

# Interagency Grizzly Bear Study Team 2023 Research & Monitoring Update



Photo: J. Davis

# Overview

## Research and monitoring update

- Recap from fall 2023 YES meeting
- Integrated population model (IPM) estimates



*Photo: A. Falgoust*

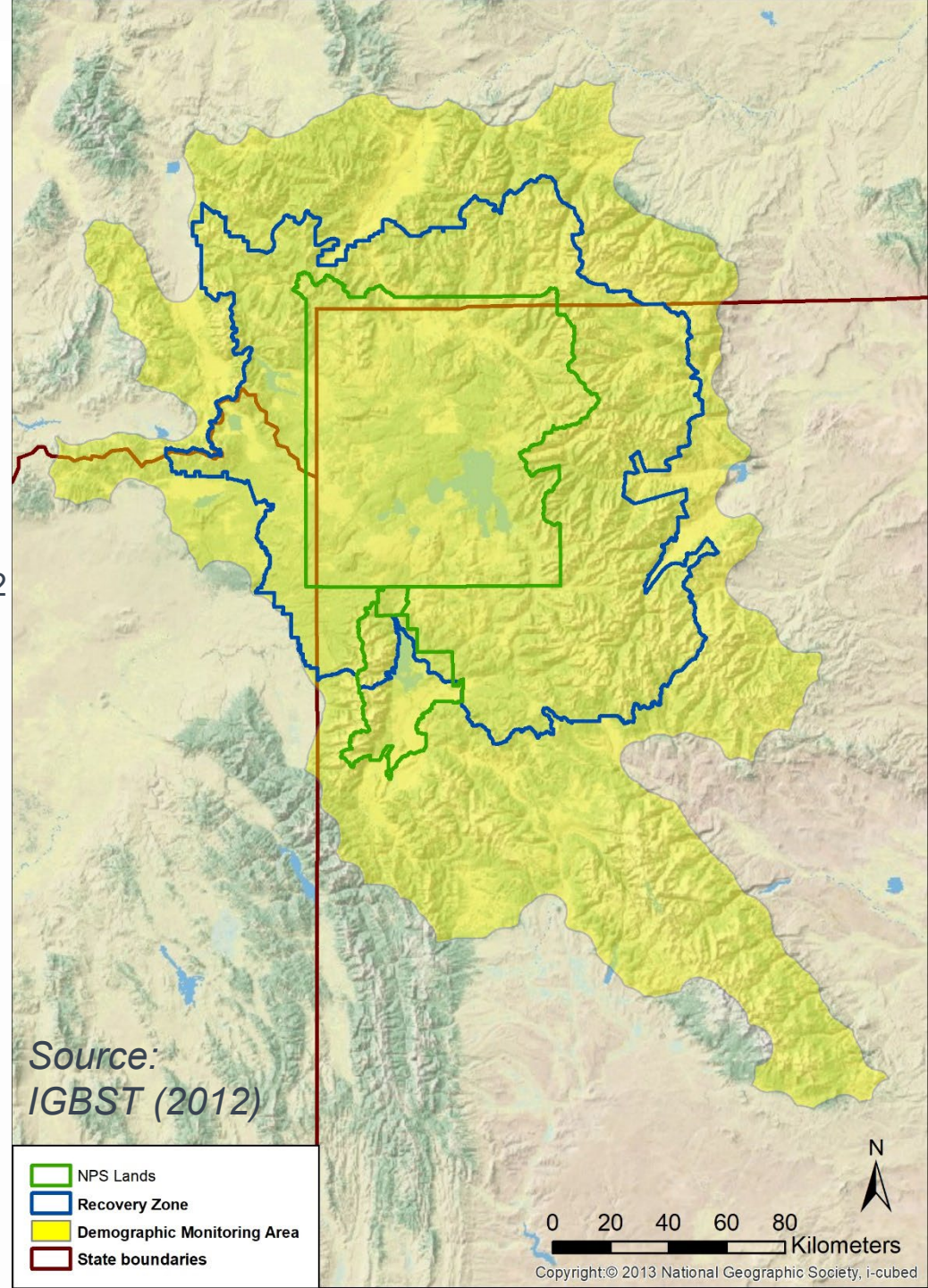
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# Greater Yellowstone Ecosystem





National Parks = 10,344 km<sup>2</sup>

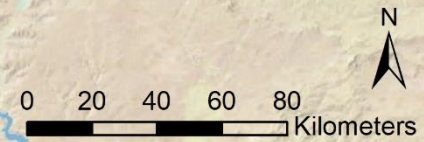
Primary Conservation  
Area/Recovery Zone = 23,828 km<sup>2</sup>

Demographic Monitoring Area  
(DMA) = 49,931 km<sup>2</sup>



Source:  
IGBST (2012)

-  NPS Lands
-  Recovery Zone
-  Demographic Monitoring Area
-  State boundaries



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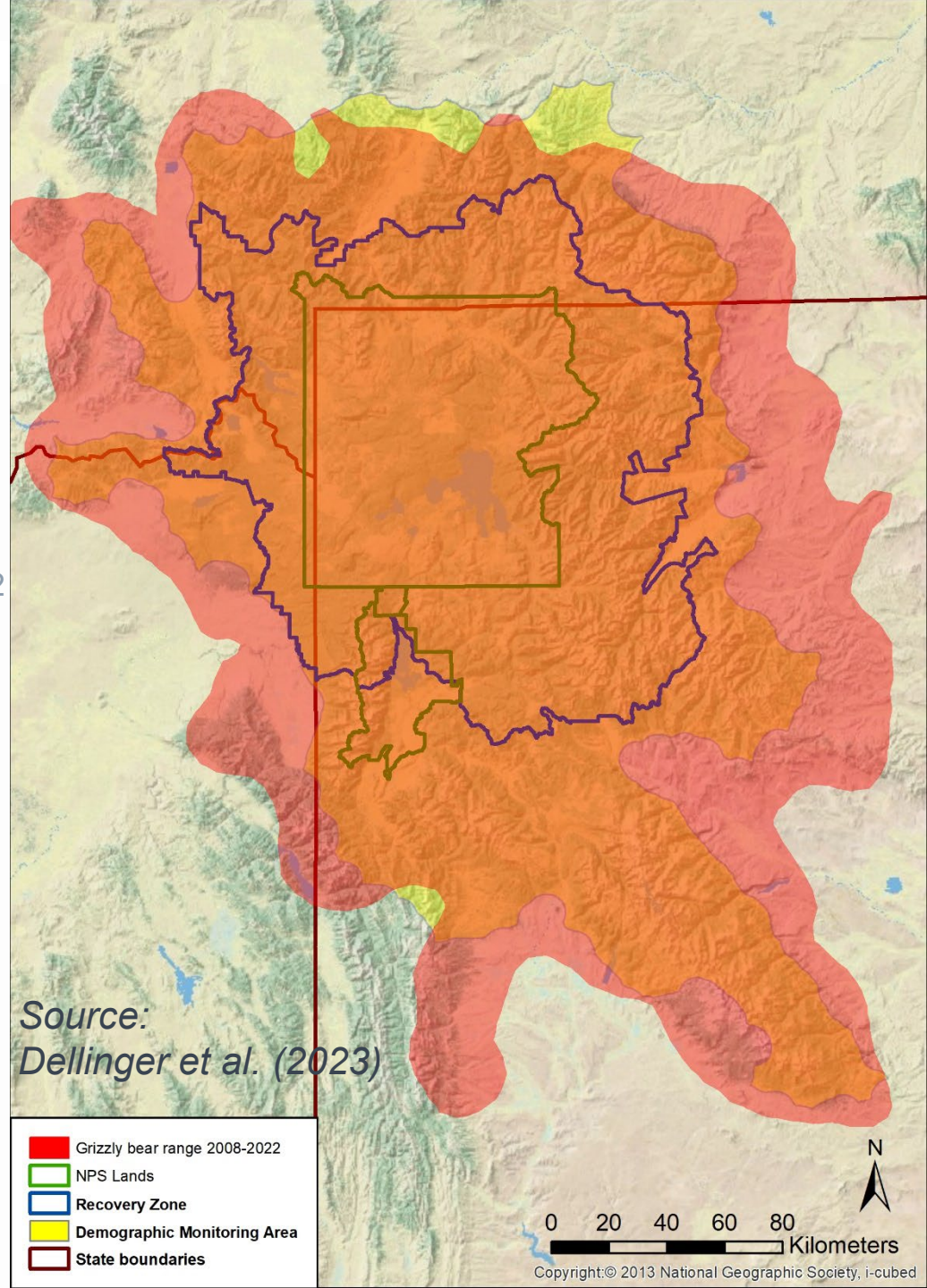
# Greater Yellowstone Ecosystem

