

Interagency Grizzly Bear Study Team 2023 Research & Monitoring Update



Photo: J. Davis

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Overview

Research and monitoring update

- Occupied range
- Females with cubs
- Occupancy of reproductive females
- Mortalities

IPM: change in timing of reporting

Miscellaneous updates

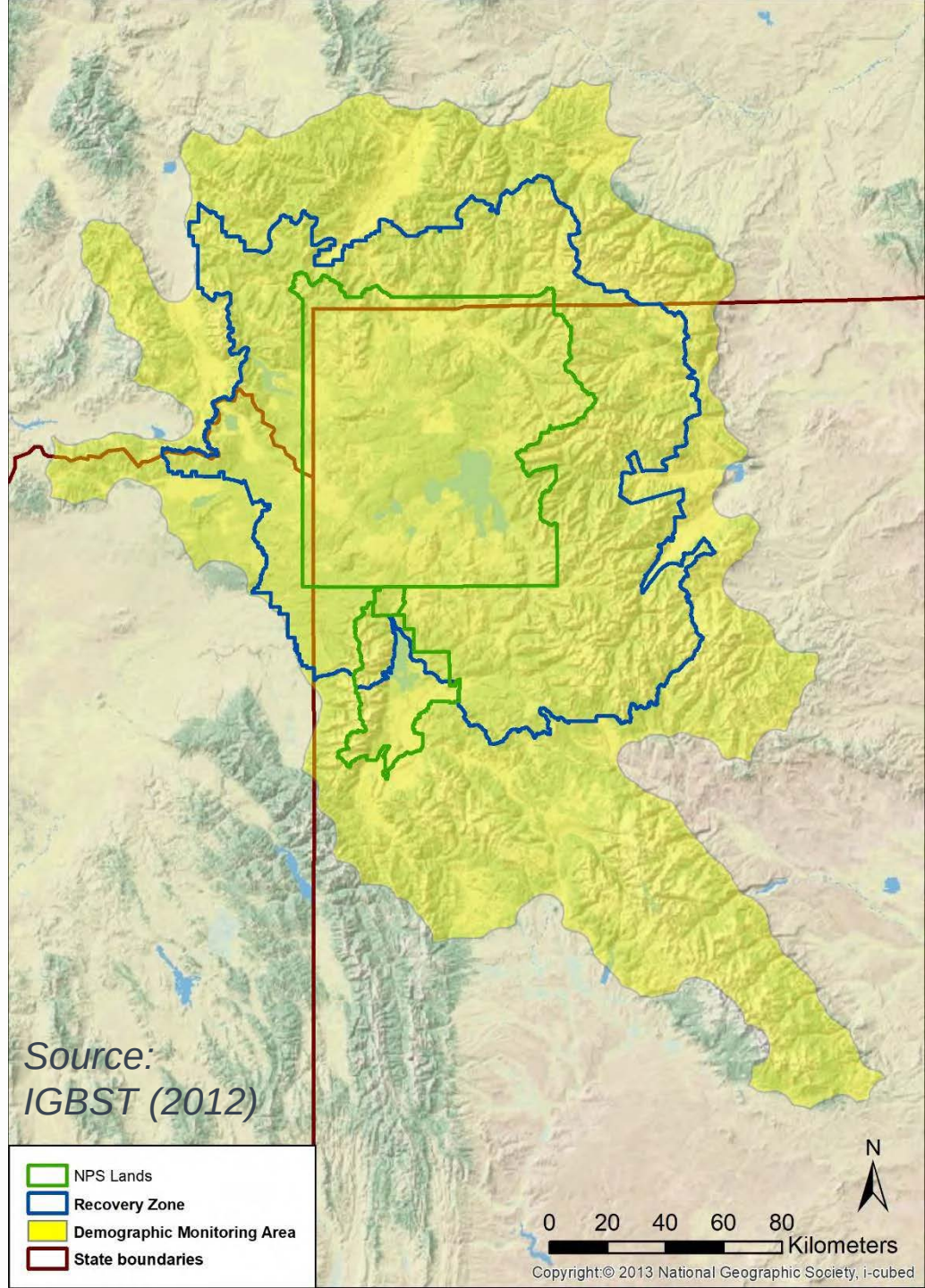
This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science. The information is provided on the condition that neither the U.S. Geological Survey nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information

Greater Yellowstone Ecosystem

National Parks = 10,344 km²

Primary Conservation
Area/Recovery Zone = 23,828
km²

Demographic Monitoring Area
(DMA) = 49,931 km²



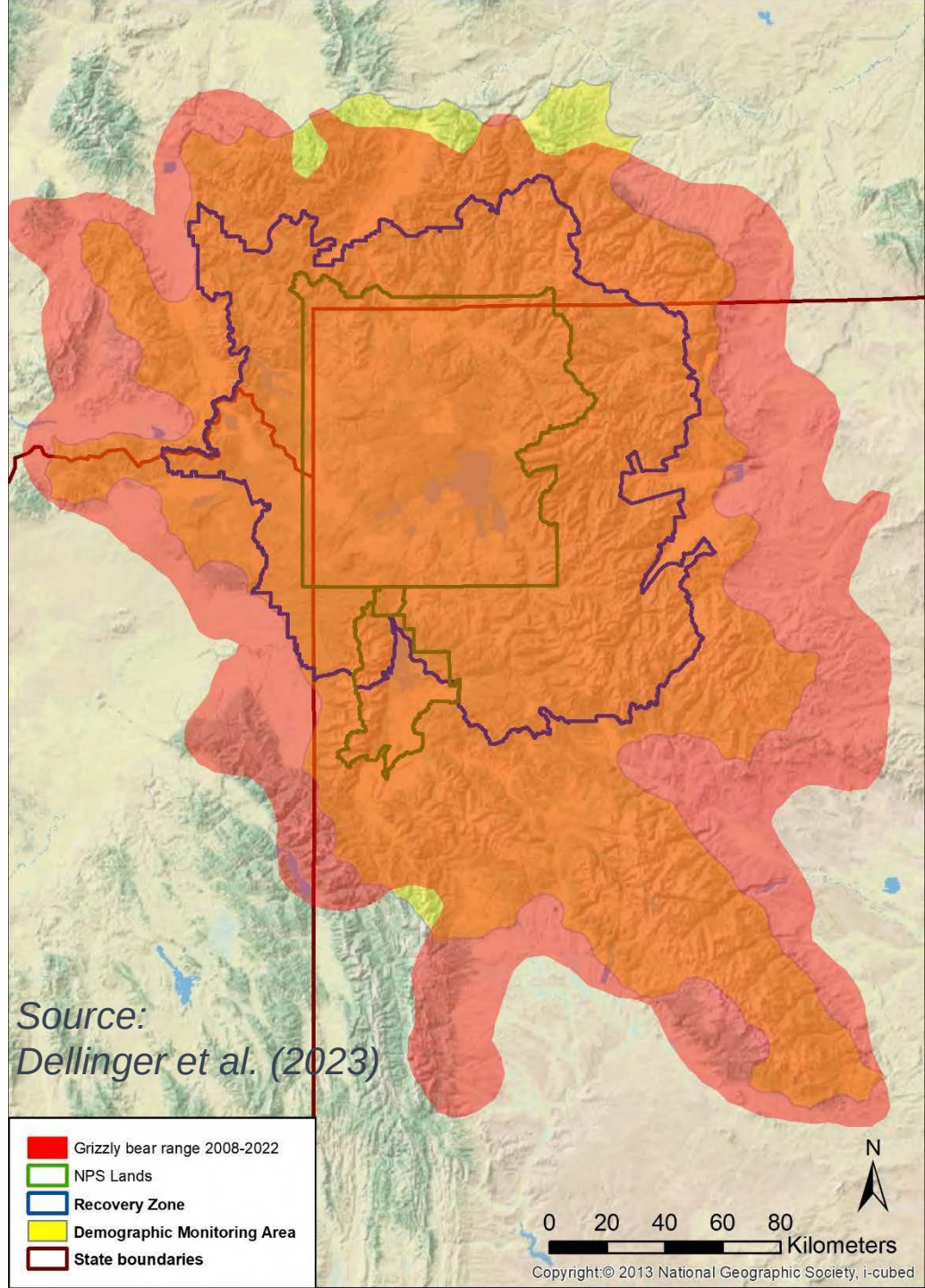
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Estimated grizzly bear range
(2008-2022) = 70,101 km²



