

Interagency Grizzly Bear Study Team Research and Monitoring Summary 2020



Photo: Jake Davis

Study Team Members

Dan Bjornlie (WGFD)
Justin Clapp (WGFD)
Hilary Cooley (FWS)
Cecily Costello (MTFWP)
Mike Ebinger (USGS)
Kevin Frey (MTFWP)
Jennifer Fortin-Noreus (FWS)
Kerry Gunther (NPS)

Mark Haroldson (USGS)
Pat Hnilicka (FWS)
Curtis Hendricks (IDFG)
Jeremy Nicholson (IDFG)
Dan Thompson (WGFD)
Dan Tyers (USFS)
Frank van Manen (USGS)
Kate Wilmot (NPS)



Overview

- Females with cubs and population size
- Occupancy by females with young
- Mortalities and mortality rates
- Additional data

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

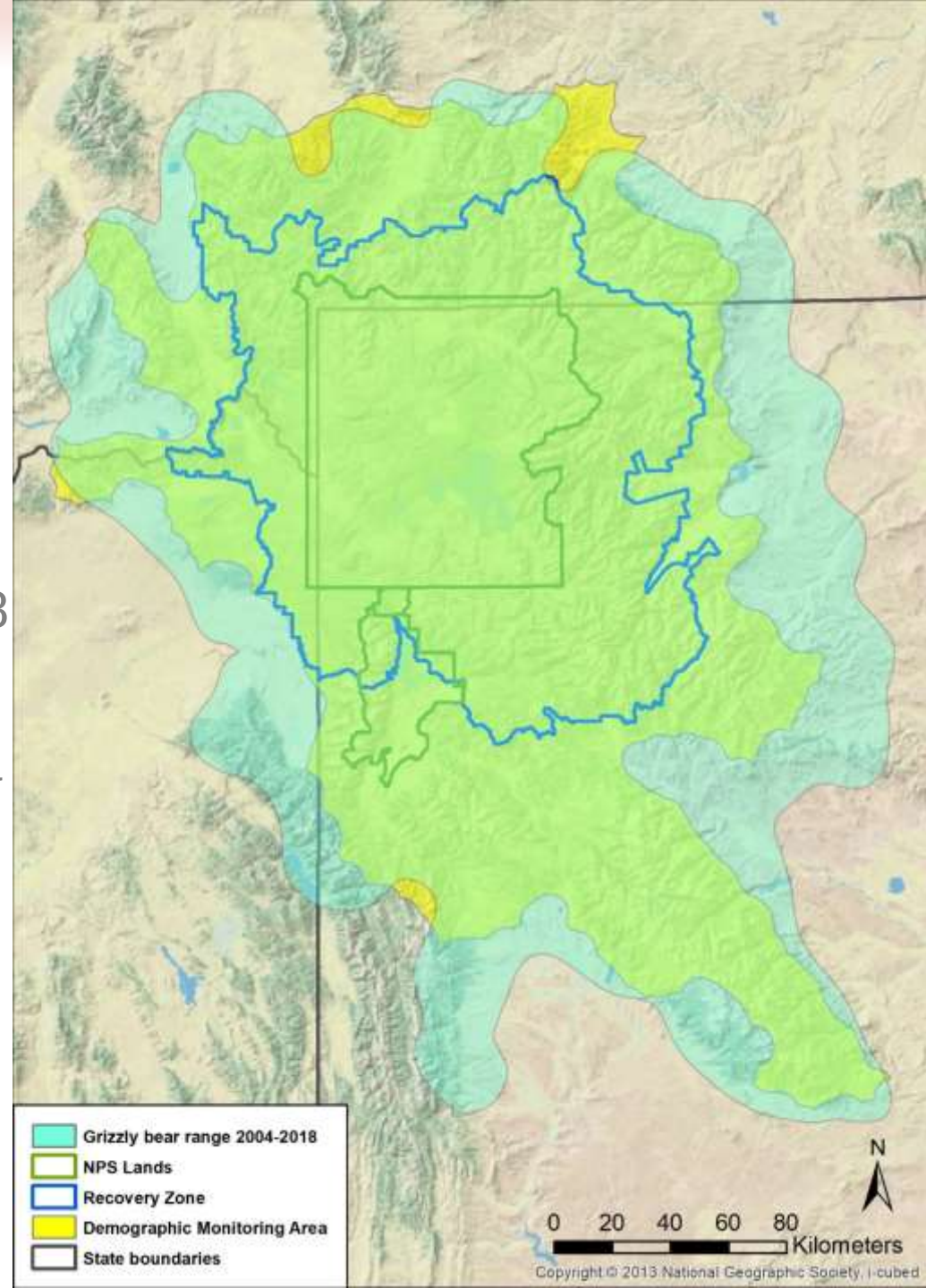
Greater Yellowstone Ecosystem

- National Parks = 10,344 km²
- Primary Conservation Area/Recovery Zone = 23,828 km²
- Demographic Monitoring Area (DMA) = 49,931 km²

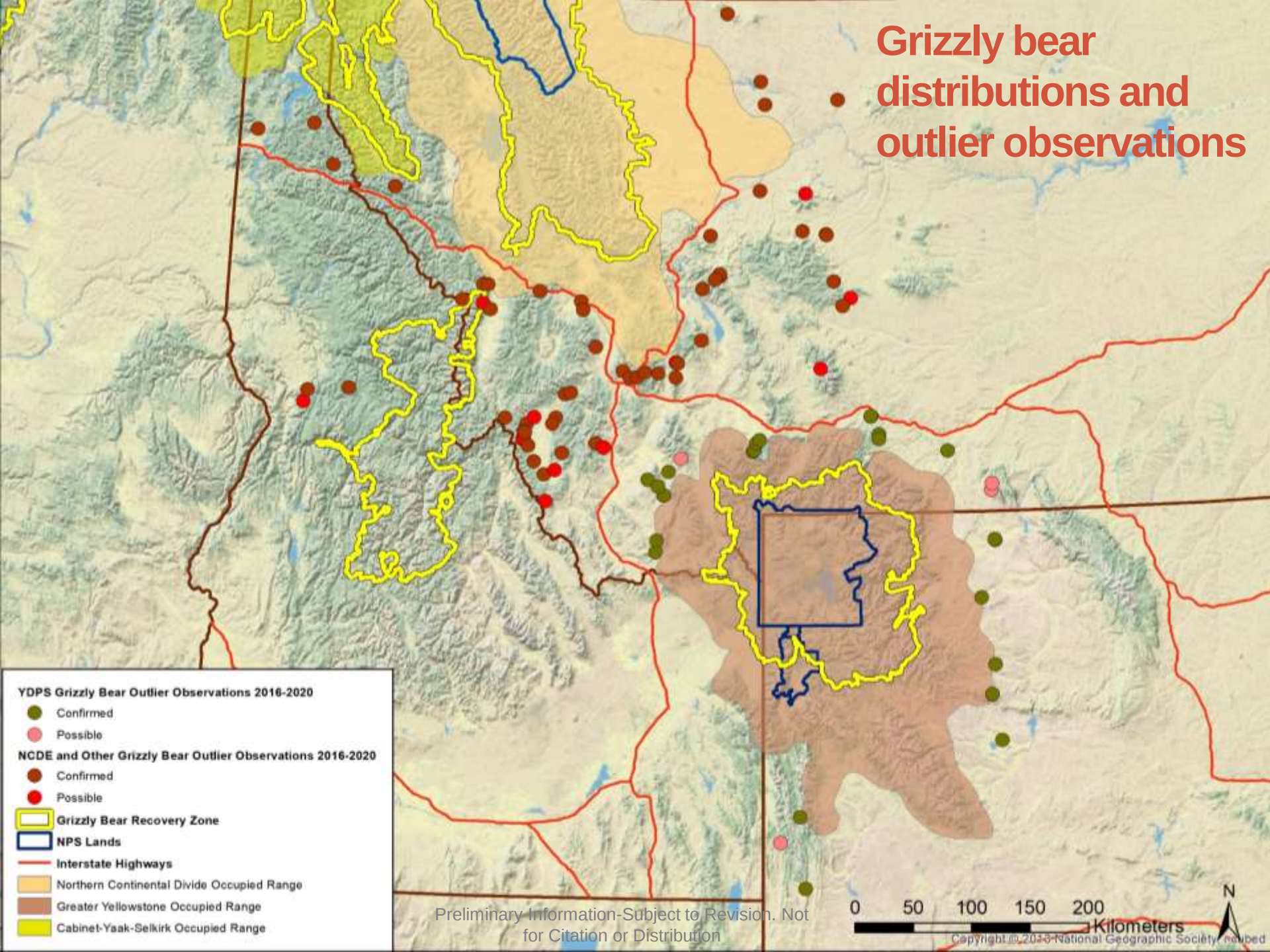


Greater Yellowstone Ecosystem

- National Parks = 10,344 km²
- Primary Conservation Area/Recovery Zone = 23,828 km²
- Demographic Monitoring Area (DMA) = 49,931 km²
- Occupied range (2004-2018) = 68,736 km²



