). Prior to 2007, no grizzly bears had been confirmed in the BE in more than 60 years. It is unknown what route the bear took to reach the BE, as it did not have a radio collar.

North Cascades

The North Cascades Ecosystem (NCE) population is estimated to be fewer than 20 animals within the 24,605 sq km (9,500 square miles) NCE Recovery Zone (Table 1). The population in adjacent British Columbia is estimated to be less than 25 grizzly bears within a 9,800 sq km (3,784 square miles) area (USFWS 2011). The distribution of grizzly bears within the NCE is unknown due to a lack of data (USFWS 2011). While study of this very rugged and remote habitat indicates that this ecosystem is capable of supporting a self-sustaining population of grizzly bears, only a remnant population may remain that is incapable of persisting without active recovery intervention efforts, including possible augmentation with bears from other areas. A confirmed sighting of a grizzly bear in 2010 is the only report of a grizzly bear in the NCE since 1996 (USFWS 2011).

Threats to grizzly bears in the NCE include the small population size, motorized recreation, population fragmentation resulting in genetic isolation, and a lack of detailed data about population size, trend, survival, and reproductive rates (USFWS 2011).

Greater Yellowstone Area[11] (includes the action area)

The 23,828 sq km (9,209 square miles) GYA RZ/PCA[12] includes portions of Wyoming, Montana, and Idaho and portions of six National Forests (Beaverhead, Bridger-Teton, Custer, Gallatin, Shoshone, and Targhee), Yellowstone and Grand Teton National Parks, John D. Rockefeller Memorial Parkway, adjacent private and State lands, and lands managed by the Bureau of Land Management.

The GYA represents the most remote portion of the current grizzly bear range in the U.S. and has been the primary focus of grizzly recovery efforts to date. The number and distribution of grizzly bears in this population have exceeded target recovery levels for the last several years. For example, the population of independent female grizzly bears has grown from a low point in 1983 of less than 30 to more than 276 today (Schwartz et al. 2011; Haroldson et al. 2015[13]). Recovery work continues to reduce grizzly bear mortalities and ensure habitat standards for maintaining a recovered population in this ecosystem. The grizzly bear population in the GYA met its recovery goals in the mid-1990s, has exceeded recovery goals every year since, and may be nearing carrying capacity (Haroldson et al. 2013).

On March 11, 2016, the Service opened a 60 day comment period on a proposed rule to identify the Greater Yellowstone Ecosystem population of grizzly bears as a DPS and remove it from the Federal List of Endangered and Threatened Wildlife (81 FR 13173). In addition, the Service released two other documents for public comment at the same time as the proposed delisting rule: 1) a draft 2016 Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Ecosystem which provides management direction for the PCA and adjacent areas within the Demographic Monitoring Area (DMA; Figure 5) was developed to guide management and monitoring of the GYA grizzly bear population and its habitat upon recovery and delisting, and 2) a draft supplement to the 1993 Grizzly Bear Recovery Plan for the Yellowstone grizzly bear population. Additionally, on February 19, 2016, the Service signed the Draft Revised Demographic Recovery Criteria for the Yellowstone Ecosystem (USFWS 2016b) which updates the demographic monitoring criteria of the 1993 Grizzly Bear Recovery Plan (USFWS 1993), as well as the subsequent supplements (USFWS 2007d; USFWS 2013).

[11] The Greater Yellowstone Area, as addressed previously, is synonymous with Greater Yellowstone Ecosystem, and Yellowstone Ecosystem. To maintain consistency through this Opinion, GYA is used to describe the Greater Yellowstone area, the Greater Yellowstone Ecosystem and Yellowstone Ecosystem.
[12] The GYA Recovery Zone (RZ) is synonymous with the PCA. As such, it is referred to as the RZ/PCA in this Opinion.
[13] The methods used for calculating grizzly bear populations are found in the Yellowstone grizzly bear investigations: annual report of the Interagency Grizzly Bear Study Team (Haroldson et al. 2015).

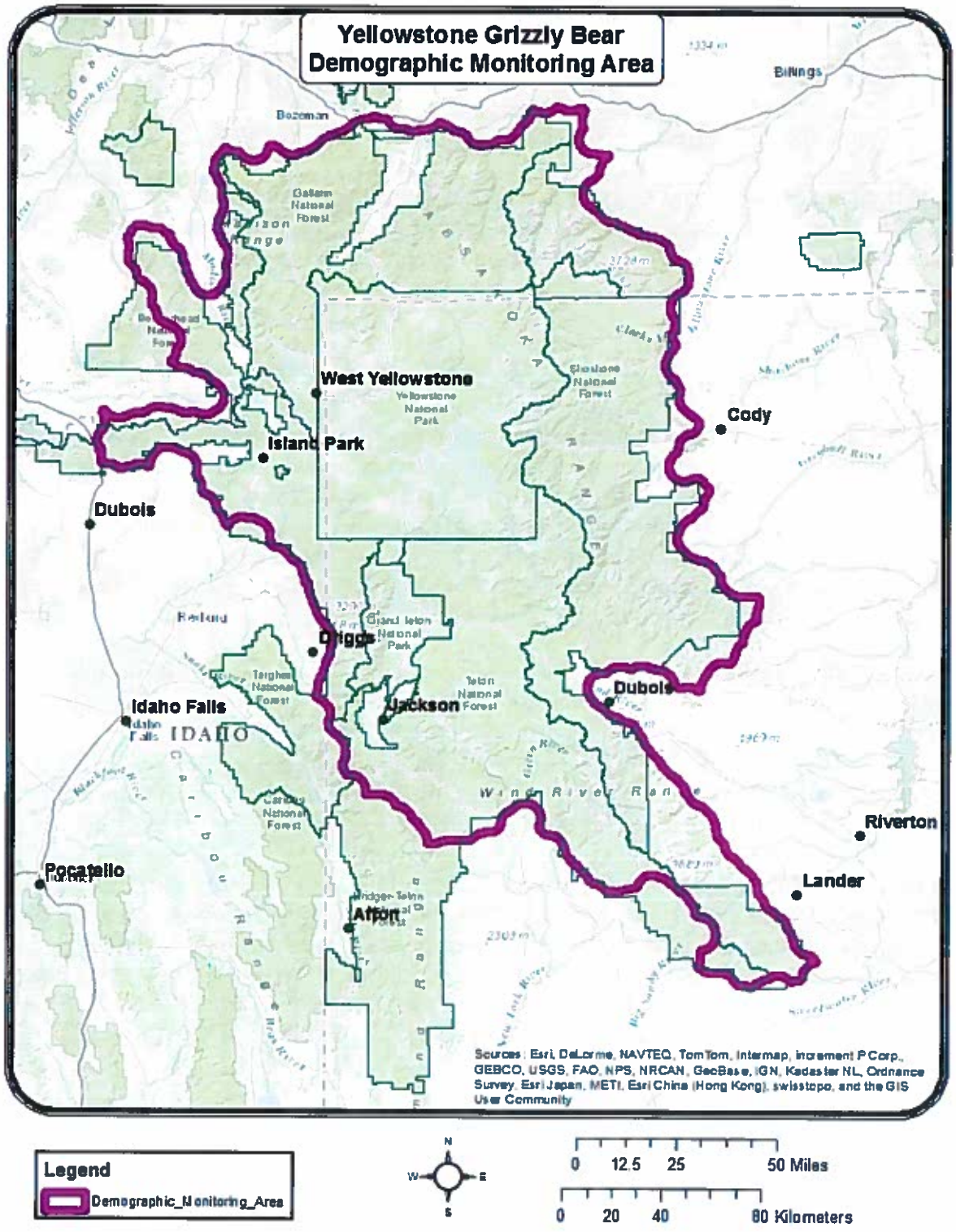

Figure 5. Yellowstone Grizzly Bear Demographic Monitoring Area

Estimation of Population Size in the GYA

The GYA grizzly bear population currently is stable to slightly increasing in the GYA (IGBST 2012). In 2014, there was an estimated average of 655 to 757 grizzly bears in the GYA (numbers depend on the method used to estimate population size; Haroldson et al. 2015). The grizzly bear population has met its recovery zone goals in the GYA[14]. Information indicates that this population of grizzly bears grew an average of 4 percent or more annually from 1983 to 2001 (IGBST 2012). From 2002 to 2011 the population's rate of growth slowed to 0 to 2.2 percent, likely because of the increase in grizzly bear density in the GYA (IGBST 2012; IGBST 2013). The range of grizzly bears in the GYA has increased, as evidenced by the 48 percent increase in occupied habitat between the 1970s and early 2000s, and is still expanding (Pyare et al. 2004; Schwartz et al. 2002; IGBST 2013; Bjornlie et al. 2013b). Grizzly bear range expansion and population increases from 2005 to 2015, including on the Forest, have been concurrent with the Forest's permitted grazing, and with other Federal and non-Federal actions described in the *Environmental Baseline* section. A larger amount of grazing pressure on the Forest, than is anticipated as part of the proposed action, occurred while grizzly bears reached the 1993 Grizzly Bear Recovery Plan (USFWS 1993) recovery goals.

In the GYA, the IGBST uses the Chao2[15] technique to estimate the number of female grizzly bears with cubs, then uses that number to estimate the size of specific population segments and to assess mortality limits. The mortality limits, and a description of how they were obtained, are provided in the IGBST annual Yellowstone Grizzly Bear Investigation reports. The IGBST has been documenting important biological processes associated with grizzly bear recovery for 42 years (since 1973). After experiencing relatively high mortality during the 1970s, the grizzly bear population began to recover in the mid-1980s (van Manen and Haroldson 2015). The population experienced robust growth, particularly during the 1990s when the population recovery goal of 500 grizzly bears was achieved. A slowing rate of population growth started in the early 2000s. This decline was primarily due to cub and yearling survival (van Manen and Haroldson 2015), and many studies were initiated to determine whether the changes in vital rates[16] are associated with changes in high-calorie food resources or population densities (van Manen and Haroldson 2015).

The IGBST monitors the population under two different protocols: 1) the Demographic Recovery Criteria and the DMA (Figure 5) of the 2007 Conservation Strategy, and 2) the updated protocols based on proposed revisions to the Demographic Recovery Criteria (USFWS 2013b). In 2013, 58 unique females with cubs were recorded, and marked the highest count since monitoring started in 1983. Results for 2014 were similar, with 50 unique females observed, resulting in a model estimate of 62 females with cubs (Haroldson et al. 2015). Excluding observations that occurred outside the DMA, there were 47 unique females with a total of 93 cubs and a mean litter size of 1.98 (Haroldson et al. 2015). Using these observations

[14] The recovery goal (a population of 500 grizzly bears) was set in the 1993 Grizzly Bear Recovery Plan and was achieved in the mid-1990s (USFWS 1993).
[15] Chao2 is an estimation technique used by the IGBST which estimates the number of female grizzly bears with cubs that are not observed based on how many times each unique female with cubs is observed to ultimately estimate the total population.
[16] Vital rates represent the change in a vital statistic, such as the rate of birth or death of the different age groups within a population.

and applying the updated vital rates, the population estimate for the 2014 Chao2 results was a population of 757 grizzly bears in the DMA (Haroldson et al. 2015).

The Chao2 regression analysis showed a 4 to 7 percent estimated growth rate during the 1980s and 1990s. Until 2011, mortality limits were based on demographic analyses of data from 1983 to 2001. The monitoring and subsequent analyses presented in the 2011 IGBST Annual Report showed a change in the number of female grizzly bears with cubs. In 2010, there were an estimated 51 individual females with cubs, while in 2011 there were 39 estimated females with cubs. This triggered a full demographic review per criteria 19 of the Service's 2007 Revised Demographic Recovery Criteria for the Yellowstone Ecosystem Supplement to the Grizzly Bear Recovery Plan (USFWS 2007d). The subsequent review of trend estimates using 2002 to 2011 vital rates suggested the population was stable to slightly increasing during this time (Haroldson et al. 2015). The number of female grizzly bears with cubs is the relied upon vital rate used to estimate grizzly bear population in the GYA. Figure 6 shows the model-averaged estimates of unique females with cubs and the 95 percent confidence interval on the predicted population size (Haroldson et al. 2015). As Figure 6 shows, there has been an average increase in the female population since 1983.

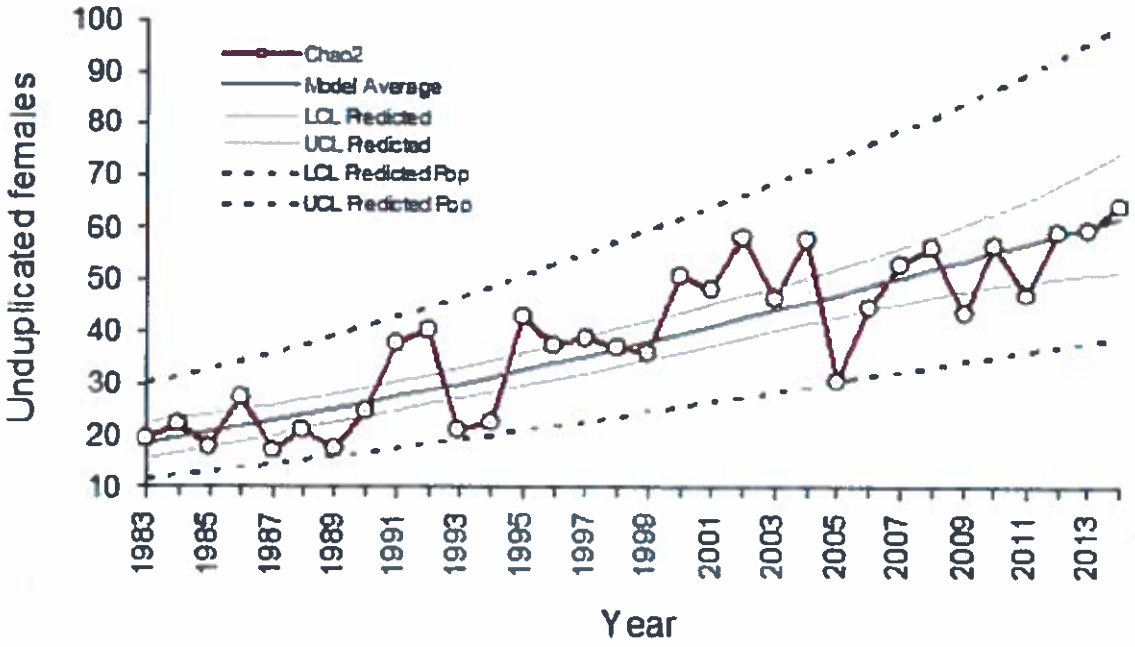

Figure 6. Model averaged estimates for the number of unique female grizzly bears with cubs in the GYA for the period 1983 to 2014, where the linear and quadratic models of Ln (N_{Cho2}) were fitted. The inner set of light solid lines represents a 95 percent confidence interval on the predicted population size, whereas the outer set of dashed lines represents a 95 percent confidence interval for the individual population estimates.

