Interagency GRIZZLY BEAR Committee

IGBC Science Subcommittee

2026 IGBC Summer Meeting

Photo: Jake Davis

Science Subcommittee members

- Hilary Cooley (USFWS)
- Cecily Costello (MTFWP-NCDE)
- Matthew Gould (USGS-GYE)
- Tavis Forrester (USFS)
- Wayne Kasworm (USFWS-SE/CYE)
- Michael Proctor (Birchdale Ecological-SE/CYE)
- Frank T. van Manen (USGS-GYE)

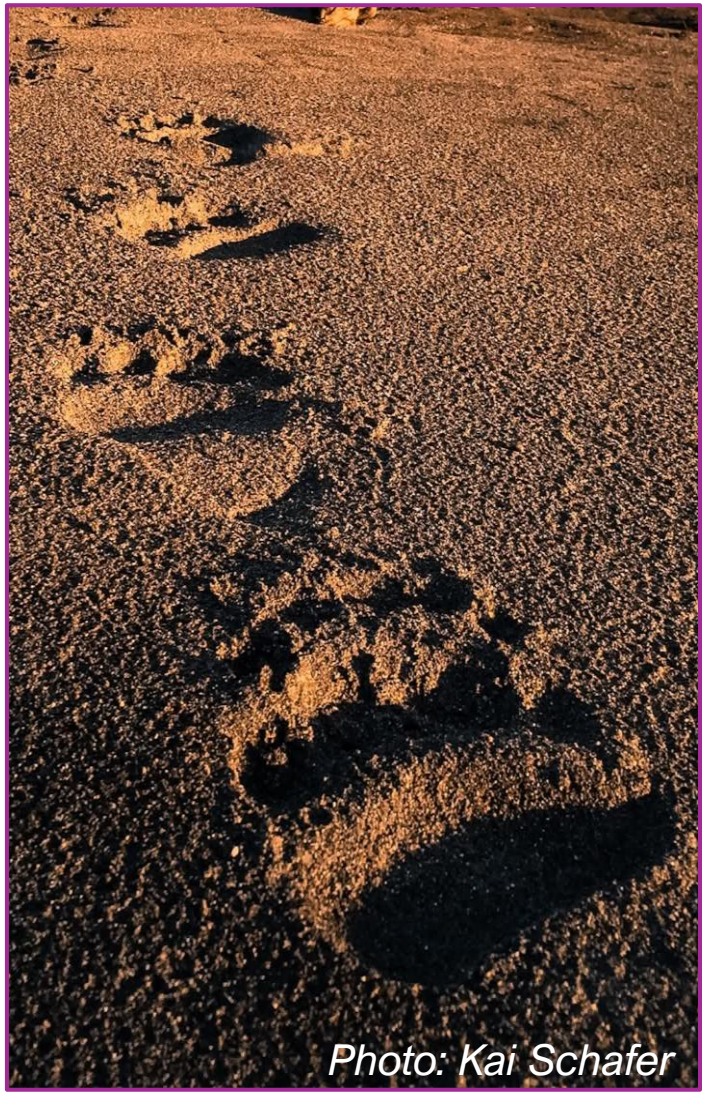
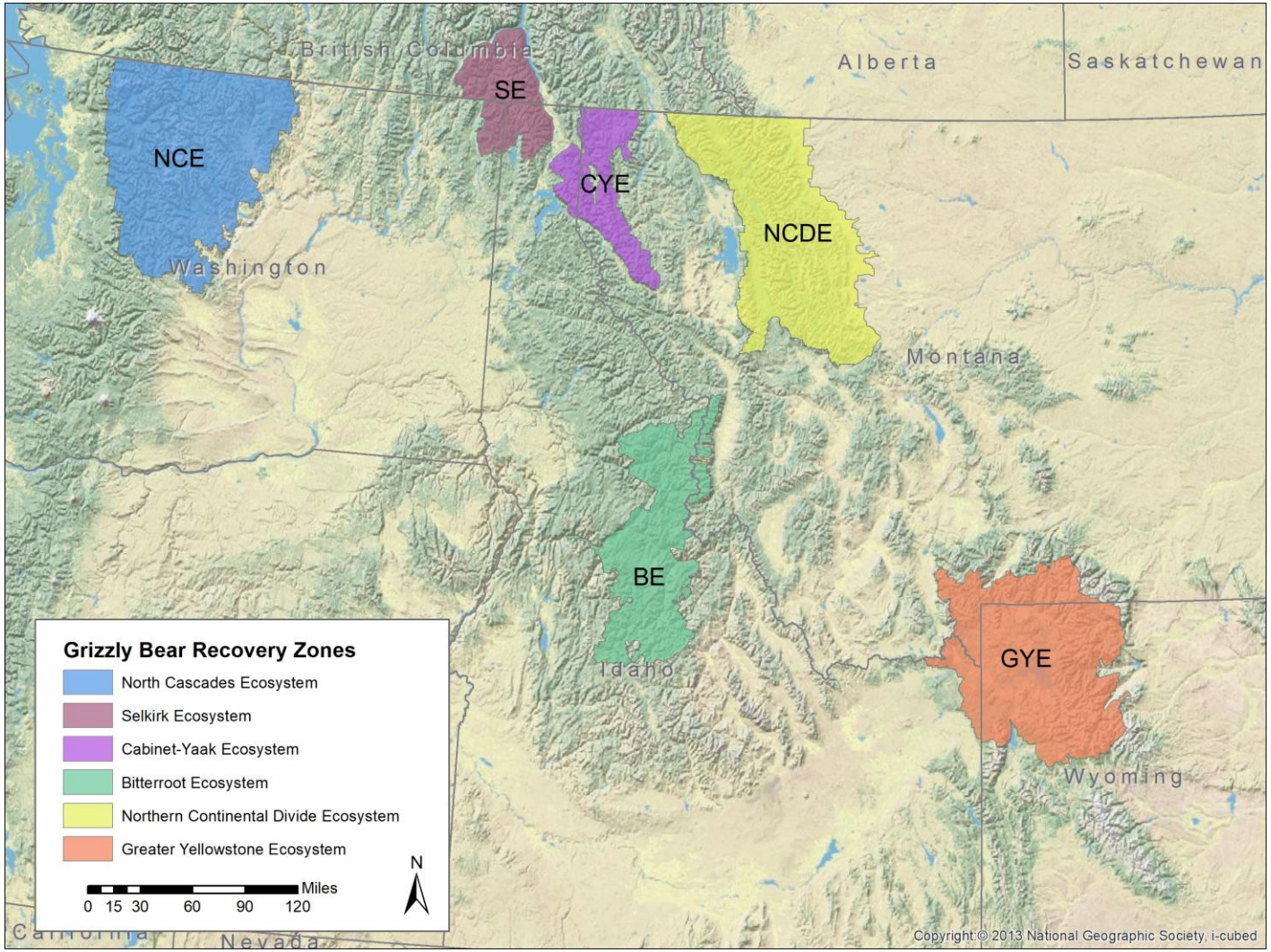