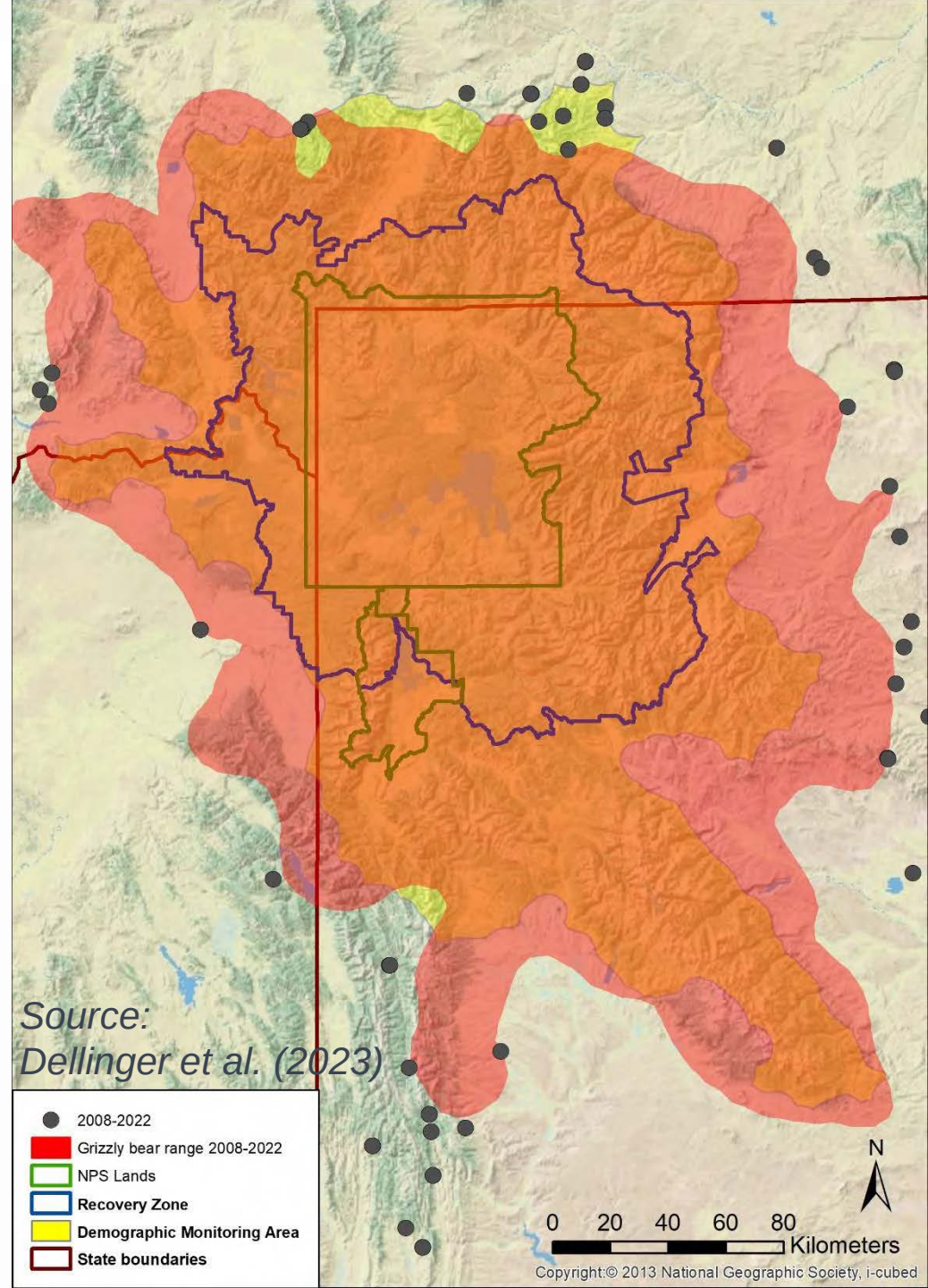
Greater Yellowstone Ecosystem

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(DMA) = 49,931 km²

Estimated grizzly bear range
(2008-2022) = 70,101 km² with
outliers



Grizzly bear occupied range

60 miles

Sources: Dellinger et al. (2023)
Costello and Roberts (2023)
Kasworm et al. (2023)
USFWS (2023)

- Interstate Highways
- Grizzly Bear Recovery Zone
- NPS Lands
- Estimated Occupied Grizzly Bear Range
- USFWS Grizzly May Be Present (07-20-2023)

0 40 80 120 160 Kilometers

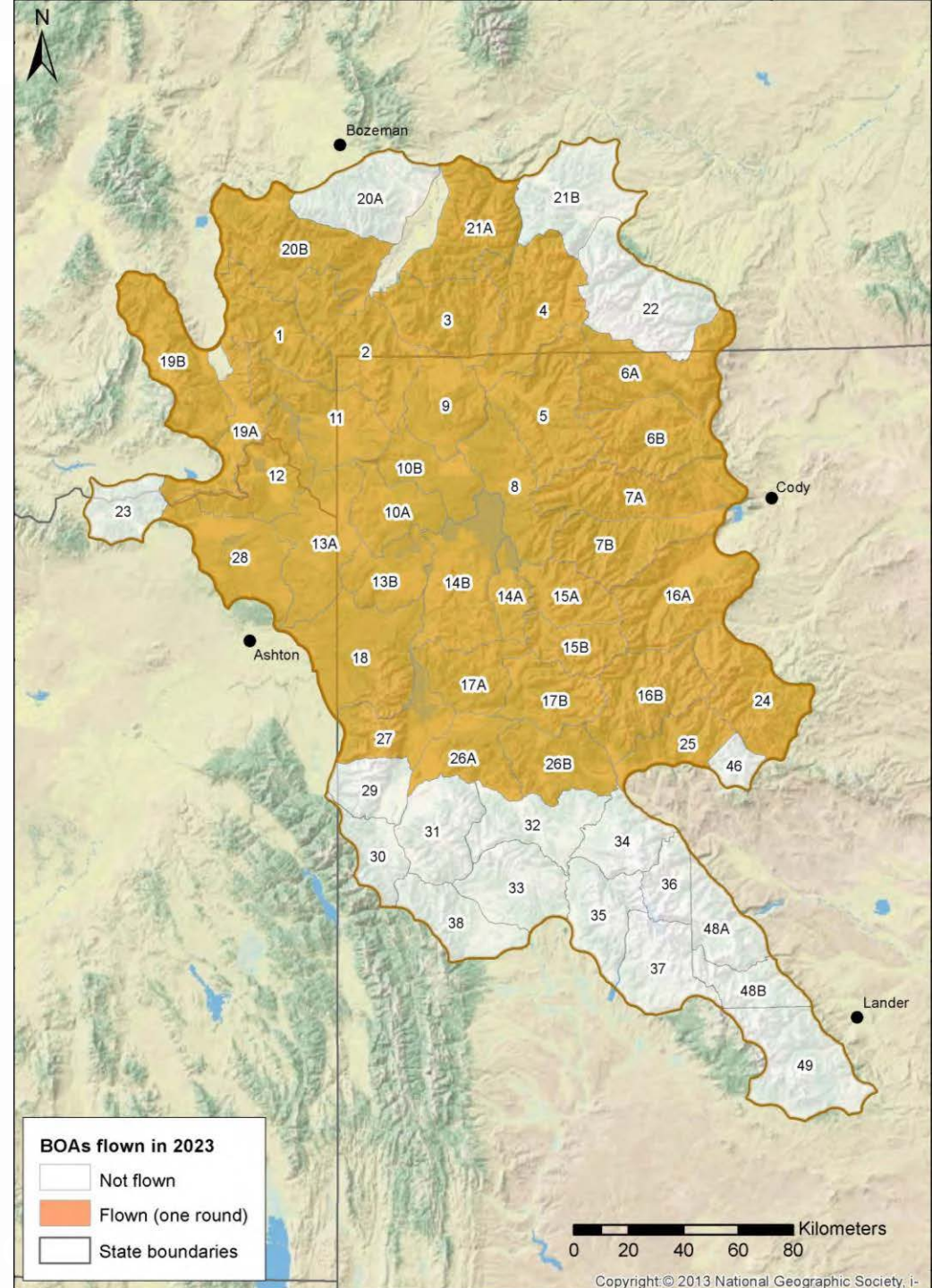
Demographic Recovery Criterion #1: Females with Cubs and Population Size



Photo: J. Davis

Observation flights 2023

- 36 units flown
- 18 units not flown
- One flight per unit



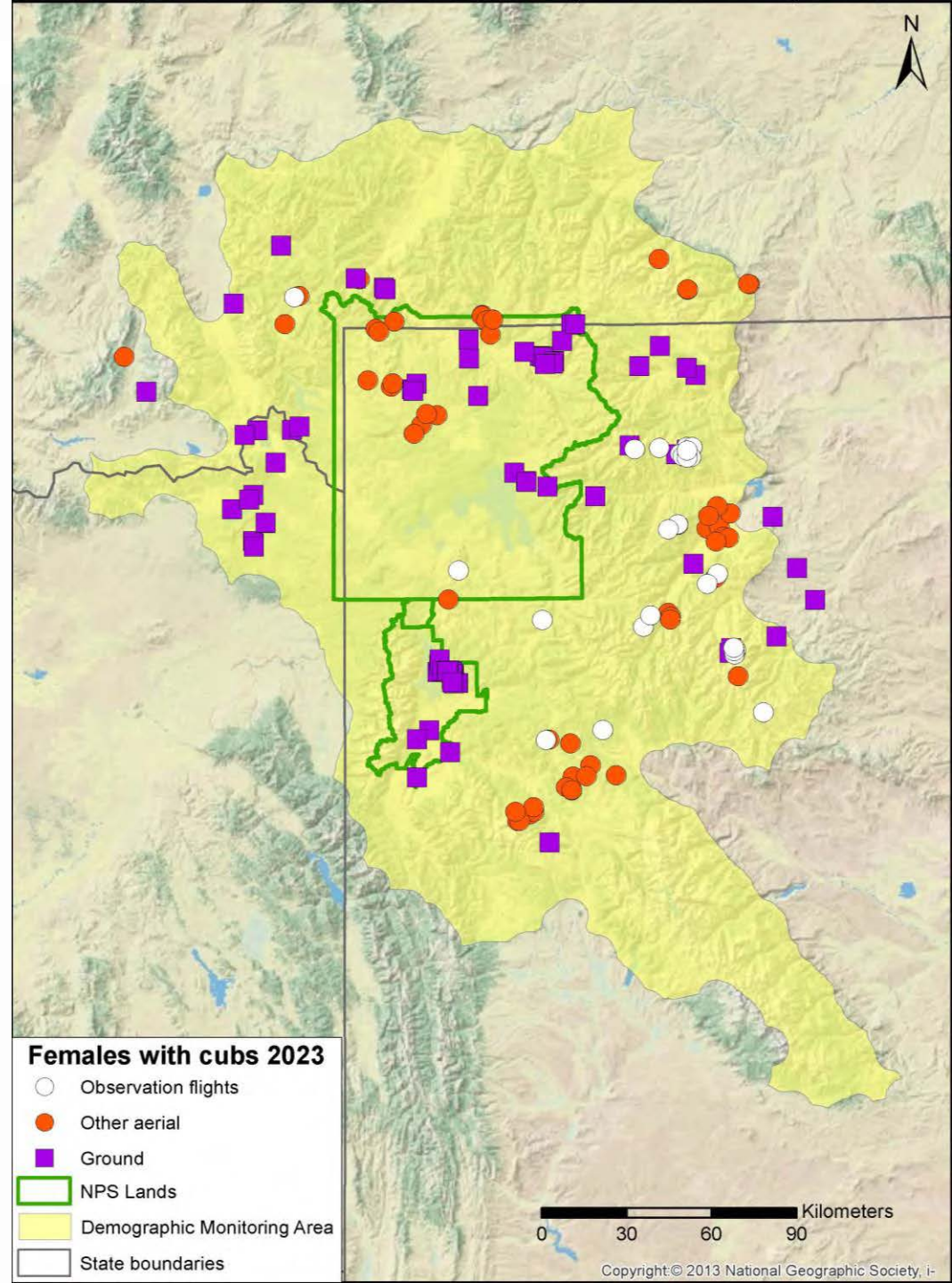
Females with cubs 2023

193 observations

29 observation flights (15%)

