U.S. Fish & Wildlife Service

Grizzly Bear Recovery Program

2021 Annual Report

Figure 1. Grizzly bear 1037 at a corral/camera site in the Selkirk Mountains.

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GRIZZLY BEAR RECOVERY PROGRAM MISSION

The mission of the Grizzly Bear Recovery Program (GBRP) is to recover grizzly bears in the lower-48 States by implementing the Grizzly Bear Recovery Plan (USFWS 1993, 1996, 1997, 2007, 2017, 2018) and coordinating research, management, and recovery efforts. To accomplish this mission, we collaborate with the Interagency Grizzly Bear Committee (IGBC), Federal, State, and Tribal agencies, the provinces of British Columbia (B.C.) and Alberta, as well as non-governmental organizations (NGOs).

In 1975, the U.S. Fish and Wildlife Service (FWS) listed the grizzly bear as a threatened species in the lower-48 States under the Endangered Species Act (ESA). The Grizzly Bear Recovery Plan outlines six recovery areas, including the Greater Yellowstone Ecosystem (GYE), Northern Continental Divide Ecosystem (NCDE), Cabinet-Yaak Ecosystem (CYE), Selkirk Ecosystem (SE), North Cascades Ecosystem (North Cascades), and Bitterroot Ecosystem (BE) (Figure 2). Principle recovery efforts focus on conflict reduction, information and education, establishment of habitat protections, and other efforts to prevent and reduce human-caused mortality.

In this report, we describe recovery efforts and program accomplishments during 2021 and the current status of grizzly bear populations. In several cases, 2021 data is not available to report and we provide the most recent estimates available.

During 2020-2021, FWS completed a Species Status Assessment (SSA) for grizzly bears in the lower-48 States. The SSA underwent peer and partner review and informed the 5-year status review, both of which were posted on March 31, 2021. In the status review we recommended no change to the threatened status of the grizzly bear in the lower-48 States. The SSA will be revised annually and the most recent version 1.2 was posted on January 25, 2022.

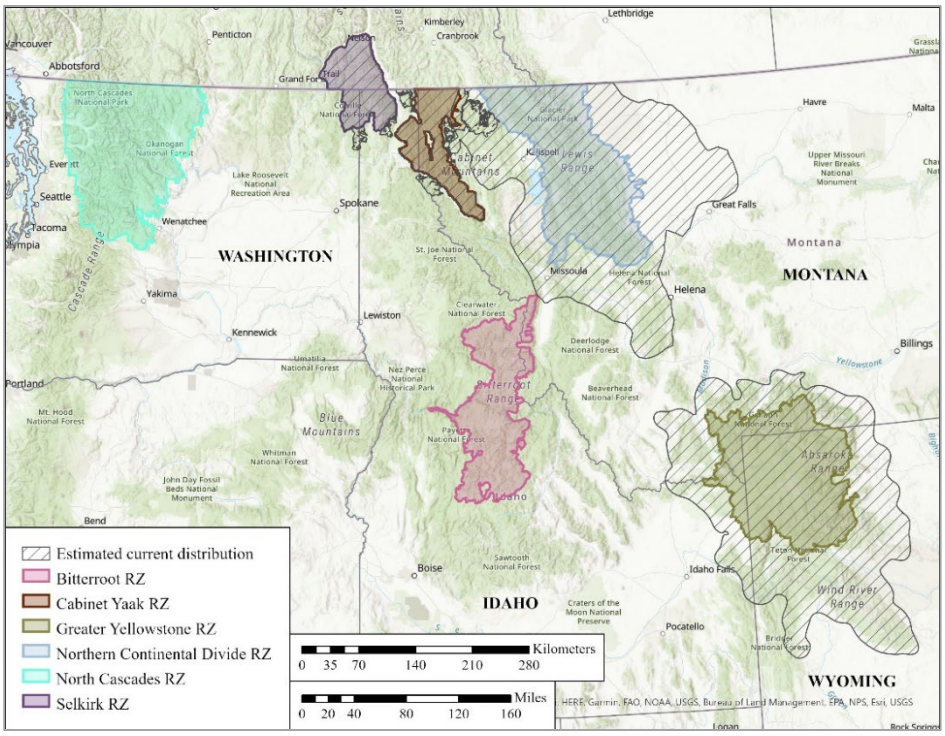

Figure 2. Recovery zones and current estimated distributions for the six ecosystems identified in the Recovery Plan. Estimated distributions are current as of 2020 for the Greater Yellowstone and the Northern Continental Divide and are current as of 2019 for the Cabinet-Yaak and Selkirk. There are currently no known populations in the North Cascades and Bitterroot. Current estimated distributions represent "occupied range," which do not include low-density peripheral locations and represent a minimum known area of occupancy, not extent of occurrence.

GRIZZLY BEAR ECOSYSTEM UPDATES

GREATER YELLOWSTONE ECOSYSTEM

The Yellowstone Recovery Zone (23,853 km^2) is located in northwest Wyoming, eastern Idaho, and southwest Montana (Figure 3). Ninety-eight percent of the Recovery Zone is federally-managed land, including all of Yellowstone National Park (YNP), as well as portions of Grand Teton National Park (GTNP), the Shoshone, Beaverhead-Deer Lodge, Bridger-Teton, Caribou-Targhee, and Custer-Gallatin National Forests (including 7 Wilderness Areas). The Demographic Monitoring Area (DMA) encompasses the recovery zone and an additional 23,131 km^2 of suitable habitat around the Recovery Zone. Monitoring of population size and mortality limits occurs within the DMA (USFWS 2017). Monitoring of distribution of females with young and secure habitat occurs within the Recovery Zone (USFWS 2007, USFWS 2017).

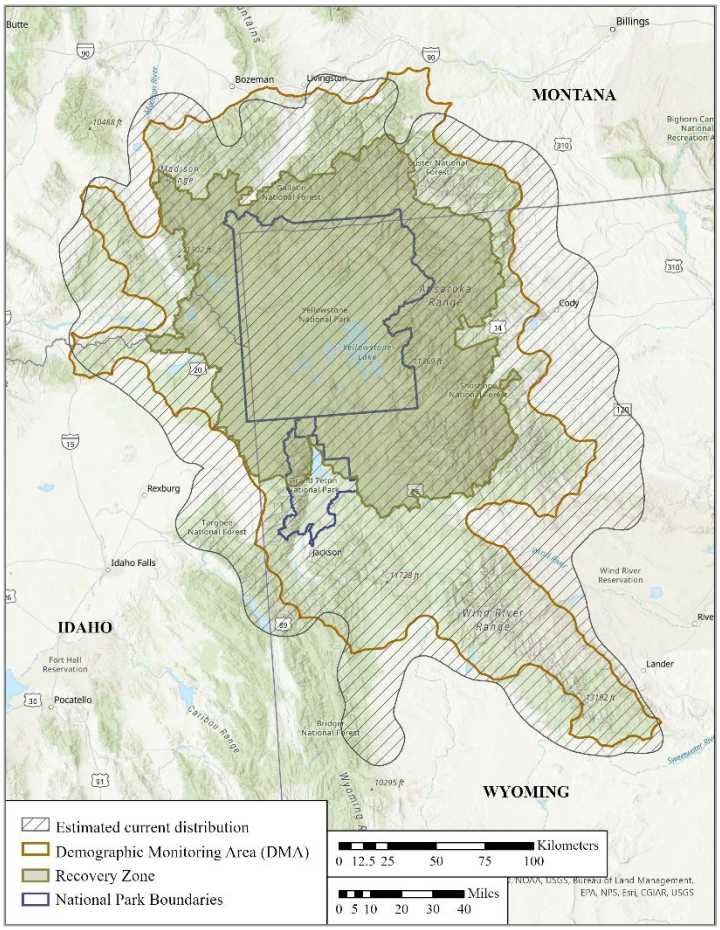

Figure 3. Map of the Greater Yellowstone Ecosystem recovery zone and demographic monitoring area (DMA) boundaries. The DMA surrounds and includes the recovery zone.

