

Forward [RS1]

~~The development of the Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area is directed by Task Y426 and Task Y53 in the Grizzly Bear Recovery Plan.~~

~~The purpose of the Conservation Strategy and the State plans are to “describe and summarize the coordinated efforts to manage the grizzly bear population and its habitat to ensure continued conservation in the GYA (Greater Yellowstone Area); specify the population, habitat, and nuisance bear standards to maintain a recovered grizzly bear population for the foreseeable future; document the regulatory mechanisms and legal authorities, policies, management, and monitoring programs that exist to maintain the recovered grizzly bear population; and document the commitment of the participating agencies” (p. 5).~~

~~The Draft Conservation Strategy was available for public comment from March 2, 2000 (65 FR 11340) until June 1, 2000. We received 16,794 comments about the Draft Conservation Strategy and published a summary of public comments in October 2000 (available online at <http://mountain-prarie.fws.gov/species/mammals/grizzly/yellowstone.htm>. Our responses to the public comments received on the Conservation Staregy are available at <http://mountain-prarie.fws.gov/species/mammals/grizzly/yellowstone.htm>. The Conservation Strategy also underwent peer review, copies of which are available in the Administrative Record.~~

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Executive Summary

Final 2016 Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area Ecosystem

Chapter 1 Introduction and Background

The future management of the Yellowstone grizzly bear population is envisioned as one in which the grizzly bear (*Ursus arctos*) and its habitat are conserved as integral parts of the Greater Yellowstone Area Ecosystem.

Within the Greater Yellowstone Area Ecosystem (GYAGYE), the grizzly bear population and its habitat will be managed utilizing a management approach that identifies a Primary Conservation Area (PCA) and adjacent areas where occupancy by grizzly bears is anticipated and acceptable. The PCA is the existing Yellowstone grizzly bear recovery zone as identified in the 1993 *Grizzly Bear Recovery Plan (Recovery Plan)* (USFWS 1993). ~~The size of the recovery zone is not being expanded in this approach. Upon implementation of this Conservation Strategy, management using a recovery zone line and grizzly bear Management Situations described in the Interagency Grizzly Bear Guidelines (IGBC 1986) will no longer be necessary[†].~~ The PCA boundary will replace the recovery zone boundary to reflect the paradigm shift from managing for recovery to one of conservation.

In the Conservation Strategy, management direction is described for both the PCA and adjacent areas within the GYA-GYE (i.e., the Demographic Monitoring Area). State grizzly bear management plans, forest plans, and other appropriate planning documents will provide specific management direction for the adjacent areas outside the PCADMA.

This Conservation Strategy was developed to be the document guiding management and monitoring of the Yellowstone grizzly bear population and its habitat upon recovery and delisting. This approach will remain in place beyond recovery and delisting. Ongoing review and evaluation of the effectiveness of this Conservation Strategy is the responsibility of the state, tribal, and federal managers in the GYAGYE. This Conservation Strategy will be updated by the management agencies every five years or as necessary, allowing public comment in the updating process.

Upon implementation of the Conservation Strategy, the Yellowstone Grizzly Bear Coordinating Committee (YGCC) will replace the Yellowstone Ecosystem Subcommittee.

The Conservation Strategy and the State Management Plans

The purpose of this Conservation Strategy (Strategy) and the state plans is to:

[†] ~~An exception is the Caribou-Targhee National Forest. The use of Management Situation lines is an integral part of management under the 1997 Targhee National Forest revised Forest Plan.~~

- Describe and summarize the coordinated efforts to manage the grizzly bear population and its habitat to ensure continued conservation in the [GYAGYE](#)
- Specify the population, habitat, and nuisance bear standards² to maintain a recovered grizzly bear population for the foreseeable future
- Document the regulatory mechanisms and legal authorities, policies, management, and monitoring programs that exist to maintain the recovered grizzly bear population
- Document the commitment of the participating agencies

Implementation of the management strategies requires continued cooperation between federal and state agencies.

The [GYA-GYE](#) is a dynamic environment; monitoring systems in the Strategy allow for dynamic management as environmental issues change. The agencies are committed to be responsive to the needs of the grizzly bear by dynamic management actions based on the results of detailed annual population and habitat monitoring.

The vision of the Strategy can be summarized as follows:

- The PCA will be a secure area for grizzly bears, with population and habitat conditions maintained to ensure a recovered population is maintained for the foreseeable future and to allow bears to continue to expand outside the PCA.
- Outside of the PCA, grizzly bears will be allowed to expand into biologically suitable and socially acceptable areas
- Outside of the PCA, the objective is to maintain existing resource management and recreational uses and to allow agencies to respond to demonstrated problems with appropriate management actions.
- Outside of the PCA, the key to successful management of grizzly bears lies in bears utilizing lands that are not managed solely for bears but in which their needs are considered along with other uses.
- Manage a population within the area called the Demographic Monitoring Area (DMA), which is the area formerly called suitable habitat. The population objective in the DMA is at the average population size in the DMA 2002-2014 when this population was essentially stable. Use the model-averaged Chao2 population estimator applied inside the DMA to estimate the population on an annual basis and to set the mortality limits within the DMA so as to maintain this average population size using a sliding scale of mortality for independent females and males, and dependent young (see Appendix C).
- Expand public information and education efforts.
- Provide quick responsive management to deal with grizzly bear conflicts.
- Manage grizzly bears as a game animal; including allowing regulated hunting when and where appropriate.

Relationship to Other Plans

² Standards are management actions that are required in this Conservation Strategy. A deviation from a standard would occur only with a revision or amendment to the Conservation Strategy.

By integrating state plans into the Strategy, it was ensured that the plans and the Strategy are consistent where necessary and complementary. The state plans are formally incorporated in the Conservation Strategy as Appendices K, L, and M.[RS3]

Relationships with national forest and national park plans are also mentioned throughout the Strategy. Land and resource management plans for ~~some~~ national forests and, national parks, ~~and the Bureau of Land Management (BLM)~~ in the GYA-GYE have incorporated the habitat standards and other relevant provisions of the Conservation Strategy. For those standards and provisions not yet incorporated into management plans, the agencies will implement the habitat standards and monitoring requirements in this conservation strategy through their established planning processes, subject to NEPA or other legal requirements

Chapter 2 Population Standards and Monitoring[RS4]

To maintain a healthy (recovered) grizzly bear population in the GYAGYE, it is necessary to have adequate numbers of bears that are widely distributed with a balance between reproduction and mortality. This section details the population criteria in the *Recovery Plan* that were necessary to achieve recovery, and the population standards necessary to maintain it (USFWS 2016). ~~The Strategy will continue to assess demographic recovery criteria focus on the PCA and a 10-mile perimeter, whereas standards in the Strategy and the parameters in appended state plans focus beyond the PCA and encompass the entire GYA within the Demographic Monitoring Area (DMA) created by the Recovery Plan.~~ Because grizzly bears are a difficult species to monitor and manage, multiple standards with additional monitoring items are identified to provide sufficient information upon which to base management decisions. It is the goal of the agencies implementing this Conservation Strategy to manage the Yellowstone grizzly bear population in the entire GYA-GYE DMA at the average population size between 2002-2014 when the population inside the Demographic Monitoring Area (DMA) was essentially stable. Using the Chao2 population estimation method this average population size was 674 (average lower 95% CI = 600; average upper 95% CI = 747) or above a total of 500 grizzly bears.

Population standards and monitoring items include:

- Monitoring unduplicated females with cubs-of-the-year for the entire GYAGYE DMA.
- Calculating a total population estimate for the GYE DMA entire GYA using based on the model averaged Chao2 estimate of females with cubs-of-the-year (see Appendix C).
- Maintaining at least a total 500 bears in the GYE population for the entire GYA-GYE DMA above 500 bears to assure the genetic health needs of the population. 500 bears is not a population goal but a minimum number necessary to address genetic health. -
- Monitoring the distribution of females with young of all ages and having a target of at least 16 of 18 BMUs (Bear Management Units) within the PCA occupied at least one year in every six, and no two adjacent BMUs can be unoccupied over any six-year period
- Monitoring all sources of mortality for independent females and males (≥ 2 years old) and dependent young (< 2 years old) within the entire GYA-GYE DMA and limiting limiting independent female mortality to annual mortality percentages on a sliding scale

~~depending on the annual population size estimate using model-averaged Chao2. 9% of the total estimate of independent females for that year and limiting independent male mortality to 15% of the total estimate of independent males for that year~~

- ~~• Monitoring known³ and probable⁴ human-caused mortalities of dependent bears (< 2-years old) within the entire GYA-GYE-DMA and limiting their mortality to 9% of the total estimate of dependent bears for that year~~
- Monitoring population trend using female survivorship and reproductive rate data from radio-collared bears
- Ensure meeting defined genetic management objectives by facilitating occasional male movement between the NCDE and Yellowstone. gement objectives

Chapter 3 Habitat Standards and Monitoring

The habitat standards identified in this document will be maintained at identified levels inside the PCA. In addition to the habitat standards, several other habitat factors will be monitored and evaluated to determine the overall condition of habitat for bears. It is the goal of the habitat management agencies to maintain or improve habitat conditions existing as of 1998, as measured within each subunit within the PCA, while maintaining options for management of resource activities at approximately the same level as existed in 1998. The habitat standards in this document are subject to revision based on the best available science and will be reviewed and updated as necessary.

Habitat standards include:

- Maintenance of secure habitat at 1998 levels in each BMU subunit through management of motorized access route building and density, with short-term deviations allowed under specific conditions. Secure habitat is defined as more than 500 meters from an open or gated motorized access route or reoccurring helicopter flight line and must be greater than or equal to 10 acres in size.
- The number and acreage of commercial livestock allotments and number of permitted domestic sheep animal months will not exceed 1998 levels inside the PCA. Existing sheep allotments will be phased out as the opportunity arises with willing permittees.
- Management of developed sites at 1998 levels within each BMU subunit, with some exceptions for administrative and maintenance needs.

Habitat criteria that will be monitored and reported include:

- Monitoring open and total motorized access route density in each BMU subunit inside the PCA

³ ~~Known (mortality): Carcass recovered or evidence to indicate known status due to radio telemetry. Known deaths require a carcass, management removal, or a cut radio collar. Found collars having the appearance of being cut should receive additional forensic review for definitive proof.~~

⁴ ~~Probably (mortality): Strong evidence to indicate mortality, reported by highly reliable sources, no carcass recovered. Probably deaths include those cases where there is supportive evidence that a bear was wounded. Circumstances of each reported instance should be considered. Probable includes those cases where evidence of blood, hair, or other tissues clearly indicates wounding serious enough to result in death. The literature is unclear on the probability of survival for orphaned cubs. Any cub orphaned during its first year of life because of a known adult female mortality is considered a probably mortality.~~

- Monitoring of four ~~major-high-calorie~~ food items throughout the Yellowstone area: winter ungulate carcasses, cutthroat trout (*Oncorhynchus clarki*) spawning numbers, bear use of army cutworm moth (*Euxoa auxiliaris*) sites, and whitebark pine (*Pinus albicaulis*) cone production. The incidence of white pine blister rust (*Cronartium ribicola*) and whitebark pine mortality in sampled areas will also be monitored.
- ~~Monitoring of habitat effectiveness in the PCA using the databases from the Yellowstone Grizzly Bear Cumulative Effects Model~~
- ~~Monitoring the number of elk hunters inside the PCA~~
- ~~Monitoring the number of grizzly bear mortalities throughout the Yellowstone area on private lands and development of a protocol to monitor private land status and condition~~
- Land managers will ensure that habitat connectivity is addressed throughout the Yellowstone area as part of any new road construction or reconstruction[RS5] and that food storage orders are in place

Chapter 4 Management and Monitoring of Grizzly Bear ~~/~~Human Conflicts

The management of grizzly bear ~~/~~human conflicts ~~inside the PCA~~ inside the DMA is based upon the existing laws and authorities of the state wildlife agencies and federal land management agencies. Outside the PCADMA, state management plans will direct the management of nuisance bears. Management of nuisance bears usually falls into one or more of the following categories:

- Removing or securing the attractant
- Detering the bear from the site through the use of aversive conditioning techniques
- Capturing and relocating the nuisance bear
- Removing the bear from the wild, including lethal control

The focus and intent of nuisance grizzly bear management ~~inside and outside the PCA~~ will be predicated on strategies and actions to prevent grizzly bear ~~/~~human conflicts. It is recognized that active management aimed at individual nuisance bears will be required in both areas. Management actions outside the PCA-DMA will be implemented according to state and tribal management plans. These actions will be compatible with grizzly bear population management objectives for each state for the areas outside the PCADMA.

In circumstances that result in a nuisance bear situation outside the PCA, more consideration will be given to existing human uses. Site-specific conflict areas within and outside the PCA will be documented and prioritized to focus proactive management actions to minimize grizzly bear ~~/~~human conflicts and address existing and potential human activities that may cause future conflicts. Past conflict management has demonstrated that grizzly bears can coexist with most human activities.

Management of all nuisance bear situations will emphasize resolving the human cause of the conflict. Relocation and removal of grizzly bears may occur if other management actions are not successful. Before any removal, except in cases of human safety, management authorities will consult with each other prior to judging the adequacy of the reason for removal.

Captured grizzly bears identified for removal may be given to public research institutions or public zoological parks for appropriate non-release educational or scientific purposes as per regulations of states and national parks. Grizzly bears not suitable for release, research, or educational purposes will be removed as described in appropriate state management plans or in compliance with national park management plans. –

All grizzly bear relocations and removals will be documented and reported annually in the IGBST (Interagency Grizzly Bear Study Team) Annual Report.

Chapter 5 Information and Education

The purposes of the information and education aspects of this cooperative effort are to support the development, implementation, and dissemination of a coordinated information and education program. This program should be understandable and useful for the people who visit, live, work, and recreate in bear habitat to minimize grizzly bear-human conflicts and to provide for the safety of people while building support for viable bear populations.

Information made available to the public will be open and responsive to public concerns. Open discussions with the public will increase credibility of the grizzly bear management program. These efforts will be reviewed periodically and program adjustments will be made as necessary. In addition, efforts will be expanded as the bear population expands and additional efforts will be needed in areas that could become occupied in the near future.

The current information and education (I & E) working group within the Greater Yellowstone [Area Ecosystem](#) will continue. Members of this I & E team include public affairs personnel from Forest Service Regions 1, 2, and 4; Grand Teton and Yellowstone National Parks; the BLM; representatives from each state wildlife agency; and the information and education specialist from the IGBC. This team will continue to work with all affected interests to ensure consistency of information, efficient funding strategies, identifying and targeting audiences, developing partnerships, and identifying new tools for implementation.

Chapter 6 Implementation and Evaluation

A new committee, the Yellowstone Grizzly [Bear](#) Coordinating Committee (YGCC), will replace the Yellowstone Ecosystem Subcommittee. YGCC meetings will be open to the public.

Some primary activities of the YGCC are:

- Coordinate implementation of this Conservation Strategy
- Ensure that population and habitat data are collected annually by the IGBST, as specified in this Conservation Strategy, and evaluated to assess current status of the grizzly bear population
- Share information and implement management actions in a coordinated fashion
- Identify management, research, and financial needs to successfully implement the coordinated Conservation Strategy

- Implement a Biology and Monitoring Review as necessary and submit a petition for relisting as appropriate to ensure agency responsiveness to changing circumstances of the grizzly [bear](#) or its habitat in the Greater Yellowstone [AreaEcosystem](#)
- Appoint a chairperson and members of the Information and Education Team, and coordinate information and education efforts

This committee does not supersede the authority of the management agencies beyond the specific actions agreed to as signatories of this Conservation Strategy.

YGCC membership consists of representatives of the following:

Federal	National parks: Yellowstone and Grand Teton National forests: Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer, ~~and~~ Gallatin, and Shoshone One Bureau of Land Management representative The Biological Resources Division of the U.S. Geological Survey
State wildlife agencies	Idaho, Montana, and Wyoming
Local government	One representative from each state
Tribal	One representative from each Native American tribe with sovereign powers over reservation lands within the ecosystem

~~Three teams, the~~ The Interagency Grizzly Bear Study Team (IGBST), ~~the Habitat Modeling Team (HEM),~~ and the Information and Education Team (I & E) will perform necessary tasks and report to the YGCC.

As detailed in the monitoring portion of this Strategy, the IGBST will take the lead in preparing an annual monitoring report with staff support from the YGCC. Agencies responsible for monitoring major demographic and habitat parameters are listed in Appendix I. Monitoring results and analysis will be presented to the YGCC by the IGBST.

If there are deviations from any of the population and/or habitat standards stipulated in this Conservation Strategy, a Biology and Monitoring Review will be initiated.

Biology and Monitoring Review

Under this Conservation Strategy, a Biology and Monitoring Review is a process carried out by the IGBST. A Biology and Monitoring Review examines management of habitat, populations, or efforts of participating agencies to complete their required monitoring. Biology and Monitoring Reviews would normally be undertaken after the annual summary of monitoring information presented to the YGCC and in response to deviations from required population or habitat standards. Any YGCC member agency can request that a Biology and Monitoring Review be considered. Such consideration would be a topic for discussion by the YGCC and the review would be initiated based on the decision of the YGCC. The Biology and Monitoring Review process will be completed within six months and the resulting written report presented to the YGCC and made available to the public. The IGBST is not responsible for completing impact

analyses for projects proposed by any agency; such analyses are the responsibility of the agency making the proposal.

The purposes of a Biology and Monitoring Review are:

- To identify the reasons why particular demographic or habitat objectives have not been achieved and to modify management as necessary, or
- To consider potential impacts of a proposed action of concern to one or more members of the YGCC, or
- To consider departures by one or more agencies from the monitoring effort required under this Conservation Strategy and to develop plans to ensure that monitoring efforts be maintained as per the standards in this document, or
- To consider and establish a scientific basis for possible changes in management due to changed conditions in the ecosystem

Biology and Monitoring Reviews will be submitted as written reports by the IGBST to the Yellowstone Grizzly [Bear](#) Coordinating Committee and made available to the public. The YGCC will respond to the Biology and Monitoring Review with actions to address the deviations from the population or habitat standards. If the situation, after completion of the Biology and Monitoring Review, is such that some or all of the desired population and habitat standards specified in this Conservation Strategy are not being met, and cannot be met in the opinion of the YGCC, then the YGCC will petition the Fish and Wildlife Service for relisting. In the case of a vote on this issue, a simple majority is necessary.

Petition for Relisting

The YGCC can petition for relisting and a resulting status review from the U.S. Fish and Wildlife Service. A status review is a process that requires the U.S. Fish and Wildlife Service to review the status of the [GYA-GYE](#) grizzly bear population and is triggered by a petition to list a species. This petition from the YGCC will be accompanied by the available specific biological data on the population and its habitat sufficient to judge its status as a recovered population as per the requirements of this Conservation Strategy. A status review will evaluate all factors affecting the population and result in a finding that summarizes the current status of the population. For purposes of a status review, the status of the entire Greater Yellowstone [Area-Ecosystem](#) grizzly bear population will be considered.

Additionally, the Fish and Wildlife Service can initiate a status review to determine if the grizzly bear in the [Greater](#) Yellowstone [Ecosystem](#) should be added to the list of candidate species for listing independent of the YGCC based on concerns about the population and/or its habitat. Under Section 4 of the Endangered Species Act, a petition from an individual or organization can also initiate a status review, as long as the petition is deemed to be warranted. To be warranted, such a petition must present credible scientific information to support the petition. If, as the result of the status review for candidate status or the petition for relisting, the population is found to be warranted for listing, as per the criteria of the Endangered Species Act in Section 4(a)(1), then the species could be immediately considered for relisting and could be

relisted under emergency regulations, per Section 4(b)(7) if the threat were severe and immediate.

The Service will initiate a status review with possible emergency relisting if necessary if there are changes to Federal, State, or Tribal laws, rules, regulations, or management plans that depart significantly from the specifics in the Conservation Strategy, thereby compromising implementation of the Strategy.

Chapter 7 Existing Authorities

The existence of adequate regulatory mechanisms that serve to maintain the [Greater Yellowstone Ecosystem](#) grizzly bear population as recovered is one of the five factors required to change the status of the population to delisted and to assure a healthy grizzly bear population. This chapter lists applicable federal, ~~and~~ state (Idaho, Montana, and Wyoming) ~~and tribal~~ acts, statutes, regulations, rules, plans, and guidelines⁵.

⁵ Guidelines are management actions that are highly recommended in this Conservation Strategy. A deviation from a guideline would not require a revision or amendment to the Conservation Strategy. A deviation from a guideline requires written rationale as to why the guideline is not being followed.

Memorandum of Understanding Detailing Agency Agreement to Implement this Conservation Strategy

The agencies signing this Conservation Strategy agree to use their authorities to maintain and enhance the recovered status of the grizzly bear in the Greater Yellowstone [Area-Ecosystem](#) by implementing the regulatory mechanisms, interagency cooperation, population and habitat management and monitoring, and other provisions of the Conservation Strategy as per the details and responsibilities described in this document. All signatories recognize that each has statutory responsibilities that cannot be delegated and that this agreement does not and is not considered to abrogate any of their statutory responsibilities. This agreement is subject to and is intended to be consistent with all appropriate federal and state laws. Funding of this MOU is subject to approval and appropriations by approved state and federal entities. All agencies will take appropriate steps to seek funding to implement this document. The adequacy of the regulatory mechanisms demonstrated by this Conservation Strategy are dependent upon funding being available to fully implement the management and monitoring actions detailed in this document. This Conservation Strategy does not go into effect until all agencies have signed this document and the final rule delisting the Yellowstone grizzly ~~bear population-DPS~~ [has been published in the Federal Register](#).

Regional Forester
U.S. Forest Service, Northern Region

Date

Regional Forester
U.S. Forest Service, Rocky Mountain Region

Date

Regional Forester
U.S. Forest Service, Intermountain Region

Date

Director
Idaho Department of Fish and Game

Date

Director
Montana Fish, Wildlife & Parks

Date

Director
Wyoming Game and Fish Department

Date

Director National Park Service, Intermountain Region	Date
Regional Chief Biologist Central Region, USGS Biological Resources Division	Date
State Director Bureau of Land Management Idaho	Date
State Director Bureau of Land Management Montana	Date
State Director Bureau of Land Management Wyoming	Date
Regional Director U.S. Fish and Wildlife Service, Region 1	Date
Regional Director U.S. Fish and Wildlife Service, Region 6	Date

Chapter 1 Introduction and Background

Introduction

The future management of the Yellowstone grizzly bear population is envisioned as one in which the grizzly [bear](#) and its habitat are conserved as integral parts of the Greater Yellowstone [Area Ecosystem](#).

Within the Greater Yellowstone [Area Ecosystem \(GYE\)](#) (~~GYA~~), the grizzly bear population and its habitat will be managed utilizing a management approach that identifies a Primary Conservation Area (PCA) and adjacent areas where occupancy by grizzly bears is anticipated and acceptable. The PCA is the existing Yellowstone grizzly bear recovery zone as identified in the 1993 *Grizzly Bear Recovery Plan (Recovery Plan)* (USFWS 1993). The size of the recovery zone is not being expanded in this approach. ~~Upon implementation of this Conservation Strategy, management using a recovery zone line and grizzly bear Management Situations as described in the Interagency Grizzly Bear Guidelines (IGBC 1986) will no longer be necessary~~⁶. The PCA boundary will replace the recovery zone boundary ~~to reflect the paradigm shift from managing for recovery to one of conservation.~~

In this Conservation Strategy, management direction is described for both the PCA and adjacent areas within the ~~GYA~~[GYE](#). State grizzly bear management plans, forest plans, and other appropriate planning documents provide ~~specific~~[additional](#) management direction for the adjacent areas outside the PCA.

~~T~~[T](#)his Conservation Strategy was developed to be the document guiding management and monitoring of the ~~Yellowstone~~[GYE](#) grizzly bear population and its habitat upon recovery and delisting. ~~This approach will remain in place beyond recovery and delisting. This Strategy will remain in effect beyond recovery, delisting, and the five year monitoring period required by the Act as grizzly bears will always be a “conservation-reliant” species (Scott *et al.* 2005, p. 384) because of their low resiliency to excessive human-caused mortality. Therefore, the need to coordinate management of the population across multiple land ownerships and jurisdictions will always remain.~~

Ongoing review and evaluation of the effectiveness of this Conservation Strategy is the responsibility of the state and federal managers in the ~~GYA~~[GYE](#). This Conservation Strategy will be updated by the management agencies every five years or as necessary, allowing public comment in the updating process.

Upon implementation of this Conservation Strategy, the Yellowstone Grizzly [Bear](#) Coordinating Committee (YGCC) replaces the Yellowstone Ecosystem Subcommittee. (See Chapter 6 for more information about the activities of the YGCC.)

⁶ ~~An exception is the Caribou-Targhee National Forest. The use of Management Situation lines is an integral part of management under the Targhee National Forest 1997 revised Forest Plan.~~

The Conservation Strategy

The purposes of this Conservation Strategy (Strategy), which includes the state plans, ~~is~~ are to:

- Describe and summarize the coordinated efforts to manage the grizzly bear population and its habitat to ensure continued conservation in the GYAGYE
- Specify the population, habitat, and nuisance bear standards to maintain a recovered grizzly bear population
- Document the regulatory mechanisms and legal authorities, policies, and management and monitoring programs that exist to maintain the recovered grizzly bear population
- Document the commitment of the participating agencies

Implementation of the management strategies requires continued cooperation between federal and state agencies.

The GYA-GYE is a dynamic environment; monitoring systems in the Strategy allow for dynamic management as environmental issues change. The agencies are committed to be responsive to the needs of the grizzly bear by dynamic management actions based on the results of detailed annual population and habitat monitoring.

Development of the Conservation Strategy and State Plans

Development of the Strategy began in 1993, when biologists representing the National Park Service; U. S. Forest Service; U. S. Fish and Wildlife Service; Interagency Grizzly Bear Study Team; Idaho Department of Fish and Game; Montana Fish, Wildlife & Parks; and the Wyoming Department of Game and Fish were appointed to the Interagency Conservation Strategy Team⁷. In March 2000, a draft Conservation Strategy was released to the public for review and comment. Later the same year, a Governors' Roundtable was organized to provide recommendations from the perspectives of the three states that would be involved with management of grizzly bears after delisting. The Governors' Roundtable recognized the need to have state management plans that would give direction for grizzly bear management outside the PCA. The state management plans apply to management of grizzly bears outside the PCA, and describe the general areas that grizzly bears are likely to occupy in the foreseeable future.

In 2002, ~~the~~ 2007 Conservation Strategy was developed, and the state plans were completed. Although this 2016 version of the Conservation Strategy updates sections of the Strategy, the vision remains the same.

The vision of the Strategy can be summarized as follows:

- The PCA will be a secure area for grizzly bears, with population and habitat conditions maintained that have allowed the grizzly bear population to achieve recovery and expand outside the PCA.
- Outside of the PCA, grizzly bears will be allowed to expand into biologically suitable and socially acceptable areas.

⁷ ~~See pages 85 and 86 for the list of Interagency Conservation Strategy Team members.~~

- Manage a population within the area called the Demographic Monitoring Area (DMA), which is the area formerly called suitable habitat. The population objective in the DMA is at the average population size 2002-2014 when the population in this area was essentially stable. Use the model-averaged Chao2 population estimator applied inside the DMA to measure the population on an annual basis and to set the mortality limits within the DMA so as to maintain this average population size using a sliding scale of mortality for independent females and males, and dependent young.
- Outside of the PCA, the objective is to maintain existing resource management and recreational uses and to allow agencies to respond to demonstrated problems with appropriate management actions.
- Outside of the PCA, the key to successful management of grizzly bears lies in bears utilizing lands that are not managed solely for bears but in which their needs are considered along with other uses.
- Expand public information and education efforts.
- Provide responsive management to deal with nuisance grizzly bears.
- Manage grizzly bears as a game animal, including allowing regulated hunting when and where appropriate.

Relationship to Other Plans

~~Since the state of plans for Idaho, Montana, and Wyoming and the Tribes of the Wind River Indian Reservation all developed grizzly bear guide state management plans of a delisted grizzly bear population outside the PCA where grizzly bears will be allowed to occupy lands that are biologically suitable and socially acceptable, key linkages between the state plans and the Strategy are described throughout this document.~~ The state plans are integrated into the Strategy to ensure that the plans and the Strategy are consistent where necessary and complementary. The state and tribal management plans are formally incorporated in the Conservation Strategy as Appendices K, L, and M.^[RS6]

~~Relationships with a~~ National forest and national park plans are also ~~mentioned complimentary to this throughout the~~ Strategy. Land and resource management plans for ~~some~~ national forests and national parks, ~~and the Bureau of Land Management~~ in the GYAGYE have incorporated the habitat standards and other relevant provisions of the Conservation Strategy. Those standards and provisions not yet incorporated into management plans will be integrated into future land management plan amendments or revisions.

Background

The Grizzly Bear Population

The grizzly bear population in the lower 48 states was listed as threatened in 1975 pursuant to the Endangered Species Act of 1973.

The *Recovery Plan* established several demographic (population) recovery targets that must be achieved for a recovered grizzly bear population. All recovery targets are currently being met. ~~Demographic recovery targets and the 2001 status of the population are displayed in Chapter 2. When grizzly bears were listed in 1975, “indiscriminate illegal killing” and management removals were identified as threats to the population. In response, the Service and signatories to this Strategy implemented demographic recovery criteria to maintain a minimum population size, a well-distributed population, and establish mortality limits based on scientific data and direct monitoring of the population. Since implementing these criteria, the GYAGYE grizzly bear population has tripled in size and range (Eberhardt *et al.* 1994, pp. 361–362; Knight and Blanchard 1995, pp. 2–11; Boyce *et al.* 2001a, pp. 1–11; Schwartz *et al.* 2006, p. 48; Pyare *et al.* 2004, pp. 5–6; Schwartz *et al.* 2006a, pp. 64–66; Interagency Grizzly Bear Study Team 2012, p. 34; Bjornlie *et al.* 2014, p. 184).~~

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

~~As required in the *Recovery Plan*, monitoring of females with cubs-of-the-year occurred within the PCA and the 10-mile perimeter. There were 35 females with cubs-of-the-year (69 cubs) for the year 2000, 42 females with cubs-of-the-year (78 cubs) for the year 2001 (Haroldson and Schwartz 2002), and 50 females with cubs-of-the-year (97 cubs) in 2002 (IGBST 2002 files, unpublished). The number of females and the number of cubs documented in 2002 are the highest recorded.~~

~~In the GYA, there were 37 females with cubs-of-the-year (72 cubs) in 2000, 42 females with cubs-of-the-year (78 cubs) in 2001 (Haroldson and Schwartz 2002), and 52 females with cubs-of-the-year (102 cubs) in 2002 (IGBST 2002 files, unpublished).~~

~~Schwartz *et al.* (2002) documented the distribution of grizzly bears in the GYA from 1990 to 2000. They state: “A comparison of our results from the 1990s to previously published distribution maps shows an approximate increase in occupied habitat of 48% and 34% from the 1970s and 1980s respectively.”~~

~~The 2001 minimum population estimate for this ecosystem is 365 grizzlies with a total population estimate of 531 (Figure 9).~~

The Primary Conservation Area and the Demographic Monitoring Area

The Strategy identifies and provides a framework for managing habitat within a Primary Conservation Area (PCA) and managing demographic parameters within a Demographic Monitoring Area (DMA) (Figure 2[RS7]). The PCA boundaries (containing 23,853 sq km (9,210 sq mi)) correspond to those of the Yellowstone Recovery Zone (U.S. Fish and Wildlife Service 1993, p. 41) and will replace the Recovery Zone boundary (see Figure 2 below). The PCA contains adequate seasonal habitat components needed to support the recovered GYAGYE grizzly bear population for the foreseeable future and to allow bears to continue to expand outside the PCA. The PCA (formerly the recovery zone) contains the minimum seasonal habitat components needed to support the recovered grizzly bear population, as defined in the *Recovery Plan*. A recovered 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 Endangered Species Act have been successfully addressed. These factors are:

- The present or threatened destruction, modification, or curtailment of its habitat or range
- Overutilization for commercial, recreational, scientific, or educational purposes
- Disease or predation
- The inadequacy of existing regulatory mechanisms
- Other natural or human-caused factors affecting the population's continued existence

The PCA encompasses 9,209 square miles (5,893,760 acres, or 23,853 square kilometers) in three states: southeast Idaho, southwest Montana, and northwest Wyoming. The National Park Service and the U. S. Forest Service manage the majority of lands within the PCA; a small percentage of land is privately owned or managed by the states or the Bureau of Land Management (BLM).

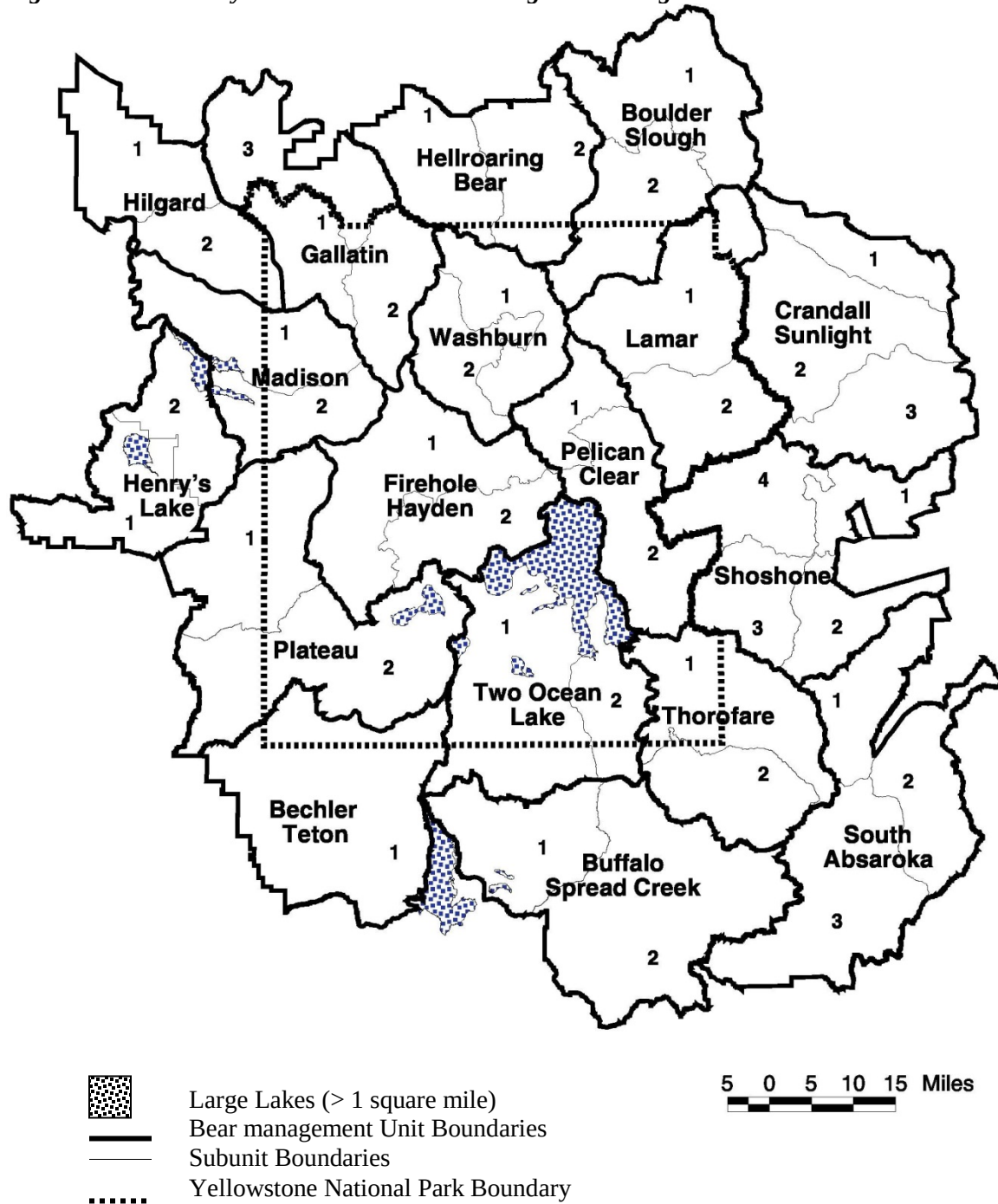
Figure-Table 1. Area of lands within the Primary Conservation Area by management type.

