

U.S. Fish and Wildlife Service



Grizzly Bear Recovery Program

2023

Annual Report

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Grizzly Bear Recovery Program

U.S. Fish and Wildlife Service

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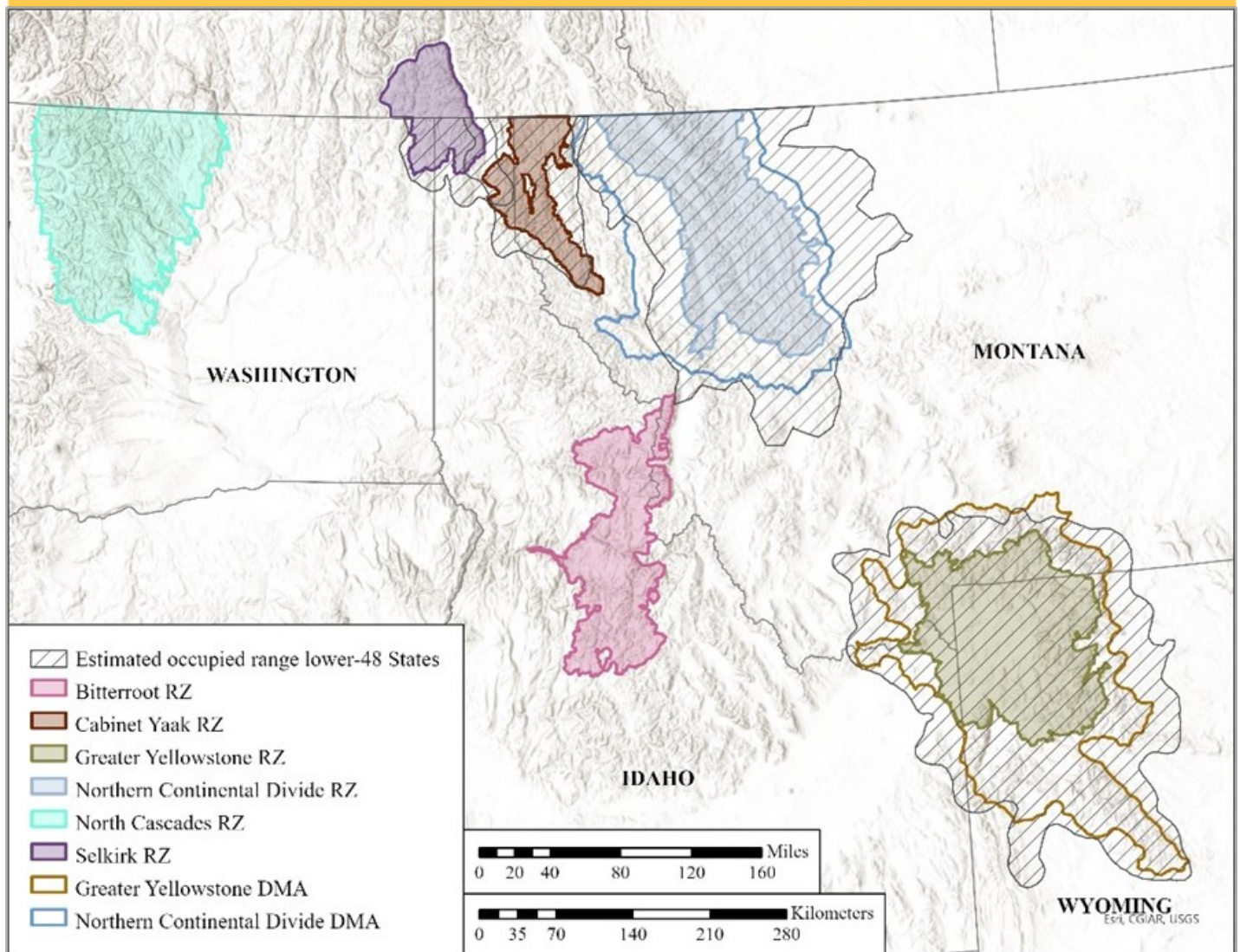
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www.fws.gov/office/grizzly-bear-recovery-program