Grizzly Bear Mortalities within the Greater Yellowstone Area

Table 2 summarizes the 293 known and probable grizzly bear mortalities from 1997 to 2009 in the GYA (IGBST 2009). During that period, there were only 13 (4.44 percent) cattle-related and 4 (1.37 percent) sheep-related grizzly bear mortalities. According to the IGBST mortality

database, from 2010 to 2015, 45 grizzly bear mortalities occurred related to livestock[17], out of 268 mortalities (approximately 16.8 percent of mortalities; NOROCK 2016). Two of the livestock mortalities occurred within the action area but not within the allotments, while the remainder occurred in Montana and Wyoming. Of the 45 grizzly bear mortalities, six were related to sheep. Four of those six occurred in Wyoming, where range expansion has brought grizzly bears into closer contact with more livestock grazing operations. None of the mortalities between 2010 and 2015 known to be sheep-related were in or near the action area.

Table 2. Known and Probable Grizzly Bear Mortalities in the GYA, 1997 to 2009

Category of Mortality	Mortality, Number of Bears	Percentage of Total Mortality
Confrontation	90	30.72
Hunting	76	25.94
Undetermined	58	19.80
Natural	24	8.19
Poaching	16	5.46
Cattle Protection	13	4.44
Research	6	2.05
Under Investigation	6	2.05
Sheep Protection	4	1.37
Total	**293**	**100**

A supplement to the Grizzly Bear Recovery Plan establishes thresholds for mortality of grizzly bears in the GYA that represent the maximum levels of mortality consistent with sustaining a stable or increasing population (USFWS 2007c). The IGBST has since recommended revising those mortality thresholds to reflect updated vital rates for the GYA grizzly bear population (IGBST 2012). The Grizzly Bear Recovery Plan 2016 Draft Supplement: Draft Revised Demographic Recovery Criteria for the Yellowstone Ecosystem states that if mortality thresholds are exceeded in more than 3 consecutive years for any sex or age class or the annual population estimate falls below 612, the IGBST will produce a Biological and Monitoring Review to inform the appropriate management response (USFWS 2016b).

The Grizzly Bear Recovery Plan's threshold for mortality from all causes of adult females (i.e., independent, older than 2 years) was 9 percent of the GYA population of adult females (USFWS 2007c). The updated mortality threshold recommended by the IGBST (2012) is 7.6 percent for adult females (IGBST 2012). Although the revised thresholds are a smaller percentage, they may represent a larger number of bears because of the growing population and statistical methodology for population estimation. Across the GYA, fewer mortalities (from all causes) of adult female grizzly bears have occurred in 12 of the past 14 years, than the threshold set to sustain an increasing population (Haroldson and Frey 2015).

[17] The IGBST data base uses the terms livestock, sheep, and cattle separately when describing and attributing causes to grizzly bear conflicts and mortalities. This Opinion uses the term "livestock" to refer to cattle, horses, sheep, and goats. This use of livestock is inclusive of cattle-related conflicts documented in the IGBST database.

The mortality threshold for cubs (i.e., dependent offspring) and yearlings is 9 percent (USFWS 2007c); the IGBST has recommended revising this to 7.6 percent of the estimated total population of dependent cubs (IGBST 2012). Unlike the threshold for independent females, only human-caused mortalities are counted against the threshold for cubs. The mortality threshold for dependent cubs and yearlings in the GYA has never been exceeded.

Although no data exist that can inform a sustainable mortality threshold for independent males because population trajectory is generally independent of male survival rates (IGBST 2012), the mortality threshold for independent males is set at 15 percent. The mortality threshold for independent males was exceeded in 2008 and 2010, and fractionally (by less than one bear) in 2011 (Haroldson and Frey 2012). In 2012, the mortality threshold for independent males was exceeded under the previous protocol, but under the updated protocol fewer mortalities occurred than the threshold. The two methods lead to different conclusions because the updated protocol (IGBST 2012) only takes into account the grizzly bear mortalities which occurred within the DMA and does not count those mortalities that occur outside of the DMA. This means that grizzly bear mortalities in areas where long-term expansion or occupancy is likely unsustainable would not be counted against mortality thresholds. It also limits the count of grizzly bear mortalities to areas where systematic data collection efforts occur (IGBST 2012).

Under both the previous protocol and the updated protocol, mortality thresholds for independent females, independent males, and dependent young were not exceeded in 2013 and 2014. Overall, in the GYA, mortalities have remained within existing sustainable mortality thresholds despite some years of exceedance, as discussed above, and the population continues to meet demographic monitoring criteria.

Grizzly Bear/Human Conflicts in the GYA

Grizzly bear/human conflicts (inclusive of grizzly bear/livestock conflicts) are defined as incidents in which grizzly bears injure people, damage property, kill or injure livestock, damage beehives, obtain anthropogenic (unnatural) foods, or damage or obtain garden and orchard fruits and vegetables. All conflicts reported to State and Federal agencies are entered into State databases, compiled annually by Yellowstone National Park, and reported in the IGBST Annual Report. Grizzly bear/human encounters that did not result in human injury or property damage are also recorded, but categorized as confrontations rather than conflicts.

There were 243 grizzly bear/human conflicts in the GYA in 2013. These incidents included bears obtaining anthropogenic foods (15 percent), killing livestock (54 percent), damaging property (12 percent), obtaining vegetables and fruits from gardens and orchards (0.01 percent), and injuring people (0.02 percent). Most conflicts occurred on private land. The remaining occurred on public lands including National Forest System, Bureau of Land Management, and National Park Service lands. Of these 243 reported conflicts, the majority occurred outside of the RZ/PCA (Landenburger et. al. 2015, pers. comm.).

Data indicate that different types of grizzly bear/human conflicts are more likely to occur on grizzly bear habitat under different ownership. On private property, bears obtaining anthropogenic foods were most common. On National Forest System lands, livestock

depredations were most common. On National Park Service lands, few grizzly bear/human conflicts occurred, but habituation of bears to people is a significant management challenge (IGBST 2012).

A 3-year conflict distribution map was constructed in 2011 (Figure 7) by the IGBST which found the areas of greatest conflict based on the historical conflicts. This map identified four areas where most grizzly bear/human conflicts occurred (57 percent of the conflicts) from 2009 to 2011. The four areas are 1) the Green River area, 2) the North and South Forks of the Shoshone River, 3) the Clarks Fork area, and 4) the Gardiner Basin area. None of these high conflict areas are within the action area.

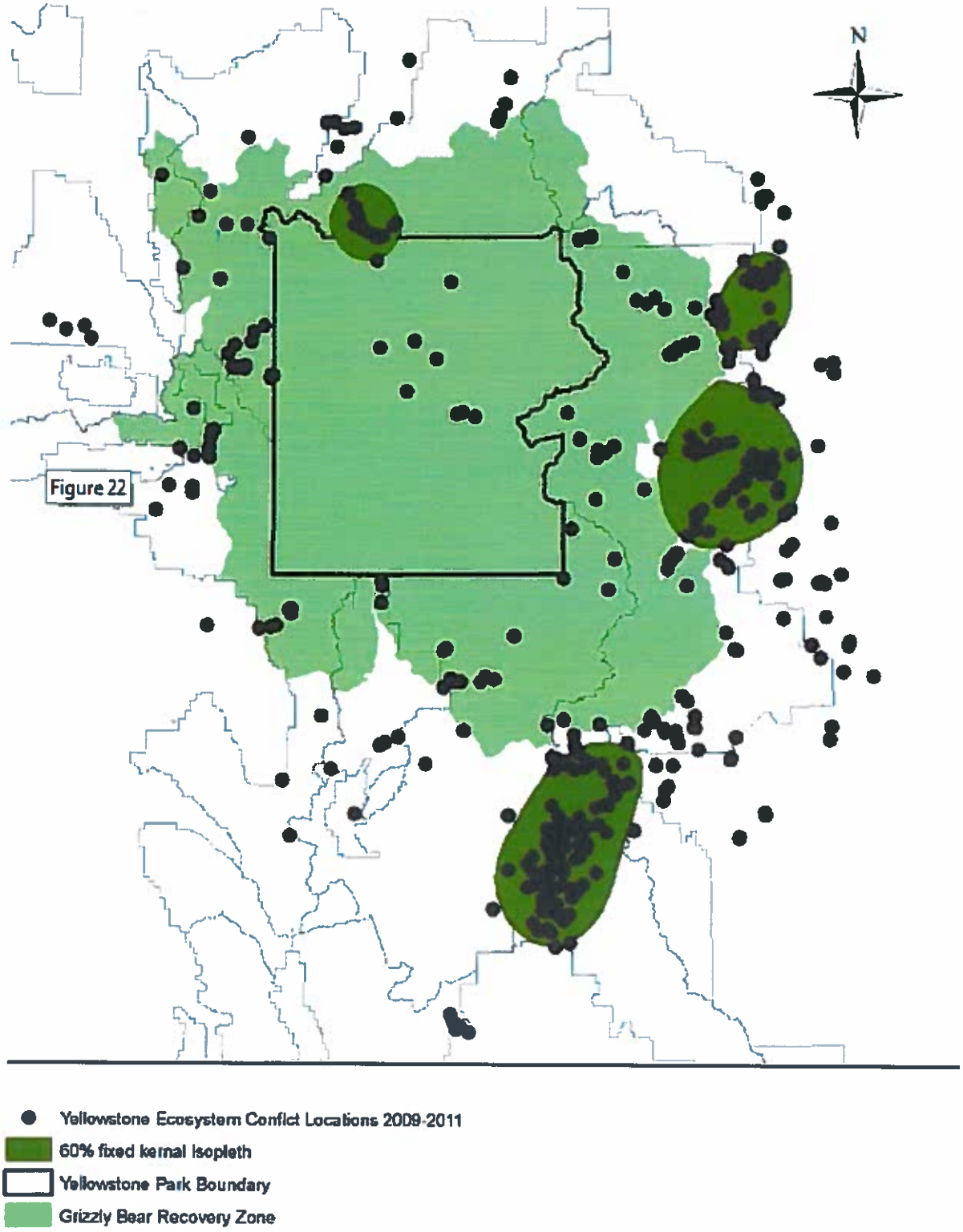

Figure 7. Concentrations (dark shaded polygons) of grizzly bear/human conflicts that occurred in the GYE from 2009 to 2011, (lightly shaded area represents the RZ/PCA)

2. Conservation

The 1993 Grizzly Bear Recovery Plan outlines recovery strategies for the various grizzly bear ecosystems (USFWS 1993). The Plan defines a recovered population as one that can sustain the existing level of known and unknown human-caused mortalities that exist in the ecosystems and are well distributed throughout their recovery zones. Within the contiguous United States, six recovery zones, as addressed above, that are associated with the various ecosystems were identified (USFWS 2011).

In an effort to facilitate consistency in the management of grizzly bear habitat within and across ecosystems, the Interagency Grizzly Bear Guidelines were developed by the IGBC for use by land managers (IGBC 1986). The IGBC developed specific land management guidelines for use in each of the five ecosystems currently occupied by grizzly bears (GYA, Northern Continental Divide, Selkirk, Cabinet-Yaak, and North Cascades; Figure 4).

Grizzly bear recovery zones have been established to include areas large enough and of sufficient habitat quality to support a recovered bear population in each zone. According to the Grizzly Bear Recovery Plan (USFWS 1993), a recovery zone is defined as that area in each grizzly bear ecosystem within which the population and habitat criteria for achievement of recovery will be measured. Areas outside of recovery zones may provide habitat that grizzly bears will use, but are not considered necessary for the survival and recovery of this species. The area outside the recovery zone but within a 10 mile diameter buffer is managed to conserve grizzly bear and their habitat whenever possible; population and mortality data within this buffer zone are collected and used to assess recovery criteria. Beyond the 10 mile buffer, grizzly bear populations are not considered when determining whether recovery goals have been met. Grizzly bears are still protected under the Act wherever they occur in the U.S.

Areas within recovery zones are also stratified into Management Situation Zones 1, 2, 3, 4, or 5, each having a specific management direction.

"Management Situation 1" (MS1) lands contain population centers of grizzly bears, are key to the survival of the species and are where management decisions will favor the needs of the bear even when other land use values compete.

"Management Situation 2" (MS2) lands are those areas that lack distinct population centers and the need for this habitat for the survival of grizzly bear is more uncertain. The status of such areas is subject to review. Management will, at least, maintain those habitat conditions that resulted in the area being classified as MS2.

"Management Situation 3" (MS3) designation is intended for lands where grizzly bear may occur infrequently. There is a high probability that Federal activities here may affect the species survival and recovery. Management focus is on grizzly bear/human conflict minimization rather than habitat maintenance and protection.

"Management Situation 4" (MS4) lands are areas where grizzlies do not occur in the area but habitat and human conditions make the area potentially suitable for grizzly occupancy, and the

area is needed for the survival and recovery of the species. Grizzly bear/human conflict minimization is not a management consideration on these lands.

"Management Situation 5" (MS5) lands are areas where grizzly bear do not occur or occur only rarely in the area. Habitat may be unsuitable, unavailable, or suitable and available but unoccupied. The area lacks survival and recovery values for the species or said values are unknown. In this area, maintenance of grizzly habitat is an option. Grizzly bear involved in grizzly bear/human conflicts are controlled.

A complete discussion of the conservation needs of the grizzly bear is presented in the Grizzly Bear Recovery Plan (USFWS 1993). Additionally, within the GYA RZ/PCA, recovery criteria have been updated since 1993 to include criteria applicable to the entire GYA ecosystem, such as population estimates and mortality thresholds.

The recovery zones are divided into smaller areas called Bear Management Units (BMUs) for the purpose of habitat evaluation and monitoring. BMUs were designed to:

- Assess the effects of existing and proposed activities on grizzly bear habitat without having the effects diluted by consideration of too large an area;
- Address unique habitat characteristics and bear activity and use patterns;
- Identify contiguous complexes of habitat meeting year-long needs of the grizzly bear;
- Establish priorities for areas where land use management needs would require cumulative effects assessments.

Within the GYA RZ/PCA, the target is to have at least 16 of 18 BMUs occupied at least 1 year in every 6, and no two adjacent BMUs can be unoccupied over any 6-year period. In 2014, 18 of 18 BMUs had verified observations of female grizzly bears with young, and 18 of 18 BMUs contained verified observations of females with young in at least 4 years of the 6-year period, 2009 to 2014 (Haroldson 2015).

Prior to the 2007 final rule to delist the GYA population of grizzly bear, the Service: (1) finalized the 2003 Conservation Strategy (Interagency Conservation Strategy Team 2007) that guides post-delisting monitoring and management of grizzly bears in the GYA, (2) appended the habitat-based recovery criteria to the 1993 Grizzly Bear Recovery Plan and the 2003 Conservation Strategy, and (3) appended the 1993 Grizzly Bear Recovery Plan and the Strategy with an updated and improved methodology for calculating total population size, known to unknown mortality ratios, and sustainable mortality limits for the entire GYA grizzly bear population (USFWS 1993; USFWS 2007b).