Grizzly bear distributions and outlier observations



Preliminary Information-Subject to Revision. Not
for Citation or Distribution

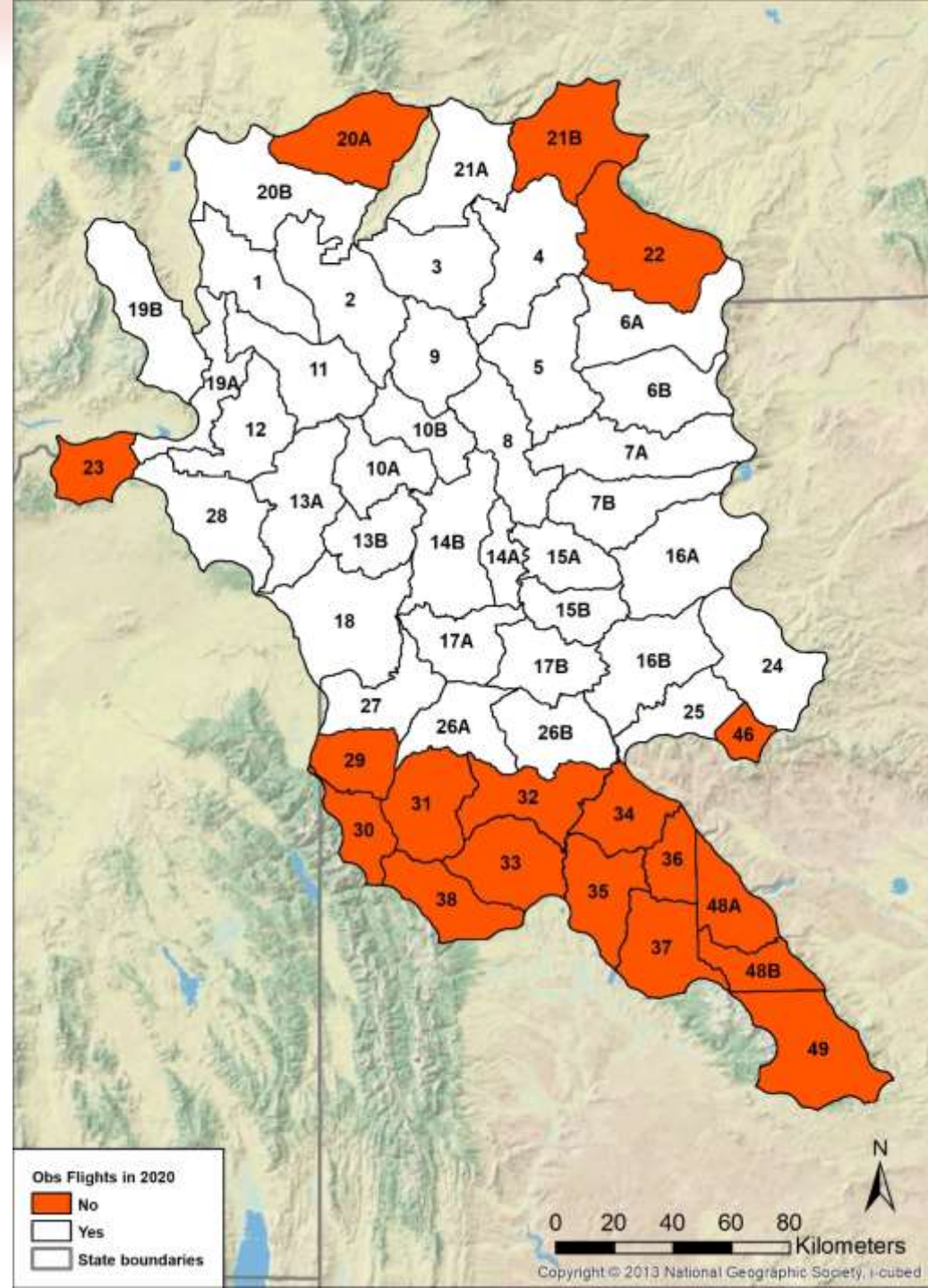
Copyright © 2023 National Geographic Society. All rights reserved.

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



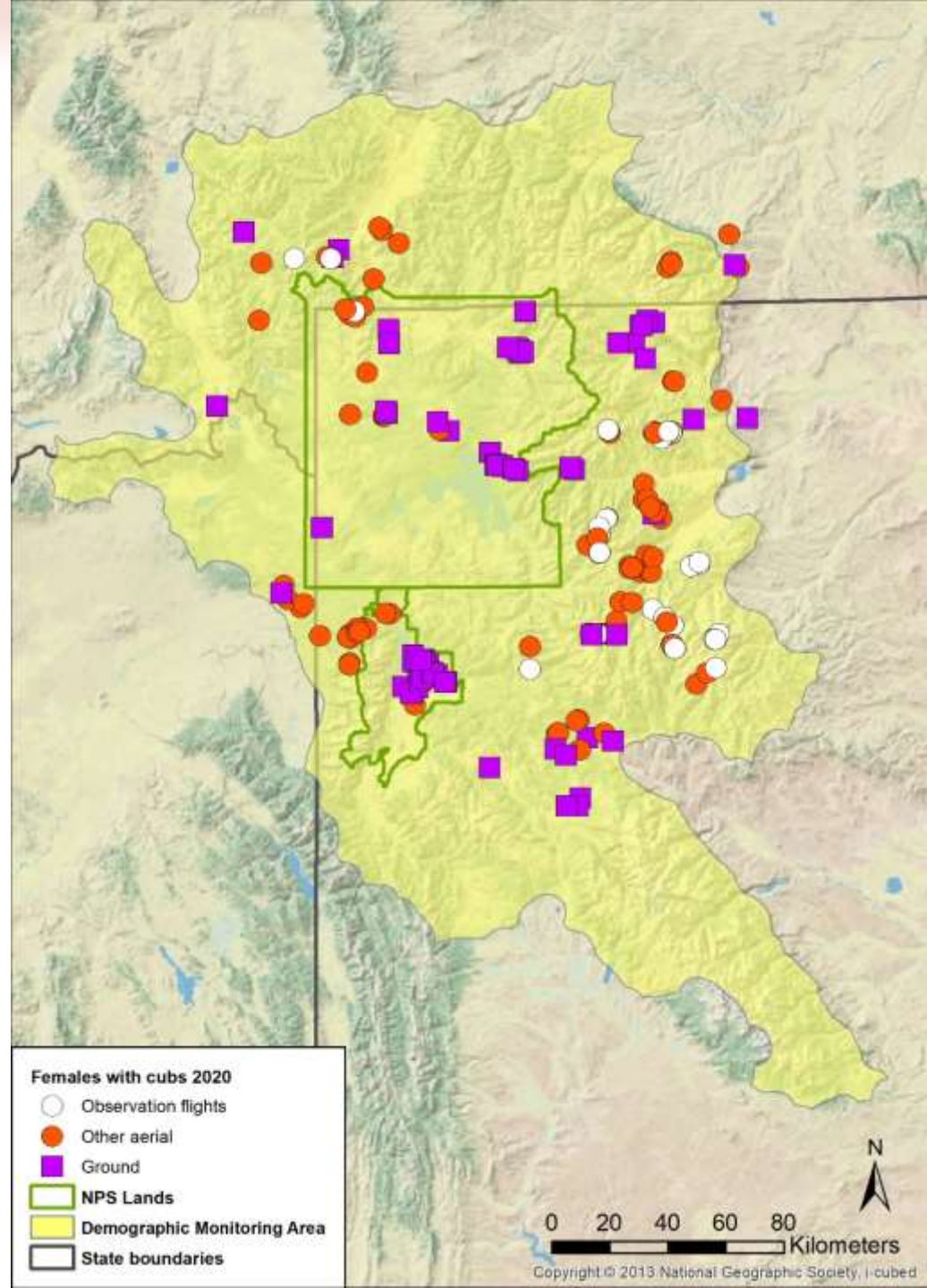
Observation flights 2020

- Excluded units (orange) in which no grizzly bears had been observed during 2015-2019 observation flights
- Reduced to one flight per unit