59 other aerial (31%)

105 ground (54%)



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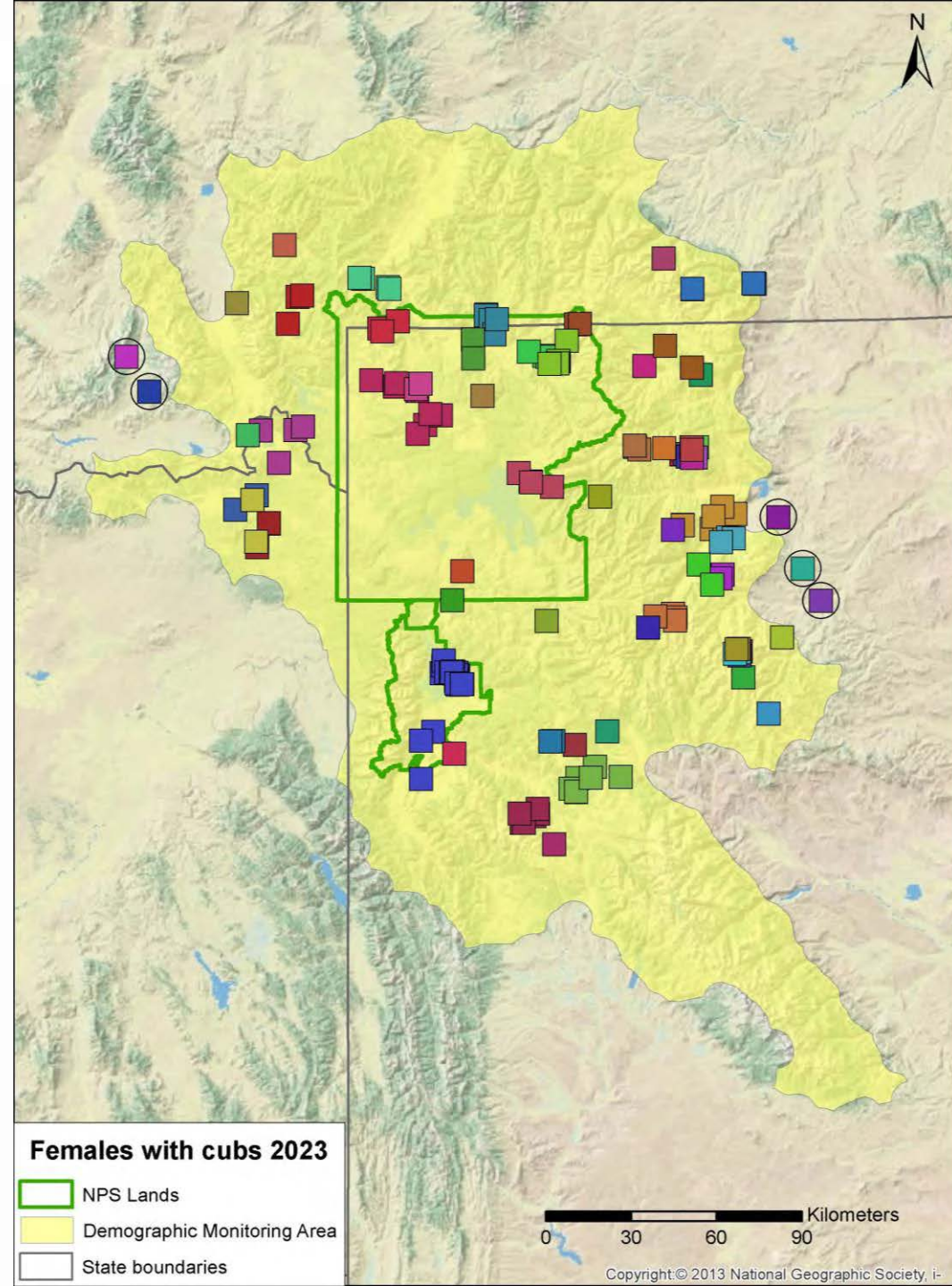
64 unique females with cubs

Mean litter size = 2.05

9 single (14%)

36 twins (56%)

19 triplets (30%)



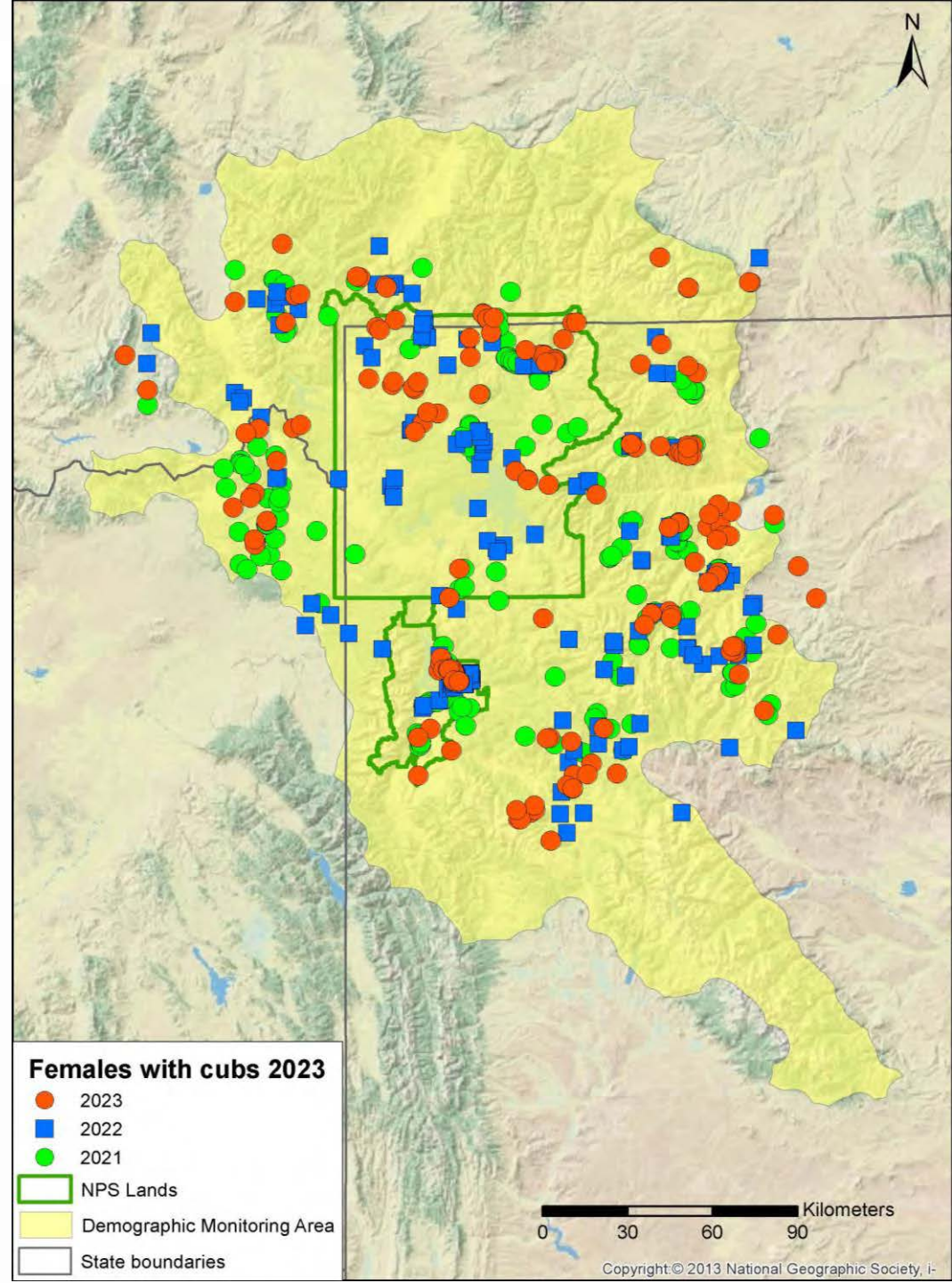
Number of females with cubs 2023

Parameter	Estimate
Unique females with cubs	64
Unique females with cubs (DMA only)	59
Unique females with cubs (DMA only + excluding telemetry sightings)	52
Chao2 estimate (DMA only)	74

Females with cubs 2021-2023

Observations

Den emergence through 31 Aug



Integrated Population Model (IPM)