National Parks = 10,344 km<sup>2</sup>

Primary Conservation  
Area/Recovery Zone = 23,828 km<sup>2</sup>

Demographic Monitoring Area  
(DMA) = 49,931 km<sup>2</sup>

Estimated grizzly bear range  
(2008-2022) = 70,101 km<sup>2</sup>



# Data Collections

Females with cubs, telemetry and observations,  
mortalities



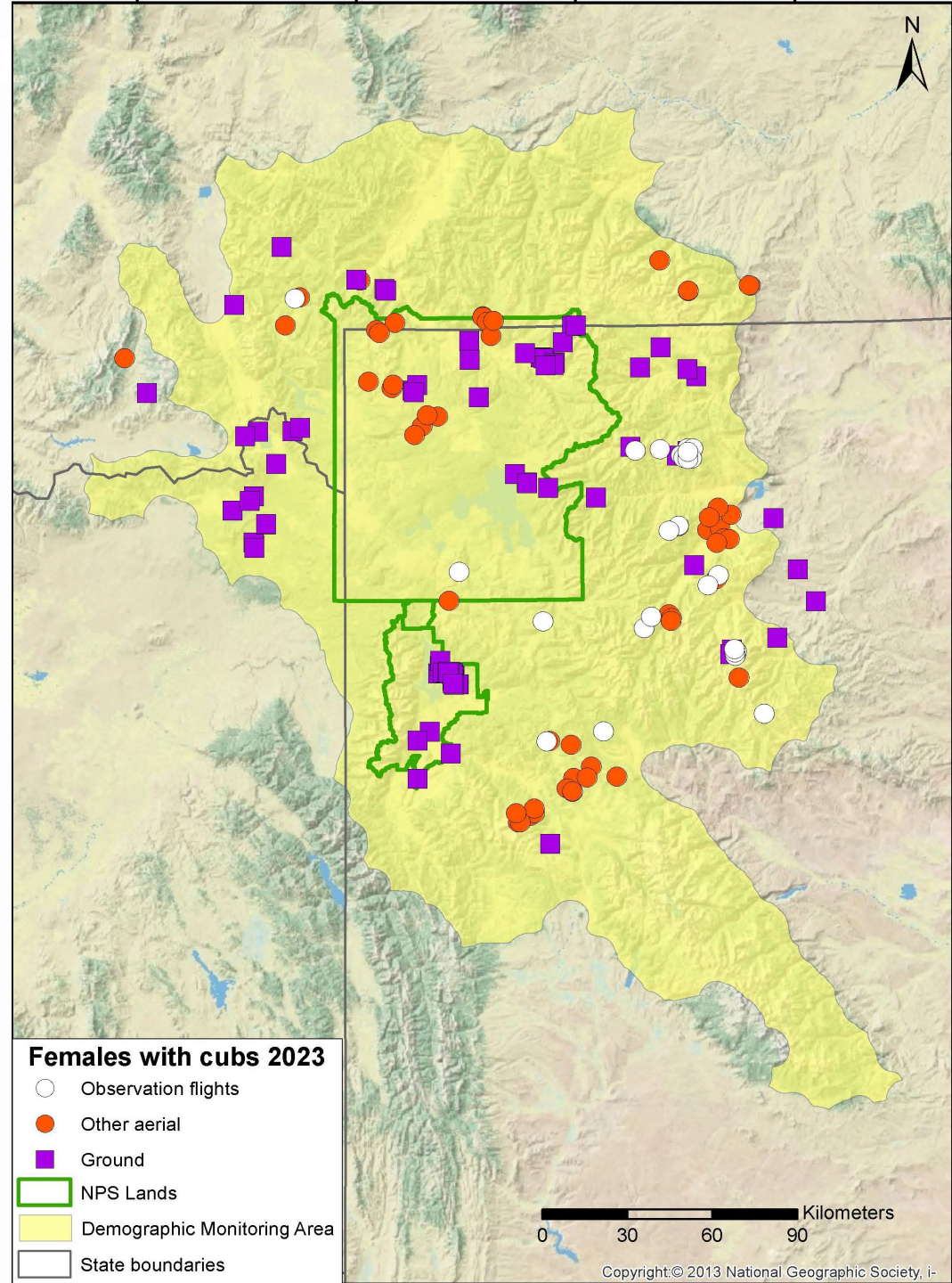
# Females with cubs 2023

## 193 observations

29 observation flights (15%)

59 other aerial (31%)

105 ground (54%)