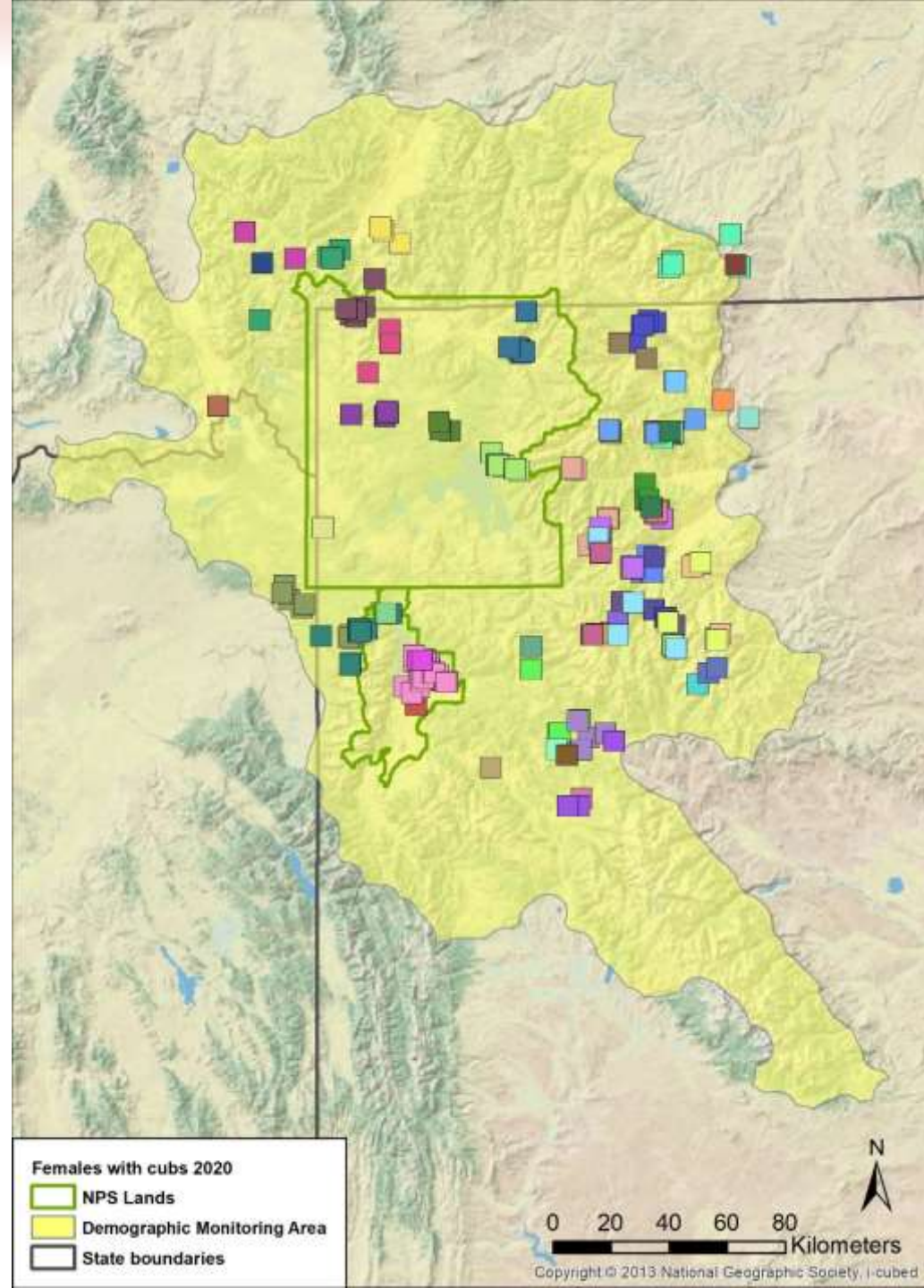
Females with cubs 2020

- **234 Observations**
 - 40 Observation flights (17%)
 - 86 Other aerial (37%)
 - 108 Ground (46%)



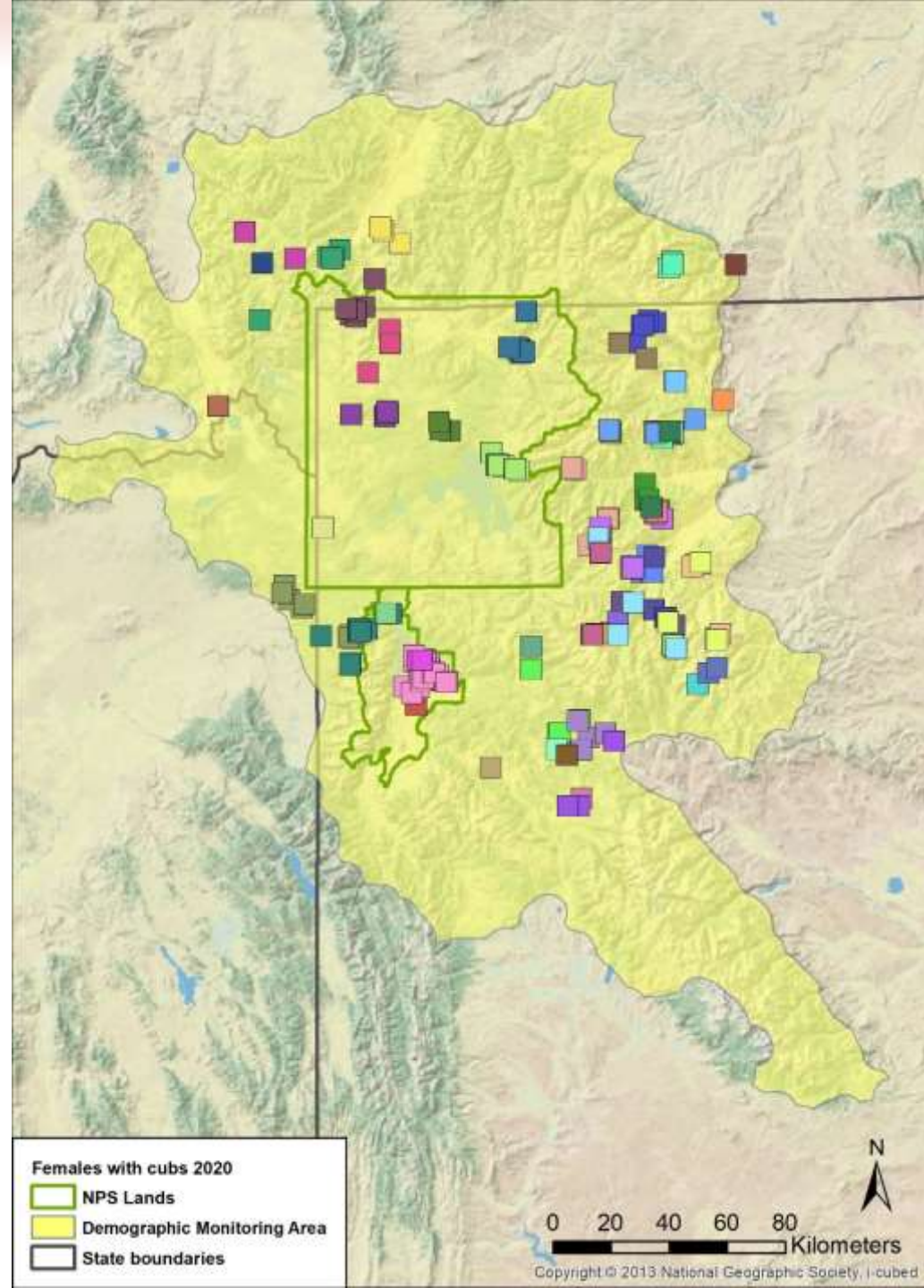
Females with cubs 2020

- **234 Observations**
 - 40 Observation flights (17%)
 - 86 Other aerial (37%)
 - 108 Ground (46%)
- **58 unique females with cubs**
 - Mean litter size = 1.95
 - 14 single (24%)
 - 34 twins (59%)
 - 9 triplets (16%)
 - 1 quadruplets (2%)