Photo: Kai Schafer

Interagency GRIZZLY BEAR Committee

- *Components of population monitoring programs by ecosystem and across ecosystems*
- *Science products (last 3 yrs)*
- *Ongoing research*
- *Big picture summary*



GYE population monitoring

- Research and monitoring since 1970s
- Captures and radio-collaring for survival and reproduction
- Unduplicated counts of females with cubs
- Application of an IPM
- Documentation of mortalities
- Key food monitoring
- Capture and radio-monitoring of bears captured at conflict sites
- Population genetics

GYE science products

- 2024 Annual Report

  https://igbconline.org/programs/bear-science/

GYE science products

Year	Authors	Title	Link
2024	Gould et al.	A unified approach to long-term population monitoring of grizzly bears in the Greater Yellowstone Ecosystem	https://doi.org/10.1016/j.gecco.2024.e03133
2024	Gunther et al.	Grizzly bear and American black bear interactions with people in Yellowstone National Park	https://doi.org/10.2192/URSUS-D-24-00001
2024	Loggers et al.	Grizzly bear responses to restrictions of recreation in Yellowstone National Park	https://doi.org/10.1002/jwmg.22527
2025	Clapp et al.	Exploring the exploitation of migratory moths by radio-marked grizzly bears in Wyoming	https://doi.org/10.1002/jwmg.70128
2025	Donatelli et al.	Bioclimatic, demographic and anthropogenic correlates of grizzly bear activity patterns in the Greater Yellowstone Ecosystem	https://doi.org/10.1002/oik.11851
2025	Donatelli et al.	The diel niche of brown bears: constraints on adaptive capacity in human-modified landscapes	https://doi.org/10.1002/ecog.07979
2025	Gaynor et al.	The influence of human presence and footprint on animal space use in US national parks	https://doi.org/10.1098/rspb.2025.1013
2025	Gunther et al.	Risk of bear-inflicted human injury in Yellowstone National Park	https://doi.org/10.2192/URSUS-D-24-00010R1
2025	Loggers et al.	Female and male grizzly bears differ in their responses to low-intensity recreation in protected areas	https://doi.org/10.1002/jwmg.70068

CYE and SE population monitoring

- Research and monitoring since 1980s
- Capture and radio-monitoring for survival and reproduction
- DNA hair snare and trail camera monitoring
- Documentation of mortalities
- Capture and radio-monitoring of bears captured at conflict sites

