IGBC Science Subcommittee

2024 IGBC WINTER MEETING

Interagency GRIZZLY BEAR Committee

Photo: Jake Davis

Science Subcommittee members

- Hilary Cooley (USFWS)
- Cecily Costello (MTFWP-NCDE)
- Jennifer Fortin-Noreus (USFWS-BE)
- Scott Jackson (USFS)
- Wayne Kasworm (USFWS-SE/CYE)
- Katie Oelrich (IDFG-BE)
- Michael Proctor (Canada)
- Frank T. van Manen (USGS-GYE)
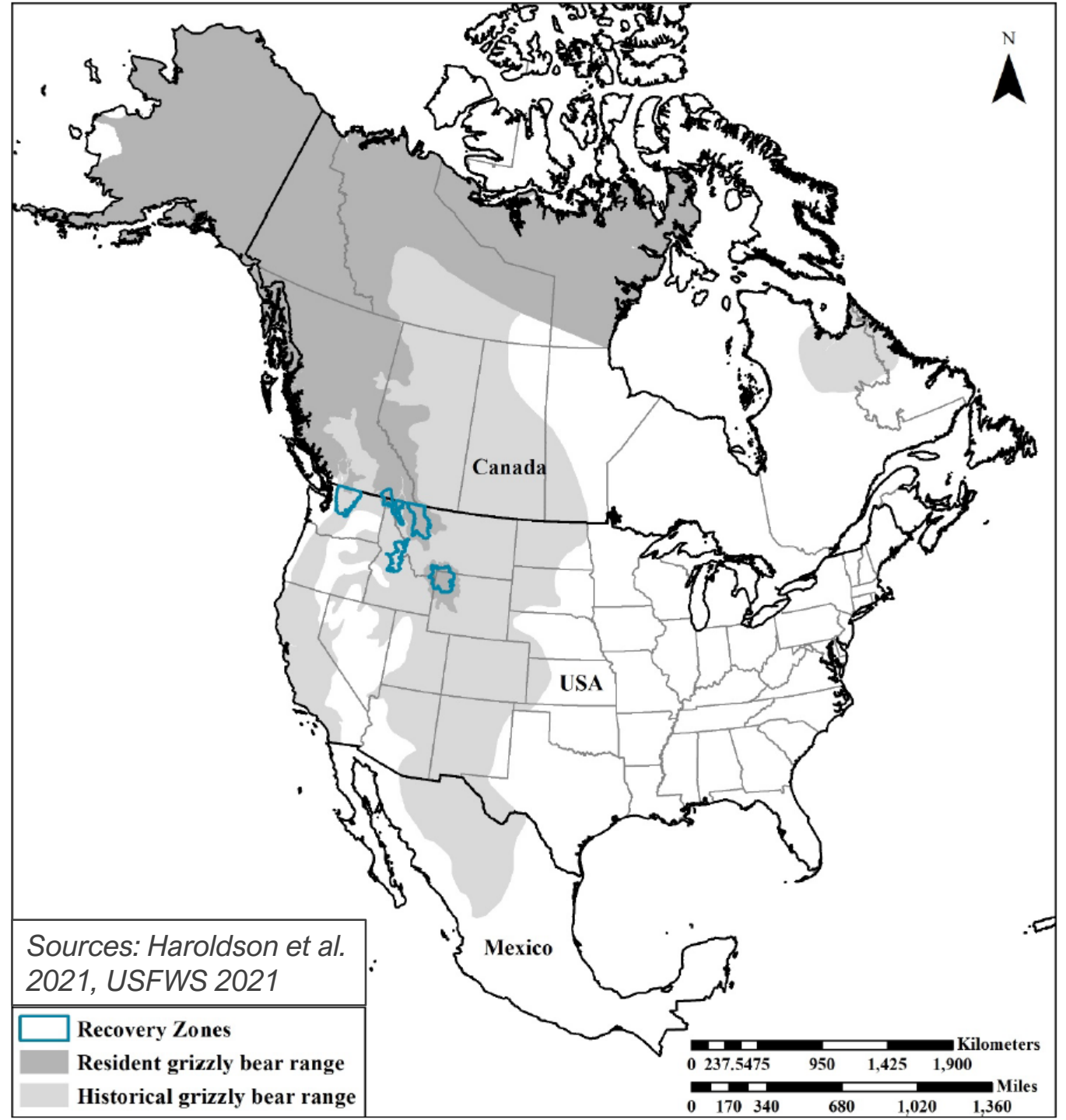
2024 Status Update

THE BIG PICTURE

The Big Picture

4 Recovery Zones with occupied range

Southern extent of occupied range in North America

Sources: Haroldson et al. 2021, USFWS 2021

☐ Recovery Zones
■ Resident grizzly bear range
■ Historical grizzly bear range

USFWS Recovery Zones

Selkirk (SE)

North Cascades (NCE)
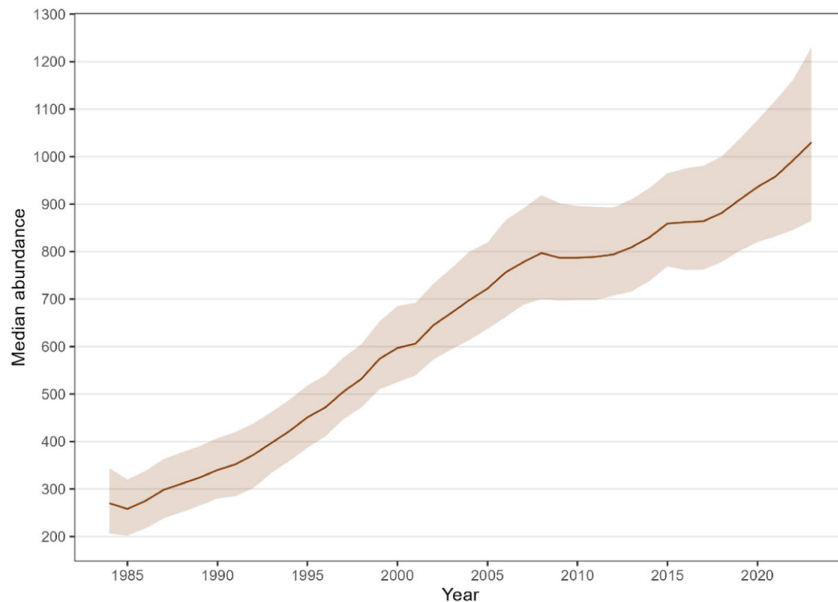
Cabinet-Yaak (C-YE)