The State and Federal implementation plans within the 2007 Conservation Strategy provide a framework for managing the RZ/PCA and adjacent areas of suitable grizzly bear habitat. The RZ/PCA is the area considered the adequate seasonal habitat needed to support the recovered Yellowstone grizzly bear population for the foreseeable future and allow bears to continue to expand outside the RZ/PCA. A recovered grizzly bear population is one having a high probability of existence into the foreseeable future (greater than 100 years) and for which the

five factors in Section 4(a)(1) of the Act have been successfully addressed. The RZ/PCA was designed specifically with these five factors in mind. Due to grizzly bear relisting in 2009, the 1993 Grizzly Bear Recovery Plan (USFWS 1993), the subsequent 2007 Demographic and Habitat-Based Recovery Criteria Supplements, and the existing Forest Plan direction are the current monitoring and management documents in use (USFWS 2007c; USFWS 2007b). The Draft 2016 Conservation Strategy and recently published literature and reports also provide best available science and are incorporated into project analyses, monitoring, and other considerations (USFWS 2016a).

The long-term conservation of grizzly bear in the GYA continues to depend largely on managing grizzly bear/human conflicts (including those related to livestock grazing), which can result in human-caused mortality of grizzly bears. Efforts focusing on education, proper food storage and disposal of bear attractants, infrastructure management, and compliance and enforcement of permit requirements will help prevent these incidents and is part of the overall management strategy for grizzly bears in the GYA.

3. Threats

The 1975 listing of grizzly bear in the coterminous U.S. identified genetic isolation of some populations of grizzly bear as a potential threat (40 FR 31734). Loss of genetic diversity is a potential concern for GYA grizzly bears, because of the large distances between this and other U.S. populations (USFWS 2011). The 1993 Grizzly Bear Recovery Plan characterizes the Yellowstone population as isolated from other populations and the suggested genetic management may become appropriate for this population (USFWS 1993). A genetic study by Miller and Waits (2003) suggests that heterozygosity (i.e., genetic variation) was historically low in the GYA population, even before the decline of grizzly bears in the 20th century, and that the viability of the population is unlikely to be affected by genetic factors in the next several generations.

Habitat degradation and fragmentation, and negative human/bear interactions are the primary factors responsible for grizzly bears' current threatened status (USFWS 2011). Grizzly bears preferentially use large areas with a low density of roads and low levels of human activity. Secure habitat is defined as areas larger than 10 acres in size and greater than 500 meters from an open road (USFWS 2007c; USFWS 2011). The average amount of secure habitat in each recovery zone ranges from 53 percent in the SE to 86 percent in the GYA (USFWS 2011).

Grizzly bears have been threatened by motorized and dispersed recreational use and forest management activities, including timber harvest. Dispersed recreational uses include hunting, fishing, camping, horseback riding, hiking, biking, off-road vehicle (ORV) use, and snowmobiling. Roads, ORVs, and some recreational uses can displace grizzly bears from available habitat (loss of habitat effectiveness due to human disturbance). Increased development on private land, primarily of residential housing, also decreases habitat availability. Finally, grizzly bears face a decrease in the quality of available habitat due to a loss of biodiversity (especially early succession-related vegetative types) and sub-optimal composition, structure, and juxtaposition of vegetation as a result of fire suppression, management strategies, and advancing succession.

Direct human-caused mortality is the most obvious threat to grizzly bears. This kind of mortality can occur in several ways: (1) mistaken identification by big game hunters; (2) malicious killing; (3) defense of human life; or (4) management removals. Bears are removed (management removals) to protect human life or property, usually because bears have become dangerously bold as a result of food conditioning at campsites, lodges, resorts, and private residences, or they become habituated predators of livestock. Habituation is the loss of a bear's natural wariness of humans caused by the continued exposure of the grizzly bear to human presence, activity, noise, etc. A grizzly bear habituates to other bears, humans, or situations when such interactions give it a positive return in resources, such as food, that outweighs the cost of the stress that precedes such habituation.

Mortalities from grizzly bear/human encounters in the GYA are currently a primary source of grizzly bear mortality and are documented in the IGBST annual reports and mortality database. Grizzly bear/human interactions have an increasing trend in Idaho and Wyoming, due in part to increasing human use and development, the increasing grizzly bear numbers, and grizzly bears and people both expanding their range of occupancy (Aber 2015; Frey 2015; DeBolt et al. 2015).

The frequency of grizzly bear/human encounters is inversely associated with the abundance of natural bear foods as addressed above (Gunther et al. 2004). Years in which natural grizzly bear food production and availability are high can result in younger age classes of grizzly bears accustomed to fairly good food availability. A year of drought and poor food production can compel grizzly bears to search widely for food. Such wide-ranging movements can bring grizzly bears into closer contact with humans, increasing grizzly bear/human encounters and resultant management actions.

With the decline of whitebark pine in the GYA, grizzly bear over the past decade have exhibited reduced selection for whitebark pine habitat and a corresponding increased consumption of meat (IGBST 2013). However, short term changes to food resource availability did not increase animal matter consumption by grizzly bear in the GYA. Grizzly bear movements and home range size did not change with the change in diet, and recent analyses suggest that grizzly bear body condition and fecundity rates have not changed with the changing diet (IGBST 2013). It has been established that variation occurs annually in the number and location of conflicts. This variation may be influenced by natural food abundance, livestock use patterns, availability of unsecured anthropogenic foods, and an expanding population (both in distribution and numbers) of both grizzly bears and humans. No single factor can be attributed to low or high conflicts in a given year, and it is always the accumulation of multiple factors. Natural foods, climate conditions, bear numbers, previous bear removals, management efforts and public actions all factor into the annual variation in grizzly bear/human encounters (USFWS 2007b; Bjornlie et al. 2013a).

The Forest Service has decreased its authorization of livestock grazing in the GYA over the past two decades. Sheep grazing does occur on private lands in the RZ/PCA, and on public and private lands in the GYA, but outside of the RZ/PCA. Grizzly bear conflicts with livestock in the GYA continue to occur and can lead to management relocations or removals of grizzly bears.

Grizzly bear/livestock conflicts over the past 10 years have frequently occurred in Wyoming with few occurrences in Montana and Idaho (Aber 2015; Frey 2015; DeBolt et al. 2015).

IV. ENVIRONMENTAL BASELINE

The preamble to the implementing regulations for section 7 (USFWS 1986) contemplates that the evaluation of "the present environment in which the species or critical habitat exists, as well as the environment that will exist when the action is completed, in terms of the totality of factors affecting the species or critical habitat will serve as the baseline for determining the effects of the action on the species or critical habitat." The regulations at 50 CFR 402.02 define the environmental baseline to include "the past and present impacts of all Federal, State, or private actions and other human activities in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process."

The analysis presented in this section supplements the above *Status of the Species* section by focusing on the current condition of grizzly bears in the action area, the factors responsible for that condition, inclusive of the factors cited above in the regulatory definition of the environmental baseline, and the role the action area plays in the survival and recovery of the grizzly bear.

A. Current Condition of the Grizzly Bear in the Action Area

The action area, as described above, encompasses 122 grazing allotments and the 12 km (7.5 miles) adjacent to those allotment boundaries. A portion of this area is inhabited by the GYA population of grizzly bears. The Service delineated a GYA grizzly bear occupied area (Figure 3), which is where we determined grizzly bears are most likely to occur within the action area. However, delineation of a grizzly bear occupied area does not imply all lands within this area are definitively known to be occupied by grizzly bears, nor does it imply that no grizzly bear use occurs outside this area. Of the 1,208,665 acres within the 122 allotments, 490,627 acres are within the occupied area (63 allotments), with 105,090 of those acres falling within the GYA RZ/PCA (10 allotments). There are 59 allotments which are not located within the RZ/PCA or grizzly bear occupied area.

1. Grizzly Bear Presence and Estimated Population

The population size and rate of growth at the small geographic scale of the action area are unknown, so we extrapolate from data covering the entire GYA and the limited data available from within and immediately adjacent to the 122 allotments. The GYA rate of population growth slowed during the last several years to approximately 0 to 2 percent (IGBST 2013). We recognize that the rate of population growth of grizzly bears in the action area may not be represented by the population growth in the GYA as a whole. There is a potential for a greater increase in both individuals through reproduction and their survival in the area, as well as through immigration into the action area, because it is on the western edge and periphery of the GYA and grizzly bear occupied area. However, lacking more site specific data, we assume the overall GYA rate of increase also applies to the action area.

Grizzly bear distribution continues to expand in the GYA, including into the action area. Grizzly bear distribution in the GYA increased 38.3 percent from 2004 to 2010, with the greatest expansion occurring in the northern and southern regions of the range (the latter includes parts of the action area). The increase in both population and range has been concurrent with livestock grazing in the action area similar to that of the proposed action. The increase in distribution likely reflects that grizzly bear are continuing to expand into ecologically suitable but unoccupied habitats on the edge of their current distribution. Within the last 10 years, grizzly bears have been documented in allotments in the western and southern portions of the action area. Some of these occurrences of grizzly bear were located outside of the GYA RZ/PCA.

Figure 8 shows the locations of GPS-collared grizzly bears in the western portion of the GYA (includes the action area) from 2005 to 2012. Not all grizzly bears are collared; therefore, the following accounts of GPS and telemetry data for grizzly bear locations does not identify all grizzly bear use of the area. While there has been some expansion to the south and west, Figure 8 shows the limited occurrences of grizzly bears in the portions of the allotments outside the area of the existing Order to the south (Figure 2).

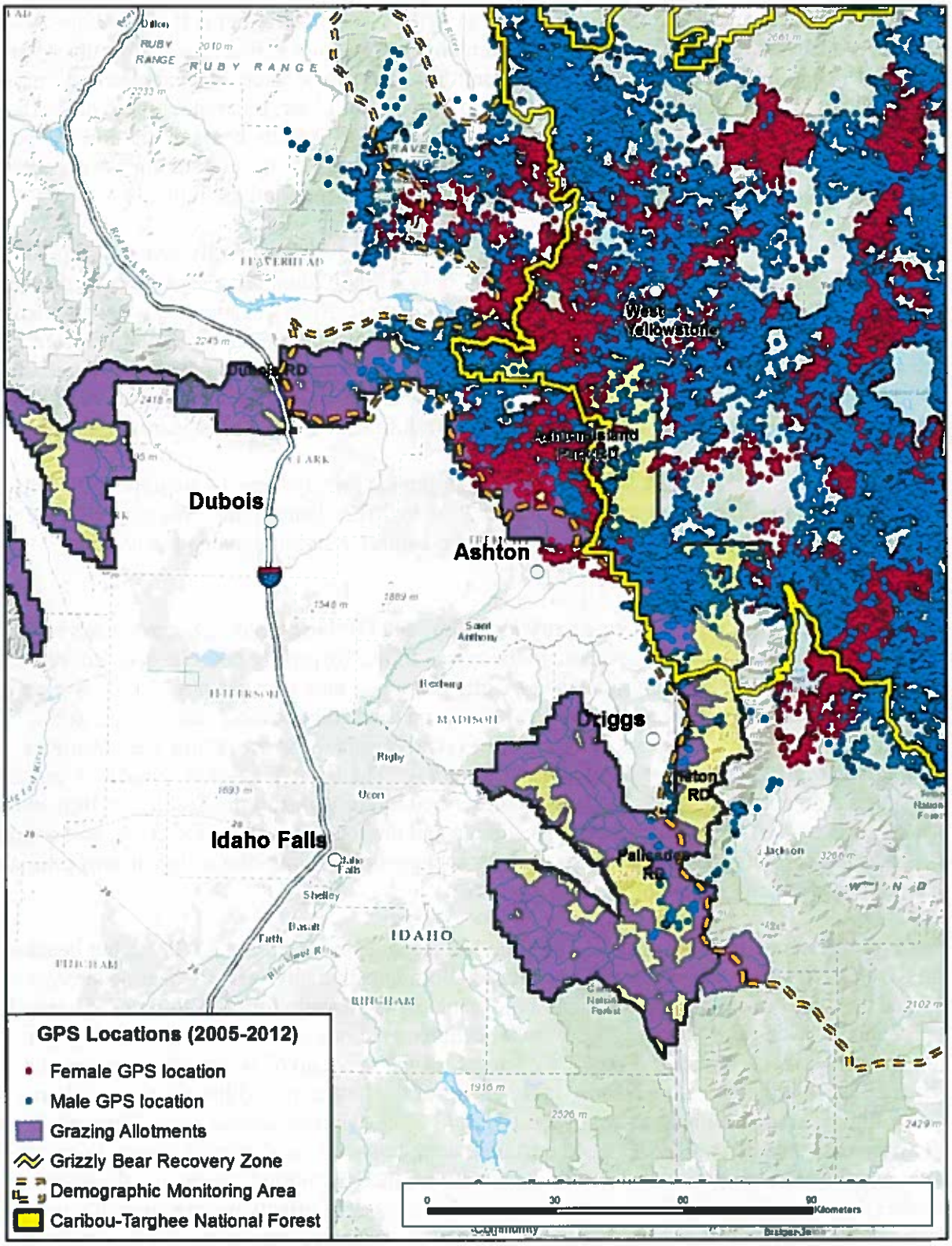

Figure 8. Locations of GPS-collared grizzly bears within grazing allotments on the northern portion of the Caribou-Targhee National Forest, 2005 to 2012.

The following accounts of grizzly bears occurred in the Forest's allotments from 2005 to 2014. There were 14 verified observations of adult female grizzly bears with a total of 27 cubs of the year (COY; Landenburger et al. 2015, pers. comm.). There were three verified observations of adult females with a total of seven older young (two years or older; Landenburger et al. 2015, pers. comm.). There were 19 verified observations of solitary grizzly bears of unknown gender (Landenburger et al. 2015, pers. comm.). The observations for all age classes are not necessarily unique individuals, but may include multiple observations of the same individuals.

There were 139 aerial telemetry locations from 13 individual female grizzly bears during 2005 to 2013 (Landenburger et al. 2015, pers. comm.). These 13 individual females were comprised of 7 subadults, 1 lone adult, and 5 adults with young. No female grizzly bears were known to den within allotments during this period. During the same period, 264 telemetry locations from 35 individual male grizzly bears (14 subadults, 21 adults) were observed (Landenburger et al. 2015, pers. comm.). One adult male had a winter den on the Davis Lake allotment during 2013. No other male grizzly bears were known to den within allotments on the Forest during this period.

There were 3,028 GPS locations from 5 individual female grizzly bears (3 subadults, 2 adults with young) in allotments on the Forest during 2005 to 2012. During the same period, there were 9,984 GPS locations from 21 (5 subadults, 16 adults) individual male grizzly bears (Landenburger et al. 2015, pers. comm.).