Recovering grizzly bears in the lower-48 States

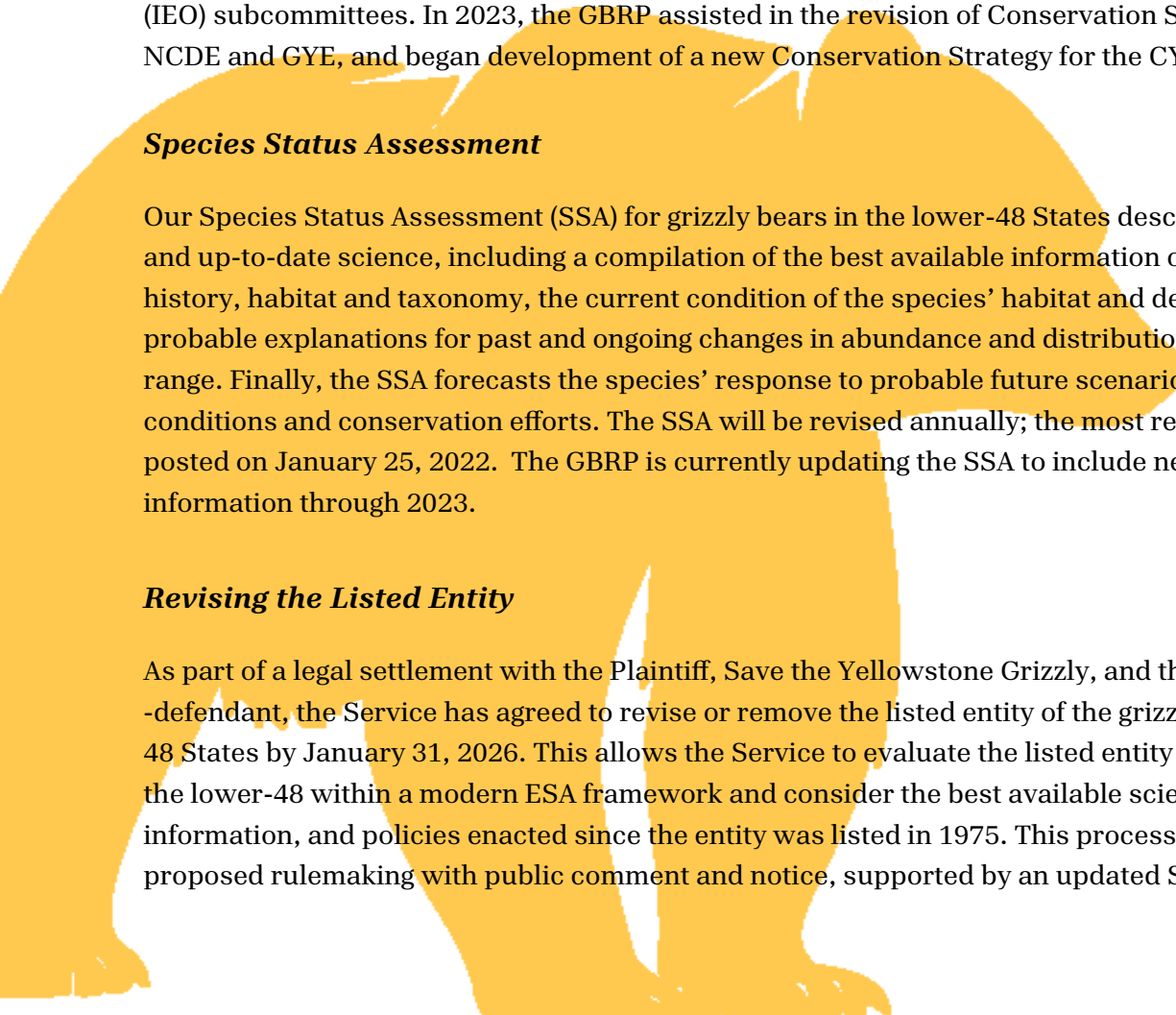
In 1975, the U.S. Fish and Wildlife Service (Service) listed the grizzly bear as a threatened species in the lower-48 States under the Endangered Species Act (Act). The Grizzly Bear Recovery Plan identifies six recovery areas, including the Greater Yellowstone Ecosystem (GYE), Northern Continental Divide Ecosystem (NCDE), Cabinet-Yaak Ecosystem (CYE), Selkirk Ecosystem (SE), North Cascades Ecosystem (North Cascades), and Bitterroot Ecosystem (BE). The Grizzly Bear Recovery Plan serves as the foundation for our work¹. This annual report describes the current status of grizzly bear populations in the continental U.S. and our accomplishments during 2023.



Recovery zones and current estimated occupied range for the six ecosystems identified in the Recovery Plan. Estimated occupied ranges are current as of 2022 within the lower-48 States. There are currently no known populations in the North Cascades and Bitterroot. Current estimated occupied range does not include low-density peripheral locations and represents a minimum known area of occupancy, not everywhere they occur.

Partnerships and Policy

To recover grizzly bears in the lower 48-States, the Grizzly Bear Recovery Program (GBRP) leads research, management, and recovery efforts with many talented partners:



- Native American governments and communities
- Federal, state, and county agencies
- The provinces of British Columbia and Alberta
- Interagency Grizzly Bear Committee (IGBC)
- Non-governmental organizations (NGOs)
- Businesses, landowners, and private citizens

Interagency Grizzly Bear Committee Participation

The GBRP supports the IGBC by advising the Executive Committee and the subcommittees for each ecosystem. We serve as members of the science teams and Information, Education, and Outreach (IEO) subcommittees. In 2023, the GBRP assisted in the revision of Conservation Strategies for the NCDE and GYE, and began development of a new Conservation Strategy for the CYE and SE.

Species Status Assessment

Our Species Status Assessment (SSA) for grizzly bears in the lower-48 States describes foundational and up-to-date science, including a compilation of the best available information on the species' life history, habitat and taxonomy, the current condition of the species' habitat and demographics, and probable explanations for past and ongoing changes in abundance and distribution within the species' range. Finally, the SSA forecasts the species' response to probable future scenarios of environmental conditions and conservation efforts. The SSA will be revised annually; the most recent [version 1.2](#) was posted on January 25, 2022. The GBRP is currently updating the SSA to include new data and scientific information through 2023.