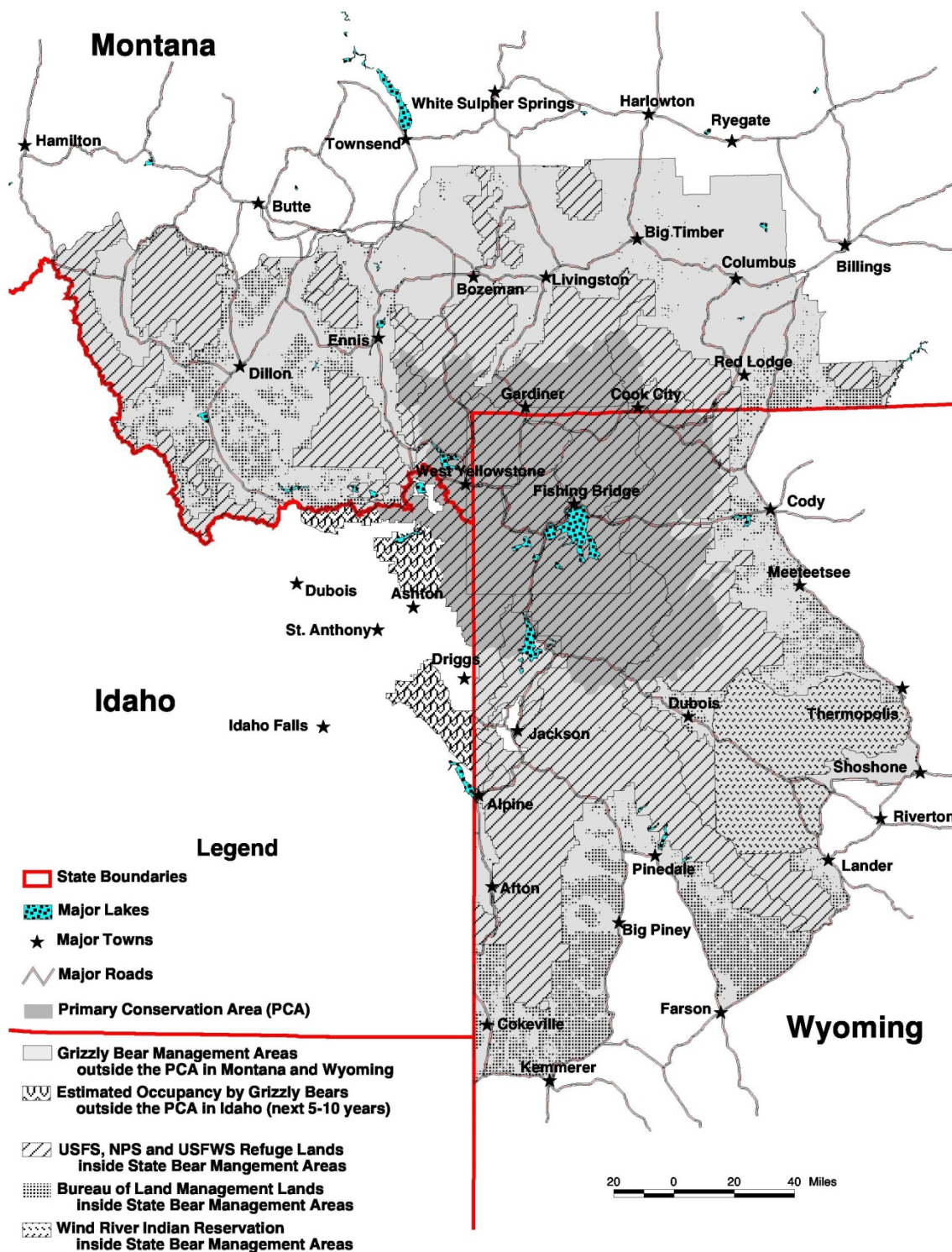
1.1.1 Management Type	Area (square miles)	Percent of the PCA
National Park Service	3,632	39.4
U. S. Forest Service	5,383	58.5
Private and Other Ownerships	195	2.1
TOTAL	9,210	100

To facilitate habitat management and ensure habitat was well distributed, the ~~recovery zone~~PCA was divided. The PCA has been divided into 18 bear management units (BMUs) and 40 subunits. BMUs are used to measure the distribution of females with offspring while and monitor population and habitat conditions; subunits allow better resolution of habitat measurement (Figure 2). Habitat protections inside the PCA that allowed the recovery of the grizzly bear population will be maintained. See Figure 3 for grizzly bear management areas specified in the Strategy and the state management plans.

Grizzly bears occupy lands outside the PCA and their distribution has increased (Schwartz et al. 2002).

Figure 2. The Primary Conservation Area showing bear management unit and subunit boundaries.





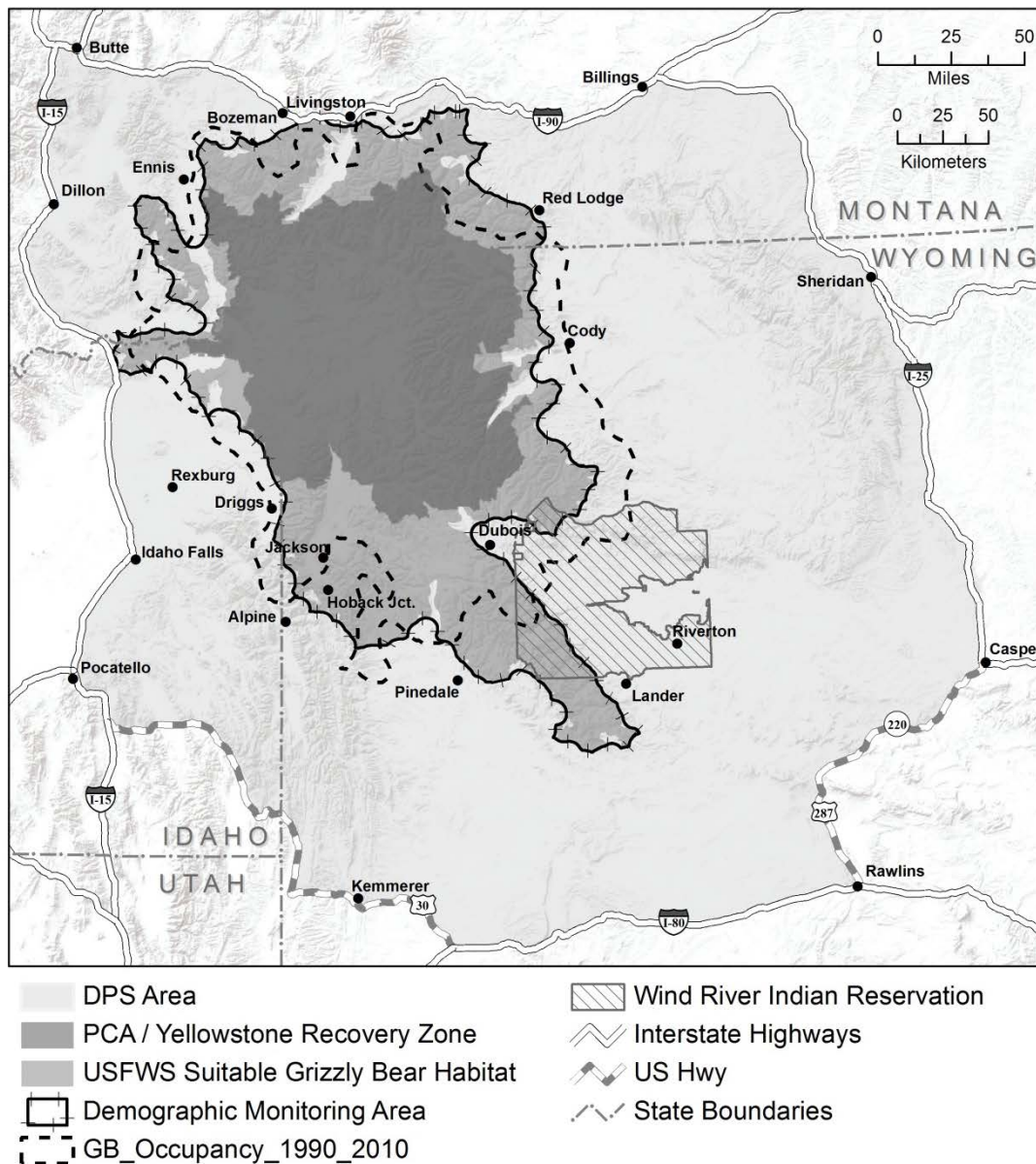


Figure [RS8]3. Map of the Greater Yellowstone Area Ecosystem. Boundaries are shown for: (1) the GYAGYE grizzly bear Distinct Population Segment Area (the legal boundary where grizzly bears would be delisted); (2) the Primary Conservation Area (PCA); (3) the Demographic Monitoring Area (DMA); and (4) the 2010 distribution of grizzly bears; Potential grizzly bear management areas specified in the Conservation Strategy and state management plans.

Characterization of Grizzly Bear Habitat

Background on the Area Necessary for a Recovered Population

Grizzly bears are one of the subspecies of brown bears, which range throughout diverse areas and habitats in Europe, Asia, and North America. Brown bears have the most widespread distribution of any bear species and live in the widest range of habitats of any bear species including deserts, boreal forests, arctic tundra, coniferous forests, deciduous forests, alpine areas, and coastal rainforests. At minimum, grizzly bears need food, seasonal foraging habitat, denning habitat, and security in an area of sufficient size for survival. Bears overlap in home ranges and change densities based on a variety of social and environmental factors. However, the precise mixture of these diverse elements and the precise size of the area necessary to support a population of grizzly bears are impossible to specify. To a great degree, the difficulty lies in the fact that grizzly bears are long-lived opportunistic omnivores whose needs for foods and space vary depending on a multitude of environmental and behavioral factors and on variation in the experience and knowledge of each individual bear. The key to establishing habitat criteria that will maintain a healthy population is to look to the habitat factors in the past that produced a grizzly [bear](#) population in the Yellowstone area that is increasing in numbers and expanding in range. Habitat factors that produced a healthy population in the past were used to establish the habitat criteria for the future that must be maintained if a healthy population continues to be preserved.

The available habitat for bears is largely determined by human activities. Human activities are the primary factor impacting habitat security. Human activities and the social structure and relationships among resident bears are the two major influences on the accessibility of available foods for bears. The issue of how many [grizzlies-grizzly bears](#) can live in any specific area is a function of overall habitat productivity, annual production, availability of important foods, and the levels and types of human activities. There is no known way to calculate the number of grizzly bears that can live in an area in relation to ongoing changes in habitat values or to fully understand the social system of the grizzly [bear](#) and how it is influenced by changes in bear density and related social interactions at various densities. As food availability fluctuates, there are corresponding changes in bear density in important use areas and changes in social tolerance within the bear population. This in turn will affect age-specific survivorship. Additional numbers of bears in many areas will result in the expansion of bear range, increasing grizzly bear-human conflicts, and erosion of public support for bears. All these factors interact.

A viable and therefore recovered population is one that has high long-term prospects for survival within acceptable levels of risk. Population size is an important factor in understanding population survival (Boyce 1992, Caughley 1994). However, there is no quantitative way to estimate precisely the number of animals required for a viable population of any species (Boyce 1992, 1993). From the mid 1980s, the Yellowstone grizzly [bear](#) population has grown at approximately 3 to 4% or more per year (Eberhardt *et al.* 1994, Boyce 1995, Boyce *et al.* 2001**b**). Boyce (1995) has calculated that the Yellowstone population currently has a probability of extinction of 0.0004 (4/10,000)—a very low probability. Nevertheless, as Boyce points out, “population size alone is not a sufficient criterion for evaluating population viability,” and “even though a population may have increased or decreased over the past 10 to 20 years, this offers no

indication that the population will continue on the same trajectory in the future.” The best way to ensure a healthy population of grizzly bears is to monitor both population and habitat parameters closely and respond when necessary with adaptive management (Walters and Holling 1990) addressing the problems of the population in a dynamic way. That is what this Conservation Strategy is designed to accomplish.

The PCA has provided the vast majority of habitat for the currently increasing population in the Greater Yellowstone [AreaEcosystem](#). This area will continue to be managed and monitored carefully to maintain ~~habitat effectiveness and~~ habitat security, and to limit access-related disturbances and developed sites on public lands at or below 1998 levels. The [YellowstoneGYE area](#) grizzly [bear](#) population was increasing at a rate of 3 to 4% per year as of 1998 (Boyce *et al.* 2001**b**). Due to this ongoing bear population increase, 1998 was chosen as the baseline year for measurement of levels of human activities. The 1998 habitat baseline ~~in terms of human activities including values for~~ secure ~~habitat and motorized access route density~~, developed sites on public lands, ~~and~~ livestock grazing, ~~habitat effectiveness, and habitat value of secure habitats is described in detail~~ are shown in Appendix F.

Food

The broad historic distribution of grizzly bears suggests adaptability in food habits of different populations. Although the digestive system of bears is essentially that of a carnivore, bears are successful omnivores, and in some areas may be almost entirely herbivorous. Bears feed on animal matter or vegetable matter that is highly digestible and high in starch, sugars, protein, and stored fat.

Grizzly bears must avail themselves of foods rich in protein or carbohydrates in excess of maintenance requirements in order to survive denning and post-denning periods. Other plant materials are eaten as they emerge, when crude protein levels are highest.

Grizzly bears are opportunistic feeders and will prey or scavenge on almost any available food including ground squirrels, ungulates, carrion, and garbage. 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. The search for food has a prime 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. Throughout late spring and early summer, they follow plant maturity back to higher elevations. In late summer and fall, there is a transition to fruit and nut sources, as well as other plant materials. This is a generalized pattern, however, and it should be kept in mind that bears are individuals trying to survive and will go where they can best meet their food requirements.

Specific to the [GYAGYE](#), four seasonal foods have been identified ~~as being important to the population for monitoring~~. These are: [winter-killed](#) ungulates (primarily elk (*Cervus elaphus*) and bison (*Bison bison*), but also deer (*Odocoileus species*) and moose (*Alces alces*)), spawning cutthroat trout, ~~seeds of~~ whitebark pine [seeds](#), and army cutworm moths. The ~~Major High-~~

[Calorie](#) Foods section in Chapter [4.3](#) provides more detail about the components of grizzly bear diet.

Cover

The relative importance of cover to grizzly bears was documented by Blanchard (1978) in a four-year study in the [GYAGYE](#). The importance of an interspersed open parks as feeding sites associated with cover is also recorded in Blanchard's study.

Changes in the distribution and quantity and quality of cover are not necessarily detrimental to grizzly bears. The Interagency Grizzly Bear Study Team studied the effects of the large 1988 wildfires on grizzly bears. "On the average, grizzly bears used burned habitats in proportion to their availability within individual annual ranges during 1989 to 1992. Seasonal indices of movement and annual range sizes of cohorts are not statistically different from the 1975 to 1987 averages" (Blanchard and Knight 1996).

Denning

Grizzly bears excavate dens. Dens are usually dug on steep slopes in forest cover where wind and topography cause an accumulation of deep snow and where the snow is unlikely to melt during warm periods. Elevations of dens vary geographically; generally, they are found at higher elevations well away from development or human activity. Abundant denning habitat is available and is not considered a limiting factor for grizzly bears (Podruzny and Gunther 2002).

Secure Habitat

History has demonstrated that grizzly bear populations survived where frequencies of contact with humans were very low. Populations of grizzly bears persisted in those areas where large expanses of relatively secure habitat were retained and where human-induced mortality was low. In the Yellowstone area, this is primarily associated with national parks, wilderness areas, and large blocks of public lands (IGBC 1998). Habitat security requires minimizing mortality risk and displacement from human activities in a sufficient amount of habitat to allow the population to benefit from this secure habitat and respond with increasing numbers and distribution. Habitat security allows a population to increase in numbers and distribution as lowered mortality results in more reproduction and cub recruitment into the adult population. This results in an increasing population. As the population increases, it begins to expand in range and distribution. Both of these responses to habitat security are currently ongoing in the Yellowstone population as the population is increasing at 3 to 4% per year (Boyce *et al.* 2001**[b](#)**), and increasing in distribution (Schwartz *et al.* 2002). Maintaining habitat security is a major goal of this conservation strategy.

By managing motorized access, the following grizzly bear management objectives can be met (IGBC 1998):

- Minimize human interaction and potential grizzly bear mortality
- Minimize displacement from important habitats

- Minimize habituation to humans
- Provide relatively secure habitat where energetic requirements can be met

Historically, management of motorized use has been primarily accomplished through restriction of certain types of motorized use on established access routes, i.e., management of open motorized route densities. Recent research has shown that secure habitat (areas that are free of motorized traffic, also referred to as core areas) is an important component of grizzly bear habitat (IGBC 1998).

The management of human use levels through access route management is one of the most powerful tools available to balance the needs of grizzly bears with the needs and activities of humans. It has been documented in several research projects, completed and ongoing, that unregulated human access and development within grizzly bear habitat can contribute to increased bear mortality and affect bear use of existing habitat (IGBC 1998).

Management Improvements and Mortality Reduction Efforts

Since listing of the grizzly bear under the Endangered Species Act (ESA), government agencies (federal, [tribal](#), state, county, and city), organizations, and individuals have worked to improve management coordination and habitat conditions, minimize grizzly bear-human conflicts and bear mortality, and increase public awareness and appreciation for the grizzly bear in the [GYAGYE](#).

Summary of Management Improvements Related to Habitat

- The Interagency Grizzly Bear Committee (IGBC) was created to coordinate management efforts across multiple federal lands and different states. The Yellowstone Ecosystem Subcommittee was also created to coordinate efforts specific to the [GYAGYE grizzly bear](#). These committees cooperated in developing the *Interagency Grizzly Bear Guidelines* (IGBC 1986) and the *Interagency Grizzly Bear Committee Taskforce Report on Grizzly Bear/Motorized Access Management* (IGBC 1998). These guidelines were instrumental in changing land management practices on federal lands to provide security and to maintain or improve habitat conditions for the grizzly bear.
- The Interagency Grizzly Bear Study Team was created to provide scientific information for the management and recovery of the grizzly bear in the [GYAGYE](#). Scientific protocols have been developed to monitor the grizzly bear population and important habitat parameters.
- Federal and state agencies developed nuisance bear guidelines to manage bears that become habituated to human foods and refuse. The overall objective of these guidelines is to provide a quick response to grizzly bear-human confrontations.
- Miles of open motorized access routes have been reduced through restrictions (such as gates and signs on motorized routes) and decommissioning (the route is no longer available for motorized use), thereby reducing open motorized access route densities and increasing secure habitat for the grizzly bear.

- Highway design changes have been implemented, including changed guardrail heights to allow cub crossings; minimized cut-slope barrier walls to facilitate movement; revegetation planting to provide cover, minimize exotic plants, and discourage planting of palatable foods; and narrower rights of way and road widths.
- Federal land management agencies have closed areas to cross-country motorized travel to provide more security for grizzly bears.
- Federal land management agencies have closed some areas to all human entry during certain seasons to increase human safety and provide security for grizzly bears.
- Many areas in the [GYA-GYE](#) have been closed to oil and gas leasing, or have restrictions (such as no surface occupancy) on oil and gas leasing to protect grizzly bear habitat.

Mortality Reduction Efforts Related to Habitat

Significant reductions in the human-caused bear mortality rate have been the primary reason the bear population is now meeting the demographic sub-goals established in the *Recovery Plan*. In addition to the above management improvements, the following actions have been found to be effective in limiting grizzly bear mortality and grizzly bear-human conflicts. These actions have been ongoing and will continue inside the PCA.

- Federal land management agencies have implemented and monitored compliance with food storage orders that require people using grizzly bear habitat to store food and refuse properly on public lands so bears will not become habituated to unnatural foods. This also reduces grizzly bear-human encounters.
- Bear-resistant garbage containers have been installed in campgrounds, picnic areas, and other public use areas on federal lands. Garbage collection schedules have been improved to collect garbage before it becomes an attractant to grizzly bears.
- Some counties and communities have improved their landfills and garbage collection systems to reduce or prevent conflicts with grizzly bears.
- Numerous education and information materials and programs have been developed by federal and state agencies and various organizations, to teach those living, working, and recreating in grizzly bear country how to be safe, to reduce grizzly bear-human encounters, and minimize grizzly bear mortality. Non-agency participation is encouraged.
- The state wildlife agencies have developed active management/conflict resolution programs to help minimize conflicts between people and bears.
- To provide increased protection for grizzly bears, Montana does not allow baiting or hound hunting for bears. Wyoming prohibits hound hunting within the state, and baiting is not allowed within the PCA. Baiting and use of hounds are not allowed within the PCA in Idaho.
- The number of domestic sheep allotments and the number of domestic sheep grazing within the PCA has been reduced; the remaining domestic sheep allotments are to be phased out as opportunities arise. Sheep grazing permittees and herders must follow strict requirements in their grazing permits to protect grizzly bears and reduce grizzly bear-grazing conflicts.
- Individuals and organizations with special use permits on federal lands must follow strict requirements in their special use permits to protect grizzly bears and reduce grizzly bear-human conflicts.

- Adjustments have been made on cattle grazing allotments within the PCA, and cattle permittees must follow strict requirements in their grazing permits to protect grizzly bears and reduce grizzly bear/grazing conflicts.
- The IGBST coordinates an annual analysis of the causes of conflicts and known and probable mortalities, and proposed management solutions. Reports were reviewed by the Yellowstone Ecosystem Subcommittee and appropriate actions initiated. The Yellowstone Grizzly [Bear](#) Coordinating Committee will continue this review process.
- Federal and non-federal landowners have cooperated in limiting grizzly bear mortality and grizzly bear/human conflicts.
- Livestock and road-killed carcasses are managed to minimize grizzly bear/human conflict. Hunters are encouraged to quickly care for and remove hunter-killed carcasses to minimize grizzly bear/human conflicts.
- State and federal law enforcement agents have cooperated to ensure consistent enforcement of laws protecting grizzly bears. A task force of state and federal prosecutors and enforcement personnel from each state and federal jurisdiction will work together to make recommendations to all jurisdictions, counties, and states, on uniform enforcement, prosecution, and sentencing relating to illegal grizzly bear kills.
- When reclaiming or obliterating motorized access routes or restricting motorized or non-motorized access, priority has been and will be given to areas with historical grizzly bear/human conflicts or areas of probable grizzly bear/human conflicts
- Appropriate actions to reduce mortality will be implemented as described in the state plans outside the PCA where grizzly bears occur or can reasonably be expected to occur when and where possible to improve public safety and minimize grizzly bear mortality.

Recovery of the grizzly bear in the [GYA-GYE](#) is the result of partnerships between federal and state agencies, the governors of three states, county and city governments, educational institutions, numerous organizations, private landowners, and the public who live, work, and recreate in the [GYA-GYE](#). Maintenance of a recovered grizzly [bear](#) population depends on these partnerships.

Chapter 2 Population Standards and Monitoring

~~NOTE: Portions of the material in this section have been revised and updated based on the best available science since the Conservation Strategy was completed in 2003. The superseded text has been identified with strikethrough to show these revised sections. These areas of text have been retained in this section so the reader can refer to the old methods as necessary. The updated material can be found in Appendix C. This revision was done as per the 2003 Draft Final Conservation Strategy (USFWS 2003, pp. 14, 126). This update was accomplished by an interagency team under the leadership of the Study Team, which produced two documents that provided the scientific foundation for these revisions (IGBST 2005, 2006). These documents are provided as appendices to this Conservation Strategy in Appendix N and Appendix O. This revision process was open to public comment (70 FR 70632, November 22, 2005) and the Fish and Wildlife Service responses to public comments received can be found at <http://mountain-prairie.fws.gov/species/mammals/grizzly/yellowstone.htm>.~~

Introduction

To maintain a healthy (recovered) grizzly bear population in the GYAGYE, it is necessary to have adequate numbers of bears that are widely distributed with a balance between reproduction and mortality. This section details the demographic criteria in the 1993 Recovery Plan that were necessary to achieve recovery, and the criteria necessary to maintain it in the Recovery Plan Supplement. 1993 Recovery Plan criteria focused on the PCA and a 10-mile perimeter, whereas criteria in the Strategy, the 2016 Recovery Plan Supplement: Revised Demographic Criteria for the Yellowstone Ecosystem, and the appended state plans encompass the entire Demographic Monitoring Area (DMA) of the GYAGYE. Because grizzly bears are a difficult species to monitor and manage, multiple criteria are identified to provide sufficient information upon which to base management decisions.

The IGBST has generated extensive information useful to determine the status of the GYAGYE grizzly bear population. Few populations have benefited from the amount of effort in data collection, as has the Yellowstone population. Agencies responsible for management will continue their commitment to data collection so population status can be determined and all designated standards maintained.

~~The standards described here may vary from those in the Recovery Plan. For example, the Recovery Plan criterion related to the number of unduplicated females referred to the recovery area plus a 10-mile area surrounding it. However, u~~Under this Conservation Strategy and the 2016 Recovery Plan Supplement: Revised Demographic Criteria for the Greater Yellowstone Ecosystem, all mortalities and all reports of unduplicated females with cubs using the model-average Chao2 method (see Appendix C) will be monitored in all areas within the DMA where grizzly bears occur in Figure 3. This will result in the management and monitoring of the grizzly bear population in the entire Yellowstone GYE DMA area as a single population, as opposed to the system in the 1993 Recovery Plan, which managed and monitored only the population inside the recovery zone and 10 miles outside the recovery zone. This wider monitoring of mortalities and accounting for mortality limits is more stringent than ~~the~~ the system under the 1993 Recovery Plan ~~and allows management of the entire population, like management of most other wildlife~~

~~species~~. None of the standards in the Strategy are associated with the 10-mile area. Conservation Strategy standards and the standards in the state plans are tied to either the PCA or ~~all areas within the Grizzly Bear Management Area~~~~the DMA~~, shown in Figure 3. The criteria and objectives of the existing 1993 Recovery Plan have been included or modified, as the 1993 Recovery Plan will no longer apply.

Population Monitoring

Primary monitoring protocols for this population will focus on being able to assess whether the demographic standards described ~~in Appendix C of this Conservation Strategy are being achieved~~. Additional monitoring or research may be conducted as determined by the IGBST.

Demographic Recovery Criteria from the ~~1993 Recovery Plan~~ 2016 Recovery Plan Supplement: Revised Demographic Criteria for the Greater Yellowstone Ecosystem

~~(Portions of this section are superceded by the methodology in Appendix C)~~
The 1993 Recovery Plan defined a recovered grizzly bear population as one that could sustain a defined level of mortality and is well distributed throughout the recovery zone. The 1993 Recovery Plan outlined a monitoring scheme that employed three demographic sub-goals to measure and monitor recovery of the Yellowstone grizzly bear population. The second criterion pertaining to the distribution of females with offspring remains unchanged. However, the first and third criteria pertaining to the minimum allowable number of females with cubs of the year and sustainable mortality limits are hereby revised and updated to reflect current methods based on the best available science. The current demographic recovery criteria in the 2016 Recovery Plan Supplement are:~~They include:~~

Demographic Recovery Criterion 1— Within the Demographic Monitoring Area (DMA), maintain a minimum population size of at least 500 animals to assure genetic health, as quantified by methods established in published, peer-reviewed scientific literature and calculated by the IGBST using the most updated protocol, as posted on their website. This number was chosen to ensure the short-term fitness of the population was not threatened by losses in genetic diversity in such an isolated population. Five hundred is not a management target or population goal. Instead, it is a minimum population threshold. The goal is to maintain the population well above this threshold to ensure that genetic issues are not a detriment to the short-term genetic fitness of the GYE grizzly bear population. At this threshold population of 500, more than a third of the suitable habitat in the DMA would be unoccupied (van Manen 2015, in litt.) and therefore the grizzly bear population could not be considered demographically recovered. The demographic population target will be reached when the population has stabilized and will be indicated by vital rates exhibited at the time the population occupies all suitable habitat in sufficient densities so that population growth slows due to density-dependent regulation effects. The existence of these vital rates, occupancy by grizzly bears of almost all of suitable habitat, and density dependent population regulation inside the DMA have now been demonstrated by van Manen et al. (2015) for the average population size 2002–2014. For genetic health, the annual estimate of total population size cannot drop below 500. The IGBST has been calculating population size on an annual basis using the model-averaged Chao2 estimate since 2002. As the

grizzly bear population has increased, model-averaged Chao2 estimates have become increasingly conservative (i.e., prone to underestimation). As a conservative approach to population estimation, the model-averaged Chao2 method will continue to be the method used to assess Criterion 1 (see *Appendix C* for the application protocol for annual population estimation using the model-averaged Chao2 method). The IGBST will continue to investigate new methods for population estimation as appropriate. If new methods become available, these will be considered for application in the GYE as long as they represent the best available science. However, until possible new methods are developed, the model-averaged Chao2 method will continue to be used.

Demographic Recovery Criterion 2—Sixteen of 18 bear management units within the PCA (see map at <http://www.fws.gov/mountain-prairie/es/grizzlyBear.php>) must be occupied by females with young, with no two adjacent bear management units unoccupied, during a 6-year sum of observations. This criterion is important as it ensures that reproductive females occupy the majority of the PCA and are not concentrated in one portion of the ecosystem.

Demographic Recovery Criterion 3—Within the DMA, establish annual mortality limits for independent females (at least 2 years old), independent males (at least 2 years old), and dependent young (less than 2 years old) that stabilizes the population at approximately the average model-averaged Chao2 estimate 2002–2014 of 674 (average lower 95% CI = 600; average upper 95% CI = 747). Each year the IGBST will calculate the model-averaged Chao2 population estimate for the DMA. This population estimate will be used to set the mortality limits for the following year. These mortality rates will be on a sliding scale with the population objective being to maintain the population within the DMA at the 2002–2014 average (using the Chao2 estimate this is 674 (average lower 95% CI = 600; average upper 95% CI = 747)). The mortality rate that resulted in population stability 2002–2011 was 7.6% for independent females, 7.6% for dependent young, and 15% for independent males (IGBST 2012). The higher rate for independent males is biologically sound since population growth is less sensitive to independent male mortality than to independent female mortality. In order to maintain the population goal at the 2002–2014 average size inside the DMA, a sliding scale of mortality rates will be applied to the model-averaged Chao2 population estimate from the year before as per Table 1. Mortalities are tracked and reported annually using data obtained within the DMA shown in Figure 2.

-
- Maintain a minimum of 15 unduplicated females with cubs of the year (COY) over a six-year average both inside the recovery zone and within a 10-mile area immediately surrounding the recovery zone (14,497 square miles).
 - Maintain a minimum of 48 females with cubs of the year in the GYE DMA (Figure 3), which is equivalent to a population of approximately 500 total individuals. The number of females with cubs of the year cannot drop below 48 for any 2 consecutive years. For genetic reasons (Miller and Waits 2003) it is desirable that the total population of grizzly bears in the GYE be maintained above 400 bears. To assure that this goal is met and in order to adopt a conservative approach, the total population will be maintained at or above 500 grizzly bears in the GYE. The estimate of 48 adult females with cubs of the year will be calculated by the IGBST based on model averaging as described in the *Reassessing Methods to Estimate Population Size and Sustainable Mortality Limits for the Yellowstone Grizzly Bear: Workshop document supplement on 19-21 June 2006* (IGBST 2006, Appendix O_[JF9]).

~~———— Sixteen of 18 Bear Management Units (BMUs) within the recovery zone PCA must be occupied by females with young, including COY, yearlings, or two-year olds, as confirmed by the IGBST from a six-year sum of observations. No two adjacent BMUs may be unoccupied during the same six-year period. This is equivalent to verified evidence of at least one female grizzly bear with young at least once in each BMU over a six-year period.~~

Table 1. Mortality limits inside the DMA using the model-averaged Chao2 population estimate method. These mortality limits are on a sliding scale to achieve the population goal inside the DMA of the average population size 2002–2014 of 674 (average lower 95% CI = 600; average upper 95% CI = 747) using the Chao2 method inside the DMA. For populations less than 600, there will be no discretionary mortality unless necessary for public safety or management of bear-human conflicts.

<u>Mortality limit % for independent FEMALES (using model-averaged Chao2 method)</u>	<u>Pop. Size using Chao2</u>	<u><600</u>	<u>601–673</u>	<u>674</u>	<u>675–747</u>	<u>>747</u>
	<u>Mort. %</u>	<u>No discretionary</u>	<u><7.6%</u>	<u>7.6%</u>	<u>9%</u>	<u>10%</u>
<u>Mortality limit % for independent MALES (using model-averaged Chao2 method)</u>	<u>Pop. Size using Chao2</u>	<u><600</u>	<u>601–673</u>	<u>674</u>	<u>675–747</u>	<u>>747</u>
	<u>Mort. %</u>	<u>No discretionary</u>	<u>15%</u>	<u>15%</u>	<u>20%</u>	<u>22%</u>
<u>Mortality limit for % of DEPENDENT YOUNG (using model-averaged Chao2 method)</u>	<u>Pop. Size using Chao2</u>	<u><600</u>	<u>601–673</u>	<u>674</u>	<u>675–747</u>	<u>>747</u>
	<u>Mort. %</u>	<u>No discretionary</u>	<u><7.6%</u>	<u>7.6%</u>	<u>9%</u>	<u>10%</u>

- ~~• For independent females (at least 2 years old), the current annual mortality limit, not to be exceeded in 2 consecutive years and including all sources of mortality, is 7.6 percent of the total number of independent females. For independent males (at least 2 years old), the current annual mortality limit not to be exceeded in 3 consecutive years and including all sources of mortality, is 15 percent of the total number of independent males. For dependent young (less than 2 years old), the current annual mortality limit, not to be exceeded in 3 consecutive years and including only known and probable human-caused mortalities, is 7.6 percent of the total number of dependent young. The Study Team will conduct a management review every 5 years to assess the population numbers and trend against the management objective based on all available scientific data. Vital rates such as age/sex-specific survival and reproductive rates will also be reevaluated using the most recent data to adjust sustainable mortality levels as necessary.~~

- ~~The running six-year average for total known, human-caused mortality as confirmed by the IGBST is not to exceed 4% of the minimum population estimate. The running six-year average annual known, human-caused female grizzly bear mortality is not to exceed 30% of the 4% total mortality limit over the most recent three-year period. These mortality limits cannot be exceeded in any two consecutive years. Beginning in 2000, probable mortalities were included in the calculation of mortality thresholds, and COY orphaned as a result of human causes will be designated as probable mortalities. Sex of probable mortalities for young is randomly assigned as described in the Monitoring Protocol for Mortality section of the Strategy.~~

Conservation Strategy Population Standards

This Conservation Strategy and the state management plans set an objective of maintaining a recovered grizzly bear population in the Yellowstone area sufficient to meet management objectives inside and outside the PCA in biologically suitable and socially acceptable habitats. The demographic standards in this Conservation Strategy are designed to meet these goals. The GVA-GYE grizzly bear population exceeds 500 total bears as of 2006 (Appendix O). The intent of the Conservation Strategy is to allow grizzlies-grizzly bears to expand their range and numbers and reoccupy all biologically suitable and socially acceptable habitats. It is the goal of the agencies of the YGCC implementing this Conservation Strategy to manage-stabilize the Yellowstone grizzly bear population inside the DMA population in the entire GVA at or above 500 total grizzly bears the 2002-2014 average Chao2 population estimate of 674 individuals (average lower 95% CI = 600; average upper 95% CI = 747).