REVEALED *in* NATURE

PHOTOGRAPH BY J. DAVIS

Photo: J. Davis

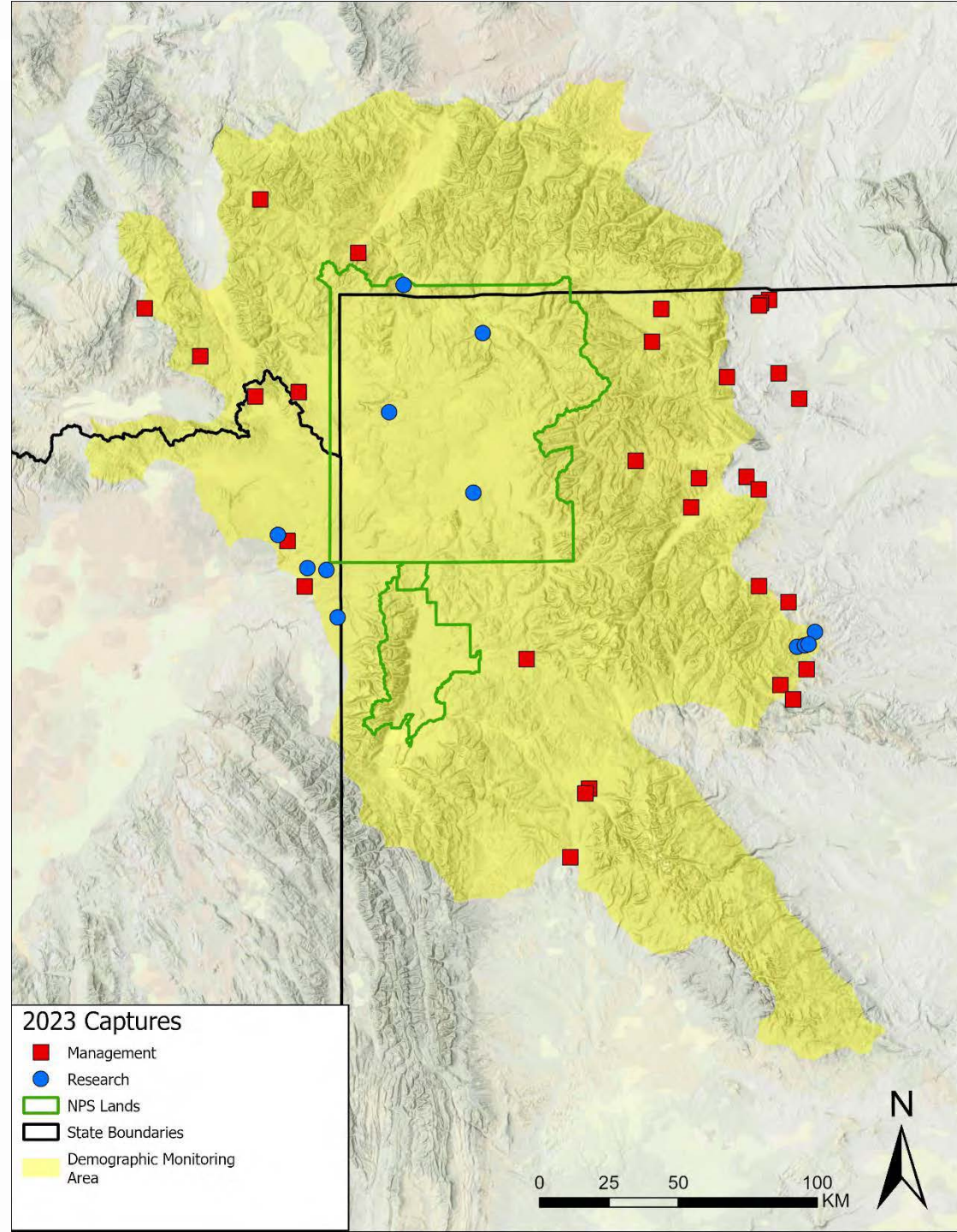
Integrated Population Model

- 2022: first implementation (1983-2022 data)
- Allows for a more unifying and flexible monitoring framework
- Changes reporting time frame to Spring

Grizzly bear captures 2023

- **Total captures = 51**
Research = 17
Management = 34
- **Individual bears = 50**
Females = 14
Males = 33
Unknown = 3
- **New bears = 32**

Monitored as of 11/8/2023



Grizzly bears radio monitored 2023

Total monitored = 83

Adult females = 35

Current = 50

Females = 27

Males = 23

Bears missing = 0*



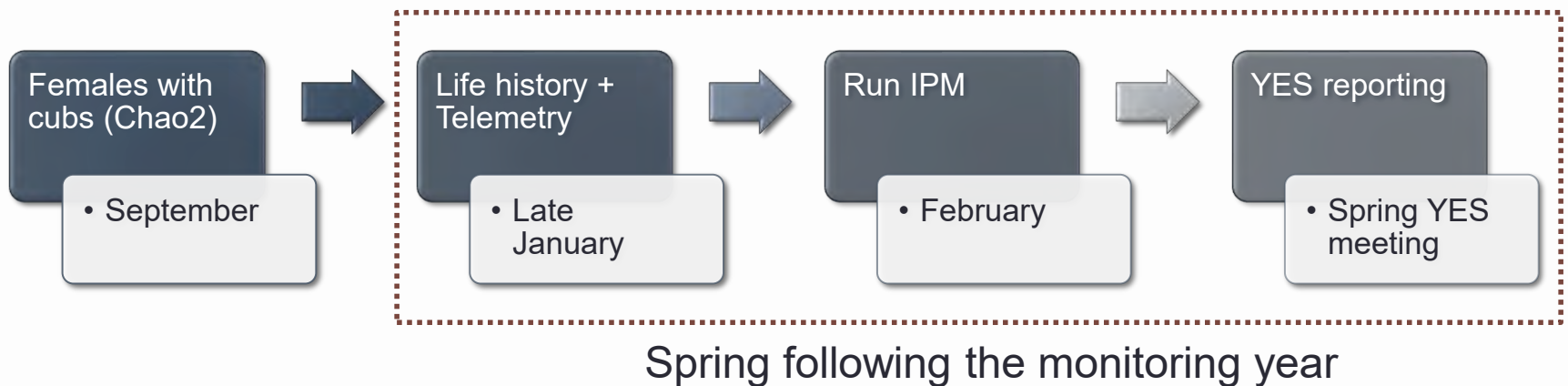
Monitored as of 10/31/2023

IPM data input timeline

Previous



IPM implementation

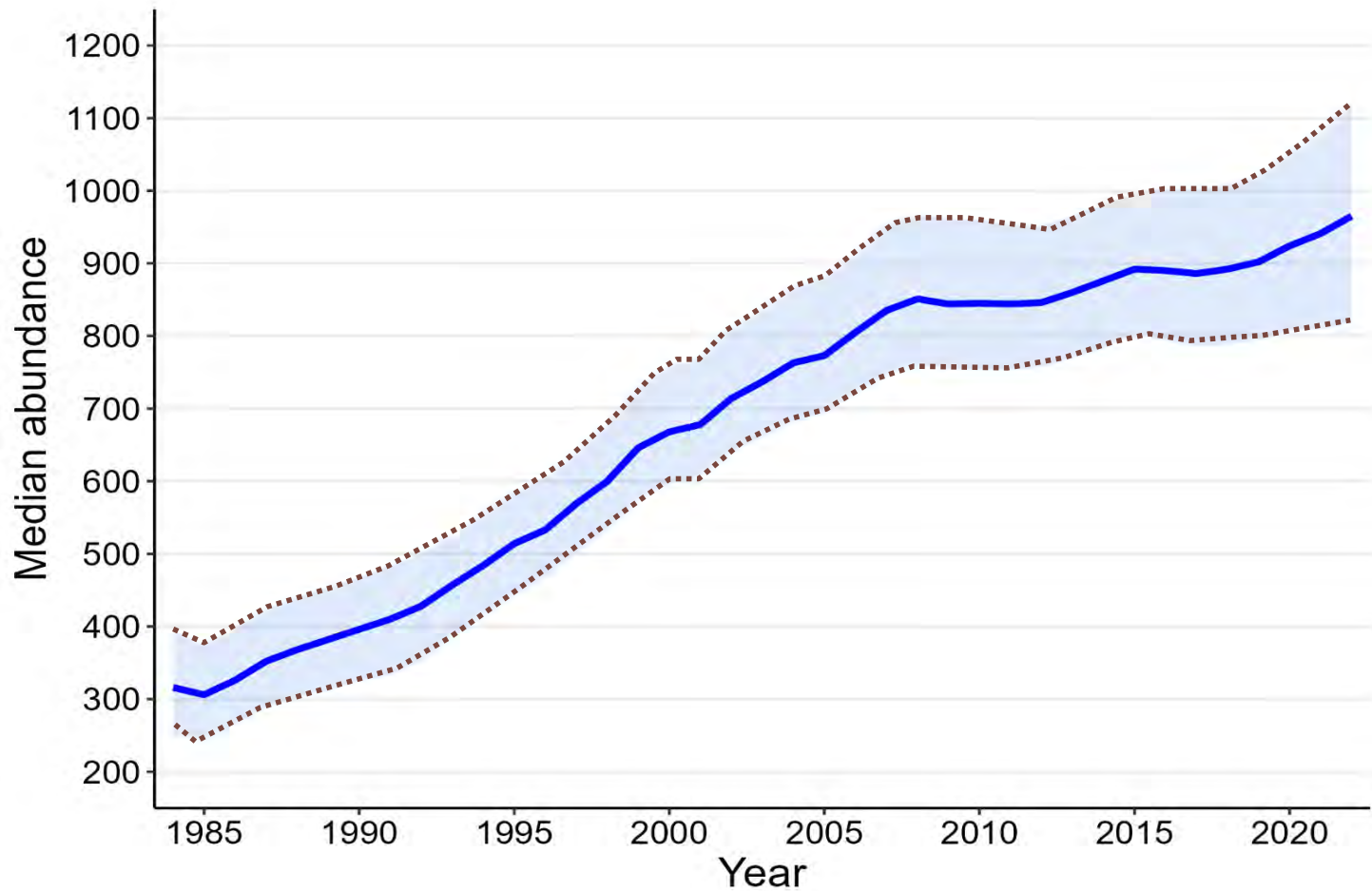


Reminder: population size 2022 (IPM, DMA)