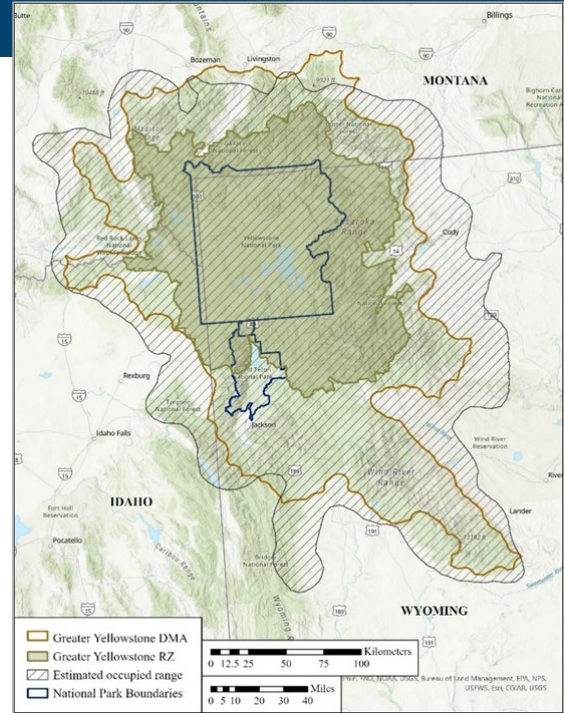
Revising the Listed Entity

As part of a legal settlement with the Plaintiff, Save the Yellowstone Grizzly, and the State of Idaho, a co-defendant, the Service has agreed to revise or remove the listed entity of the grizzly bear in the lower-48 States by January 31, 2026. This allows the Service to evaluate the listed entity for grizzly bears in the lower-48 within a modern ESA framework and consider the best available science, additional information, and policies enacted since the entity was listed in 1975. This process will include a proposed rulemaking with public comment and notice, supported by an updated SSA.

Recovery Zones (RZ)

GREATER YELLOWSTONE ECOSYSTEM

Latest estimated population in DMA	1,030 ⁸
Area within the RZ	23,853 km ²
Total area of the DMA	46,984 km ²
Percent of RZ on Federally-managed lands	98%
National Parks	2
National Forests	5
Wilderness Areas	6
Native American Reservations	0
States	3
Percent of DMA occupied	97%
Percent of suitable habitat occupied	97%



Map of the Greater Yellowstone Ecosystem recovery zone (RZ), demographic monitoring area (DMA), and estimated occupied range as of 2022.

Demographic Recovery Criteria

Criterion 1

Maintain a minimum population size of 500 bears
and
Support at least 48 females with cubs-of-the-year within the DMA

Progress

There were an estimated 1,030 bears and 87 females with cubs in 2023

Criterion 2

16 of 18 Bear Management Units (BMUs) within the Recovery Zone
must be occupied by females with young
and
no 2 adjacent BMUs are unoccupied, during a 6-year sum of observations

Progress

18 of 18 BMUs occupied by females with young in 2023 and during the most recent 6-year period

Criterion 3

Maintain 2002–2014 model-averaged Chao 2 population estimate within the DMA
- Mortality limits were 9% for independent females and 20% for independent males, and the human-caused mortality limit was 9% for dependent young -

Progress

Mortality rates were 5% for independent females, 6% for independent males, and 2% for dependent young
- Population growth rate of 3% -



Grizzly bear 1068 being fitted with a satellite collar, 2023. USFWS

Research in the GYE

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](#).

Army Cutworm Moths in the GYE

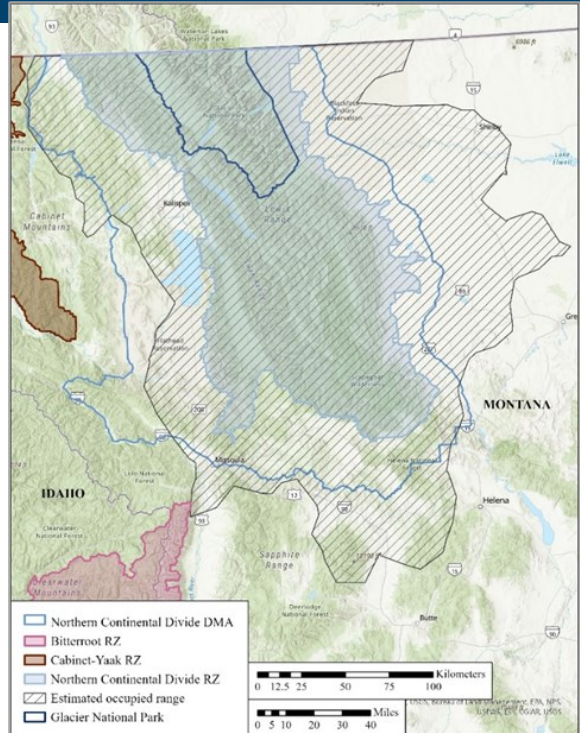
Army cutworm moths occur in remote, high-elevation alpine sites dominated by talus and scree slopes in parts of the GYE and NCDE. When available, they are an important food source for grizzly bears because of their high caloric and nutrient content. Stable isotope analysis has previously been used to 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. From 2018 to 2020, results were submitted for 79 food samples, including 18 moth samples, and 13 grizzly bear hair samples for analysis. Analysis for an additional 3 moth samples and 17 grizzly bear hair samples were submitted to the lab in early 2023. A draft manuscript is expected in 2024. For more information, contact Jennifer Fortin-Noreus.