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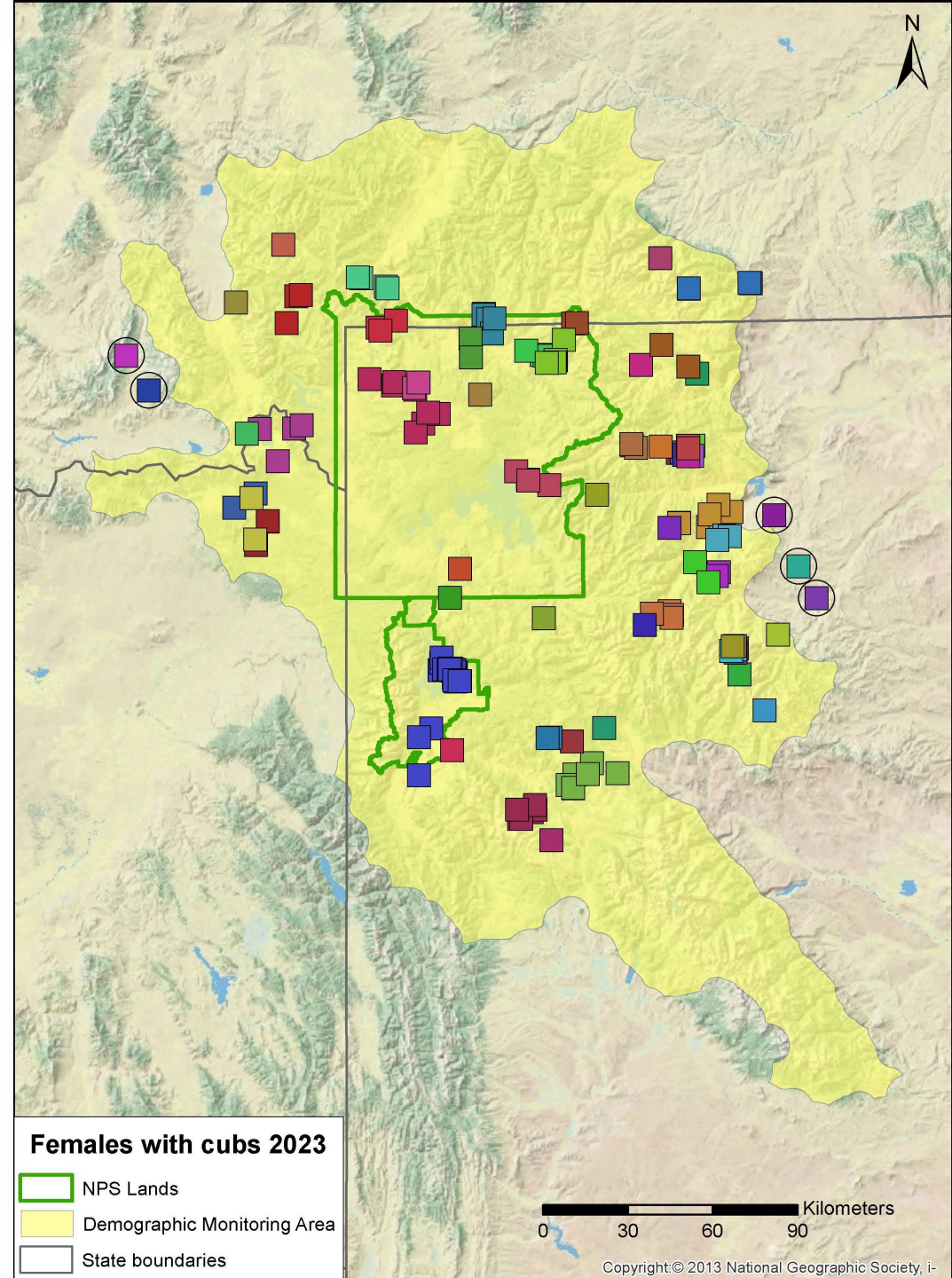
## 64 unique females with cubs

Mean litter size = 2.05

9 single (14%)

36 twins (56%)

19 triplets (30%)



Preliminary information-Subject to revision.  
Not for citation or distribution.

# Number of females with cubs 2023

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

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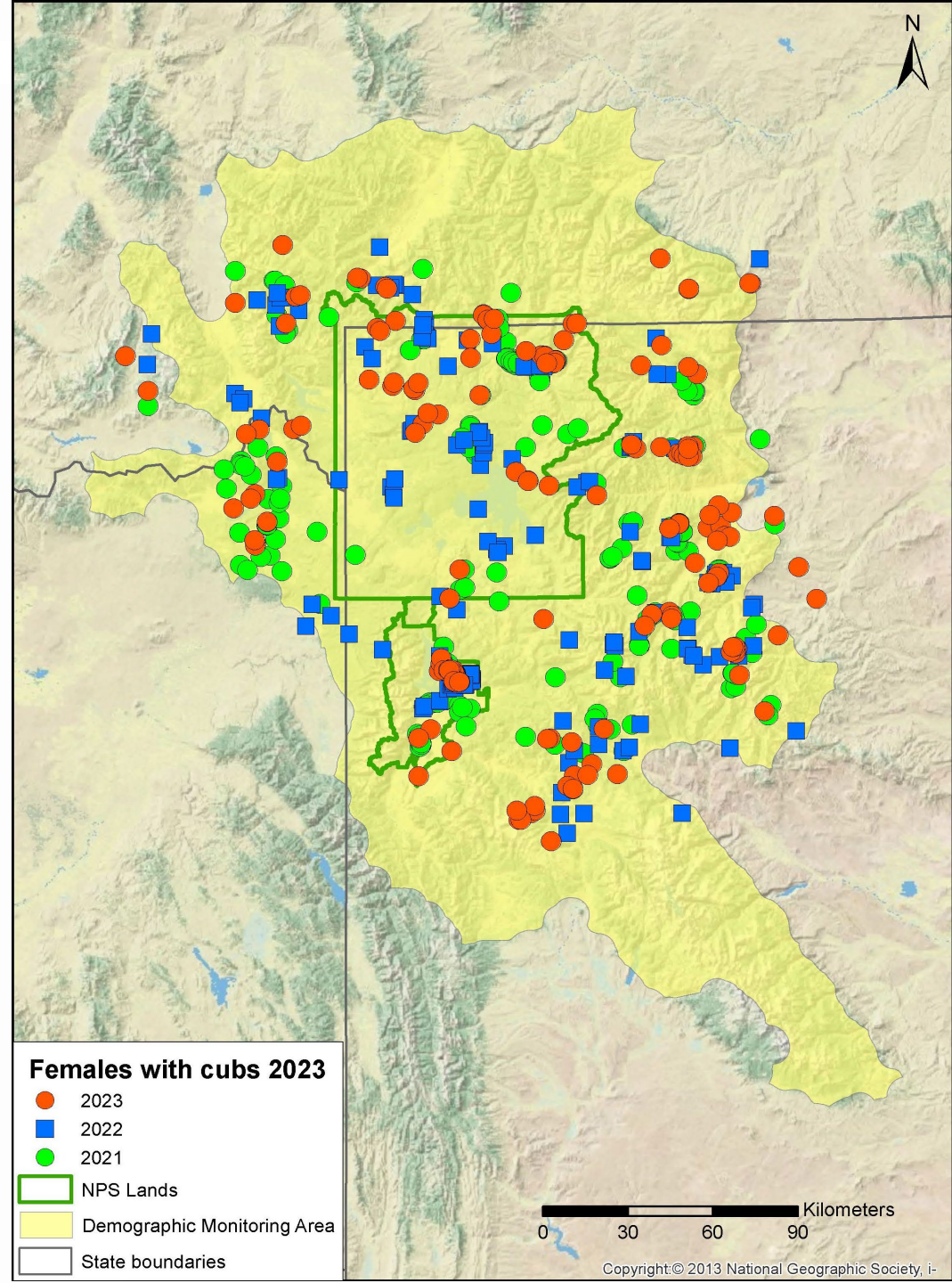
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# Females with cubs 2021-2023