While the verified observations, telemetry locations, and GPS locations of grizzly bears in the Forest's allotments helps us to understand the extent of use by grizzly bears, it does not represent the total number of individual grizzly bears using the action area because not all grizzly bear use will be observed, and not all grizzly bears are collared to enable location information to be collected. Therefore, we address the number of grizzly bears using the action area through a comparison of the grizzly bear population in the GYA. The IGBST estimates the GYA grizzly bear population using the Chao2 technique (described in the *Status of the Species* section above). We create a ratio of the GYA population estimate and the total acreage of the GYA, and compare that ratio to the total acreage of the grizzly bear occupied area within the action area to estimate the number of grizzly bears within the action area.

The action area has 105,090 acres in 10 of the 122 allotments within the RZ/PCA, but because the RZ/PCA does not capture all of the Forest's allotments that have grizzly bear occurrences, we use the grizzly bear occupied area as a more inclusive measure for our estimate. As stated above, the Service finds that the grizzly bear occupied area represents the area most likely to have grizzly bear occurrence. The 490,627 acres, which make up 63 of the allotments in the grizzly bear occupied area, represents 3.94 percent of the total acres within the occupied area. These figures are not representative of the 12 km (7.5 mile) buffer around each allotment, or the 59 allotments outside the RZ/PCA and occupied area; however, as shown in Figure 3 (occupied area) and Figure 8 (grizzly bear location information), there is limited use by grizzly bears outside the occupied area. We can approximate the number of grizzly bears potentially using the action area by applying the 3.94 percent estimate of the occupied area to the GYA population estimates.

Population estimates for grizzly bears in the GYA range from 655 to 757. As stated above and shown in Figure 8, grizzly bear use of the action area and the adjacent GYA is not uniform. However, given the complexity of estimating the grizzly bear population within the action area, we assume (for this estimate only) that grizzly bear density is uniform both in the GYA and the allotments within the grizzly bear occupied area.

Applying the two estimates of grizzly bear population in the GYA and assuming a uniform distribution of grizzly bears throughout the GYA, we calculate approximately 26 to 30 grizzly bears are using 63 (10 in the RZ/PCA, 53 outside the RZ/PCA) of the allotments which fall within the grizzly bear occupied area. Because the remaining 59 allotments are currently outside of the grizzly bear occupied area, we do not anticipate grizzly bear use during the 10-year term of the action, and therefore we are not estimating grizzly bear use within those allotments. The estimate for grizzly bear numbers only indicates the use within the 63 allotments and does not include the 12 km (7.5 miles) buffer adjacent to the allotments, and therefore may underestimate the amount of use for the entire action area. Figure 8 shows GPS and VHF records of grizzly bear movement, and there is a rough demarcation at the western boundary for grizzly bear use. The portion of the action area on the western boundary that falls within the 12 km (7.5 miles) buffer, but not within the Forest, is not included in the estimate of grizzly bear use; however, as the GPS data in Figure 8 shows, limited use of the area by grizzly bears has occurred. As such, we find this calculation of grizzly bear use to be appropriate for the analysis of the action area.

In order to estimate the number of grizzly bears in the action area, we assume there is a uniform density of grizzly bears in the Forest's allotments within the grizzly bear occupied area. However, we understand that the density of grizzly bears is not uniform throughout the action area. Therefore, to better analyze grizzly bear presence and distribution in the action area it is accepted that grizzly bear occurrence is variable in the action area.

Sightings and radio locations of grizzly bears have increased outside the RZ/PCA, and numbers of grizzly bears have been increasing. Documented use has occurred in many areas west and south of the RZ/PCA both on and off the Forest (Figure 8). Within the action area, the most extensive use by grizzly bears outside the RZ/PCA occurs in habitats west of the RZ/PCA, in the Ashton/Island Park Ranger District. Grizzly bear densities are generally high in the area from the Montana border to areas north of Ashton. Grizzly bears have also increased in the northern areas of the Forest over the past two decades.

Grizzly bear mortalities and multiple conflicts have occurred both on and off the Forest. Grizzly bears are known to occur on all four ranger districts of the Targhee portion of the Forest, particularly the Ashton/Island Park and Teton Basin Ranger Districts. Sightings have also increased on the Palisades and Dubois Ranger Districts. Grizzly bears have been documented south of Teton Pass on the Forest's boundary. There have also been documented sightings in the Bighole Range above Kelly Canyon. Grizzly bear use is also expanding immediately south of Driggs. No bears have been documented west of I-15 on the Dubois Ranger District.

Grizzly bears of both sexes and all age classes were located or observed within some of the 122 allotments during 2005 to 2014. Grizzly bear locational data indicate that some of the allotments on the Forest overlap with the home range of a substantial number of individual male and female

grizzly bears. Most of the known grizzly bear activity is focused in grazing allotments within the Ashton/Island Park Ranger District that are inside or immediately adjacent to the RZ/PCA. GPS and VHF records show limited grizzly bear movement in the Palisades and Teton Basin Ranger Districts; however, when combined with verified observations, captures, and mortalities the total accounts of grizzly bear indicate a consistent and significant presence of grizzly bears on grazing allotments within those districts (Landenburger et al. 2015, pers. comm.). Viewed collectively, the combined locational data pertaining to grizzly bear occurrence inside the allotments on the Forest (with the exception of the allotments west of I-15 and southwest of the South Fork of the Snake River) indicate frequent, consistent, and long-term use by all cohorts of grizzly bears (Landenburger et al. 2015, pers. comm.).

2. Grizzly Bear Habitat and Management in the Action Area

The Targhee National Forest was established in 1908. Livestock grazing has taken place on the areas that are now the Palisades, Ashton/Island Park, Dubois, and the Teton Basin Ranger Districts since the late 1800s, with trailing likely as early as the 1840s. Both cattle and sheep grazed on public and private land. Overgrazing was noticeable on the Forest since its establishment, and was attributed to the numbers of transient sheep (Assessment, p. 45).

Since 1997, the Forest has closed over 575,000 acres to grazing to reduce grizzly bear conflicts with sheep (Assessment, p. 46). The Forest's monitoring and evaluating reports (1997 to 2004) document 16 allotments that have been closed to sheep grazing (Assessment, p. 46). The Forest has closed all but one domestic sheep allotment within the RZ/PCA. The Forest established food storage regulations, provided bear resistant containers for garbage and food storage, provided information and education materials and programs, established special grizzly bear requirements in contracts and permits, and issued access restrictions and regulations, to benefit the grizzly bear population. Further, the Forest has specific habitat standards and monitoring focus areas which are described in the 2007 Conservation Strategy (USFWS 2007b), the document developed to guide management and monitoring of the Yellowstone grizzly bear population and its habitat upon recovery and delisting.

Of the 122 allotments in the action area, 45 are sheep and goat allotments, 76 are cattle and horse allotments, and 1 is vacant. The allotments are located in sagebrush-grasslands, aspen-limber pine fringes, subalpine montane meadow types, with some areas including alpine grasslands. Natural barriers in combination with drift fences and pasture fences generally define the allotment boundaries.

Some of the Forest's allotments are located within the GYA, while others are on the periphery. Some, but not all, of the Forest's 122 allotments fall within three BMUs: Henry's Lake, Plateau, and Bechler-Teton (USFWS 2007b). As discussed in the *Status of the Species,* BMUs are designed for the purpose of habitat evaluation and monitoring. GYA BMUs have an established target of at least 16 BMUs within the RZ/PCA occupied at least 1 year in every 6, with no two adjacent BMUs unoccupied over any 6 year period. In 2014, all BMUs had verified observations of female grizzly bears with young and all contained observations of females with young in at least 4 years of the 6 year period (2009 to 2014).

As stated above, there are 105,090 acres in ten allotments within the RZ/PCA (Figure 9). As described in the *Status of the Species* section above, the RZ/PCA is the area considered in the 2007 Conservation Strategy to be adequate seasonal habitat needed to support the recovered Yellowstone grizzly bear population for the foreseeable future. There are approximately 490,627 acres of 53 allotments which are within the 2010 grizzly bear occupied area (this area is inclusive of the 105,090 acres within the RZ/PCA; Figure 10). Therefore, there are approximately 385,537 acres of 43 allotments which are outside of the RZ/PCA and inside of the occupied area.

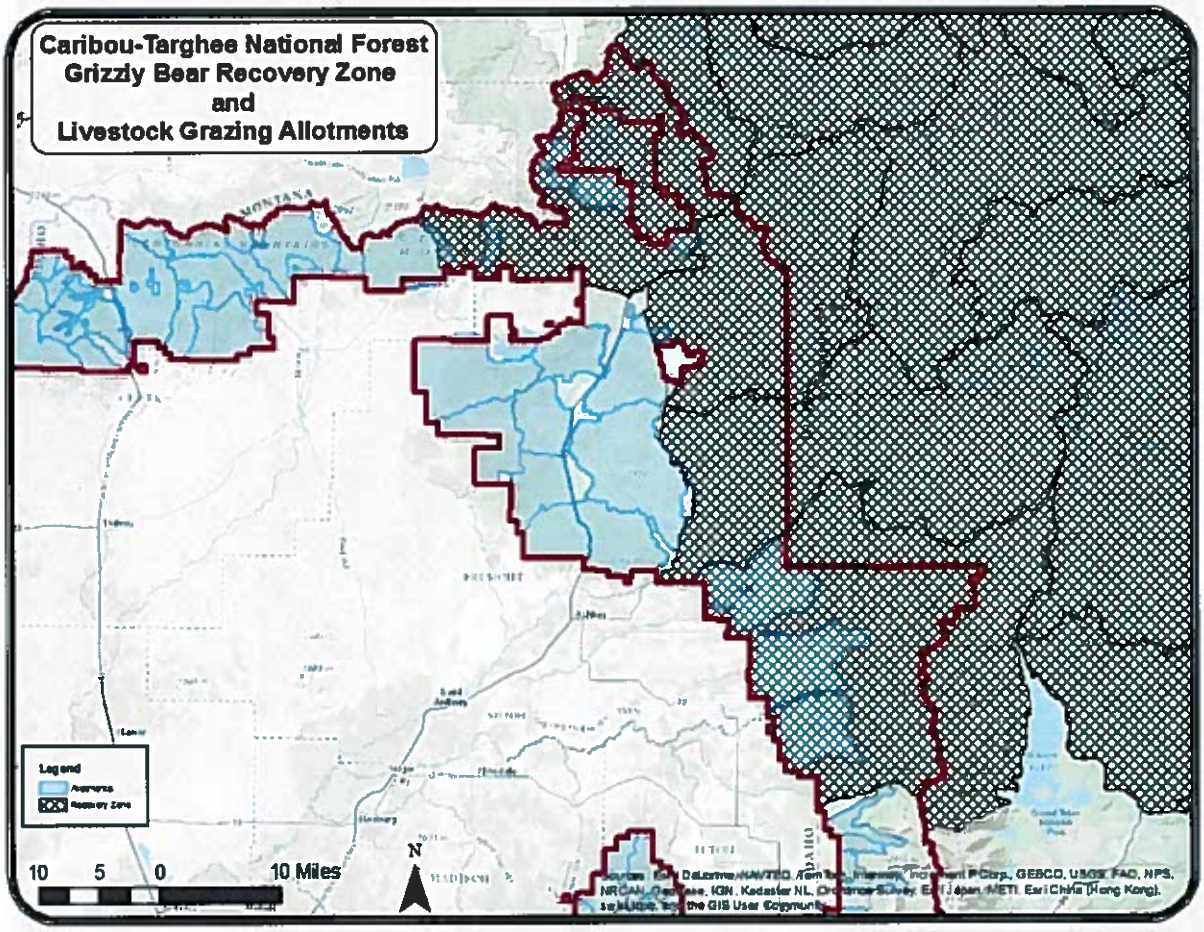

Figure 9. Map of the Forest's Allotments as they relate to the Grizzly Bear Recovery Zone (RZ/PCA)

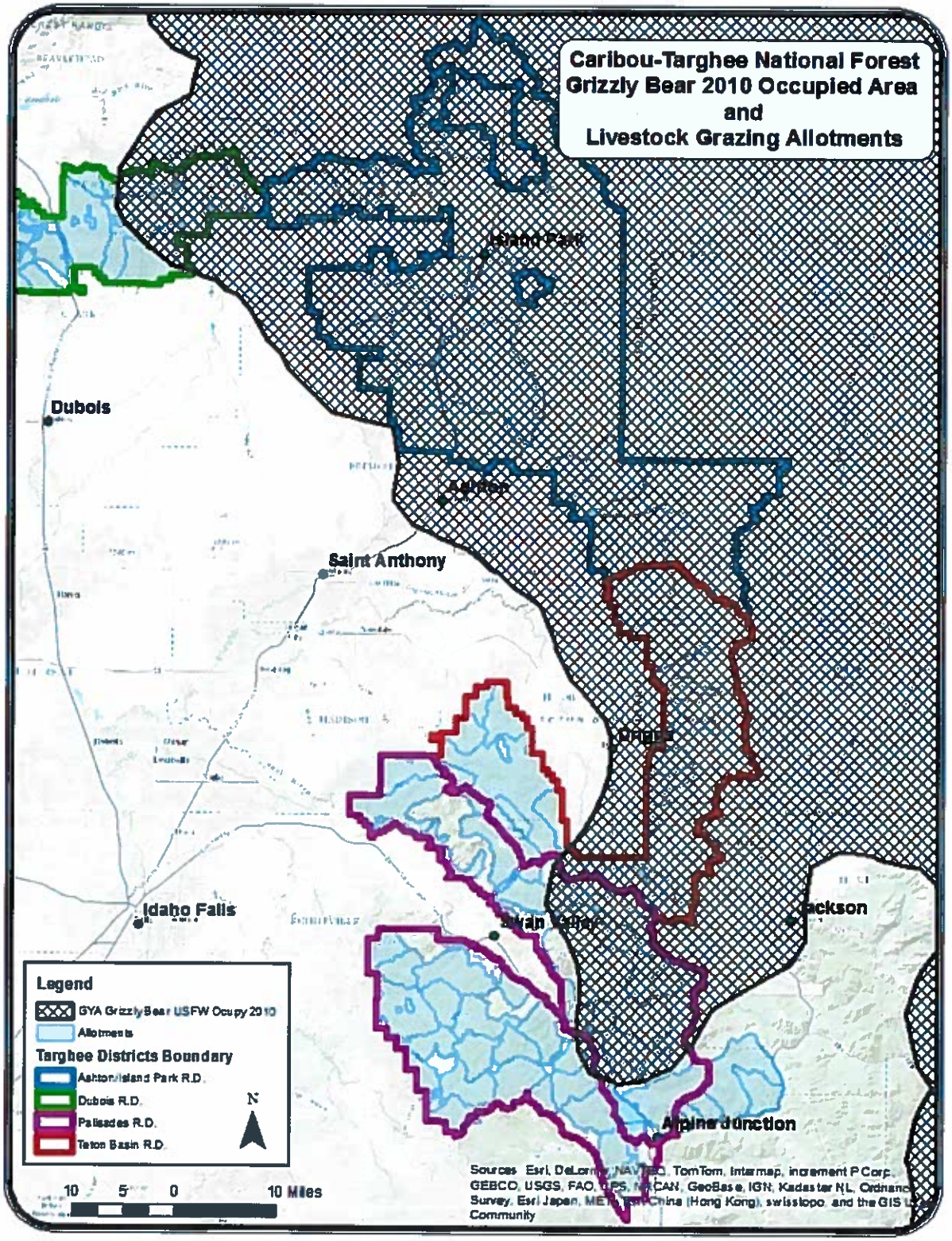

Figure 10. Ranger Districts on the Forest as they relate to the Service's 2010 grizzly gear occupied area

Grizzly bear occurrence and use are common in and adjacent to the 10 allotments (1 is vacant) wholly or partially within the RZ/PCA, as well as the grizzly bear occupied area as shown in Figure 9 and Figure 10 (Assessment, pp. 5-15). Livestock depredation, other conflicts, and control actions have occurred in these areas. These allotments have the highest potential for grizzly bear/livestock conflicts. From 2007 to 2016, there were two allotments (Bootjack and Squirrel Meadows) within the RZ/PCA where grizzly bear/livestock conflicts occurred. The Squirrel Meadow Allotment has the majority of grizzly bear/livestock conflicts (22) throughout the action area.