Northern Continental Divide (NCDE)
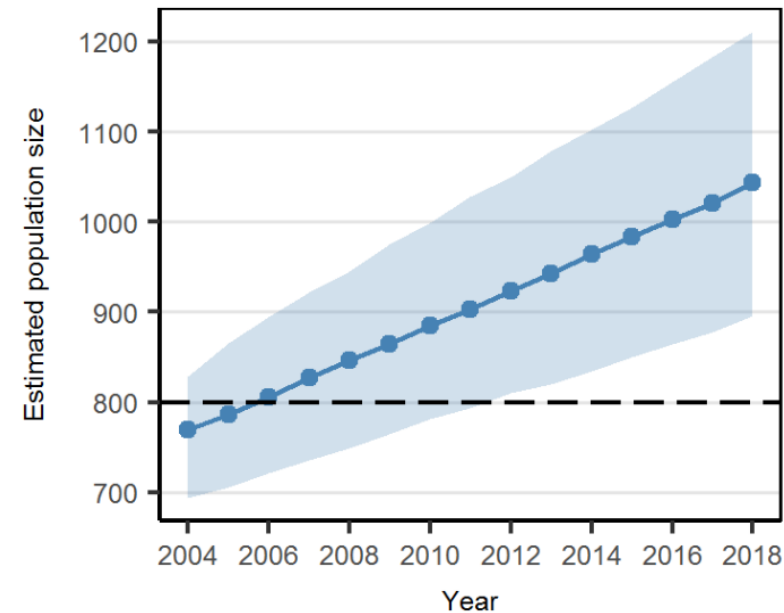
Yellowstone (GYE)

Bitterroot (BE)
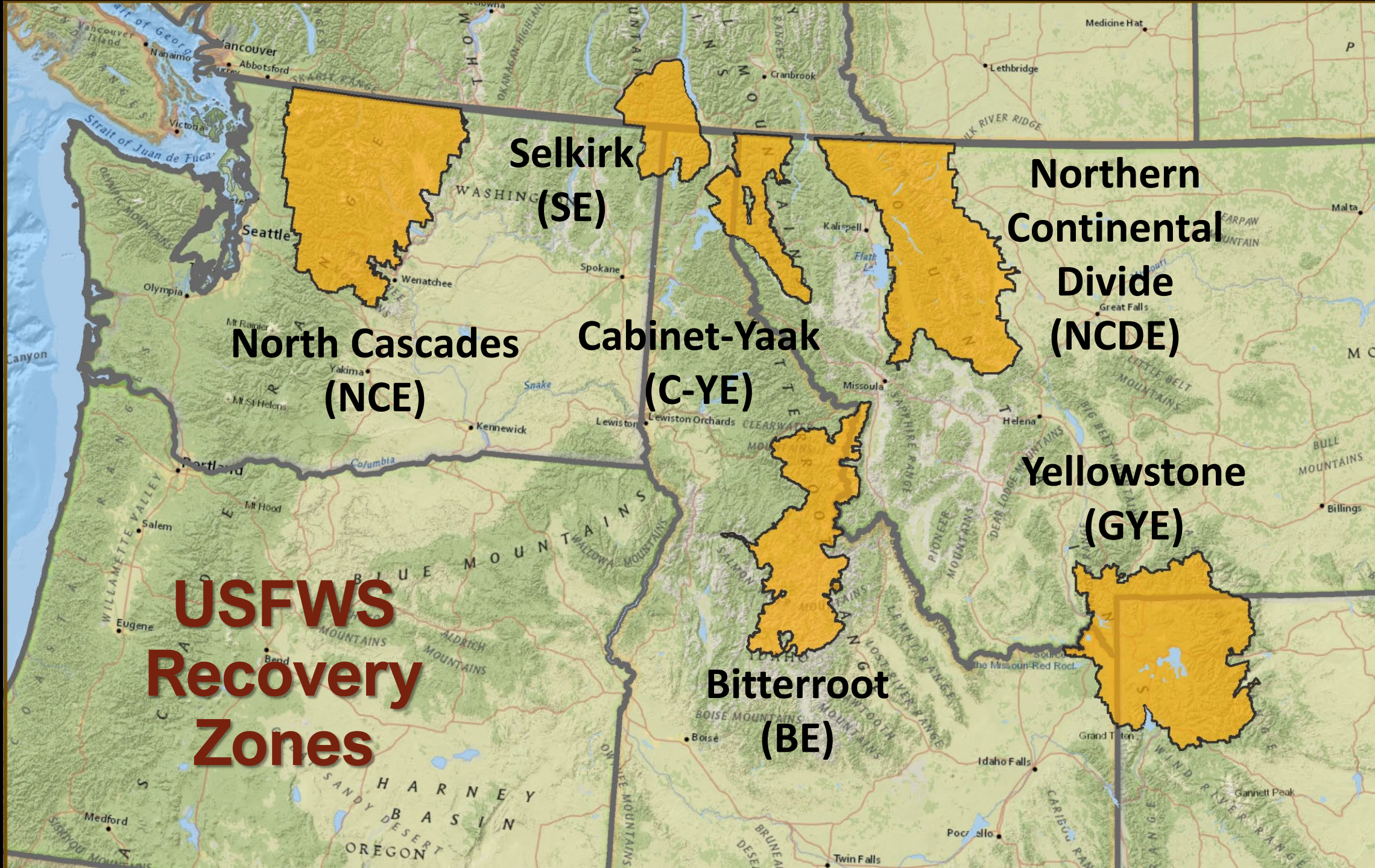
Population – size and trend