Population Status

As of 2021, the GYE grizzly bear population was estimated at 1,069[1] individuals inside the DMA (IGBST 2021), more than double the estimated population size of 136 to 300 at the time of listing in 1975 (Cowan et al. 1974, Craighead et al. 1974, McCullough 1981). This estimate does not capture the entire distribution of bears in the GYE. As predicted by Pyare et al. (2004), grizzly bears have naturally recolonized many areas and currently occupy about 98 percent of suitable habitat (45,992 km^2) and 98 percent of the DMA (48,898 km^2), and are expanding beyond the DMA. Thirty percent of the current estimated distribution occurs beyond the DMA (21,570 km^2) (Bjornlie and Haroldson 2021). We do not have an estimate for the number of grizzly bears ecosystem-wide, however it is important to recognize that bears are permanently occupying areas beyond the DMA. Grizzly bears have tripled the

[1] Using the revised Chao2 approach which addressed two limitations of the model-averaged Chao2 method (IGBST 2021). First, the revised Chao2 approach adjusts the distance criterion in the rule set from 30 km to 16 km to address the underestimation bias in differentiating sightings of females with cubs into unique individuals. Second, it uses generalized additive models (GAMs) instead of the model-averaging approach to more effectively detect population trends, including population stability, in females with cubs.

extent of their occupied range in the GYE since the early 1980s (USFWS 1982, Bjornlie and Haroldson 2021).

Recovery Criterion 1: Maintain a minimum population size of 500 animals and at least 48 females with cubs-of-the-year within the DMA. Progress: There were an estimated 1,069 bears and 84 unique females with cubs in the DMA in 2021. This criterion has been met.

Recovery Criterion 2: 16 of 18 Bear Management Units (BMUs) within the Recovery Zone must be occupied by females with young, with no 2 adjacent BMUs unoccupied, during a 6-year sum of observations. Progress: 18 of 18 BMUs occupied by females with young in 2021 and during the most recent 6-year period of 2016–2021. This criterion has been met.

Recovery Criterion 3: Maintain the population within the DMA around the 2002–2014 model-averaged Chao 2 estimate (average = 674; 95% CI = 600–747; 90% CI = 612–735) by maintaining annual mortality limits for independent females, independent males, and dependent young. The 2021 total mortality limits were 9% for independent females and 20% for independent males, and the human-caused mortality limit was 9% for dependent young. Progress: 2021 mortality rates were 5.7% for independent females, 8.1% for independent males, and 2.5% for independent young; all of which are under current recovery criteria thresholds.

Habitat-based recovery criteria for the GYE incorporate thresholds for secure habitat (areas with no motorized access), livestock allotments, and developed sites (USFWS 2007). All habitat-based recovery criteria have been maintained since 1998.

The GYE grizzly bear population is currently isolated from other grizzly bear populations, with no documented genetic interchange between the GYE and NCDE. Despite this isolation, the genetic health of the GYE population has not declined over the last several decades (Miller and Waits 2003, Kamath *et al*. 2015). Additionally, natural connectivity is expected to occur in the near future as both the GYE and NCDE populations expand in distribution. Based on 2020 distributions, the two populations are now only 57 km apart, with additional verified locations between the two distributions. This distance has steadily and significantly decreased in the last decade as they were approximately 122 km apart in 2006.

The Interagency Grizzly Bear Study Team (IGBST) is an interdisciplinary group of State, Tribal, and Federal scientists responsible for long-term monitoring and research on grizzly bears in the GYE. Detailed monitoring information, including data summarized here, including annual reports and research results, can be found on the IGBST website.

Northern Continental Divide Ecosystem

The Northern Continental Divide Recovery Zone (23,135 km^2) is located in northwest Montana and is well connected to large populations in Canada (Figure 4). It includes all of Glacier National Park (GNP), as well as portions of the Flathead, Helena-Lewis and Clark, Kootenai, and Lolo National Forests (including 4 Wilderness Areas), and the Flathead and Blackfeet Indian Reservations. The Demographic Monitoring Area (DMA) encompasses the Recovery Zone and a 19,444 km^2 buffer (Zone 1). Monitoring of population size, mortality limits, and distribution of females with young occurs within the DMA (NCDE Subcommittee 2020). Monitoring of secure habitat occurs within the Recovery Zone (USFWS 2018). Due to its connectivity to large populations in Canada, the NCDE has the potential to serve as an important genetic corridor between Canadian grizzly bear populations and the GYE, the BE, and the CYE, and is a potential source population for the BE, which is currently unoccupied.

Population Status

Since the 1975 listing of grizzly bears as threatened under the Act, the NCDE grizzly bear population has more than doubled in size and range (from 24,800 km^2 to 67,652 km ^{2}) (Dood et al. 1986, USFWS 1993, Kendall et al. 2009, Mace et al. 2012, Costello et al. 2016b, Costello and Roberts 2021). The NCDE population has increased from as few as 300 bears in 1986 to an estimated 765 bears in 2004, based on a genetic capture/recapture population estimate (Dood 1986, Kendall et al. 2009). The population is contiguous with grizzly bears in Canada. Applying a calculated population growth of 2.3 percent annually since 2004, the 2021 population estimate was 1,114 individuals in the NCDE (Costello et al. 2016b, Costello and Roberts 2021).

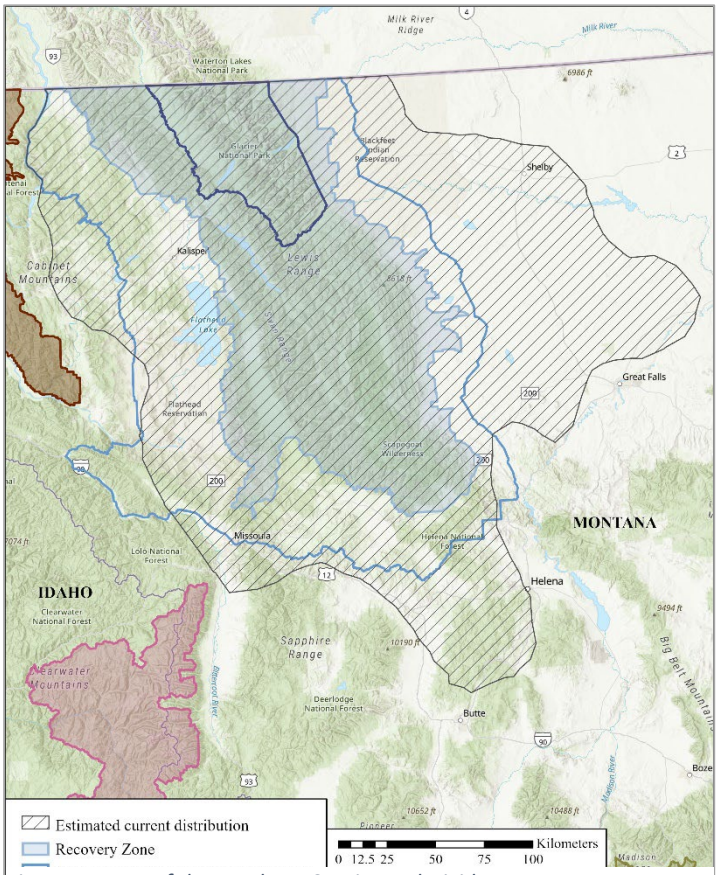

Figure 4. Map of the Northern Continental Divide Ecosystem recovery zone and demographic monitoring area (DMA) boundaries. The DMA surrounds and includes the recovery zone.

The 1993 Recovery Plan identified three demographic recovery criteria to: (1) establish a minimum population size through the monitoring of unduplicated females with cubs; (2) ensure reproductive females (i.e., females with young) are well distributed across the recovery zone; and (3) outline human-caused mortality limits that would allow the population to achieve and sustain recovery. Since establishment of these criteria, monitoring methods have improved and estimation techniques have become more accurate. We have incorporated these scientific improvements into demographic objectives outlined in the NCDE Conservation Strategy (NCDE Subcommittee 2020). These objectives assess the same indicators of population status as described in the 1993 demographic criteria.

Objective 1: Maintain a well-distributed grizzly bear population within the DMA.

Occupancy threshold: Maintain the documented presence of females with dependent offspring in at least 21 of 23 BMUs of the Recovery Zone and in at least 6 of 7 occupancy units of Zone 1 at least every six years. Progress: For the 6-year period 2016–2021, all 23 BMUs within the recovery zone and all 7 occupancy units within Zone 1 were occupied by females with young, above the minimum thresholds of 21 BMUs and 6 occupancy units.

Objective 2: Manage mortalities from all sources to support an estimated probability of at least 90% that the grizzly bear population within the DMA remains above 800 bears, considering the uncertainty associated with all of the demographic parameters.

Independent female survival threshold: Using a six-year running average, maintain estimated annual survival of independent females within the DMA of at least 90% and a rate at or above the minimum level consistent with a projected probability of at least 90% that the population within the DMA will remain above 800 grizzly bears based on population modeling. The minimum female survival threshold for 2021 was 0.93. Progress: For the 6-year period 2016–2021, the average estimated annual survival rate for independent females in the DMA was 0.93. This objective has been met.