This Conservation Strategy requires continued monitoring of the standards in the 2016 Recovery Plan Supplement originally prescribed by the to the 1993 Recovery Plan and some additional standards. Specific population standards, and the area they are applied to, will vary. For example, the standards for mortality will be applied to all areas occupied by grizzly bears, while the standard for the spatial distribution of females with young will be applied only to the PCA the population within the DMA. The population standards to be met in this Conservation Strategy include:

The total population (Appendix C) throughout the ecosystem must be more than 500 bears to ensure a minimum loss of genetic diversity (Miller and Waits 2003). (Appendix D provides information about genetic management and monitoring.)

Sixteen of 18 bear management units (BMUs) within the PCA will be occupied by females with young as confirmed by documented reports by the IGBST from a six-year sum of observations; no two adjacent BMUs may be unoccupied during the same six-year period. This is equivalent to verified evidence of at least one female grizzly bear with young at least once in each BMU over a six-year period. While this standard will apply only to the PCA, all three state management plans propose to let bears expand into additional suitable habitats.

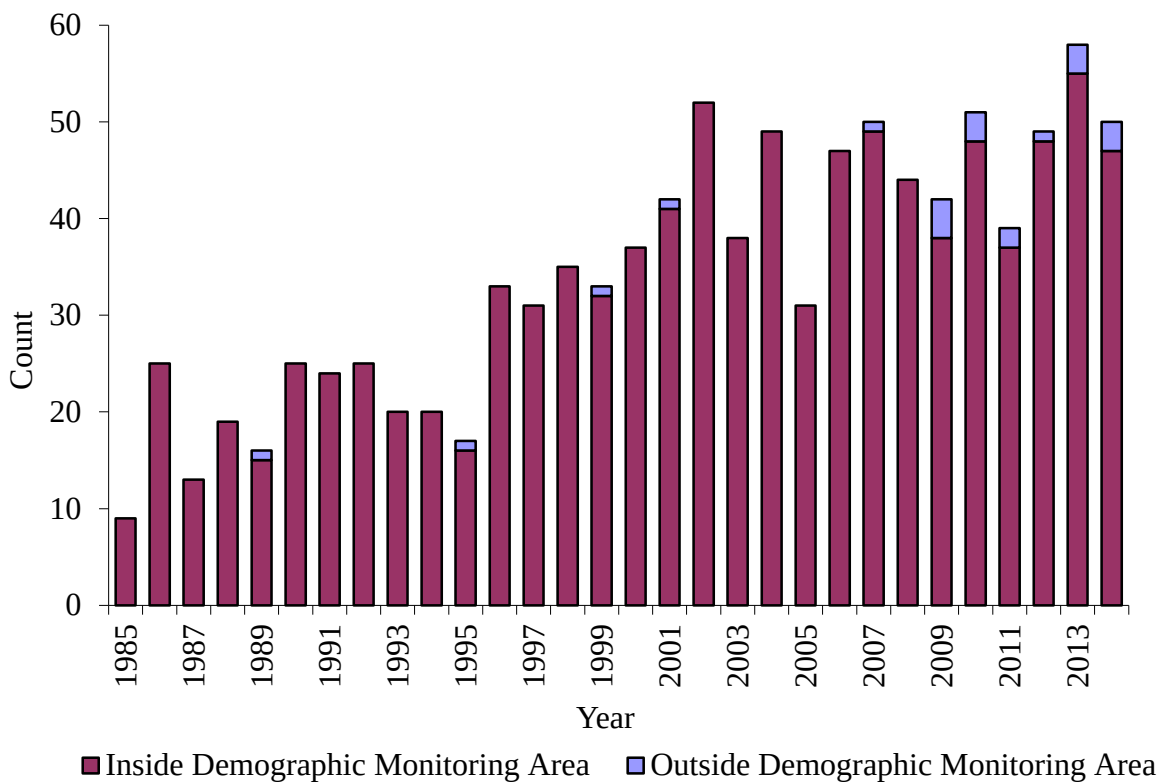
For independent females (> 2 years old), the annual mortality limit, not to be exceeded in 2 consecutive years and including all sources of mortality, is 9 percent of the total number of independent females. For independent males (> 2 years old), the annual mortality limit not to be exceeded in 3 consecutive years and including all sources of mortality, is 15 percent of the total number of independent males. For dependent young ($\leq$ 2 years old), the annual mortality limit, not to be exceeded in 3 consecutive years and including known and probable human-caused mortalities only, is 9 percent of the total number of dependent young.

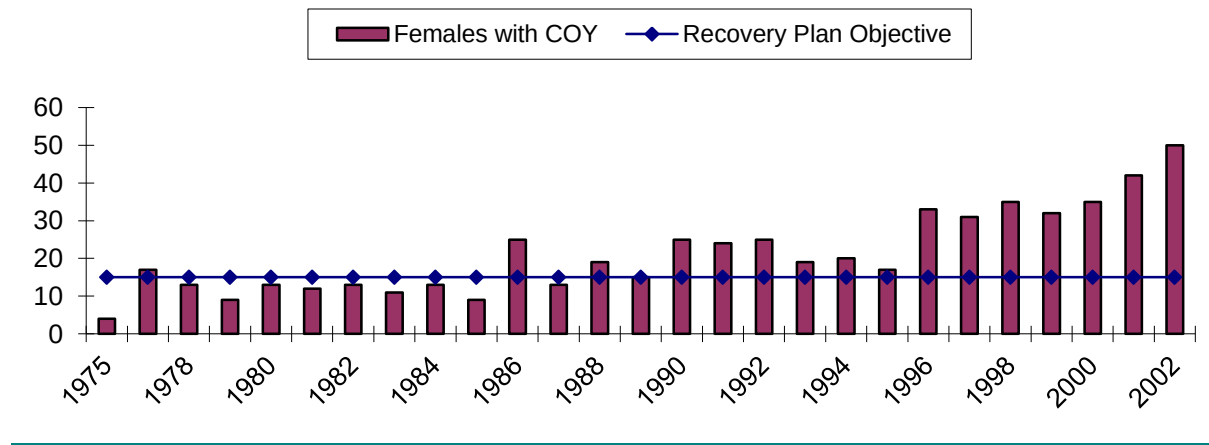
Unduplicated Females with Cubs-of-the-Year

Background

The recovery criterion for the number of unduplicated females with COY (15) has been exceeded since 1988 (Figure 4). In fact, the number of females with COY has exceeded 30 every year since 1996. Fifty females with COY were observed in 2002. Females with COY also occupy all of the existing bear management units within the PCA as well as areas outside the PCA (Figure 5).

Figure 4. The number of unduplicated females with cubs-of-the-year ~~within~~inside and outside the Primary Conservation Area and the 10-mile-perimeter-area Demographic Monitoring Area, as per the Recovery Plan, ~~1975~~1985–20022014.

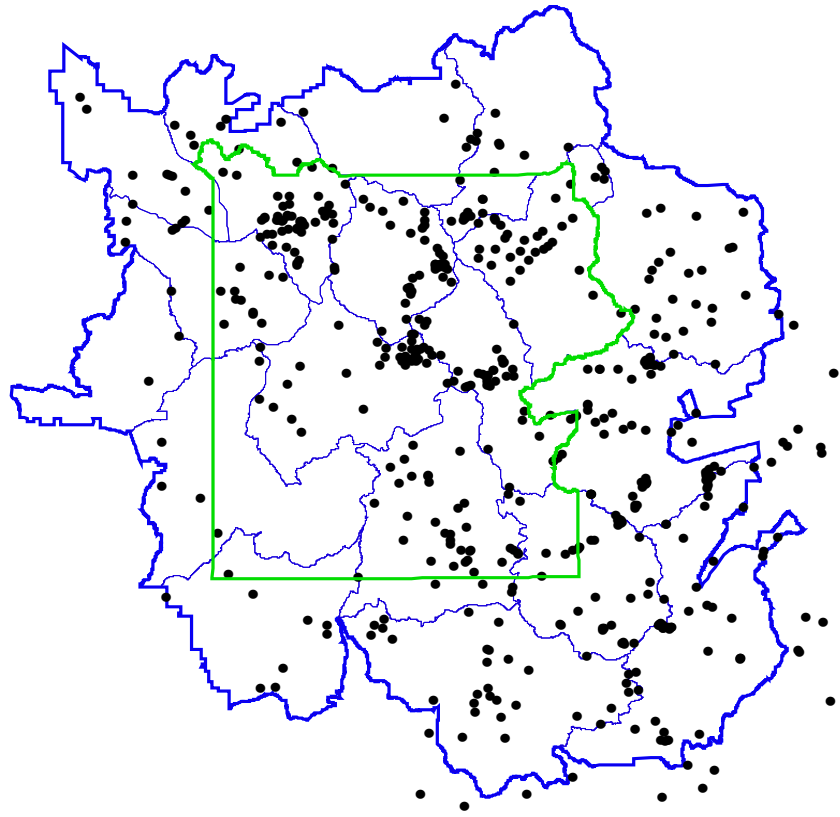




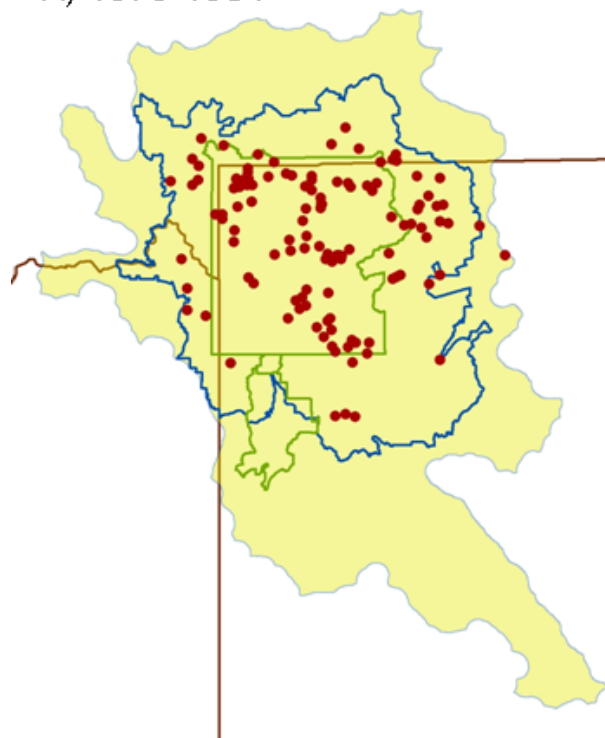
Monitoring Protocol

Monitoring unduplicated females with COY will provide information to demonstrate adequate reproduction and to estimate *total* population size. *Total* population size will be estimated, as described in [Appendices B, C, N, and O](#) ^[JF10] using the sightings and resightings of unduplicated females with cubs from all areas where grizzly bears occur in Figure 3. This is a departure from the way the population estimate was done per the [1993 Recovery Plan](#). In the [1993 Recovery Plan](#), a *minimum* population estimate was made based on the most recent three years of sightings of unduplicated females with cubs, using only unduplicated sights from the recovery zone and 10 miles outside the recovery zone. The revised and improved methodology used in this document allows an estimate of the *total* [population using the model-averaged Chao2 method](#) rather than the *minimum* population size. This allows the calculation of mortality limits based on the total population size of each age and sex class (i.e., independent females, independent males, and dependent young) within the entire area in Figure 3 occupied by the Yellowstone grizzly bear population. This method allows mortality management and population monitoring of ~~the entire Yellowstone area GYE~~ grizzly bear [DMA](#) population, as opposed to the method used in the *Recovery Plan*, which focused mortality management and population monitoring on only a portion of the Yellowstone grizzly bear population [inside the PCA and within 10 miles of the outer boundary of the PCA](#). The number of females with COY can also be used to demonstrate that a sufficient number of adult females are alive within the population to reproduce and offset existing levels of human-caused mortality. ~~These data for the PCA will be evaluated concerning established population management standards.~~ The most recent year of unduplicated sightings and resightings of females with cubs of the year will be reported by the IGBST. Using these data, the IGBST will produce the model-averaged Chao2 estimate of the total number of independent females in the population [inside the DMA](#) which will then be used to estimate the total population size [in the DMA](#). This total population estimate will be used to calculate biologically sustainable mortality limits [within the DMA](#) for both independent females (> 2 years old) and independent males (> 2 years old) from all causes as well as sustainable mortality limits for dependent young ($\leq$ 2 years old) from human-caused mortality. For a more detailed description of this methodology, see Appendix C.

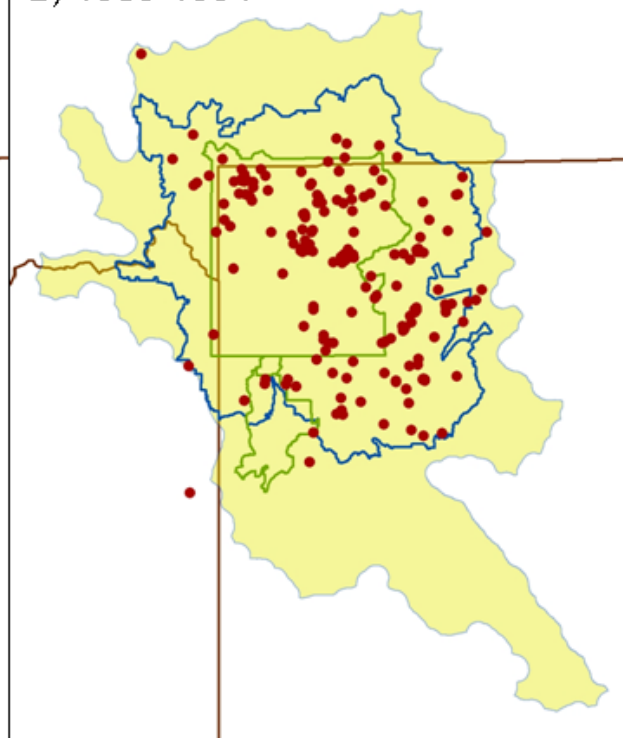
Sightings and resightings of females with COY [inside the DMA](#) will be obtained from numerous sources, including radio tracking flights, confirmed sightings, and observation flights. Observation flights are primarily designed to survey [the DMA and tall existing BMUs to obtain these data](#). The number of flights conducted ~~in each BMU~~ is standardized to ensure equal effort in obtaining data. The IGBST will verify the reliability of all sightings. The IGBST will plot all sightings and summarize data for unduplicated females and numbers of cubs seen for the entire population. Methodology developed by Knight *et al.* (1995) will be used to separate duplicated from unduplicated sightings [\(see Appendix C for more information\)](#).



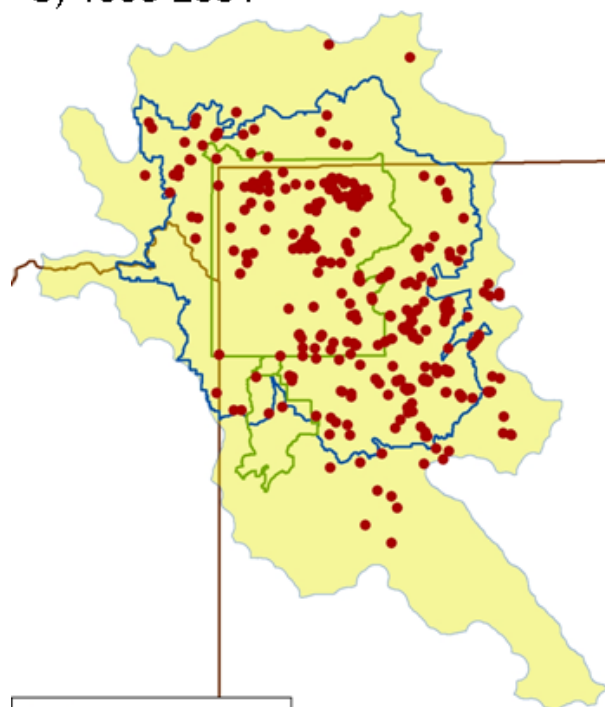
A) 1975-1984



B) 1985-1994



C) 1995-2004



D) 2005-2014

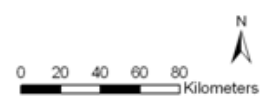
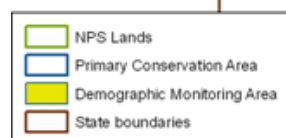
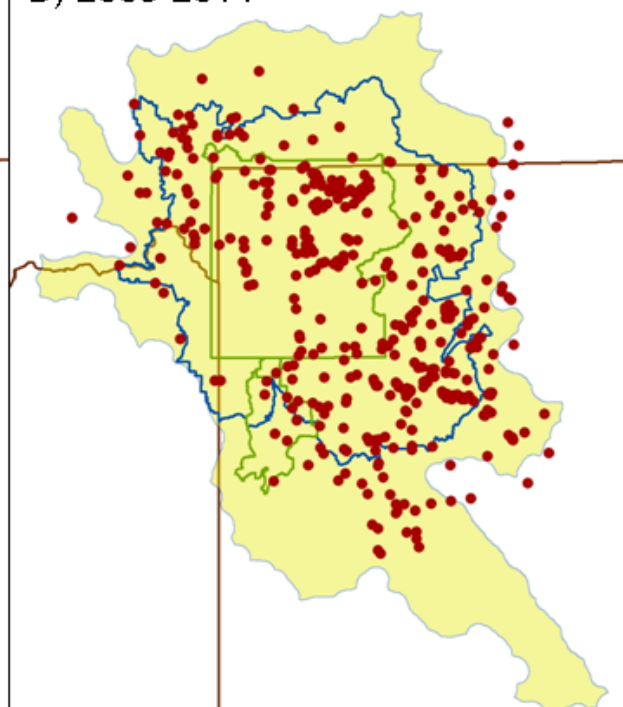


Figure 5. Initial sightings of unduplicated females with cubs-of-the-year in the Greater Yellowstone AreaEcosystem, ~~1985~~1975–2001–2014 (IGBST Data).

Distribution of Females with Young

Background

The distribution of females with young, based on the most recent six years of observations in the ecosystem, is presented in Figure 6. The recovery criterion of having 16 of 18 BMUs occupied with no two adjacent units vacant has been met. This criterion is important as it ensures that females occupy the majority of the PCA and that successful reproductive females are not concentrated in one portion of the ecosystem.

Figure 6. Bear Management Units occupied by females with young based on verified reports, 1996–2001/2009–2014.

Bear Management Unit	2009	2010	2011	2012	2013	2014	Years occupied
1) Hilgard	X	X	X	X	X	X	6
2) Gallatin	X	X	X	X	X	X	6
3) Hellroaring/Bear	X	X	X	X	X	X	6
4) Boulder/Slough	X	X	X	X	X	X	6
5) Lamar	X	X	X	X	X	X	6
6) Crandall/Sunlight	X	X	X	X	X	X	6
7) Shoshone	X	X	X	X	X	X	6
8) Pelican/Clear	X	X	X	X	X	X	6
9) Washburn	X	X		X	X	X	5
10) Firehole/Hayden	X	X	X	X	X	X	6
11) Madison	X	X	X		X	X	5
12) Henry's Lake	X	X	X	X	X	X	6
13) Plateau	X	X			X	X	4
14) Two Ocean/Lake	X	X	X	X	X	X	6
15) Thorofare	X	X	X	X	X	X	6
16) South Absaroka	X	X	X	X	X	X	6
17) Buffalo/Spread Creek	X	X	X	X	X	X	6
18) Bechler/Teton	X	X	X		X	X	5
Totals	18	18	16	15	18	18	

Bear Management Unit	1996	1997	1998	1999	2000	2001	Years Occupied
1) Hilgard	X		X	X	X		4
2) Gallatin	X	X	X	X	X		6
3) Hellroaring/Bear	X		X	X	X		4
4) Boulder/Slough	X	X	X	X	X		5
5) Lamar	X	X	X	X	X		6
6) Crandall/Sunlight		X	X	X	X	X	5
7) Shoshone	X	X	X	X	X		6
8) Pelican/Clear	X	X	X	X	X		6
9) Washburn	X	X	X	X	X		6
10) Firehole/Hayden	X	X	X	X	X	X	6
11) Madison	X	X	X	X	X		5
12) Henry's Lake	X	X		X	X		4
13) Plateau			X	X	X		3
14) Two Ocean/Lake	X	X	X	X	X	X	6
15) Thorofare	X	X	X	X	X		6
16) South Absaroka	X	X	X	X	X		6
17) Buffalo/Spread Creek	X	X	X	X	X	X	6
18) Bechler/Teton	X	X	X	X	X		6
TOTALS	12	17	14	17	18	18	

Monitoring Protocol

This effort will provide information to assess distribution of the reproductive cohort in all occupied habitats, although specific standards will apply only to the PCA. A recovered population should be well distributed throughout grizzly bear range. Successful reproduction is one indicator of habitat sufficiency, thus distribution of family groups is one indicator of suitable habitat in areas where such sightings occur. Since sub-adult females usually establish home ranges adjacent to that of their mothers, the distribution of family groups is also an indication of future occupancy of these areas by grizzly bears.

Radio tracking flights, observation flights, agency personnel sightings, and verified reports from other individuals will be the primary methods employed to collect female distribution data. The IGBST will verify all reports and keep a record of locations. Data will be maintained by the IGBST.

The number of BMUs occupied by females with young will be reported for the last six years. Females with young outside the PCA will also be reported, but only those females with young within the PCA will be used to document achievement of this distribution standard.

Mortality

(Portions of this section are superseded by the methodology in Appendix C.)

Background

Agencies have placed significant effort toward limiting human-caused deaths for grizzly bears. To date, these efforts have been very successful at limiting mortality, allowing the population to increase since it was listed in 1975.

~~Although there was no legal hunter harvest from 1991 to 2001, 110 known and probable human-caused grizzly bear mortalities have been documented in the GYAGYE. Female grizzly bears accounted for 41 of these mortalities (37%). The distribution of known and probable human-caused mortalities 1975-2014 is shown in (Figure 9). Annual total human-caused mortality has not exceeded 22, while human-caused known and probable mortalities of females has not exceeded eight for the 1991–2001 period (Figure 9). Based on population criteria described in Appendix C, the threshold mortality limits for independent females, independent males, and dependent young have not been exceeded in any 2 consecutive years (Figures 1, 2, and 3 in Appendix C). As can be seen in Figure 7, the distribution of known and probable bear mortalities has occurred throughout the grizzly bear's documented range. As the population continues to expand, the percentage of known and probable mortalities occurring outside the PCA and outside the DMA is increasing.~~

Monitoring Protocol

The management of human-caused mortality of grizzly bears is key to successful maintenance of the grizzly bear population in the Greater Yellowstone AreaEcosystem. Mortality limits are a

necessary tool for managers in regulating impacts to any wildlife population, including ~~grizzlies~~grizzly bears. Managing mortality is necessary to avoid the unregulated killing that occurred as the Yellowstone area was settled and to build support for long-term survival of the population. ~~A H~~higher ~~numbers-rate~~ of mortalities can be expected in areas outside the DMA as the y is expected as the grizzly bear population expands, particularly in ~~peripheral a~~ areas on the edge of the range when bears move on to private lands or in areas with higher levels of human development. Mortality management ~~will~~ recognizes the need for some bears to be removed to address recurring conflicts to meet management needs for nuisance bears, human safety issues, etc. Regulated harvest may be utilized as a management tool when and where appropriate, and all known and probable mortalities due to regulated harvest will be limited by the overall ecosystem mortality limits. Mortality limits will be monitored and managed within the mortality limits described in Table 1 and Table x~~evaluated annually and applied to the entire population~~ to ensure mortality is not jeopardizing the survival of the population.

~~Harris (1986) reported that grizzly bear populations having the characteristics of those in the interior Rocky Mountains could sustain 6.5% human-caused mortality without population decline when no more than 30% of the known and probable mortalities are females. The 6.5% level suggested by Harris (1986) was reduced to a conservative 4% limit of known, human-caused mortality to:~~

- ~~• Facilitate continuing recovery and population expansion into desirable areas~~
- ~~• Use a conservative approach~~
- ~~• Ensure that unknown, unreported human-caused mortality, when added to the known mortality level, is not likely to exceed 6.5% of the population estimate. (The current ratio of known and probable to unknown mortalities is 2:1; therefore, an upper limit of 4% documented mortality allows for an actual mortality limit of 6%.)~~

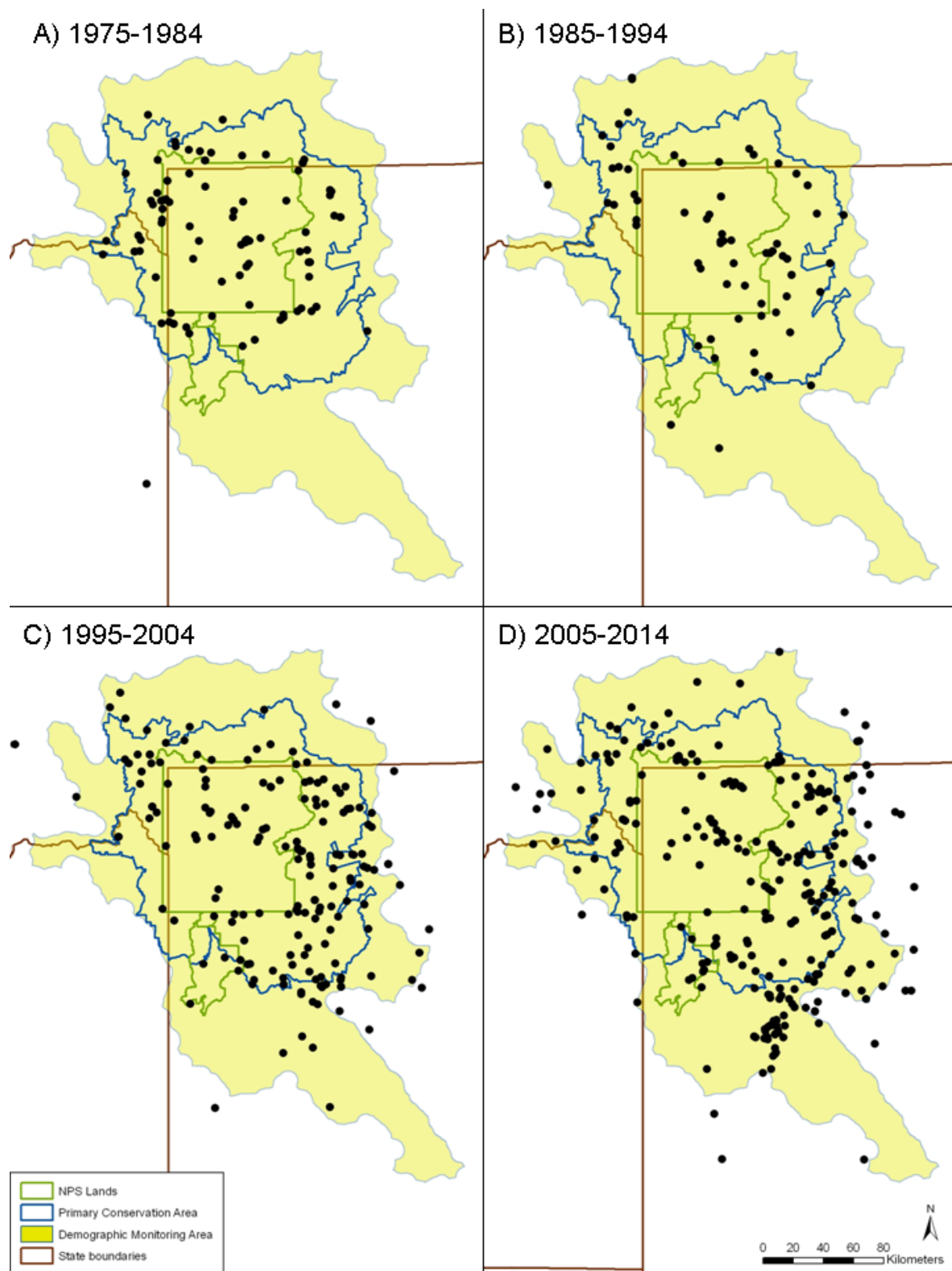


Figure 7. Distribution of 307 known and probable human-caused mortalities, from all causes, in the Greater Yellowstone AreaEcosystem, 1975–~~2001~~ 2014 (IGBST Data).

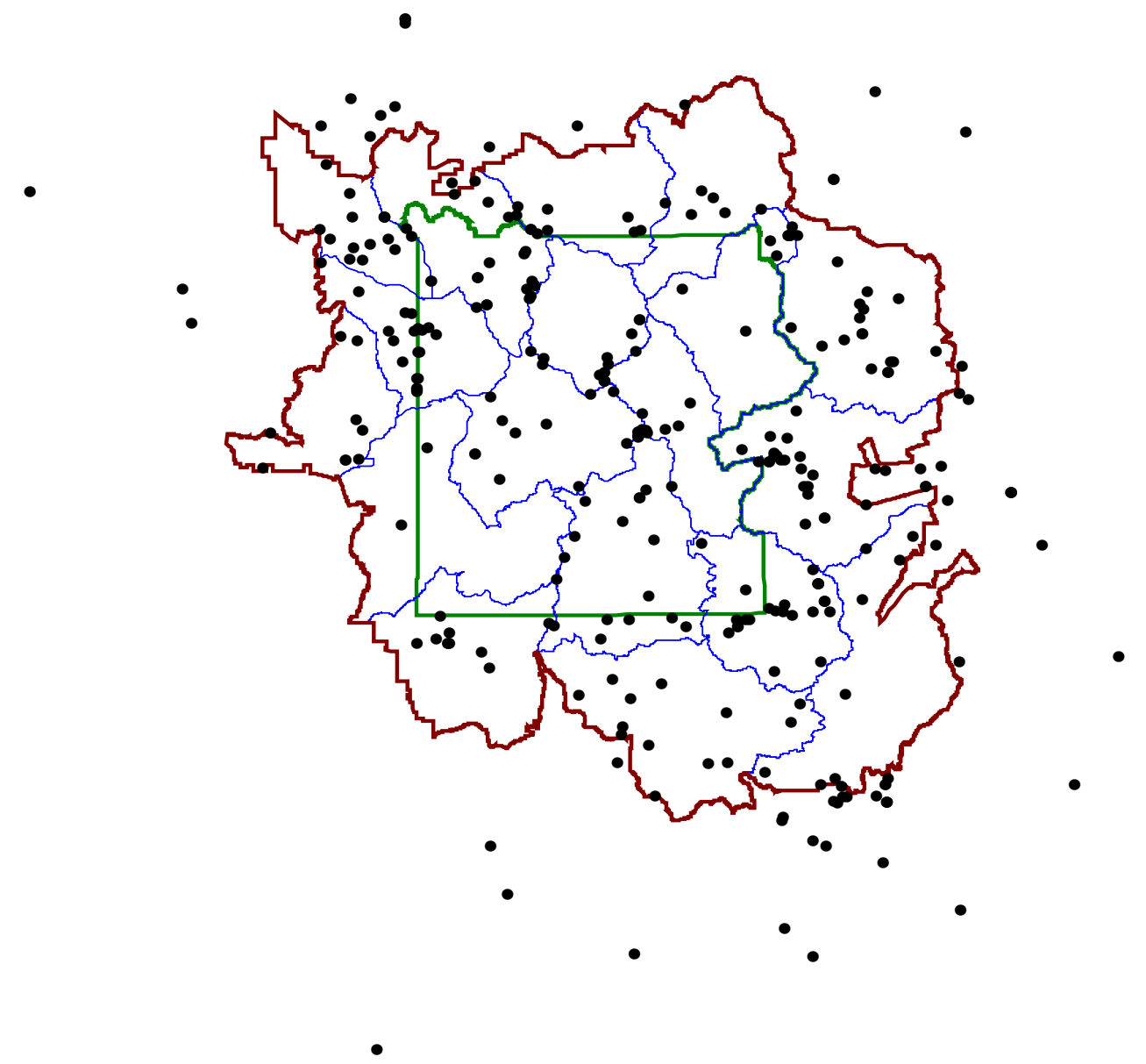


Figure 88. Example of the 2001 minimum and total population estimates within the Greater Yellowstone Area and 4% and 30% female mortality limits.

	<i>Minimum Population Estimate</i>	<i>Total Estimate</i>
	<i>365</i>	<i>531</i>
<i>4%</i>	<i>14.6</i>	<i>21.2</i>
<i>30% females</i>	<i>4.4</i>	<i>6.4</i>

Table x. Framework to manage inside the DMA for the population goal of the average population 2002–2014 using the model-averaged Chao2 method.

<u>Management Framework</u>	<u>Background and Application Protocol</u>					
<u>1. Area within which mortality limits apply.</u>	<u>49,928 sq km (19,279 sq mi)</u> <u>Demographic Monitoring Area (DMA) (Figure 2).</u>					
<u>2. Management objective.</u>	<u>To maintain the population at the average estimate for 2002–2014, a period of population stability (674 using the model-averaged Chao2 methodology (Keating <i>et al.</i> 2002; Cherry <i>et al.</i> 2007; Harris <i>et al.</i> 2007) (average lower 95% CI = 600; average upper 95% CI = 747)).</u>					
<u>3. Population estimator.</u>	<u>The model-averaged Chao2 population estimator will be used as the population measurement tool unless another scientifically sound method becomes available. The model-averaged Chao2 population estimate for 2002–2014 was 674 (average lower 95% CI = 600; average upper 95% CI = 747).</u>					
<u>4. Mortality limit setting protocol.</u>	<u>Each fall the IGBST will annually produce a model-averaged Chao2 population estimate for the DMA. That population estimate will be used to establish the mortality limit percentages for each age/sex class for the following year as per #7, #8, and #9 (below).</u>					
<u>5. Allocation process for managed mortalities</u>	<u>The States will coordinate to manage within the mortality limits per age/sex class outside National Parks and the Wind River Reservation (WRR). The WRR will receive a portion of the available mortality limit based on the % of the WRR geographic area within the DMA. Mortalities outside the DMA are the responsibility of each State and do not count against mortality limits.</u>					
<u>6. Management review by the IGBST every 5–10 years to assure that management actions are achieving the objective of a stable population at the estimated number at time of delisting.</u>	<u>This management review will assess if the management system is achieving the desired objective to maintain a stable population at the 2002–2014 average estimated population size based on the model-averaged Chao2. The management review is a science-based process that will be led by the IGBST (which includes all State and Federal agencies and the WRR Tribes) using all recent available scientific data to assess population numbers and trend against the management objective. Vital rates such as age/sex-specific survival and reproductive rates will also be reevaluated using the most recent data to adjust mortality levels as necessary.</u>					
<u>7. Mortality limit % for independent FEMALES based on the results of the model-averaged Chao2 method.</u>	<u>Pop. size</u>	<u><674</u>	<u>674</u>	<u>675–747</u>	<u>>747</u>	
	<u>Mort. %</u>	<u><7.6%</u>	<u>7.6%</u>	<u>9%</u>	<u>10%</u>	
<u>8. Mortality limit % for independent MALES based</u>	<u>Pop. size</u>	<u><674</u>	<u>674</u>	<u>675–747</u>	<u>>747</u>	

<u>on the results of the model-averaged Chao2 method.</u>	<u>Mort. %</u>	<u>15%</u>	<u>15%</u>	<u>20%</u>	<u>22%</u>
<u>9. Mortality limit for % of dependent young based on the results of the model-averaged Chao2 method.</u>	<u>Pop. size</u>	<u><674</u>	<u>674</u>	<u>675–747</u>	<u>>747</u>
	<u>Mort. %</u>	<u><7.6%</u>	<u>7.6%</u>	<u>9%</u>	<u>10%</u>
<u>10. Example of background level of annual mortalities from management and other causes – Using average yearly total mortality of independent bears (≥2 years) from all causes including unknown/unreported estimates, this example uses the average 2011 to 2014.</u>	<u>38 expected independent bear deaths/year due to management, illegals, and other deaths (17 F, 21 M).</u> <u>(This includes dead bears from inside the DMA only.)</u> <u>Note that this is only an example of the expected background level of annual mortalities. This number may vary from 38/year and will have to be factored into the numbers presented in items #11 and #12 below. The average number of background mortalities inside the DMA for the previous four years will be used to estimate the expected number of animals available for discretionary mortality allocation.</u>				
<u>11. Total annual mortality limit from all causes for independent FEMALES (≥2 years).</u>	<u>< 600 (as an example of <7.6% mortality)</u>	<u>600–673</u>	<u>674</u>	<u>675–747</u>	<u>>747</u>
	<u><7.6% mortality</u>	<u><7.6% mortality</u>	<u>at 7.6% mortality</u>	<u>at 9% mortality</u>	<u>at 10% mortality</u>
<u>12. Total annual mortality limit from all causes for independent MALES (≥2 years).</u>	<u><600</u>	<u>600–673</u>	<u>674</u>	<u>675–747</u>	<u>>747</u>
	<u>at <15% mortality</u>	<u>15% mortality</u>	<u>at 15% mortality</u>	<u>at 20% mortality</u>	<u>at 22% mortality</u>
	<u><31</u>	<u>31 to 34</u>	<u>35</u>	<u>47 to 52</u>	<u>>57</u>

~~The mortality thresholds established in the Recovery Plan of 4% or less of the minimum population provided population growth and expansion. The mortality limit established in the Strategy of no more than 4% of the total population is also conservative and should allow these trends to continue (Figure 8).~~

~~A mortality threshold for the GYGYE DMAA, rather than just the recovery zone and 10 miles beyond the recovery zone, will be managed so that known and probable human-caused mortality will not exceed 4% of the total population estimate. No more than 30% of the 4% total allowable mortality should be females. This equates to human-caused female known and probable mortalities being no more than 1.2% of the total population estimate. Protecting females, especially adult female bears, is an important part of mortality management.~~

~~Mortality limits of 4% of the total population in the GYA will be calculated on a six year running average. The total population estimate will be based on the sum of the most recent three years of females with COY sightings and resightings using the approach in Appendix B. Calculating mortality limits on a six year running average covers two breeding cycles and provides a conservative estimate of allowable mortality. The annual allowable take of bears may be updated as new information becomes available through additional analysis.~~

Known and probable human-caused mortalities are defined as follows:

Known. Carcass recovered or evidence to indicate known status due to radio telemetry. Known deaths require a carcass, management removal, or a cut radio collar. Found collars having the appearance of being cut should receive additional forensic review for definitive proof.