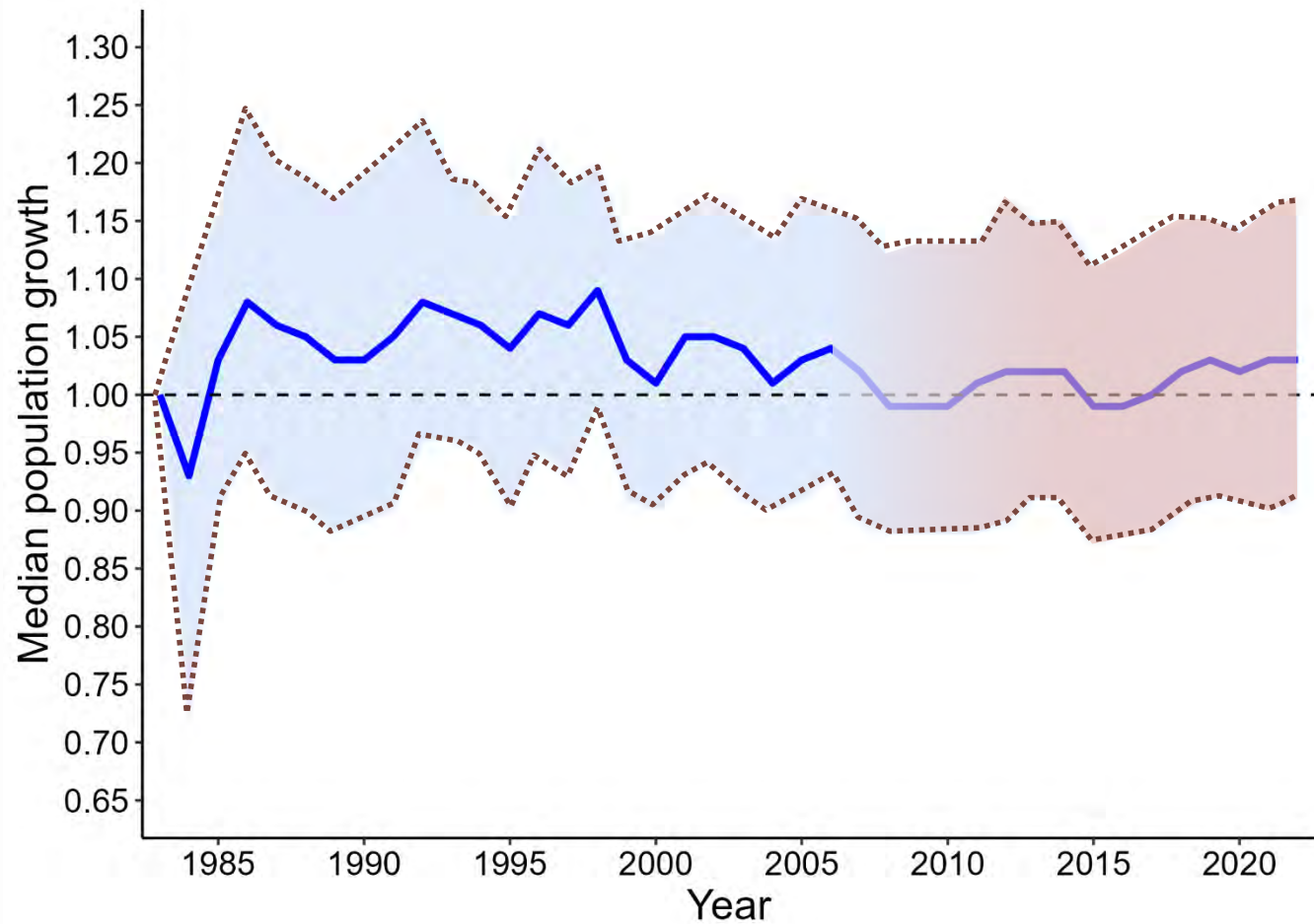
Population segment	Median estimate
Independent females (≥ 2 yrs)	328
Independent males (≥ 2 yrs)	332
Yearlings	98
Cubs born	200
Total estimate 2022*	965 (95% CI = 819–1121)

*Sum of segment medians slightly different from median of total estimate

Total population size (IPM, DMA)



Population growth (IPM, DMA)



Source: Gould et al. (2023)