Independent female mortality threshold: Using a six-year running average, limit annual estimated number of total reported and unreported mortalities of independent females within the DMA to a number that is no more than 10% of the number of independent females estimated within the DMA based on population modeling and a number that is at or below the maximum consistent with a projected probability of at least 90% that the population within the DMA will remain above 800 grizzly bears based on population modeling. For 2021, the maximum threshold was 25. Progress: For the 6-year period 2016–2021, the average total reported and unreported mortalities for independent females within the DMA was 15. This objective has been met.

Independent male mortality threshold: Using a six-year running average, limit annual estimated number of total reported and unreported mortalities of independent males within the DMA to a number that is no more than 15% of the number of independent males estimated within the DMA based on population modeling. For 2021, the maximum threshold was 30. Progress: For the 6-year period 2016–2021, the average total reported and unreported mortalities for independent males within the DMA was 23. This objective has been met.

Objective 3: Monitor demographic and genetic connectivity among populations.

The distribution of the NCDE grizzly bear population will be estimated biannually. Progress: As of 2020, bears occupy 67,652 km^2, which includes 40,509 km^2 inside the DMA (95 percent of the DMA) and 27,143 km^2 outside the DMA.

The population of origin for individuals sampled inside and outside of the DMA will be identified to detect movements of individuals to and from other populations or recovery areas. Progress: Genetic samples and telemetry in the Cabinet-Yaak from 1983-2020 has identified 4 bears that immigrated from the CYE to the NCDE (Kasworm et al. 2021). All were males and one animal is known to have reproduced and one is known dead. We have no new evidence of immigration from the SE into the NCDE. We also have no evidence of immigration into the NCDE from the GYE or emigration from the NCDE into the GYE.

Habitat-based recovery criteria for the NCDE incorporate thresholds for secure core (areas with no motorized access), livestock allotments, and developed sites (USFWS 2018). All habitat-based recovery criteria have been met since 2011.

Montana Fish, Wildlife and Parks (MFWP), in collaboration with Glacier National Park, the Confederated Salish & Kootenai Tribes, and the Blackfeet Nation are the primary agencies responsible for monitoring of the NCDE grizzly bear population. Additional details, annual reports, and select publications are available on the MFWP website.

CABINET-YAAK ECOSYSTEM

The Cabinet-Yaak Recovery Zone (6,705 km^2) is located in northwest Montana and northeast Idaho (Figure 5). Blocks of contiguous habitat extend into B.C., making this an international population. The Recovery Zone includes portions of the Kootenai, Idaho Panhandle, and Lolo National Forests (including 1 Wilderness Area). The Kootenai River bisects the CYE, with the Cabinet Mountains to the south and the Yaak River drainage to the north. The degree of grizzly bear movement between the Cabinet Mountains and Yaak River drainage is believed to be minimal but several movements by males into the Cabinet Mountains from the Yaak River and the Selkirk Mountains have occurred since 2012.

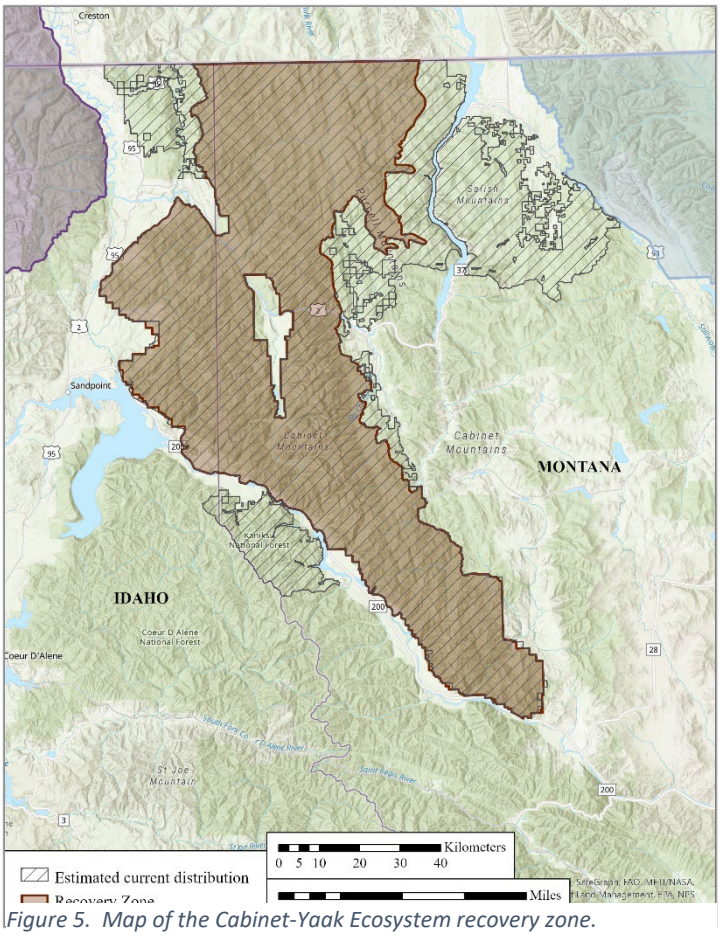

Figure 5. Map of the Cabinet-Yaak Ecosystem recovery zone.

Population Status

Based on known fates of radio-collared individuals and reproductive outputs, the population of grizzly bears in the CYE is currently growing at approximately 1.7% per year (Kasworm et al. 2021a). This is a significant improvement from earlier trend calculations that indicated the population was declining, and now represents 13 years of an improving trend since 2006 (Kasworm et al. 2021a). In 2019, a minimum of 50 grizzly bears were detected in the Cabinet-Yaak Ecosystem, with approximately half of these in the Cabinet Mountains and half in the Yaak River portions of the recovery area. Genetic DNA results are not yet complete for sampling in 2020. This minimum population estimate was derived from capture and collaring individuals, rub tree DNA, corral DNA, opportunistic DNA sampling, photos, and credible observations. The actual population is probably larger by an unknown amount. Genetic results from the laboratory are not completed until the year after collection.

Recovery target 1: 6 females with cubs over a running 6-year average both inside the Recovery Zone and within a 10-mile area immediately surrounding the Recovery Zone. Progress: Unduplicated females with cubs averaged 3.3 per year from 2015–2020. This target has not been met.

Recovery target 2: 18 of 22 BMU's occupied by females with young from a running 6-year sum of verified evidence. Progress: 13 of 22 BMUs were occupied from 2015–2020. This recovery target has not been met.

Recovery target 3: The running 6-year average of known, human-caused mortality shall be ≤ 4% of the population estimate; and ≤ 30% shall be females. The mortality limit for 2020 was 2.1 bears/year and 0.6 females/year. Progress: Average human-caused mortality for 2015–2020 was 2.8% (1.5 bears/year)

and female mortality was 0.9% (0.5 females/year). This recovery target was met in 2015–2020. Two known human-caused mortalities occurred during 2020. A subadult male was killed by a black bear hunter through mistaken identity. The bear had a neck snare around its neck that may have ultimately killed the bear had it not been shot. The second bear was an adult female that is under investigation by enforcement authorities.

Population linkage (and more importantly, gene flow) is needed to achieve and maintain long-term genetic health. We have documented gene flow from sources unrelated to the augmentation program (see below); three migrants, all originating from the Purcell Mountains north of HWY 3 in B.C., have produced 4 offspring south of HWY 3 from 1988–2020. We have yet to document gene flow from either the SE or NCDE.

Figure 6. Female grizzly bear with yearlings at a corral/camera site in the Selkirk Mountains.

The FWS has been leading research and monitoring in the CYE since 1989. Key research partners include Idaho Department of Fish and Game, Montana Fish, Wildlife and Parks, Kootenai Tribe of Idaho, Idaho Panhandle National Forest, Kootenai National Forest, and Lolo National Forest. Further monitoring and research details can be found in the 2020 Cabinet-Yaak Grizzly Bear Recovery Area Research and Monitoring Progress Report.

Augmentation Program

An augmentation program in the Cabinet Mountains portion of the population began in 1990 after research estimated fewer than 15 animals in the area. Primary objectives of the program are to bolster reproduction through the addition of female bears and improve overall genetic diversity through the addition of female and male bears. Twenty-two bears have been added in the Cabinet Mountains since 1990. All bears have no history of conflicts with people and were moved in the summer to take advantage of developing food supplies in the form of huckleberries. Initial augmentation consisted of

females but in recent years males have also been added. Of 22 bears released through 2020, 8 are known to have left the target area, 5 were killed by humans, and two died of unknown causes. Reproduction has been documented by at least 3 of the transplanted bears, with 2 females and 1 male that are known to have produced at least 14 first generation offspring, 22 second generation offspring, and 4 third generation offspring. In 2019, 1 female and 1 male were moved from the NCDE into the Cabinet Mountains as part of the augmentation program.