## Observations

Den emergence through 31 Aug



# Grizzly bear captures 2023

- **Total captures = 51**

Research = 17

Management = 34

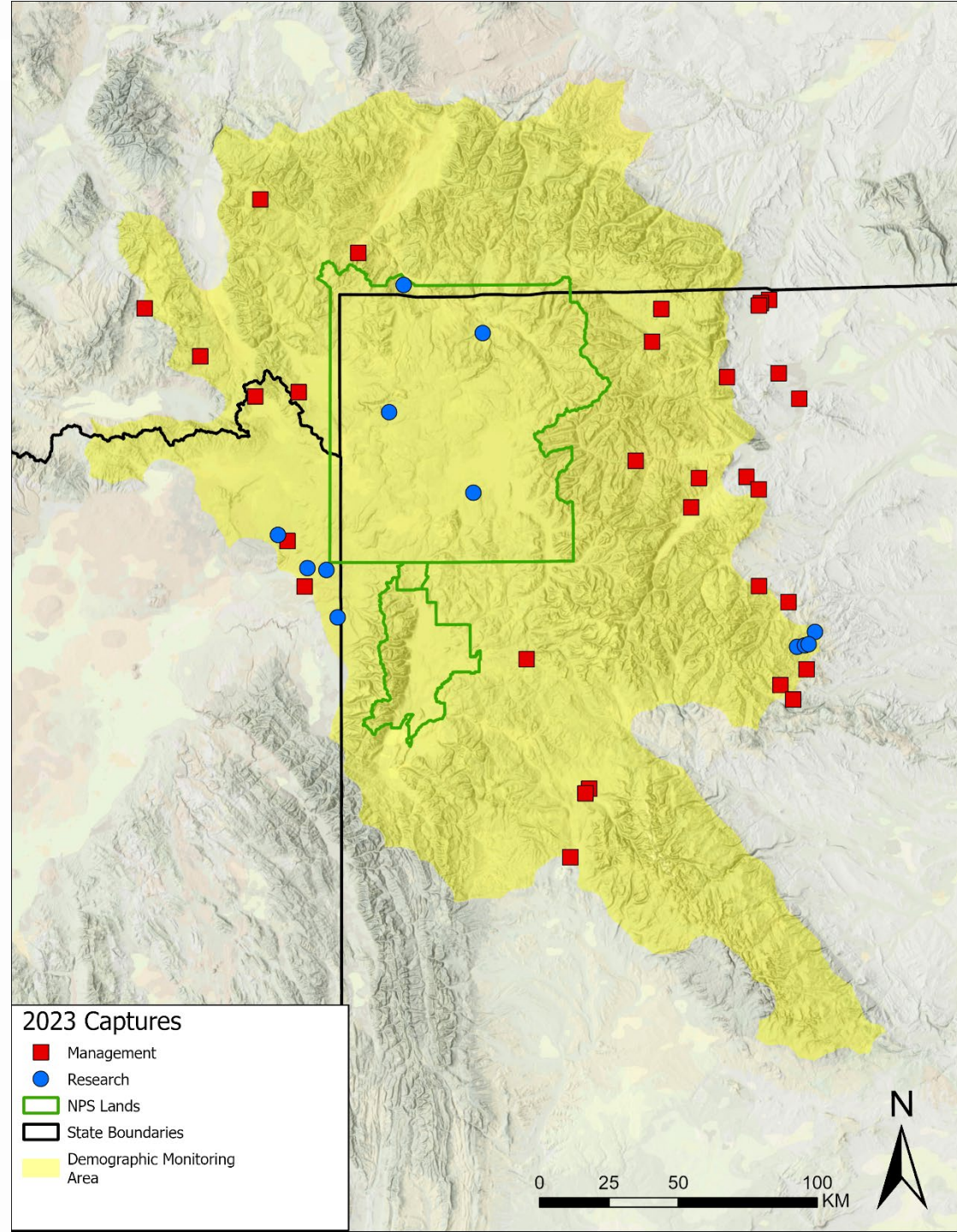
- **Individual bears = 50**

Females = 14

Males = 33

Unknown = 3

- **New bears = 32**



# Grizzly bears radio monitored 2023

**Total monitored = 84**

Adult females = 33

**Current = 49**

Females = 26

Males = 21

Bears missing = 0\*

Preliminary information-Subject to revision.  
Not for citation or distribution.