IGBST Annual Report 2022



Demographic Recovery Criterion #2: Occupancy by Females with Young

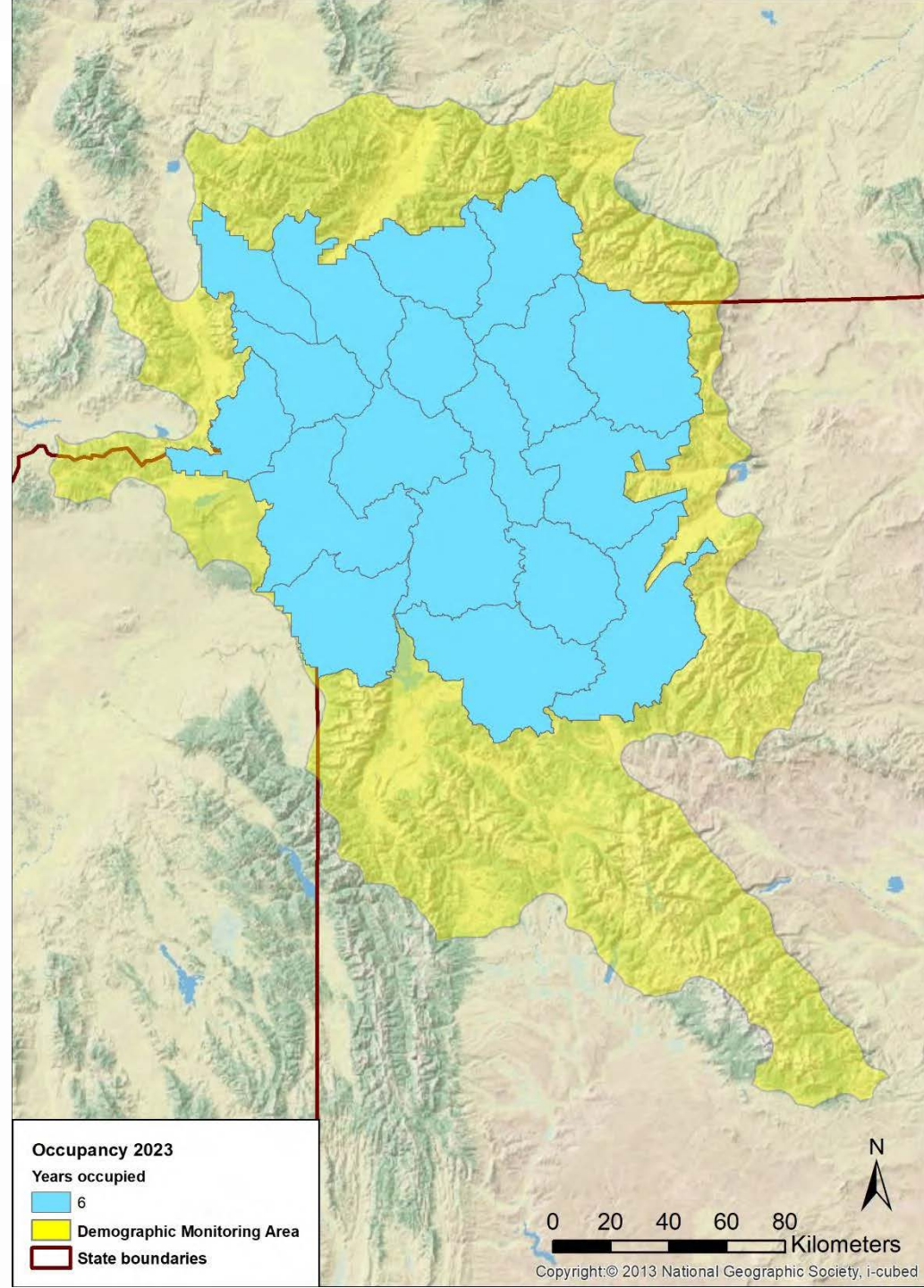


REVEALED in NTW

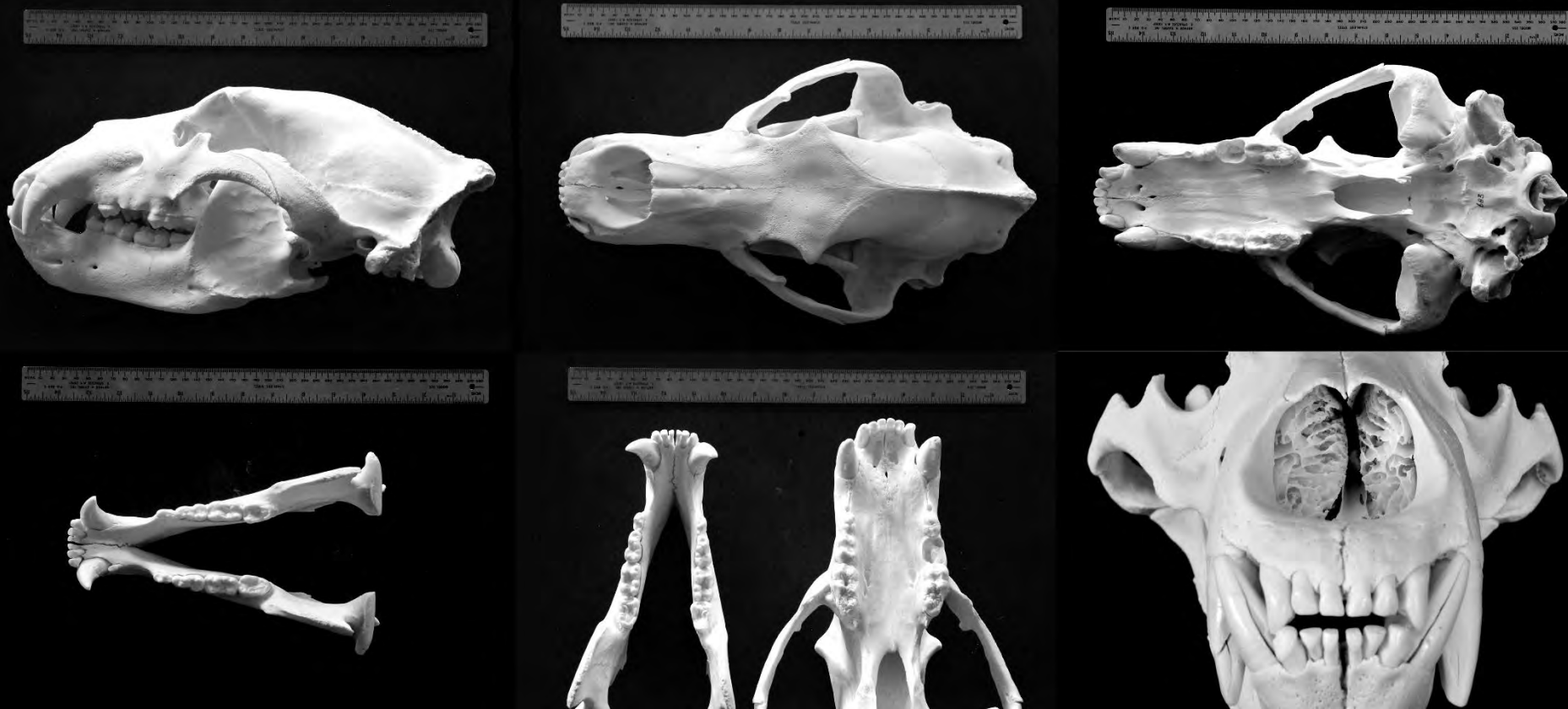
Photo: J. Davis

Occupancy by females with young (cubs, yearlings, or 2-year-olds) 2023

- 18 of 18 Bear Management Units (BMUs) occupied during 2023
- 18 of 18 BMUs occupied at least 6 of last 6 years (2018-2023)



Demographic Recovery Criterion #3: Mortalities

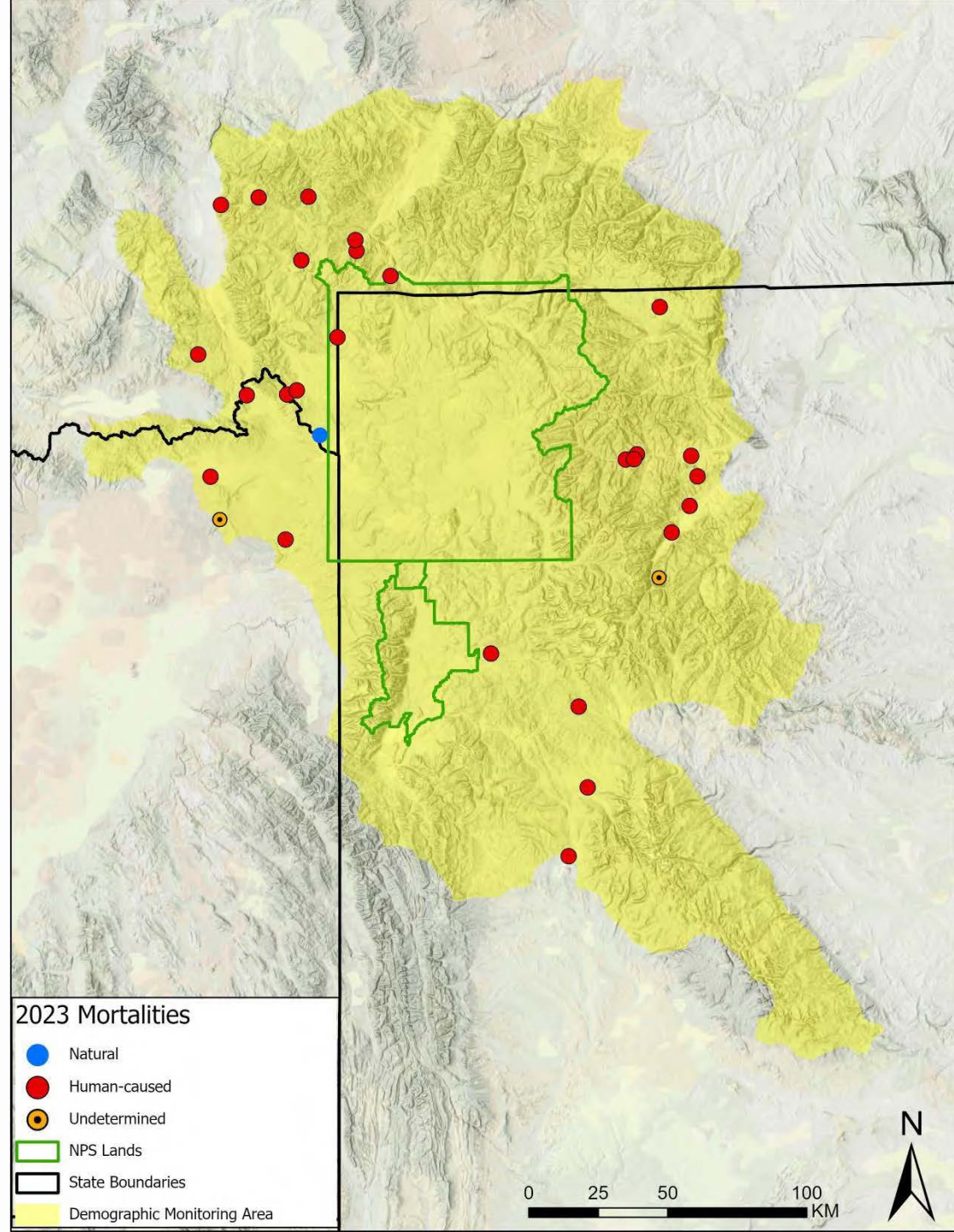


Photos: F.T. van Manen/USGS

Known and probable mortalities 2023

- **33 in DMA**
 - 28 human-caused
 - 3 natural
 - 2 undetermined cause

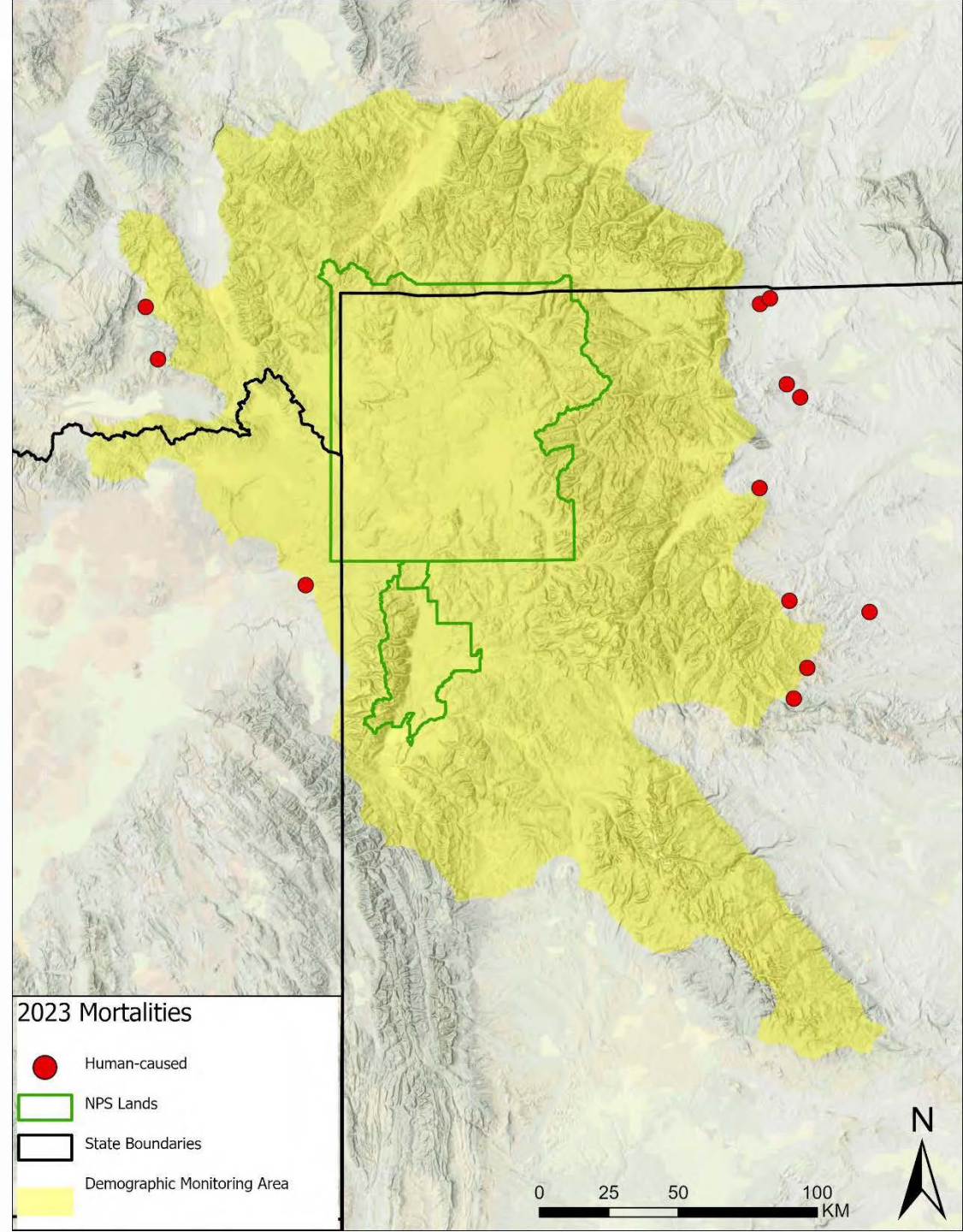
Mortalities as of 11/8/2023



Known and probable mortalities 2023

- **33 in DMA**
 - 28 human-caused
 - 3 natural
 - 2 undetermined cause
- **14 Outside DMA**
 - All human-caused

