

Spring Research and Monitoring Update Northern Continental Divide Ecosystem 2021 Annual Results



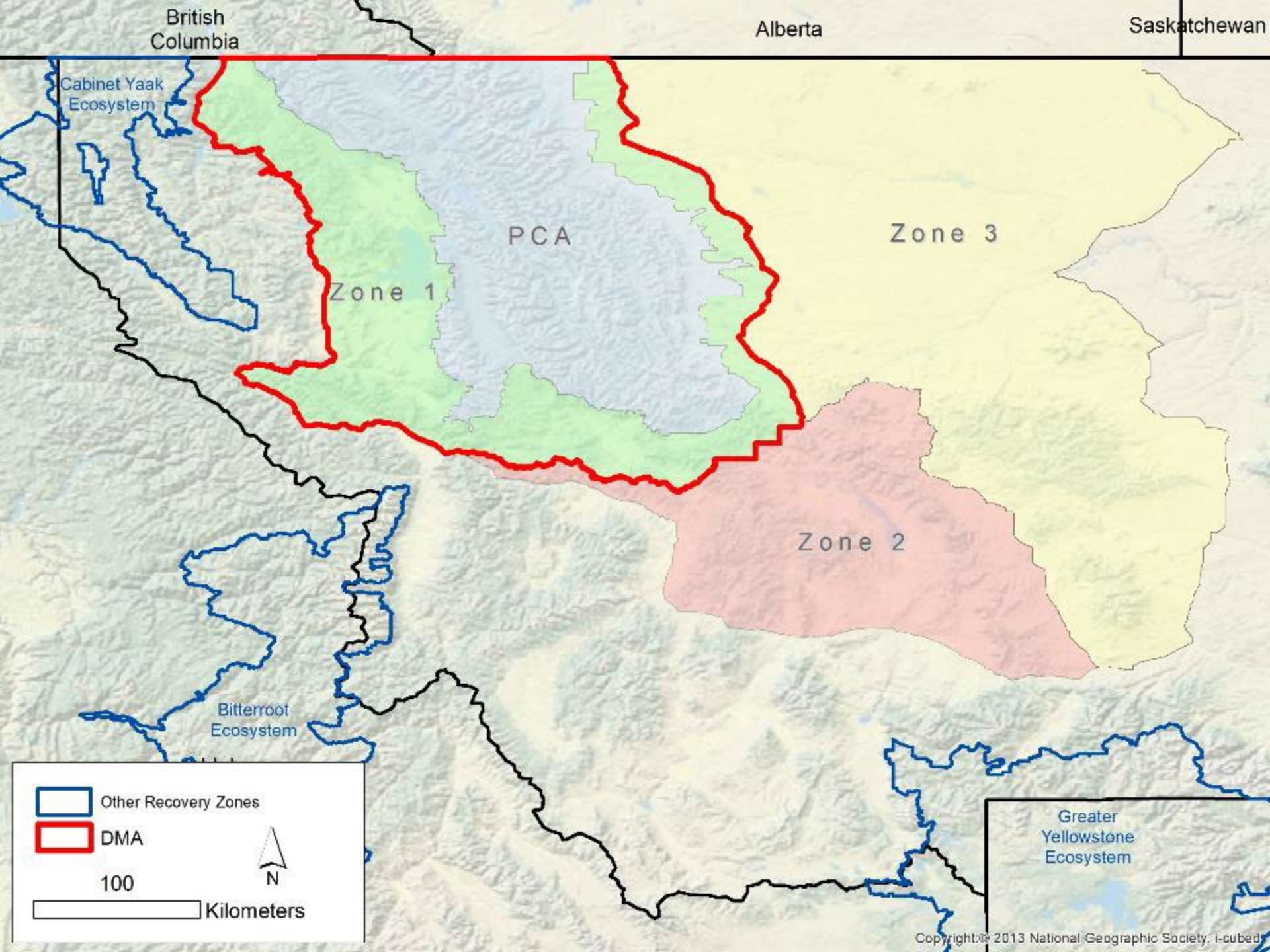
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Topics