Fifty-three allotments are outside of the RZ/PCA, but within the grizzly bear occupied area (Figure 10, Table 3). Habitat outside the RZ/PCA, but within the occupied area, has Forest management direction intended to consider and protect grizzly bear and its habitat whenever possible, recognizing that population and mortality data pertinent to recovery criteria are collected there (USFWS 1993). Grizzly bear use of these allotments is variable, but is anticipated to increase as most are in historical habitat. Depredation, other conflicts, and control actions have occurred in these areas. These allotments have a high to moderate potential for grizzly bear/livestock conflicts. Between 2007 and 2016, four of the allotments outside the RZ/PCA, but within the occupied area, had grizzly bear/livestock conflicts. On three of these allotments (Antelope Park, Davis Lake, and Palisades) the conflicts did not result in management actions. The capture and removal listed for Davis Lake Allotment in 2014 was on private lands not associated with the allotment, but was potentially related to a conflict which occurred the previous year on the allotment. For the purposes of this Opinion, we assume that the Davis Lake Allotment management action was the result of livestock grazing on the Forest. As the grizzly bear population expands, there may be more conflicts associated with allotments outside the RZ/PCA boundary, but within the grizzly bear occupied area. Livestock conflicts within these allotments have the greatest potential to result in management actions (e.g., relocations, removals).

There are 59 allotments outside of the RZ/PCA and outside the occupied area (Table 3). Grizzly bear occurrence on these 59 allotments on the Dubois, Teton Basin, and Palisades Ranger Districts has not been documented in recent times (Assessment, p. 50). Habitat which is suitable for grizzly bear is likely to exist throughout these allotments as evidenced by the common presence of black bears and historical records of grizzly bear occurrence. These areas are likely to be occupied by grizzly bears in the future due to natural expansion, resulting in a potential for future livestock conflicts. Though to date, there have been no grizzly bear/livestock conflicts on allotments outside the occupied area.

Table 3. Summary of Grizzly Bear Occurrence and Bear/Livestock Conflicts within Allotments on the CTNF (2007-2016)

	# of Allotments	# of Conflicts	Years conflicts Occurred	Type of Conflict	Management Action
Grazing Allotments within or partially within the RZ/PCA (Figure 9)	9 (1*)	23	2007, 2008, 2009, 2010, 2012, 2016	Cattle Depredation	No removals, 1 relocation
Grazing Allotments outside the RZ/PCA, but within grizzly bear occupied area (Figure 10)	53	7	2009, 2010, 2014, 2016	4 Sheep Depredation, 3 Cattle Depredation	2 removals (private land near Davis Lake Allotment 2014, Ching Creek Allotment 2016), No relocations
Grazing Allotments outside of the RZ/PCA and grizzly bear occupied area	59	0		No reported conflicts	No management actions

* One vacant allotment occurs within the RZ/PCA

As stated in the *Status of the Species* section, grizzly bear conservation depends upon the successful management of grizzly bear/human interactions, as most grizzly bear deaths are attributable to grizzly bear/human conflicts. The amount of secure habitat and density of roads have the greatest effect on grizzly bear survival (Schwartz et al. 2010).

Secure habitat as defined in the 2007 Conservation Strategy is any contiguous area greater than 10 acres in size occurring more than 500 meters away from an open or gated motorized access route or recurring helicopter flight line. Maintaining or improving secure habitat at or above the 1998 levels in each bear management subunit inside the RZ/PCA was required as a 2007 Conservation Strategy objective. No motorized access objectives are identified for areas outside the RZ/PCA in the 2007 Conservation Strategy. Reporting changes in secure habitat is required annually for areas inside the RZ/PCA and in alternating years for areas outside the RZ/PCA. On the Forest, changes in secure habitat were last reported for areas both inside and outside the RZ/PCA in 2012 and 2014. The 2013 monitoring report indicated there had been no decline in secure habitat in any of the bear management subunits in the RZ/PCA, including the Forest's

(Assessment, p. 58). The amount of secure habitat, in any of the bear analysis units outside of the RZ/PCA and on the Forest, increased by 0.1 percent between 2008 and 2012 (Assessment, p. 58). The Forest is in compliance with the 2007 Conservation Strategy's secure habitat objective.

The Forest also instituted a Food Storage Order (04-15-117) on the northern sections of the Targhee portion of the Forest, except Forest land west of I-15 and South of Teton Canyon. The guidelines in the Order are detailed in the Assessment (Appendix B) and the boundaries are shown in Figure 2. This Order was implemented to reduce grizzly bear/human conflicts associated with developed sites, as well as dispersed sites.

Mattson and Knight (1991) analyzed grizzly bear mortality data by three eight-year periods (1962 to 1969, 1975 to 1982, and 1983 to 1990) and by association with different levels of human access, including major developments, primary roads, secondary roads, and backcountry areas. They reported that unit area mortality rates associated with all levels of access decreased over the three time periods. Renkin and Gunther (1996) evaluated bear mortalities in relation to developed sites over a 10 year period (1987 to 1996) and found that bear mortalities in relation to developed areas declined during that period. Even though grizzly bear/human conflicts still occur throughout the GYA (and the action area), these studies show that efforts to reduce those conflicts have been successful. The following section discusses the threats to grizzly bears and the risks of mortality in the action area.

B. Factors Affecting the Condition of the Grizzly Bear in the Action Area

As previously discussed, the primary threat to grizzly bear is human conflict which results in grizzly bear mortality. Grizzly bear/human conflicts as described in the *Status of the Species* section can be many different interactions between humans and grizzly bears. Within the action area, livestock conflicts are the primary concern, but other grizzly bear/human conflicts can lead to habituation and result in grizzly bear mortality. Mortality thresholds have been identified based on the level of grizzly bear mortality which occurred while the GYA grizzly bear population continued to increase. Those mortality thresholds are one of the standards which are used to ensure the recovery and persistence of the species. Thus, it is important to identify where threats of grizzly bear mortality exist within the action area.

1. Mortality

Although the Service is aware of a mortality of an adult male grizzly bear caused by a management removal within the action area in 2016, lacking more recent complete information, we rely on historical mortality data from 2005 to 2014 in order to understand the rate of mortality within the action area. There were no female mortalities on the 122 allotments from 2005 to 2014, but there were seven male grizzly bear mortalities on the allotments. Of those mortalities, one was of natural cause and six were human-caused. Of the six human-caused mortalities, two subadults died of capture-related infection, one adult was a management removal for livestock conflict (Davis Lake Allotment), and three adult mortalities occurred in hunting-related incidents (Landenburger et al. 2015, pers. comm.).

From 2005 to 2014, there were 13 grizzly bear mortalities on the Forest (which includes the seven mortalities on the allotments). This accounts for 0.04 percent of all grizzly bear mortalities in the GYA (341). The majority of the mortalities on the Forest occurred from human causes (92 percent), and 1 (8 percent) was natural-caused (Table 4). The human-caused mortalities include one livestock-related management removal (Davis Lake) and one mortality as a result of defense of life (non-agency action; Table 4). There were six agency actions that resulted in accidental mortality or management-related mortality associated with grizzly bear conflicts not associated with livestock (e.g., unnatural food source, garbage conflict).

Table 4. Numbers of documented known and probable grizzly bear mortalities in the GYA and the Forest during 2005 to 2014. GYA-wide numbers are inclusive of the Forest numbers. (Assessment, p. 35).

Mortality Source		GYA-wide	Forest	Forest Buffer*
Agency actions (management or research)	Accidental	9	3	3
	Livestock-related removal	41	1	1
	Other Management removals	66	3	7
	Sub-Total	**116**	**7**	**11**
Non-Agency actions	Natural	56	1	3
	Accidental	20	0	2
	Defense of Life or Property	92	1	2
	Livestock	1	0	0
	Mistaken ID	17	1	1
	Vandal Killing	17	3	4
	Undetermined	22	0	2
	Sub-Total	**225**	**6**	**14**
Total Mortalities		**341**	**13**	**25**

* The Forest Buffer is the area of the TNF buffered by a distance of 13 km. The 13 km buffer distance is based on the average lifetime activity radius of a male grizzly bear in the (GYA). The Service applies this data to the action area.

As described above, the action area includes the 122 allotments and an area of 12 km (7.5 miles) around those allotments. The Assessment reported the number of management removals within a 13 km buffer area from the boundary of the Targhee portion of the Forest (Figure 3). The Forest's 13 km buffer is 1 km (approximately 0.5 mile) larger than the Service's buffered area and is measured from the Forest boundary rather than the allotment boundaries. With the provided data we can identify the number of grizzly bear mortalities within the Forest's buffer area, but not specifically within the action area. The action area falls entirely within the Forest's buffer, and because we lack specific data for the action area, we assume that the mortalities which occurred within the Forest's 13 km buffer also occurred within the action area. Those grizzly bear mortalities are discussed below.

There were seven management removals not associated with livestock conflicts that occurred within the action area. There were two grizzly bear mortalities related to a defense of life conflict in the action area. The one livestock-related management removal (Davis Lake Allotment) in the action area equals 4 percent of the total mortalities. This grizzly bear mortality associated with a livestock conflict in the action area equaled 0.15 percent of the lowest estimate for the current GYA grizzly bear population (655). This management removal (Davis Lake Allotment) occurred on the periphery of the RZ/PCA, and it is unclear if it counted toward the IGBST's calculation of the mortality threshold identified in USFWS 2013. Using a conservative approach, we assume that the management removal was within the RZ/PCA and counts toward the mortality threshold.

In general, management removals occur as a result of grizzly bear habituation, as well as when there is an increased risk to human life or property. Management removals are not necessarily the result of individual conflicts. In general, conflicts that occur on the Forest, Yellowstone National Park, and Bridger-Teton National Forest are less likely to result in management removals, if the grizzly bear does not demonstrate habituation. The likelihood is also reduced when there are lower human population densities, conservation measures in place by land management agencies, and a smaller area of urban interface, as is the case on the eastern boundary of the action area. Lands which contain an increased density of urban development, private lands without federal conservation measures in place, and greater areas of urban interface are expected to have higher occurrences of management actions as a result of grizzly bear/human conflicts. This is the case in the Ashton/Island Park Ranger District and presents a greater potential for human/grizzly bear conflicts, as well as habituation.

Defense of life mortalities can occur anywhere that there are humans and grizzly bears. A defense of life mortality could occur as the result of a hunter or recreationist startling a grizzly bear (more so during hyperphagia). As noted in Table 4 above, the largest portion (27.0 percent) of mortalities in the GYA occurred as a result of defense of life or property. In contrast, the action area had two mortalities (8 percent of the total mortalities) that were the result of defense of life or property. Therefore, it is assumed that there is a greater potential for a defense of life mortality to occur throughout the GYA, and a lower probability for it to occur within the action area, but outside of the GYA. It should be noted that this represents the number of mortalities within the entire action area, not just within the Forest's allotments.

2. Conflicts

During a 10 year span (2007 to 2016) there was a total of 38 conflicts which occurred within the Forest's 122 allotments (Table 5). Of those, 30 were related to livestock. The number of livestock conflicts is 78.9 percent of the total conflicts on the allotments. The number of food attractant-related conflicts makes up 2.6 percent of the total conflicts on the allotments. The number of non-hunting related human injuries on the allotments makes up 5.3 percent of the total conflicts. While it can be assumed that livestock conflicts which occur on the allotments are likely related to the historical grazing of those allotments, the same cannot necessarily be said of other conflict types. Hunting conflicts are not assumed to be associated with grazing activities on the allotments. Food attractant conflicts may be the result of improper food storage associated with grazing activities; however, food attractant conflicts include a broad range of

incident parameters. Further, there is a Food Storage Order in place for a majority of the allotments associated with the action area. The food attractant conflict identified in Table 5 occurred in an allotment required to comply with the Order. There have been no food attractant conflicts outside of the area of the Order and within the grizzly bear occupied area from 2007 to 2016. There have been no permittee rider conflicts on the 122 allotments.

Table 5. Grizzly bear/human conflicts per grazing allotment on the north portion of the CTNF during 2007 to 2016. (Landenburger et al. 2015, pers. comm.; Yorgason 2016, *in litt.*)

Allotment Name	Total Num. Conflicts	Livestock	Non Hunting Human Injury	Hunting	Food Attractants
Antelope Park C&H	2	2	0	0	0
Bootjack C&H	1	1	0	0	0
Ching Creek S&G	3	3	0	0	0
Davis Lake C&H	2	1	1	0	0
Fall River Ridge C&H	1	0	0	1	0
Fogg Butte C&H	1	0	1	0	0
High Five C&H	1	0	0	1*	0
Highpoint S&G	1	0	0	1*	0
Mill Creek-Teton C&H	1	0	0	0	1
Palisades S&G	1	1	0	0	0
Ripley Butte C&H	2	0	0	1 (1*)	0
Squirrel Meadows C&H	22	22	0	0	0
Total	38	30	2	5*	1

* Three of the five hunting related conflicts resulted in human injury

As discussed above, there have been 30 livestock-related grizzly bear conflicts on the 122 allotments from 2007 to 2016 (Table 5). Of the 30 grizzly bear/livestock conflicts, 26 involved cattle grazing allotments (Squirrel Meadows, Antelope Park, Bootjack, and Davis Lake) and 4 involved sheep allotments (Palisades and Ching Creek). The six allotments in which livestock conflicts occurred are dispersed throughout the action area, but most are located within the Ashton/Island Park Ranger District.

When and where a grizzly bear conflict will occur is difficult to predict. As shown in Figure 11 and Table 5, some allotments have a multitude of conflicts, while others have few or none. Grizzly bear livestock conflicts have been associated with a reduction in available food resources; however, data collected from 2005 to 2014 indicate there is very little correlation between food resource availability and livestock conflicts within the action area (Assessment, pp. 39-40).