GYE: Population estimate (2023): 1,030
Rate of growth (1983−2023): 3.6%

NCDE: Population estimate (2018): 1,047
Rate of growth (2004−2018): 2.3%

C-YE: Population estimate (2023): 65-70
Rate of growth (1983−2023): 2.7%

SE: Population (BC + US) estimate (2023): 80-90
Rate of growth (1983−2023): 2.5%

Sources: Proctor et al. 2012; Gould et al. 2024a,b; Costello et al. 2016, 2023; Kasworm et al. 2024a,b

Habitat security – metrics

Ecosystem	Public lands in Recovery Zone	Protected lands in Recovery Zone [a]	Private land - % in easements or land trusts
GYE	98%		
NCDE	93%		
C-YE	98%		
SE (US portion)	97%		
SE (Canada portion)	77%		
BE	99.9%		
NCE	90%		

Source: U.S. Fish and Wildlife Service 2021

Habitat security – metrics

Ecosystem	Public lands in Recovery Zone	Protected lands in Recovery Zone [a]	Private land - % in easements or land trusts
GYE	98%	82%	
NCDE	93%	67%	
C-YE	98%	44%	
SE (US portion)	97%	38%	
SE (Canada portion)	77%	7%	
BE	99.9%	98%	
NCE	90%	64%	

[a] Includes designated and defacto wilderness + Inventoried Roadless Areas

Habitat security – metrics

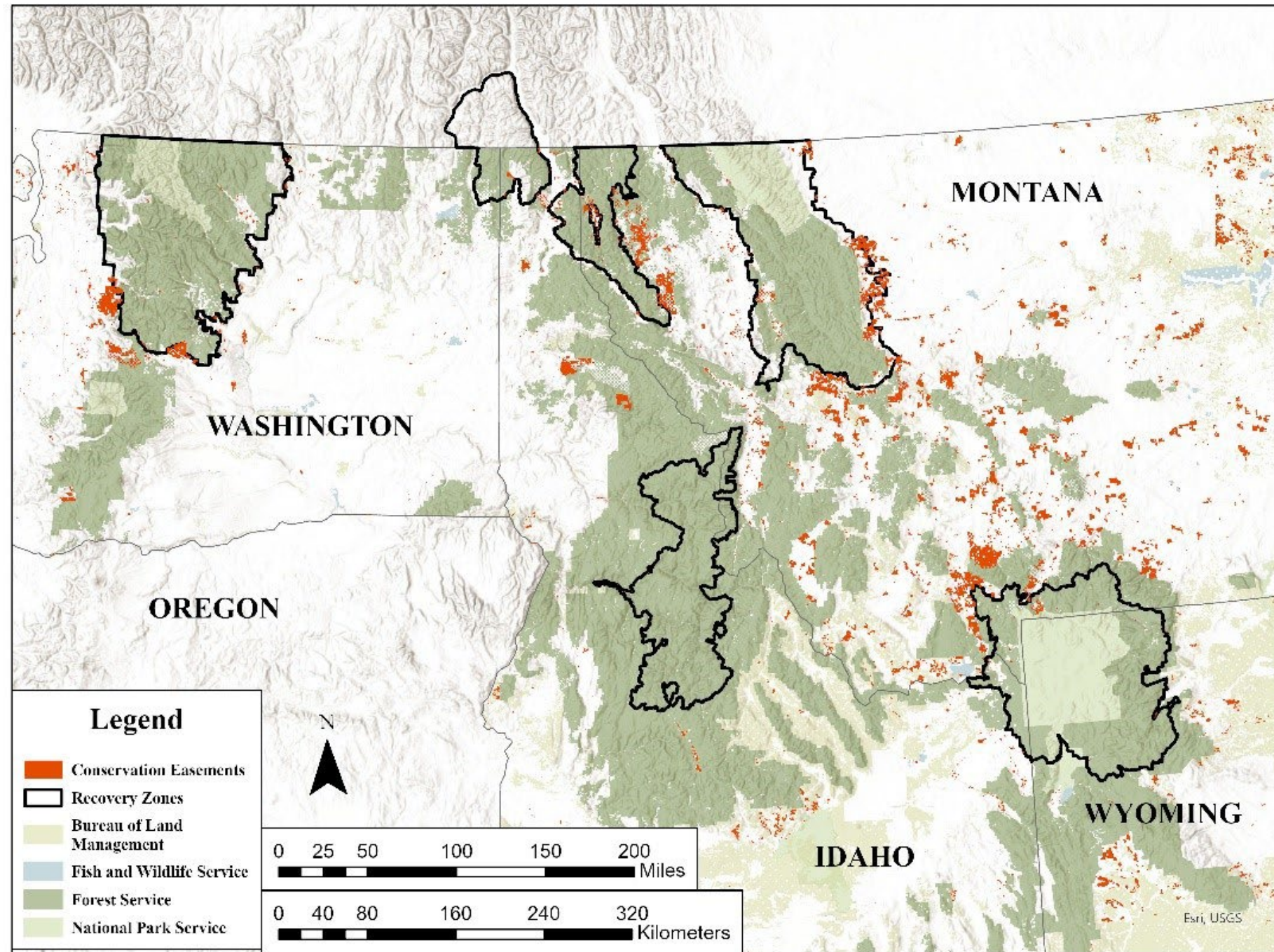| Ecosystem	Public lands in Recovery Zone	Protected lands in Recovery Zone [a]	Private land - % in easements or land trusts
GYE	98%	82%	40% in RZ 24% out RZ, in DMA
NCDE	93%	67%	45% in RZ 22% in Zone 1 11% in Zone 2
C-YE	98%	44%	--
SE (US portion)	97%	38%	--
SE (Canada portion)	77%	7%	15% in RZ
BE	99.9%	98%	--
NCE	90%	64%	13% in RZ

[a] Includes designated and defacto wilderness + Inventoried Roadless Areas

Conservation easements

Legend
- Conservation Easements
- Recovery Zones
- Bureau of Land Management
- Fish and Wildlife Service
- Forest Service
- National Park Service