SELKIRK ECOSYSTEM

The Selkirk Mountains Grizzly Bear Recovery Zone (6,575 km^2) is located in northwest Idaho, northeast Washington, and southeast B.C. (Figure 7). It includes portions of the Idaho Panhandle and Colville National Forests (including 1 Wilderness Area) and the South Selkirk unit in B.C.

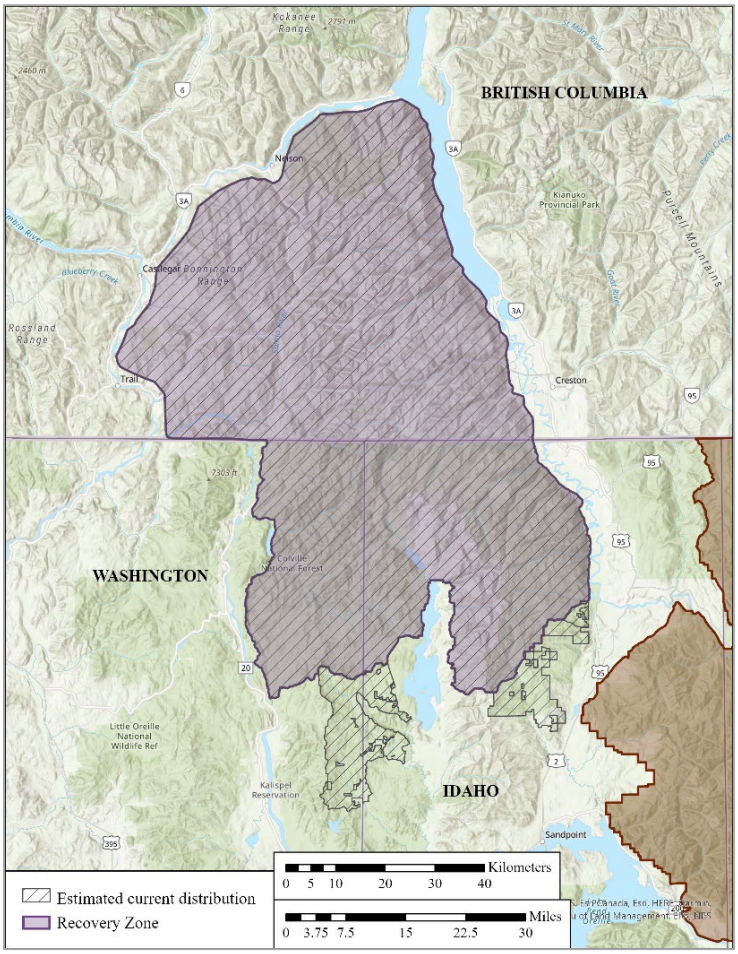

Figure 7. Map of the Selkirk Ecosystem recovery zone.

Population Status

DNA analysis of hair from captured bears, corrals, rub sites, opportunistic collection efforts, and collared bears identified a minimum of 44 grizzly bears (21 male, 19 female, 4 unknown) within the U.S. portion of the SE in 2019 (Kasworm et al. 2021b). Some of these individuals likely have home ranges that overlap with Canada, for which there is not an updated estimate. There were an estimated 58 bears in the Canadian portion of the population as of 2005 (Proctor et al. 2007). Based on known fates of radio-collared individuals and reproductive outputs, it is estimated that the population of grizzly bears in the SE, including Canada, is currently increasing, with an annual growth rate of 2.9% between 1983 and 2020 (Kasworm et al. 2021b). The trend calculation utilizes all collared bears in the U.S. and B.C. The U.S. and B.C. population estimates for the SE are not completely exclusive because numerous bears overlap in their home ranges, therefore adding estimates together would cause some double counting. An estimate of 83 bears for the international population was made in 2010 (Proctor et al. 2012, p. 31). A new effort to estimate the population is ongoing on the B.C. side of the SE and should be integrated with U.S. data and complete in 2022.

Recovery target 1: 6 females with cubs over a running 6-year average both inside the Recovery Zone and within a 10-mile area immediately surrounding the Recovery Zone. Progress: Unduplicated females with cubs averaged 3.83 per year from 2015–2020. This target has not been met.

Recovery target 2: 7 of 10 BMUs occupied by females with young from a running 6-year sum of verified evidence. Progress: 8 of 10 BMUs were occupied during 2015–2020. This recovery target has been met.

Figure 8. Female grizzly bear with cubs at a corral/camera site in the Selkirk Mountains.

Recovery target 3: The running 6-year average of known, human-caused mortality shall be ≤ 4% of the population estimate; and ≤ 30% shall be females. The 2019 mortality limit was 1.6 bears/year and 0.5 females/year. Progress: The 6-year average human caused mortality for 2015–2020 was 5.5% (2.2 bears/year) and female mortality was 2.0% (0.8 females/year). Total mortality numbers for this period and female mortality came in over the limit. Two known human caused mortalities occurred in 2020 consisting of a subadult female and a subadult male. The male was killed by a neck snare and the female was struck by a vehicle. The SE is a historically isolated population, having among the lowest documented genetic diversity of interior North American populations (*H*=0.54, Proctor et al. 2012). Recently, we have documented movement between the Selkirk population and the Purcell Mountains population north of HWY 3 in B.C. Perhaps more importantly, we have detected gene flow into the Selkirks from two migrant males from the Purcells. These two males have produced nine known offspring in the Selkirks (median birth year 2015) from 2000–2019. Recent genetic monitoring has detected increased genetic variability since monitoring began in 1983 through greater heterozygosity and number of alleles in the population (Proctor et al. 2018).

The FWS has been leading a grizzly bear monitoring and research program in the SE since 2012. Key research and funding cooperators include Idaho Department of Fish and Game, the Panhandle National Forest, the Colville National Forest, Idaho Department of Lands, the Kalispel Tribe, the Kootenai Tribe of Idaho, and Washington Department of Fish and Wildlife. The B.C. effort was led by Dr. Michael Proctor with key funding provided by B.C. Habitat Conservation Trust Fund and B.C. Fish and Wildlife Compensation Fund. Further monitoring and research details can be found in the 2020 Selkirk Mountains Grizzly Bear Recovery Area Research and Monitoring Progress Report.

North Cascades Ecosystem

The North Cascades Recovery Zone (25,305 km^2) is located in northcentral Washington (Figure 9). It includes all of North Cascades National Park and portions of the Mount Baker-Snoqualmie, Wenatchee, and Okanogan National Forests (including 9 Wilderness Areas). The ecosystem extends north of the border into B.C.; however, it is isolated from grizzly bear populations in other parts of the U.S. and Canada.

Population Status

The overall population status of grizzly bears in the greater North Cascades is unknown; however, it is highly unlikely that the North Cascades contains a grizzly bear population (defined as two or more reproductive females or one female reproducing during two separate years). There have been only four confirmed detections of grizzly bears in the greater North Cascades in the past 10 years, all of which occurred in B.C. and may comprise only two individuals. There has been no confirmed evidence of grizzly bears within the US portion of the North Cascades since 1996. The most recent direct evidence of reproduction was a confirmed observation of a female and cub on upper Lake Chelan in 1991 (Almack et al. 1993). The lack of recent evidence of reproduction indicates that a grizzly bear population, as defined in the Bitterroot EIS (USFWS 2000), no longer exists within the North Cascades (NPS and USFWS 2017). Lyons et al. (2018) estimated the carrying capacity of the North Cascades at approximately 278 bears.