Delisting the GYE

On January 21, 2022, the Service received a petition from the State of Wyoming to designate and delist a GYE Distinct Population Segment (DPS) of the grizzly bear under the Act. On February 6, 2023, we announced our 90-day finding on the petition (88 FR 7658). Based on our review, we found that the petition presented substantial scientific or commercial information indicating the petitioned action may be warranted and we initiated a status review to determine whether the petitioned action is warranted.

NORTHERN CONTINENTAL DIVIDE ECOSYSTEM

Latest estimated population:	1,163 ^{11,12}
Area within the RZ	23,135 km ²
Total area of the Demographic Monitoring Area (DMA)	42,579 km ²
Percent of RZ on Federally-managed lands:	98%
National Parks	1
National Forests	4
Wilderness Areas	5
Native American Reservations	2
States	1



Map of the Northern Continental Divide Ecosystem recovery zone (RZ), demographic monitoring area (DMA), and estimated occupied range as of 2022.

Research in the NCDE

Montana Fish, Wildlife and Parks (MFWP), in collaboration with Glacier National Park, the Confederated Salish & Kootenai Tribes (CSKT), 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](#).

Demographic Recovery Objectives^{7,10}

Objective 1

Maintain a well-distributed grizzly bear population within the DMA

Occupancy Threshold

Maintain the presence of females with dependent offspring in at least 21 of 23 BMUs of the RZ

and

in at least 6 of 7 occupancy units of Zone 1 at least every six years

Progress

All 23 BMUs within the recovery zone and all 7 occupancy units within Zone 1 were occupied by females with young during the most recent 6-year period

Objective 2

Independent Female Survival Threshold

Maintain estimated annual survival of independent females 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 will remain above 800 grizzly bears
 - *Minimum threshold in 2023 was 0.92* -

Progress

The estimated annual survival rate was above the threshold at 0.93

Independent Female Mortality Threshold

Limit annual estimated number of total mortalities of independent females to no more than 10% of the estimated number of independent females
and
 below the maximum number consistent with a projected probability of at least 90% that the population will remain above 800 grizzly bears
 - *The 2023 mortality threshold was 26* -

Progress

The 6-year mortality average was 16

Independent Male Mortality Threshold

Limit annual estimated number of total mortalities of independent males to no more than 15% of the estimated number of independent males
 - *The mortality threshold in 2023 was 31* -

Progress

The 6-year mortality average was 22

Objective 3

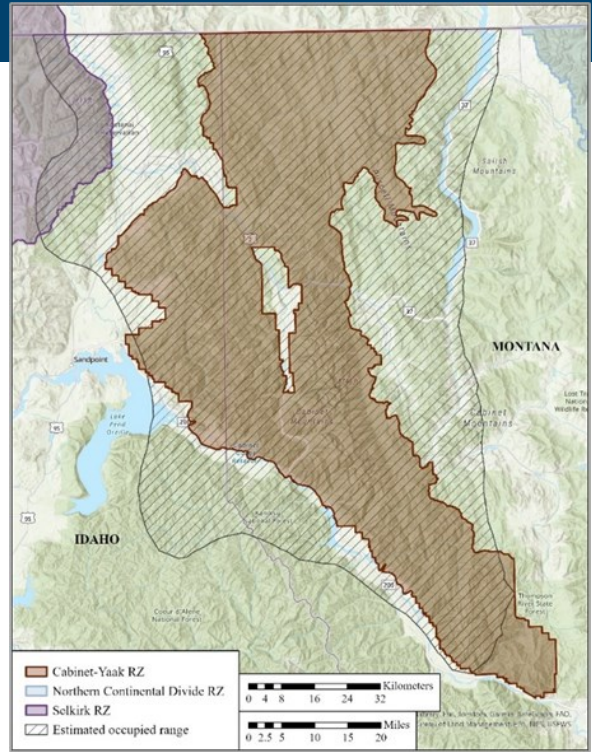
Monitor demographic and genetic connectivity among populations

Progress

As of 2022, bears occupied 93% of the DMA
and
 We documented 6 bears moving from the NCDE to the CYE but 3 are known to be dead and no gene flow has been detected

CABINET-YAAK ECOSYSTEM

Latest estimated population	70 ¹³
Area within the RZ	6,705 km ²
Percent of RZ on Federally-managed lands:	97%
National Parks:	0
National Forests:	3
Wilderness Areas:	1
Native American Reservations:	0
States:	2



Map of the Cabinet-Yaak Ecosystem recovery zone (RZ) and estimated occupied range as of 2022.

Demographic Recovery Targets

Target 1

6 females with cubs both inside the RZ and within a 10-mile buffer surrounding the RZ

Progress

Females with cubs averaged 3.2 per year

Target 2

18 of 22 BMUs occupied by females with young from a running 6-year sum

Progress

16 of 22 BMUs were occupied

Target 3

Human-caused mortality shall be $\leq 4\%$ of the population estimate and $\leq 30\%$ shall be females
 - The mortality threshold for 2023 was 1.4 bears and 0.4 females per year -

Progress

Human-caused mortality was 1.75 bears and 0.58 females

*Recovery targets in the CYE are calculated using a 6-year running average.

Research in the CYE

The Service 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 [Cabinet-Yaak Grizzly Bear Recovery Area 2023 Research and Monitoring Progress Report](#)¹³.