MONTANA

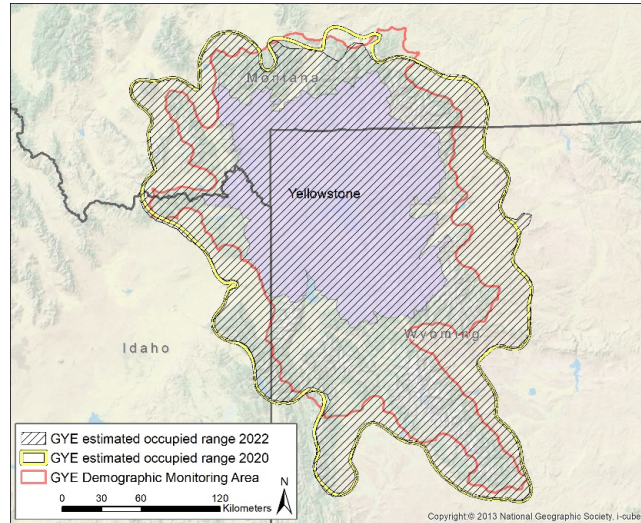WASHINGTON

OREGON

IDAHO

WYOMING

Esri, USGS

Source: U.S. Fish and Wildlife Service

Occupied range – area and trend

GYE: 70,101 km^2 (stabilizing?)

NCDE: 55,652 km^2 (expanding)

C-YE: 12,337 km^2
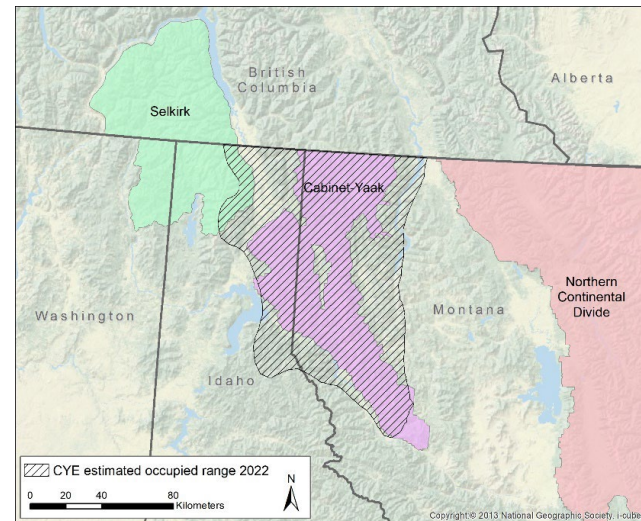
SE: 10,928 km^2 (4,791 km^2 in BC)

Sources: Costello et 2023; Kasworm et al. 2023a, 2023b; Dellinger et al. 2023
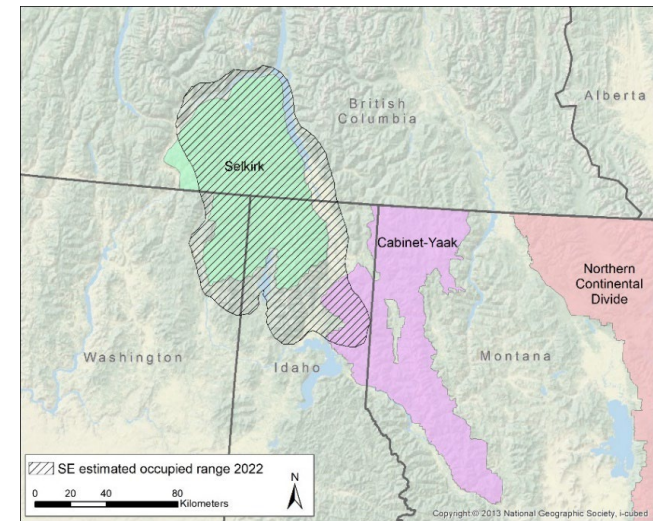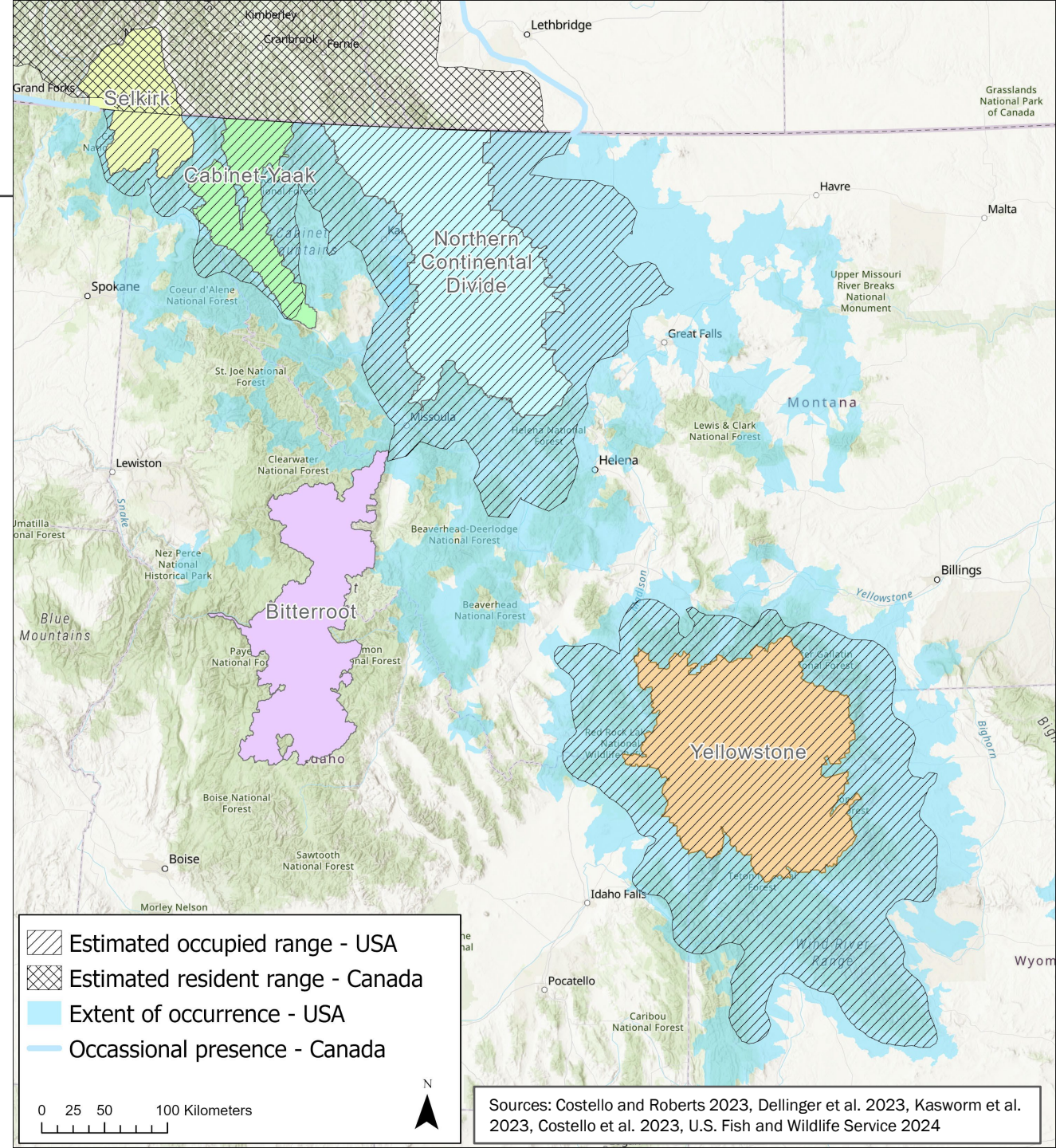
Combined range