Birchdale Ecological
Trans-Border Grizzly Bear Project

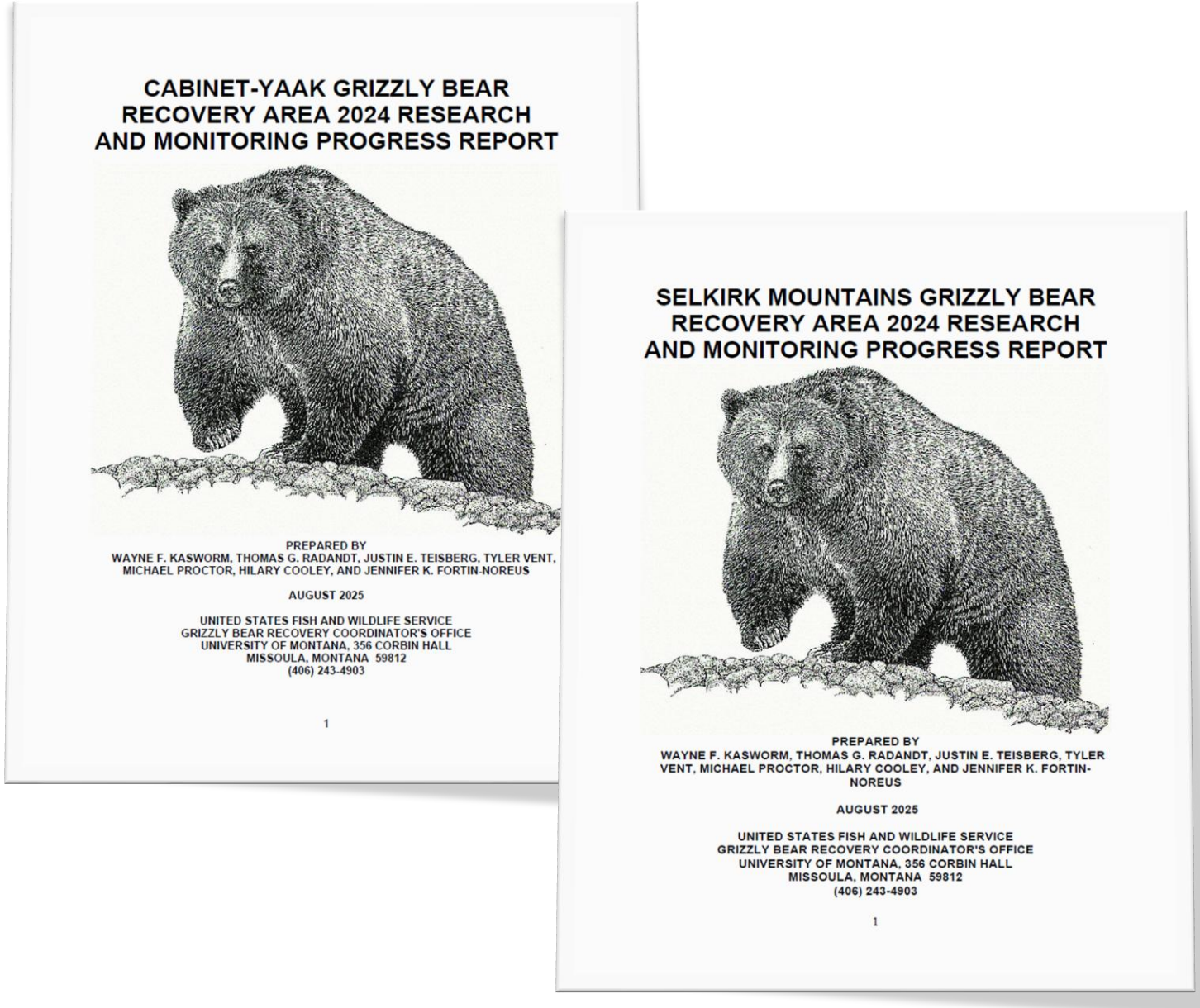
CYE and SE science products

- 2024 CYE Annual Report

  https://www.fws.gov/sites/default/files/documents/2025-09/cabinet-yaak-grizzly-bear-recovery-area-2024-research-and-monitoring-progress-report.pdf

- 2024 SE Annual Report

  https://www.fws.gov/rivers/sites/default/files/documents/2025-09/selkirk-mountains-grizzly-bear-recovery-area-2024-research-and-monitoring-progress-report.pdf



CYE and SE science products

Year	Authors	Title	Link
2024	Turnock et al.	Gene flow prevents genetic diversity loss despite small effective population size in fragmented grizzly bear (*Ursus arctos*) populations	https://rdcu.be/ftOEf
2025	Proctor et al.	Quantifying recovery of British Columbia's South Selkirk grizzly bear population	https://doi.org/10.2192/URSUS-D-24-00012
2026	Balmer et al.	Per- and Polyfluoroalkyl Substances and Pesticides in Black Bears (*Ursus americanus*) and Grizzly Bears (*Ursus arctos horribilis*) from Montana's Cabinet-Yaak Ecosystem: A Baseline Assessment of Emerging and Legacy Contaminants	https://doi.org/10.1016/j.envpol.2026.128079
2026	Teisberg et al.	Huckleberry habitat and its influence on two small populations of grizzly bears (*Ursus arctos*)	https://doi.org/10.1002/ece3.72905