Selkirk-Cabinet-Yaak Genetic Diversity and Structure

We are collaborating with University of Idaho graduate student, Megan Turnock (also a wildlife biologist with the Kalispel Tribe) to evaluate and update our knowledge about the genetic diversity and landscape connectivity of Selkirk and Cabinet-Yaak grizzly bear populations. The study focuses on estimating current and historic heterozygosity, levels of inbreeding, and effective population sizes (N_e) of these populations. Megan is also examining the effects and consequences of past and future natural gene flow or management actions (e.g., Cabinet Mountains augmentation program) on genetic diversity. Megan is advised by Dr. Lisette Waits at the University of Idaho. For more information, contact Justin Teisberg.

Assimilated diets of CYE and SE grizzly bears

We are developing a hair and blood isotope dataset for the CYE and SE that will allow us to (1) estimate the berry portion of a grizzly bear diet and (2) evaluate the nutritional importance of huckleberries to CYE and SE grizzly bears. In 2023, we completed analyses on 36 samples from captured CYE and SE grizzly bears. Preliminary results suggest grizzly bear diets, on average, are composed of at least 20% berries during the summer months (4–15 quarts of berries per day). As next steps, we are assessing whether these diet estimates predict or align with patterns of habitat use, dispersal, body condition, and individual reproductive fitness. For more information, contact Justin Teisberg.

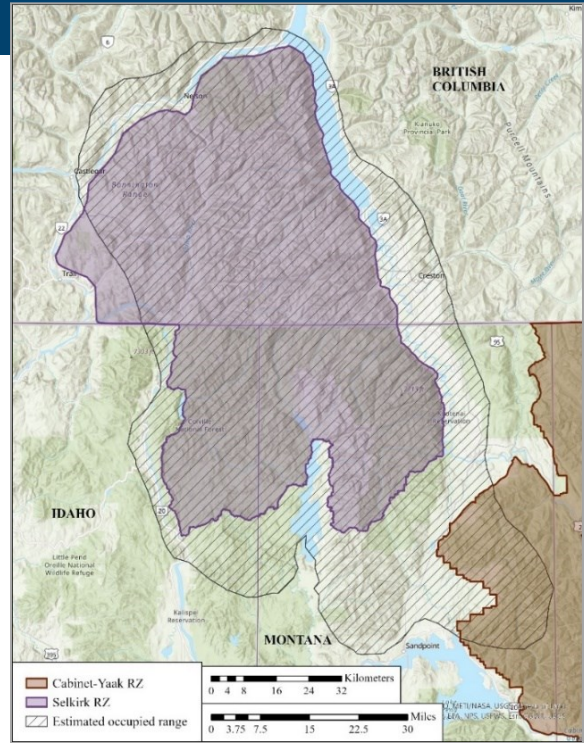
Augmentation Program

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 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. In 2021–2023, no bears were moved into the Cabinet Mountains due to poor berry production, trap success, and personnel constraints.

SELKIRK ECOSYSTEM

Latest estimated population *	<83 ¹⁴
Area within the RZ	6,575 km ²
Percent of RZ on Federally-managed lands	97%
National Parks	0
National Forests	2
Wilderness Areas	1
Native American Reservations	0
States	2

*cross-boundary estimate in 2010. 2023 data show there are minimum of 51 in the U.S. portion of the ecosystem.



Map of the Selkirk Ecosystem recovery zone (RZ) and estimated occupied range as of 2022.

Recovery Targets

Target 1

6 females with cubs both inside the RZ and within a 10-mile buffer surrounding the RZ

Progress

Females with cubs averaged 3.2 per year

Target 2

7 of 10 BMUs occupied by females with young from a running 6-year sum

Progress

9 of 10 BMUs were occupied

Target 3

Human-caused mortality shall be $\leq 4\%$ of the population estimate and $\leq 30\%$ shall be females
 - The mortality threshold for 2023 was 2.0 bears and 0.6 females per year -

Progress

Human-caused mortality was 2.0 bears and 0.5 females

*Recovery targets in the SE are calculated using a 6-year running average.

Research in the SE

The Service 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 (IDFG), 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 [Selkirk Mountains Grizzly Bear Recovery Area 2023 Research and Monitoring Progress Report](#)¹⁴.

Transboundary Population Estimate for Selkirk Mountains' Grizzly Bears

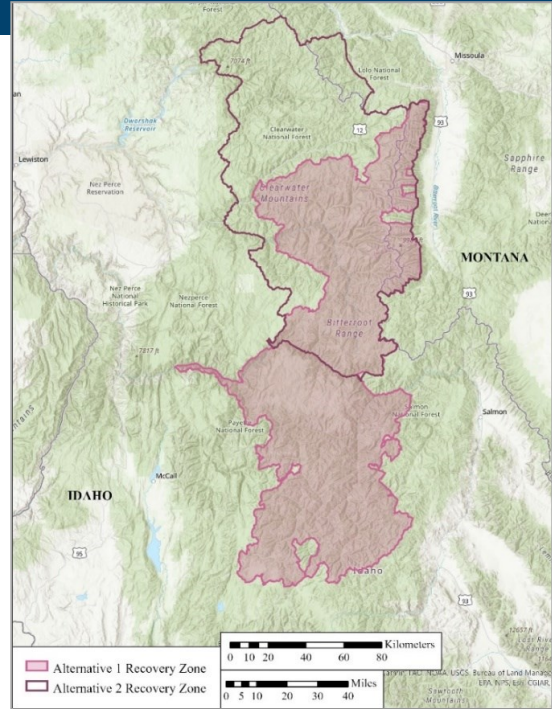
Working with colleagues in B.C. (M Proctor, Birchdale Ecological), we collected grizzly bear DNA hair samples in 2020 and 2021 from a combination of corral and rub sites within the occupied extent of the Selkirk Mountains recovery zone. This transboundary effort was possible with extensive interagency cooperation across three states and one province, as well as multiple land management jurisdictions. We intend to form a transboundary population estimate and will assess grizzly bear density in the Selkirks relative to spatial predictors such as road density, secure habitat, and productive habitat variables. Analyses are being performed with contracted help from Dr. John Boulanger (Integrated Ecological Research).