Field Data Collection

Conservation Strategy Demographic Objectives

Management Summary



Field Data Collection

Capture

- Trend research: 12 (4F, 8M, 1U)
- Management or other: 61 (29F, 28M, 3U)

Radio-monitoring

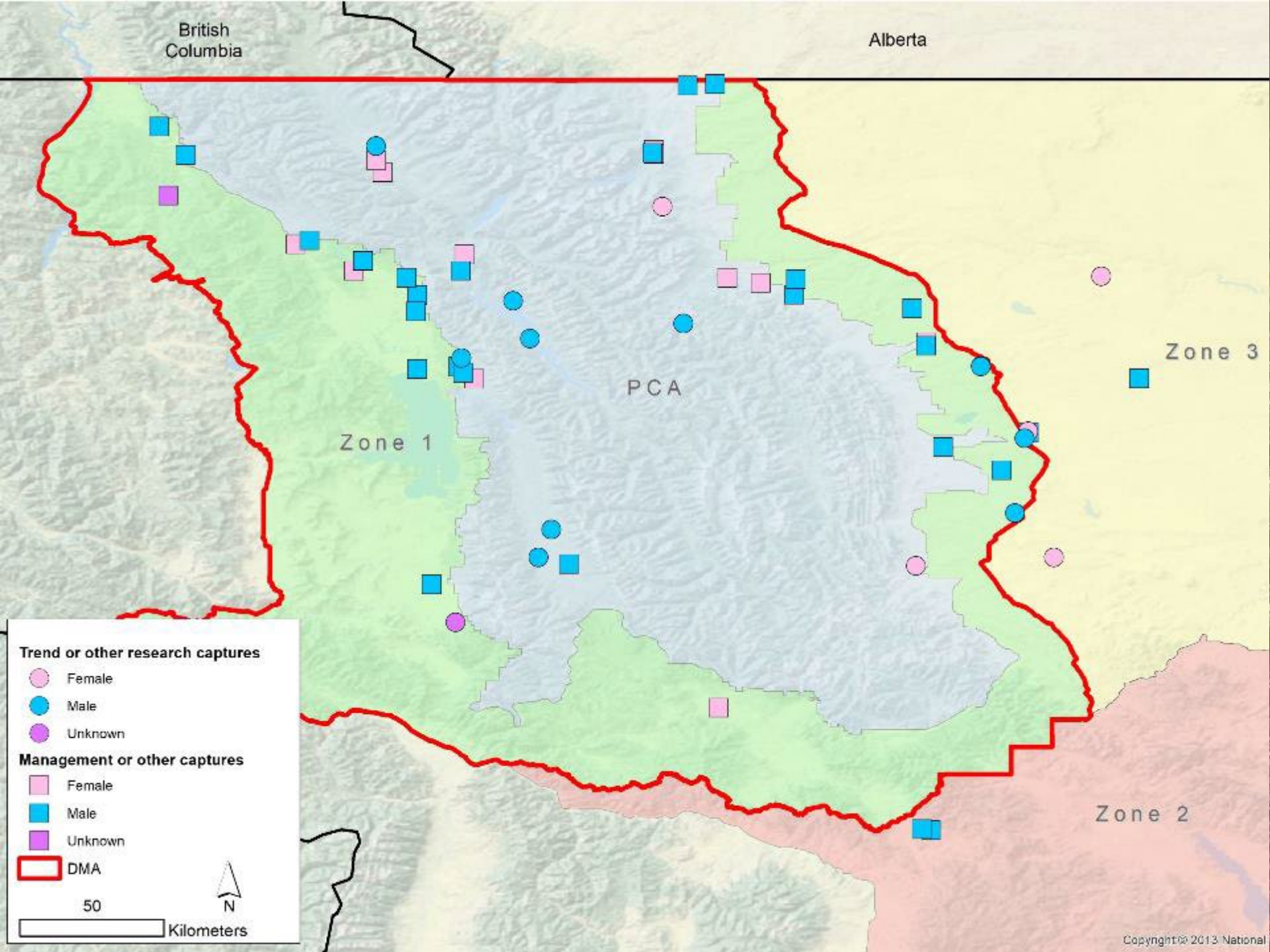
- Trend research: 24 (21F, 3M)
- Management or other: 45 (30F, 15M)