Total occupied range in US:

144,237 km^2 (55,690 mi^2)

Total extent of occurrence ("maybe present" area):

236,777 km^2 (91,420 mi^2)

Legend:
- Estimated occupied range - USA
- Estimated resident range - Canada
- Extent of occurrence - USA
- Occassional presence - Canada

0 25 50   100 Kilometers

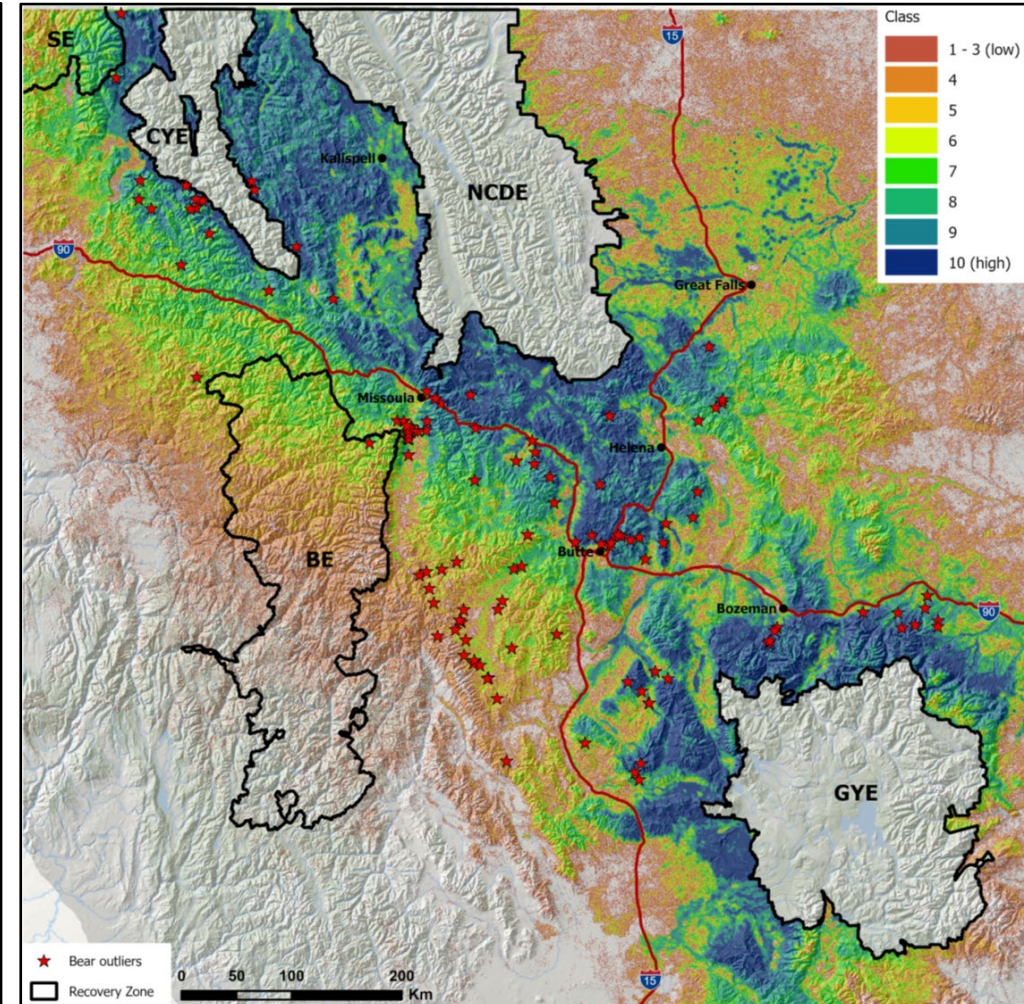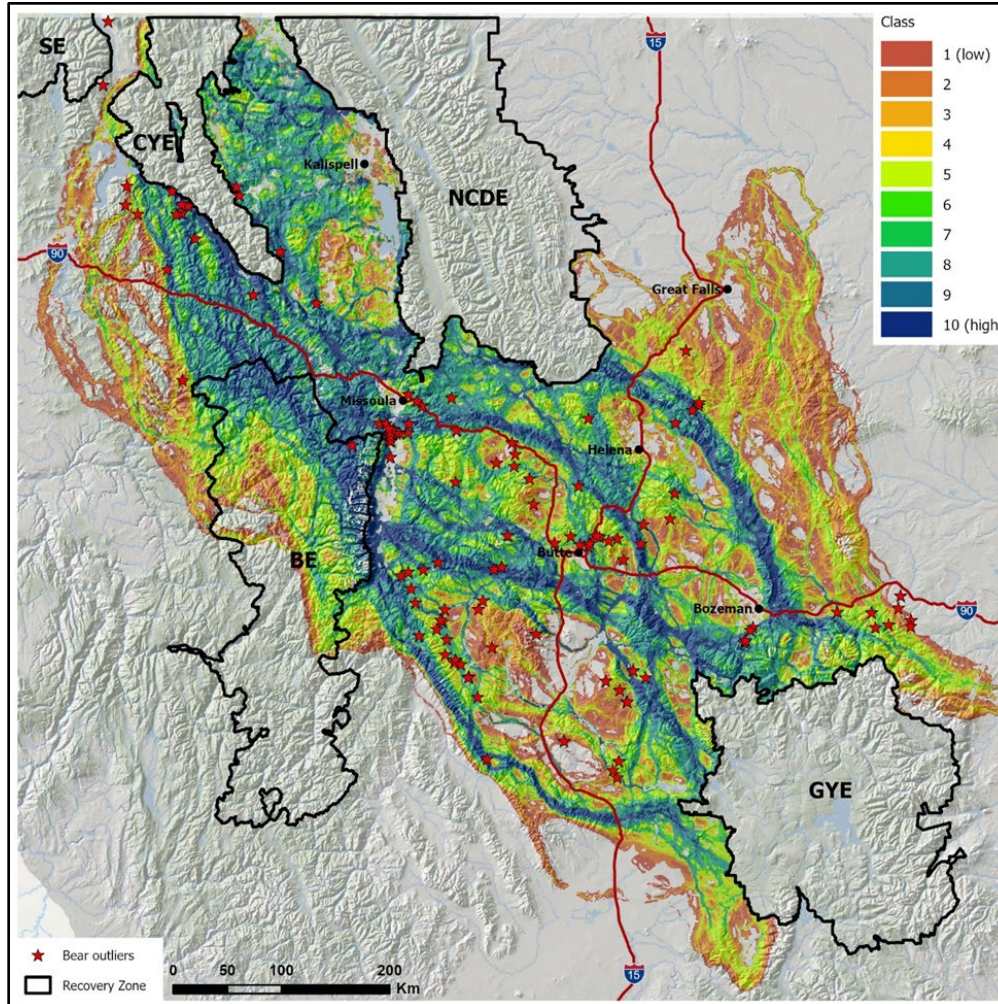Sources: Costello and Roberts 2023, Dellinger et al. 2023, Kasworm et al. 2023, Costello et al. 2023, U.S. Fish and Wildlife Service 2024