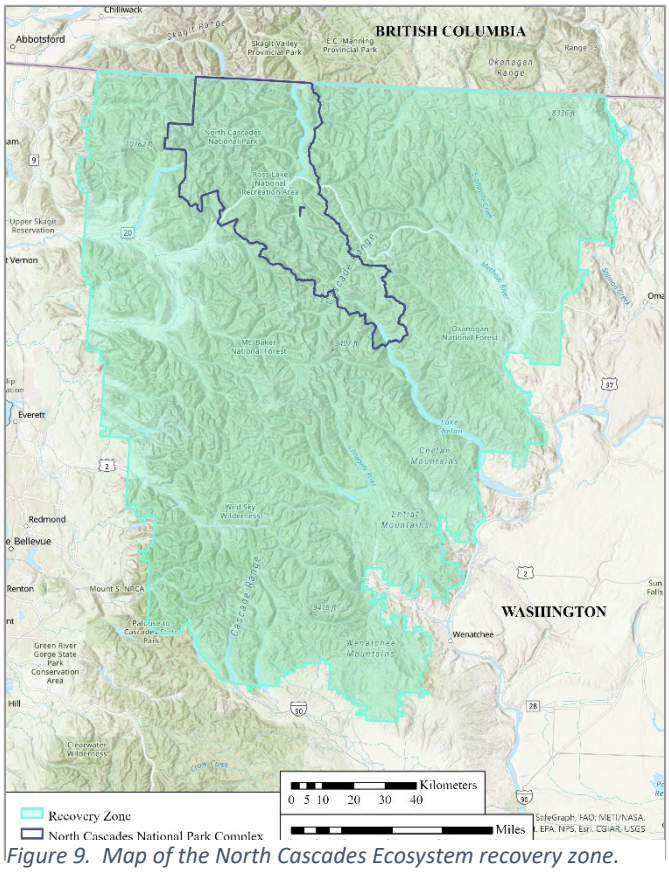

Figure 9. Map of the North Cascades Ecosystem recovery zone.

Recovery Efforts

In 2017, the FWS and North Cascades National Park released a range of alternatives to recover the grizzly bear population in the North Cascades. The draft EIS addressed several proposed action alternatives, all of which proposed to achieve a restoration goal of 200 grizzly bears in the North Cascades. The action alternatives differed in the rate and total number of grizzly bears released, and the timeframe for achieving the restoration goal of 200 grizzly bears. The proposed restoration proved controversial, and in response to a congressional request included in an appropriations bill, a second comment period on the draft EIS was opened in July 2019. On July 7, 2020, the FWS and NPS announced their decision to discontinue the proposal to develop and implement a Grizzly Bear Restoration Plan for the North Cascades Ecosystem. First Nations in B.C. have initiated a collaborative process with the B.C. government and environmental NGOs intended to restore grizzly bears to the North Cascades and

nearby areas in B.C where they are threatened. They are currently drafting a recovery plan that will include a strategy leading to translocation and active stewardship of grizzly bears in the North Cascades in B.C.

Although final recovery criteria have not yet been established for the North Cascades, the recovery plan states that the population will be considered recovered when monitoring indicates: (1) that the population is large enough to offset some level of human-induced mortality and be self-sustaining despite foreseeable influences of demographic and environmental variation; and (2) reproducing bears are distributed throughout the recovery area.

BITTERROOT ECOSYSTEM

The Bitterroot Recovery Zone (15,100 km^2), located in central Idaho and western Montana, is one of the largest contiguous blocks of Federal land in the lower-48 States (Figure 10). Ninety-eight percent of the Recovery Zone, as identified in the preferred alternative, is contained within two Wilderness Areas in the Nez Perce-Clearwater, Bitterroot, and Salmon-Challis National Forests.

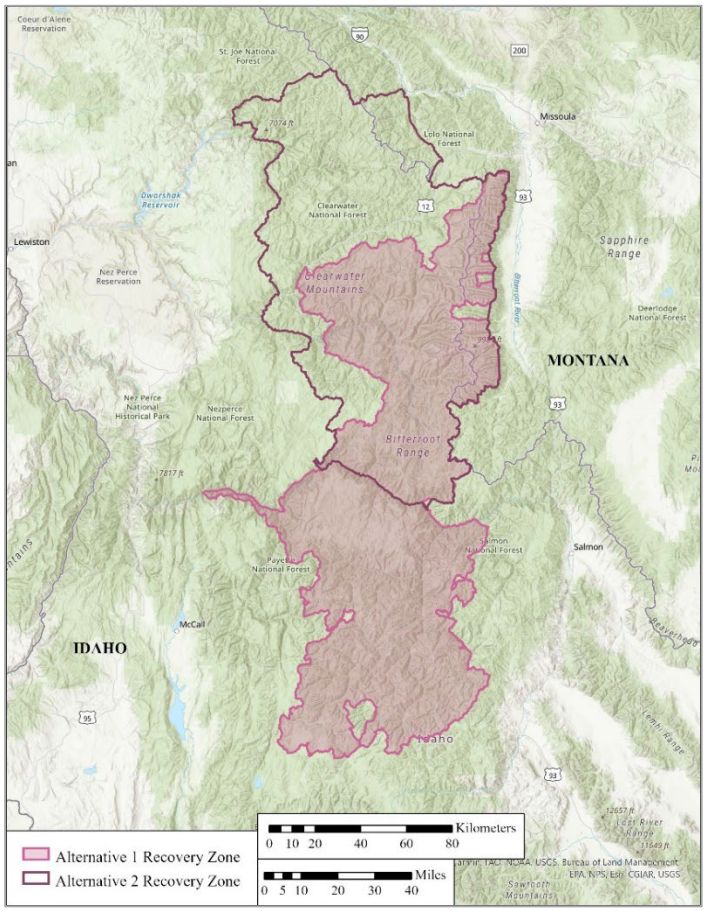

Figure 10. Map of the Bitterroot Ecosystem recovery zone as identified in the Final EIS under the preferred alternative, reintroduction, and alternative 2, natural recovery.

Population Status

The BE is thought to be unoccupied by a grizzly bear population (two or more reproductive females or one female reproducing during two separate years). At the time of listing, there were no known grizzly bears in the BE. It was believed that no grizzly bears occurred in the BE until a young male grizzly bear was killed just to the north of the BE recovery zone in 2007. To assess the presence of grizzly bears in the northern Bitterroot Mountains portion of the BE in the area in which the grizzly bear was killed in 2007, a systematic survey for grizzly bears was conducted between Hwy 12 and I-90 during 2008 and 2009 using DNA hair corrals and cameras (Servheen and Shoemaker 2010, entire). No photos of or hair samples from grizzly bears were obtained during this study.

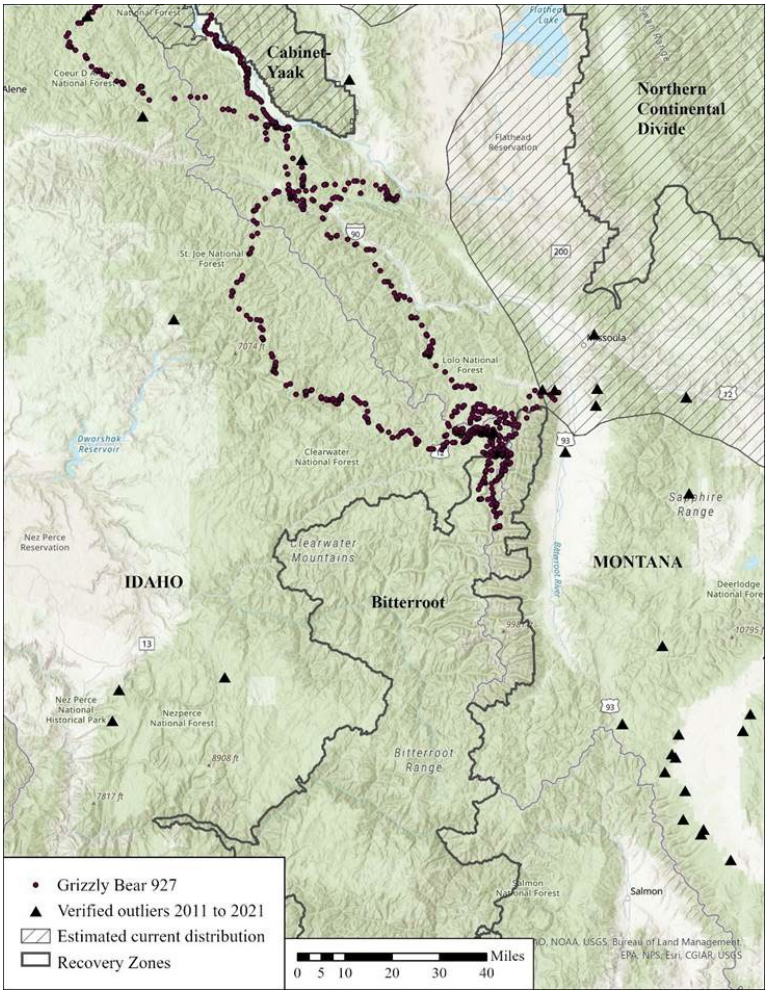

Figure 11. Estimated distribution of grizzly bears in the NCDE and CYE, and verified grizzly bear observations between the ecosystems based on data from 2010 to 2021.