Photo: M. Gould/USGS

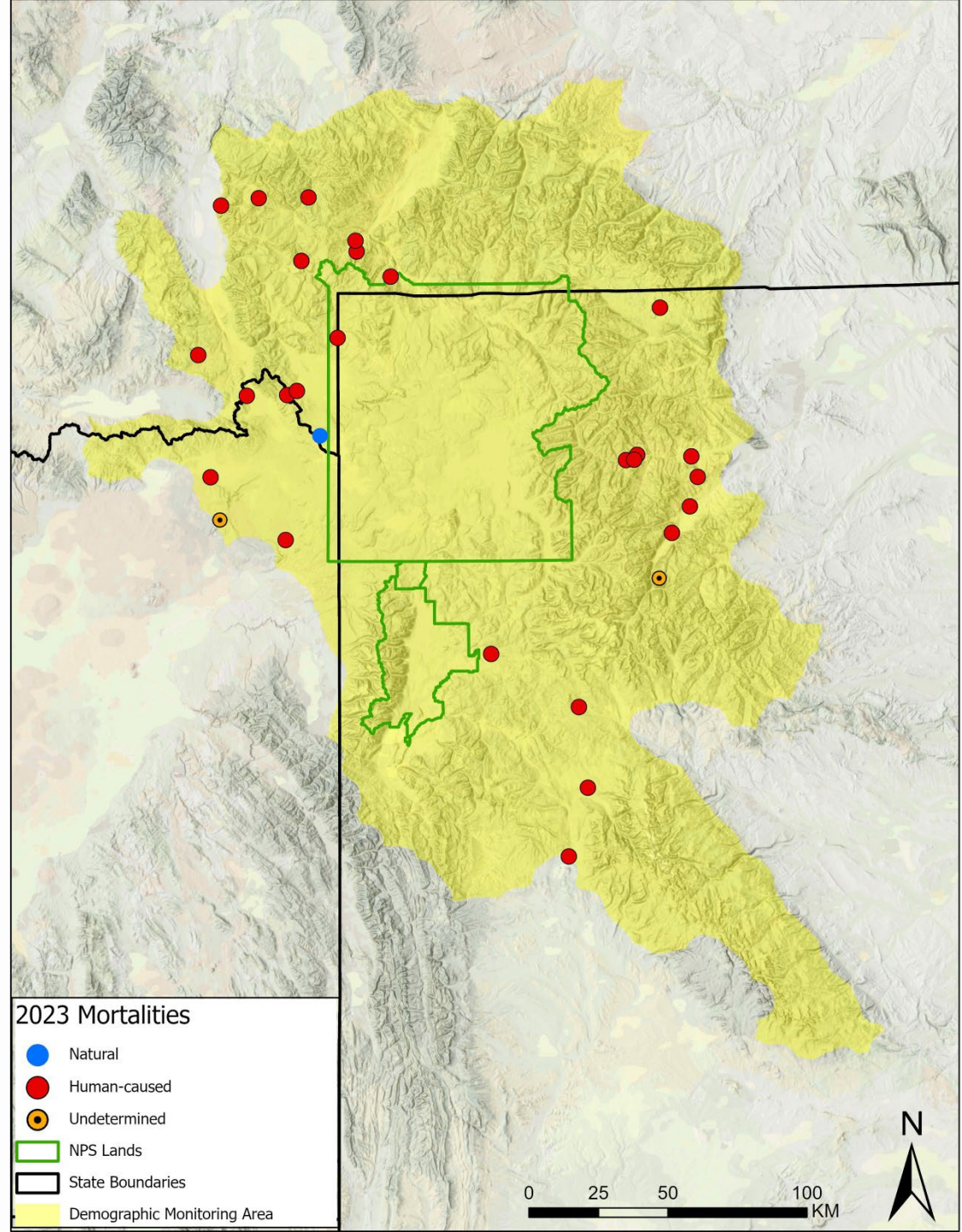
# Known and probable mortalities 2023

- **33 in DMA**

  - 28 human-caused

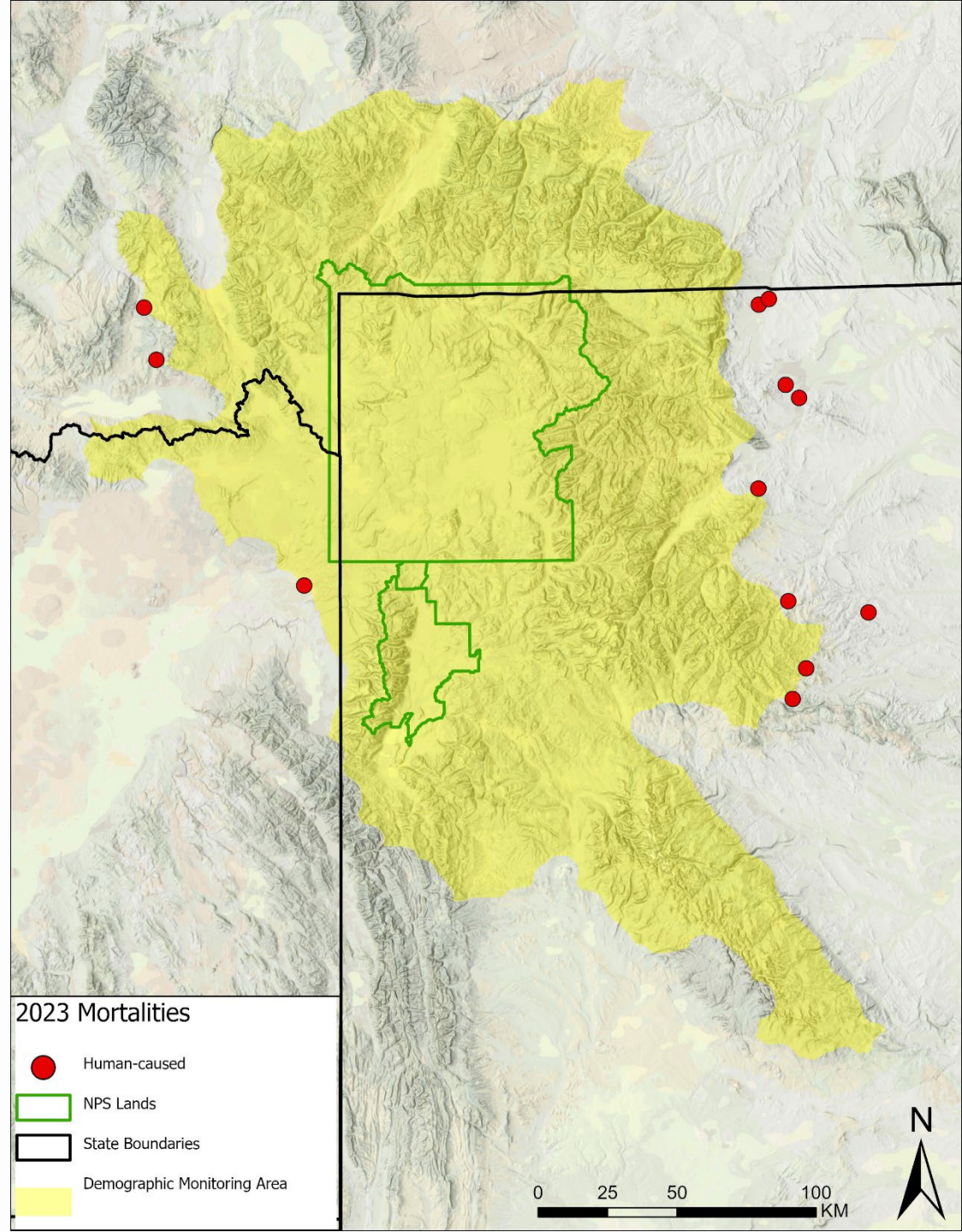
  - 3 natural

  - 2 undetermined cause



# Known and probable mortalities 2023

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



# 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	27	33

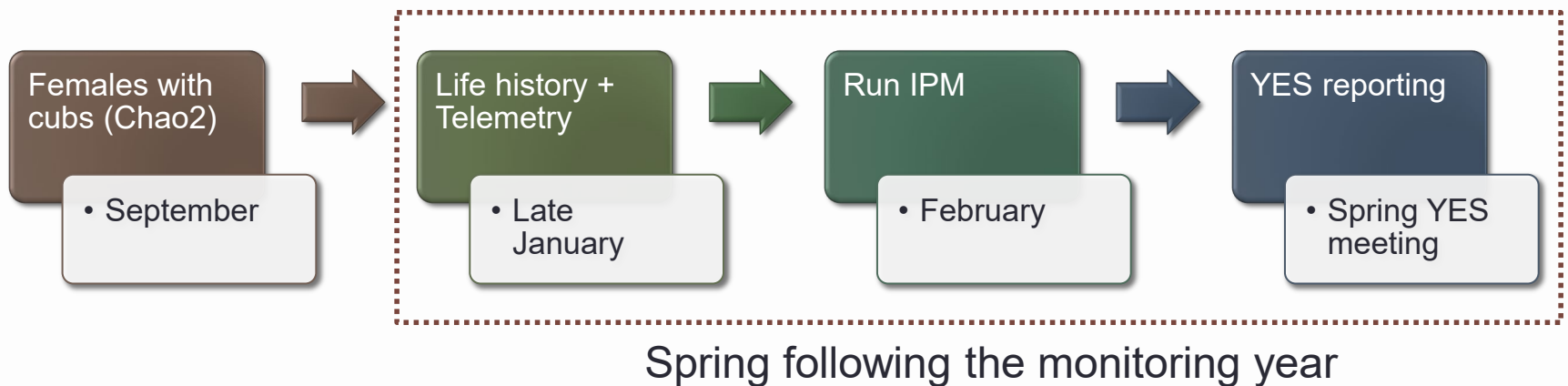
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# Integrated population model (IPM)