Connectivity

Movement pathways for female grizzly bears

- Directed (left)

- Undirected (right)

Download maps: https://doi.org/10.5066/P91EWUO8

Source: Sells et al. 2023

Connectivity

To or from NCDE area

Movements to or from the NCDE area documented through genetic relationships and field data, 2010-2023

Sex of bear that moved
- ○ Female
- ● Male

Closest relative from source
- △ Mother
- ■ Other relative
- ★ Population only

Movement type detected
- ►► Dispersal/residency
- ›› Movement only

▭ Demographic Monitoring Areas
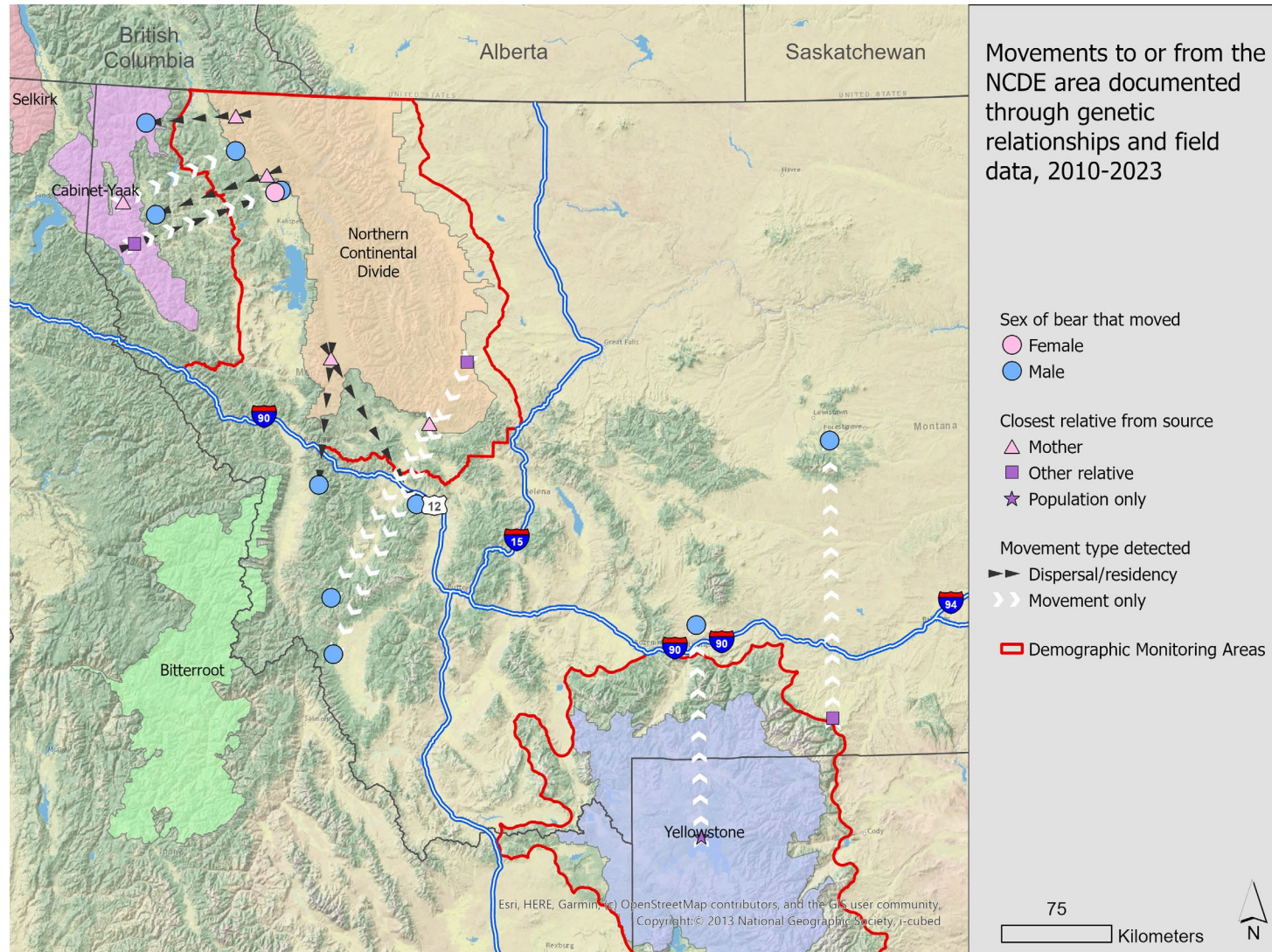
Sources: Costello et al. 2021, 2022, 2023, 2024