However, as the GYE and NCDE populations continue to expand, grizzly bears have increasingly been confirmed nearby and within the BE, including a grizzly bear captured in Stevensville, Montana in October 2018 (Figure 11). In June 2019, male bear number 927, traveled south of I-90, spending two months moving around the Bitterroot Ecosystem and in the northern part of the recovery zone before heading back north into the Cabinet Mountains to den in October (see map above). Prior to this, grizzly bears had not been verified inside the recovery zone since the 1940s. Also in 2019, a male grizzly bear was confirmed to the east of the recovery zone near Grangeville, Idaho. Genetic analysis of hair collected at the site concluded that this bear was from the SE.

Multiple grizzly bears have been confirmed in areas immediately surrounding the recovery zone over the last 15 years, including near Lolo, Montana in 2020. It is possible that additional undetected individuals are currently in the area. The BE is within maximum dispersal distance of three ecosystems, including the GYE, CYE, and NCDE, and we expect grizzly bears to naturally recolonize the BE, albeit slowly.

In 2021, we initiated a pilot project in southwest Montana using noninvasive techniques to detect dispersing grizzly bears and better understand the potential for natural recolonization of the BE (see project description below). The project primarily focused on areas immediately to the east and north of

the BE where dispersers might be moving through from other ecosystems. In 2022, we intend on increasing our coverage of these areas to improve the probability of detection.

In 2000, the SFWS issued a rule designating the Bitterroot Grizzly Bear Experimental Area as a nonessential experimental (10(j)) population and authorized reintroduction of grizzly bears under certain conditions. Reintroduction has not occurred and there are currently no plans to do so. With the recent occurrence of bears naturally dispersing to the Experimental Area, the FWS clarified that the section 10(j) regulation does not apply to grizzly bears that have dispersed into the area on their own, and that grizzly bears present in the Experimental Area are considered threatened under the ESA (USFWS 2020, *in litt*).

GRIZZLY BEAR PROGRAM OUTREACH & EDUCATION

The FWS regularly gives informational and educational presentations to community groups, schools, and professional meetings beyond our regular management meetings with governmental organizations. Due to COVID-19 restrictions in 2021, the GBRP gave fewer presentations than usual. 2021 presentations included:

- 2021 International Bear Association Conference:
    - Grizzly Bear Recovery in the Lower-48 (Hilary Cooley)
    - Cabinet Mountains Augmentation Program (Wayne Kasworm)
    - Trophic Position and Berry Use of Cabinet-Yaak and Selkirk Ecosystem Grizzly Bears (Justin Teisberg)
    - Distribution and Range of the Cabinet-Yaak and Selkirk Mountains Grizzly Bear Populations (Tyler Vent)
- Grizzly Bear Handling Workshop – GBRP developed 2-day virtual training for interagency staff

GRIZZLY BEAR PROGRAM PROJECTS

27th International Conference on Bear Research and Management

GBRP staff were members of the organizing and program committees for the International Bear Association's (IBA) 27th International Conference on Bear Research & Management that took place virtually in September of 2021. Four GBRP staff contributed poster or oral presentations. For more information visit the conference website.

Huckleberry Habitat Modeling

The GBRP is working on a project to model high quality huckleberry habitat in the Cabinet-Yaak and Selkirk recovery areas. The project is using habitat use patterns from collared bears to identify additional areas of expected use and examine the human or natural actions that may have created or maintained these sites (e.g., wildfire, prescribed fire, or timber harvest).

During months of August 2018–2020, we conducted berry surveys at 680 seasonal grizzly bear collar locations. On average, huckleberry plants covered ~20% of the ground at sampling locations, with some sites upwards of 85% coverage. We attempted to model huckleberry habitat important to grizzly bears

using 29 environmental variables thought to influence productive huckleberries via resource selection function analyses. Important variables ($P < 0.00001$; positive [+] or negative [-] relationship) include canopy closure (-), moisture deficit (-), time since last wildfire (-), solar radiation (+), snow water equivalent (-), and summer maximum temperature (+). Our team is now applying the model to second-order questions of how productive huckleberry habitat relates to population productivity, space use and range overlap, calorie base, and land management prescriptions. Manuscript preparation is currently underway with expected completion in winter 2022–23. For more information, contact Wayne Kasworm.

Figure 12. Grizzly bear traveling on a restricted road in the Selkirk Mountains.

Selkirk-Cabinet-Yaak Genetic Diversity and Structure

A graduate student (Megan Wright; wildlife biologist with the Kalispel Tribe) has begun a Master's program evaluating and updating what we know about genetic diversity and landscape connectivity of Selkirk and Cabinet-Yaak grizzly bear populations. The study will focus on estimating current and historic heterozygosity, levels of inbreeding, and effective population sizes of these populations. This research will also examine the effects and consequences of past and future natural gene flow or management actions (e.g., Cabinet Mountains augmentation program) on genetic diversity. Last, the study will investigate any measurable population structure occurring within and between ecosystems, possibly identifying historic barriers to genetic connectivity. The program is with Dr. Lisette Waits at the University of Idaho. The GBRP will provide genetic data and participate in the student's graduate thesis committee. For more information, contact Justin Teisberg.

Assimilated diets of CYE and SE grizzly bears

Similar to work in the NCDE, our program is producing and analyzing a hair and blood isotope dataset for the CYE and SE, including samples dating back to the early 1980s (N = 473). Using known isotopic ratios

of plant and animal food items common to bears, we estimate assimilated diets of CYE grizzly bears include 10–22% animal meat on average, differing by age-class and sex. Diets of sampled SE bears have even lower proportions of animal meat (12%, on average). In comparison to other ecosystems, summer diets of grizzly bears in the NCDE and GYE consist of 47% and 42% animal matter, respectively. The low use of meat by CYE and SE grizzly bears is more spatially uniform across the two Ecosystems, especially when compared with the NCDE where grizzly bears have plant-based diets in northwestern part of ecosystem and animal-based diets in southern and eastern areas.

Our team discovered that berries (huckleberries in particular) carry a unique isotope signature, allowing us to (1) estimate the berry portion of a grizzly bear diet and (2) specifically assesses the nutritional importance of huckleberries to CYE and SE grizzly bears. Preliminary results suggest grizzly bear diets, on average, are composed of at least 20% berries during the summer months. At that rate, we estimate an adult female grizzly bear typically consumes at least four quarts of berries a day during the peak of an average berry season, though the number could be as large as fifteen quarts at higher levels of consumption. We continue to monitor isotope values of samples collected at capture events of grizzly and black bears in the Cabinet-Yaak and Selkirks. We anticipate more results from the 2021 field season (N = 49 capture events). As next steps, we intend to assess whether these diet estimates predict or align with patterns of habitat use, dispersal, body condition, or individual reproductive fitness. We also hypothesize species differences in huckleberry use, and our results may indicate level of interspecies competition for berry resources in the Cabinet-Yaak and Selkirks. Expected manuscript completion spring of 2023. For more information, contact Justin Teisberg.

Army Cutworm Moths in the GYE

Army cutworm moths occur in remote, high-elevation alpine sites dominated by talus and scree slopes in parts of the GYE and NCDE. When available, they are an important food source for grizzly bears because of their high caloric and nutrient content. Moth sites in the GYE have been well mapped and grizzly bear use of moth sites is monitored annually. Stable isotope analysis has previously been used to estimate assimilated meat and plant matter for GYE grizzly bear diets but intake of army cutworm moths by grizzly bears has not previously been quantified. Initial results from grizzly bear food items in the GYE, including army cutworm moths, indicate that stable isotope analysis can be used to quantify the intake of army cutworm moths by grizzly bears in the GYE. Hair samples collected near army cutworm moth feeding sites were initially submitted for DNA analysis such that only 1 sample per year per individual was submitted for stable isotope analysis. From 2018 to 2020, we submitted and received results for 79 food samples, including 18 moth samples, and 13 grizzly bear hair samples for analysis. An additional 3 moth samples and 17 grizzly bear hair samples await analysis, which has been delayed by a transition at the lab. For more information, contact Jennifer Fortin-Noreus.

SW MT DNA Study

During the summer of 2021, the GBRP partnered with the U.S. Forest Service and Defenders of Wildlife to conduct a pilot project that used digital cameras and hair snare corrals to look for the presence of grizzly bears in southwest Montana. The goal of the project was to document presence of grizzly bears outside of current estimated distributions of the species to document range expansion. From mid-May through the end of August we placed 140 hair corrals on the Bitterroot, Lolo, and Beaverhead-Deerlodge National Forests. Site locations were based on previous verified and possible sightings and biologists' recommendations. Each corral was in place for 3 to 4 weeks for a total of 3,446 corral nights.