## Previous



## IPM implementation



# Population size 2023 (IPM, DMA)

Population segment	Median estimate
Independent females ( $\geq 2$ yrs)	355
Independent males ( $\geq 2$ yrs)	
Yearlings	
Cubs born	
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Total estimate 2023*	

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



# Survival

Median survival rate



## Age class

Adult ( $\geq 3$  yrs old)

Subadult (2 yrs old)

Yearling (1 yr old)

Cub (<1 yr old)

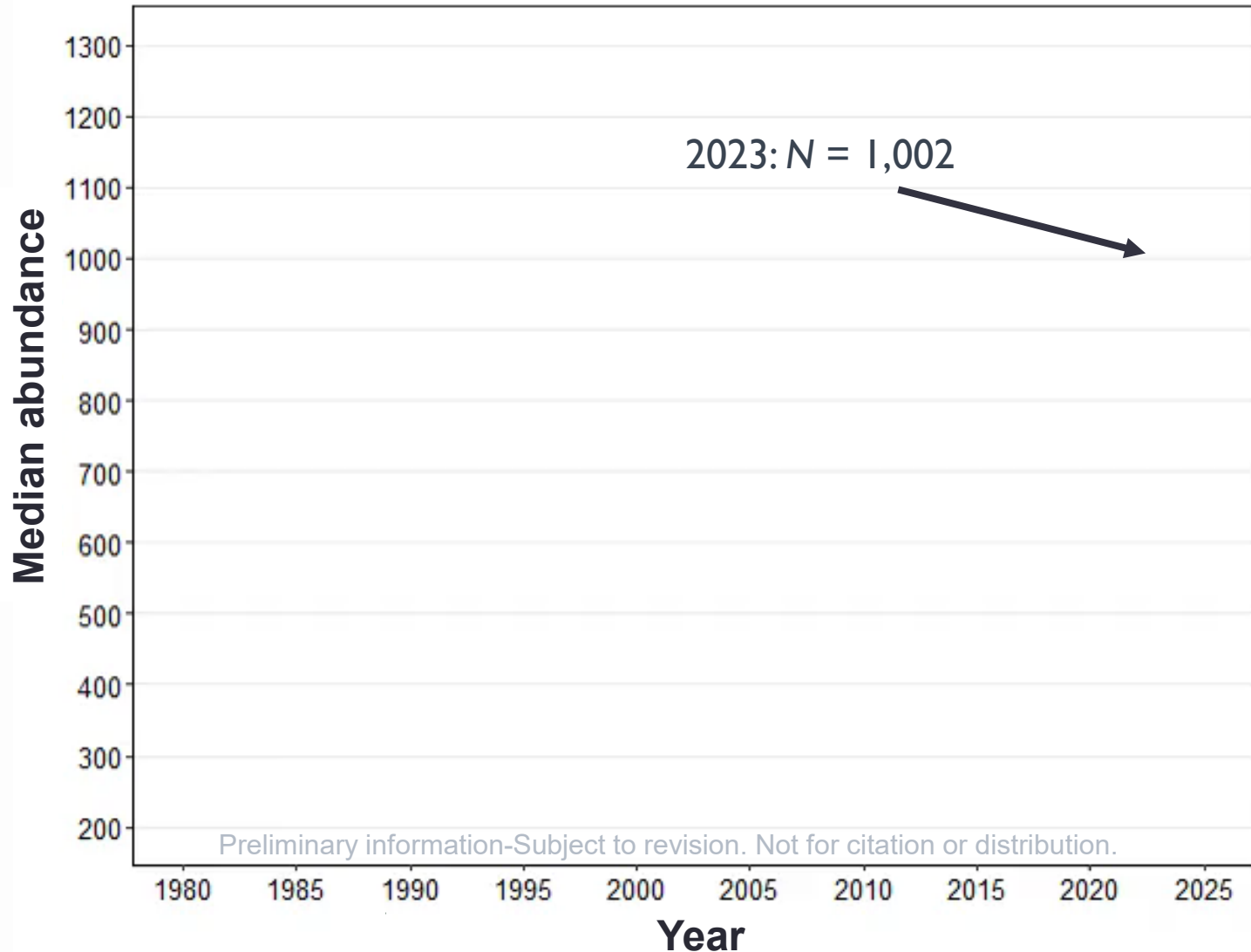
## Sex

Females

Males

Females & males

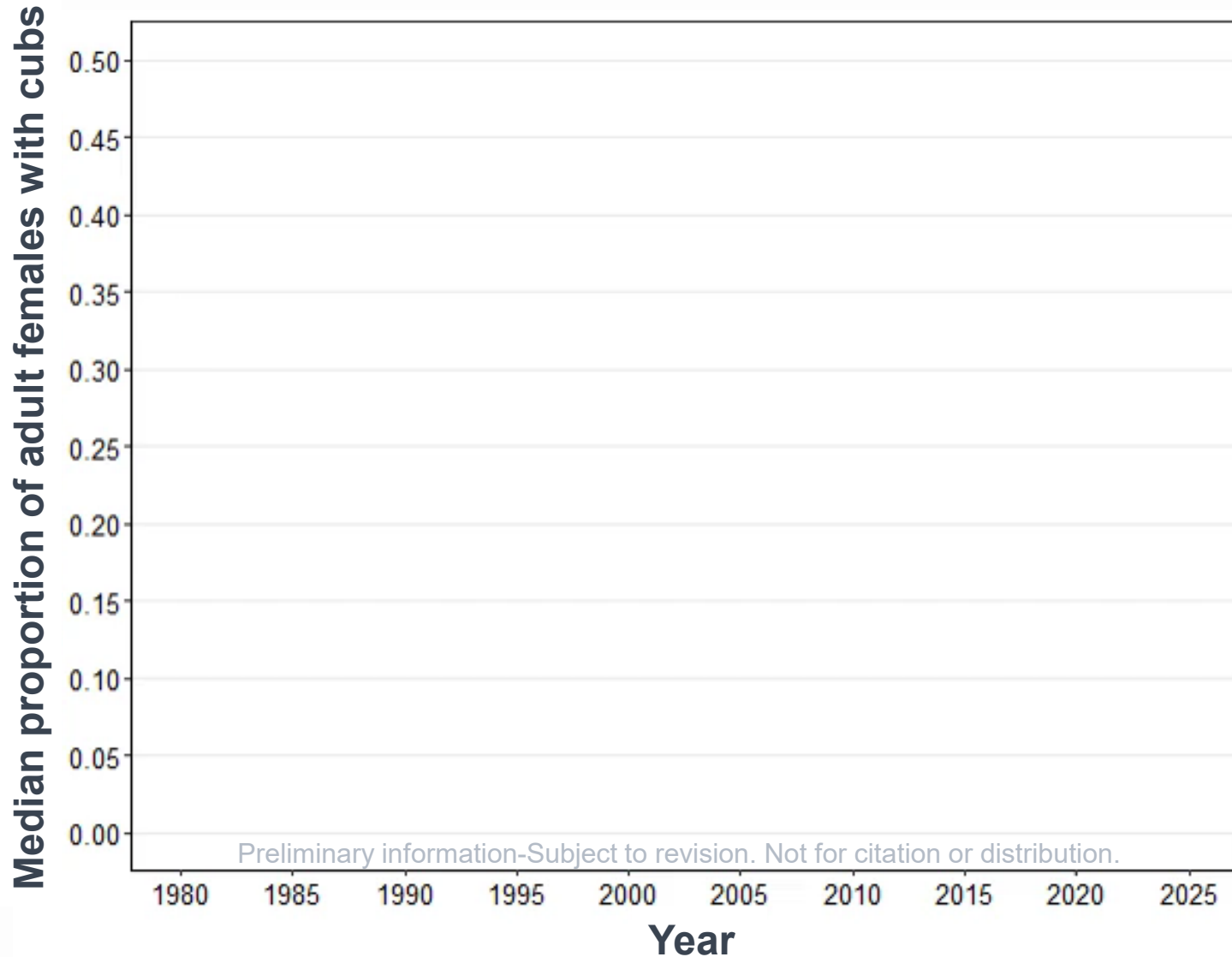
# Total population size (IPM, DMA)