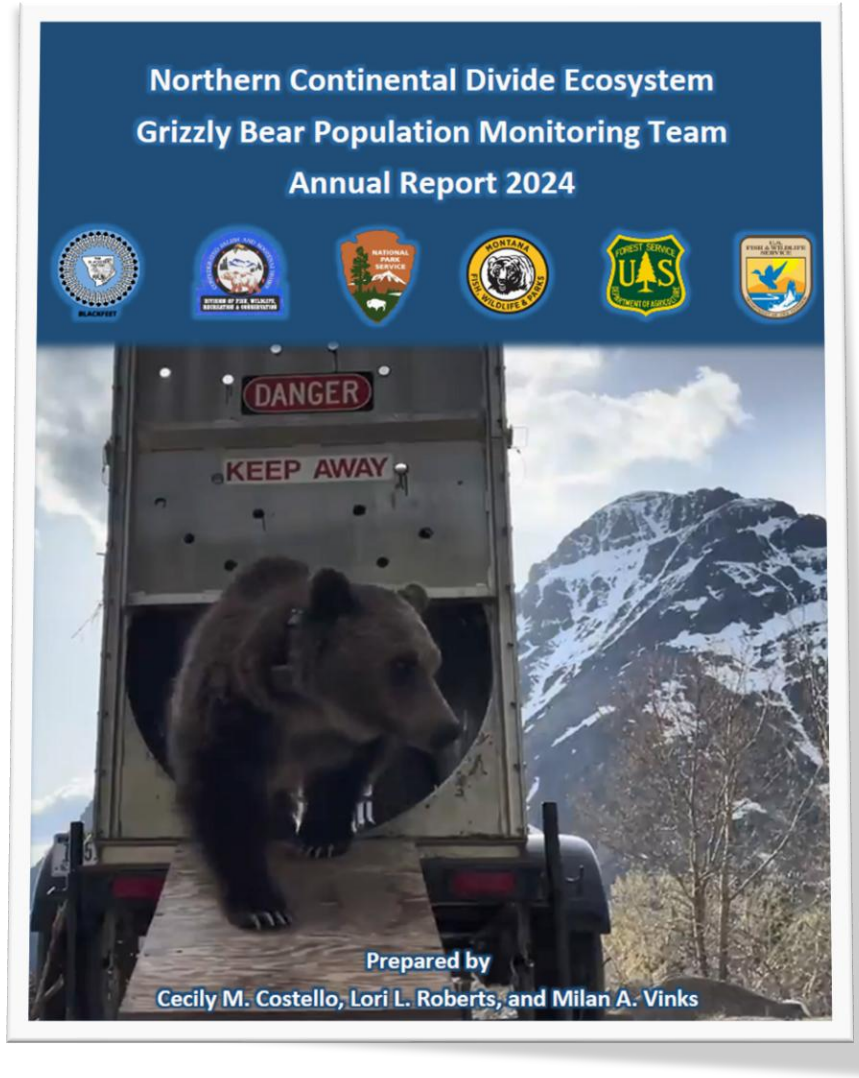
NCDE population monitoring

- Research since 1970s, ecosystem-wide monitoring since 2004
- Capture and radio-monitoring for survival and reproduction
- 2004 DNA baseline estimate and population modeling from vital rates
- Documentation of mortalities
- DNA sampling
- Capture and radio-monitoring of bears captured at conflict sites

NCDE science products

- 2024 Annual Report

  https://fwp.mt.gov/conservation/wildlife-management/grizzly-bears



NCDE science products

Year	Authors	Title	Link
2024	Young and Sarmento	Can an old dog learn a new trick? Efficacy of livestock guardian dogs at keeping an apex predator away from people	https://doi.org/10.1016/j.biocon.2024.110554
2024	Sarmento	Bear deterrence with scare devices, a non-lethal tool in the use-of-force continuum	https://doi.org/10.1002/jwmg.22552
2025	Sarmento	Drone outperform dogs for hazing grizzly bears: a comparison of carnivore aversive conditioning tools	https://doi.org/10.3389/fcosc.2024.1478450
2026	Peterson et al.	Broad-scale models of a foundational alpine insect: implications for grizzly bear ecology and conservation	https://doi.org/10.1002/jwmg.22552

Inter-ecosystem monitoring

- Documentation of verified outlier observations
- Biennial estimation of occupied range
- “May be present” mapping for extent of occurrence
- Population of origin and parentage analyses for long-distance movements
- Collaborative studies

Inter-ecosystem monitoring

- 2024 Distribution Report

https://igbconline.org/document/a-summary-of-grizzly-bear-distribution-in-the-lower-48-us-states-2024/

A Summary of Grizzly Bear Distribution in the Lower 48 US States in 2024

Cecily M. Costello, Montana Fish, Wildlife and Parks
Justin A. Dellinger, Wyoming Game and Fish Department
Jennifer K. Fortin-Noreus, U.S. Fish and Wildlife Service
Mark A. Haroldson, U.S. Geological Survey
Bryn E. Karabensh, U.S. Geological Survey
Wayne F. Kasworm, U.S. Fish and Wildlife Service
Lori L. Roberts, Montana Fish, Wildlife and Parks
Justin E. Teisberg, U.S. Fish and Wildlife Service
Frank T. van Manen, U.S. Geological Survey
Tyler J. Vent, U.S. Fish and Wildlife Service