Huckleberry Habitat Modeling

The GBRP is developing a huckleberry habitat model in the Cabinet-Yaak and Selkirk recovery areas. The study modeled abiotic and biotic features associated with ground-truthed GPS locations of collared bears to identify huckleberry habitat and examine the human or natural actions that may have created or maintained these sites (e.g., wildfire, prescribed fire, or timber harvest). 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 (+). Secondly, we found that quality and quantity of predicted huckleberry habitat influences dispersal patterns, degree of female range overlap, and seasonal space use within a range. We also found that huckleberries provide a significant calorie base, and, as an important food resource, may nutritionally cue body size of Selkirk-Cabinet-Yaak bears.

BITTERROOT ECOSYSTEM

Latest estimated population	0
Area within the RZ	15,100 km ²
Percent of RZ on Federally-managed lands	98%
National Parks	0
National Forests	4
Wilderness Areas	2
Native American Reservations	0
States	2



Map of the Bitterroot Ecosystem recovery zone as identified in the 2000 Final EIS under the preferred alternative, reintroduction, and alternative 2, natural recovery.

Population linkage and gene flow

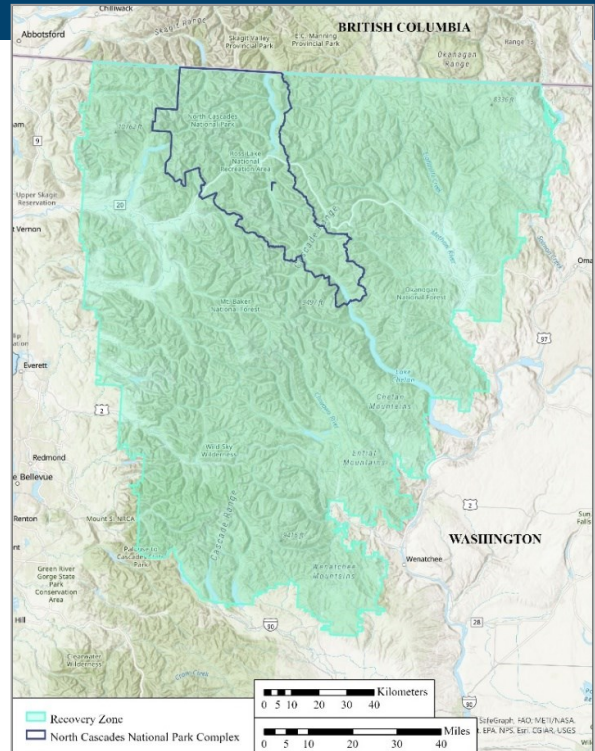
There is currently no known population in the BE and isolation is a concern for any future populations. However, multiple grizzly bears have been confirmed in areas immediately surrounding the recovery zone over the last 15 years. In addition, current distributions of grizzly bears in the GYE and NCDE continue to expand. The NCDE estimated occupied range is less than 5 km (3 mi) from the Bitterroot recovery zone, and multiple verified sightings have occurred between the GYE and NCDE estimated occupied range and the Bitterroot recovery zone.

Environmental Impact Statement (EIS)

In 2000, the Service released a Final Environmental Impact Statement (2000 FEIS), Record of Decision (ROD), and final section 10(j) regulation to reintroduce grizzly bears into the BE as a nonessential experimental population with citizen management. In 2001 DOI published a Notice of Intent proposing to reevaluate our ROD and select the “no action” alternative, and a proposed rule to remove the 10(j) regulation. That proposal was never finalized, and we took no further action to reevaluate our ROD or withdraw the 10(j) designation and associated regulation. In November 2021, the Service was challenged in the Montana District Court due to an “unreasonable delay” in implementing non-discretionary actions described in the action alternative. The court remanded this matter to the Service and ordered the Service to propose a timeline and plan for completion of a supplemental EIS and if warranted, a new ROD and final rule. In April 2023, the court issued an order approving the Service’s proposal and timeline to complete this process by October 2026. The Service published a notice of intent to initiate the public scoping process on January 17, 2024. For additional information, please refer to the Service’s [Bitterroot Grizzly Bear EIS Project](#) website.

NORTH CASCADES ECOSYSTEM

Latest estimated population	0
Area within the RZ	25,322 km ²
Percent of RZ on Federally-managed lands	97%
National Parks	1
National Forests	2
Wilderness Areas	9
Native American Reservations	0
States:	1



Map of the North Cascades Ecosystem recovery zone.