Independent survival monitoring

- Trend research: 3 radioed deaths (2F, 1M)
- Management or other: 4 radioed deaths (1F, 3M)

Reproductive monitoring with telemetry

- Reproductive status: 34 (7 CB, 5 YR, 4 2YO, 1 3YO, 17 NONE)
- Cub survival: 3 litters, 5 individuals (3 alive, 2 dead)
- Yearling survival: 2 litters, 4 individuals (1 alive, 3 dead)

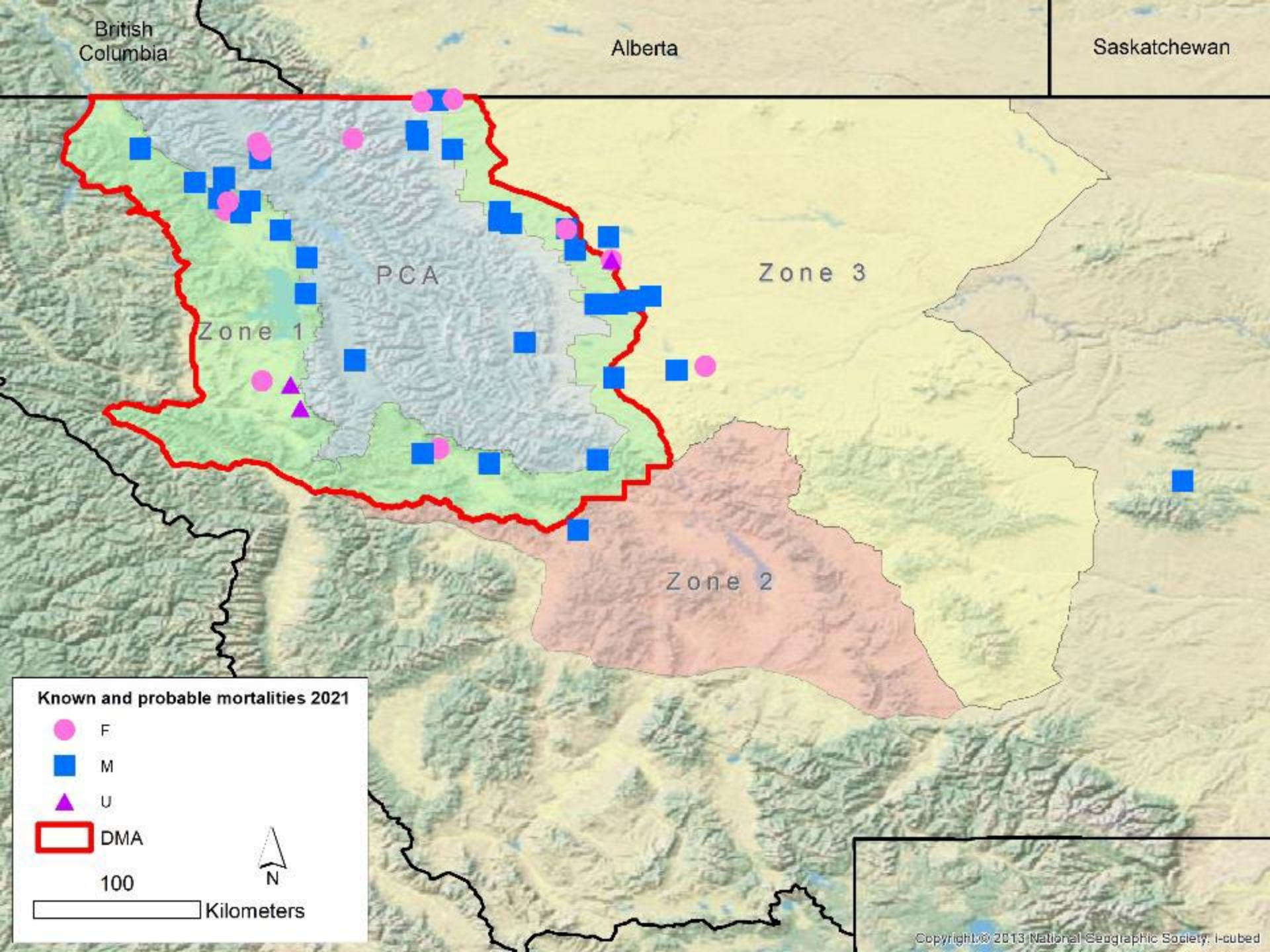


Documented Mortalities

All zones, all age classes

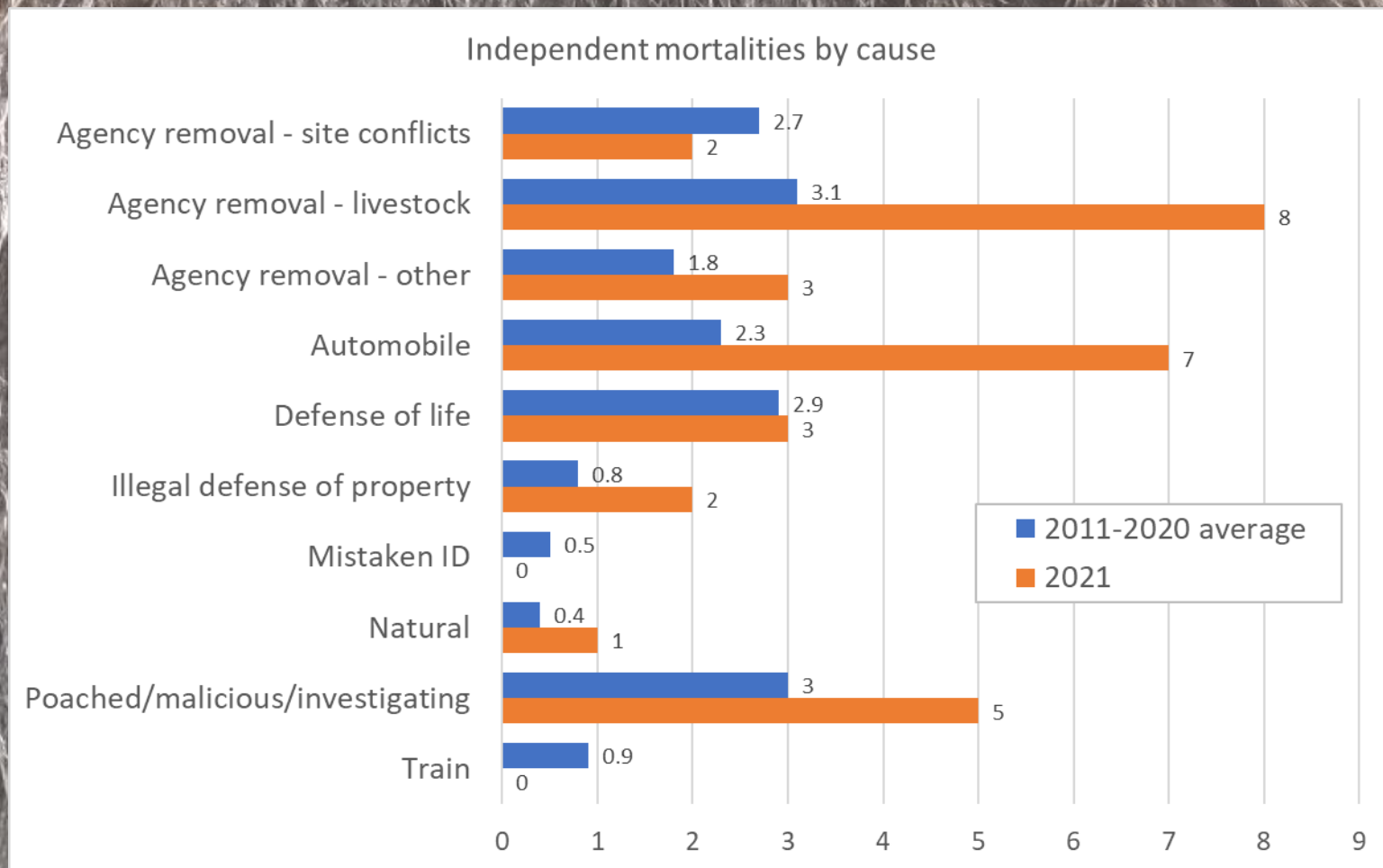
Documented mortalities 2021

		Unknown			
	Ageclass	Female	Male	sex	Total
Inside DMA	Dependent	6	4	1	11
	Independent	10	22	1	33
	Total	16	26	2	44
Outside DMA	Dependent	0	2	1	3
	Independent	2	6	0	8
	Total	2	8	1	11