INTRODUCTION

Understanding the distribution of grizzly bear populations in the lower 48 states can support their conservation and management and increase public safety. Previously, our research teams working in grizzly bear ecosystems in the lower 48 states used varying methods to estimate distribution of grizzly bear populations. In the Greater Yellowstone Ecosystem (GYE) and Northern Continental Divide Ecosystem (NCDE), zonal analysis and ordinary kriging were applied to an array of grid cells with or without verified presence of grizzly bears, however the parameters of the methods varied between the two ecosystems. In the Cabinet-Yaak Ecosystem (CYE) and the Selkirk Ecosystem (SE), population distribution was mapped as the Recovery Zone plus "bears outside of Recovery Zone" areas (Allen 2011). Additionally, the U.S. Fish and Wildlife Service developed a method for estimating areas where grizzly bears "may be present" to help agencies or prospective applicants evaluate whether or not proposed actions may affect grizzly bears (U. S. Fish and Wildlife Service 2020). Since the mid 2010s, cooperating agencies have collaborated in documenting verified outlier observations that occur between or well outside of grizzly bear Recovery Zones and these data inform the "may be present" mapping (U. S. Fish and Wildlife Service 2020).

Following preliminary analyses and a joint meeting in 2022, we developed guidance for consistent methods to use across all grizzly bear ecosystems in the lower 48 states. First, we defined two levels of distribution: occupied range and extent of occurence.

> ***Occupied range*** is an estimate of the roughly contiguous, minimum area within which grizzly bears have established residency or have demonstrated habitat use. It does not include occasional forays outside the estimated range or low-density peripheral areas and therefore does not represent the total known extent of occurrences. The area of occupied range is estimated using methods described by Bjornlie et al. (2014) and are detailed below. Due to the smoothing inherent in the methods, range edges may extend over features that might act as partial barriers to grizzly bear movement, such as Interstate Highway 90 or Lake Koocanusa. Range estimates for neighboring populations may also overlap, but this does not represent evidence of genetic or demographic connectivity.

Inter-ecosystem science products

Year	Authors	Title	
2024	Sells and Costello	Predicting future grizzly bear habitat use in the Bitterroot Ecosystem under recolonization and reintroduction scenarios	https://doi.org/10.1371/journal.pone.0308043
2025	Andersen et al.	Identifying presence or absence of grizzly bear and polar bear cubs from the movements of adult females with machine learning	https://link.springer.com/article/10.1186/s40462-025-00577-y
2026	Costello et al.	An energetic tradeoff best explains parturition timing in grizzly bears	https://doi.org/10.1002/ece3.72914
2026	Roberts et al.	Detecting occurrence and timing of grizzly bear parturition based on anomalies in radio-collar activity	Ursus, in press

Ongoing research

Demographics: density estimation using cameras in YNP (with MSU); spatially explicit survival (with U Trento); Selkirk BC and US population estimate; close-kin mark-recapture to estimate population size; estimating time to reach BE targets under EIS alternatives

Habitat and connectivity: habitat modeling and connectivity areas (with UI); effects of forest management and wildfire disturbance on habitat selection (with UM); factors influencing denning habitat (with UM);

Behavior and ecology: grizzly bear use and army cutworm moths; accelerometer data to predict bear behaviors (with WSU, fRi); complete blood count reference panel for grizzly bears (with Polish Academy of Sciences); natal dispersal; factors influencing denning chronology (with UM)

Genetics: grizzly bear genome project (with UC-Riverside, UC-Santa Cruz, WSU)