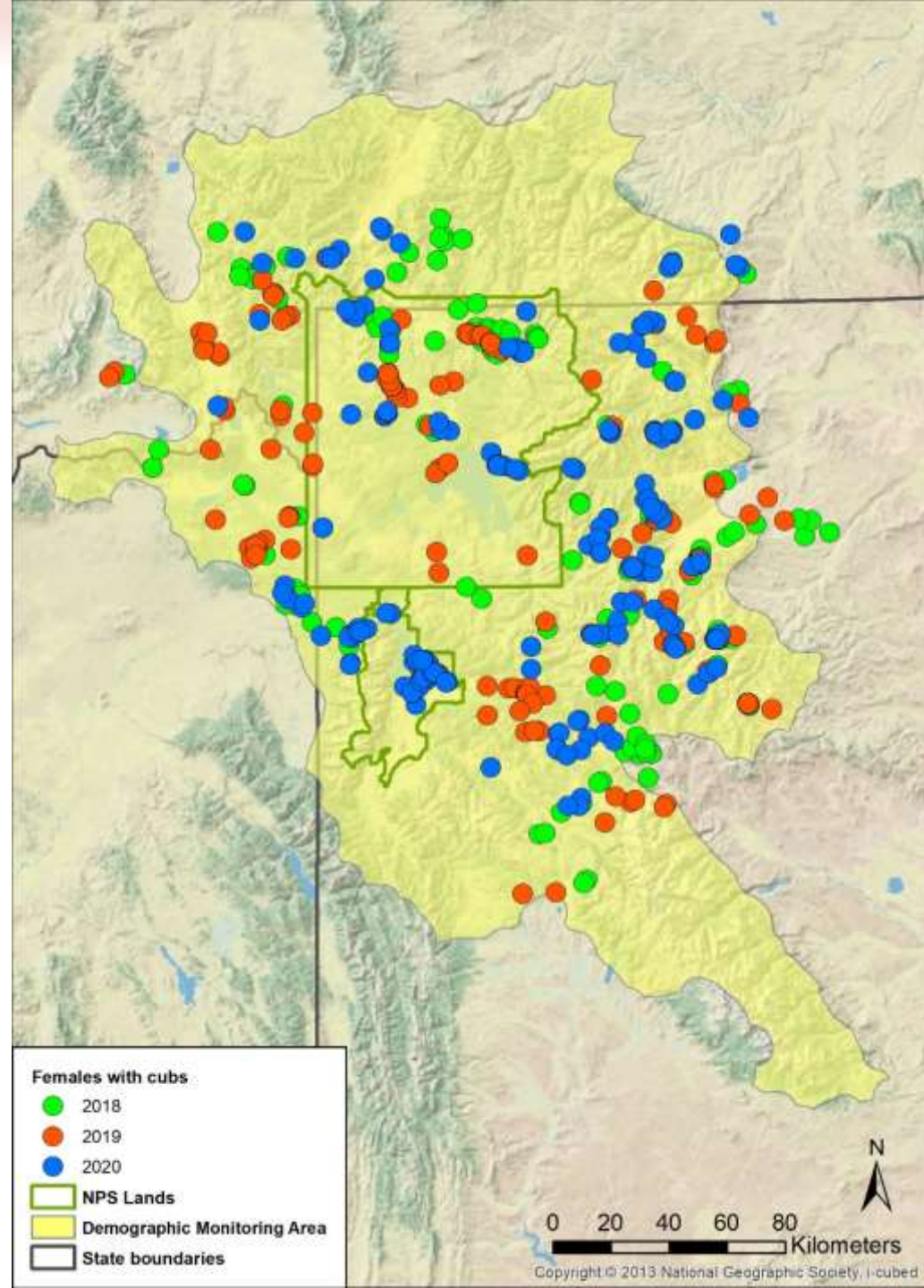


Females with cubs 2020

- **234 Observations**
 - 40 Observation flights (17%)
 - 86 Other aerial (37%)
 - 108 Ground (46%)
- **58 unique females with cubs**
 - Mean litter size = 1.95
 - 14 single (24%)
 - 34 twins (59%)
 - 9 triplets (16%)
 - 1 quadruplets (2%)
- **58 in DMA**



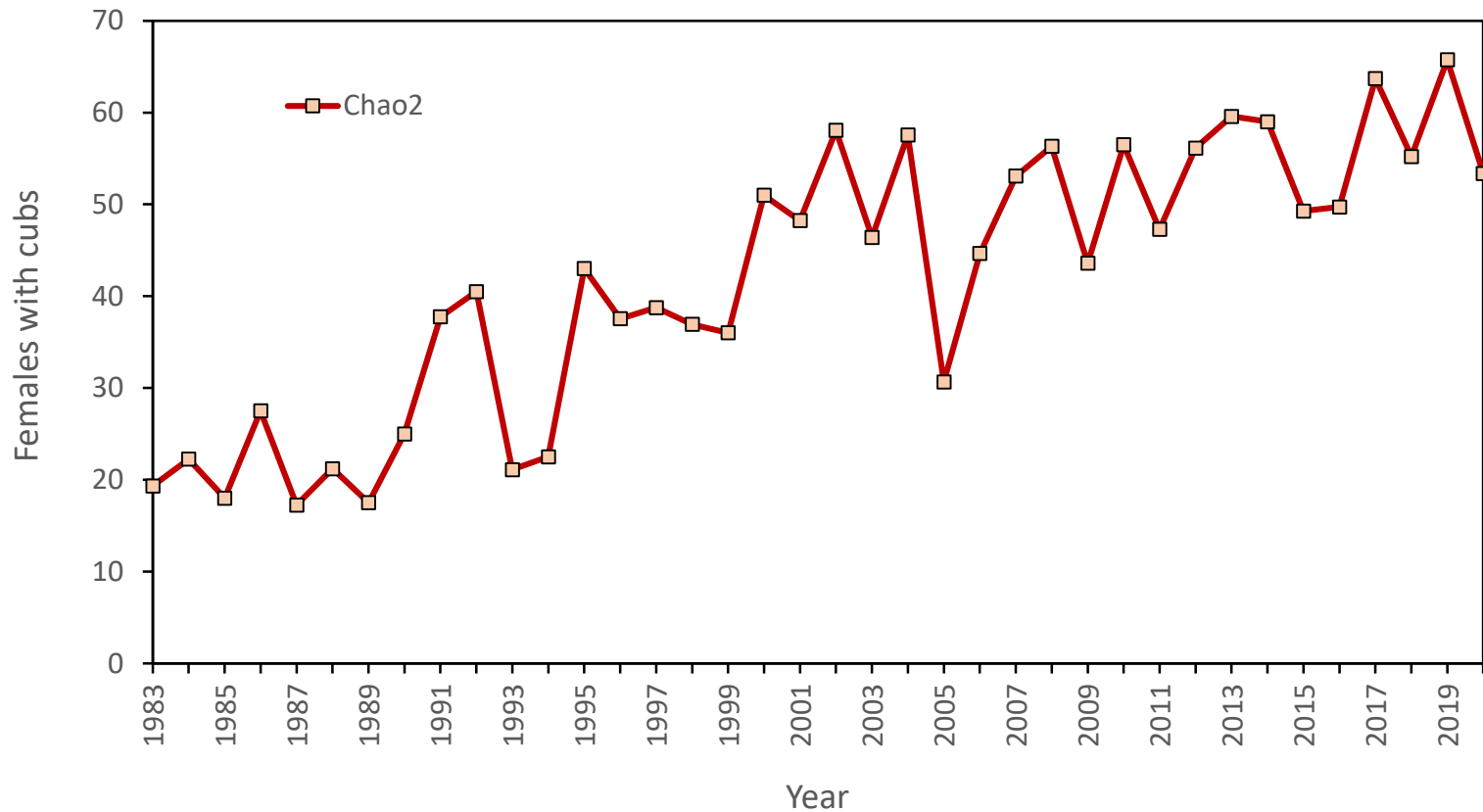
Female with cub observations, den-emergence to 31 August, 2018-2020



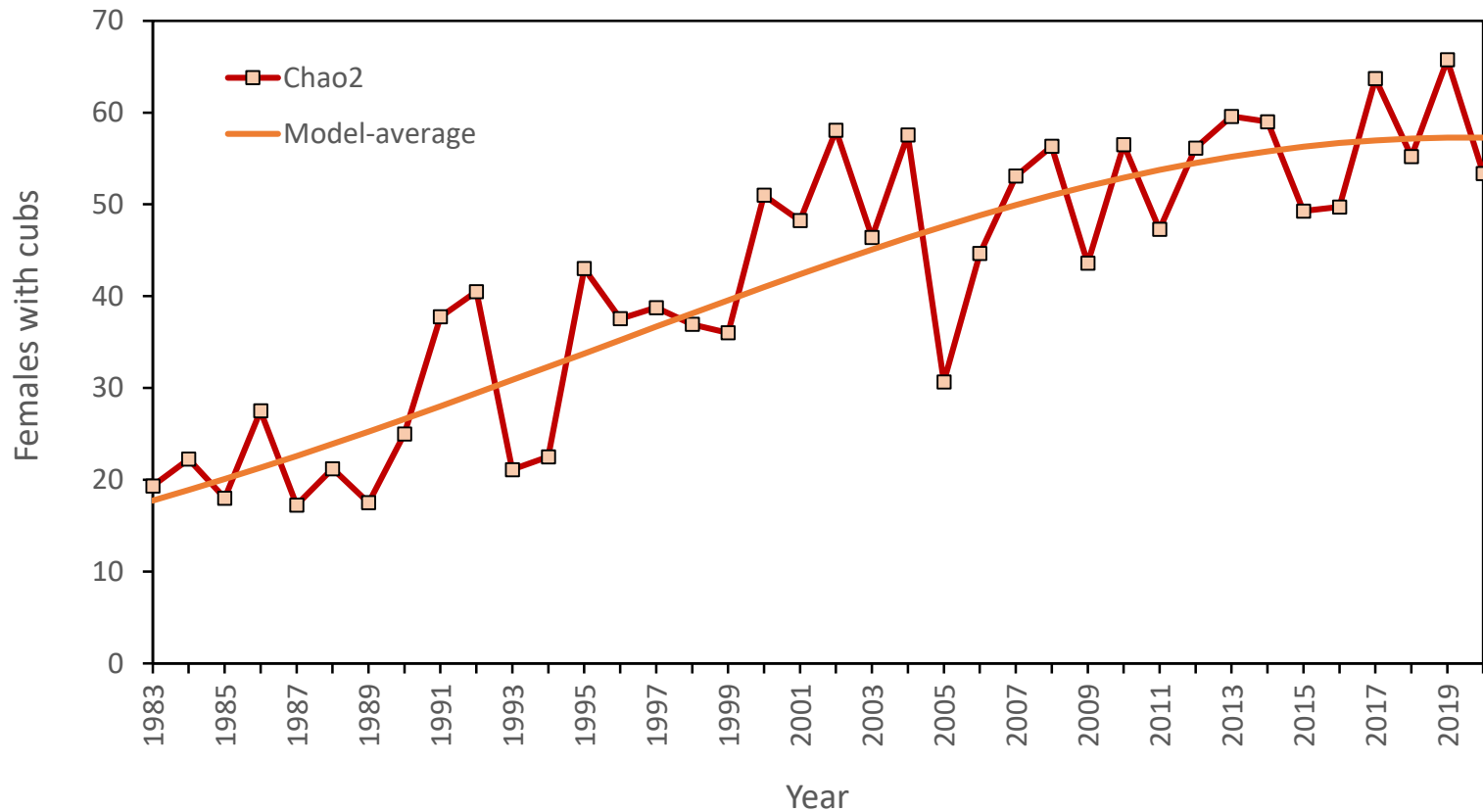
Number of females with cubs 2020 (DMA)