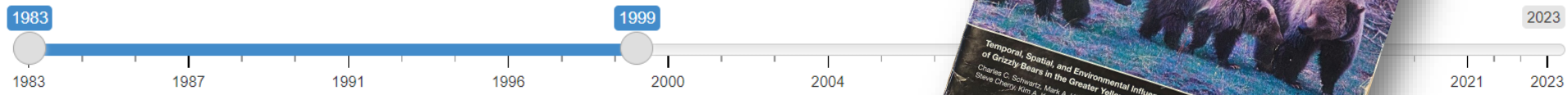
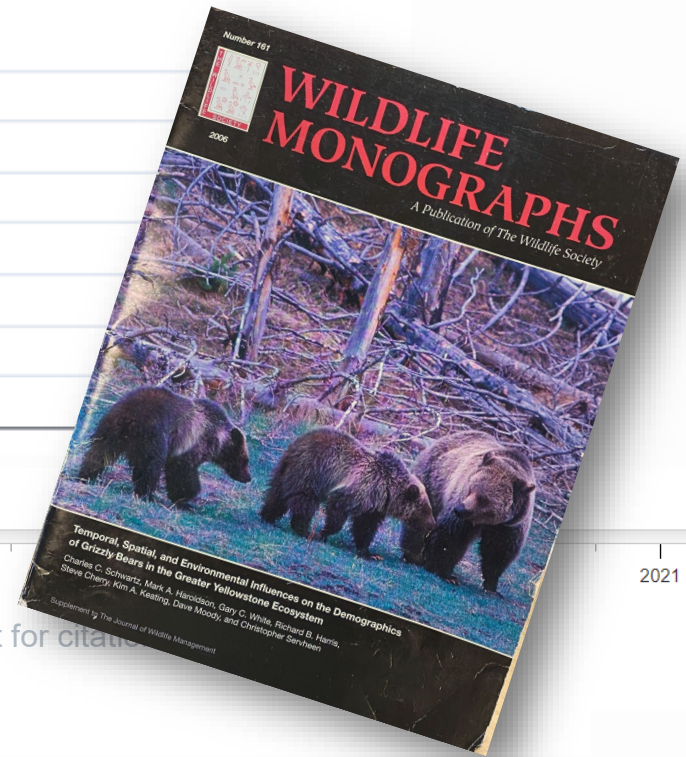
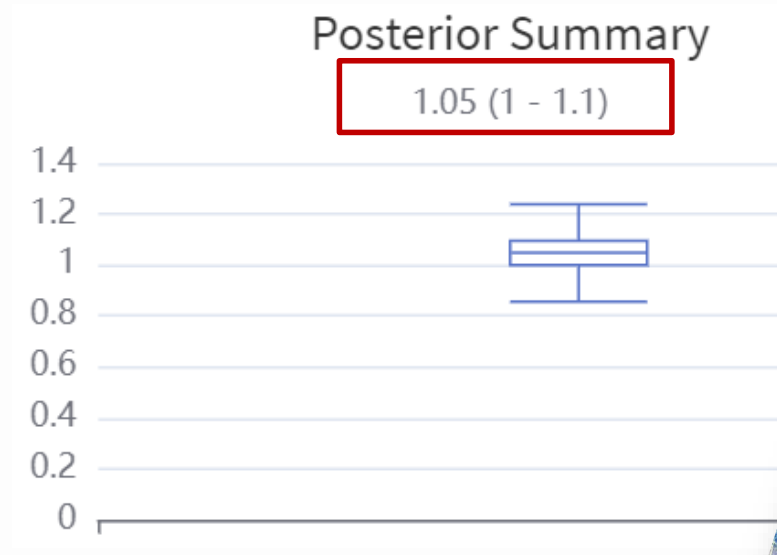
# Population growth rate (IPM, DMA)



# Proportion of adult females with cubs

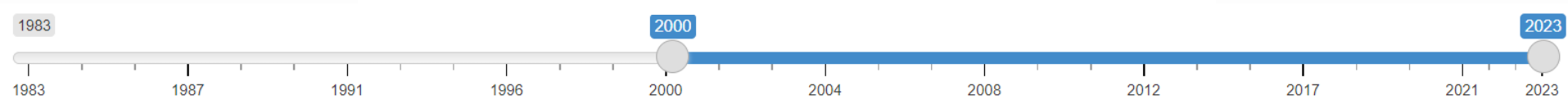
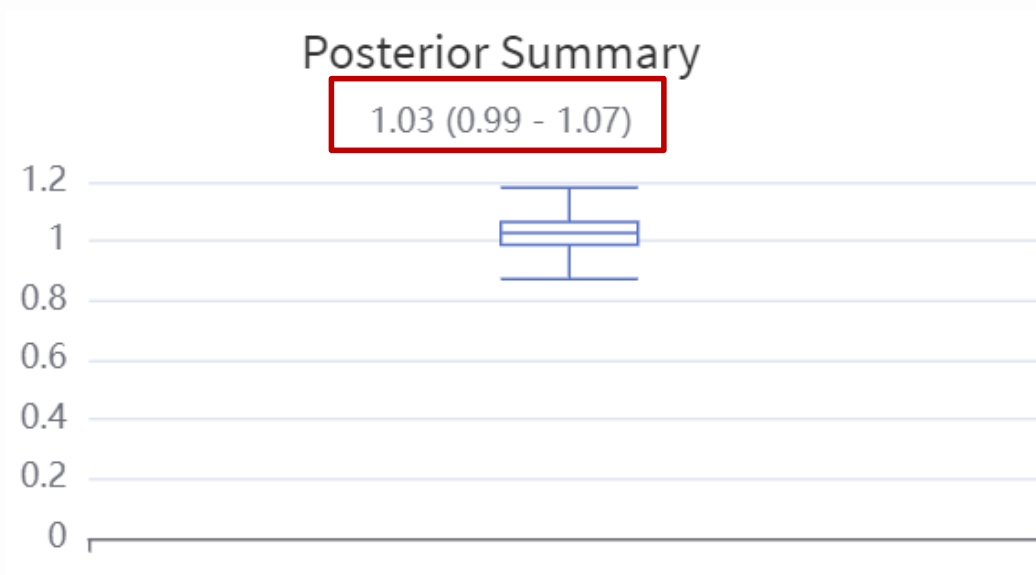