Recovery Efforts

The Service and North Cascades National Park are jointly working on a final EIS for the restoration of grizzly bears in the North Cascades Ecosystem. Agencies released for public comment a draft EIS in November featuring a preferred alternative of active restoration with an experimental population designation under section 10(j) of the Endangered Species Act. A Final EIS and 10(j) rule are expected to publish in spring 2024. See the website for further information: <https://www.nps.gov/noca/grizzly.htm>.

In B.C., First Nations have declared grizzly bears within the North Cascades Grizzly Bear Population Unit as in immediate need of restoration and protection (ONA 2014, entire, Piikani Nation 2018, entire). A Joint Nation partnership has been established in collaboration with the British Columbia Government to outline population recovery objectives and strategies in a ‘North Cascades Grizzly Bear Stewardship Strategy’ (in review).

Recovery Criteria

Recovery criteria have not yet been established for the North Cascades. 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.

BETWEEN ECOSYSTEMS



Young grizzly bear in the north Sapphire Mountains, 2023. USFWS

Southwest Montana DNA Study

In 2023, we conducted our third field season using digital cameras and hair snare corrals to look for the presence of grizzly bears in southwest Montana and document range expansion. We placed 104 hair corrals on the Bitterroot, Lolo, and Beaverhead-Deerlodge National Forests, and on BLM and Montana DNRC lands. Site locations were based on habitat connectivity modelling by Sells et al. 2023. We confirmed one grizzly bear in the north Sapphire Mountains in 2023.

Partners include the U.S. Forest Service, Defenders of Wildlife, MFWP, Montana DNRC, and the U.S. Bureau of Land Management. For more information, contact Jennifer Fortin-Noreus.

Cabinet-Yaak, Selkirks and Bitterroot Mountains Connectivity

We are collaborating with a graduate student from the University of Idaho (Nathaniel Rice, M.S. candidate) to develop habitat mapping for grizzly bear connectivity between the Cabinet-Yaak and Selkirk recovery areas and the Bitterroot Mountains to the south. The student started in fall semester of 2023 and is co-advised by Dr. David Ausband (University of Idaho faculty and UI/USGS Cooperative Unit) and Dr. Simona Picardi (University of Idaho faculty). For more information, contact Wayne Kasworm.

Transportation

The GBRP collaborates with partners to mitigate transportation issues affecting grizzly bears and their continued recovery. We work with other Service offices, the U.S. Federal Highways Administration, Native American Tribes, State highway departments, State wildlife agencies, as well as NGOs and community led groups to improve connectivity and decrease vehicle and train-strike mortalities.

Partners for Fish and Wildlife

The GBRP is collaborating with the USFWS Partners for Fish and Wildlife Program to develop shared capacity and support for private lands in the Upper Clark Fork/Flint Creek areas of west-central Montana. It is a key landscape for potential connectivity between the GYE, NCDE, and Bitterroot Ecosystems.

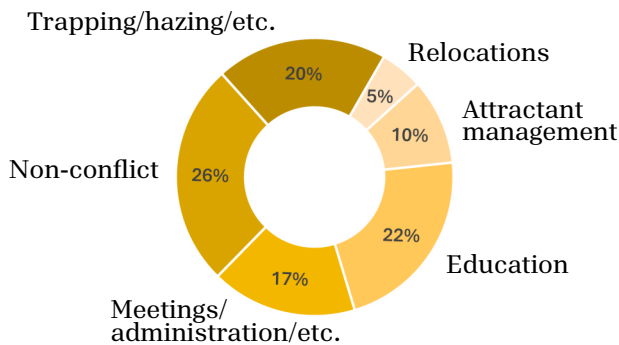
Human-Grizzly Bear Conflict

In 2022, the Service established a Conflict Program within the Grizzly Bear Recovery Program. Its mission is to assist Tribes, states, federal agencies, and numerous other partners to prevent and respond to grizzly bear conflict. The Conflict Program consists of three conflict specialists distributed across Montana and Wyoming within or near areas experiencing a high incidence of grizzly bear conflict, and a conflict coordinator based in Missoula, Montana. In addition to conflict duties, the added capacity of Conflict Program staff has contributed to the continued success of grizzly bear recovery.

Some of the many ways the GBRP Conflict Program supports bear conflict reduction include:

- Developing and leading information, outreach, and education (IEO) efforts
- Assisting partner agencies in the relocation of grizzly bears
- Partnering with agencies, landowners/homeowners, and individuals to prevent and respond to human-bear conflicts
- Providing financial, material, and technical support

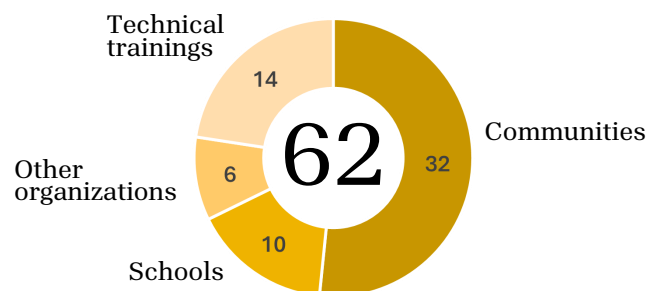
How we spend our time



of bears relocated
26

of miles driven
38,071

of education events



Conflict Collaborations

The conflict staff builds and maintains partnerships with all groups and individuals involved in grizzly bear conflict reduction. Conflict staff have assumed roles on various IGBC subcommittees, in BearWise WY communities, and the USFWS Partners for Fish and Wildlife Program. Conflict specialists serve on the IGBC IE&O committees for the Selkirk-Cabinet-Yaak, Bitterroot, NCDE and GYE subcommittees. Specialists also began coordinating roles for the IGBC Bear Smart Communities framework and BearWise Jackson Hole. The Conflict Program has dedicated efforts to collaborate and assist Native American Tribal natural resource departments throughout current and emerging grizzly bear range.