Probable. Strong evidence to indicate mortality, reported by highly reliable sources, no carcass recovered. Probable deaths include those cases where there is supportive evidence that a bear was wounded. Circumstances of each reported instance should be considered. Probable includes those cases where evidence of blood, hair, or other tissues clearly indicates wounding serious enough to result in death. The literature is unclear on the probability of survival for orphaned cubs. Any cub orphaned during its first year of life because of a known adult female mortality is considered a probable mortality.

Because probable mortalities will be counted against the mortality quota, and because there is a female quota, each probable mortality must be assigned a sex. Sex will be assigned in the following manner:

- Probable deaths of adult bears where cubs-of-the-year are reported present will be classified as sex = female.
- Lone bears classified as probable deaths will be assigned sex based upon statistics available from known deaths in the ecosystem. The percentage of known male and female deaths in the [GYA-GYE](#) between 1975 and 1998 is 59% and 41% respectively. These estimates exclude natural mortalities, management removals, and females with young. Therefore, sex will be assigned to probable adult mortalities in the [GYA-GYE](#) at a ratio of 59:41, male:female.
- Cubs-of-the-year that are orphaned and counted as mortalities will be assigned sex based a 50:50 sex ratio at birth (Eberhardt *et al.* 1994). For each cub, a random number will be drawn between 1 and 100. If the number is 1 through 50, the sex will be assigned as male; if the number is 51 to 100, the sex will be assigned as female.

Mortality Management

State agencies will assure that mortalities remain within the limits described in Table 1 and table x by enacting specific regulatory mechanisms in state law and regulation to demonstrate adequate regulatory mechanisms over human-caused mortality, including mortality from sport hunting. The States will coordinate via a signed MOU to manage total mortalities within the DMA to be within the age/sex mortality limits as per Table 1. These regulations will include: suspending all discretionary mortality inside the DPS area, except if required for human safety or management of bear/human conflicts if the model-averaged Chao2 population estimate is below 600; and suspending grizzly bear hunting inside the DMA if the independent female mortality limits (as per Tables 1 and 2) are exceeded at any time during the year. In addition, the States will enact specific mechanisms in law and regulation to suspend grizzly hunting inside the DMA if mortality limits for independent females, independent males, or dependent young are exceeded for 3 consecutive years. If any of these situations occur, the IGBST will complete a biology and monitoring review to evaluate the impacts of these mortality levels on the population and present it to the YGCC and the public. In addition, State regulations will specify that the number exceeding the mortality limit for independent females, independent males, and

dependent young will be subtracted from the next year's discretionary mortality for that sex/age class to assure that long-term mortality levels remain within prescribed limits.

Other regulations, such as timing and location of hunting seasons should seasons be implemented, would be devised by the States to minimize the possibility that mortality limits of independent females are exceeded within the DMA.

It is recognized that established mortality limits might be exceeded in any given year. Any mortality threshold will not affect the immediate management of bears for human safety concerns or for management of ~~an~~ nuisance grizzly bears. This document describes agency responsibilities and actions to reduce mortality should this occur. State plans provide for the take of nuisance bears regardless of the current mortality quota upon consultation among all involved agencies.

Monitoring Protocol

~~A running six-year average for mortality gives agencies flexibility to deal with years of high bear conflicts due to environmental factors, while ensuring the long-term viability of the population. In short, it is acceptable to exceed the allowable mortality in one year because mortality limits will be calculated on a running six-year average.~~

~~The 4% total allowable mortality limit and 30% allowable take of female bears will be applied to the entire GYA.~~ Mortality will be monitored by the IGBST by reports from all sources. The IGBST will estimate the annual unknown and unreported mortality as per Appendix C and these mortalities will be added to the known and probable mortalities to produce a total annual mortality estimate. Each state wildlife agency, Tribe, and National Ppark will provide mortality information to the IGBST, who will report ongoing mortalities within the DMA to all agencies so that mortality management can be adjusted in rapid fashion should that be necessary if a mortality limit is approached or exceeded. The IGBST will annually summarize all mortality information as to location, type, date, sex, and age for the Greater Yellowstone AreaEcosystem.

~~The established outer boundary for grizzly bear occupancy in Wyoming encompasses most of the area within the Wyoming portion of the Greater Yellowstone AreaEcosystem, shown in Figure 3 as the gray area in Wyoming, and in Figure 12 in the Wyoming State Management Plan (Appendix L). Grizzly bears that occur outside this boundary will be dealt with on an individual basis, utilizing the Wyoming Game and Fish Department's full array of management practices. If necessary, bears outside this area will be removed from the population, and those removals will not count against the mortality threshold.~~

~~Once population and distribution goals have been met, the m~~Mortality standards will be reviewed and reported by the IGBST every 5 years and revised as necessary using the best available information and science to meet these population objectivesgoals. All management of and information on mortality management will be open to full public review.

Population Trend

Background

The most current information indicates that this population of grizzly bears was increasing at approximately 4% to 7% annually between 1983 and 2001 (Eberhardt *et al.* 1994, Boyce 1995, Boyce *et al.* 2001b, Harris *et al.* 2006). While there is some debate related to the actual level of increase since the bear was listed in 1975, all of the current information, number of unduplicated females (Figure 9), distribution of reproducing females, distribution of bears, informal sightings by agency personnel, and areas where nuisance bears are being managed indicate this population has increased in both numbers of bears (Figure 9) and the geographic area they occupy (Schwartz *et al.* 2002).

Schwartz *et al.* (2006b) used data from 1983 through 2001, while the 2012 IGBST report examined a more recent time period, 2002 through 2011 (IGBST 2012). The IGBST found that population growth had slowed since the previous time period, but was still stable to slightly increasing, meaning the population had not declined. Because the fates of some radio-collared bears are unknown, Schwartz *et al.* (2006b) and the IGBST (2012) calculated two separate estimates of population growth rate: one based on the assumption that every bear with an unknown fate had died (i.e., a conservative estimate); and the other simply removing bears with an unknown fate from the sample. The true population growth rate is assumed to be somewhere in between these two estimates because we know from 30 years of tracking grizzly bears with radio-collars that every lost collar does not indicate a dead bear. While Schwartz *et al.* (2006b) found the GYE grizzly bear DMA population increased at a rate between 4.2 and 7.6 percent per year between 1983 and 2002, the IGBST (2012) found this growth had slowed and leveled off and was between 0.3 percent and 2.2 percent per year during 2002–2011.

Schwartz *et al.* (2006b) analyzed survivorship of cubs, yearlings, and independent bears based on whether they lived inside Yellowstone National Park, outside the Park but inside the Recovery Zone or Primary Conservation Area (PCA), or outside the PCA entirely. The PCA boundaries (containing 23,853 sq km (9,210 sq mi) correspond to those of the Yellowstone Recovery Zone (U.S. Fish and Wildlife Service 1993) and will replace the Recovery Zone boundary (Figure 2). They concluded that grizzly bears were approaching carrying capacity inside Yellowstone National Park. The IGBST (2012) documented lower cub and yearling survival than in the previous time period, results consistent with the conclusion by Schwartz *et al.* (2006b). Importantly, annual survival of independent females (the most influential age-sex cohort on population trend) remained the same while independent male survival increased (IGBST 2012). Collectively, these two studies indicate that the growth rate of the GYE grizzly bear DMA population has slowed as bear densities have approached carrying capacity, particularly in the core area of occupied range. Recent work by van Manen *et al.* (2015) confirms that population growth has slowed and the population is showing density dependent population regulation as the population occupies all suitable habitat in the DMA.

Monitoring Protocol

This Strategy recognizes that any one factor cannot provide the needed information to assess population size and trend. Ultimately, assessments will require multiple sources of information. One technique that provides insight into trend is the application of the Lotka equation. Population trend, using the Lotka equation as calculated from survivorship and reproductive rate data for the appropriate period (Eberhardt *et al.* 1994, Eberhardt and Knight 1996), will be used

as supportive information to evaluate population trend. This method will be applied to the entire population.

Estimates of population trend using critical population parameters can yield the rate of change in a population and proximate causes for the change. Using the statistical method called bootstrapping and the Lotka equation as described in Eberhardt *et al.* (1994) and Eberhardt (1995), it is now possible (given sufficient data) to estimate the population trajectory of a grizzly bear population with confidence limits. To use this method, female survivorship and reproductive rate must be monitored.

The agencies will strive to maintain a minimum of 25 adult female grizzly bears fitted with mortality-sensing radio collars and monitored at all times. To adequately sample survival, these 25 females will be spatially distributed throughout the ecosystem. The target distribution of these 25 radio-collared adult females will be determined by the IGBST; the expected distribution of collared females by agency will be assigned. Each female will be monitored using aerial telemetry flights during the non-denning period. These data will be collected in conjunction with other regularly scheduled relocation flights. When a radio collar indicates that a bear may have died, a field crew will evaluate the actual status of the female and determine cause of death. The IGBST will coordinate field crew collection of mortality data on each bear.

Data to calculate reproduction and survival are collected annually in all areas occupied by grizzly bears throughout the ~~DMA.Greater Yellowstone AreaEcosystem~~. These data sets will be maintained by the IGBST and used periodically to evaluate population trend.

										Conservation Strategy Mortality Thresholds					
Years	Unduplicated females with COY			Human-caused mortality						Total human-caused mortality		Total female-mortality			
	Annual minimum count	Annual total count ^e	6-year Average ^b	Annual		6-year Average		Total population estimate							
				Total	Female	Total	Female				4% of total population	Year-Result	30% of total mortality	Year-Result	
1991	24	35	20	0	0	4.7	-2.5	287	11.5		3.4				
1992	25	48	20	4	1	3.8	-1.8	377	15.1		4.5				
1993	20	24	22	3	2	3.8	1.8	374	15.0	Under	4.5	Under			
1994	20	26	22	11	4	4.8	-2.2	341	13.6	Under	4.1	Under			
1995	17	55	22	17	7	7.3	-3.3	364	14.6	Under	4.4	Under			
1996	33	41	23	10	4	7.5	-3.0	425	17.0	Under	5.1	Under			
1997	31	41	24	10	4	9.2	-3.7	480	19.2	Under	5.8	Under			
1998	35	41	26	3	1	9.0	-3.7	427	17.1	Under	5.1	Under			
1999	33	37	28	10	3	10.2	-3.8	407	16.3	Under	4.9	Under			
2000	37	63	31	22	7	12.0	-4.3	484	19.3	Under	5.8	Under			
2001	42	55	35	20	8	12.5	-4.5	531	21.2	Under	6.4	Under			

Figure 8. Annual count of unduplicated females with cubs-of-the-year (COY), and known and probable^a human-caused grizzly bear mortalities within the Greater Yellowstone AreaEcosystem, 1991-2001 2004-2014.

									1993 Recovery Plan Mortality Thresholds			
Years	Unduplicated females with COY			Human-caused mortality				Total population estimate	Total human- caused mortality		Total female mortality	
	Annual minimum count	Annual total count ^c	6-year Average ^b	Annual		6-year Average			4% of total population	Year Result	30% of total mortality	Year result
				Total	Female	Total	Female					
1991	24	35	20	0	0	4.7	2.5	287	11.5		3.4	
1992	25	48	20	4	1	3.8	1.8	377	15.1		4.5	
1993	20	24	22	3	2	3.8	1.8	374	15	Under	4.5	Under
1994	20	26	22	11	4	4.8	2.2	341	13.6	Under	4.1	Under
1995	17	55	22	17	7	7.3	3.3	364	14.6	Under	4.4	Under
1996	33	41	23	10	4	7.5	3	425	17	Under	5.1	Under
1997	31	41	24	10	4	9.2	3.7	480	19.2	Under	5.8	Under
1998	35	41	26	3	1	9	3.7	427	17.1	Under	5.1	Under
1999	33	37	28	10	3	10.2	3.8	407	16.3	Under	4.9	Under
2000	37	63	31	22	7	12	4.3	484	19.3	Under	5.8	Under
2001	42	55	35	20	8	12.5	4.5	531	21.2	Under	6.4	Under

	<u>Unduplicated females with COY</u>			<u>Human-caused mortality</u>				<u>Total population estimate</u>	<u>Total human-caused mortality^a</u>		<u>Total female mortality^a</u>	
<u>Year</u>	<u>Annual minimum count</u>	<u>Annual total count^c</u>	<u>6-year average</u>	<u>Annual</u>		<u>6-year average</u>		<u>Total</u>	<u>4% of total population</u>	<u>Year result</u>	<u>30% of total mortality</u>	<u>Year result</u>
				<u>Total</u>	<u>Female</u>	<u>Total</u>	<u>Female</u>					
2004	<u>49</u>											
2005	<u>31</u>											
2006	<u>47</u>											
2007	<u>50</u>											
2008	<u>44</u>											
2009	<u>42</u>											
2010	<u>51</u>											
2011	<u>39</u>											
2012	<u>49</u>											
2013	<u>58</u>											
2014	<u>50</u>											

^a ~~Beginning in 2000, probable human-caused mortalities are used in calculation of annual mortality thresholds.~~1993 Recovery Plan Mortality Thresholds

^b ~~Recovery Plan target is 15 females in the recovery zone and 10-mile perimeter area.~~

^c Total numbers calculated using methods of Keating *et al.* 2002 (Appendix B)

Genetic Management

Background

The GYE supports the southernmost population of grizzly bears remaining in North America. Areas of human occupation, development, and transportation networks separate the Yellowstone grizzly bear from its nearest neighboring population in the Northern Continental Divide Ecosystem (NCDE) of northwestern Montana. Currently, physical distance and relatively high mortality risk due to anthropogenic influences inhibits gene flow between these two grizzly bear populations. As with any isolated population, genetic issues can potentially be of concern for the Yellowstone grizzly bear population because of **long-term** inbreeding effects due to the loss of genetic diversity. The question of concern is whether genetic factors pose a risk of compromising the long-term viability of the Yellowstone population.

DNA analyses conducted on museum specimens by Miller and Waits (2003) indicated a slight decline in genetic variability in the Yellowstone population since the early 20th century; however, this loss of variability was less severe than previously hypothesized. Indeed, a more recent study by Kamath *et al.* (2015) using recent advances in genetic analysis techniques with molecular markers (Luikart *et al.* 2010) indicate that despite isolation, genetic diversity in the contemporary population has stabilized. Kamath *et al.* (2015) found that the current rate of inbreeding in the Yellowstone grizzly bear population is very low (0.2%). Likewise, the effective population size (N_e), which reflects the number of reproducing individuals in a population, has increased from 102 to 469 during the 25-year period of 1982–2007. This positive trend is important because N_e serves as a surrogate measure for a population's evolutionary potential and risk of inbreeding (Franklin and Frankham 1998). The most current N_e estimate of 469 based on Kamath *et al.* (2015) approaches the minimum threshold criterion of 500 required for a threatened population to retain long-term evolutionary potential and maintain adequate genetic variation necessary for adaptation to environmental change. It also exceeds the requisite minimum threshold ($N_e > 50$ individuals) needed to avoid risk of inbreeding (Franklin 1980). The recent findings that 1) genetic diversity is **not decliningstable**, 2) rate of inbreeding since 1985 is very low, and 3) effective population size has increased nearly 4-fold since 1982, collectively indicate that, at current population levels and under the current environmental conditions, genetic factors do not pose a substantial risk to the viability of the Yellowstone grizzly bear population. ~~Because of this, the need for intervening genetic management of the population (i.e., translocation of grizzly bears from other populations) as previously specified in the 2007 Conservation Strategy document is considered unwarranted at this point in time (2015).~~

Given that the Yellowstone grizzly bear is an isolated population, it is inevitable that sometime in the future there will be loss of genetic variation in the population if no natural movement between neighboring population(s) and no artificial transplants occur. Although in the short term the urgency of this scenario is reduced (Kamath *et al.* 2015), the genetic diversity of Yellowstone grizzly bears remains low relative to other interior grizzly bear populations. **However, Kamath *et al.* (2015) recommend that efforts continue to eventually realize natural connectivity and therefore gene flow between Yellowstone and other ecosystems: "Thus, our study suggests that**

current effective population sizes are sufficiently large ($N_e \gg 50$) to avoid substantial accumulation of inbreeding depression, reducing concerns regarding genetic factors affecting the viability of Yellowstone grizzly bears. Nonetheless, the historically small N_e , relatively low diversity and isolation over many generations suggest the grizzly population could benefit from increased fitness following the restoration of gene flow (e.g. Tallmon et al. 2004; Hogg et al. 2006), particularly given the unpredictability of future climate and habitat changes." Therefore, it is imperative that monitoring for flow of new genetic material via natural immigration and assessment of genetic diversity is continued. In recent decades, as the NCDE and Yellowstone populations have both increased in numbers and expanded in range, the prospect for re-establishing natural connectivity has been improved (Haroldson et al. 2010; Proctor et al. 2012). Although current methods yield a very high probability (0.96) for detecting a first-generation hybrid if one is to occur, no evidence of recent immigration from neighboring populations has been observed (Haroldson et al. 2010).

It is important to continue to facilitate natural movement between the NCDE and the GYE by management of attractants on public lands in the intervening areas through food storage orders and outreach and education about the fact that grizzly bears may occasionally be present in these intervening areas, and by minimizing discretionary mortality in these intervening areas. This effort to facilitate natural connectivity between the NCDE and the GYE will not impact necessary management of nuisance bears should they occur in these intervening areas. If genetic connectivity between the Yellowstone and other (e.g., NCDE, Selkirks) populations is not evident and genetic monitoring indicates a decline in genetic diversity such that an introduction of new genetic material into the GYE population is warranted, translocations will be conducted as needed. Miller and Waits (2003) suggest that one to two effective migrants per generation from the genetically diverse NCDE population would be an appropriate level of gene flow to maintain or increase current levels of genetic diversity in the Yellowstone population. Monitoring of transplants would be conducted to ensure that any new population members successfully breed and that resulting hybrid progeny survive to successfully introduce new genetic material into the Yellowstone population.

Genetic Monitoring Protocol

Genetic samples will be collected from all grizzly bear captures and mortalities in the GYE for analysis via cooperative efforts between the IGBST and recognized genetic experts. Genetic analyses of these samples will be conducted and evaluated for potential evidence of grizzly bears from other populations immigrating into the Yellowstone population and producing offspring. Monitoring of radio-collared grizzly bears will be used to document potential movements between other ecosystems and the GYE.

Background

Genetic issues are of concern for the Yellowstone grizzly bear population because it is the only isolated population other than the North Cascades (where no data are currently available), and in any isolated population, genetic declines over time are to be expected due to inbreeding effects.

Two migrants per generation will maintain the current level of divergence between the Yellowstone Ecosystem and Northern Continental Divide Ecosystem (NCDE) grizzly bear populations. Miller and Waits (2003) suggest that one to two effective migrants per generation from NCDE into the GYA Yellowstone Ecosystem are an appropriate level of gene flow to maintain or increase the level of genetic diversity in the Yellowstone population. An effective migrant is one that survives and breeds in the Yellowstone area Yellowstone.

Movement of grizzly bears into the Greater Yellowstone Area Ecosystem could take the form of either artificial translocation or natural movements. Bears could be captured in areas and moved into the GYA Yellowstone Ecosystem at any time. Natural gene flow involving bears moving across the landscape and entering the GYA Yellowstone Ecosystem may be several years away. Natural connectivity will require a concerted and cooperative effort on the part of federal and state agencies, private landowners, industry, political leaders, and the public. The obstacles to achieving natural connectivity are substantial. Miller and Waits state that the need for gene flow into the Yellowstone area Yellowstone Ecosystem is not urgent, and that current efforts should be concentrated on establishing intermediate populations and protecting and maintaining the opportunities for bears to move between the large blocks of land in the United States by establishing linkage zones (Servheen et al. 2001) in intervening habitat. They further conclude that if gene flow does not occur naturally within two to three decades, artificial translocation should be conducted.

The most important finding of Miller and Waits is that the Yellowstone area Yellowstone Ecosystem grizzly bear population is not in the troubling genetic condition that it was previously thought to be. The more immediate threat to the Yellowstone grizzly bear (and nearly all other *Ursus arctos* populations) is habitat loss and human-caused mortality. A sound policy to ensure the survival of the Yellowstone grizzly bears is to focus on maintaining the Yellowstone area Yellowstone Ecosystem and NCDE grizzly bear populations at or above their current sizes and to encourage range expansion through natural dispersal and/or reintroduction in suitable areas such as the Bitterroot Ecosystem. This approach will improve the demographic security of grizzly bears south of the Canadian border as well as address long term genetic concerns.

Monitoring Protocol

Monitoring for genetic purposes will seek to understand if grizzly bears are moving into the GYA Yellowstone Ecosystem. This monitoring will be accomplished by radio tracking the movements and ranges of bears in areas on the northern periphery of the GYA Yellowstone Ecosystem and the southern periphery of the NCDE. Genetic samples will be collected from all captured and dead bears in these areas, and maintained for analysis by a cooperative effort of the IGBST and recognized genetic experts. These genetic analyses will seek to determine if NCDE-origin genetic material is found in the GYA Yellowstone Ecosystem. If no genetic material is found and no movements are detected by 2020, then plans will be prepared to translocate two or more grizzly bears from other populations into the GYA Yellowstone Ecosystem beginning by 2022 to ensure that genetic diversity in the Yellowstone area Ecosystem grizzly bears does not decline below existing levels.

Chapter 3 Habitat Standards and Monitoring

Introduction~~Background~~

~~Since~~ ~~Between~~ 1986 and ~~prior to~~ the initial 2007 delisting of the Yellowstone ~~grizzly bear~~ population, grizzly bear habitats for grizzly bears in the Greater Yellowstone ~~Area Ecosystem~~ (GYE) ~~had been~~ ~~were~~ managed under standards and guidelines specified in national forest and national park management plans, which included ~~G~~guidelines established by the Interagency Grizzly Bear Guidelines (IGBC 1986). ~~Acknowledging that humans are the primary agent of grizzly bear mortalities, a principal objective of the IGBC was to improve survival rates by implementing management strategies that minimized anthropogenic influences and grizzly bear-human-human-grizzly conflicts.~~ IGBC measures implemented inside the Grizzly Bear Recovery Zone (GBRZ) improved management of garbage and food attractants, reduced sheep grazing, and restrict motorized access and human development. These standards and guidelines ~~that were imposed upon public lands were have been~~ instrumental in recovery of the grizzly bear in the ~~GYA~~GYE.

The ~~subsequent~~ 1993 *Recovery Plan* required the ~~documentation~~ ~~preservation and monitoring of the~~ habitat necessary to support a recovered population. ~~This led to the ,leading. This task led to the development of more explicit and measureable the habitat criteria to be applied inside the GBRZ, as per the Recovery Plan Supplement: Habitat-based Recovery Criteria for the Greater Yellowstone Ecosystem (USFWS 2007c). for the GYA GYE that were first released for public comment in 1999. These same~~ To satisfy this requirement, measureable habitat criteria ~~were established that called for no net loss of secure habitat with respect to 1998 conditions. These criteris were embraced and incorporated into the were included in the~~ draft Conservation Strategy ~~that was and~~ released for public comment in 2000. ~~Content a~~Analysis of ~~the~~ public comments ~~and for both documents, as well as~~ new information, ~~were was~~ used to ~~develop establish~~ the final habitat standards ~~for a recovered Yellowstone population as identified in this the 2007 Conservation Strategy (USFWS 2007a) and appended in a supplement to the Recovery Plan (USFWS 2007b).~~ Upon delisting of the Yellowstone population, the GBRZ will be referred to as the Primary Conservation Area (PCA) to reflect the shift from managing for recovery to one of conservation. This 2016 revision of the Conservation Strategy includes some changes to the 2007 document that help clarify habitat standards as they pertain to the 1998 baseline. Clarifying language to the application rules has been inserted where necessary to provide better direction for application of these standards on a local project level. No substantive changes in the content of habitat standards have been made under this revision. However, some modifications in habitat monitoring protocols have been made and are documented in this chapter.

Introduction

Habitat standards apply to Federal lands inside the PCA and identify three factors that must be maintained at, or improved upon with respect to conditions existing in 1998: 1) secure habitat, 2) number and capacity of developed sites, and 3) number and acreage of active commercial livestock grazing allotments. All three of these factors are linked to human activities that affect

grizzly bear mortality and displacement. These three standards apply only to public lands within the PCA, and the area where past recovery efforts and present habitat conservation measures are primarily focused. The PCA serves as a relatively safe haven located at the core of the ecosystem and accounts for approximately 47% of the Yellowstone grizzly bear's occupied range as estimated from methods of Bjornlie *et al.* 2014 (Figure 1). The 1998 baseline for habitat standards was selected because studies showed (and recently affirmed) that the Yellowstone grizzly bear population was increasing annually at a robust rate of 4 to 7 percent between 1983 and 2001 (Boyce *et al.* 2001b; Harris *et al.* 2006, 2007; IGBST 2012). Habitat conditions in 1998 were considered representative of this time period since levels of secure habitat and developed sites inside the PCA had remained relatively constant in the 10 years preceding 1998 and beyond (USDA 2004). Hence, conditions in 1998 are believed to have supported and contributed to the population growth observed during 1983-2001. Habitat standards, as they apply to the 1998 baseline, impose measureable side boards on allowed levels of human activity inside the PCA and establish a clear benchmark against which future improvements and impacts of habitat can be measured.

To facilitate management of habitat throughout the PCA, the area inside the PCA is divided into 18 distinct bear management units (BMUs) and 40 subunits (Figure 2, Chapter 1). BMU boundaries were delineated to approximate the average *lifetime* range of an adult female grizzly bear in the GYE. Each BMU was further subdivided into one or more subunits comparable in size to the average *annual* home range of an adult female grizzly bear. Monitoring habitat at a subunit scale provides greater spatial resolution and proved to be better suited for analyzing habitat use patterns and ensuring good distribution of bear habitat throughout the PCA (USDA 1985). Hence, conditions pertaining to secure habitat and developed site standards are measured and compared against 1998 levels for each of the 40 bear management subunits within the PCA. To date, habitat-based criteria throughout the PCA have been successfully maintained at, or ~~surpassed~~ improved upon, 1998 levels for all 40 subunits. Adherence to these standards ensures that sufficient habitat for the Yellowstone grizzly bear will continue to be available into the foreseeable future. Habitat standards in this document are subject to revision based on the best available science and will be reviewed and updated as necessary.

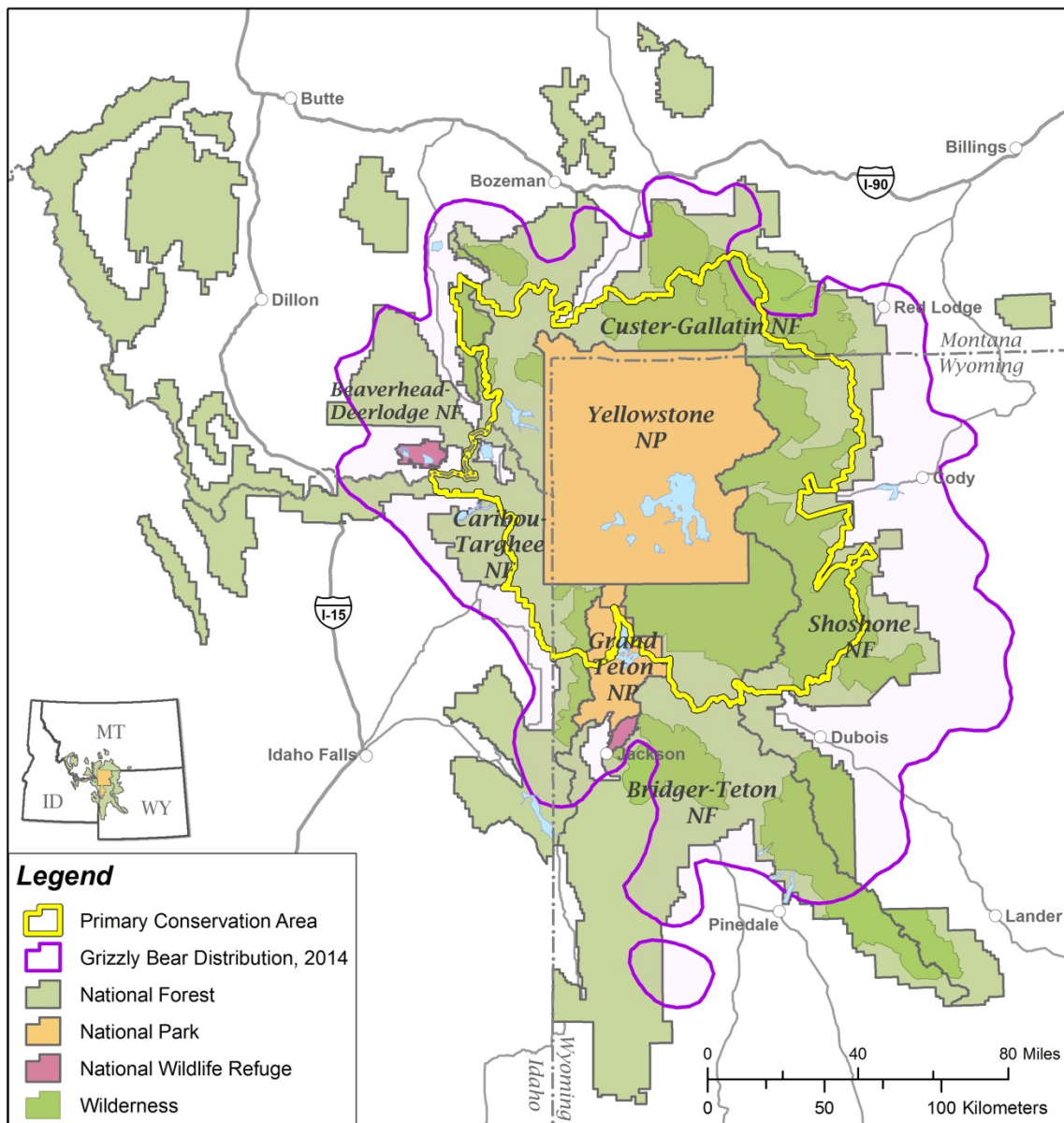


Figure 9. Federal lands comprising the Greater Yellowstone Ecosystem (GYE), the Primary Conservation Area (PCA), and estimated current (2014) Grizzly Bear Occupied Range.

Bear management units (BMUs) and subunits were identified to provide a basis for ensuring that habitats for bears were well distributed across the recovery area. The recovery area was divided into 18 BMUs and 40 BMU subunits. Due to their smaller size, subunits rather than BMUs proved to be better suited as a base for ensuring good distribution of bear habitat.

The habitat standards identified in this document are factors that will be maintained at identified levels. In addition to the mandatory habitat standards, several other habitat factors parameters will be monitored and evaluated to determine the overall condition of habitat for grizzly bears in the PCA. These additional monitoring items include habitat connectivity, hunter numbers, and

productivity of the following four high-calorie foods: 1) winter-killed ungulates, 2) cutthroat trout, 3) army cutworm moths, and 4) whitebark pine seeds. Information on monitoring protocols for these items is found in subsequent sections of this chapter. The habitat standards in this document are subject to revision based on the best available science and will be reviewed and updated as necessary.

The agencies responsible for habitat management of grizzly bear habitat in the GYA-GYE agree are committed to continue to collecting the necessary information needed to evaluate adherence to habitat maintenance of these standards and monitoring protocols throughout other habitat parameters within the PCA. The overall goal objective for habitat management inside the PCA is to reduce human-caused grizzly bear mortalities by maintaining or improving habitat with respect to 1998 conditions as of 1998, as measured within each subunit within the PCA, while maintaining options for resource management activities at approximately the same level as existed in 1998. The habitat standards and monitoring requirements in this Conservation Strategy will be incorporated into National Forest, National Park, and BLM plans. [JF11]

Outside the PCA, grizzly bears are allowed to expand into adjacent areas considered biologically suitable and socially acceptable, as per direction in the State management plans (Appendices K, L, and M). The key to successful management of grizzly bears outside the PCA is realized by striking a sustainable balance that accommodates the needs of grizzly bears along with the competing demands of human use. As such, an important management objective for areas outside the PCA is to maintain existing resource management and recreational uses and allow agencies to respond to demonstrated problems with appropriate management actions. Approximately 83 percent of suitable habitat outside the PCA occurs on federally owned land and about 66 percent of that suitable habitat is occupied by grizzly bears (Figure 1). A flexible management strategy is crucial for promoting acceptance and tolerance for grizzly bears as they continue to expand into suitable habitat outside the PCA. Standards and guidelines for other wildlife species identified in National Forest and Park management plans indirectly provide additional habitat management direction for bears outside the PCA.

The three State grizzly bear management plans for Idaho, Montana, and Wyoming recommend and encourage land management agencies to maintain or improve habitats that are important to grizzly bears and to monitor habitat conditions outside the PCA. These three states acknowledge Each state recognizes the importance of secure habitat, motorized access management, and road density issues related to the survival of grizzly bears and other wildlife. Consequently, levels of secure habitat and motorized route density are monitored on federal lands outside the PCA to identify and prevent potential habitat threats from negatively impacting the long-term viability of the Yellowstone grizzly bear population. This access management issue has also been recognized in each state's elk management efforts. Land management agencies will work cooperatively with state wildlife agencies to meet identified population and habitat goals for grizzly bears in the GYA-GYE. and The process of implementing state and federal grizzly bear management these goals will be coordinated by the Yellowstone Grizzly Bear Coordinating Committee (YGCC) representing all respective land management the agencies in the GYE (refer to Yellowstone area (see Chapter 6 Implementation and Evaluation).