We collected 805 hair samples, of which 181 hair samples from corrals at which grizzly bears were detected via camera (n = 1 corral) or at which there were camera issues (n = 52 corrals) were submitted for DNA analysis. Preliminary information gathered by cameras and DNA analysis revealed the presence of two unrelated male grizzly bears near the headwaters of the east fork of the Bitterroot River (Figure 13). DNA analysis assigned both of their populations of origin to the NCDE. Preliminary results were presented at community and IGBC subcommittee meetings during the fall of 2021. Final results are anticipated later in 2022 and will be presented at IGBC meetings. The project is planned to continue during the summer of 2022. For more information, contact Jennifer Fortin-Noreus.

Figure 13. Two unrelated male grizzly bears visit a hair snare corral near the headwaters of the east fork of the Bitterroot River.

Teton County, Wyoming Bear Management

In 2021, Wyoming Department of Game and Fish (WGF) requested assistance from the GBRP to help manage two celebrity grizzly bears in Teton County, including Bear 863 (Togwotee Pass) and Bear 399. From June through October, the GBRP, in cooperation with the USFS, GTNP, WGF, and YNP, initiated a hazing program to deter Bear 863 from lingering near the highway and humans. We coupled non-lethal hazing with public outreach at highway pullouts and in the media. The effort had limited success; Bear 863 remained in the area, but her behavior became more wary of people and parked vehicles and she appeared to maintain a greater distance from the highway, unless crossing. She and her cubs successfully denned in October.

Bear 399 and her four yearlings travelled south of Jackson in late summer where they received multiple food rewards at and near residences. In October, the GBRP began a multi-agency (USGS, NPS, FWS) capture effort with the goal of collaring the family group to enable better monitoring, hazing, and conflict prevention. The team captured three two-year old cubs and attached iridium satellite collars to two male cubs. Within days of the capture effort, the family group travelled north, through the town of Jackson, to GTNP, and remained out of conflict until denning around Thanksgiving Day.

GRIZZLY BEAR PROGRAM FUNDING

The GBRP supports a number of programs and projects to promote grizzly bear conservation in the lower-48 States. Population status assessment and science-based management are integral to conservation and recovery; the majority of our support goes towards these efforts (monitoring recovery criteria, management of conflict situations, and research to inform data gaps). Maintaining grizzly bears on the landscape requires tolerance. We fund various NGOs, groups, landowners, and projects that promote awareness and understanding of grizzly bears, and work to prevent or reduce conflicts. Projects listed below are funded through ESA recovery dollars; the FWS funds additional grizzly bear projects not mentioned here through other programs, including Tribal Wildlife Grants, Section 6 Agreements, and the Refuges program. This list of expenditures below also does not include Federal or administrative staffing, FWS travel, IT, vehicle costs, or office supplies.

MANAGEMENT + MONITORING	**TOTAL $892,000**

Montana Fish, Wildlife & Parks
Wyoming Game & Fish Department
US Geological Survey: Interagency Grizzly Bear Study Team
Forest Service: Interagency Grizzly Bear Committee
USDA APHIS Wildlife Services - Montana
National Park Service: Yellowstone
Interagency Conflict Management in Teton County, WY

INFORMATION, EDUCATION + OUTREACH	**TOTAL $5,000**

Swan Valley Connections: Outreach and educational events in the NCDE
Defenders of Wildlife: Electric fencing outreach and education

PREVENTATIVE PROJECTS	**TOTAL $44,000**

Blackfoot Challenge: Preventative Funding NCDE
Swan Valley Connections: Conflict prevention projects in the NCDE
Defenders of Wildlife: Electric Fencing Incentive Program
Blackfoot Challenge: Bear Range Rider
Cost shared prevention projects with Montana Fish, Wildlife & Parks and People and Carnivores

RESEARCH	**TOTAL $172,000**

CYE and SE Monitoring & Research
SW Montana DNA Study
Washington State University Bear Center
Washington State University: Isotope Analyses
DNA Analysis: Shoshone NF Army Cutworm Moth Project
Review of Canadian grizzly bear populations for Species Status Assessment
2021 IBA Conference Support

2021 TOTAL	**$1,113,000**

RECENT PUBLICATIONS

Proctor, M. F., W. F. Kasworm, J. E. Teisberg, C. Servheen, T. G. Radandt, C. T. Lamb, K. C. Kendall, R. D. Mace, D. Paetkau, and M. S. Boyce. 2020. American black bear population fragmentation detected with pedigrees in the trans-border Canada-United States region. Ursus *i31:1–15.*

Lyons, A. L., W. L. Gaines, P. H. Singleton, W. F. Kasworm, M. F. Proctor, and J. Begley. 2018. Spatially explicit carrying capacity estimates to inform species specific recovery objectives: Grizzly bear (*Ursus arctos*) recovery in the North Cascades. Biological Conservation 222:21–32.

Proctor, M. F., W. F. Kasworm, K. M. Annis, A. G. Machutchon, J. E. Teisberg, T. G. Radandt, and C. Servheen. 2018. Conservation of threatened Canada-USA trans-border grizzly bears linked to comprehensive conflict reduction. Human Wildlife Interactions 12:348–372.

Robbins, C.T., and J. K. Fortin-Noreus. 2017. Nutritional Ecology. Pages 46–61 *in* P.J. White, K. A. Gunther, and F. T. van Manen, eds. Yellowstone Grizzly Bears: ecology and conservation of an icon of wilderness. Yellowstone Forever, Yellowstone National Park, Wyoming.

Fortin, J. K., K. D. Rode, G. V. Hilderbrand, J. Wilder, S. Farley, C. Jorgensen, and B. G. Marcot. 2016. Impacts of human recreation on brown bear (*Ursus arctos*): A review and new management tool. Plos One 11: e0141983.

Jansen, H. T., T. Leise, G. Stenhouse, K. Pigeon, W. Kasworm, J. Teisberg, T. Radandt, R. Dallmann, S. Brown, and C. T. Robbins. 2016. The bear circadian clock doesn't 'sleep' during winter dormancy. Frontiers in Zoology 13:42–56.

Ebinger, M. R., M. A. Haroldson, F. T. van Manen, C. M. Costello, D. D. Bjornlie, D. J. Thompson, K. A. Gunther, J. K. Fortin, J. E. Teisberg, S. R. Pils, P. J. White, S. L. Cain, and P. C. Cross. 2016. Detecting grizzly bear use of ungulate carcasses using global positioning system telemetry and activity data. Oecologia 181:695–708.

Coltrane, J. A., S. Farley, D. Saalfeld, D. Battle, T. Carnahan, and J. Teisberg. 2015. Evaluation of dexmedetomidine, tiletamine, and zolazepam for the immobilization of black bears. Wildlife Society Bulletin 39:378–382.

Proctor, M. P., Nielson, S. E., W. F. Kasworm, C. Servheen, T. G. Radandt, A. G. Machutchon, and M. S. Boyce. 2015. Grizzly bear connectivity mapping in the Canada–United States trans-border region. Journal of Wildlife Management 79:544–558

Barta, J. L., C. Monroe, J. E. Teisberg, M. Winters, K. Flanigan, and B. M. Kemp. 2014. One of the key characteristics of ancient DNA, low copy number, may be a product of its extraction. Journal of Archaeological Science 46:281–289.

Schwartz, C. C., J. K. Fortin, J. E. Teisberg, M. A. Haroldson, C. Servheen, C. T. Robbins, and F. T. van Manen. 2014. Body and diet composition of sympatric black and grizzly bears in the Greater Yellowstone Ecosystem. Journal of Wildlife Management 78:68–78.

Schwartz, C. C., J. E. Teisberg, J. K. Fortin, M. A. Haroldson, C. Servheen, C. T. Robbins, and F. T. van Manen. 2014. Use of isotopic sulfur to determine whitebark pine consumption by Yellowstone bears: A reassessment. Wildlife Society Bulletin 38:664–670.

Teisberg, J. E., S. D. Farley, O. L. Nelson, G. V. Hilderbrand, M. J. Madel, P. A. Owen, J. A. Erlenbach, and C. T. Robbins. 2014. Immobilization of grizzly bears (*Ursus arctos*) with dexmedetomidine, tiletamine, and zolazepam. Journal of Wildlife Diseases 50:74–83.

Teisberg, J. E., M. A. Haroldson, C. C. Schwartz, K. A. Gunther, J. K. Fortin, and C. T. Robbins. 2014. Contrasting past and current numbers of bears visiting Yellowstone cutthroat trout streams. Journal of Wildlife Management 78:369–378.