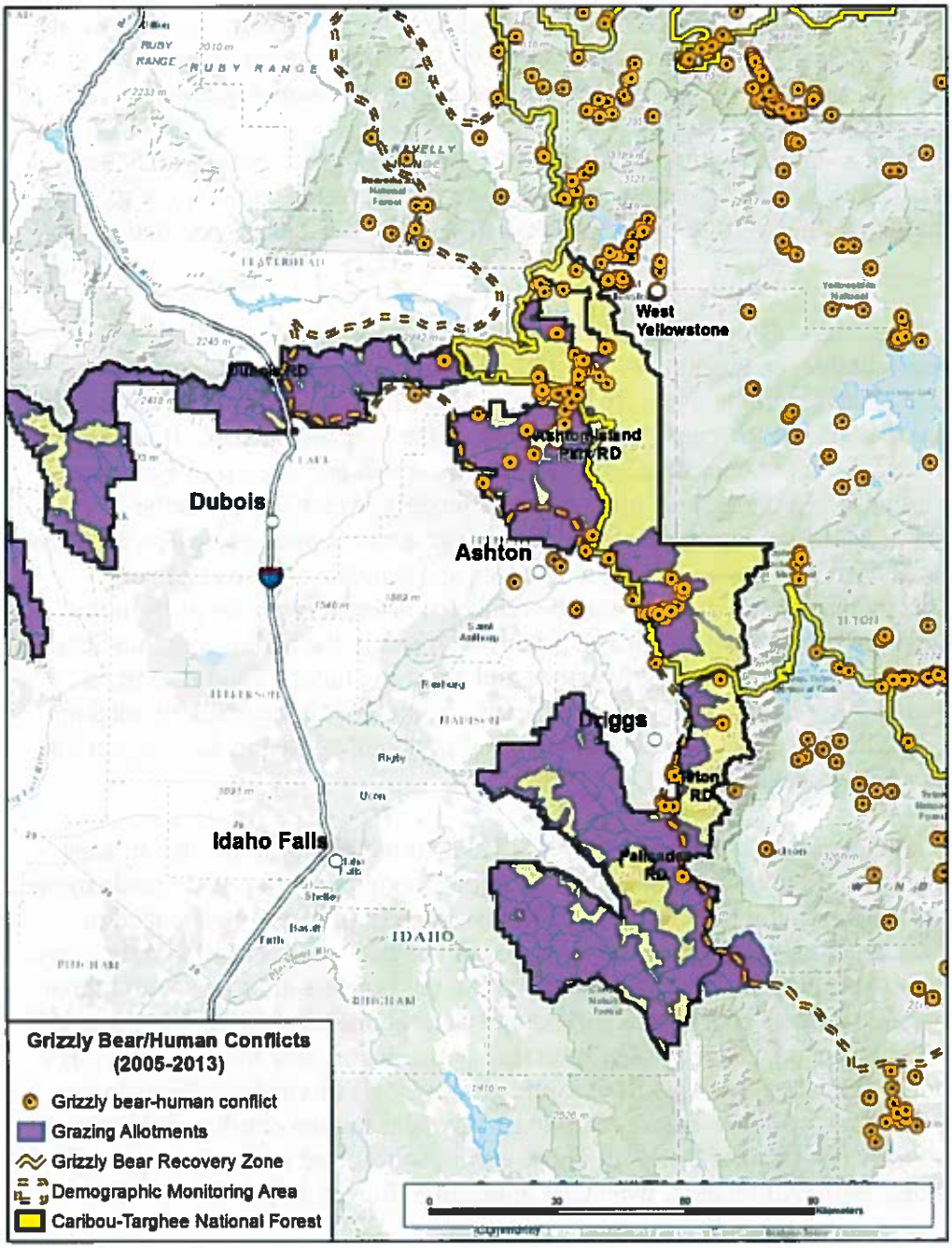

Figure 11. Reported grizzly bear/human conflicts within grazing allotments on the northern portion of the CTNF, 2005 to 2013

A conflict could result in many different management actions, including a bear being removed (lethal action), trapped and relocated, or aversive-conditioned. Between 2007 and 2016, there were two management removals (Davis Lake and Ching Creek), one relocation (Squirrel Meadows), and three non-target captures of adult male grizzly bears associated with livestock conflicts on the 122 allotments. There was one non-target capture of a female grizzly bear associated with livestock conflicts. Based on this information, 3.3 percent of the grizzly bears involved in livestock conflicts are relocated. This does not allow for multiple conflicts to have been the result of the same grizzly bear; as such, it is an overestimation of the percentage of

grizzly bears which may be relocated as a result of livestock conflicts. Further, the number of management removals equals 6.7 percent of the total grizzly bears involved in livestock conflicts. Once again, this assumes that every conflict was the act of a separate grizzly bear.

In total, there were four non-target captures related to livestock conflicts. These grizzly bears were released on site. Three of the non-target captures were related to the capture of a grizzly bear involved in a single conflict. Of the 30 livestock conflicts, 6.7 percent (2) resulted in non-target captures.

The portion of the action area outside of the 122 allotments has a variety of secure, unsecure, occupied, unoccupied, suitable, and unsuitable habitats. The action area may also contain private grazing, as well as urban development. Grizzly bear/human conflicts have occurred within this area and are expected to continue to occur during the term of the proposed action. It is likely that some of grizzly bears learn depredatory behaviors outside the action area then move into the action area and repeat those behaviors, becoming repeat offenders, which increases the likelihood of habituation and a management action. The reverse can happen as well, with grizzly bears learning depredatory behaviors within the allotments and repeating those behaviors elsewhere. Those grizzly bears subsequently may be relocated or lethally removed from the population. While there is limited information on grizzly bear use in the action area, the Service assumes that some bears are not depredating livestock and are using natural food resources, including wildlife and wildlife carcasses, on the landscape. Some grizzly bears likely feed on livestock carcasses provided by other depredation actions, but do not subsequently prey on the livestock themselves (Anderson et al. 2002).

In addition to ongoing livestock grazing, some recreational activities occur in the action area, such as camping, fishing, and hunting. Recreational activities on public and private lands in the parts of the action area surrounding the Forest, in particular hunting in densely vegetated or riparian areas, have the potential to result in self-defense actions that injure or kill grizzly bears. There were five hunting-related grizzly bear conflicts within the Forest's allotments with three human injuries. Big game hunters may mistakenly identify grizzly bears as black bears and kill or injure them. There was one mistaken identity mortality in the action area from 2005 to 2014. Additionally, individuals may maliciously kill or injure grizzly bears (4 vandal killings in the action area from 2005 to 2014). There have been two grizzly bear/human conflicts related to non-hunting human injury (Assessment, p. 44). Those conflicts occurred in the same year (2013) in Davis Lake and Fogg Butte Allotments, which are adjacent to human population centers.

There are many factors which influence grizzly bear behavior; therefore, grizzly bear conflicts are difficult to predict. Further, management actions which reduce the number of conflicts and the number of management removals are difficult to identify. Conservation measures implemented by the Forest in the action area may have reduced the number of grizzly bear/human conflicts and management actions while the grizzly bear population increased in range and size.

The grizzly bear population is continuing to expand into the action area with a potential for increases in grizzly bear densities. As stated above, the action area is directly adjacent to multiple high-density human populations. If the grizzly bear population continues to expand into

highly populated areas, increases in conflicts are expected. The greatest threat to grizzly bears within the action area is mortality as a result of grizzly bear/human conflicts. The ability of humans in populated areas to tolerate grizzly bear presence is one of the largest factors which will determine the number of conflicts and the resulting number of grizzly bear mortalities.

Recent levels of mortality in the GYA have been sustainable, as discussed in the *Status of the Species* section. Data do not suggest the mortalities in the action area affected the survival of independent aged grizzly bears or grizzly bear population growth at the level of the GYA or rangewide (Haroldson et al. 2015).

C. Role of the Action Area in the Survival and Recovery of the Grizzly Bear

The action area, as described above, contains portions of three BMUs, portions of the RZ/PCA, occupied areas, and suitable habitat. These areas represent those portions of the landscape which provide connectivity, food resources, and habitat which is necessary for grizzly bear recovery and survival.

Grizzly bear use the action area seasonally from early May to mid-November. Grizzly bears that use the action area seasonally move north to Montana, east to Yellowstone National Park, and southeast to Bridger-Teton National Forest. There has been a single documented grizzly bear that denned in the action area. While there is limited grizzly bear use of the action area for denning, there is a possibility for additional occurrences over the term of the project.

The action area provides a mosaic of habitats which grizzly bear require for survival, and contains portions of three BMUs which are used to assess the status of grizzly bear. The presence of female grizzly bears with cubs of the year in BMUs is a demographic recovery criterion and when not met can trigger a demographic review. These BMUs provide a variety of habitats to address the unique habitat needs and grizzly bear activity use patterns, provide connectivity between complexes of habitat which meet year-long needs, and are used by the IGBST to assess the effects of existing and proposed activities on grizzly bear habitat.

The 1975 listing of grizzly bear in the conterminous U.S. identified genetic isolation of some populations of grizzly bear as a potential threat (40 FR 31734). Loss of genetic diversity is a potential concern for GYA grizzly bears because of the large distances between this and other U.S. populations (USFWS 2011). The 1993 Grizzly Bear Recovery Plan characterizes the Yellowstone population as isolated from other populations and suggested genetic management may become appropriate for this population (USFWS 1993). The Centennial Range, which contains portions of the action area, has potential to be a travel corridor for the GYA population of grizzly bear to connect with other recovery zones. This has not occurred to date, but because genetic exchange is important for the long-term recovery and survival of the grizzly bear, the Centennial Range corridor may provide an integral link between the GYA grizzly bears and other grizzly bear populations.

The action area overlaps with Yellowstone National Park, Gallatin National Forest, Beaverhead-Deerlodge National Forest, and Bridger-Teton National Forest, which have policies in place for the protection of grizzly bear. The greatest threat to grizzly bear mortality is human conflicts.

With multiple population centers within or directly adjacent to the action area, there is likely to be a continuation of the historical trend of grizzly bear/human conflicts. While the conservation measures addressed in the Assessment will become conditions of the grazing permits for the 122 allotments, and the Forest has policy and management direction for the conservation of grizzly bear, the area not within the Forest's boundaries are not subject to those same conservation measures, policy, or management direction. Therefore, secure habitat and suitable habitat may not be protected off the Forest. With the majority of the action area contained within the Forest, Yellowstone National Park, and Bridger-Teton National Forest, there is a greater area of habitat which falls under the policy and management directions which are protective of grizzly bear. As such, the action area provides habitat for grizzly bear, has policy to reduce grizzly bear/human conflicts, and has a potential travel corridor for grizzly bear to expand its range and increase its population numbers.

V. EFFECTS OF THE ACTION

A. Direct and Indirect Effects of the Proposed Action

The implementing regulations for section 7 define "effects of the action" as "...the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline..." (USFWS 1986, p. 19958). "Indirect effects" are defined in the regulations as "...those that are caused by the proposed action and are later in time, but still are reasonably certain to occur." (USFWS 1986, p. 19958).

Mistaken identity killings have occurred within the action area. Many factors contribute to a mistaken-identity grizzly bear mortality (e.g., hunter education, hunting technique, habitat). Considering the extensive use of the action area by grizzly bears and hunters alike, it is not possible to be reasonably certain that a mistaken-identity grizzly bear mortality would be an effect of the proposed action and is not addressed further.

Vandal killings of grizzly bear have also occurred within the action area. However, illegal activities are not subject to consultation under the Act and these will not be addressed further.

The potential effects to grizzly bear from the proposed action are: (1) change in the quality and quantity of grizzly bear habitat and the availability of food; (2) attraction to the 122 allotments because of livestock presence; (3) habituation or conditioning of grizzly bear to humans, livestock, or related food sources; (4) displacement of grizzly bear from habitat as a result of humans and other activities associated with livestock grazing; and (5) relocations or mortalities due to management actions, self-defense by herders, riders, permittees, or others associated with livestock grazing.

1. Change in the quality and quantity of grizzly bear habitat and the availability of food

As described in the *Status of the Species* section, grizzly bear are opportunistic omnivores that use a wide variety of food resources. Because grizzly bear across the GYA are able to find adequate food resources, and given the habitat conditions present on the 122 allotments, we

assume conditions within the suitable habitat of the action area also provide adequate natural food resources throughout grizzly bears active (non-hibernating) period. Natural foods can vary significantly within seasons and from year to year due to adverse or extreme weather conditions. For example, in drought years, some natural foods may be unavailable, such as berries; similarly, whitebark pine nuts may be unavailable during a non-masting year. However, grizzly bear consume a wide variety of vegetation, roots, tubers, and other foods not consumed by domestic ungulates, and exhibit plasticity in their ability to switch between food resources.

As livestock graze across the landscape, there is less forage available for grizzly bear and their ungulate prey. While livestock densities are variable (within the parameters of the proposed action) and livestock are not anticipated to be distributed evenly across an entire allotment, livestock could be widely scattered across an allotment as they forage areas for a discrete period of time. It is not anticipated that all available food resources would be consumed as livestock move through an area. While we lack data on exactly what foods grizzly bears and wild ungulate prey are using in the area, based on the characteristics and the abundant and widely distributed food and cover available within the action area, we assume that at least some of the area without livestock present will provide foraging opportunities for grizzly bear and their wild prey. Further, areas adjacent to livestock may offer food resources, thus providing grizzly bear the opportunity to utilize alternative food resources while livestock are present. Therefore, under the proposed action, we would expect competition for forage between livestock, grizzly bear, and wild ungulates, but the effects from depletion of that forage, would be immeasurable. The proposed action is similar to historical grazing in the area which was concurrent with the increasing trend of the GYA grizzly bear population, and the effects of the proposed action are anticipated to be similar to that of historical grazing. The impacts of historical grazing did not appreciably affect the increasing trend of the GYA population of grizzly bear. The Service expects the proposed action to result in minimal changes in the quality and quantity of grizzly bear habitat; therefore, impacts to grizzly bear via this effect are expected to be insignificant.

Changes to secure habitat (as described in the *Status of the Species* section) are not an anticipated effect of the proposed action because livestock grazing (reduction of herbaceous forage and presence of livestock) does not impact secure habitat standards. In addition, there is no increase in the number of livestock allotments from the 1998 baseline, nor is there any increase in road density from the proposed action. Therefore, there are no anticipated effects from the proposed action to secure habitat within the action area.

2. Attraction to the action area because of livestock presence

Grizzly bear are suspected to have a keen sense of smell (Craighead 1976), which likely attracts them to livestock and livestock carcasses associated with the proposed action. As mentioned in the *Action Area* section, grizzly bear movement towards the scent of carcasses is highly variable and depends on the individual bear, the prey item, weather and topographic conditions, and other factors.