Mortalities as of 11/8/2023



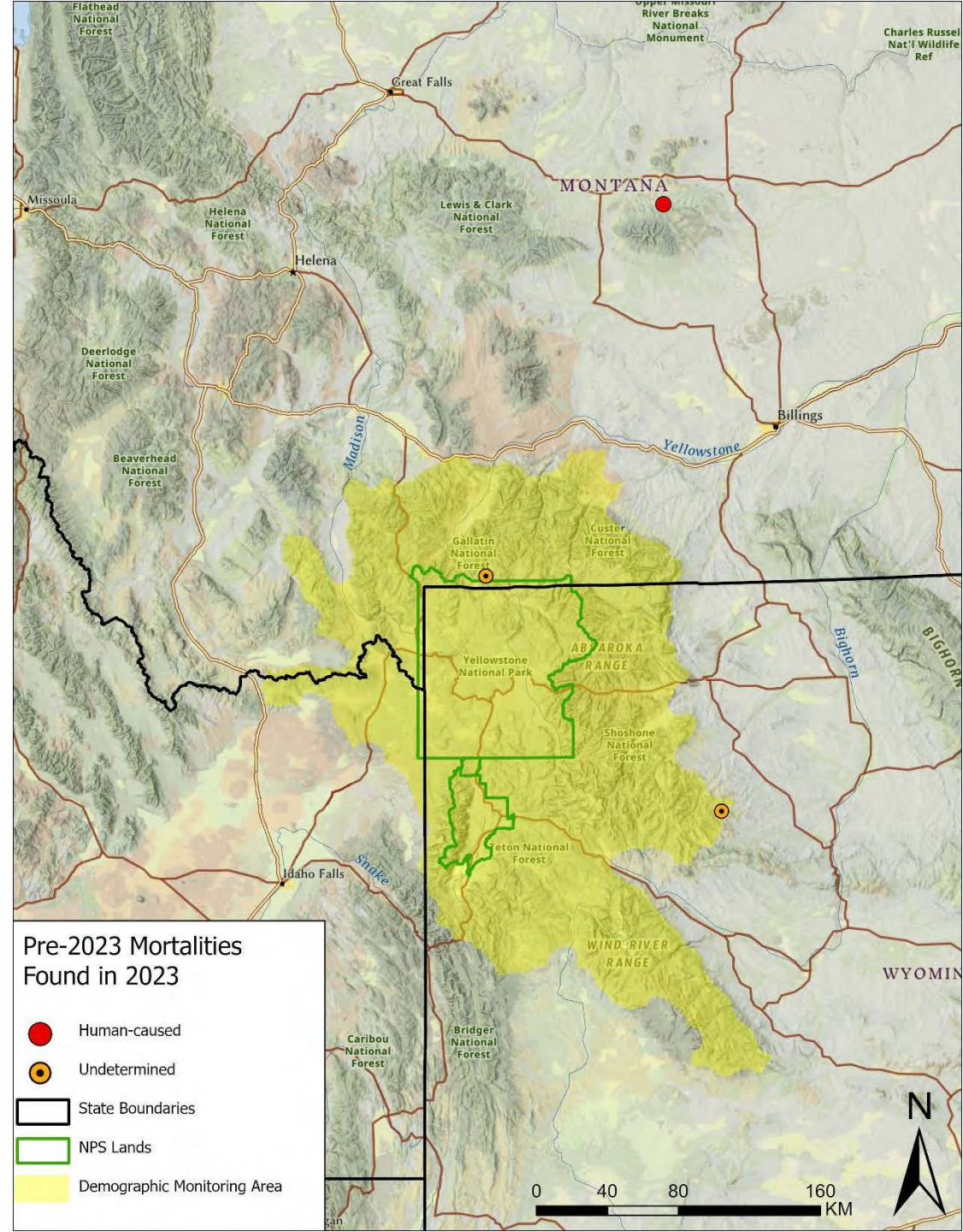
Preliminary Information-Subject to

IGBST Revision. Not for Citation or Distribution.

Known and probable mortalities 2023

- **33 in DMA**
 - 28 Human-caused
 - 3 Natural
 - 2 Undetermined cause
- **14 Outside DMA**
 - All human-caused
- **3 additional mortalities from previous years**

Mortalities as of 11/8/2023



Known and probable mortalities by sex and age class 2023 (DMA)

Area	Sex	Age class		Total
		Dependent	Independent	
		(<2 years old)	(≥2 years old)	
Inside DMA	Female	2	10	12
	Male	4	16	20
	Unknown	0	1	1
	Total	6	26	32

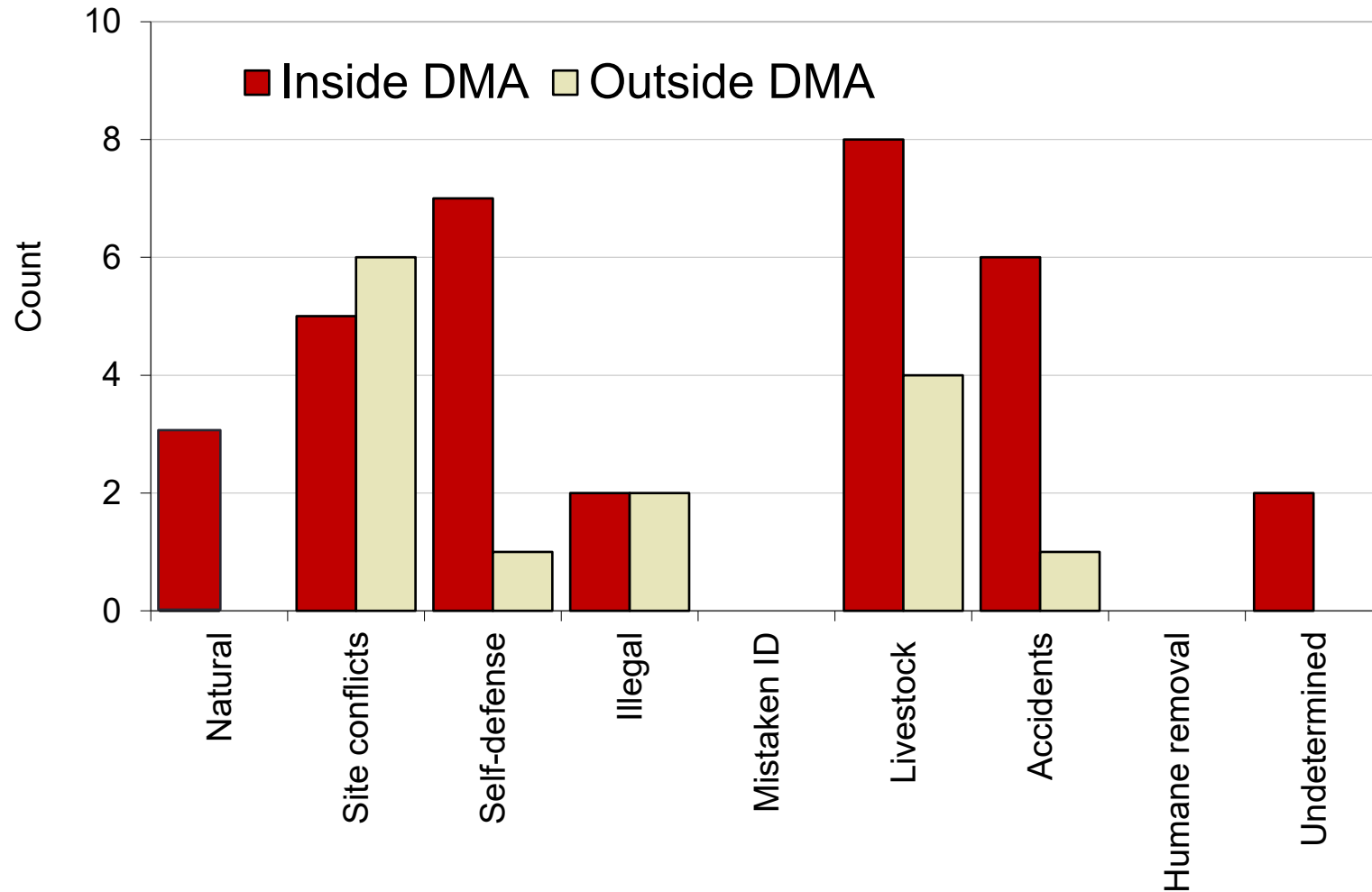
Mortalities as of 10/31/2023

Known and probable mortalities by sex and age class 2023 (outside DMA)

Area	Sex	Age class		Total
		Dependent	Independent	
		(<2 years old)	(≥2 years old)	
Outside DMA	Female	1	3	4
	Male	1	9	10
	Unknown	0	0	0
	Total	2	12	14