Connectivity

SE

C-YE

Connectivity

Sources: MTFWP, IGBST
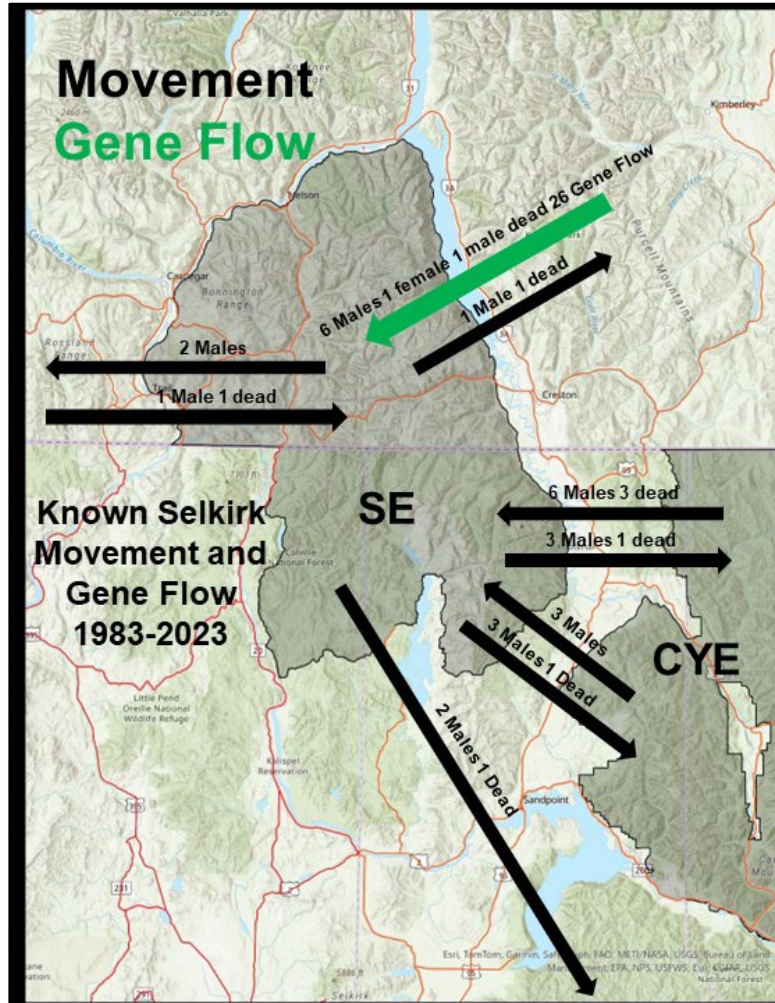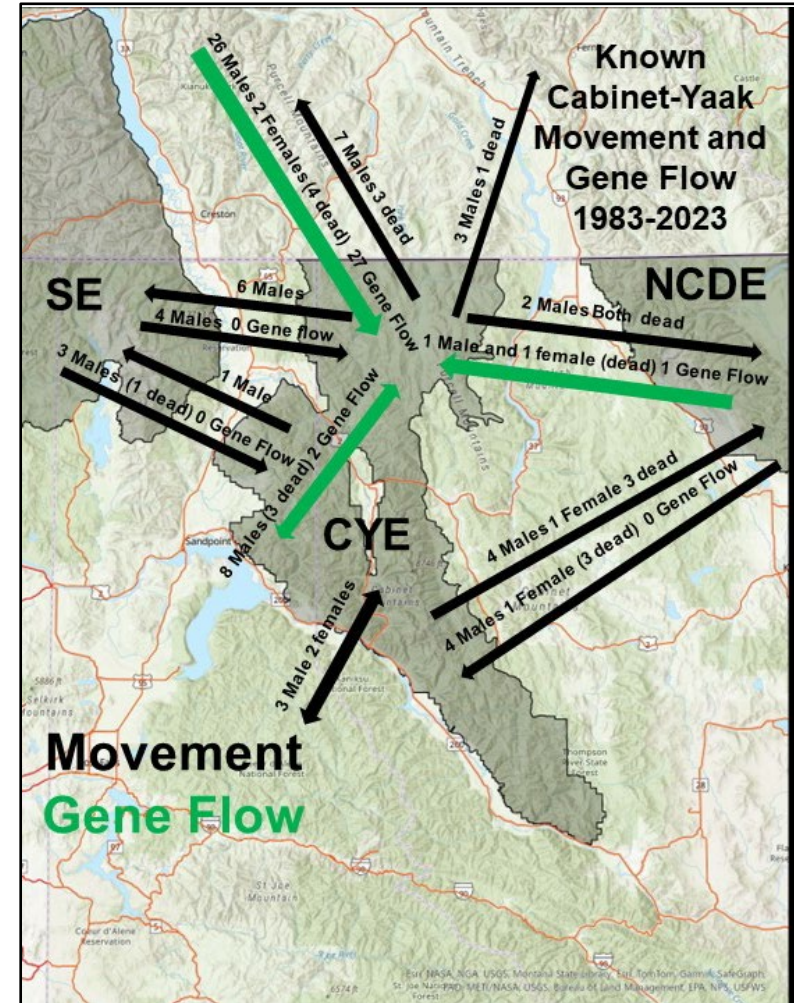
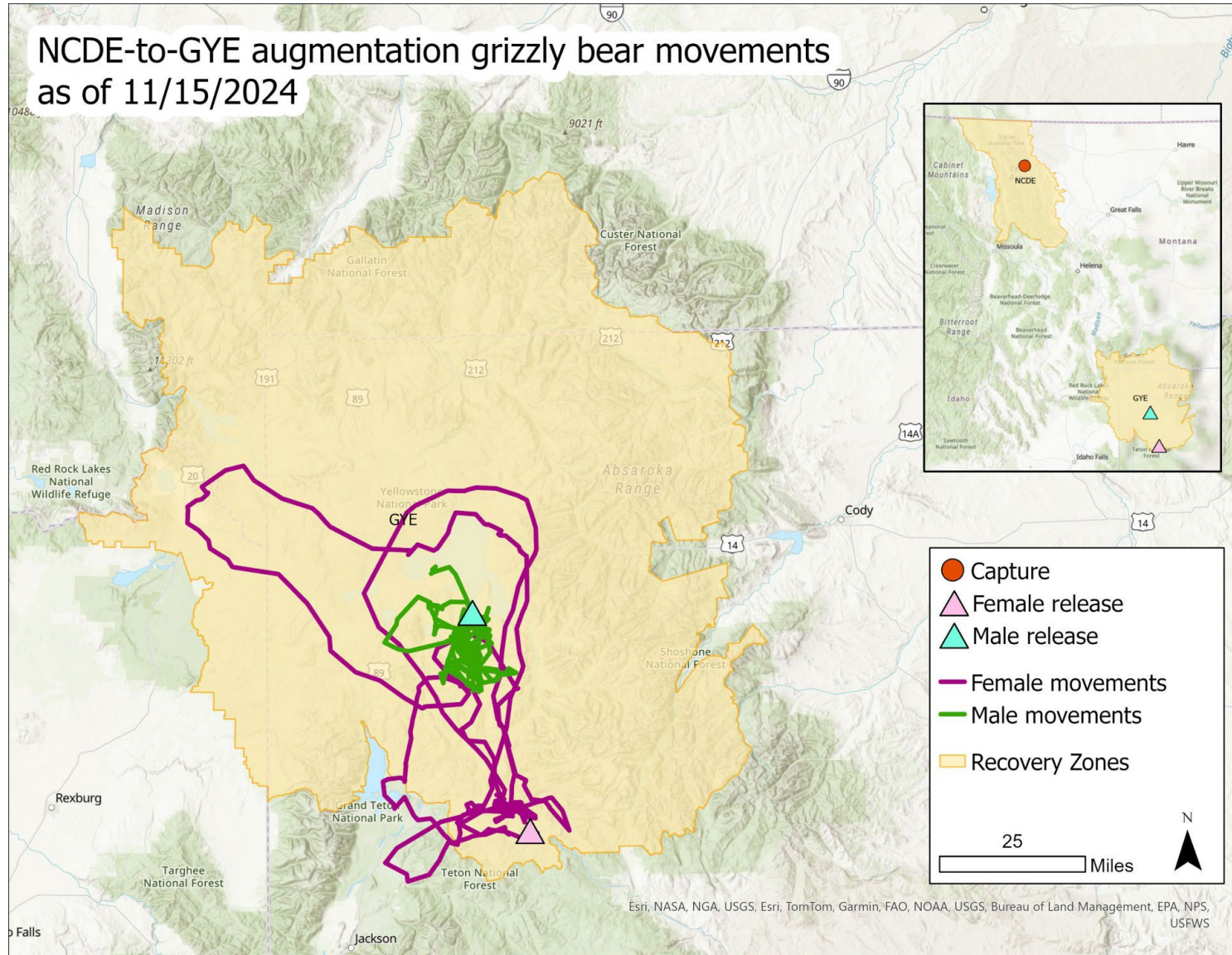# Ongoing and recent science