Wherever carcasses of livestock are available within grizzly bear occupied habitat, grizzly bear may be drawn to the area, thus altering normal grizzly bear behavior patterns by attracting them away from their normal feeding and sheltering areas. This change in habitat use and behavior

has the potential to make affected grizzly bear more susceptible to conflicts. To address this issue, under the proposed action, carcasses will be removed or disposed of as soon as possible, depending on the location (Conservation Measures 11, 12, and 13). Livestock carcass availability also will be reduced by implementation of good animal husbandry and herding practices to minimize stray animals and sickness (Conservation Measure 11). In addition, the Forest will explore additional means of reducing grizzly bear/livestock conflicts (Conservation Measure 16). We recognize that complete livestock carcass removal from the allotments is not possible due to the large remote areas grazed by livestock on the 122 allotments and the difficulty in locating all carcasses over such vast areas in a timely manner, but the likelihood that grizzly bear would be attracted to carcasses associated with the proposed action will be minimized on the Forest's allotments by implementation of the conservation measures.

Normal behavior patterns of grizzly bears exposed to livestock may also be altered if a bear learns to associate livestock as easy prey. The attraction of grizzly bear to the presence of livestock or livestock carcasses, in itself, is not expected to have adverse effects. When grizzly bear are attracted to livestock to such an extent that there are resulting grizzly bear/livestock or grizzly bear/human conflicts, adverse effects are anticipated.

The data available for grizzly bear/livestock conflicts is not sufficient to determine a trend. With a flat to slightly increasing trend of GYA grizzly bear population growth, we assume that a similar number of conflicts will occur for the term of the proposed action as did for the data available during the period from 2007 to 2016 (Table 5). It is difficult to determine if conflicts other than grizzly bear/livestock conflicts can be attributed to the proposed action. Hunting-related grizzly bear conflicts likely occurred in areas not occupied by livestock and are likely due to factors unrelated to livestock presence. Therefore, hunting-related grizzly bear conflicts are not attributed to the proposed action. Human injury and food attractant conflicts, however, may have been the result of a grizzly bear which became habituated as a result of the proposed action. Lacking more specific information to inform the Service's analysis, we will attribute non-hunting human injury and food attractant conflicts to the proposed action. Using Table 5, we find 30 livestock-related conflicts, 1 food attractant conflict, and 2 non-hunting human injury conflicts. Therefore, we anticipate that for the term of the proposed action as a result of livestock presence 33 grizzly bears are likely to change behavioral patterns to such an extent that a grizzly bear/livestock or grizzly bear/human conflict will subsequently occur.

Vehicle collisions with livestock can occur any place where roads and allotments intersect. As addressed above, carcasses are a strong attractant to grizzly bear in the GYA. The potential for grizzly bear to be attracted to and feed on a vehicle-struck carcass exists. There were 20 vehicle collisions with grizzly bear within the GYA from 2005 to 2014. The circumstances of those collisions are not clear. The action area contains portions of the GYA; however, there have not been any vehicle/grizzly bear collisions in the Forest's allotments. Areas within 500 meters of a road are considered unsecure habitat and present additional risk for mortality of grizzly bear. The proposed action would not increase road densities, vehicular use, or decrease grizzly bear secure habitat, thus there is not expected to be an increase in the potential exposure or risk for vehicle/grizzly bear collisions. Further, the population of the grizzly bear in the GYA is flat to slightly increasing. Taking into account the historical number of vehicle/grizzly bear collision in the action area and considering the current grizzly bear population trend, the Service does not

find there to be a reasonable likelihood of a vehicle/grizzly bear collision occurring as a result of the proposed action. As such, the potential for a vehicle/grizzly bear collision resulting from the proposed action is discountable.

3. Habituation or conditioning of grizzly bears to humans, livestock, or related food sources

Grizzly bear habituation to humans and human activities can lead to grizzly bear/human conflicts, which may ultimately lead to grizzly bear relocation, harm, or mortality (McClellan 1989). Habituation is the loss of a grizzly bear's natural wariness of humans, resulting from continued exposure to human presence and activity. A grizzly bear can habituate or become conditioned to other bears, humans, or situations when interactions give the grizzly bear a return in resources, such as food, that outweighs the cost of the stress (McArthur Jope 1980). Habituated grizzly bears can lose fear of people and develop unsafe behaviors. Food-conditioned grizzly bears often end up obtaining human food or garbage and learn to associate human activity with food rewards. Habituated or food-conditioned grizzly bear are more vulnerable to mortality because of their tolerance to people, and can be subsequently relocated or removed from the population, or involved in a defense of life conflict as a result.

Generally, the frequency of grizzly bear/human conflicts is inversely related to the abundance of natural grizzly bear food resources (Assessment, p. 39). When natural bear foods are abundant, conflicts with property or anthropogenic foods tend to be infrequent. When natural grizzly bear food resources are scarce, the frequency of grizzly bears damaging property and obtaining anthropogenic foods tends to increase, especially in late summer and fall when grizzly bears are gaining weight prior to denning. However, livestock depredations tend to occur independently of the availability of natural bear foods (Gunther et al. 2004; Gunther et al. 2012). Because grizzly bears seem prone to preying on livestock independent of natural food availability, and because of grizzly bears' demonstrated ability to learn foraging behavior, we assume that once a grizzly bear has preyed on livestock, it likely becomes conditioned to feed on them. If humans are present when grizzly bear prey on livestock, it is assumed that they will likely become habituated to the situation (less wary of humans). Once a grizzly bear has become conditioned to preying on livestock, it is more likely that it will also become habituated and less wary of humans. While grizzly bear that prey on livestock are assumed to be conditioned, not all food conditioned grizzly bears are assumed to be habituated.

Grizzly bear depredation of domestic sheep and cattle is well documented. Most situations where grizzly bear are exposed to domestic sheep result in conflict or depredation, although some grizzly bear coexist with livestock and never prey on them (Assessment, p. 42). Grizzly bear predation on sheep and cattle likely will result in the affected bears seeking out domestic livestock to supplement natural foods. This in turn, will likely cause a disruption of natural grizzly bear movements and an increased potential for grizzly bear/human conflicts. Once a grizzly bear successfully obtains a food reward at a particular location, the site is usually periodically revisited (Stokes 1970; Meagher and Phillips 1983; Wilson et al. 2005).

Grizzly bear food conditioning and habituation results in a change in feeding behavior which does not, by itself, cause injury or mortality to the involved grizzly bear. However, a small percentage of grizzly bear that have depredated livestock are more likely to be the subject of

grizzly bear/livestock or grizzly bear/human conflicts in the future. As such, those grizzly bear conflicts may lead to an authorized relocation or removal (injury or mortality).

The risk of a grizzly bear/sheep conflict is minimized by the implementation of Conservation Measures 10, 11, and 17 described in the *Proposed Action* section. Grizzly bear may depredate sheep during the daylight hours; however, the continual presence of sheep herders and their dogs reduces this potential. At night, when grizzly bears are most likely to attack, sheep herders will be present to implement best management practices. The probability of grizzly bear/livestock encounters, conflicts, and subsequent conditioning is likely reduced in areas with the presence of riders; however, there will be large areas grazed without riders present, and we expect conditioning, particularly in cattle allotments, to continue.

Some grizzly bear can become food conditioned or habituated to human garbage or livestock feed if sheep and cow camps are left unclean. Grizzly bears that become food conditioned or habituated can become nuisance bears subject to management actions, such as relocation or removal. To address the potential for grizzly bear food conditioning, the Forest implemented the Order, which requires appropriate human food, garbage, and livestock feed storage. The Forest, as part of the proposed action, would require permittees of allotments within the grizzly bear occupied area to become compliant with the Order within 3 years. As discussed above, there have not been any food attractant grizzly bear conflicts outside of the area of the Order and within the grizzly bear occupied area. In addition, conservation measures 13 and 14 which address compliance with the Order, carcasses handling, and monitoring of grazing permit comliance, will ensure that the Forest will monitor allotments for compliance on a regular basis.

The conservation measures of the proposed action will reduce the potential for grizzly bear conditioning and habituation on the 122 allotments. However, the presence of livestock and livestock carcasses will continue to attract some grizzly bears and result in some level of grizzly bear conditioning and habituation. To quantify the number of grizzly bears affected by the proposed action through food conditioning and habituation, we look to the historical number of grizzly bear conflicts. As addressed above, the conflict data available is insufficient to determine a trend. Therefore, we look at the total number of conflicts for the previous 10 years as the quantity of probable conflicts during the term of the proposed action (10 years).

Grizzly bear that are habituated are likely to be involved in multiple conflicts. We assume the number of grizzly bear that are repeat offenders is correlated to the number which are removed or relocated. There were three management actions which relocated or removed grizzly bear from 2007 to 2016. We assume that a grizzly bear that is removed or relocated is one which is involved in multiple conflicts. For the purposes of this Opinion, we assume that grizzly bears involved in two conflicts will be the subject of a management action and that grizzly bears that were subject to relocation were not the subject of an additional management action.

Because a grizzly bear may become conditioned or habituated from a livestock conflict and then be involved in another conflict type, we evaluate all conflicts, with the exception of hunting conflicts (addressed above), as a potential grizzly bear that has become habituated. From 2007 to 2016 there were three management actions as a result of livestock conflicts. We assume that those three grizzly bears were involved in 6 livestock conflicts. As noted above in the section

addressing attraction to the action area because of livestock presence, 33 conflicts likely related to an action similar to the proposed action occurred between 2007 and 2016. We expect that six of those were the result of three grizzly bears, and 27 conflicts were the result of grizzly bears involved in just a single conflict. We find that from 2007 to 2016 there were 30 grizzly bears that were either food conditioned (27) or habituated (3) from an action similar to the propose action. As such, we anticipate that there will be 27 grizzly bears food conditioned and 3 grizzly bears habituated for the term of the proposed action.

4. Displacement of grizzly bear from habitat as a result of humans and other associated activities

Some grizzly bear may be displaced by noise and other disturbances on allotments from humans, sheepherding dogs, vehicle use, and other activities associated with livestock grazing. The level of grazing-related activities varies from day to day and throughout the season, depending on where livestock and camps are located, availability of forage, and other factors.

Grizzly bear generally try to avoid human contact. The proposed action would continue, for the life of the action (10 years), at a similar level of human disturbance which currently occurs in the action area. While we know the displacement of grizzly bears is likely to occur, we do not know how often it will occur or how far grizzly bears will be displaced in each instance. We assume that displacement means some grizzly bear would spend less time foraging within portions of their home ranges, but the extent and duration are unknown. However, not all of the action area provides suitable grazing habitat. Further, the livestock grazing is a discrete activity both in time and space, occurring on specific portions of allotments for specific periods of time. Livestock grazing is permitted only between June and October. During that time, it is likely livestock would not graze all portions of an allotment due to the presence of areas with vegetation or terrain unsuitable for livestock use. Due to the nature of livestock grazing, it is not anticipated that cattle will graze the entire allotment for the entire duration. It is anticipated that livestock grazing will occur with variable densities of livestock (within the parameters of the proposed action), and vary in location within each allotment. Therefore, displacement of grizzly bears by livestock presence is anticipated to be discrete both in time and space, and allow grizzly bear to return to normal behaviors in either adjacent areas or at a later time.

Based on the habitat description in the Assessment, we assume there are other available natural food sources and less human disturbance in the areas considered unsuitable for grazing. Additionally, any areas with suitable grazing habitat, but not currently being grazed, as well as habitat within the surrounding portion of the action area, would likely provide grizzly bear food resources. The large extent of grizzly bear habitat likely means most grizzly bears displaced by the proposed action will be able to find comparable suitable habitat nearby. As such, the effects of the displacement of grizzly bear as a result of the proposed action are expected to be insignificant.

5. Direct mortality due to management actions or self-defense by herders, riders, and others

Under the Act's 4(d) exemption that is part of the listing rule for grizzly bear in the 48 conterminous states of the United States (50 CFR 17.40(b)), taking of grizzly bears is prohibited except as provided in paragraphs 17.40(b)(1)(i)(B) through (F). The exceptions to the take

prohibition include self-defense and defense of others, and the removal of nuisance grizzly bears, when the taking conforms to the requirements specified in the rule. The exemption allows for the killing, capture, relocation, and removal of grizzly bears in the above circumstances, and exempts from the prohibition of section 9 of the Act, those people engaging in those actions. Although trapping, transporting, and lethal removal of grizzly bears is not part of the Forest's proposed action, the Service anticipates those activities may result as an effect of the proposed action.

Grizzly bear have been expanding their range, and while they have occurred in the action area for many years, it is likely the number of grizzly bear in the area has increased. Grizzly bear that live in or move through the area are likely to encounter livestock that are widely scattered throughout the allotments. It is likely some of those grizzly bears will feed opportunistically on livestock carcasses and some may learn to depredate livestock, in turn becoming repeat offenders. This process will continue as long as livestock are on the landscape, resulting in future grizzly bear/livestock and grizzly bear/human conflicts, with some grizzly bears becoming chronic depredators.

Removal of chronic depredators can reduce livestock losses significantly and may be key to addressing conflicts with grizzly bears on rangelands (Anderson et al. 2002). Management removal of depredating grizzly bear may be a short-term solution, as conflicts may temporarily decrease until other grizzly bears learn depredating behaviors and the scenario repeats itself. We consider lethal removal as a management tool available for specific, chronic depredation situations, to be used in conjunction with other measures that focus on preventing and minimizing the causes of grizzly bear/livestock and grizzly bear/human conflicts. The historical management actions in the action area have been concurrent with an increase in grizzly bear population within the GYA and have not shown a significant impact on the GYA grizzly bear population.

Capturing, transporting, and relocating grizzly bear impairs their behavioral patterns by disrupting feeding, breeding, and sheltering as grizzly bears adjust to a new location or, in some cases, travel back to the area from which they were relocated. Relocations give grizzly bears a second or third chance; further, grizzly bear that are relocated are collared and subsequently monitored. Some grizzly bears are not involved in conflicts post-relocation, while others continue conflict behaviors. From a biological perspective, relocations do not have the substantial adverse effect that removals have. However, relocation is expected to adversely affect grizzly bears due to trapping, physically moving, and releasing a grizzly bear into a different location, which would significantly disrupt, at least temporarily, grizzly bear feeding, breeding, and sheltering behaviors. Typically, a removal action results in death of grizzly bear. Rarely, grizzly bear may be removed from the wild and placed in zoos or sanctuaries. The historical data show that there were two removals and one relocation from 2007 to 2016 in the action area (all male). Lacking sufficient data to determine a trend, we assume an equal number of removals and relocations will occur for the term of the proposed action. Therefore, it is anticipated that the proposed action will result in two grizzly bears being subject to management removals (lethal or moved to a zoo) and one grizzly bear relocation related to grizzly bear/human and grizzly bear/livestock conflicts.

Occasionally non-target grizzly bears are captured during attempts to capture the targeted conflict-related grizzly bears. Non-target grizzly bears are released on site when this occurs. Considering the historical number of non-target captures from 2007 to 2016 (3 males and 1 female), the Service anticipates an equal number of non-target grizzly bear captures (3 males and 1 female) for the term of the proposed action.