~~Forest and park plan standards and guidelines for other wildlife species will provide some habitat management direction for bears outside the PCA. Immediately upon ESA delisting of the species~~By approval of this Conservation Strategy, Forest Service regional foresters in ~~R~~regions 1, 2, and 4 agree to add the grizzly bear to their ~~S~~sensitive ~~S~~species lists ~~for the five National Forests in the GYE~~immediately upon ESA delisting of the species. Forest Service sensitive species direction requires that any project “*must not result in loss of species viability or create significant trends toward federal listing*” (~~USDA 2005~~~~Forest Service Manual (FSM) 2600~~). Sensitive species direction also requires the Forest Service to “*assist states in achieving their goals for conservation of endemic species*” (~~FSM 2600~~~~USDA 2005~~). A biological evaluation will be completed for all Forest Service projects potentially affecting the grizzly bear. These evaluations will be completed ~~for all Forest Service projects potentially affecting the grizzly bear.~~ ~~and These evaluations will be used to determine if whether projects will do or will do not meet the habitat standards in this Conservation Strategy.~~ If the biological evaluation ~~shows demonstrates~~ that ~~the a~~ project ~~will does~~ not meet the habitat standards ~~as well as other relevant habitat and population criterion in this Conservation Strategy,~~ the project will be modified as necessary to ensure complete adherence with all required measures.~~that it will meet these standards.~~

~~Conservation Strategy~~ Habitat Standards Inside the PCA

Human activity is the primary factor negatively impacting availability and security of grizzly bear habitat in the GYE. The relationship between bears and habitat is extremely complex and difficult to quantify. However, unfettered human activity is known to result in displacement and mortality of grizzly bears and was a significant contributing factor leading to listing the grizzly bear in the conterminous U.S. as a Threatened species in 1975. Restrictions in human activities due to management practices implemented by the IGBC in the mid-1980s correlate strongly with the steady increase in the Yellowstone grizzly bear population that was observed between 1983 and 2001. Habitat standards formalized in this document impose measurable sideboards on levels of human activity allowed on Federal lands inside the PCA, thereby reducing opportunities for grizzly bear-human conflicts, habitat disturbance, and displacement of grizzly bears from valuable habitat.

Habitat standards identified in this document address three key factors related to human activity (motorized access, site development, and commercial livestock grazing) and specifically call for no net loss in secure habitat inside the PCA from what existed in 1998 (Appendix F). Adequate secure habitat is essential to the survival and reproductive success of grizzly bears, particularly adult females.

~~The most important issues to control on the landscape are the levels of human activities. Human activities resulting in mortality and displacement were the main reasons the grizzly bear was listed as threatened. Changes in human activities may have allowed bears to achieve recovered status. The key issues related to human activity are food storage, livestock allotments, motorized access, and site developments, as these were activities that either resulted in mortality or habitat displacement.~~

It is the goal of the habitat management agencies to maintain or improve habitat conditions throughout the PCA at or above 1998 levels as of 1998, as measured per bear management within each subunit within the PCA, while maintaining options for resource management activities at approximately the same level as existed in 1998 (Appendix F). The grizzly population achieved all demographic recovery goals by 1998 with this management regime in place. The habitat standards identified here are similar to those identified in the draft Strategy, with some modifications in response to public comments and to increase the effectiveness of application. These levels of secure habitat have been maintained and will continue to be maintained, and improved on where possible, long into the future. standards apply only inside the PCA. Changes to these standards can be made by the YGCC, following appropriate public processes of the affected land management agencies, if monitoring indicates a need or better scientific information becomes available.

Existing forest and park plan standards and guidelines will provide grizzly bear habitat management direction outside the PCA. Land management agencies will cooperate with the appropriate state wildlife agency in development of additional future, area-specific grizzly bear management goals. All projects on federal public lands outside the PCA will be evaluated through the NEPA (National Environmental Policy Act) process. Potential impacts to grizzly bears and their habitat will be evaluated and mitigated using the criteria and standards in this Conservation Strategy in coordination with the state wildlife agencies. Appendix G presents an analysis of the potential for motorized access management changes both inside and outside the PCA.

Omissions to the 1998 habitat measurements comprising the baseline (Appendix F) may be corrected for when based on new and well documented information substantiating the existence and status of anthropomorphic features (i.e., motorized routes, developed sites, or livestock allotments) that were not properly accounted for in the 1998 baseline. When verified, legitimate corrections to the baseline will be tracked and reported and will constitute new baseline habitat levels against which future change will be measured.

Application rules under specific to each habitat standard are provide additional direction on how these standards the specific ways that each habitat standard will be applied to implement this Conservation Strategy are to be implemented at a Federal project level. The following specific habitat standards and application rules apply on to all F federal lands inside the PCA, and will be monitored and maintained on subunits in the PCA.

Secure Habitat Standard

The Secure Habitat Standard requires that inside the PCA, the percentageThe percent of secure habitat within each bear management subunit must be maintained at or above levels that existed in 1998 (Appendix F). The sole exception to the 1998 secure habitat baseline applies to the three subunits identified in the 2007 Conservation strategy as in need of improvement above 1998 levels (Gallatin #3, Henrys Lake #2, and Madison #2). These three subunits must be maintained at or above levels attained from the full implementation of the 2006 Gallatin National Forest Travel Management Plan (Appendix F). Authorized Federal projects that result in temporary or permanent changes to secure habitat must follow the Application Rules identified

~~below. Temporary and permanent changes are allowed under specific conditions identified below. Appendix G provides additional information on definitions and rules for implementation of this standard. Figure 10 provides a summary of the secure area management rules. The rule set in Figure 10 will be used in management and evaluation of projects and habitat management actions as appropriate under this Conservation Strategy.~~

Secure habitat is defined as any contiguous area ≥ 10 acres in size and more than 500 m from an open or gated motorized access route (road or trail) or recurring low level helicopter line during the non-denning period (March 1 – November 30). Gated routes that are closed year-round to public motorized use but remain accessible to administrative personnel are still considered motorized access routes, and hence, detract from secure grizzly bear habitat. Decommissioned routes that are permanently and effectively closed to the public and administrative staff do not count against this standard. Lakes larger than 1.6 sq km (1 sq mi) in spatial extent~~d~~ are excluded from secure habitat calculations.

Application Rules for Permanent Changes in Secure Habitat

Permanent changes to secure habitat are allowed inside the PCA when associated with an authorized Federal ~~A~~-project involving construction of new motorized routes (i.e., roads or trails), reconstruction of existing motorized routes, or opening of a previously decommissioned route if, and only if, the following conditions are met:

- Any loss in secure habitat below baseline levels is replaced by restoring secure habitat of equivalent quality and quantity (e.g., through decommissioning) in the same bear management subunit. Habitat quality must be assessed based on the best collective scientific understanding of grizzly bear habitat ecology, and the rationale for all mitigation measures must be fully documented.
- Replacement habitat must be in place before project implementation or concurrent with project development as an integral part of the project plan. Replacement habitat must remain in place for a minimum of 10 years before it can be subsequently replaced and mitigated for per application rules (this duration is based upon the generation time for a female grizzly bear, or the time it takes to replace herself in the population).
- For those subunits identified as in need of improvement above 1998 levels (*Gallatin #3, Madison #2, and Henry's Lake #2*), secure habitat will be maintained at or above levels associated with full implementation of the 2006 Gallatin National Forest Travel Management Plan (see Appendix F).
- For activities based on statutory rights, such as access to private lands under the *Alaska National Interest Lands Conservation (ANILCA)* or the *1872 General Mining Law*, where permanent reductions in secure habitat cannot be replaced within the affected subunit, then secure habitat will be compensated at a commensurate level at or above the baseline in the nearest possible subunit. In these rare situations, subsequent changes to secure habitat in the two affected subunits constitute permante changes to the baseline.

- Honor existing oil and gas or other mineral leases. Proposed Applications for Permit to Drill (APDs) and operating plans within those leases would strive to meet the application rules for changes to secure habitat. New leases, APDs, and operating plans must meet the secure habitat and developed site standards.
- Motorized routes on private land that post-date 1998 are not counted against this standard. However, for motorized roads or trails acquired through land exchanges or acquisition that are desirable to maintain for public use, mitigation is strongly recommended.

may permanently change secure habitat provided that replacement secure habitat of equivalent habitat quality (as measured by the Cumulative Effects Model or equivalent technology) is provided in the same grizzly bear subunit. The replacement habitat must either be in place before project initiation or be provided concurrently with project development as an integral part of the project plan.

Application Rules for Temporary Changes in Secure Habitat

Temporary changes-reductions to-in secure habitat below baseline levels inside the PCA are allowed when associated with authorized Federal projects. Project activities should be concentrated in space and time to minimize disturbance. Temporary reductions in secure habitat can occur to allow projects, if all of the-The following conditions are-must be met for temporary projects:

- Only one project affecting secure habitat may be is-active per-within a given grizzly bear management subunit at any one time.
- Total acreage of secure habiat affected active-projects within a given BMU will-does not exceed 1 percent% of the acreage in the largest subunit within that BMU-(see Appendix G). The acreage of a project that counts against the 1 percent% limit (i.e., the amount of secure habitat affected) is measured as the acreage associated-with-within the 500-meter buffer around any temporary motorized access route or low-level helicopter flight line that intrudes that-extends-into existing secure habitat.
- Secure habitat is restored within one year after completion of the project.
- Use of project roads will be limited to administrative purposes associated with project activities. Project implementation shall not reduce secure habitat below baseline levels for more than 4 consecutive years. The collective set of project roads that affect secure habitat below baseline levels shall be closed to all motorized travel after 3 eyarsyears. Project roads shall be decommissioned such that secure habitat is restored within 1 year after road closure.

Activities Allowed in Secure Habitat

The following activities are allowed in secure habitat inside the PCA without violating the standard:

- Activities that do not require route construction or reconstruction, re-opening of a permanently closed road, or recurring low-level helicopter flight lines.
- Helicopter use for short term (no more than 2 days in the duration of a project), or at higher elevations (> 500 m above ground level with no landing). Aircraft used in emergency firefighting are allowed.
 - Non-wheeled, over-the-snow use (i.e., snow machines) is allowed unless new research identifies a concern. Conflicts associated with winter-use activities that develop either during denning or after den emergence in the spring can be addressed with local area restrictions.
 - Access to power lines and/or utility corridors for occasional and necessary maintenance service that does not require new route construction and is **used only for administrative** purposes related to power line/utility maintenance.
 - Project activities (e.g., temporary road construction and maintenance, or use of recurring low-level helicopter flights) that occur during the grizzly bear denning season between December 1 and February 28.

Figure 10. The rule set for secure habitat management in the Yellowstone Primary Conservation Area [JF12].

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

<i>Proactive-Improvement in Secure Habitat</i>	<i>A proactive increase in secure habitat may be used at a future date to mitigate for impacts of proposed projects of that administrative unit within that subunit.</i>
<i>Exceptions for Caribou-Targhee NF</i>	<i>When fully adopted and implemented the Standards and Guidelines in the 1997-revised Targhee Forest Plan met the intent of maintaining secure habitat levels.</i>

Developed Site Standard

The Developed Site Standard requires that on Federal lands inside the PCA, the number and capacity for human use of developed sites must within the PCA will be maintained at or below the 1998 levels with the following exceptions: any proposed increase, expansion, or change of use of developed sites from the 1998 baseline in the PCA (Appendix F) will be analyzed, and potential detrimental and positive impacts documented through biological evaluation or assessment by the action agency. Projects that propose a change in the number or capacity of developed sites must follow the Application Rules specified below.

Developed sites refer to those sites or facilities on public land with features intended to accommodate administrative and public recreational use. Such sites typically are identified or advertised via visitor maps or information displays as discernable destination sites promoted by the agency. Developed sites are often associated with human activities that may disrupt grizzly bear use of habitat, or have attractants that potentially lead to increased human-bear conflicts. Examples of developed sites include, but are not limited to: campgrounds, picnic areas, trailheads, boat launches, rental cabins, summer homes, lodges, service stations, restaurants, visitor centers, and administrative sites. **Administrative sites** are those sites or facilities constructed for use primarily by government employees to facilitate the administrations and management of public lands. Administrative sites are counted towards developed sites. Examples include: administrative headquarters, ranger stations, patrol cabins, park entrances, federal employee housing, and other facilities supporting government operations. **Dispersed sites**, in contrast to developed or administrative sites, are those not associated with a developed site, such as a front-country campground. These sites are typically characterized as having no permanent agency-constructed features, have minimal to no site modifications, and may include primitive road access. Dispersed sites are not counted toward developed sites.

A **developed site** includes but is not limited to sites on public land developed or improved for human use or resource development such as campgrounds, trailheads, lodges, administrative sites, service stations, summer homes, restaurants, visitor centers, and permitted resource-development sites such as oil and gas exploratory wells, production wells, plans of operation for mining activities, work camps, etc.

Application Rules for Developed Sites

On Federal lands inside the PCA, changes to developed sites or construction of new developed sites are allowed if the following conditions are met:

~~Mitigation of detrimental impacts will occur within the affected subunit and will be equivalent to the type and extent of impact. Mitigation measures will be in place before the initiation of the project or included as an integral part of the completion of the project.~~

- Construction of new sites will be mitigated for within that subunit to offset any increase in the number of developed sites and/or capacity for human use, habitat loss, and increased access to surrounding habitats.

- Mitigation of detrimental impacts will occur within the affected subunit and adequately compensate for ~~will be equivalent to the type and extent of impacts.~~ Mitigation measures will be in place before ~~implementation~~the initiation of the project or included as an integral part of ~~the completion of the project.~~

- Consolidation and/or elimination of dispersed campsites is camping will be considered adequate mitigation for increases in human capacity at developed campgrounds if the new campsite capacity is less than or equivalent to that of the dispersed camping eliminated and if future overnight use of the dispersed site(s) is definitively curtailed.
- New sites will require mitigation within that subunit to offset any increases in human capacity, habitat loss, and increased access to surrounding habitats.
- Conversion of uncontrolled dispersed campsites to a minor day-use site is allowed if there is a net benefit to both human and bear safety, and if the dispersed site(s) can be modified in such a way that future over-night use of the site is definitively curtailed. Such modification of site-use would not contribute to an increase in baseline developed sites.

- Expansion of existing ~~Administrative sites~~ expansions are is exempt from human capacity mitigation expansion if such developments are deemed necessary for enhancement of public land management of public lands and other viable alternatives are not available. Temporary construction of work camps for highway construction or other major maintenance projects are exempt from human capacity mitigation if other viable alternatives are not available. Food storage facilities structures and management must be in place to ensure food storage compliance, i.e., regulations established and enforced, camp monitors, etc. All and all other factors resulting in potential detrimental impacts to grizzly bears will be mitigated as identified for other developed sites.

- Modifications to existing developed sites that reduce resource damage, detrimental environmental impacts, and/or the potential for grizzly bear conflicts are allowed (e.g., installing a vaulted toilet to avoid damage to water resources or installing bear-resistant storage structures to reduce conflict).
- Land managers may improve the condition of developed sites for bears or reduce the number of sites. The improvements may then be used at a future date to mitigate equivalent impacts of proposed site development increase, expansion, or change of use for that administrative unit within that subunit.

- ~~For To the fullest extent of its regulatory authority, the Forest Service will minimize effects on grizzly bear habitat from activities based in statutory rights, such as the (e.g., 1872 General Mining Law, Americans with Disability Act, ANILCA, etc), if the number of developed sites exceeds the 1998 baseline, the Forest Service will, to the fullest extent of its regulatory authority, reduce developed sites to commensurate levels and mitigate. In those expected few cases where the mitigated effects will result in an exceedance of the 1998 baseline that cannot be compensated for within that subunit, compensation, in the PCA, to levels at or below the 1998 baseline will be accomplished in adjacent subunits when possible, or the closest subunit if this is not possible, or in areas outside the PCA adjacent to the subunit impacted. Mitigation for Mining Law site impacts will follow standard developed site mitigation to offset any increases in human capacity, habitat loss, and increased access to surrounding habitats within the affected subunit if possible. In those rare cases where mitigation cannot be accomplished within that subunit, commensurate compensation will be accomplished in the nearest subunit and changes in the two affected subunits become permanent changes to the baseline. Access impacts relating to Mining Law activities will be mitigated per the applications rules for changes in secure habitat.~~
- Honor existing oil and gas and other mineral leases. For proposed Applications for Permit to Drill (APDs) and operating plans within those leases, the Forest Service should, to the fullest extent of their regulatory authority, strive to meet the developed site standard and satisfy application rules for changes in secure habitat. New leases, APDs, and operating plans must meet the developed site standard and satisfy application rules for changes in secure habitat.
- Developments on private land are not counted against this standard. However, for developed sites acquired through land exchanges or acquisitions that are desirable to maintain, mitigation is strongly encouraged but not required. The rationale behind this is to encourage acquisition and transformation of private land to public ownership since this negates the potential for future development, and results in better management for grizzly bears.

Livestock Allotment Standard

The Livestock Allotment Standard requires that on Federal lands inside the PCA, there will be no increase in the number or acreage of no new active commercial livestock grazing allotments nor an increase will be created and there will be no increases in permitted sheep Animal Months (AMs) relative to that which existed in from the identified 1998 baseline (see Appendix F). Existing sheep allotments will be monitored, evaluated, and phased out as the opportunity arises with willing permittees.

Application Rules

Grazing Allotments tracked for purposes of grizzly bear conservation include both vacant and active commercial livestock units for sheep, cattle, and/or horses on Federal lands inside the

PCA. grazing allotments. Active allotments are livestock units with active grazing permits. Vacant allotments are those without an active permit, but which may be restocked or grazed used periodically by other permittees at the discretion of the land management agency to resolve resource issues or other concerns. Changes in livestock allotments inside the PCA that satisfy the allotment standard may occur if the following conditions are met:

Reissuance of permits for

- A vacant cattle allotments may be reissued an active permit resulting in an increase in the number of permitted cattle, but the number and net acreage of active allotments inside the PCA would must remain the same as not exceed the 1998 baseline. Appropriate analysis by the action agency must be conducted to evaluate impacts on grizzly bears.
- Combining or dividing existing allotments would be is allowed as long as the net acreage and number of active in allotments does not increase exceed 1998 levels.
- Any such use of vacant cattle allotments resulting in an increase in permitted cattle numbers will be allowed only after an analysis by the action agency to evaluate impacts on grizzly bears.
- Where chronic grizzly bear conflicts occur on livestock allotments inside the PCA, and an opportunity exists with a willing permittee, alternatives for resolving conflicts may include authorization of a non-use permit, moving livestock to a vacant allotment where there is less likelihood of conflict, or cattle grazing can be phased out on that allotment.

Habitat Monitoring

The primary objective of H habitat monitoring is to track and assess the status of grizzly bear habitat throughout the ecosystem with an emphasis placed on habitat inside the PCA. Monitoring requirements presented in this section will focus on evaluation of adherence to the habitat standards identified such that secure habitat, developed sites, and commercial livestock grazing allotments are maintained at, or improved upon, 1998 levels. in this Strategy. However, additional habitat parameters pertaining to four high-calorie foods of the grizzly bear diet are also monitored to assist in evaluating the status of grizzly bear habitat and its ability to support a - Monitoring of other important habitat parameters will provide additional information to evaluate fully the status of the habitat for supporting a recovered grizzly bear population, and the effectiveness of habitat standards. Habitat standards and other habitat parameters will be monitored as follows:

Monitoring Secure Habitat and Motorized Access Route Density

Background

Humans are the primary agent influencing grizzly bear mortality and population trajectories in the Yellowstone ecosystem GYE and elsewhere (McLellan and Shackleton 1988; Mattson and

Knight 1991; Mace *et al.* 1996; Schwartz *et al.* 2010; Proctor *et al.* 2012). Motorized access is one of the most influential factors affecting grizzly bear use of habitats. Open road density has been utilized as a surrogate measure of human presence on the landscape, and consequently serves as the basis for differentiating secure and non-secure habitat throughout the ecosystem. Restricted roads and motorized trails are important factors in evaluating habitat potential for and mortality risk to grizzly bears (Mace *et al.* 1996). Grizzly bear researchers and managers generally agree that secure habitat, defined as those areas more than 500 meters (550 yards) from a motorized access route during the non-denning period, are especially important to the survival and Land managers throughout the GYE recognize that availability of secure habitat is crucial to the survival and long-term reproductive success of grizzly bears, especially adult female grizzly bears. Managing the landscape to reduce grizzly bear mortality risk requires that motorized roads and trails be considered when evaluating and maintaining secure habitat throughout the ecosystem.

Motorized access parameters, including: 1) were measured and calculated using procedures identified in the 1998 IGBC Taskforce Report on Grizzly Bear/Motorized Access Management. For the Yellowstone PCA, the percent of secure habitat, 2) open motorized access route density (OMARD), greater than one mile/square mile, and 3) total motorized access route density (TMARD) greater than two miles/square mile per subunit in, are measured and monitored against levels that existed in 1998, is presented in Appendix F. No change in these parameters has occurred since 1998, as managers agreed to maintain these values pending the finalization of the Strategy. To date, no net decrease in secure habitat relative to 1998 levels has occurred on federal lands in any of the 40 bear management subunits within the PCA. Instead, reductions in motorized access implemented post-1998 have led to an increase of 1.4 percent in secure habitat inside the PCA; a gain approximate in size to the area of Yellowstone Lake.

Subunits with potential for improvement

Several subunits, Gallatin #3, Henrys Lake #2, Gallatin #3, and Madison #2, were targeted in the 2007 Conservation Strategy have been identified as needing improvement in secure habitat with respect to 1998 levels. access parameters. The specific areas with potential for improvement identified in these three subunits is fall within the boundaries of the Gallatin National Forest boundary and consequently, the quantity and timing of improvements was to be determined by the Gallatin National Forest Travel Management Plan (TMP). However, a large percentage of the OMARD and TMARD values and secure habitat loss in these subunits is due to motorized access features on private land (Appendix G). The Forest is working on several land exchange efforts with private parties in these subunits. These land exchanges would allow management of the roads on these private parcels and increase the secure habitat in these subunits. The Gallatin Range Consolidation Act will result in trading timber for land in the Gallatin #3 and Hilgard #1 subunits. The private land involved will become public land under the jurisdiction of the Gallatin National Forest. bWith implementation of the 2006 Gallatin TMP, many roads inherited from these exchanges have been permanently decommissioned. Non-system routes that are not maintained by the Forest Service have subsequently been closed, with a high priority given to road decommissions in the three subunits identified as in need of improvement. With full implementation of the Gallatin Travel Plan near completion, measureable increases in secure habitat with respect to 1998 baseline levels (Appendix F) and

reductions in motorized route density have been realized in the in three targeted subunits. The Gallatin National forest determine, via a Travel Plan Amendment, that all gains in secure habitat resulting from full implementation of the TMP will effectively constitute new baseline levels for these three subunits. If and when approved, elevated secure levels for these three subunits will serve as a new measure against which future change will be made. In order to complete the exchange, access values in these two subunits will temporarily decline below 1998 values. However, upon completion of this sale and land exchange, secure habitat and motorized access route density in these subunits will be improved from the 1998 baseline (Appendix F).

All the above mentioned subunits on the Gallatin National Forest have the potential for improvement in the long term. The timing and amount of improvement will be determined through the Gallatin National Forest travel management planning process. This is a new effort since the release of the 2000 draft Conservation Strategy and may take several years to complete. The Travel Plan will amend the Forest Plan and set a new baseline for access values in these subunits. This travel plan revision will reduce the motorized access route density in these subunits and increase secure habitat.

Several other subunits were listed as needing improvement in the 2000 draft Conservation Strategy (Plateau #1, Plateau #2, and Henrys Lake #1). The draft stated that upon full implementation of the access management changes in the revised Targhee Forest Plan, those subunits will be acceptable for OMARD, TMARD, and secure habitat. Those access management changes have been fully implemented and those subunits are no longer identified as having potential for improvement. This is due to road decommissioning that was completed following the signing of the 1997 revised Targhee Forest Plan and the 1999 FEIS for the Targhee Travel Plan (Open Road and Open Motorized Trail Analysis (motorized road and trail travel plan)). The 1998 baseline (Appendix F) for these subunits was modified to reflect the full implementation of the 1997 Targhee Forest Plan. Henrys Lake subunit #1 still has high levels of motorized access density and a low secure habitat level. However, much of the effect is due to motorized access routes on private lands (Appendix F). Little opportunity remains for improvement on public lands due to the legal requirements to provide access to Sawtell Peak, state lands, mining claims, county, state, and federal rights of way, private lands, and summer homes.

Monitoring Protocol

—Motorized Secure habitat and motorized route density are monitored and tracked throughout the ecosystem to verify compliance with secure habitat standards inside the PCA and to assist in balancing grizzly bear security and survival with human land use concerns outside the PCA. Motorized access parameters that are monitored and reported include levels of 1) Secure habitat, 2) open motorized access route density (OMARD) greater than 1.6 km/sq km (1 mi/sq mi) one-mile/square-mile, and 3) total motorized access route density (TMARD) greater than 3.2 km/sq km (2 mi/sq mi) two miles/square mile. Inside the PCA, these three parameters are measured and reported annually for each bear management subunit. Outside the PCA, secure habitat is measured and reported biennially (even numbered years) for each bear analysis unit (BAU, see Figure 2). Changes in configuration and status of motorized routes are submitted each year to the Grizzly Bear Habitat Database Coordinator by representatives from each National Forest and

National Park in the ecosystem. Status and configuration of motorized access routes are inventoried and tracked by the Database Coordinator. This insures that reported measurements are based on the most current available information. Percent secure habitat, OMARD, and TMARD are calculated using the Motorized Access Model as described in Appendix F. will be monitored utilizing Yellowstone Grizzly Bear Cumulative Effects Model (CEM) Geographic Information System (GIS) databases, and reported annually within each subunit in the IGBST Annual Report. Protocols are established for an annual update of motorized access routes and other CEM GIS databases for the PCA. To provide evaluation of motorized access proposals relative to the 1998 baseline, automated GIS programs are available on each administrative unit (Appendix G).

Secure habitat, as defined earlier, refers to those areas ≥ 10 acres in size and more than 500 m from an open or gated motorized route. Lakes greater than 1.6 sq km (1 sq mi) are excluded from secure habitat calculations. **OMARD** is a measure of the density of motorized routes that are open to the public for one or more days during the non-denning portion of the year when grizzly bears are active (March 1-November 30). **TMARD** measure the density of all motorized routes open to the public and/or administrative personnel for one or more days during the non-denning season. Roads that are closed year-round to the public but open to administrative personnel detract from secure habitat and count toward TMARD, but do not contribute to OMARD. Motorized routes that have been permanently decommissioned such that there is no motorized use by either the public or administrative staff, do not contribute to OMARD or TMARD, and do not detract from secure habitat. For a more detailed discussion of OMARD and TMARD, as well as changes in monitoring protocol, please refer to Appendix F. Measurements are reported annually (inside the PCA) and biennially (outside the PCA) in the Interagency Grizzly Bear Study Team (IGBST) Annual Report, *Yellowstone Grizzly Bear Investigations* and are posted online for public access at the IGBST website (<http://nrmssc.usgs.gov/products/IGBST>).

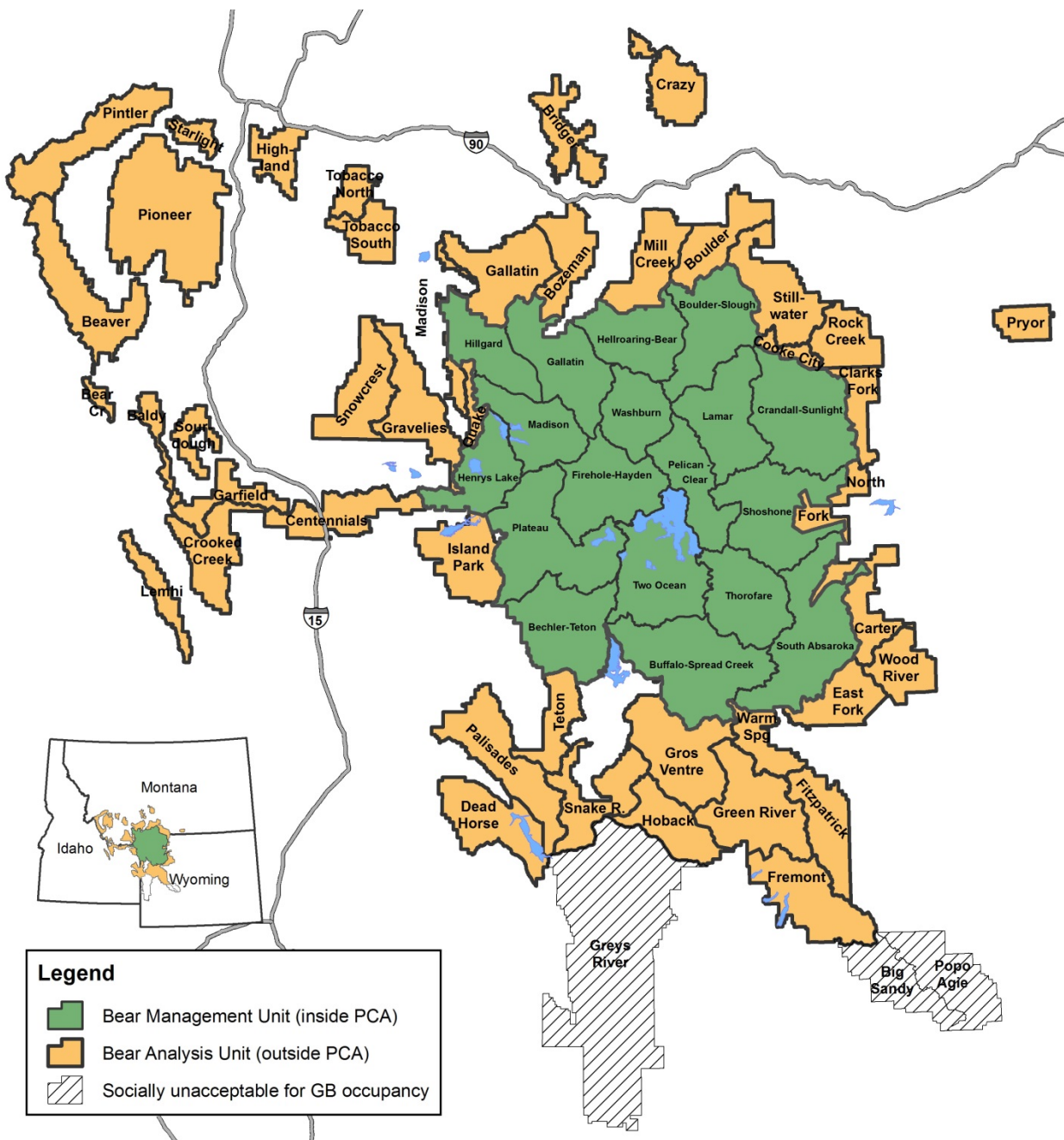


Figure 2. Bear management units and subunits inside the PCA and bear analysis units outside the PCA.

Monitoring Developed Sites

Background

—Levels of human development on the landscape have been shown to be an important predictor of grizzly bear mortality in the GYE (Schwartz et al. 2010). Developed sites increase the spatial and temporal extent of human presence on the landscape and contribute to the displacement and

~~mortality of grizzly bears. are known to displace grizzly bears and this has some direct effect on habitat effectiveness. The primary~~A significant concern related to developed sites is ~~the increased potential for grizzly bear/-human conflicts attributable mortality connected to food conditioning and bear habituation.~~ Past attempts at modeling grizzly bear mortality in the GYA-GYE have focused on ~~levels of overnight human use numbers of people spending the night~~ as a primary factor related to ~~grizzly bear~~ mortality. Increased numbers of people using an area and potentially interacting with grizzly bears is ~~an~~the important issue in evaluating ~~the impacts from of developed sites on grizzly bear survival. Impacts to bears as a result of new or expanding developed sites could result from increases in human capacity at the site, temporary or permanent loss of habitat, increased length of time of use, increased access to surrounding areas or backcountry trails, and unsecured bear attractants.~~

The effects of the current number of developed sites are considered the level that can be accommodated on public lands because the 1998 level of site development is allowing a stable to increasing grizzly bear population (Appendix F). All changes in developed sites since 1998 have been evaluated against the baseline and have been determined acceptable under the standard for developed sites identified in this Strategy.

Monitoring Protocol—

~~Monitoring numbers of developed sites can indirectly assess displacement from habitat, habituation to human activities, and increased grizzly bear mortality risk. Changes in developed sites the number and capacity of developed sites on public lands inside the PCA are measured, tracked, and evaluated against 1998 levels (Appendix F). Information pertaining to changes in the number of developed sites inside the PCA is submitted annually to the Grizzly Bear Habitat Database Coordinator by representatives from each National Forest and National Park Ecosystem. Current and baseline numbers of developed sites are inventoried in a GIS database and reported annually in the IGBST Annual Report Yellowstone Grizzly Bear Investigations, available online (<http://nrmssc.usgs.gov/products/IGBST>), will be compiled annually and compared to the 1998 baseline. Developed sites are currently inventoried in existing GIS databases and are an input item to the CEM. Appendix F displays the number of developed sites in the PCA within seven categories and will serve as the 1998 baseline.~~

Monitoring Livestock Grazing

Background

~~—Interaction Conflicts~~ between livestock and grizzly bears ~~have~~s historically led to ~~the~~ relocation or removal of grizzly bears ~~in the GYE. Grizzly bears tend to prey on cattle and sheep regardless of the abundance of natural foods because livestock in occupied grizzly bear territory represent one of many foraging opportunities (Gunther et al. 2004). Most grizzly bear-livestock conflicts tend to occur outside the PCA since all commercial allotments on National Park lands and many allotments on National Forest lands inside the PCA have been permanently closed. Consequently, monitoring grizzly bear-livestock conflicts on public lands is not limited to inside the PCA, but is conducted annually throughout the entire ecosystem. Currently, approximately 59 percent of the Yellowstone grizzly bear's occupied range falls outside the PCA. As~~

commercial livestock grazing persists in areas where grizzly bears live, the number of conflicts will most likely continue to pose a challenge to grizzly bear managers. This is particularly true on domestic sheep allotments. Financial incentives offered through non-governmental organizations (NGOs) have proven to be a successful mechanism for retiring sheep grazing allotments on public land when willing participants were available (Gunther *et al.* 2004). These types of opportunistic partnerships between federal agencies, NGOs, and willing permittees may be considered an alternative for resolving chronic conflicts on grazing allotments within prime grizzly bear habitat. While there have been recent increases in bear depredations on cattle in the Greater Yellowstone Area Ecosystem, the number of allotments and distribution of cattle inside the PCA in 1998 did not preclude achieving the demographic recovery criteria. In the case of sheep allotments, conflicts are much more prevalent and more difficult to resolve without eventually phasing out sheep grazing in the PCA.

Livestock Grazing Monitoring Protocol

—On federal lands inside the PCA, the number and acreage of commercial livestock grazing allotments and the number of sheep animal months (AMs) is monitored and reported annually relative to 1998 levels. Inside and outside the PCA, grizzly bear conflicts associated with grazing of commercial livestock on federal lands is monitored and reported annually. Commercial livestock grazing and conflict information is submitted for publication in the IGBST annual report, *Yellowstone Grizzly Bear Investigations*, available online (<http://nrmssc.usgs.gov/products/IGBST>).

There were 73 cattle and 15 sheep allotments inside the PCA as of 1998. A total of 17,279 sheep AMs were permitted inside the PCA in 1998 (Appendix F).