Parameter	Estimate
Unique females with cubs	58
Chao2	53
Model-averaged Chao2	57

Trend in annual estimates of females with cubs 1983-2020 (DMA)



Trend in annual estimates of females with cubs 1983-2020 (DMA)



Total population estimate 2020 (Chao2 estimator; DMA)

Population segment	Estimate	95% confidence interval	
		Lower	Upper
Independent females (≥ 2 yrs old)	252	201	303
Independent males (≥ 2 yrs old)	252	196	307
Dependent young (cubs and yearlings)	223	201	245
Total	727	648	806

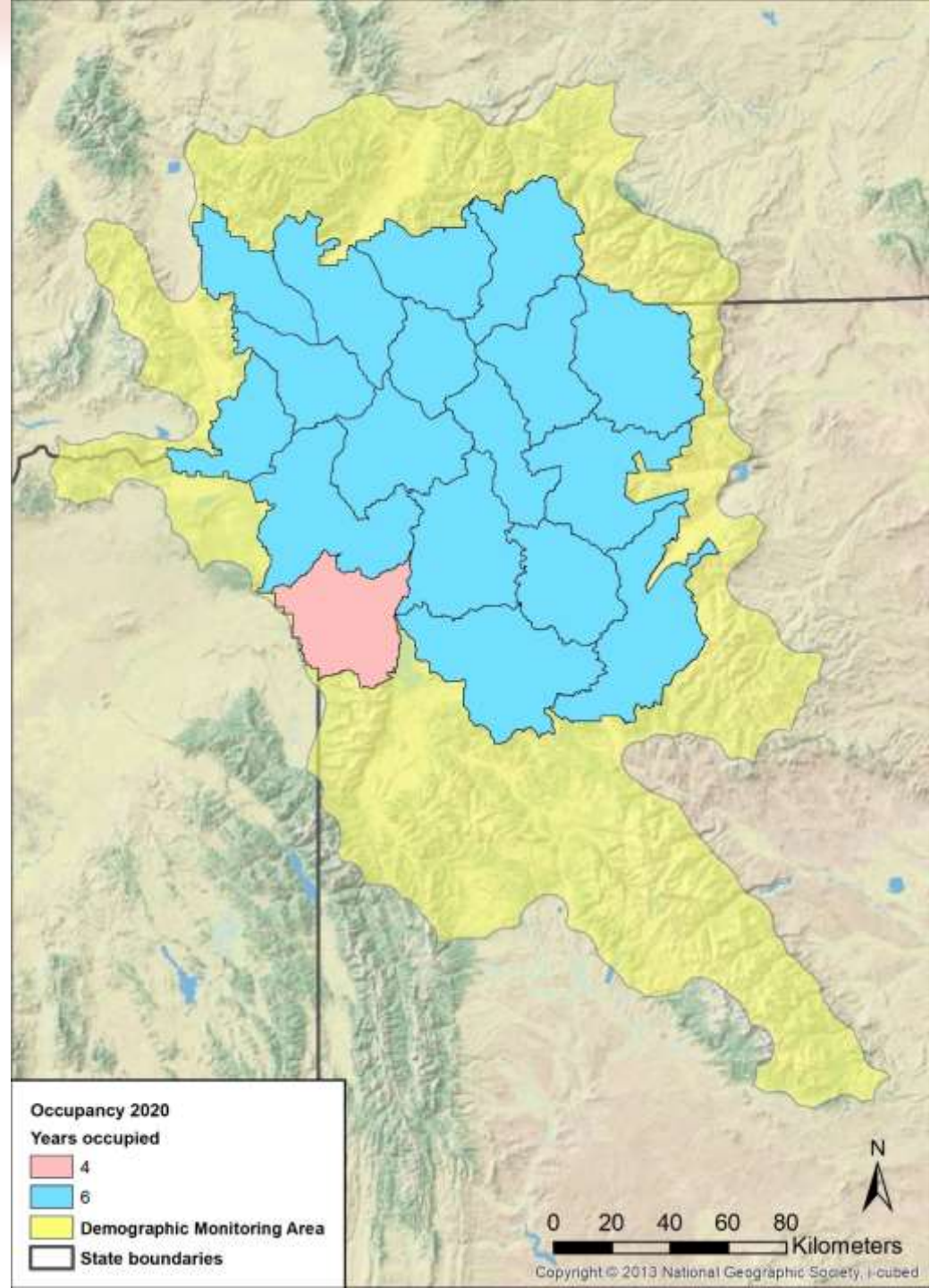
Demographic Recovery Criterion #2: Occupancy by Females with Young



Photo: Jake Davis

Occupancy by females with young (cubs, yearlings, or 2-year-olds) 2020

- 18 of 18 Bear Management Units (BMUs) occupied during 2020)
- 18 of 18 BMUs occupied at least 4 of last 6 years (2015-2020)



Demographic Recovery Criterion #3: Mortalities and Mortality Rates



Photo: WGFD

Known and probable mortalities 2020

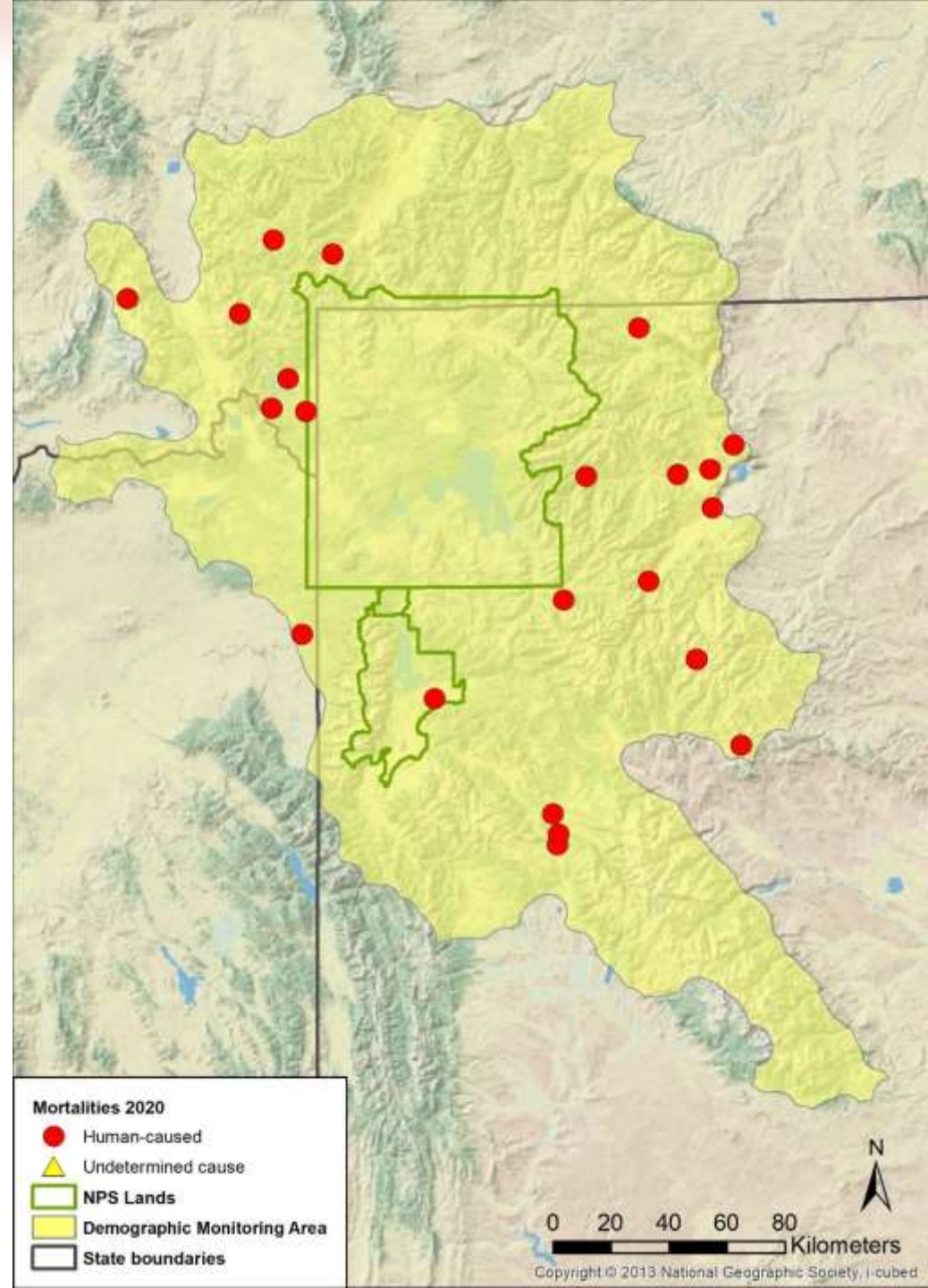
- **25 in DMA**

25 human-caused

0 natural

0 undetermined cause

Mortalities as of 10/25/2020



Known and probable mortalities by area, sex, and age class 2020 (DMA)