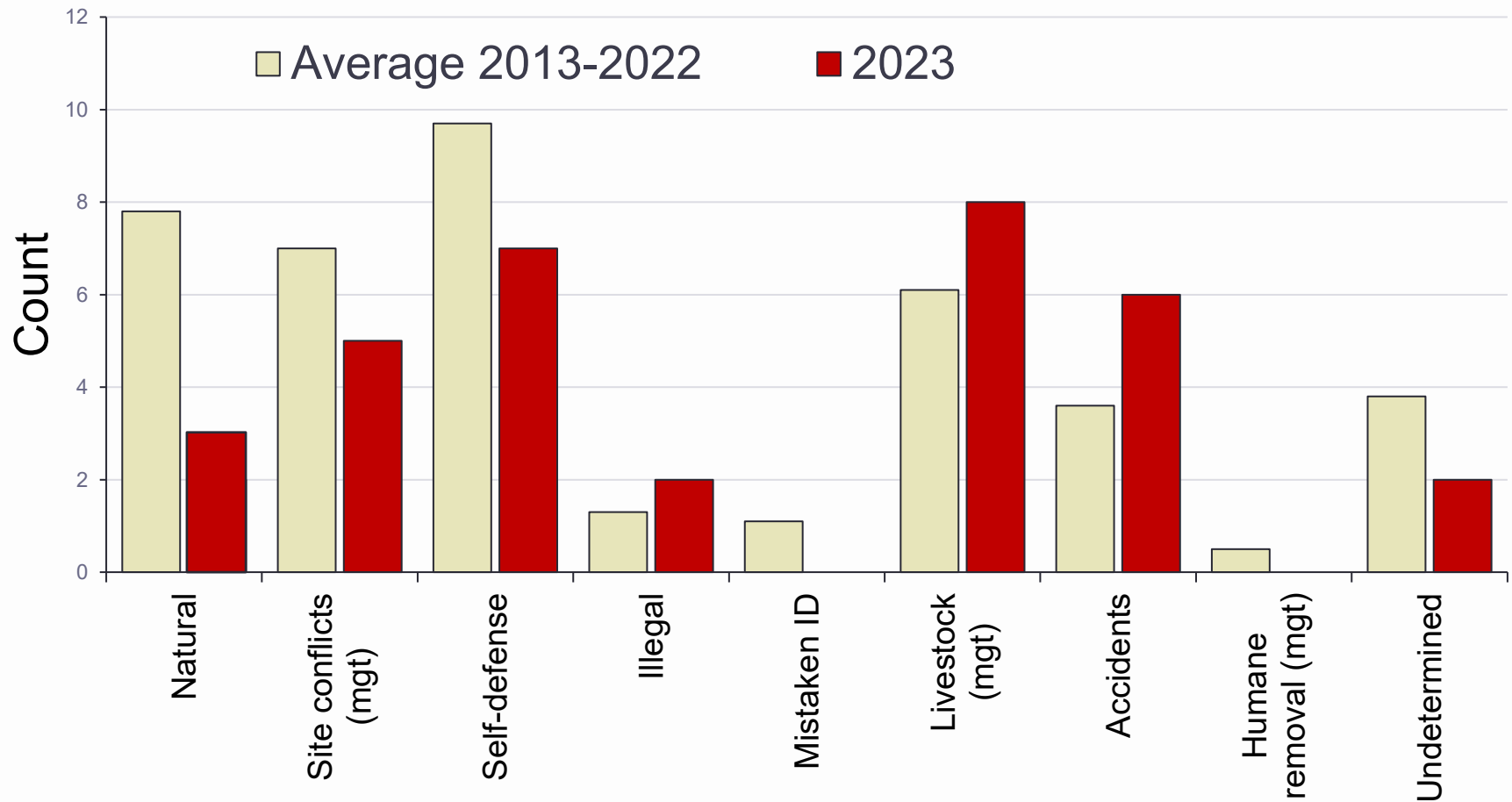
Mortalities as of 10/31/2023

Mortalities inside/outside DMA by cause 2023



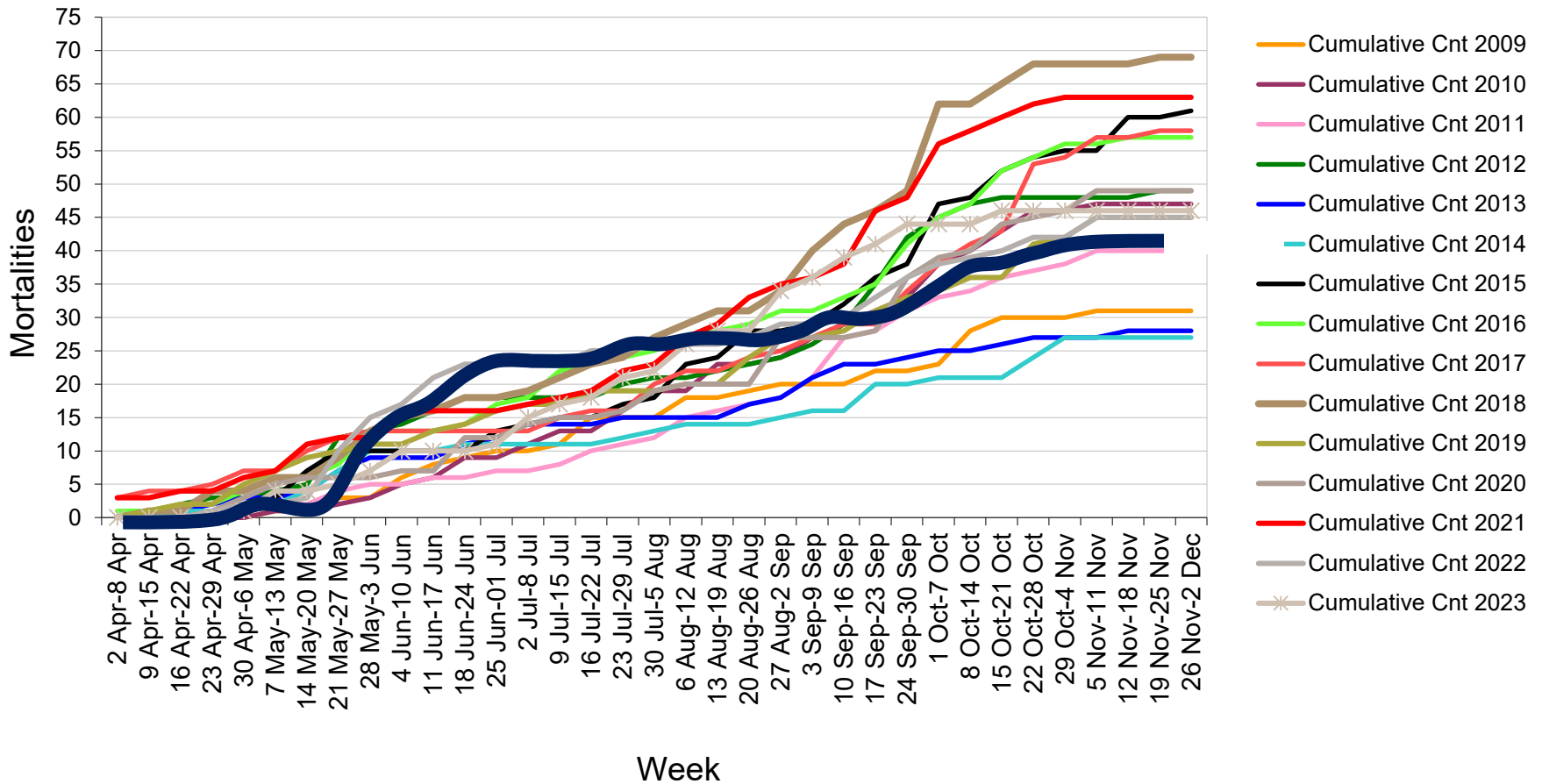
Mortalities as of 10/31/2023

Annual mortalities inside DMA by cause 2013-2022 vs. 2023



Mortalities as of 10/31/2023

Cumulative documented mortalities by week 2009-2023



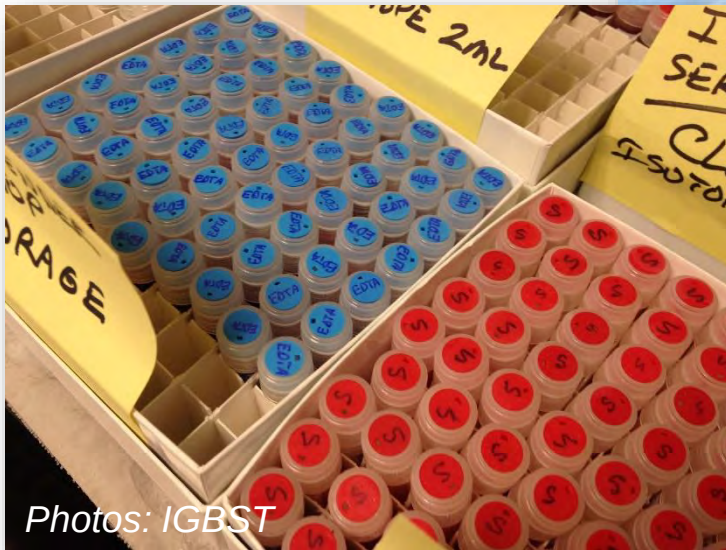
Mortalities as of 10/31/2023

Miscellaneous Updates



Genetic monitoring

- Results for 1983-2021
- **1,472** individuals genotyped (20 microsatellite markers)
- No evidence of non-GYE ancestry in any of the individuals genotyped to date



Photos: IGBST



Remote camera photo: C. Whitman/USGS



Photo: C. Whitman/USGS



**Study Team website:
search “IGBST”**

**Annual/Technical reports:
IGBC website
(IGBConline.org)**

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