Direct mortality due to self-defense actions by permittees, their agents, their employees (such as herders and riders), and others involved in grazing activities has not occurred in the action area. However, self-defense actions by those engaged in livestock grazing activities will always be a risk. Direct mortality due to self-defense actions in the action area have occurred infrequently (twice between 2007 and 2016) and did not occur within the Forest's allotments or as a result of actions similar to the proposed action. There have been no grizzly bear conflicts with permittees or their riders. Grizzly bear which otherwise would not be attracted to the action area except for the proposed action (presence of livestock) have the potential to be involved in a grizzly bear/human conflict which results in a defense of life mortality. It is unknown whether the two grizzly bears involved in the past conflicts were attracted to the area by the historical grazing activity, if they would have occurred in the area through natural movements, or were attracted to the area from other activities not associated with the proposed action. The lack of historical defense of life actions associated with grazing within the allotments and the limited number which occurred outside of the allotments but within the action area indicate that there is a low likelihood of grizzly bear being attracted to the area by grazing activities and then being involved in a defense of life action. The Forest's Conservation Measures 6, 8, 15, and 17 and required permit clauses will continue to ensure grazing-related personnel understand their responsibilities when working in grizzly bear habitat. Therefore, effects of the proposed grazing action from self-defense actions are expected to be discountable.

B. Effects of Interrelated or Interdependent Actions

The implementing regulations for section 7 define interrelated actions as those that are a part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. The Service has not identified any interrelated or interdependent actions in this consultation.

VI. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The Service is not aware of any future non-Federal actions reasonably certain to occur in the action area. Ongoing actions in the action area, such as recreational use, hunting, and livestock grazing on private lands, and their impacts on grizzly bears are discussed in the *Environmental Baseline* section, above, and are expected to continue. The Service is not aware of any reasonably foreseeable circumstances that would significantly alter existing State, tribal, local, or private activities in the action area from what is described in the *Environmental Baseline* section.

VII. CONCLUSION

After reviewing the current status of the grizzly bear, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the conterminous U.S. population of the grizzly bear. Although, we anticipate some level of take of grizzly bears, primarily due to management relocations and mortalities within the allotments, it is our opinion that the proposed action will not appreciably reduce the survival and recovery of grizzly bear. The Service's rationale for this conclusion is presented below.

The grizzly bear population within the GYA has experienced significant increases and exceeds the recovery zone goals established in the Grizzly Bear Recovery Plan. The GYA grizzly bear population grew at an average of 3 to 4 percent or more annually, although the rate has slowed in recent years as grizzly bear numbers in parts of the GYA approach carrying capacity. Current population estimates for the GYA are 655 to 757 grizzly bears, with a stable to slightly increasing growth rate (0 to 2 percent). In addition, the range of the grizzly bear in the GYA has expanded, as evidenced by the increase in occupied habitat in the GYA since the 1970s (Pyare et al. 2004; Schwartz et al. 2002; Bjornlie et al. 2013b; Figure 3). Range expansion and population increase occurred concurrently with the Forest implementing grazing actions similar to those described in the proposed action, and with other Federal and non-Federal actions described in the *Environmental Baseline* section. This means that historical activities comparable to the proposed action have had little to no discernable effect on the GYA grizzly bear population's trend toward recovery. Additionally, as grizzly bear expanded into new areas, including less secure habitats and locations with more human activities, the number of grizzly bear/human interactions has increased, but estimates of mortality rates have not exceeded the mortality rate thresholds. This suggests the population will be sustained at the current above recovery goal level at the current level of mortalities.

The Forest is committed to implementing the conservation measures described in this Assessment, and the direction of the RFP. These actions include managing livestock carcasses, and requiring food storage guidelines in the area of the Order and the allotments which fall within the extended area. The conservation measures are expected to reduce the potential for grizzly bear/livestock and other grizzly bear/human conflicts.

Although grizzly bear/livestock conflicts will continue and individual grizzly bears will likely be adversely impacted by management relocations and removals, the core population of GYA grizzly bear is expected to be relatively unaffected by grazing activities in the action area. The adverse effects from the proposed action to individual grizzly bears will occur in only a small portion of grizzly bear range in the GYA. Considering the large amount of available grizzly bear habitat in the GYA, the resource management within such habitat (i.e., the expectations to maintain secure habitat, and conserve habitat for grizzly bear), and the robust and stable population status of grizzly bear in the GYA, we do not expect the level of adverse effects to diminish appreciably the numbers, distribution, or reproduction of grizzly bears.

Finally, the anticipated level of incidental take, described below, will have a relatively minor impact on the overall population of this species, which has increased significantly in distribution and abundance. The Service does not anticipate future levels of incidental take in the action area will differ significantly from the past 10 years because the rate of grizzly bear population growth is expected to be the same for the term of the action, as it was for the previous 10 year period, and during that period a similar amount of grazing within the action area took place. Mortality is expected to remain within the constraints of recovery criteria mortality limits established by the Grizzly Bear Recovery Plan and supplements that were developed to facilitate the further increase in grizzly bear numbers and distribution in the GYA (USFWS 1993).

In summary, we have determined that the proposed action is not likely to appreciably diminish the reproduction, numbers, or distribution of grizzly bear in the GYA. If the adverse effects of the proposed action on grizzly bear are not significant at the recovery area scale, then those effects are unlikely to be discernable at the rangewide scale. On that basis, we conclude that the effects of the proposed action are not likely to appreciably reduce the likelihood of the survival and recovery of grizzly bear in the wild.

VIII. INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of an Incidental Take Statement. The measures described below are non-discretionary, and must be undertaken by the Forest so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply.

A. Amount or Extent of Take Anticipated

Based on the results presented in the *Effects of the Action* analysis above, the Service finds that over the 10 year term of the action lethal take of a maximum of two adult male grizzly bears is likely to occur. Additionally, the Service finds that incidental take of grizzly bear is likely to occur in the form of capture of a maximum of five adult grizzly bears. Of these five grizzly bears captured, the Service expects four non-target adult grizzly bears (3 males and 1 female) to be captured and released on site, while one of the five captures will be capture of a conflict-related grizzly bear that will be relocated out of the area and then released.

As described above in the *Status of the Species* section, grizzly bears have large home ranges and are known to travel large distances. Additionally, grizzly bear behavior is unpredictable, and data is lacking which provides evidence that grizzly bear are becoming habituated from the proposed action and then being involved in conflicts off the Forest's allotments or outside of the action area. The large area being used for livestock grazing, and the low human presence allow limited opportunities for grizzly bear to become habituated from the proposed action (as shown by the low number of historical relocations and removals of grizzly bear in the action area). We assume, based on the low number of relocations and removals, that there is a low likelihood that a grizzly bear will become habituated on the allotments and then be subject to a management action outside the action area. The ability to determine if this situation has occurred is limited by the nature of grizzly bear/livestock conflicts. Grizzly bears involved in livestock conflicts are not always able to be identified, and as such, it is not always possible to connect two separate livestock conflicts to the same grizzly bear. Therefore, the following discussion identifies when and where take will be attributed to the proposed action.

When a grizzly bear/livestock conflict or a grizzly bear/food attractant conflict occurs on the Forest's 122 allotments and a resultant management action occurs at that location, that management action is attributed or assigned to the proposed action. The grizzly bear would not have been involved in a livestock or food attractant conflict but for the proposed action (livestock presence), even if the grizzly bear was previously food conditioned or habituated from an activity other than the proposed action, or in an area other than the action area. Livestock-related management actions of grizzly bears, which were previously relocated for non-livestock conflicts on the Forest's allotments, will be attributed to the location where the livestock-related management action occurs. Grizzly bear/non-livestock related conflicts are not anticipated to alter grizzly bear behavior such that they would habituate or be conditioned and therefore be involved in future livestock conflicts.

We acknowledge that other grizzly bear management actions may occur within the home range of a grizzly bear that uses the action area, but whose food conditioning or habituation did not occur as a result of the proposed action. When we know the origin (Point A) of a grizzly bear/livestock conflict and that grizzly bear is subsequently trapped, collared, or relocated, and then it engages in an additional livestock conflict at a different location (Point B) and is the subject of management removal, then the incidental take will be attributed or assigned to Point A.

Absent convincing evidence that a management action and associated take of a grizzly bear is unrelated to the proposed action, such take is attributable to the proposed action when:

a grizzly bear/livestock conflict (including a grizzly bear consuming all or a portion of a livestock carcass) occurs on the Forest's allotments and another grizzly bear/livestock conflict and resulting management action occurs within the action area, but off the Forest's allotments, within the same calendar year, that management action is attributed or assigned to the proposed action. The decision to attribute take to the proposed action under these circumstances will be at the discretion of the Service using the best available information.

1. Approach to Assigning Take

The take allocation discussed above reflects our analysis of the effects of the Forest's proposed action on grizzly bear, taking into account the location of the action area in relation to the GYA and the grizzly bear recovery zone, the range expansion and population increases of grizzly bear within the GYA (including portions of the action area), and the availability of GPS, and telemetry data from radio-collared grizzly bears. These conditions may be unique to the Forest, and may not occur elsewhere within the range of the grizzly bear. Therefore, assigning take in this manner for other Federal actions within the grizzly bear's range may not be possible or appropriate.

The status of the grizzly bear in the GYA is changing in at least three ways (as described in the *Status of the Species* section above) that may affect the likelihood of grizzly bear/livestock conflicts in the action area and cause future livestock-related grizzly bear mortalities away from the Forest's allotments: grizzly bears are increasing in abundance (Bjornlie et al. 2013b); grizzly bears in the GYA are eating more meat (IGBST 2013); and conflicts with livestock account for an increasing percentage of grizzly bear mortalities in the GYA (Aber 2015; Frey 2015; DeBolt et al. 2015).

It is important to note that it is not currently possible to assign a grizzly bear management removal from an area outside of the action area to the specific site where the grizzly bear was food conditioned, because that conditioning may have occurred on the Forest's allotments or elsewhere, and not all grizzly bears in the GYA have radio telemetry collars.

Because grizzly bear home ranges overlap and are quite large, it is possible that a livestock-related grizzly bear removal that occurs within the action area could involve a grizzly bear that had not used the Forest's allotments. The action area contains the Forest's 122 allotments, as well as the 12 km (7.5 miles) adjacent to them. There exist areas within the action area where the proposed action will not occur. Therefore, if a removal occurs outside of the 122 allotments but within the action area, then that removal will not be attributed to the proposed action if no livestock conflicts have occurred on the Forest's allotments in the past year, or if annual livestock depredations have not occurred within that area following a livestock conflict on the Forest's allotments.

All known grizzly bear mortalities in the GYA, from all causes, are reported in a publically available mortality database on the Interagency Grizzly Bear Study Team's (IGBST) website. Database entries include a general description of the location and a cause of death. All grizzly bear relocations are reported in the annual reports of the IGBST, which are also publically available on their website. Consequently, it is possible for the Forest, in coordination with the IGBST and the Service, to determine annually if any livestock-related grizzly bear mortalities or relocations have occurred within the action area.

B. Effect of the Take

In the accompanying Opinion, the Service determined that the above level of anticipated take is not likely to jeopardize the continued existence of grizzly bear.

C. Reasonable and Prudent Measures

The Service finds that compliance with all conservation measures and required permit clauses, as outlined in the Assessment for the proposed action, is essential to minimizing the impacts of incidental take of the grizzly bear on the Targhee Forest Range Allotments. Had the Forest not already committed to these actions, the Service would have required them as a reasonable and prudent measure.

The Service also finds that the following Reasonable and Prudent Measure is necessary and appropriate to minimize the impacts of incidental take of grizzly bears caused by the proposed action.

Reasonable and Prudent Measure 1 –The Forest shall report annually on the number of grizzly bear interactions (conflicts or encounters) with livestock or humans in the action area.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Forest must comply with the following terms and conditions, which implement the reasonable and prudent measure, described above, and outline required monitoring/reporting requirements. These terms and conditions are non-discretionary.

Term and Condition 1: The Forest shall conduct monitoring and reporting of incidental take as follows. By December 31 of each year for the term of the proposed action, the Forest shall submit a report summarizing grizzly bear conflicts (with livestock or humans), relocations, removals, and non-target captures within the action area for that year to the Service's Eastern Idaho Field Office in Chubbuck, Idaho. This reporting is in addition to that given to the Interagency Grizzly Bear Study Team. The report shall include the following:

(1) Number of grizzly bear sightings, encounters, and conflicts for each of the Forest's allotments (identifying type of conflict);

(2) Outcome of each conflict, encounter, or sighting (e.g., number of livestock killed, no conflict, management actions);

(3) A discussion of the actions taken by the Forest and permittees to avoid more conflicts (e.g., livestock were moved to another area in same allotment or livestock were removed from the allotment);

(4) A description of the grizzly bear/livestock conflicts and grizzly bear relocations outcomes, if known;

(5) The Forest's actions to implement and monitor compliance with its conservation measures and required permit clauses as described in the Assessment, and this Opinion;

(6) Description of violations, such as food storage or improper handling of grizzly bear encounters.

Changes to the above protocol can be made, as appropriate, in coordination with and the approval of the Service.

Term and Condition 2: The Forest shall annually coordinate with the Interagency Grizzly Bear Study Team to gather data on the number of grizzly bear/livestock conflicts that resulted in grizzly bear capture and relocation or mortality within the action area (as described in the *Action* Area section above). The Forest shall report the results of that coordination by December 31 of each year to the Service's Eastern Idaho Field Office in Chubbuck, Idaho.

IX. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop new information on listed species.

In this case, the Service has the following recommendations:

1. Implement the expansion of the food storage order for permits which are within the grizzly bear occupied area upon permit issuance, rather than allowing for 3 years for the permittee to become compliant

2. Require permittees and those working under their permit to carry bear pepper spray, and be trained on its proper use prior to field going employees entering areas with grizzly bear occurrences

3. Work with the Service, State Fish and Game Departments, and the permittees to identify levels of livestock losses from grizzly bear/livestock conflicts which would prompt cattle relocation within an allotment or to another grazing area.

4. Close or convert to forage reserve those cattle allotments with chronic grizzly bear/livestock conflicts (as described in the Assessment, p. 67) which fall within the RZ/PCA or suitable habitat.

In order for the Service to be kept informed of actions that minimize or avoid adverse effects or benefit listed species or their habitats, we request notification of the implementation of any conservation recommendations.

X. REINITIATION-CLOSING STATEMENT

This concludes formal consultation on the proposal action. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or

control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the Forest must immediately contact the Service to reinitiate consultation and to determine if any modification of the operations causing such take must cease pending reinitiation.

If during implementation of the proposed action, circumstances or the proposed action changes, the Forest should assess the changes and any potential impacts to listed species, review the reinitiation triggers above, and coordinate with the Service's Eastern Idaho Field Office at (208) 237-6975 for advice (if needed), and make a determination as to whether reinitiation is necessary.

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