Roadside Bears

Since June 2021, GBRP conflict specialists have worked with U.S. Forest Service, Wyoming Game and Fish, and Grand Teton National Park to discourage habituated roadside bear behavior on Togwotee Pass, Beartooth Pass, and areas east of Yellowstone NP, in WY. The efforts to haze bears away from human occupied areas and the road involve a variety of strategies, including adverse conditioning and Karelian bear dogs. Managing public traffic and the feeding of bears continue to be major issues.

Professional Presentations: Communicating our work

National Wildlife Society Meeting 2023

- Cabinet Mountains Augmentation Program (Wayne Kasworm)*
- Identifying huckleberry habitat of importance to Cabinet-Yaak and Selkirk grizzly bears (Justin Teisberg)*
- Conservation genetics of fragmented grizzly bear populations in the Selkirk and Cabinet-Yaak Ecosystems (Megan Turnock, and GBRP coauthors)*

Grizzly Bear Handling Workshop 2023

- GBRP provided a 2-day virtual training for interagency partners*

31st annual Endangered Species Act Conference

- Grizzly bear recovery in the lower-48 States (Jennifer Fortin-Noreus)*

Expenditures

The Service supports a number of programs and projects that are critical to grizzly bear conservation and recovery. The projects and partners listed below are funded through Endangered Species Act recovery funds. The list below does not include Federal staff, administrative support, travel, vehicles, office and storage rental, or office supplies. It also does not include support for grizzly bears provided by other Service programs.

<u>\$1,348,000</u> 2023 Total Expenditures	
\$925,000	Interagency Cooperative Agreements: Management + Monitoring
	Idaho Department of Fish & Game Montana Fish, Wildlife & Parks NPS: Grand Teton USDA APHIS Wildlife Services—Montana USFS: Interagency Grizzly Bear Committee USGS: Interagency Grizzly Bear Study Team Washington Department of Fish & Game Wyoming Game & Fish Department
\$29,000	NGO Support: Conflict Prevention + IEO
	Blackfoot Challenge: Wildlife Coordinator support + conflict support Defenders of Wildlife: Electric Fencing Incentive Program+ IEO Swan Valley Connections: Prevention + IEO in the NCDE
\$84,000	USFWS: Conflict Management + IEO
	Conflict Supplies & Equipment IEO Materials Conflict management support
\$310,000	USFWS: Research + Monitoring
	CYE and SE Monitoring & Research SW Montana DNA Study Washington State University Bear Center

Recent Publications

- Proctor, M.F., C.T. Lamb, J. Boulanger, A. G. MacHutchon, W. F. Kasworm, D. Paetkau, C.L. Lausen, E. C. Palm, M.S. Boyce, and C. Servheen. 2023. Berries and Bullets: Influence of Food and Mortality Risk on Grizzly Bears in British Columbia. *Wildlife Monographs* 213:1-77.
- 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* 31:1–15.
- 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.

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1. U.S. Fish and Wildlife Service. 1982. Grizzly bear recovery plan. Denver, Colorado, USA.
2. U.S. Fish and Wildlife Service. 1993. Grizzly bear recovery plan. Missoula, Montana, USA.
3. U.S. Fish and Wildlife Service. 1996. Grizzly bear recovery plan supplement: Bitterroot Ecosystem recovery plan chapter. Missoula, Montana, USA.
4. U.S. Fish and Wildlife Service. 1997. Grizzly bear recovery plan supplement: North Cascades Ecosystem recovery plan chapter. Missoula, Montana, USA.
5. U.S. Fish and Wildlife Service. 2007. Grizzly bear recovery plan supplement: Habitat-based recovery criteria for the Yellowstone Ecosystem. Missoula, Montana, USA.
6. U.S. Fish and Wildlife Service. 2017. Grizzly bear recovery plan supplement: Revised demographic recovery criteria for the Greater Yellowstone Ecosystem. Missoula, Montana, USA.
7. 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.
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KEEP BEARS WILD



- **CARRY BEAR SPRAY AND KNOW HOW TO USE IT**
- **NEVER APPROACH BEARS AND STAY AT LEAST 300 FEET AWAY**
- **PRACTICE ETHICAL WILDLIFE VIEWING**
- **DO NOT FEED BEARS**
- **STORE FOOD, GARBAGE, AND OTHER ATTRACTANTS IN A BEAR-RESISTANT PLACE**
- **BE ON HIGH ALERT IN LIMITED VISIBILITY AREAS AND AVOID THICK BRUSH**
- **RECREATE IN GROUPS AND MAKE LOTS OF NOISE**
- **AVOID RECREATING AT DUSK, DAWN, OR AT NIGHT**
- **DO NOT RUN IF YOU ENCOUNTER A BEAR**
- **KNOW AND FOLLOW PUBLIC LAND REGULATIONS**