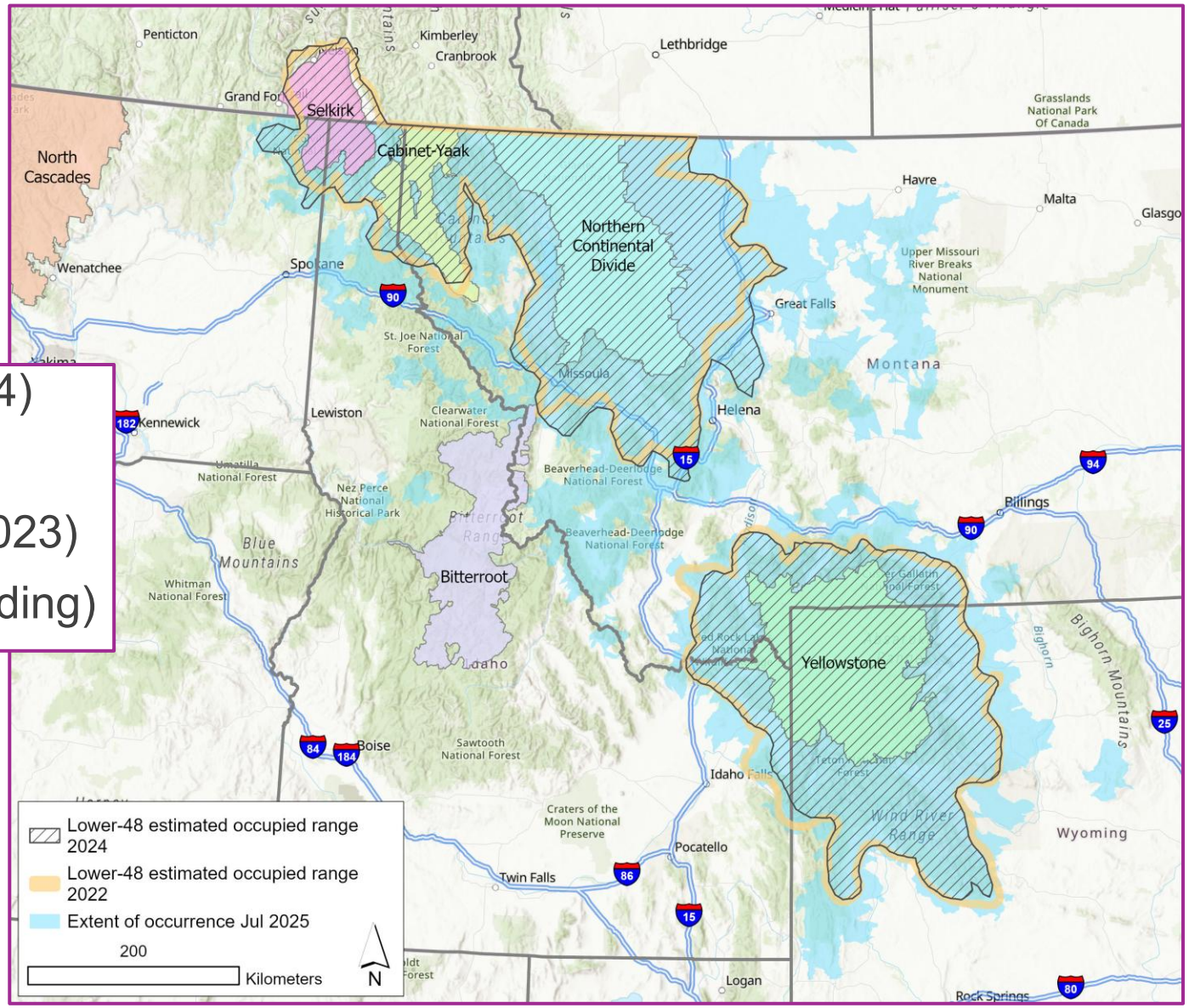
Human influences on bears: responses to recreational activities in YNP (with MSU); decadal growth of traffic volume on US Highway 2 and grizzly bear crossings; responses to recreational activities in Glacier National Park (with UM); evaluation of illegal motorized access; white paper on secure habitat and road density

Human-bear conflict: spatiotemporal patterns of livestock depredation (UC-Berkeley); responses to residential human-bear conflicts; grizzly bear use of grain bins;

Climate change: YNP grizzly bear foods and demographics (with MSU); decision tools for managers (with MSU)

Big picture summary

- GYE: estimate of 1,050 bears (DMA, 2024)
- CYE: minimum of 58 bears (2023)
- SE (US portion): minimum of 57 bears (2023)
- NCDE: estimate of 1,047 (2018; new pending)



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