Area	Sex	Age class		Total
		Dependent (<2 years old)	Independent (≥2 years old)	
Inside DMA	Female	0	8	8
	Male	0	14	14
	Unknown	3	0	3
	Total	3	22	25

Mortalities as of 10/25/2020

Mortality rate thresholds

	Total Grizzly Bear Population Estimate*		
	≤674	675–747	>747
Total mortality rate for independent <u>FEMALES</u> .	<7.6%	9%	10%
Total mortality rate for independent <u>MALES</u> .	15%	20%	22%
Total mortality rate for dependent young.	<7.6%	9%	10%

Estimated percent mortality for population segments (DMA)

Mortalities as of 10/25/2020

Population segment	Estimated N	Documented mortality	Estimated total mortality ^a	Estimate % mortality
Independent aged females (≥ 2 yrs old)	252	8	14	5.6
Independent aged males (≥ 2 yrs old)	252	14	17	6.8
Dependent young (< 2 yrs old)	223	3		1.3 ^b

^a Unknown/Unreported estimate is not applied to loss of dependent young

^b Estimated from documented human-caused mortalities only

Other Monitoring Data

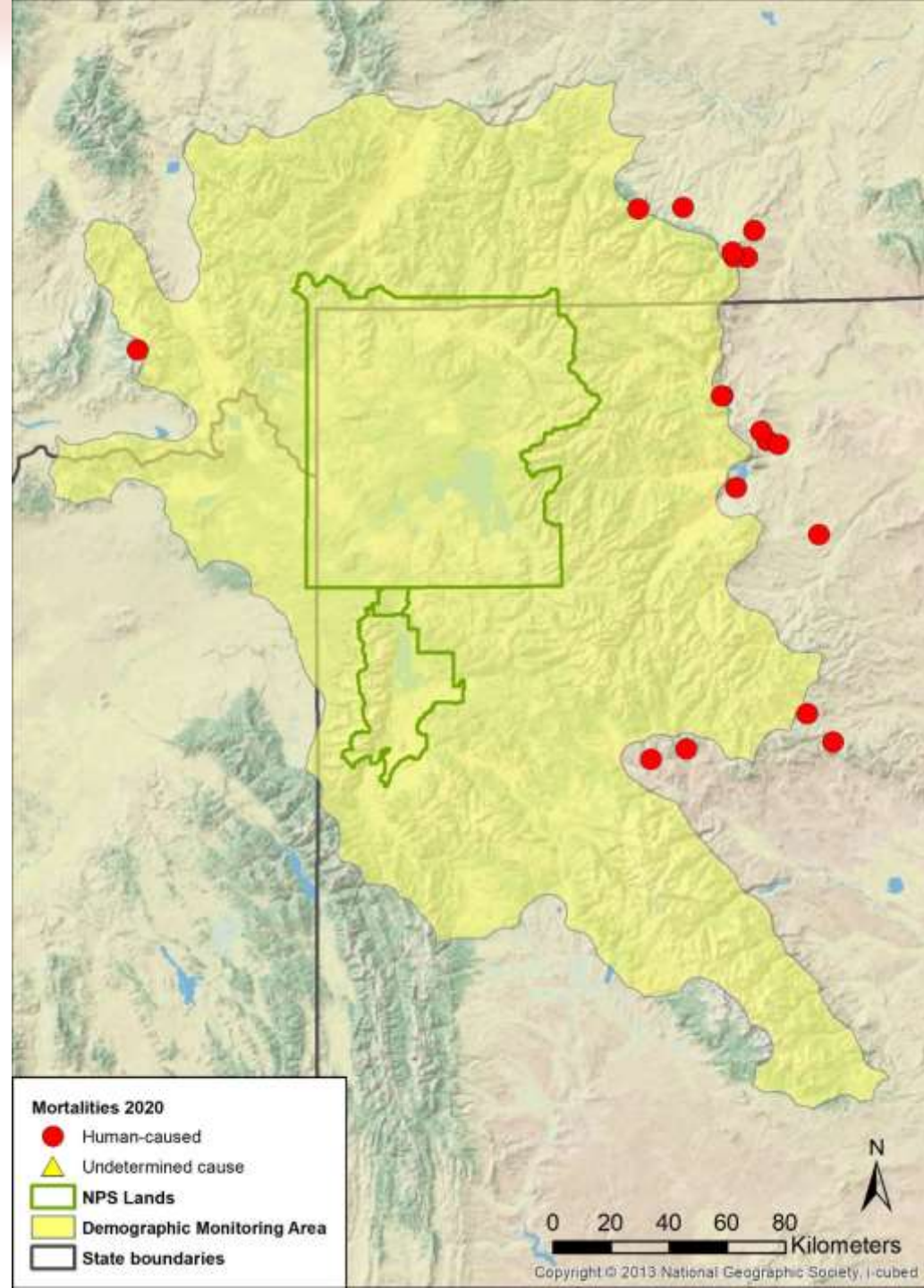


Photo: Jake Davis

Known and probable mortalities 2020

- **25 in DMA**
 - 25 human-caused
 - 0 natural
 - 0 undetermined cause
- **18 outside DMA**
 - all human-caused