Two sheep allotments on the Caribou-Targhee National Forest within the PCA have been phased out since the establishment of the 1998 baseline, resulting in a decrease of 7,889 sheep AMs in the PCA.

Monitoring Protocol

To ensure no increase from the 1998 baseline, numbers of commercial livestock grazing allotments and numbers of sheep AMs within the PCA will be monitored and reported to the IGBST annually by the permitting agencies.

Major Foods Monitoring High-Caloric Foods

Background

—Grizzly bears are opportunistic omnivores who have evolved highly versatile foraging strategies allowing them to shift diets among numerous food sources, depending on what is available spatially and temporally (Schwartz *et al.* 2003, 2013). Long-term management and conservation of grizzly bears in the GYE call for monitoring of four high-calorie foods. Four food items have been identified as major components of the GYA GYE grizzly bear diet (Mattson *et al.* 1991). These four food types listed by dry weight kilocalories per gram (kcal/g) include: 1) army cutworm moths (7.91 kcal/g), 2) winter-killed ungulates (6.80 kcal/g), 3) cutthroat trout (6.10 kcal/g), and 4) whitebark pine seeds (3.99 kcal/g). are seeds of the whitebark pine, army cutworm moths, ungulates, and spawning cutthroat trout. These food

~~sources may exert a positive influence on grizzly bear fecundity and survival and are some of the highest sources of digestible energy available to grizzly bears in the Yellowstone area (Mealey 1975, Servheen et al. 1986, Pritchard and Robbins 1990, Craighead et al. 1995). Each of t~~These four foods have varying distributions in the ecosystem sources is limited in distribution and are subject to wide annual fluctuations in availability and therefore do not necessarily serve as a major dietary component of every grizzly bear in the GYE. Natural annual fluctuations in abundance and distribution of these four calorie-rich foods make it very challenging to establish reliable thresholds. However, t~~These four high-calorie foods sources may~~are known to exert a positive influence on grizzly bear fecundity and survival and are constitute some of the highest sources of digestible energy available to grizzly bears in the Yellowstone area GYE (Mealey 1975, Servheen et al. 1986, Pritchard and Robbins 1990, Mattson et al. 1992, Haroldson et al. 2006, Schwartz et al. 2006 Craighead et al. 1995). During years when these food sources are abundant, there are very few grizzly bear/human conflicts in the GYA GYE (Gunther et al. 1997). In contrast, during years when there are shortages of one or more of these foods, grizzly bear/human conflicts are more frequent and there are generally higher numbers of human-caused grizzly bear known and probable mortalities (Mattson et al. 1992a, Mattson et al. 1992b, Gunther et al. 1997).

Gunther et al. (2014a) exhaustively documented the diet of the GYE grizzly bears to include over 266 distinct plant and animal species ranging from grasses, fungi, berries and seeds, to fish and carrion. The trophic flexibility of grizzly bears, as documented by the variety of foods they consume, allow them to opportunistically forage across diverse habitats spanning the entire GYE. Their highly varied diet serves as an adaptive mechanism that enhances their ability to persist when faced with rapid and long-term changes in availability and abundance of any one food source. Compositional analysis of scats collected over a 37-year period (1943 to 2009) showed that grizzly bears within the GYE most frequently feed on foods that are consistently available and widely distributed, such as grasses, sedges, and ants (Gunther et al. 2014a). However, when opportunity arises, grizzly bears will shift their diet to maximize body mass gain by selecting calorie-rich foods such as ungulates, fish, whitebark pine seeds, clover, moths, and small mammals.

Human-induced environmental change, such as introduced organisms, habitat loss, climate change, and other anthropogenic factors, have the potential to affect availability and distribution of these calorie-rich foods in the future. However, despite a substantial decline of whitebark pine and natural stochasticity of other food resources within the GYE, grizzly bears have shown notable resilience by adjusting habitat use (Costello et al. 2014) and shifting diets to maintain body mass and condition (Schwartz et al. 2014). Because of their high caloric value and use by grizzly bears, whitebark pine, ungulates, cutthroat trout, and arm cutworm moths are currently monitored either directly or indirectly on an annual basis.

These foods are very important to grizzly bears in the GYA~~GYE. Introduced organisms, habitat loss, and other human activities have the potential to impact negatively the abundance and distribution of these foods. Because of natural annual changes in abundance and distribution of these four major foods, threshold values of abundance for each food have not been established. Whitebark pine, ungulates, cutthroat trout, and army cutworm moths are currently monitored either directly or indirectly on an annual basis.~~

By expanding the distribution and range of bears in the GYAGYE, additional food resources will become available.

Monitoring Protocol

—To monitor these major four high-caloric foods and their importance to grizzly bears, the IGBST will survey and report on each of these food groups annually as budgetary constraints allow, as and per the detailed food monitoring protocols identified in Appendix E, as budgetary constraints allow. IGBST scientists will analyze the relationship between Food abundance and availability of these four food types data will be compared with information on with the numbers of grizzly bear/human conflicts, grizzly bear management actions, human-caused known and probable grizzly bear mortalities, and changes in the distribution and trend of the YellowstoneGYE grizzly bear population of bears. This analysis will be completed by the IGBST, including interpretations of influences of food availability on population standards and grizzly bear/human conflict rates. Results of these analysis will be presented, when available, in the annual reports prepared by the IGBST and relevant peer-reviewed publications. If detectable declines in certain foods occur and, using the best available scientific data and techniques, the IGBST concludes these declines are related to biologically significant changes in demographic parameters increases in bear known and probable mortalities and that such increases could threaten the grizzly bear population, the IGBST shall recommend a petition for relistingreport these findings for consideration by the GYCC (see Chapter 6, Implementation and Evaluation, for details on this process). Significant declines in important foods could also result in reductions in cub production. Since both human-caused mortality and numbers of females with cubs are measurable criteria monitored annually for the population, any significant decline in important foods would also be reflected in changes in these measurable population standards.

Monitoring protocols of high-caloric foods identified in this Conservation Strategy will continue as long as budgets allow. Monitoring and surveying methods may be modified when necessary to incorporate new technological advances in monitoring techniques or new knowledge of bear foraging and habitat use within the GYE. Existing monitoring programs may be expanded, as budget allows, to include occupied habitat beyond the PCA and areas predicted for future use by bears. Monitoring results of whitebark pine, winter-killed ungulates, cutthroat trout, and army cutworm moths, when available, are to be reported in the annual IGBST publication Yellowstone Grizzly Bear Investigations available online (<http://nrmse.usgs.gov/products/IGBST>). these important foods also provides managers with some ability to predict annual seasonal bear habitat use, and estimate, prepare for, and avoid grizzly bear/human conflicts due to a shortage of one or more foods.

Existing monitoring programs will be continued under this Conservation Strategy; however, monitoring programs may be changed to incorporate new technological advances in monitoring techniques or new knowledge of bear habitat use in the Greater Yellowstone AreaEcosystem. Existing monitoring programs may be expanded beyond the PCA to areas currently being used by bears or areas predicted for future use by bears.

Winter-killed Ungulates

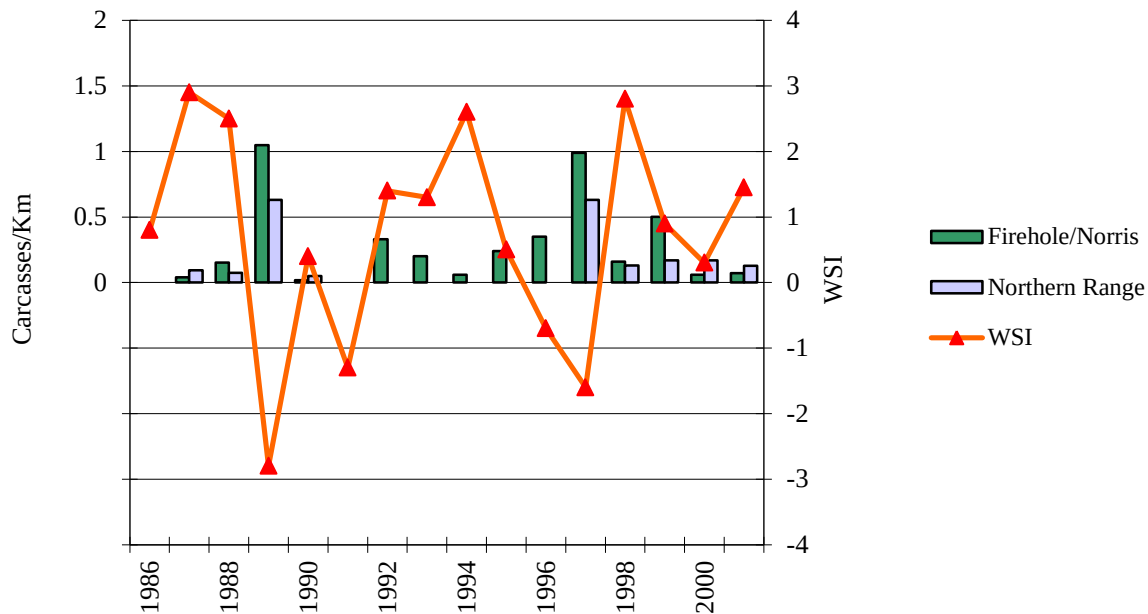
Background—The GYA-GYE harbors one of the most carnivorous grizzly bear populations inhabiting the North American interior (Jacoby *et al.* 1999; Mowat and Heard 2006). Isotopic nitrogen ($\delta^{15}\text{N}$) levels measured in 221 grizzly bear hair samples collected between 2000 and 2010 indicate that on average, terrestrial meat accounted for 44.4% of the assimilated protein in the diet of Yellowstone grizzly bears (Schwartz *et al.* 2014). In contrast, in Glacier National Park and adjacent national forest lands, meat accounts for a smaller proportion of the grizzly bear diet; using stable isotope analysis for a small sample of grizzly bears, Jacoby *et al.* (1999) found that meat accounted for only 33%, 0%, and 6% of adult male, adult female and subadult diets, respectively. Protein and fat from ungulate carcasses ranks as the second-highest food source of gross caloric value available to grizzly bears in the GYE (Gunther *et al.* 2014a, b). Winter-killed ungulates, primarily elk and bison, provide an important source of protein to bears especially during early spring before most plant foods become available. As an alternative to carcasses as a spring food, grizzly bears also consume earthworms, ants, and pocket gophers. Grizzly bears continue to opportunistically forage for animal matter and scavenge carrion throughout the active season and will seek out gut piles and other remains left by ungulate hunters in the fall (Haroldson *et al.* 2004). is unique among areas in North America inhabited by grizzly bears in that ungulates are a major food source, as indicated by bear scats (Mattson 1997), feed site analysis (Mattson 1997), and bear hair isotope analysis (Hildebrand *et al.* 1999). On average, approximately 79% of the diet of adult male and 45% of the diet of adult female grizzly bears in the GYA-GYE is meat (Hildebrand *et al.* 1999). In contrast, in Glacier National Park, over 95% of the diets of both adult male and female grizzly bears is vegetation (Hildebrand *et al.* 1999). Ungulates rank as the second highest source of net digestible energy available to grizzly bears in the GYA-GYE (Mealey 1975, Pritchard and Robbins 1990, Craighead *et al.* 1995). Ungulates are also important to bears because they provide a high quality food source during early spring before most plant foods become available. Grizzly bears with home ranges in areas with few plant foods depend extensively on ungulate meat (Harting 1985). Grizzly bears feed on ungulates primarily as winter-killed carrion from March through May (Mattson and Knight 1992, Green *et al.* 1997). Carcass availability fluctuates with winter severity (Figure 11).



Monitoring Protocol—Relative abundance of ungulate carrion is often monitored by correlating the number of carcasses available to grizzly bears and other scavengers during the spring with measures of snow-water equivalency (depth, density, and moisture content) in snowpack (Podrutzny *et al.* 2012). Availability of carrion for grizzly bears is potentially affected by increased competition from recently reintroduced wolves and changes in elk and bison management practices. For these and other reasons historic carcass transects will continue to be surveyed as long as budgetary allocations permit. There are currently 30 spring ungulate carcass survey routes in Yellowstone National Park (YNP) and 124 transect routes on Yellowstone's Northern Range in the Gallatin National Forest (Haroldson *et al.* 1998). Current survey methods and ungulate carcass survey routes may be redesigned or modified when appropriate. When available, monitoring results of winter-killed ungulate carcass availability will be summarized and reported annually in the IGBST publication *Yellowstone Grizzly Bear Investigations* available online (<http://nrmc.usgs.gov/products/IGBST>). Under this Conservation Strategy, monitoring of winter-killed ungulate carcass availability will continue.

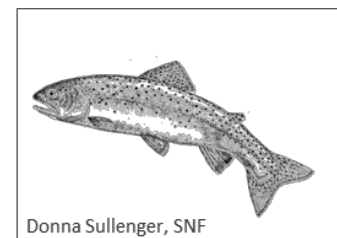
and the results summarized and reported annually. Data from these survey efforts will also be used to update productivity values in the CEM. Current survey methods may be redesigned or modified when appropriate.

Figure 11. Winter Severity Index (WSI) derived for elk on the Northern Range and ungulate carcasses/km along transects in two survey areas, Yellowstone National Park, 1986–2001 (Podruzny and Gunther 2002).



Cutthroat Trout

Background—Due to their high digestibility and protein and lipid content, spawning cutthroat trout are one of the highest sources of digestible energy available to bears in [with home ranges in close proximity of Yellowstone Lake and its tributaries Yellowstone National Park](#) (Mealey 1975, Pritchard and Robbins 1990, [Gunther et al. 2014a](#)). Grizzly bears ~~are~~ [were once](#) known to prey on cutthroat trout in at least 36 different streams tributary to Yellowstone Lake (Hoskins 1975, Reinhart and Mattson 1990). ~~In 2002,~~ [Haroldson et al. \(in review a2005\)](#) estimated that approximately ~~69 to 85~~ [68](#) grizzly bears per year frequented and likely fished [ten Yellowstone Lake spawning streams tributariesy monitored during 1997-2000- to Yellowstone Lake](#). ~~In 1994,~~ [Introduction of](#) non-native lake trout (*Salvelinus namaycush*) and effects of drought and whirling disease (*Myxobolus cerebralis*) has led to a decline in native cutthroat trout populations and [an associated decline in number of bears visiting spawning streams \(Teisberg et al. 2014\)](#). ~~were discovered in Yellowstone Lake. Lake trout could depress the native cutthroat trout populations and associated bear fishing activity (National Park Service 1994).~~



Monitoring Protocol—The Yellowstone Lake cutthroat trout population is currently monitored most years in the spring, depending on weather and spring snow melt, using stream surveys, large mesh gillnets, weirs with fish weirstraps, and occasionally electronic fish counters. spawning stream surveys, and hydroacoustic techniques (Appendix E). An electronic sonar fish counter was installed and calibrated in 2013 along Clear Creek on the east side of Yellowstone Lake to facilitate annual counting of spawning cutthroat trout ascending Clear Creek on the east side of Yellowstone Lake. Visual stream surveys are also conducted most years to identify trends in the number of cutthroat trout spawning Yellowstone Lake tributaries. Visual surveys to measure the presence of cutthroat trout and rainbow hybrids are also typically conducted at the Trout Lake inlet creek. Yellowstone NP biologists provide YNP will provide an annual summary of cutthroat trout monitoring results to the IGBST for publication in the Yellowstone Grizzly Bear Investigations available online (<http://nrmssc.usgs.gov/products/IGBST>). Current survey methods may be modified or redesigned as appropriate.

Moth Aggregation Sites

Background—Alpine moth aggregations are a calorie-dense and nutrient-rich an important food source found at remote, high-elevation alpine sites dominated by talus and scree slopes in the eastern half of the ecosystem. Knowledge regarding the intricate relationship between army cutworm moths and grizzly bears has improved substantially since the late 1980s when grizzly bear use of moth aggregation sites was first discovered and such sites were included in observation flights (Bjornlie and Haroldson 2014). When available, moths are a valuable source of nutrition for grizzly bears because they have the highest reported gross caloric content per gram of any food available to grizzly bears in the GYE (7.91 kcal/g; Gunther *et al.* 2014a). for a significant portion of the Yellowstone grizzly bear population (Mattson et al. 1991). As many as 55 different grizzly bears have been observed feeding at moth sites on a single morning (Annual Report 2002 in prep). Some bears may feed almost exclusively on moths for a period of over one month (French *et al.* 1994). Moths have the highest caloric content per gram of any other bear food (French et al. 1994) and are available during the late summer/early fall periods when bears are consuming large quantities of foods in order to acquire sufficient fat levels for winter (Mattson et al. 1991). A grizzly bear feeding extensively on moths over a 30-day period can consume 47%, or close to half, of its annual energy budget of 960,000 calories (White 1996). Grizzly bears whose home ranges include moth aggregation sites often visit these talus slopes during mid-to-late summer and early fall to accumulate fat reseraves in preparation for the winter denning season. Although grizzly bear use of moth sites does not vary widely over time (1993 is one notable exception; low bear use due to late, extensive snow cover), annual monitoring provides important data regarding this high-calorie resource. Moths are also valuable to bears because they are located in relatively remote areas, thereby reducing the potential for grizzly bear/human conflicts during the late summer tourist months. During years when moths are abundant on high elevation moth sites, there are few grizzly bear/human conflicts at nearby low elevation human developments (Gunther et al. 1997). During years when moths are absent from the high elevation talus slopes, there are more grizzly bear/human conflicts at nearby low elevation human developments (Gunther et al. 1997).

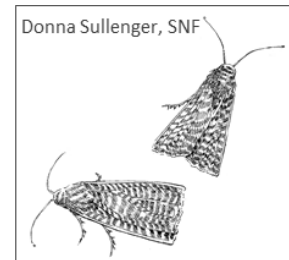


Figure 12. The annual number of confirmed moth sites in the Greater Yellowstone Area Ecosystem, the number used by bears, and the total number of telemetry relocations or aerial observations of bears recorded at each site, 1986–2001 (Bjornlie and Haroldson 2002).

Year	Number of confirmed moth sites ^a	Number of moth sites used ^b	Number of locations or observations ^c
1986	5	3.1.1—2	3.1.2—8
1987	3.1.3—6	3.1.4—4	3.1.5—15
1988	3.1.6—7	3.1.7—4	3.1.8—43
1989	3.1.9—11	3.1.10—9	3.1.11—47
1990	3.1.12—13	3.1.13—10	3.1.14—69
1991	3.1.15—16	3.1.16—14	3.1.17—144
1992	3.1.18—19	3.1.19—15	3.1.20—88
1993	3.1.21—19	3.1.22—2	3.1.23—4
1994	3.1.24—20	3.1.25—7	3.1.26—14
1995	3.1.27—23	3.1.28—13	3.1.29—28
1996	3.1.30—24	3.1.31—14	3.1.32—69
1997	3.1.33—24	3.1.34—14	3.1.35—67
1998	3.1.36—26	3.1.37—17	3.1.38—124
1999	3.1.39—27	3.1.40—17	3.1.41—144
2000	3.1.42—27	3.1.43—14	3.1.44—78
2001	3.1.45—27	3.1.46—16	3.1.47—98
Total			3.1.48—1,040

^a The year of discovery was considered the first year a telemetry location or aerial observation was documented at a site. Sites were considered confirmed every year thereafter regardless of whether additional locations were documented.

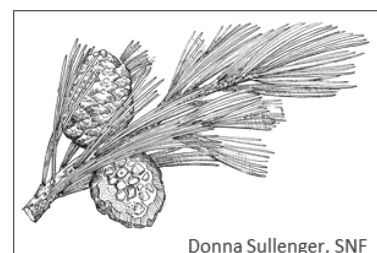
^b A site was considered used if ≥1 location or observation was documented within the site that year.

^c May include replicate sightings or telemetry relocations.

Monitoring Protocol—As of 2013, 37 confirmed and 16 possible moth sites have been identified in the GYE. However, size, location and moth abundance of sites fluctuate from year to year due to natural variation in environmental factors, such as snow cover (Bjornlie and Haroldson 2014). Bear use of moth aggregation sites has been noted during Aerial observations of bears feeding at moth sites are made from fixed-wing aircraft as part of on-going radio tracking and observation flights conducted by the IGBST. Although this monitoring protocol does not provide direct information regarding the abundance of moths, grizzly Bear use of these aggregation sites will be used as an provide an indirect measure of the relative moth abundance of this resource in a given year. Aerial surveys of all confirmed for moth use sites will be conducted annually on and representative moth feeding sites (Figure 12). Results will be summarized and reported presented in the annual IGBST Annual Report report Yellowstone Grizzly Bear Investigations available online (<http://nrmc.usgs.gov/products/IGBST/>).

Whitebark Pine Cone Production

Background—Due to their high fat content and potential abundance as a pre-hibernation food, whitebark pine seeds are an



important fall food for bears in the ~~GYA-GYE~~ (Mattson and Jonkel 1990). Yellowstone grizzly bears consume whitebark pine seeds extensively when whitebark cones are available. Bears may feed almost ~~predominantly exclusively~~ on whitebark pine seeds when production exceeds 22 cones per tree (Mattson *et al.* 1992). ~~Because whitebark pine is a masting species, availability varies substantially from year to year.~~ During ~~years-fall seasons~~ of low whitebark pine seed availability, grizzly bears often seek alternate foods at lower elevations, ~~in association with human activities,~~ leading to ~~increased nuisance bear management actions and human-caused grizzly bear known and probable~~ more frequent bear conflicts and human-caused grizzly bear mortalities ~~during the fall~~ (Mattson *et al.* 1992, Knight and Blanchard 1994, Gunther *et al.* 1997, Haroldson *et al.* 2006). ~~During years when~~ Conversely, when whitebark pine nuts are abundant, there are generally very few grizzly bear-human conflicts during the fall season (Mattson *et al.* 1992, Gunther *et al.* 1997). ~~Studies have shown that during poor whitebark pine years grizzly bears alter their selection~~ selected less for whitebark pine stands (Costello *et al.* 2014) and consumed more animal matter, boosting their fat levels to match those measured in years of high cone production (Schwartz *et al.* 2014). Although whitebark pine has experienced widespread declines in the GYE (see subsequent section), extensive studies by the IGBST showed no profound negative effects on grizzly bears at the individual or population level (IGBST 2013). Costello *et al.* (2014) reported that approximately one-third of Yellowstone grizzly bears in their study included little or no whitebark pine stands within their fall range.

Monitoring Protocol—Currently there are ~~19-21~~ whitebark pine cone production transects (Figure 13) within the ~~GYA, GYE~~ nine of which have been monitored on an annual basis since 1980 (Knight *et al.* 1997). Annual transect surveys are typically conducted between July 15 and August 15 to count cones after maturation, but before cones and seeds have been collected by red squirrels (*Tamiasciurus hudsonicus*) and Clark's nutcrackers (*Nucifraga columbiana*). The presence or absence of blister rust and, beetle infestations as well as activity levels of grizzly bear, black bear, red squirrel, and Clark's nutcracker are also recorded during transect surveys. Monitoring of whitebark pine cone production using current or modified methods will continue under this Conservation Strategy. ~~New transects may be added or methods changed as knowledge of bear use of this resource evolves, and~~ Results will be summarized and reported in the IGBST Annual Report publication Yellowstone Grizzly Bear Investigations available online (<http://nrmc.usgs.gov/products/IGBST>).

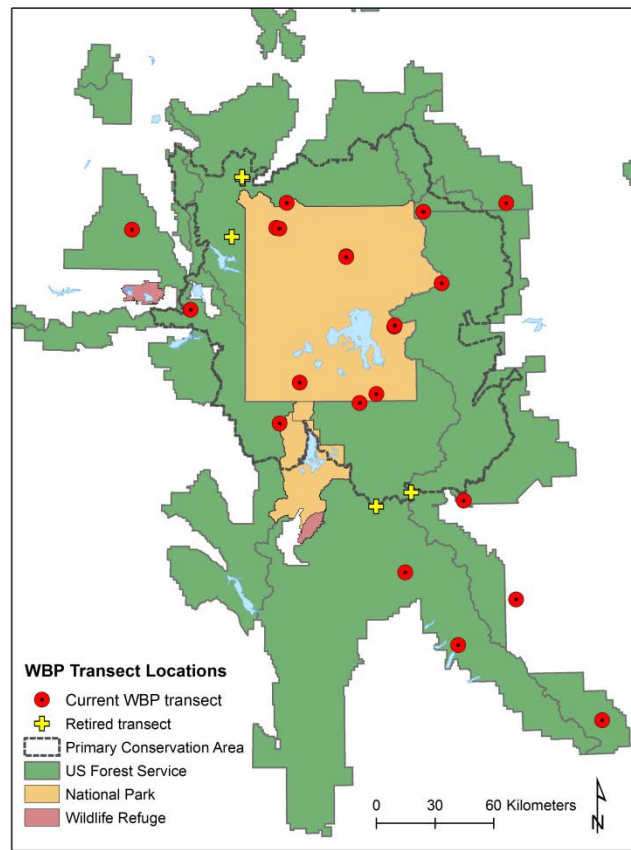


Figure 13. Location of whitebark pine cone production transect sites in the GYE, 2014.

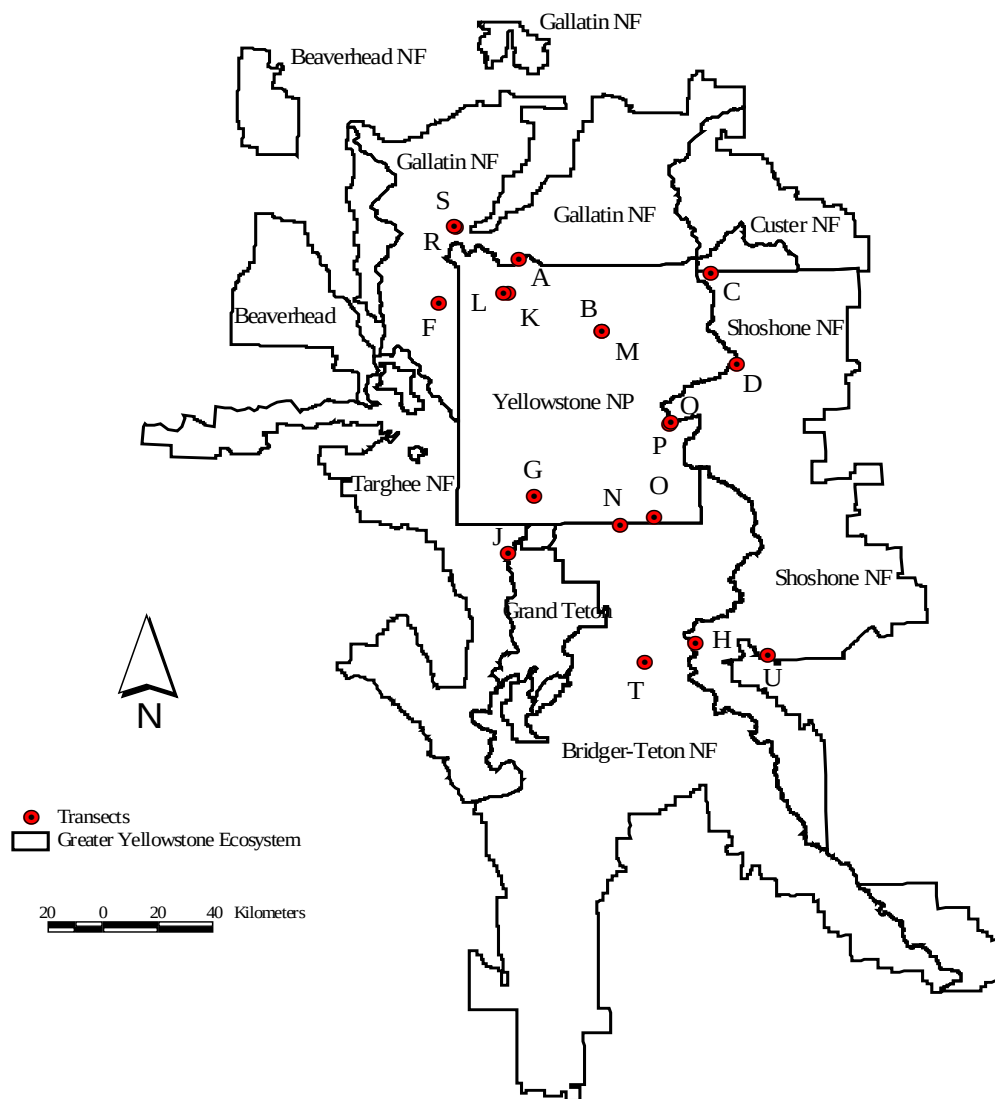


Figure 10. Location of whitebark pine cone transects.

Monitoring Mountain Pine Beetle Infestation and White Pine Blister Rust Infection

Background—Since the early 2000s, whitebark pine has declined significantly throughout much of the species' historic range in the Northern Rockies due to the spread of mountain pine beetle (*Dendroctonus ponderosae*) and white pine blister rust (*Cronartium ribicola*). The greatest levels of whitebark mortality resulted from mountain pine beetle, a native insect that typically attacks large, mature trees with inner bark thick enough to support larvae (Larson 2011). Beetle infestations tend to occur episodically every 20-40 years resulting in high, widespread mortality across coniferous forests. The most recent outbreak began in the early 2000s and impacted millions of hectares in the Rocky Mountains (Raffa *et al.* 2008). The infestation was exacerbated by warmer winters at higher elevations allowing for increased brood development and survival of adult beetles, and greater opportunity for reproduction (Bentz *et al.* 1991, Perkins and Roberts 2003, Larson 2011, Dooley 2012).

White pine blister rust, an exotic invasive pathogen introduced to North America in 1910, affects whitebark pines of all age classes, although seedlings and saplings are especially susceptible to infection. This exotic fungal pathogen infects the cambium of whitebark pine and other five-needle pines, causing reproductive failure and tree mortality (McKinney *et al.* 2009, Bockino and Tinker 2012). However, some individual whitebark pines carry genetic traits that make them more resistant to the disease. Restoration programs launched by the Forest Service use a technique described by Mahalovich *et al.* (2006) to breed and plant rust-resistant whitebark pines as part of an on-going effort to restore and maintain the species in the ~~Yellowstone~~ ecosystemGYE.

In 2000, under the auspices of the Greater Yellowstone Coordinating Committee (GYCC), the Whitebark Pine Subcommittee (WPBSC) was created and tasked with forging a comprehensive long-term strategy for monitoring whitebark pine throughout the ecosystem. Recognizing the persistent and pervasive threat that blister rust and pine beetle posed to the health of whitebark pine, the subcommittee reached out to other agency and non-governmental partners to avoid duplication of efforts. The result of these alliances is the Greater Yellowstone Whitebark Pine Monitoring Working Group (GYWPMWG), which consists of partners from the National Park Service (NPS), U.S. Forest Service (USFS), U.S. Geological Survey (USGS), and Montana State University (MSU). Led by the NPS Greater Yellowstone Inventory and Monitoring Network (GRYN), a strategic and peer-reviewed monitoring protocol was established for detecting, tracking, assessing, and reporting the health, status, and trends of whitebark pine throughout the GYE (GYWPMWG 2011). This ground-based monitoring program was initiated in 2004 and will continue to assess the current status and long-term trends of whitebark pine into the foreseeable future.

~~Whitebark pine mortality due to white pine blister rust exceeds 90% throughout the northwest U.S. (Kendall and Arno 1990). Although tree mortality has been low to date in the GYA GYE, some whitebark pine stands are infected with blister rust. The extent of the blister rust infection and the future effects it will have on whitebark pine in the GYA GYE are unknown.~~

Monitoring Protocol—Spearheaded by the GRYN, an interagency collaborative monitoring effort involving NPS, USFS, and USGS partners will measure the status and trends of whitebark

pine throughout the GYE. Monitoring efforts will focus on collecting critical baseline information for assessing 1) infection rates and severity of white pine blister rust; 2) survival of whitebark pine, taking into account synergistic interactions of blister rust, mountain pine beetle, wildland fire, and other agents of change; and 3) recruitment of whitebark pine trees into cone-bearing age classes. Monitoring protocols will follow methods and procedures established in the *Interagency Whitebark Pine Monitoring Protocol for the Greater Yellowstone Ecosystem* (GYWPMWG 2011). Results of current whitebark pine status and trends will be made available at the GRYN Inventory and Monitoring website and referenced in the annual IGBST monitoring report *Yellowstone Grizzly Bear Investigations*.

~~Along each whitebark pine cone transect, each tree will be examined for presence of blister rust, and the data recorded. Results will be recorded and reported annually by the IGBST.~~

~~Habitat Effectiveness and Habitat Value~~

~~Background~~

~~The Yellowstone Grizzly Bear CEM was designed to assess the inherent productivity of grizzly bear habitat and to assess the effects of human activities on bear use of that habitat (Dixon 1997, Weaver et al. 1986, Mattson et al. in press). The model uses GIS databases and relative value coefficients of human activities, vegetation, and key grizzly bear foods to calculate Habitat Value (HV) and Habitat Effectiveness (HE) (Weaver et al. 1986, Bevins 1997, Mattson et al. in press 2004). The CEM is the result of more than a decade of interagency effort. Interagency mapping protocols and procedures (Mattson and Despain 1985) have been developed and approved for the PCA. Research is limited as to what level of human activity on backcountry trails actually displaces bears from these habitats. Additional information on human use in the backcountry may help determine the relationship between human activities and bear use.~~

~~Habitat Value in the CEM is a relative measure of the average net digested energy potentially available to bears in a subunit for each of four seasons. Habitat Effectiveness is that part of the energy potentially derived from the area that is available to bears given their response to humans (Mattson et al. in press 2004). It is recognized that motorized access and site developments are the primary human activities influencing grizzly bear use of habitats. However, there are other activities that collectively may have significant impact on the effectiveness of the habitat for bears. The CEM can be used to estimate the cumulative effects of all human activities on the availability of habitats and associated foods to bears. The 1998 baseline seasonal HE values for each subunit from CEM are displayed in Appendix F.—~~

~~The current level of HE for some subunits likely differs from the 1998 baseline. This is not due to changes in the level of human activity, as human activity has not significantly changed since 1998. Rather, several wildfires and prescribed fires have occurred which changed HV. Since HE is calculated as a percentage of the HV, this has resulted in a corresponding change in HE. The change is likely not detrimental to bears and in some instances has improved the seasonal HV.~~

~~Monitoring Protocol~~

The agencies will measure changes in seasonal Habitat Effectiveness in each BMU and subunit by regular application of the CEM or the best available system, and compare outputs to the 1998 baseline (Appendix F). CEM databases will be reviewed annually and updated as needed. These databases include location, duration, and intensity of use for motorized access routes, non-motorized access routes, developed sites, and front country and backcountry dispersed uses. Emphasis and funding will continue to refine and verify CEM assumptions and to update databases.—

Representative trails or access points, where risk of grizzly bear mortality is highest, will be monitored when funding is available. CEM databases will be updated to reflect any noted changes in intensity or duration of human use.—

Hunter Numbers

Background

The number of elk hunters in Wyoming, Idaho, and Montana who recreate in the PCA (Figure 14) were estimated and compared ~~to with~~ grizzly bear known and probable grizzly bear mortalities, ~~both verified and probable,~~ from 1987 to 1997 to determine if bear mortality is correlated ~~to with~~ hunter numbers. Those data showed ~~there is little evidence of a~~ relationship between hunter numbers and human-caused grizzly bear mortality^{JF13}.