# Trend analyses – population growth rate



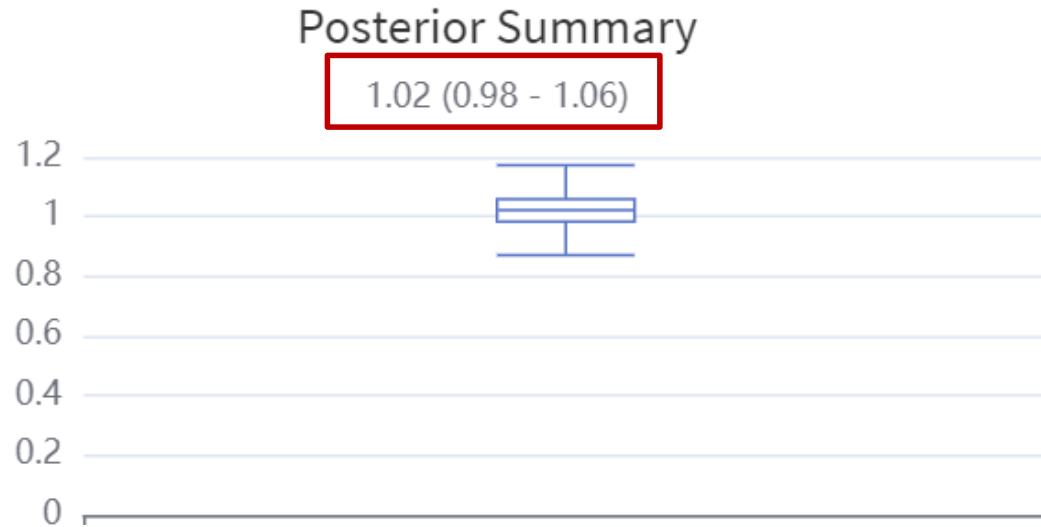
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# Trend analyses – population growth rate

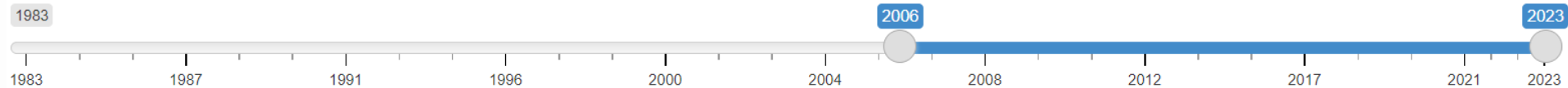


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# Trend analyses – population growth rate

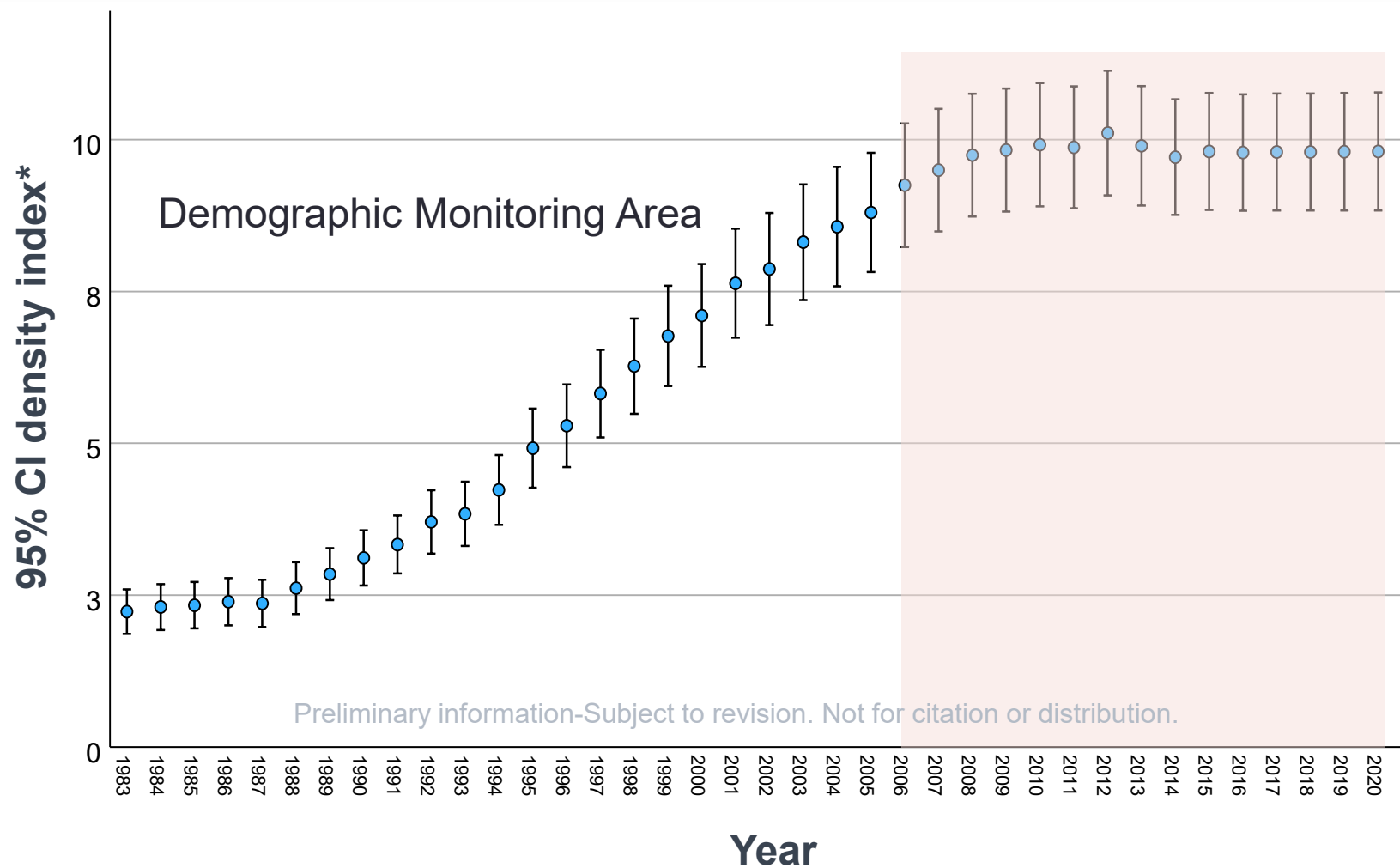


Trend Period



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# Density index over time



\*Based on Bjornlie et al. 2014, Corradini et al. 2023



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# Acknowledgments 2023

- **IDFG:** C. Anderson, C. Bowlin, J. Brower, R. Cavallaro, J. Heald, C. Hendricks, J. Hussman, C. Johnson, T. Lewis, J. Locke, D. Newman, T. Nicholson, A. Sorensen, T. Swearingen, S. Wood
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**Study Team website: search “IGBST”**  
**Annual/Technical reports: IGBOnline.org**



*Remote camera video: C. Whitman/USGS*