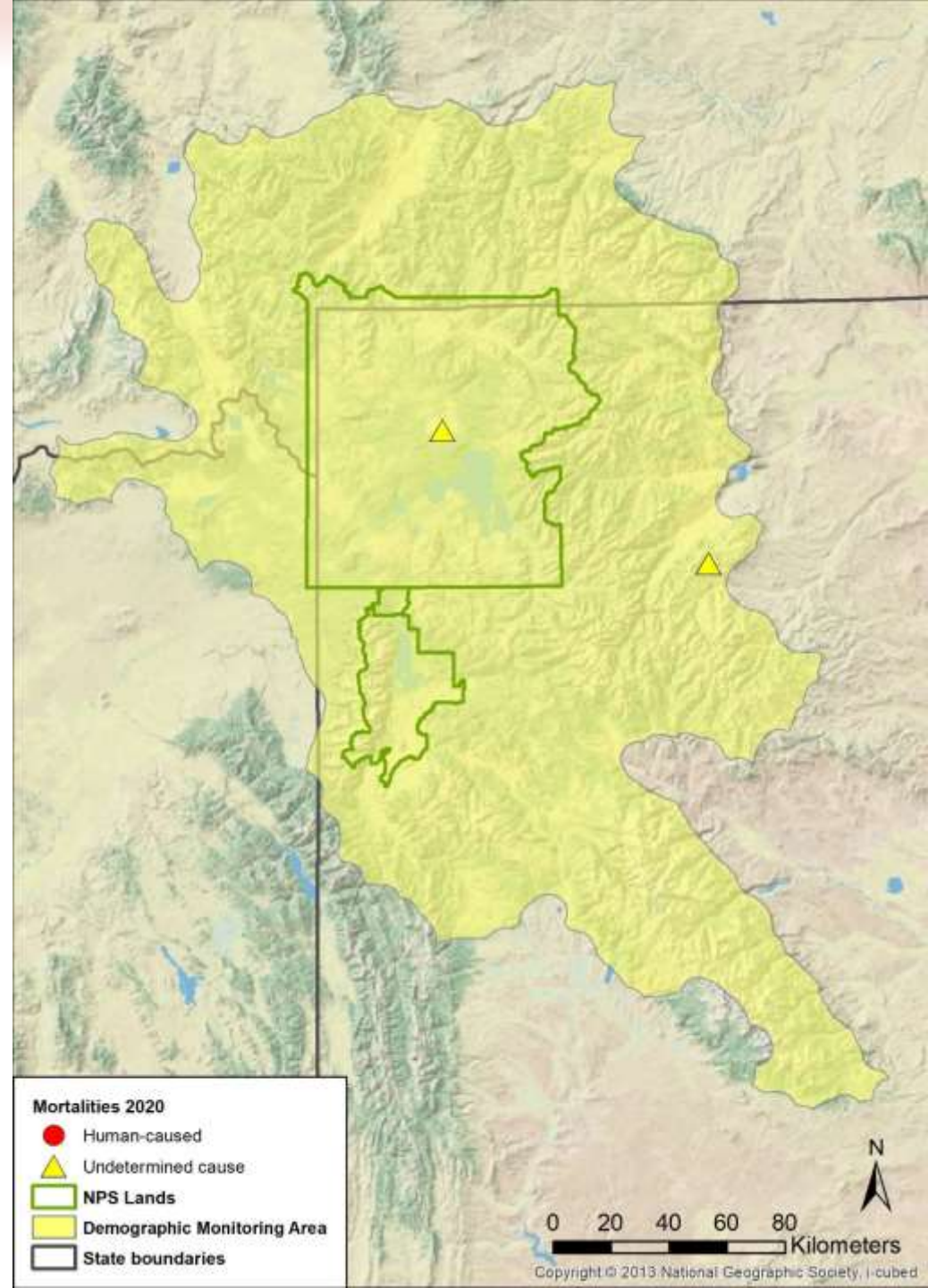
Mortalities as of 10/25/2020



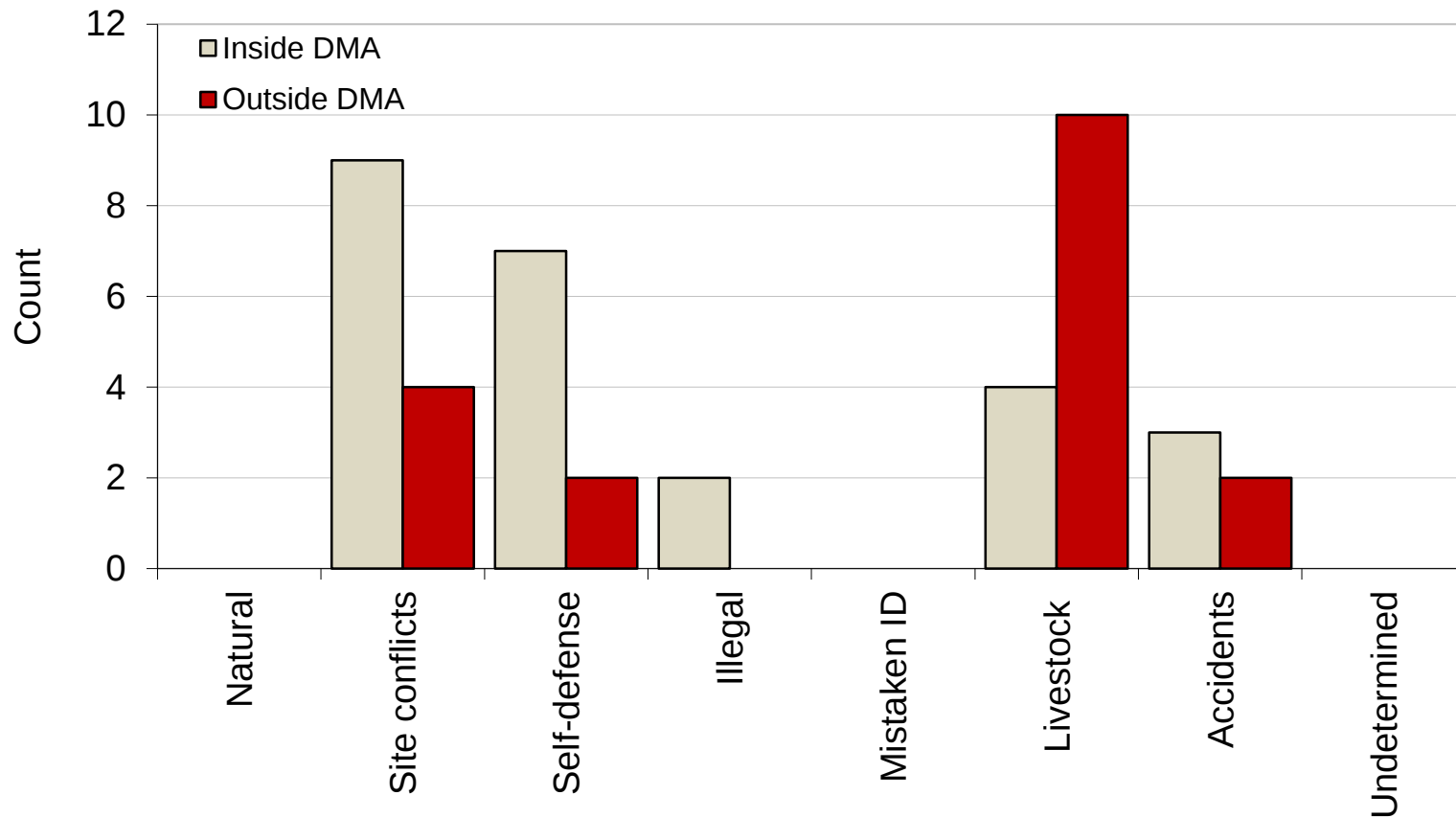
Known and probable mortalities 2020

- 25 in DMA
 - 25 human-caused
 - 0 natural
 - 0 undetermined cause
- 18 outside DMA
 - all human-caused
- 2 additional mortalities from 2019
 - Undetermined causes

Mortalities as of 10/25/2020



Mortalities inside and outside of the DMA by cause in 2020



Mortalities as of 10/25/2020

Captures and Known-Fate Monitoring

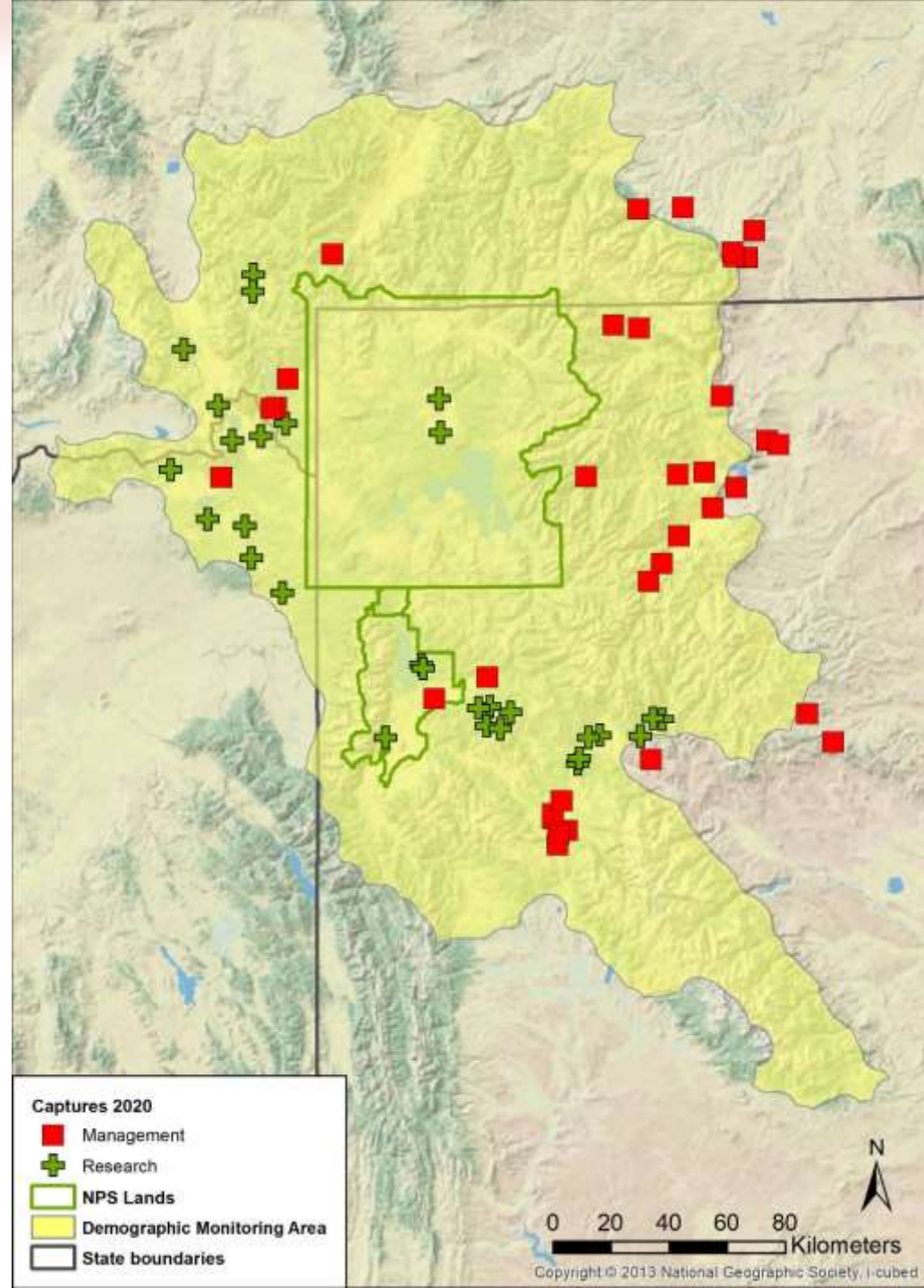


Photo: F. T. van Manen/IGBST

Grizzly bear captures 2020

- **Total captures = 110**
 - Research = 70
 - Management = 40
- **Individuals bears = 93**
 - Females = 32
 - Males = 55
 - Unknown = 6
- **New bears = 59**