Underline = recent publication

Demographics: Selkirk BC and US population estimate; detecting birth events using activity data (NCDE, GYE, CYE, SE, Gates of the Arctic Park and Preserve); density estimation using cameras in YNP (GYE, with MSU); spatially explicit survival (GYE, with Univ. Trento); <u>Integrated Population Model (GYE)</u>; estimating time to reach BE targets under EIS alternatives (NCDE, GYE, CYE, SE)

Habitat and connectivity: habitat modeling and connectivity areas (SE+CYE, with UI); <u>effectiveness of BMAs in YNP (GYE, with MSU)</u>; effects of forest management and wildfire disturbance on habitat selection and movements (NCDE, UM); huckleberry mapping for SE+CYE; <u>prioritizing habitat on private lands (GYE, with MSU)</u>

Bear ecology: dispersal (NCDE and CYE); drivers of birth timing (NCDE, GYE, CYE, SE, Gates of the Arctic Park and Preserve); post-den movements to identify females with cubs (NCDE, GYE; with FWS Polar Bear Program, CYE+SE); grizzly bear use and army cutworm moths (GYE); complete blood count reference panel for grizzly bears (GYE, with Polish Academy of Sciences)

Genetics: SE+CYE (UI MS Thesis, Megan Turnock 2024); grizzly bear genome project (with WSU)

Activity: daily movement rates (GYE + European populations, with Univ. Rome-La Sapienza); activity patterns (GYE, with Univ. Rome-La Sapienza); accelerometer data to predict bear behaviors (GYE + Alberta, with WSU, fRi)

Human-bear interactions and conflict: <u>Proctor et al. 2023 (Berries and Bullets monograph)</u>; responses to residential human-bear conflicts (NCDE, southern BC); grizzly bear use of grain bins (NCDE); <u>efficacy of guard dogs to reduce human-bear conflict (NCDE, with Utah State University)</u>; <u>efficacy of scare devices to reduce human-bear conflict (NCDE)</u>; <u>efficacy of hazing to reduce human-bear conflict (NCDE)</u>; spatiotemporal patterns of livestock depredation (GYE, with UC-Berkeley)

Social science: <u>comment analysis of 2018 DEIS and survey (NCE, with U-Mich)</u>; <u>Montana human dimensions studies (with UM)</u>

Recreation: responses to recreational activities in YNP (GYE, with MSU)

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

What science needs can be addressed through subcommittee?

Photo: Jake Davis

Acknowledgments

Science Team members
and field personnel

Photo: Jake Davis