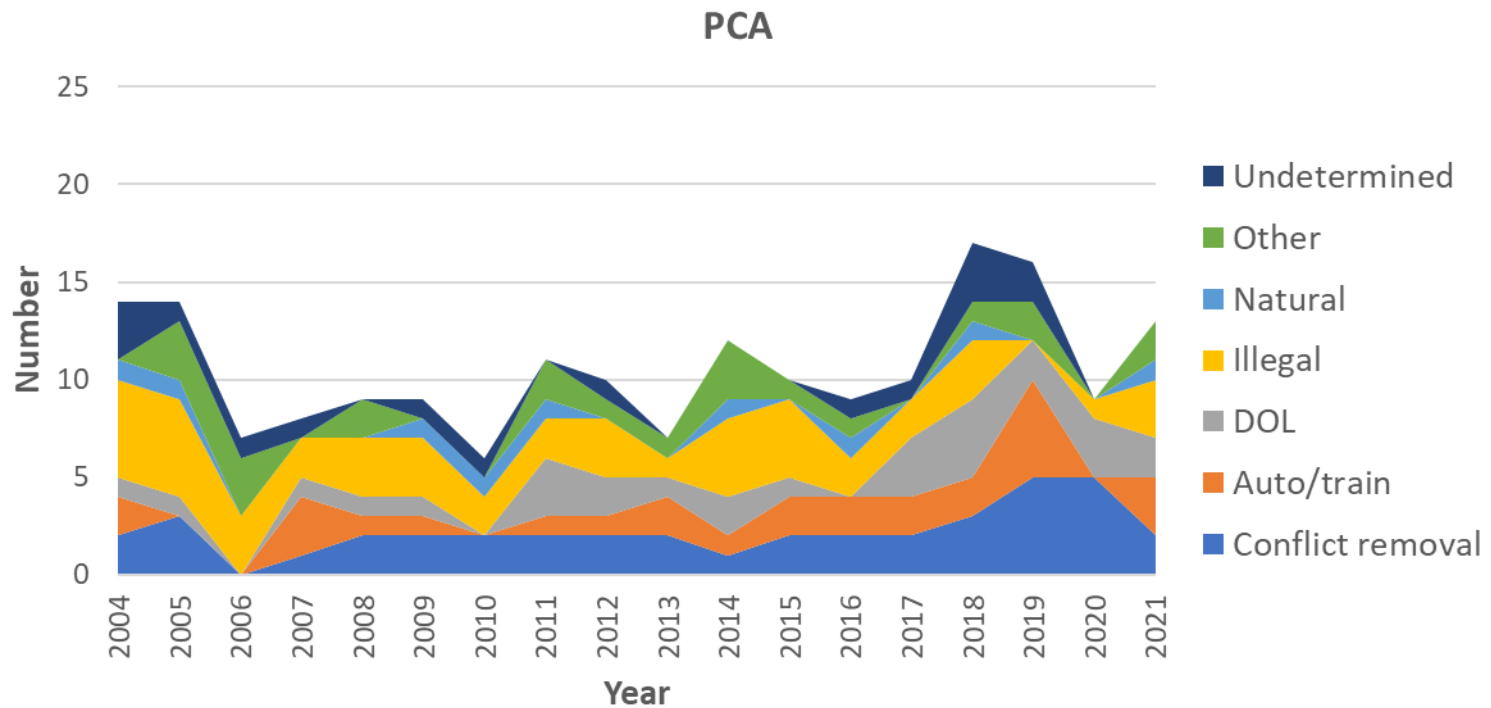
Cause of Death

Independent bears inside DMA