The ~~highest greatest~~ source of grizzly bear (≥ 2 years old) mortality during 2004–2014 in the GVA-GYE has been due to interactions with hunters. Nearly all known and probable bear mortalities occur as surprise encounters, at big game carcasses, or at hunter camps. The number of mistaken identity kills (i.e., mistaken for black bear) are small. Although ~~While~~ the number of hunters using the PCA ~~has have not increased significantly~~ decreased, the number of grizzly bear known and probable mortalities due to interactions with hunters increased in the last decade, primarily outside the PCA (Figure 7). Possibilities-Potential explanations for why this occurred include bears learning to seek hunter-killed game, an increase in population size and concurrent expansion of occupied range, and greater use of ungulate resources and bear distribution shifting to elk hunting units that open early (Haroldson *et al.* ~~in review~~ 2004, Schwartz *et al.* 2010, IGBST 2013). ~~Nearly all known and probable bear mortalities occur as surprise encounters, at big game carcasses, or at hunter camps.~~

Figure 11. Estimated numbers of elk hunters within the GYE grizzly bear recovery zone plus a 10-mile perimeter in Idaho, Montana, and Wyoming, ~~for the years 1991–2001~~ 2005–2014.

State	Year									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Idaho ^a	<u>3,619</u>	<u>3,016</u>	<u>2,592</u>	<u>1,763</u>	<u>1,819</u>	<u>1,904</u>	<u>1,860</u>	<u>1,803</u>	<u>1,937</u>	<u>2,771</u>
Montana ^c	<u>12,365</u>	<u>12,211</u>	<u>12,635</u>	<u>12,470</u>	<u>12,382</u>	<u>12,334</u>	<u>12,269</u>	<u>10,936</u>	<u>NA^b</u>	<u>11,925</u>
Wyoming ^{a,d}	<u>9,888</u>	<u>9,346</u>	<u>8,716</u>	<u>8,792</u>	<u>8,440</u>	<u>6,712</u>	<u>6,413</u>	<u>7,566</u>	<u>7,818</u>	<u>8,109</u>

Total 25,872 24,573 23,943 23,025 22,641 20,950 20,542 20,305 NA 22,805

^a Idaho and Wyoming numbers include archery and gun hunters.

^b NA = hunter number estimates not currently available.

^c Gun-only season.

^d A percentage of total hunter numbers was used in hunt areas 61 to 63, 67, 68, 73, and 83 because a portion of the hunt area falls outside the designated area.

State	Year										
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Idaho ^a	2,292	2,573	2,962	2,682	2,366	3,102	2,869	2,785	2,883	NA ^b	2,914
Montana	18,26	16,06	16,09	16,47	15,28	16,10	NA	NA	14,29	14,87	12,50
^c	4	2	2	7	8	8			8	2	4
Wyomin	16,23	17,15	17,10	17,05	17,46	16,28	17,45	15,43	15,72	12,81	13,59
^d	3	4	5	3	4	3	8	9	7	2	1
Total	36,78	35,78	36,15	36,21	35,11	35,49			32,90		29,00
	9	9	9	2	8	3			8		9

^a Idaho and Wyoming numbers include archery and gun hunters.
^b NA = hunter number estimates not currently available.
^c Gun only season.
^d A percentage of total hunter numbers was used in hunt areas 61 to 63, 67, 68, 73, and 83 because a portion of the hunt area falls outside the designated area.

State and federal wildlife agencies have attempted to reduce the loss of bears to hunters by expanding information and education programs. “Living in Bear Country” workshops are conducted regularly in many [GYA-GYE](#) communities, and licensed outfitters and guides have increased training for their members and clients.

Monitoring Protocol

Data from state wildlife agencies on big game herd units or hunting districts will be used as an index to backcountry use during the hunting season. Hunter use levels combined with numbers of grizzly bear-human conflicts will be used to identify when and where to increase public education efforts and develop appropriate management actions to minimize grizzly bear-human conflicts that result in bear mortality.

Private Land Development

Background

~~While the existing cumulative effects database accounts for private land development effects within the PCA, influences outside this area are not included. Outside the PCA, several factors influence state and federal grizzly bear management programs. Among the most important is the rapidly accelerating growth of human populations in some areas in grizzly bear habitat in~~

western Montana, southeast Idaho, and northwest Wyoming. This growth results not only in increased visitor use, but also increased residential development on important wildlife habitat adjacent to public lands. This increased human use, primarily residential development, results in the loss of wildlife habitat and permanent increases in grizzly bear/human conflicts, resulting in higher bear mortality rates.

Activities associated with permanent human presence often result in continual management actions that adversely impact bears. Many of these activities occur on or are associated with private lands. Private lands account for a disproportionate number of bear deaths and conflicts (Figures 15 and 16).

Management agencies devote significant efforts toward private landowner outreach programs to minimize grizzly bear/human conflicts and to manage bears and potential conflict situations on such sites. Both the Montana Fish, Wildlife & Parks Department and the Wyoming Game and Fish Department employ bear management specialists devoted specifically to managing grizzly bear/human conflicts on private lands and to working with private landowners to minimize such conflicts.

It is recognized that federal land management and state wildlife agencies do not have direct management authority over private lands and that these agencies do not have the ability to respond to all private land development by management actions on public lands. As private lands are developed and as secure habitat on private lands declines, state and federal agencies will work together to explore options that address impacts from private land development.

Monitoring Protocol

Human-caused mortality related to private land conflicts will be monitored and must be controlled to meet the standards in this Conservation Strategy. This requires ongoing efforts to limit grizzly bear/human conflicts on private lands inside and outside the PCA. To assist in minimizing grizzly bear/human conflicts on private lands, a need exists to develop a protocol to categorize private lands and report changes. The objective is to provide a system for monitoring the status of grizzly bear habitat on private lands within the PCA, and to direct management efforts, conservation actions by private organizations, and outreach efforts to the public in areas where private lands are being developed. The protocol should provide a qualitative and quantitative system for classifying the potential of private land parcels as productive and secure grizzly bear habitat.

While the sole responsibility for monitoring the status and condition of private lands does not lie with the states, the states will assist private non-profits and other entities to categorize and prioritize potential lands suitable for permanent conservation. The quality and availability of land parcel data varies greatly within and among states and is generally available through the various county governments. Therefore, the methodology to monitor private land status and condition will be specific to data availability by county/state.

Figure 15. Land ownership where known and probable human-caused grizzly bear mortalities occurred in the Greater Yellowstone Area Ecosystem during 1987–~~2001~~.

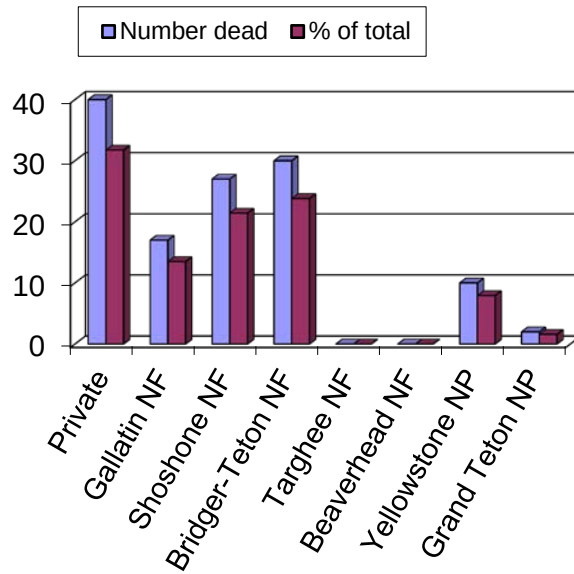
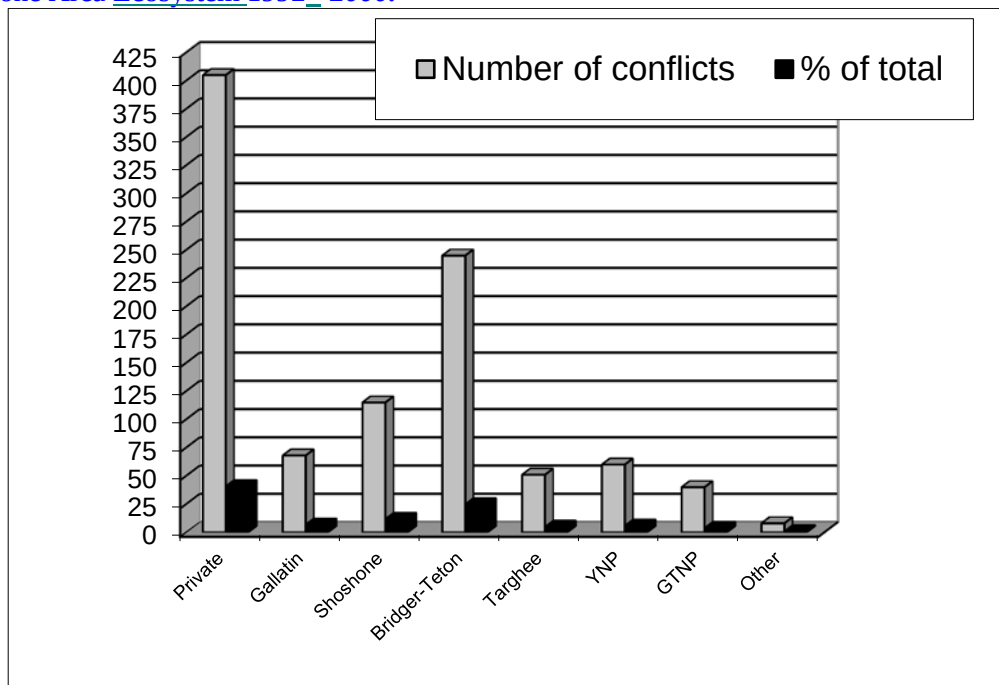


Figure 16. Land ownership where known grizzly bear/human conflicts occurred in the Greater Yellowstone Area Ecosystem 1992–2000.



Monitoring Habitat Connectivity

Background

Habitat connectivity is the degree to which the landscape promotes natural movement of wildlife as they seek important resources for survival and successful procreation. Potential effects of highway improvements, such as increased motorized access, higher traffic volume, and higher speed limits, are known to increase grizzly bear mortality, reduce habitat connectivity, and potentially inhibit gene flow among nearby populations (Mace 2004, Summerfield *et al.* 2004, Proctor *et al.* 2012). Certain road designs and road improvements potentially discourage bear crossings, may lead to increased mortality from vehicle collisions, and may cause habitat fragmentation. The potential impact of highways on demographic and genetic connectivity of grizzly bears in the GYE is a key consideration in the transportation planning process.

~~Excessive clearing widths, increased speeds, increased traffic volume, and widened roads, e.g., four lanes, passing lanes, and wide shoulders, are known to cause increased road mortality and/or reduce habitat connectivity (Proctor 2003, Clevenger *et al.* 2002).~~

~~Vehicle size and numbers continue to increase on the roads in the GYAGYE. As existing roads age and deteriorate, plans are developed to reconstruct these roads to support increases in the size and numbers of vehicles. Federal and state highway departments prefer to design roads that allow increased speed, have wider road surfaces, including wider shoulders, and wide vegetation clearing widths for visibility. A combination of any or all of these design standards results in increased driver comfort and higher speeds. This increase in speed results in increased wildlife mortality (Gunther *et al.* 1998).~~

~~Certain road improvement designs can cause reduction of bear crossings. This results in elimination of traditional dispersal routes and fragmentation of home ranges in the GYAGYE.~~

Monitoring Protocol

To prevent habitat fragmentation and loss of connectivity, existing road survey information will be compiled and evaluated by the appropriate land management agency as an integral part of the planning stage of any proposed road improvement and/or construction project in suitable grizzly bear habitat within the GYE (both inside and outside the PCA). During the NEPA analysis stage of such projects, analyses of road survey information will be conducted to evaluate potential impacts of the project on grizzly bear habitat connectivity. More specifically, federal agencies will identify important crossing areas by collecting and/or assessing existing information about known grizzly bear sightings, ungulate road mortalities, locations of game trails, and bear home ranges and habitat use within and near the road corridor. By identifying crossing areas used by grizzly bears, federal officials can recommend mitigation measures to reduce potential impacts from road construction both during and after a project. For example, during construction, work camps should be placed in areas with lower risk of displacing grizzly bears and use of bear-proof food and garbage storage containers should be implemented. Highway planners are encouraged to place warning signs at points of high mortality risk and implement wildlife crossing infrastructure such as culverts or underpasses to enhance safe passage. Road construction in

areas of relatively high value for potential grizzly bear habitat linkage should be designed to mitigate potential negative impacts on habitat connectivity, including the consideration of installing crossing structures.

~~Monitoring and surveys will be conducted before designs are initiated. These surveys or analyses will include known bear crossing areas, bear sighting information, ungulate road mortality data, bear home range analysis, and game trail information. This information will be used to complete a connectivity analysis to identify important crossing areas.~~

~~To ensure that habitat connectivity is addressed for new road construction or reconstruction in the GYAGYE, federal land management agencies will evaluate habitat connectivity during the NEPA analysis process.~~

Chapter 4 Management and Monitoring of Grizzly Bear-Human Conflicts

Introduction

Humans and grizzly bears occasionally come into conflict in areas where they encounter one another. ~~From 1992 to 2001, as few as 24 and as many as 165 grizzly bear/human conflicts were reported annually in the GYA (Gunther et al. in press).~~

The objective of nuisance management is to minimize grizzly bear-human conflicts. In the Greater Yellowstone AreaEcosystem, nuisance bear management is essential to successful grizzly bear conservation and is often necessary to prevent property damage, livestock losses, and human injury or death. Grizzly bears cannot be totally protected. Like other species, grizzly bears develop individual traits, and some of those traits are not compatible with coexistence with humans. Management emphasis will shift from protecting every individual grizzly bear in the population to assessing an individual's importance to the entire population before instituting management actions. Females will continue to receive a higher level of protection than males. Management of nuisance bears requires rapid responses by state and federal agencies to address conflict situations. This agency response will address the sources of the conflict through public education, removal of attractants, or preventive sanitation of human use areas. Agencies will also capture, relocate, or destroy repeat offender grizzly bears when necessary and when other options have been exhausted.

Analysis of grizzly bear-human incidents indicates that most property damage incidents are the result of bears attempting to gain access to garbage, human foods, livestock or pet foods, or other human-related foods in areas of human presence. Occasionally bears will prey on domestic swine, fowl, or goats, or will damage apiaries. They have rarely injured horses.

Although aggression toward people and human injury or death are rare, bears will occasionally harm people. Incidents of injury are usually the result of a surprise encounter, protection of cubs, defense of a food cache, harassment, or when bears have become accustomed to obtaining food from humans.

The management of grizzly bear-human conflicts is based upon the existing laws and authorities of the state and federal land management agencies as detailed in Chapter 7. Management of nuisance bears usually falls into one or more of the following categories:

- Removing or securing the attractant
- Detering the bear from the site through the use of aversive conditioning techniques
- Capturing and relocating the nuisance bear
- Removing the bear from the wild, including lethal control

Definitions:

- **Unnatural aggression** by a grizzly bear is defined as behavior that includes active predation on humans, approaching humans or human use areas, such as camps, in an aggressive way, or aggressive behavior when the bear is unprovoked by self-defense, defense of cubs, defense of foods, or in a surprise encounter.

- **Grizzly bear-~~human~~ conflicts** are incidents in which bears injure people, damage property, kill or injure livestock, damage beehives, obtain anthropogenic foods, or damage or obtain garden and orchard fruits and vegetables.
- **Natural aggression** by a grizzly bear is defined as defense of young, food, during a surprise encounter, or self-defense.
- A bear is classified as **food conditioned** when it has received a significant food reward of human foods such as garbage, camp food, pet food, or processed livestock food, and persistently seeks these foods.
- A bear is classified as **habituated** when it does not display avoidance behavior around humans or in human use areas such as camps or town sites or within 100 meters of open roads.
- **Relocation** is the capture and movement by management authorities of a bear involved in a conflict with humans or human-related foods, to a remote area away from the conflict site, usually after fitting the bear with a radio collar.
- **Repeat offense** is the involvement of a bear that has been previously relocated in a nuisance situation or, if not relocated, continues to repeat a behavior that constitutes a grizzly bear-~~human~~ conflict.
- **Removal** is the capture and placement of a bear in an authorized public zoological or research facility or destruction of that bear. Removal can also involve killing the bear through active measures in the wild when it is not otherwise possible to capture the bear.
- **Management authorities** are the designated representatives of the agencies in the ~~GYA~~ GYE including: Yellowstone National Park; Grand Teton National Park (GTNP); Wyoming Game and Fish Department; Montana Fish, Wildlife & Parks; Idaho Department of Fish and Game; Interagency Grizzly Bear Study Team; each of the ~~GYA~~ GYE national forests—Custer-Gallatin, ~~Custer~~, Shoshone, Bridger-Teton, Caribou-Targhee, and Beaverhead-Deerlodge; the BLM; and USDA Wildlife Services. These authorities will make the decision to classify a bear as nuisance inside the ~~GYA~~ GYE in compliance with the nuisance bear criteria (discussed below). Outside Yellowstone and Grand Teton National Parks within the PCA, subsequent management actions will be coordinated and completed by state wildlife agencies, after coordination with other appropriate agencies. Nuisance grizzly bear conflict management is under the authority of the states, who will have primary responsibility for the management action. When nuisance bears are in YNP or GTNP, decisions will be made by park representatives, and coordinated with state and Forest Service representatives when necessary, e.g., for bear relocations. Management of nuisance bears outside the PCA will be conducted as described in the state grizzly bear management plans or appropriate park management plans.

Management of nuisance grizzly bears in the Greater Yellowstone ~~Area-Ecosystem~~ will vary depending on whether they are inside or outside the PCA. This system will provide increased security for grizzly bears inside the PCA, as bears will be given greater consideration in most conflicts inside the PCA. Minimization of grizzly bear-human conflicts and management of individual nuisance bears is the primary direction for management within the PCA.

In circumstances that result in a nuisance bear situation outside the PCA, more consideration will be given to existing human uses. Site-specific conflict areas within and outside the PCA will be documented and prioritized to focus proactive management actions to minimize grizzly bear-human conflicts and address existing and potential human activities that may cause future conflicts. Past conflict management has demonstrated that grizzly bears can coexist with most human activities.

Outside the PCA, state management plans will govern how nuisance grizzly bears are handled. Site-specific conflict areas within and outside the PCA will be documented routinely and prioritized to focus proactive management actions to minimize grizzly bear-human conflicts and address existing and potential human activities that may cause future conflicts. The following nuisance grizzly bear standards apply only to the PCA. All nuisance grizzly bear conflicts that occur outside the PCA will be managed according to guidelines in each of the state management plans (Appendices K, L, and M).

~~Conservation Strategy~~ Nuisance Bear Standards

The focus and intent of nuisance grizzly bear management inside and outside the PCA are predicated on strategies and actions to prevent grizzly bear-human conflicts. It is recognized that active management aimed at individual nuisance bears will be required in both areas. Management actions outside the PCA will be implemented according to state management plans in coordination with landowners and land management agencies. These actions will be compatible with grizzly bear population management objectives for each state for the areas outside the PCA.

General Criteria

Location, cause of incident, severity of incident, history of bear, health/age/sex of bear, and demographic characteristics of animals involved will all be considered in any relocation or removal. Removal of nuisance bears will be carefully considered and consistent with mortality limits for the ~~GYA-GYE~~ as described in the Conservation Strategy. Recognizing that conservation of female bears is essential to maintenance of a grizzly bear population, removal of nuisance females will be minimized.

Within the Primary Conservation Area

Within the PCA, management of nuisance bears will be addressed according to the following standards:

- Bears displaying food conditioning and/or habituation may be either relocated or removed based on specific details of the incident. State wildlife agencies, following

consultation with other appropriate management authorities, and national parks will make this judgment after considering the cause, location, and severity of the incident or incidents.

- Bears may be relocated as many times as judged prudent by management authorities. No bear may be removed for any offense, other than unnatural aggression, without at least one relocation unless representatives of affected agencies document the reason in writing. All relocations outside the PCA will be governed by state management plans.
- Bears may be preemptively moved when they are in areas where they are likely to come into conflicts with site-specific human activities, but only as a last resort. Such preemptive moves will not count against the bear as nuisance moves.
- Bears preying on lawfully present livestock (cows, domestic sheep, horses, goats, llamas, etc.) on public lands will be managed according to the following criteria:
 - No grizzly bear involved in livestock depredations inside the PCA shall be removed unless it has been relocated at least one time and continues to cause livestock depredations. ~~This does not apply to depredations occurring in sheep allotments inside the PCA in areas that were designated Management Situation 1⁸ under the Interagency Grizzly Bear Guidelines (IGBC 1986).~~
 - ~~• Grizzly bears will not be removed or relocated from sheep allotments on federal land inside the PCA in areas that were designated Management Situation 1 under the Interagency Grizzly Bear Guidelines (IGBC 1986).~~
- Before any removal, except in cases of human safety, management authorities will consult by telephone or in person to judge the adequacy of the reason for removal.
- Bears displaying natural aggression are not to be removed, even if the aggression results in human injury or death, unless it is the judgment of management authorities that the particular circumstances warrant removal.
- Bears displaying unnatural aggression will be removed from the population.
- Decisions will be based on criteria for relocation and removal inside the PCA for management of nuisance bears in the Conservation Strategy and best biological judgment of authorities.
- Authorized National Park Service authorities will implement removals and relocations within YNP and GTNP.
- Authorized state or tribal authorities outside YNP and GTNP will implement other removals and relocations.
- State and tribal wildlife agencies in coordination with the appropriate federal agencies will predetermine adequate and available sites for relocations. Relocation sites should be agreed upon before the need for relocation occurs. In order to deal with problem bears more efficiently, managers should have full access to relocation sites without having to conduct individual consultation for each relocation.
- Livestock damage prevention and compensation are addressed in individual state management plans.
- Management of all nuisance bear situations will emphasize removal of the human cause of the conflict, when possible, or management and education actions to limit such

⁸ ~~Management Situation 1 areas are described in existing forest plans.~~

conflicts. Relocation and removal of grizzly bears may occur if the above actions are not successful.

Specific Criteria for Removals

Captured grizzly bears identified for removal may be given to public research institutions or public zoological parks for appropriate non-release educational or scientific purposes as per regulations of states and national parks. Grizzly bears not suitable for release, research, or educational purposes will be removed as described in appropriate state management plans or in compliance with national park rules and regulations.

Outside of national parks, individual nuisance bears deemed appropriate for removal may be taken by a legal hunter in compliance with rules and regulations promulgated by the appropriate state wildlife agency commission, as long as such taking is in compliance with existing state and federal laws, and as long as mortality limits specified for the ~~GYA~~~~GYE~~ as described in this Conservation Strategy are not exceeded. This could include licensed hunters or property owners or their agents who have obtained appropriate permits from the state. Licensed hunters will be allowed to possess bear parts for bears that are legally harvested under a state permit.

Monitoring Protocol

All nuisance bear control actions, and grizzly bear-~~h~~human and grizzly bear-~~l~~livestock conflicts will be summarized annually in the Annual Report of the IGBST. Most conflicts are due to availability of human foods, human developments, or livestock depredations in occupied grizzly bear habitat. This report will detail the cause and location of each conflict and management action and display an annual spatial distribution of conflicts that can be used by managers to identify where problems occur and to compare trends in locations, sources, land ownership, and types of conflicts.

Chapter 5 Information and Education

Introduction

The future of the Yellowstone grizzly bear lies in our ability to learn to coexist with the grizzly [bear](#) and to accept this animal as a cohabitant of the land. Historically, excessive human-caused mortality and loss of habitat are the major factors in grizzly bear population decline. Addressing the source of grizzly bear-human conflicts is critical to an effective public outreach plan. Public attitudes in large part determine the success of efforts to manage a recovered grizzly bear population in the Greater Yellowstone [AreaEcosystem](#). For the good of the bear and to develop positive public attitudes, a coordinated information and education campaign is essential.

The purposes of the information and education aspects of this cooperative effort are to support the development, implementation, and dissemination of a coordinated information and education program. This program should be understandable and useful for the people who visit, live, work, and recreate in bear habitat to minimize grizzly bear-human conflicts and to provide for the safety of people while building support for viable bear populations.

Other management strategies outlined in this plan are unlikely to succeed without useful, state-of-the-art public information and education programs. A partnership information and education approach involving state and federal agencies, tribes, local communities, and private interests can result in minimizing grizzly bear-human conflicts while building support for bears and bear management.

Successful long-term community involvement in future grizzly bear management efforts requires continued use of current effective methods and tools that have contributed to the success story of the recovered population we have today. In addition, to meet the needs of an ever-growing human population and expanding bear population, it will be necessary to develop new processes and outreach tools to further enhance public involvement and appreciation of the grizzly bear and monitor social behavior and attitudes. Through close monitoring, we will be able to gauge our success in reaching our diverse public and in minimizing grizzly bear-human conflicts, adjusting programs as needed.

Successful public education and involvement should result in the understanding that it is acceptable and expected human behavior to practice good stewardship, and this will in turn allow us to live with the grizzly bear as part of our valued wildlife resources.

The Information and Education Team

The information and education effort will continue to be coordinated between all agencies and private interests to ensure timely, accurate, and consistent messages to the public. The current information and education (I & E) working group within the Greater Yellowstone [AreaEcosystem](#) will continue. Members of this I & E Team include public affairs personnel from Forest Service Regions 1, 2, and 4; Grand Teton and Yellowstone National Parks; the BLM; representatives from each state wildlife agency; and the information and education specialist

from the IGBC. This team will continue to work with all affected interests to ensure consistency of information, efficient funding strategies, identifying and targeting audiences, developing partnerships, and identifying new tools for implementation.

A coordinated information and education campaign will be most effective if it facilitates changing inappropriate human behaviors and helps people learn to coexist with bears. The benefits of grizzly bear management for a multitude of resources and species, including elk habitat management, black bear management, and water quality, recreation, and aesthetic values of access management, will be included in the information and education efforts. Long-term community engagement in grizzly bear issues is necessary to increase the awareness of bear behavior and biology and how these can be compatible with human needs and activities. Identification of sources of grizzly bear-human conflicts and the use of public education as a tool are essential. The responsibilities of the I & E Team include the following:

- Develop a coordinated information and education campaign to cultivate an appreciation of the value of the grizzly bear resource in this area. The grizzly bear will be presented as a valuable wildlife resource, while still acknowledging the risks associated with them in publications and educational outreach.
- Continue and expand living-with-bears workshops or outreach with a similar message for citizens and teachers within the Greater Yellowstone [Area Ecosystem](#). Similar seminars for other specific target groups such as hunters and other backcountry recreationists will be used as appropriate.
- Local citizens involvement groups and processes will be used to facilitate information exchange and identify other community interests regarding the grizzly bear.
- Updates and information will be provided to all affected interests through various media including news releases and mailings, television, etc.
- State and federal volunteer programs will be encouraged to identify and provide an opportunity for public participation in grizzly bear information outreach and management. This could include trailhead demonstrations on bear resistant containers, distribution of brochures, school education programs, etc.
- Proactive and preventative safety messages will be expanded.
- Citizens will be encouraged to participate in land management decisions at the project level on state and federal lands affecting grizzly bear habitat and management.
- Citizens will also be encouraged to be involved in private land issues associated with grizzly bear management. This may include sanitation ordinances, conservation easements, developing private land management plans, and supporting informational outreach campaigns to private landowners.
- Knowledge about bears and acceptance of grizzly bears by people and groups that live, work, and recreate in grizzly bear country are key to the long-term conservation of a healthy grizzly bear population. Continuing specific outreach messages and techniques tailored to the needs of these groups is essential. Some of these groups include landowners, mining industry, timber industry, firewood gatherers, ranchers, outfitters, anglers, hunters, front country visitors, backcountry visitors, summer home owners, local business owners, developers, county planners, and school children.

Finally, information made available to the public will be open and responsive to public concerns. Open discussions with the public will increase credibility of the grizzly bear management program.

These efforts will be reviewed periodically and program adjustments will be made as necessary. In addition, efforts will be expanded as the bear population expands and additional efforts will be needed in areas that could become occupied in the near future.

Many brochures, videos, signs, articles, etc. are currently available and in use. Examples of these specific information and education tools are discussed in the state management plans.

Chapter 6 Implementation and Evaluation

Implementation

A new committee will replace the Yellowstone Ecosystem Subcommittee. The new committee, the Yellowstone Grizzly [Bear](#) Coordinating Committee (YGCC), is the body that will coordinate management and promote the exchange of information about the Yellowstone grizzly bear population. The YGCC will inform the IGBC about the Yellowstone grizzly bear population for the benefit of grizzly bear conservation and management.

The Yellowstone Grizzly [Bear](#) Coordinating Committee

Within 30 days of a final rule delisting the Greater Yellowstone [Area-Ecosystem](#) grizzly bear population, the signatories of this Conservation Strategy will name their agency representatives to the YGCC. The person who was chairperson of the Yellowstone Ecosystem Subcommittee when the final rule changing status is published will call the first meeting of the YGCC. At this first meeting, the YGCC will elect a chairperson. Chairpersons will be elected at intervals determined by the members of the YGCC. The YGCC will meet at least two times each year; public notification of these meetings will be made by the chairperson or her/his representatives. The YGCC will strive for consensus, but when consensus cannot be achieved, decisions of the YGCC will be determined by majority vote. The details on locations and times of meetings and other business issues associated with the functioning of the YGCC will be determined at the first meeting.

YGCC members' expenses will be paid by their respective agencies.

YGCC authorities include:

- Revise or amend the Conservation Strategy based on the best biological data and the best available science. Any such amendments will be subject to public review and comment. Amendments will be made by the YGCC with a majority vote.
- Establish meeting rules and procedures, and chairperson election rules for the committee.
- Seek funding to further the conservation of the Yellowstone grizzly bear by implementing this Conservation Strategy. Each agency is responsible for seeking the necessary funding to carry out the tasks assigned in this Conservation Strategy.

Some primary activities of the YGCC are:

- Coordinate implementation of this Conservation Strategy
- Ensure that population and habitat data are collected annually by the IGBST, as specified in this Conservation Strategy, and evaluated to assess current status of the grizzly bear population
- Share information and implement management actions in a coordinated fashion
- Identify management, research, and financial needs to successfully implement the coordinated Conservation Strategy

- Implement a Biology and Monitoring Review as necessary and submit a petition for relisting as appropriate to ensure agency responsiveness to changing circumstances of the grizzly or its habitat in the Greater Yellowstone ~~Area~~Ecosystem
- Appoint a chairperson and members of the Information and Education Team, and coordinate information and education efforts

This committee does not supersede the authority of the management agencies beyond the specific actions agreed to as signatories of this Conservation Strategy.

YGCC membership will consist of representatives of the following, each having one vote:

Federal	National parks: Yellowstone and Grand Teton National forests: Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer-, Gallatin, and Shoshone One Bureau of Land Management representative The Biological Resources Division of the U.S. Geological Survey
State wildlife agencies	Idaho, Montana, and Wyoming
Local government	One representative <u>from each state</u>
Tribal	One representative from each Native American tribe with sovereign powers over reservation lands within the ecosystem

~~Three teams, the Interagency Grizzly Bear Study Team (IGBST), the Habitat Modeling Team (GEM), and the Information and Education Team (I & E) will perform necessary tasks and report to the YGCC.~~

The Interagency Grizzly Bear Study Team

In order to understand the dynamics of grizzly bears throughout the ~~GYY~~GYE, a need for centralized responsibility to collect, manage, analyze, and distribute science-based information was identified. To meet this need, in 1973 agencies formed the Interagency Grizzly Bear Study Team, a cooperative effort between the U.S. Geological Survey, National Park Service, U.S. Forest Service, U.S. Fish and Wildlife Service, and the state wildlife agencies of Idaho, Montana, and Wyoming.

Since 1974, the IGBST has published ~~164~~more than 200 scientific papers on the grizzly bear. A complete list of these papers can be found at: <http://nrmssc.usgs.gov/science/igbst/detailedpubs> ~~http://www.nrmssc.usgs.gov/research/igbstpub.pdf~~.

Quantitative data on grizzly bear abundance, distribution, survival, mortality, nuisance activity, and bear foods are critical to formulating management strategies and decisions. The IGBST coordinates data collection and analysis on an ecosystem scale, prevents overlap of efforts, and pools limited economic and human resources.

The IGBST will continue to function under this Conservation Strategy after delisting.

The responsibilities of the IGBST are to:

- Conduct both short- and long-term research projects addressing information needs for bear management
- Monitor the bear population, including status and trend, numbers, reproduction, and mortality
- Monitor grizzly bear habitats, foods, and the impacts of humans
- Provide technical support to agencies and other groups responsible for the immediate and long-term management of grizzly bears in the [GYAGYE](#)
- Take the lead in preparing a Biology and Monitoring Review with staff support from the YGCC in response to deviations from required population or habitat standards

~~The primary responsibilities of the Habitat Modeling Team are:~~

- Coordinate annual updates of the motorized access database
- Coordinate annual evaluation of motorized access route density and secure habitat
- ~~• Coordinate updates of the CEM (Cumulative Effects Model) vegetation layer for changes due to timber harvest, fire, and insects and disease~~
- ~~• Coordinate periodic update of the CEM human activities database~~
- ~~• Coordinate periodic evaluation of habitat effectiveness~~
- Document annually any changes in developed sites, livestock allotments, or permitted sheep numbers and maintain associated databases
- Ensure all units have the tools and the training to evaluate motorized access route density and secure habitat for projects
- Evaluate the need for changes in ways to evaluate motorized access route density, secure habitat, and habitat effectiveness, and make recommendations to the YGCC on such changes, as necessary
- Set and maintain standards, definitions, values, formats and processes for collecting and updating data and assessment models, and maintaining data consistency between units.
- ~~• Coordinate with the IGBST for~~Produce annual reports on population and habitat - reporting annual monitoring items

The USGS employee who is the lead biologist for USGS on the [Greater](#) Yellowstone [Ecosystem](#) grizzly bear population chairs the IGBST and will call meetings at least twice each year. The majority of funding for the IGBST comes from USGS but additional funding and in-kind efforts are made by all agencies (see Appendix H). The IGBST will report its findings to the YGCC.

~~The Habitat Modeling Team~~

~~The habitat standards and many of the habitat monitoring items identified in the Strategy require the use of cartographic modeling and the intensive maintenance of geographic information system databases. Computer technology is constantly changing and assessment protocols must be updated as software and hardware are replaced. Models used to evaluate these parameters require continual reevaluation and testing. A coordinated approach to database maintenance and monitoring is necessary for success.~~

~~Members of the Habitat Modeling Team will include biologists and GIS specialists from each of the six national forests and two national parks in the GYA, and a database coordinator. The Habitat Modeling Team will report to the YGCC.~~

The Information and Education Team

Successful maintenance of a recovered grizzly bear population in the Yellowstone area GYE requires joint understanding of issues, sharing of knowledge (including new science and results of monitoring), and open communication among agencies, tribes, elected officials, non-governmental groups and organizations, and the public. The goals of the Information and Education (I & E) Team are:

- Increase public support for and compliance with agency management actions to maintain a secure Yellowstone area GYE grizzly bear population
- Utilize all possible modern technology and media resources to help decrease grizzly bear-human conflicts while still maintaining maximum access to natural resources for both humans and grizzly bears
- Increase an understanding of grizzly bears and their habitat
- Foster information sharing to ensure maximum resource, policy, and scientific informational exchange among agencies, tribes, elected officials, interest groups, local residents, and the public.
- Provide for meaningful public involvement through use of open houses, direct mailings, and media campaigns to inform the public about agency decisions relating to grizzly bear habitat and population management activities and other management actions that may affect local residents, landowners, tribes, and users

Members of the Information and Education Team will include I & E specialists from the National Park Service, U.S. Forest Service, and the state wildlife agencies of Idaho, Montana, and Wyoming. The I & E Team will report to the YGCC.

Evaluation

The evaluation of the effectiveness of grizzly bear conservation measures detailed in this Conservation Strategy will be an ongoing process shared by all the members of the Yellowstone Grizzly Bear Coordinating Committee.