Captures as of 10/25/2020



Grizzly bears radio-monitored 2020

Total monitored = 103

Adult females = 39

Current = 59

Females = 37

Males = 22

Bears missing = 2



Photo: J. Hadley/NPS

Monitored as of 10/25/2020

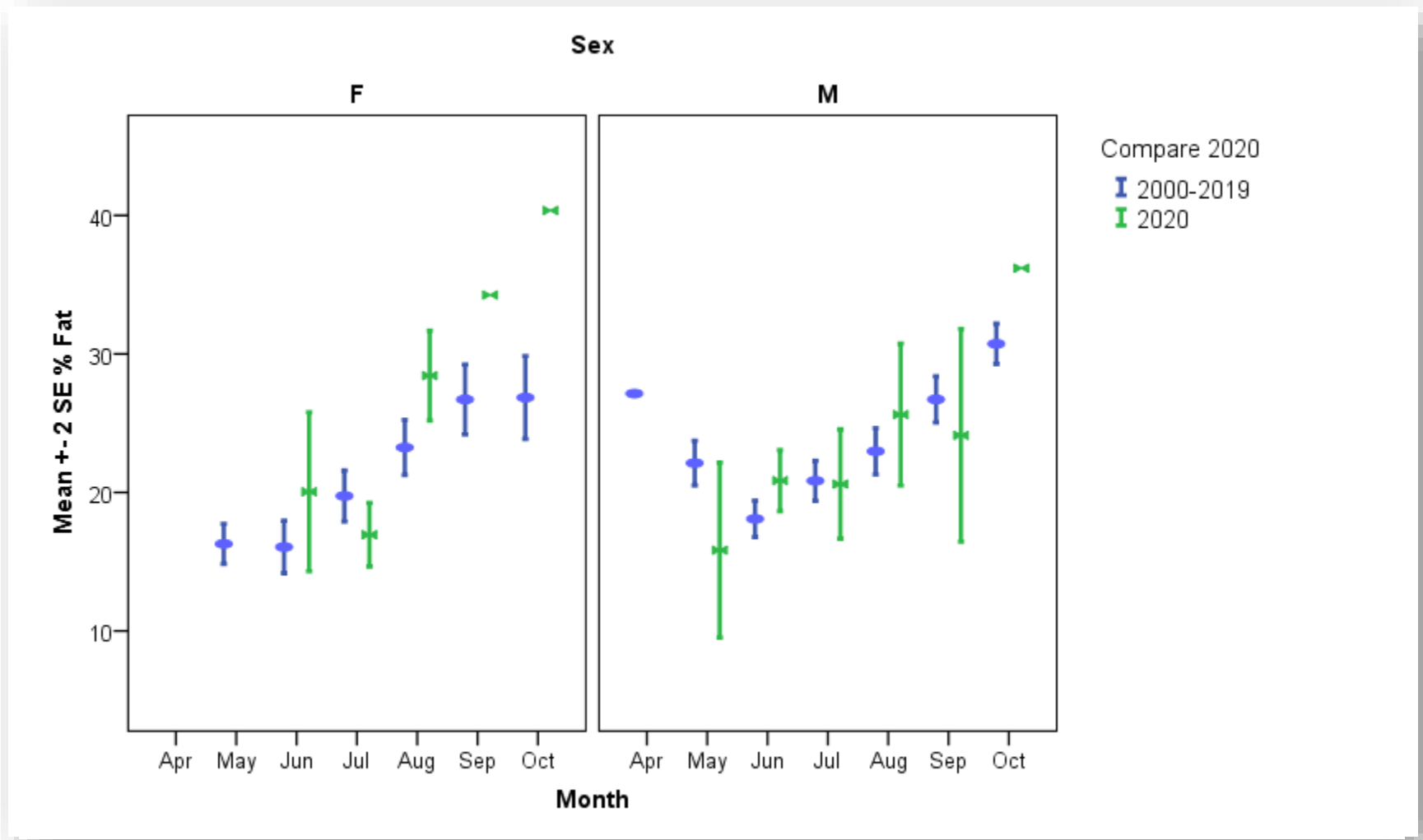
Body Condition and Genetic Monitoring



Estimating body condition (% body fat)

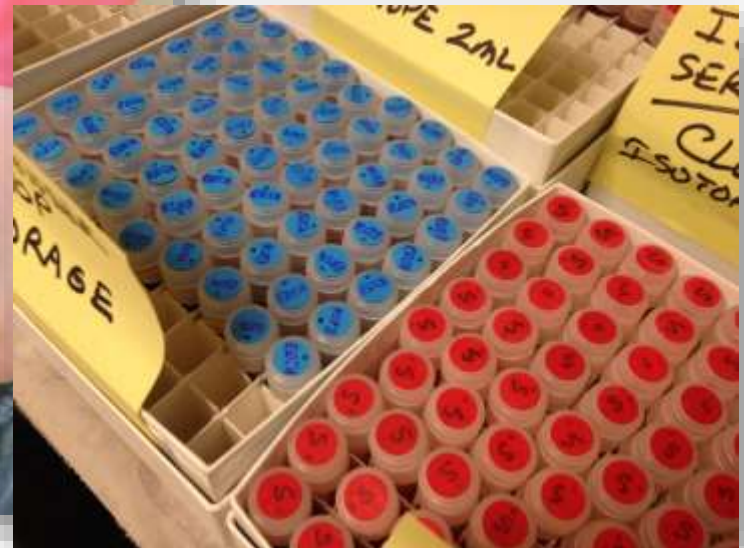


Average % body fat by month, 2000–2019 vs. 2020



Genetic monitoring

- Results through 2018
- **1,186** individuals genotyped (20 microsatellite markers)
- No evidence of non-GYE ancestry in any of the individuals genotyped to date



Summary

Population

- High count for females with cubs in DMA ($n = 58$)
- Population estimate = 727
- No major change from previous years

Mortality

- Primary causes inside DMA: site conflict, self-defense, and livestock
- 2020 mortality rates in DMA
 - Within thresholds for independent females (5.6%)
 - Within thresholds for independent males (6.8.%)
- 42% of mortalities occurred outside the DMA

Year of relatively good food supply

- Good berry production
- Average whitebark pine cone production, better in the north
- High moth site year, bear activity into early October

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



Acknowledgments

IDFG: C. Anderson, P. Atwood, J. Beer, C. Bleke, J. Brower, L. Cepenzski, D. Cureton, J. Farr, K. Garrett, K. Guy, C. Hendricks, R. Howe, C. Johnson, L. Lane, A. McKarley, J. Nicholson, T. Nicholson, M. Pieron, R. Poole, M. Proett, J. Rydalch, J. White

MSU: N. Bowersock, A. Hoegh, A. Litt, E. Loggers,

MTFWP: S. Brozovich, K. Carson, C. Costello, J. Cunningham, D. Fagone, J. Feddes, K. Frey, M. Heaton, B. Lloyd, R. Pickens, R. Pohle, J. Ramsey, J. Smith, D. Scott, S. Stewart, M. Wemple, D. Waltee

NPS N. Adams, G. Angelo, B. Apel, K. Atkins, B. Bennett, J. Bennett, D. Bergum, E. Boyd, C. Butler, M.K. Clark, S. Condolo-Murphy, R. Coscarelli, S. Dewey, C. Donovan, J. Erwin, R. Evans, C. Flaherty, C. Greenbaum, S. Greenbaum, G. Grieco, K. Gunther, D. Gustine, C. Hayden, T. Hayden, A. Hanna, K. Harrigan, D. Harris, S. Hegg, B. Helms, D. Houck, J. Jakicic, B. Johns, E. Johnston, P. Kirchner, M. Landry, C. Liesen, J. Lodge, E. Maki, T. J. Mascia, R. Mascia, S. Mayberry, J. Mills, J. Mohr, J. Moul, L. Muir, P. Navaille, S. Nestler, E. Reinertson, M. Renteria, T. Ritter, A. Rodriguez, J. Roper, W. Scherer, D. Schneider, C. Schoner, P. Schoner, J. Schwabedissen, M. Scott, D. Stahler, P. Stalker, J. Stephenson, L. Stevenson, B. Swift, B. Tatu, T. Tatu, S. Stewart, L. Templin, C. Valdez, J. Warren, G. White, A. Willemain, C. Willemain, J. Willemain, K. Wilmot, G. Wilson, L. Wofford, R. Wofford, M. Wrigley, T. Wyman, A. Zuckerman

Pilots and Observers: N. Cadwell, J. Ortman, M. Packila, K. Robinson, J. Romero, T. Schell

Shoshone and Arapaho Tribes: J. Friday, A. Lawson, B. Snyder

USFS: J. Brandl, S. Derusseau, L. Dickerson, S. Halman, A. Pils, S. Pils, C. Pultz, D. Tyers, L. Raadt;

USFWS: S. Becker, H. Cooley, L. Connell, J. Fortin-Noreus, P. Hnilicka, M. Mazur, S. Stoinski

USGS: D. Dickinson, M. Ebinger, M. Haroldson, B. Karabensh, V. Villalobos, C. Whitman, A. Corradini, F. T. van Manen

WS: K. Glazier, T.J. Dorvall, C. Hoover, J. Meitdke, G. McDougal, J. Rost, D. Tidwell;

WGFD: G. Anderson, C. Atkinson, B. Baker, D. Bjornlie, M. Boyce, J. Clapp, D. Clause, A. Courtemanch, B. Debolt, L. Ellsbury, T. Fieseler, G. Fralick, R. Fuda, M. Gocke, Z. Gregory, H. Haley, M. Hooker, A. Johnson, R. Kindermann, J. Kraft, B. Kroger, K. Lash, D. Lasseter, T. Mong, P. Quick, S. Ryder, J. Stephens, D. Thompson, Z. Turnbull, B. Wise, L. Wood.