Fortin, J. K., C. C. Schwartz, K. A. Gunther, J. E. Teisberg, M. A. Haroldson, M. A. Evans, and C. T. Robbins. 2013. Dietary adjustability of grizzly bears and American black bears in Yellowstone National Park. Journal of Wildlife Management 77:270–281.

Fortin, J. K., J. V. Ware, H. T. Jansen, C. C. Schwartz, and C. T. Robbins. 2013. Temporal niche switching by grizzly bears but not American black bears in Yellowstone National Park. Journal of Wildlife Management 94:833–844.

LITERATURE CITED

Almack, J. A., W. L. Gaines, R. H. Naney, P. H. Morrison, J. R. Eby, G. F. Wooten, M. C. Snyder, S. H. Fitkin, and E. R. Garcia. 1993. North Cascades grizzly bear ecosystem evaluation. Final Report to the Interagency Grizzly Bear Committee.

Bjornlie, D. D., and M. A. Haroldson. 2021. Grizzly bear occupied range in the Greater Yellowstone Ecosystem, 1990–2020. Pages 24–27 *in* F. T. van Manen, M. A. Haroldson, and B. E. Karabensh, editors. Yellowstone grizzly bear investigations: annual report of the Interagency Grizzly Bear Study Team, 2020. U.S. Geological Survey, Bozeman, Montana, USA.

Costello, C. M., and L. Roberts. 2016. Northern Continental Divide Ecosystem grizzly bear population monitoring annual report – 2015. Montana Fish, Wildlife & Parks, Kalispell, Montana, USA.

Costello, C. M., and L. Roberts. 2021. Northern Continental Divide Ecosystem grizzly bear population monitoring annual report, 2020. Montana Fish, Wildlife & Parks, Kalispell, Montana, USA.

Cowan, I. M., D. G. Chapman, R. S. Hoffmann, D. R. McCullough, G. A. Swanson, and R. B. Weeden. 1974. Report of the Committee on the Yellowstone grizzlies. National Academy of Sciences Report.

Craighead, J.J., J. R. Varney, and F. C. Craighead, Jr. 1974. A population analysis of the Yellowstone grizzly bears. Bulletin 40, Montana Forest and Conservation Experiment Station, University of Montana, Missoula, Montana, USA.

Dood, A. R., R. D. Brannon, and R. D. Mace. 1986. Management of grizzly bears in the Northern Continental Divide Ecosystem, Montana. Transcripts of the 51st North American Wildlife & Natural Resources Conference:162–177.

Interagency Grizzly Bear Study Team. 2021. Research and monitoring summary 2021. Presentation to the Yellowstone Ecosystem Subcommittee. 8 November 2021.

Kamath, P.L., M.A. Haroldson, G. Luikart, D. Paetkau, C. Whitman, and F.T. van Manen. 2015. Multiple estimates of effective population size for monitoring a long-lived vertebrate: an application of Yellowstone grizzly bears. Molecular Ecology 24:5507–5521.

Kasworm, W. F., T. G. Radandt, J. E. Teisberg, T. Vent, A. Welander, M. Proctor, H. Cooley and J. K. Fortin-Noreus. 2021. Cabinet-Yaak grizzly bear recovery area 2020 research and monitoring progress report. U.S. Fish and Wildlife Service, Missoula, Montana. 108 pp.

Kasworm, W. F., T. G. Radandt, J. E. Teisberg, A. Welander, T. Vent, M. Proctor, H. Cooley, and J. K. Fortin-Noreus. 2021. Selkirk Mountains grizzly bear recovery area 2020 research and monitoring progress report. U.S. Fish and Wildlife Service, Missoula, Montana. 69 pp.

Kendall, K. C., A. C. Macleod, K. L. Boyd, J. Boulanger, J. A. Royle, W. F. Kasworm, D. Paetkau, M. F. Proctor, K. Annis, and T. A. Graves. 2016. Density, distribution, and genetic structure of grizzly bears in the Cabinet-Yaak ecosystem. Journal of Wildlife Management 80:314–331.

Kendall, K. C., J. B. Stetz, J. Boulanger, A. C. Macleod, D. Paetkau, and G. C. White. 2009. Demography and genetic structure of a recovering grizzly bear population. Journal of Wildlife Management 73:3–17.

Lyons, A. L., W. L. Gaines, P. H. Singleton, W. F. Kasworm, M. F. Proctor, and J. Begley. 2018. Spatially explicit carrying capacity estimates to inform species specific recovery objectives: grizzly bear (*Ursus arctos*) recovery in the North Cascades. Biological Conservation 222:21–32.

Mace, R. D., D. W. Carney, T. Chilton-Radandt, S. A. Courville, M. A. Haroldson, R. B. Harris, J. Jonkel, B. McLellan, M. Madel, T. L. Manley, C. C. Schwartz, C. Servheen, G. Stenhouse, J. S. Waller, and E. Wenum. 2012. Grizzly bear population vital rates and trend in the Northern Continental Divide Ecosystem, Montana. Journal of Wildlife Management 76:119–128.

McCullough, D. R. 1981. Population dynamics of the Yellowstone grizzly bear. Pages 173-196 in Fowler, C. W. and T. D. Smith, editors. Dynamics of large mammal populations, John Wiley and Sons, New York, New York, USA.

Miller, C. R., and L. P. Waits. 2003. The history of effective population size and genetic diversity in the Yellowstone grizzly (*Ursus arctos*): Implications for conservation. Proceedings of the National Academy of Sciences 100:4334–4339.

National Parks Service and U.S. Fish and Wildlife Service. 2017. Draft grizzly bear restoration plan / environmental impact statement: North Cascades Ecosystem.

Northern Continental Divide Ecosystem Subcommittee. 2020. Conservation strategy for the grizzly bear in the Northern Continental Divide Ecosystem.

Proctor, M. F., D. Paetkau, B. N. McLellan, B. B. Stenhouse, K. C. Kendall, R. D. Mace, W. F. Kasworm, C. Servheen, C. L. Lausen, M. L. Gibeau, W. L. Wakkinen, M. A. Haroldosn, G. Mowat, C. D. Apps, L. M. Ciarniello, R. M. R. Barclay, M. S. Boyce, C. C. Schwartz, and C. Strobeck. 2012. Population fragmentation and inter-ecosystem movements of grizzly bears in western Canada and the northern United States. Wildlife Monographs 180:1–46.

Proctor M. F., W. F. Kasworm, K. M. Annis, A. G. MacHutchon, J. E. Teisberg, T. G. Radandt, and C. Servheen. 2018. Conservation of threatened Canada-USA trans-border grizzly bears linked to comprehensive conflict reduction. Human-Wildlife Interactions 12:348–372.

Pyare, S., S. Cain, D. Moody, C. Schwartz, and J. Berger. 2004. Carnivore re-colonization: reality, possibility and a non-equilibrium century for grizzly bears in the southern Yellowstone Ecosystem. Animal Conservation 7:1–7.

Schaub, M., and F. Abadi. 2010. Integrated population models: a novel analysis framework for deeper insights into population dynamics. Journal of Ornithology 152:227–237.

U.S. Fish and Wildlife Service. 1982. Grizzly bear recovery plan. Denver, Colorado, USA.

U.S. Fish and Wildlife Service. 1993. Grizzly bear recovery plan. Missoula, Montana, USA.

U.S. Fish and Wildlife Service. 1996. Grizzly bear recovery plan supplement: Bitterroot Ecosystem recovery plan chapter. Missoula, Montana, USA.

U.S. Fish and Wildlife Service. 1997. Grizzly bear recovery plan supplement: North Cascades Ecosystem recovery plan chapter. Missoula, Montana, USA.

U.S. Fish and Wildlife Service. 2007. Grizzly bear recovery plan supplement: Habitat-based recovery criteria for the Yellowstone Ecosystem. Missoula, Montana, USA.

U.S. Fish and Wildlife Service. 2017. Grizzly bear recovery plan supplement: Revised demographic recovery criteria for the Greater Yellowstone Ecosystem. Missoula, Montana, USA.

U.S. Fish and Wildlife Service. 2018. Grizzly bear recovery plan supplement: Habitat-based recovery criteria for the Northern Continental Divide Ecosystem. Missoula, Montana, USA.

U.S. Fish and Wildlife Service. 2020. Letter from Jodi Bush and Chris Swanson, USFWS office supervisors to supervisors of the Bitterroot, Nez Perce-Clearwater, Lolo, and Salmon-Challis National Forests.

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