As detailed in the monitoring portion of this strategy, the IGBST will take the lead in preparing an annual monitoring report with staff support from the YGCC. Agencies responsible for monitoring major population and habitat parameters are listed in Appendix I. Monitoring results and analyses will be presented to the YGCC by the IGBST. ~~If there are deviations from any of the population and/or habitat standards stipulated in this Conservation Strategy, a~~ Biological and Monitoring Review would be initiated triggered if any of the following conditions were met:

- Exceeding female mortality limits in 2 consecutive years
- Exceeding male mortality limits in 3 consecutive years
- Exceeding dependent young mortality limits in 3 consecutive years
- Failure to meet the distribution criterion in 2 consecutive years
- Failure to meet any of the habitat standards
- Failure to receive adequate funding to implement the monitoring and management requirements of the Conservation Strategy ~~The IGBST is given this task as they are the preparers of the annual monitoring reports and are therefore most able to assess deviations from the population or habitat standards and the efforts of each agency to~~

~~complete their monitoring tasks necessary to produce the monitoring data for the annual report.~~

Biology and Monitoring Review

Under this Conservation Strategy, a Biology and Monitoring Review is a process carried out by the IGBST. A Biology and Monitoring Review examines management of habitat, populations, or efforts of participating agencies to complete their required monitoring. Biology and Monitoring Reviews will be undertaken after the annual summary of monitoring information presented to the YGCC and in response to deviations from required population or habitat standards. Any YGCC member agency also can request that a Biology and Monitoring Review be considered. Such consideration would be a topic for discussion by the YGCC and the review would be initiated based on the decision of the YGCC. The Biology and Monitoring Review process will be completed within six months and the resulting written report presented to the YGCC and made available to the public. The IGBST is not responsible for completing impact analyses for projects proposed by any agency; such analyses are the responsibility of the agency making the proposal.

The purposes of a Biology and Monitoring Review are:

- To identify the reasons why particular demographic or habitat objectives have not been achieved and to recommend modifications to the YGCC for changes as necessary
- To consider potential impacts of a proposed action of concern to one or more members of the YGCC, or
- To consider departures by one or more agencies from the monitoring effort required under this Conservation Strategy and to recommend plans to the YGCC to ensure that monitoring efforts be maintained as per the standards in this document, or
- To consider and establish a scientific basis for possible changes in management due to changed conditions in the ecosystem and make those recommendations to the YGCC
- Make recommendations as to whether a petition for relisting should be submitted

Biology and Monitoring Reviews will be based on the best available science. Biology and Monitoring Reviews will be submitted as written reports by the IGBST to the YGCC and made available to the public. The YGCC will respond to the Biology and Monitoring Review in a written form either through the minutes of the YGCC meeting or in specific Biology and Monitoring Review response documents, as necessary. The purpose of the YGCC response is to address the issues(s) raised in the Biology and Monitoring Review with an explanation or management changes as necessary. In the case of a deviation from monitoring efforts required under this Conservation Strategy, the response will identify the means to be implemented by the YGCC to ensure continued population and/or habitat monitoring efforts as required in this document.

A Biology and Monitoring Review is generally triggered by negative deviations from the desired conditions established in this Conservation Strategy for population, mortality reduction, and habitat parameters; however, the IGBST can recommend a Biology and Monitoring Review to the YGCC if they deem it necessary.

A Biology and Monitoring Review will make recommendations as to whether a petition for relisting should be made. This recommendation shall be based upon the magnitude of the threat that the deviation from the desired condition poses to the maintenance of a recovered population. The YGCC has to formally agree with a recommendation from the IGBST to petition for relisting.

If the situation, after completion of the Biology and Monitoring Review, is such that some or all of the desired population and habitat conditions specified in this Conservation Strategy are not being met, and cannot be met in the opinion of the YGCC, then the YGCC will submit to the Fish and Wildlife Service a petition for relisting. In the case of a vote on this issue, a simple majority is necessary.

~~Petition for Relisting~~ USFWS Service Status Review

There are two processes by which relisting the YellowstoneGYE grizzly bear population can be initiated:

1. Receipt of a petition from any entity such as the YGCC, an organization, or a citizen
2. A status review initiated by the Fish and Wildlife Service to determine if a species should be a candidate species listed by the normal process, or should be emergency-listed by the Fish and Wildlife Service.

Under Section 4 of the Endangered Species Act, a petition from an individual or organization to relist this population will initiate a status review, if the Fish and Wildlife Service determines that the petition is warranted. To be warranted, such a petition must present credible scientific information to support the petition. The YGCC can petition the Fish and Wildlife Service to relist the YellowstoneGYE grizzly bears. The Fish and Wildlife Service is to perform a status review upon receipt of such a petition that contains sufficient information to demonstrate that the request to relist is warranted. A relisting petition from the YGCC should be accompanied by the available specific biological data on the population and its habitat sufficient to judge its status as a recovered population as per the requirements of this Conservation Strategy. A status review will evaluate the factors affecting the population and result in a finding that summarizes the status of the population and recommends listing or not. For purposes of a status review, the status of the entire Greater Yellowstone Area-Ecosystem grizzly bear population would be considered.

The U.S. Fish and Wildlife Service can unilaterally initiate a status review to determine if the YellowstoneGYE grizzly bears should be a candidate species and be added to the species to be listed. This could be accomplished independently of the YGCC based on Fish and Wildlife Service concerns about the population and/or its habitat. Based on a review of a petition or a status review initiated by the Fish and Wildlife Service, if the Fish and Wildlife Service finds serious and imminent threats to the population as per the criteria of the Endangered Species Act in Section 4(a)(1), the species could be immediately considered for relisting or could be relisted under emergency regulations, per Section 4(b)(7).

A USFWS Service status review would be triggered if any of the following conditions were met:

- Exceeding female mortality limits in 3 consecutive years
- Exceeding male mortality limits in 4 consecutive years

- Exceeding dependent young mortality limits in 4 consecutive years
- A total population estimate of less than 500 inside the DMA

Changes in federal, state, or tribal laws

Chapter 7 Existing Authorities

Introduction

The existence of adequate regulatory mechanisms that serve to maintain the Yellowstone grizzly bear population as recovered is one of the five factors required to change the status of the population to delisted and to ensure a healthy grizzly bear population.

The management of populations of grizzly bears and the habitats these bears require for survival is dependent upon the laws and regulations of the federal and state agencies in the Greater Yellowstone [AreaEcosystem](#). These laws and regulations provide the legal basis for controlling mortality, providing secure habitats, managing grizzly bear-human conflicts, controlling hunters, limiting access where necessary, controlling livestock grazing, maintaining education and outreach programs to control conflicts, monitoring populations and habitats, and requesting management and petitions for relisting when necessary. Many of these laws provide authorities for a number of these actions and controls.

The following laws and regulations, or portions thereof, exist and are relevant to agency programs regarding management of the grizzly bear and its habitat in the Greater Yellowstone [AreaEcosystem](#). These provisions, whether national or state, have application in terms of agency compliance, agency authority, or discretion to act.

The relationship between the existing authorities and the five factors in Section 4)(a)(1) used to consider listing and delisting of a species is presented in Appendix J. These five factors are all relevant to maintain a recovered population.

Federal Lands

Acts of Congress⁹

The Act of Congress March 1, 1872. Set Yellowstone apart as a public park for the benefit and enjoyment of the people" and "for the preservation, from injury or spoliation, of all timber, mineral deposits, natural curiosities or wonders...and their retention in their natural condition". 16 U.S.C. §§21-22.

National Park Service Organic Act, 1916. The National Park Service...shall promote and regulate the use...by such means... to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such a manner...as will leave them unimpaired for future generations. 16 U.S.C. §31 repealed June 25, 1948.

Lacey Act, Criminal Code Provisions, 18 U.S.C. 42-44. This Act makes it illegal to import, export, transport, sell, receive, acquire, or purchase any fish or wildlife or plant taken or possessed in violation of any law, treaty or regulation of the United States or in violation of any

⁹ Federal legislation can be viewed at the Library of Congress web site: <http://thomas.loc.gov>

Indian tribal law; to import, export, transport, sell, receive, acquire, or purchase in interstate or foreign commerce any fish or wildlife taken, possessed, transported, or sold in violation of any law or regulation of any state or in violation of any foreign law. 18 U.S.C. §§42—43.

Fish and Wildlife Coordination Act, 16 U.S.C. §§661-666c. This Act relates to wildlife as associated with water resource development. This act also authorizes that lands and waters may be acquired by Federal construction agencies for wildlife conservation to mitigate water projects in order to preserve and assure for the public benefit the wildlife potential of the particular water project area.

The Act of Congress September 14, 1950. (Expansion of Grand Teton National Park to include Jackson Hole National Monument) "The national park so established shall, so far as consistent with the provisions of this Act, be administered in accordance with the general statutes governing national parks..." 16 U.S.C. § 406d-1

Sikes Act, 16 U.S.C. §670g. The Secretaries of Agriculture and Interior and the State agencies will cooperate under this act to plan, develop, maintain, and coordinate programs for the conservation and rehabilitation of wildlife, fish and game. These programs shall include, but not be limited to, specific habitat improvements projects and related activities and provide adequate protection for species considered threatened or endangered pursuant to Section 4 of the ESA. Multiple-Use Sustained-Yield Act, 16 U.S.C. §§528-531. It is the policy of the Congress that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed and wildlife and fish purposes. As used in this Act, "Multiple Use" means the management of all the various resources of the National Forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

National Environmental Policy Act, 42 U.S.C. §§ 4321-4331. The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment: to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality. The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall—

(A) Utilize a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision making which may have an impact on man's environment; (B) Identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by Title II of

this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations; (C) Include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

- (i) The environmental impact of the proposed action
- (ii) Any adverse environmental effects which cannot be avoided should the proposal be implemented
- (iii) Alternatives to the proposed action.
- (iv) The relationship between local short term uses of man's environment and the maintenance and enhancement of long term productivity, and
- (v) Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency that has jurisdiction by law or special expertise with respect to any environmental impact involved.

The Act of Congress August 25, 1972, PL. 94-404 86 §620. Authorization to establish John D. Rockefeller, Jr. Memorial Parkway "... to provide both a symbolic and desirable physical connection between... Yellowstone, and the Grand Teton National Park..." "The Secretary shall administer the parkway as a unit of the national park system in accordance with the authority contained in the Act of August 25, 1916..." Established by the Secretary of the Interior, September 30, 1977.

Endangered Species Act, 16 U.S.C. § 1533. ESA - Section 4 of the Act gives the criteria for determining a species' status as threatened or endangered. In order to delist a species, it must be shown that the opposite is true. It must be shown that: a) the species' habitat or range is not threatened with destruction, modification or curtailment, b) the species is not being over utilized for commercial, recreational, scientific or educational purposes, c) disease and predation are not significant problems, d) there are adequate regulatory mechanisms in place, and e) there are no significant other natural or manmade factors affecting the continued existence of the species. The Secretary of Interior and States shall effectively monitor recovered species for not less than five years after the species is delisted and no longer protected under the ESA.

Forest and Rangeland Renewable Resources Planning Act, 1974. In recognition of the vital importance of America's renewable resources of the forest, range, and other associated lands to the Nation's social and economic well being, and of the necessity for a long term perspective in planning and undertaking related national renewable resource programs administered by the Forest Service, the Secretary of Agriculture shall prepare a Renewable Resources Assessment. A strategic plan for all Forest Service activities shall be prepared every five years based on the assessment of renewable natural resources and on all land ownerships every 10 years. It provides direction that land management plans specify guidelines for land management plans, which provide for diversity of plant and animal communities. 16 U.S.C. §1600.

National Forest Management Act (NFMA) of 1976. NFMA provides the legal basis and direction for development of national forest plans. NFMA specifies that the National Forest System be managed to provide for diversity of plant and animal communities to meet multiple use objectives. Subsequent regulations for planning land and resource management (36 CFR 219), adopted in 1979 augmented the diversity policy by requiring management of habitats to maintain viable populations of vertebrates. 15 U.S.C. §1600.

Federal Land Policy and Management Act. Public lands will be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values...that will provide food and habitat for fish and wildlife and domestic animals, and that will provide for outdoor recreation and human occupancy and use. 43 U.S.C. §§ 1701-1777.

Fish and Wildlife Improvement Act, 16 U.S.C. § 742(a).

Fish and Wildlife Conservation Act, 16 U.S.C. §§ 2901-2911. Each State should be encouraged to develop, revise and implement, in consultation with appropriate other agencies, a plan for the conservation of fish and wildlife, particularly those species, which are indigenous to the State. The purpose of this act is to provide financial and technical assistance to the States for the development, revision and implementation of conservation plans and programs for nongame fish and wildlife and to conserve and promote conservation of nongame fish and wildlife and their habitats.

The National Parks Omnibus Management Act of 1998 (PL 105-391, 112 Stat. 3497). Title I, Section 101 recognizes the ever increasing societal pressures being placed upon America's unique natural and cultural resources contained in the National Park System, the Secretary shall continually improve the ability of the National Park Service to provide state-of-the-art management, protection, and interpretation of and research on the resources of the National Park System. Title II, Section 201, National Park System Resource Inventory and Management identifies the need to enhance management and protection of national park resources by providing clear authority and direction for the conduct of scientific study in the National Park system and to use the information gathered for management purposes. 16 U.S.C. §5901.

Federal Regulations

36 CFR 1.5 (a)(1). Gives National Park Superintendents the authority to establish for all or a portion of a park area a reasonable schedule of visiting hours, impose public use limits, or close all or a portion of a park area to all public use or to a specific use or activity in order to protect natural resources or provide for human safety.

36 CFR 1.7(B). National Park Service Superintendents shall publish in writing all designations, closures, permit requirements and other restrictions imposed under discretionary authority.

36 CFR 1.7(B) 1.2 (d). Gives National Park Superintendents the ability to regulate activities conducted by National Parks, or their agents, relative to the management and handling of grizzly bears (*Ursus arctos horribilis*). Specifics are described in Park Annual Bear Management Plans.

36 CFR 2.10 (d). Gives the National Park Superintendents authority to designate all or a portion of a park area where food, lawfully taken fish or wildlife, garbage and equipment used to cook or store food must be kept to avoid bear-human conflicts. This restriction does not apply to food that is being transported, consumed, or prepared for consumption.

36 CFR 219. Specifies that the National Forest System be managed to provide for diversity of plant and animal communities to meet multiple use objectives. Subsequent regulations for planning land and resource management and requiring management of habitats to maintain viable populations of vertebrates.

36 CFR 219.19. Requires that Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. A viable population shall be regarded as one, which has the estimated numbers, and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area.

36 CFR 219.26. Specifies that Forest planning shall provide for diversity of plant and animal communities to meet multiple use objectives.

36 CFR 219.27 (a) (6). States that (a) All management prescriptions shall – (6) Provide for adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species.

36 CFR 261.50 (a) and (b). Gives Forest Supervisors the authority to issue orders which close or restrict the use of described areas, or of any forest development road or trail within the area over which he has jurisdiction. This authority is used to close areas to minimize human/bear conflicts and to issue food storage, carcass storage and camping requirements.

36 CFR 261.53 (a) and (e). States that when provided for in an order authorized under 36 CFR 261.50 (a) and (b) it is prohibited to go into or be upon any area which is closed for the protection of: (a) threatened, endangered, rare, unique, or vanishing species of plants, animals, birds or fish or; (b) for public health or safety.

36 CFR 261.58 (e) and (s) and (cc). States that when provided for in an order authorized under 36 CFR 261.50 (a) and (b) the following are prohibited. (a) Camping; (s) Possessing, storing, or transporting any bird, fish, or other animal or parts thereof as specified in the order; (cc) Possessing or storing any food or refuse, as specified in the order.

States

*Wyoming State Statutes*¹⁰

23-1-101(a)(xii). "Trophy game animal" means black bear, grizzly bear, or mountain lion.

¹⁰ Wyoming statutes are available from the Wyoming State Law Library at http://courts.state.wy.us/state_law_library.htm.

23-1-103. Ownership of wildlife. For the purpose of this act, all wildlife in Wyoming is property of the State. There shall be no private ownership of live animals classified as big or trophy game animals.

23-1-302(a)(ii). Powers and duties of the commission. To establish zones and areas in which trophy game animals may be taken as game animals with a license or in the same manner as predatory animals without a license, giving proper regard to livestock and game industries in those particular areas.

23-1-901. Owner of damaged property to report damage; claims for damages; time for filing; determination; appeal; arbitration. This is a lengthy statute that addresses procedures for filing damage claims.

23-2-101(e). Fees. This statute requires the commission to maintain a \$500,000 balance to be used to compensate landowners for damage done by game animals.

23-3-102(b). License requirements. Requires a license to take a grizzly bear, except as otherwise provided.

23-3-102(d). Provides for a minimum of \$5,000 and a maximum of \$10,000 fine for killing a grizzly bear.

23-3-103(b). Taking predatory animals and trophy animals. Allows trophy game animals to be taken in areas designated by the Commission by the same means as a predatory animal.

23-3-106. Interstate game tag required. Regulates the transportation of bears within and across Wyoming State lines.

23-3-107. Wanton destruction. Prohibits a person from wantonly destroying any grizzly bear.

23-3-109. Use of dogs. Prohibits the use of dogs to hunt, run, or harass big or trophy game animals except as especially permitted by statute.

23-3-112. Firearms. Prohibits the use of certain types of firearms to take game animals.

23-3-115. Taking black bears doing damage. Allows landowner to kill black bears doing damage and requires them to notify the department. Grizzly bears may not be taken.

23-3-301. Importation and sale prohibited. Prohibits the importation and sale of bears.

Wyoming Game and Fish Commission Regulations

Chapter XLIII. Prohibits the taking of any wildlife unless the season is specifically opened by the commission.

Chapter II. Requires the taking of any grizzly [bear](#) to be reported to the department and the U.S. Fish Wildlife Service immediately. Section 7.

Chapter III. Prohibits the placement of baits in the current grizzly bear recovery zone. Section 6(a)(v).

*Idaho State Statutes*¹¹

36-103 (a). Wildlife property of State - Preservation - Wildlife Policy. All wildlife, including all wild animals, wild birds, and fish, within the State of Idaho, is hereby declared the property of the State of Idaho. It shall be preserved, protected, perpetuated, and managed. It shall only be captured or taken at such times or places, under such conditions, or by such means, or in such manner, as will preserve, protect, and perpetuate such wildlife, and provide for the citizens of this State and, as by law permitted to others, continuous supplies of such wildlife for hunting, fishing and trapping.

36-103 (b). Commission to Administer Policy. Authority, power and duty of the Fish and Game Commission to administer and carry out the provisions of the Idaho Fish and Game Code. The Commission is not authorized to change the states' wildlife policy but only to administer it.

36-201. Fish and Game Commission authorized to classify wildlife. With the exception of predatory animals, the Idaho fish and game commission is hereby authorized to define by classification or reclassification all wildlife in the State of Idaho.

Idaho Fish and Game Commission Regulations

IDAPA 13 G 1.9. Species of Special Concern, Threatened or Endangered Species. Lists the grizzly bear as a Threatened Species. By definition a species likely to be classified as Endangered within the foreseeable future throughout all or a significant portion of its Idaho range.

IDAPA 13 G 2.2. No person shall take or possess those species of wildlife classified as Protected non game, Species of Special Concern, or Threatened or Endangered at any time or in any manner, except as provided in Sections 36-106 (e) 5 and 36-1107, Idaho code or by commission regulation.

*Montana State Statutes*¹²

¹¹ Idaho statutes are available from <http://www3.state.id.us/idstat/TOC/idstTOC.html>.

¹² Montana statutes are available from <http://www.lawlibrary.state.mt.us>, the State Law Library of Montana.

Section 87-1-301. MCA, Powers of the Commission. Statutes, State of Montana, Department of Fish, Wildlife and Parks.

Requires the Fish, Wildlife and Parks Commission to set policies for the protection, preservation, and propagation of the wildlife, fish, game, furbearers, waterfowl, nongame species, and endangered species of the State and for the fulfillment of all other responsibilities of the department as provided by law.

Section 87-5-301. MCA Policy toward grizzly bear. Statutes, State of Montana, Department of Fish, Wildlife and Parks.

It is hereby declared the policy of the State of Montana to protect, conserve, and manage grizzly bears as a rare species of Montana wildlife.

Section 87-5-302. MCA Commission regulation on grizzly bear. Statutes, State of Montana, Department of Fish, Wildlife and Parks.

The commission shall have authority to provide open and closed seasons; means of taking; shooting hours; tagging requirements for carcasses, skulls, and hides; possession limits; and requirements for transportation, exportation, and importation of grizzly bears.

Section 87-2-101. MCA Definitions. Statutes, State of Montana, Department of Fish, Wildlife and Parks.

By definition under this section bears are classified a game animal in Montana.

Administrative Rules of Montana

MCA 12.9.103. Grizzly Bear Policy (1) Whereas, the Montana Fish and Game Commission has management authority for the grizzly bear, a resident wildlife species, and is dedicated to the preservation of grizzly bear populations within the State of Montana; and

Whereas the secure habitat for the grizzly [bear](#) has been greatly reduced as a result of human development and population growth from 1850 through 1950 in the bear's traditional range in all western States; and

Whereas, a significant portion of the remaining grizzly bear habitat and population is located in Montana and these Montana populations occur in wildlands such as wilderness, primitive areas, de facto wilderness areas, national forests, national parks, Indian reservations, and seasonally, on adjacent private lands.

Now, therefore, in order to promote the preservation of the grizzly bear in its native habitat, the commission establishes the following policy guidelines for the Montana Department of Fish, Wildlife and Parks action when dealing with grizzly bear.

(a) Habitat. The department shall work to perpetuate and manage grizzly bear in suitable habitats of this State for the welfare of the bear and the enjoyment of the people of Montana and the nation. In performing this work the department should consider the following:

(i) the commission has the responsibility for the welfare of the grizzly [bear](#) and advocates the protection of the bear's habitat;

(ii) management of Montana's wildlands, including the grizzly bear habitat, is predominately, but not exclusively, a responsibility of various Federal agencies and private landowners;

(iii) land use decisions made by these agencies and individuals affect grizzly bear habitat, thus cooperative programs with these agencies and individuals are essential to the management of this species;

(iv) preservation of wildlands is critical to the protection of this species and the commission advocates wildland preservation in occupied grizzly bear habitat; and

(v) while some logging may not be detrimental to grizzly [bear](#) habitat, each logging sale in areas inhabited by grizzly bear should be carefully reviewed and evaluated.

(b) Research. It is recognized by the commission that research on the habitat requirements and population characteristics of the grizzly bear is essential for the welfare of the species. Departmental research programs and proposals directed at defining those habitat requirements are encouraged and supported.

(c) Hunting and recreational use. The commission recognizes its responsibility to consider and provide for recreational opportunities as part of a grizzly bear management program. These opportunities shall include legal hunting, recreational experiences, aesthetics of natural ecosystems, and other uses consistent with the overall welfare of the species.

(i) the department should consider the variability of values between individuals, groups, organizations, and agencies when management programs for various grizzly bear populations are developed.

(ii) sport hunting is considered the most desirable method of balancing grizzly bear numbers with their available habitat, minimizing depredations against private property within adjacent to grizzly bear habitat, and minimizing grizzly bear attacks on humans.

(d) Depredations. Contacts between grizzly bear and humans, or property of humans, require delicate handling and consideration. When these contacts reach the stage for definite action, the following actions should be carried out:

(i) grizzly bear, in the process of threatening or endangering human life, shall be captured or dispatched immediately.

(ii) where no immediate threat to human life exists, individual bear encounters with humans shall be evaluated on a case-by-case basis and when the attack is abnormal or apparently unprovoked, the individual bear involved shall be captured or dispatched.

(iii) when the attack is normal (e.g., a female defending her cubs, any bear defending its food, or any bear defending itself) but the situation leads itself to no reasonable possibility of leaving the bear in place, then the bear should be removed.

(iv) grizzly bear committing depredations that do not directly endanger human life but that are causing property losses shall be evaluated on an individual case basis.

(v) where removal is determined to be the best resolution to the problem, depredating or nuisance bear shall be trapped, and if determined to be suitable for transplanting, shall be marked and released in suitable habitat previously approved with appropriate land management agencies.

(vi) reasonable efforts shall be made to inform the public of the transplant program, fully explaining the reasons for the capturing and locations of the release area.

(vii) upon request by an authorized scientific investigative agency or public zoological institution, a captured bear may be given to that agency or institution, for appropriate non release research purposes. A reasonable charge may be required to cover costs of handling.

(e) Depredating grizzly bear that are not suitable for release or research because of old age, acquired behavior, disease, or crippling, shall be killed and sent to the department's research facilities for investigation. The public shall be fully informed when these actions are taken and the reasons for these actions shall be fully explained

(f) Coordination. The department shall consult with appropriate Federal agencies and comply with applicable Federal rules and regulations in implementation of this policy. (History: Sec.87-1-301MCA, IMP, 87-1-201, 87-1-301 MCA; Eff. 12/31/72; AMD, 1977 MAR p.257, Eff. 8/26/77.)

Montana Department of Natural Resources and Conservation

Title 75, Chapter 1, MCA - Montana Environmental Policy Act. Establishes policy of the State of Montana to use all practicable means and measures to create and maintain conditions under which man and nature can coexist in productive harmony.

Title 76, Chapter 14, MCA - Montana Rangeland Resource Act. Establishes a program of rangeland management whereby the importance of Montana's rangeland with respect to wildlife habitat and the natural beauty of the State is recognized.

Title 77, Chapter 1, MCA - Administration of State Lands. Directs the State board of land commissioners to manage State lands to support education and for the attainment of other worthy objectives helpful to the well-being of the people of Montana. It further directs the board to manage State lands under the multiple-use management concept to insure: 1) they are utilized in that combination best meeting the needs of the people and the beneficiaries of the trust; and 2) harmonious and coordinated management of the various resources.

Title 87, Chapter 5, MCA - Nongame and Endangered Species Conservation Act. Establishes Montana policy to manage certain nongame wildlife for human enjoyment and to insure their perpetuation as members of ecosystems. It further declares the policy of the State of Montana to protect, conserve, and manage the grizzly bear as a rare species of Montana wildlife.

Montana Constitution. Article IX - Environment and Natural Resources. Section 1 - Protection and Improvement. The State and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations.

Federal Plans and Guidelines

In addition to federal and state laws, the following plans and guidelines provide both direction and guidance for grizzly bear population and/or habitat management.

National Park Service

NPS-77, Natural Resource Management Guidelines, May 16, 1991. Guides National Park managers to perpetuate and prevent from harm (through human actions) wildlife populations as part of the natural ecosystems of parks.

Final Environmental Impact Statement, Grizzly Bear Management Program, Yellowstone National Park, July 1983:

- Identifies sanitation procedures designed to ensure that human foods and attractants are kept secured from bears. Garbage and other unnatural food attractants will be eliminated before control actions are required. The solid waste handling program will encompass use of trash containers of bear-resistant design, careful and frequent garbage pickup to prevent overflow and overnight accumulations.
- The Superintendent authorizes and approves the YNP Grizzly Bear Management Program that outlines the park's Bear Management Area Program. The Bear Management Area Program restricts recreational activity in areas with seasonal concentrations of grizzly bears. The goals of these restrictions include: (1) minimize bear-people interactions that may lead to habituation of bears to people (habituation can result in bears being removed from the population for human safety), (2) prevent human-caused displacement of bears from prime food sources, and (3) decrease the risk of bear-caused human injury in areas with high levels of bear activity.
- Outlines Park bear monitoring program.
- Outlines Park bear research goals and objectives.
- Leaves open the possibility for supplemental feeding of grizzly bears, if deemed necessary.
- Identifies as an objective that public awareness of exposing bears to unnatural food sources may lead to human injury, or to the bears' destruction, or both. Requires an active information program be directed at both visitors and employees to inform them of policies and goals of bear management, and the reasons for these. Provides guidelines for the distribution of bear safety warning information through entrance stations, signs, visitor contacts, and literature.

Yellowstone National Park Annual Bear Management Plan: Outlines grizzly bear ecology and management information distributed to park employees and the general public by the Bear Management Office.

Grand Teton National Park Human/bear Management Plan, 1989:

- Identifies sanitation procedures designed to ensure that human foods and attractants are kept secured from bears. Garbage and other unnatural food attractants will be eliminated before control actions are required. The solid waste handling program will encompass use of trash containers of bear-resistant design, and careful and frequent garbage pickup to prevent overflow and overnight accumulations. Containers not of bear-resistant design must be located inside the building served. Large animal carcasses that are near trails, facilities, or roads will be managed in a way to reduce human/bear encounters.
- Grizzly bear management follows the *Interagency Grizzly Bear Guidelines* (IGBC 1986). Management of Situation 1 areas includes area closures and/or activity curtailments to protect the bears.

- Follows the procedures outlined in the *Interagency Grizzly Bear Guidelines* (IGBC 1986). Actions subsequent to capture are coordinated with the U.S. Fish and Wildlife Service Grizzly Bear Recovery Coordinator.
- All incidents involving human/bear interactions are documented on Bear Sighting/Identification reports. All Park employees and visitors are encouraged to complete these forms for all bear sightings.
- Outlines Park bear research goals and objectives.
- Outlines a program for the dissemination of information of human/bear relationships, the causes of human/bear conflicts, and how visitors, inholders, Park, and concession employees can help alleviate problems through their personal actions and compliance with Park regulations.

U.S. Forest Service

If a change of status for the Yellowstone grizzly bear population under the ESA takes place, Forest Service Regions 1, 2, and 4 will classify the grizzly bear as a sensitive species¹³ in the ~~Yellowstone area~~[GYE](#). Grizzly bears and their habitats will then be managed as sensitive on National Forest System lands in accordance with Forest Service Manual 2670 (specifically 2670.22, 2670.32, and 2676.1-2676.17e). In addition, national forests will continue to follow direction established in existing land management plans until amended or revised. ~~Beaverhead-National Forest Plan (1986)~~

Bridger-Teton National Forest Land and Resource Management Plan [with Amendments and Corrections \(1989/2015\)](#)

Custer National Forest and Grasslands Land and Resource Management Plan (1987)

~~Deerlodge National Forest Plan (1987)~~

Gallatin ~~National Forest Plan (1987)~~[1987 as Amended through November 2014](#)

1997 Revised Forest Plan - Targhee National Forest

Shoshone National Forest Land ~~and Resource~~ Management Plan (~~1986~~[2015](#))

[Beaverhead-Deerlodge National Forest Land and Resource Management Plan \(2009\)](#)

State Plans and Guidelines

Montana Department of Natural Resources and Conservation

¹³ [2672.1 - Sensitive Species Management](#). Sensitive species of native plant and animal species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing.

There must be no impacts to sensitive species without an analysis of the significance of adverse effects on the populations, its habitat, and on the viability of the species as a whole. It is essential to establish population viability objectives when making decisions that would significantly reduce sensitive species numbers.

[2672.11 - Identification of Sensitive Species](#). Regional Foresters shall identify sensitive species occurring within the Region. They shall examine the following sources as possible candidates for listing as sensitive species:

1. Fish and Wildlife Service or National Marine Fisheries Service candidates for Federal listing (categories 1 and 2) under Federal Register Notice of Review.

2. State lists of endangered, threatened, rare, endemic, unique, or vanishing species, especially those listed as threatened under State law.

3. Other sources as appropriate in order to focus conservation management strategies and to avert the need for Federal or State listing as a result of National Forest management activities.

It is the policy of MDNRC to conduct programs and activities in a manner that limits the potential for conflicts between grizzly bears and people and that provides habitat to help achieve and sustain recovery within the [Yellowstone Area GYE](#). Land uses which can adversely affect ~~grizzlies-grizzly bears~~ or their habitat will be designed and coordinated in a manner that is compatible with grizzly bear behavior and habitat needs, but not to the extent of excluding other uses.

The Forestry Division of the MDNRC has additional policy guidance for management of grizzly bear habitat within the Yellowstone. In 1988, grizzly bear management standards and guidelines were implemented to integrate management of grizzly bear habitat with timber management on State lands within the [Yellowstone Area GYE](#). Performance standards and guidelines cover long range planning, project planning and design, management of bear-human conflicts, and special management areas. These will be implemented until the Forestry Division develops and adopts other guidance through a programmatic planning effort that will incorporate grizzly bear management objectives.

Additional policy guidance will be developed in the near future. The USFWS and MDNRC have mutually agreed to develop and implement guidelines for integrating grizzly bear habitat protection and MDNRC land management activities. MDNRC will continue to consult with MFWP on specific projects that may adversely affect any species of wildlife in Montana, in an attempt to minimize or avoid adverse impacts to populations or their habitats.

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Terms Used in this Document

Guidelines are management actions that are highly recommended in this Conservation Strategy. A deviation from a guideline would not require a revision or amendment to the Conservation Strategy. A deviation from a guideline requires written rationale as to why the guideline is not being followed.

Inclusions (in secure habitat) means roads restricted with permanent barriers (not gates), decommissioned or obliterated roads, and/or non-motorized trails in secure habitat.

Known (mortality) Carcass recovered or evidence to indicate known status due to radio telemetry. Known deaths require a carcass, management removal, or a cut radio collar. Found collars having the appearance of being cut should receive additional forensic review for definitive proof.

Probable (mortality) Strong evidence to indicate mortality, reported by highly reliable sources, no carcass recovered. Probable deaths include those cases where there is supportive evidence that a bear was wounded. Circumstances of each reported instance should be considered. Probable includes those cases where evidence of blood, hair, or other tissues clearly indicates wounding serious enough to result in death. The literature is unclear on the probability of survival for orphaned cubs. Any cub orphaned during its first year of life because of a known adult female mortality is considered a probable mortality.

Restricted is used to describe management of motorized access on roads. A restricted road is one on which motorized vehicle use is restricted seasonally or yearlong. The road requires effective physical obstruction (generally gated). Motorized administrative use by personnel of resource management agencies is acceptable at low intensity levels as defined in existing cumulative effects analysis models. This includes contractors and permittees in addition to agency employees.

Standards are management actions that are required in this Conservation Strategy. A deviation from a standard would occur only with a revision or amendment to the Conservation Strategy.

Species

Army cutworm moth (*Euxoa auxiliaris*)

Bison (*Bison bison*)

Cutthroat trout (*Oncorhynchus clarki*)

Elk (~~Cervus elaphus~~)

Grizzly bear (~~Ursus arctos~~)

Moose (~~Alces alces~~)

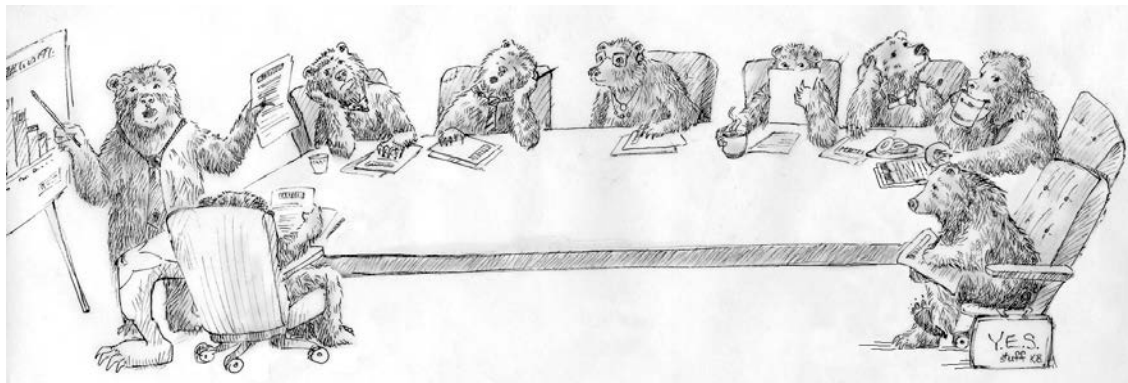
Mule Deer (~~Odocoileus hemionus~~)

Whitebark pine (~~Pinus albicaulis~~)

White pine blister rust (~~Cronartium ribicola~~)

The Interagency Conservation Strategy Team

Name	Agency Affiliation	Position
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