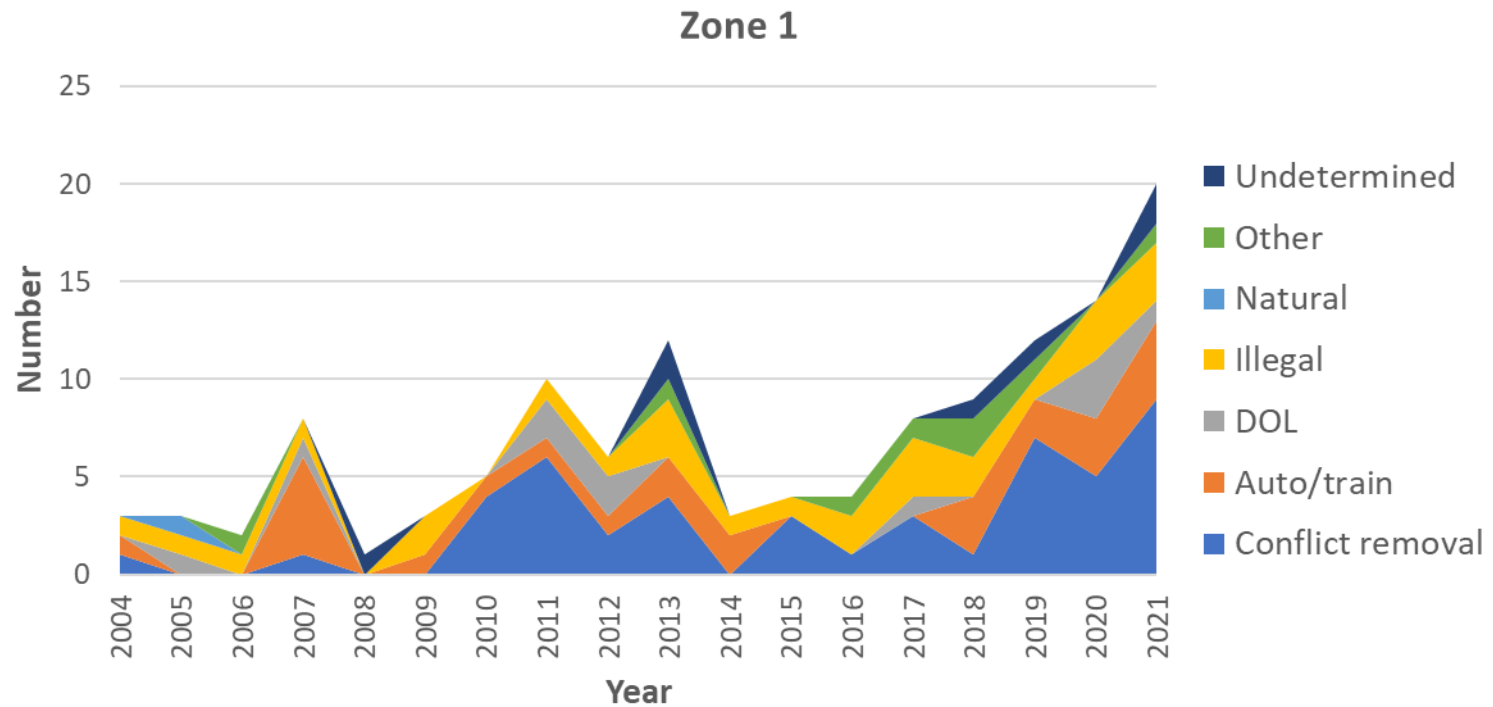
Cause of Death

Independent bears in PCA



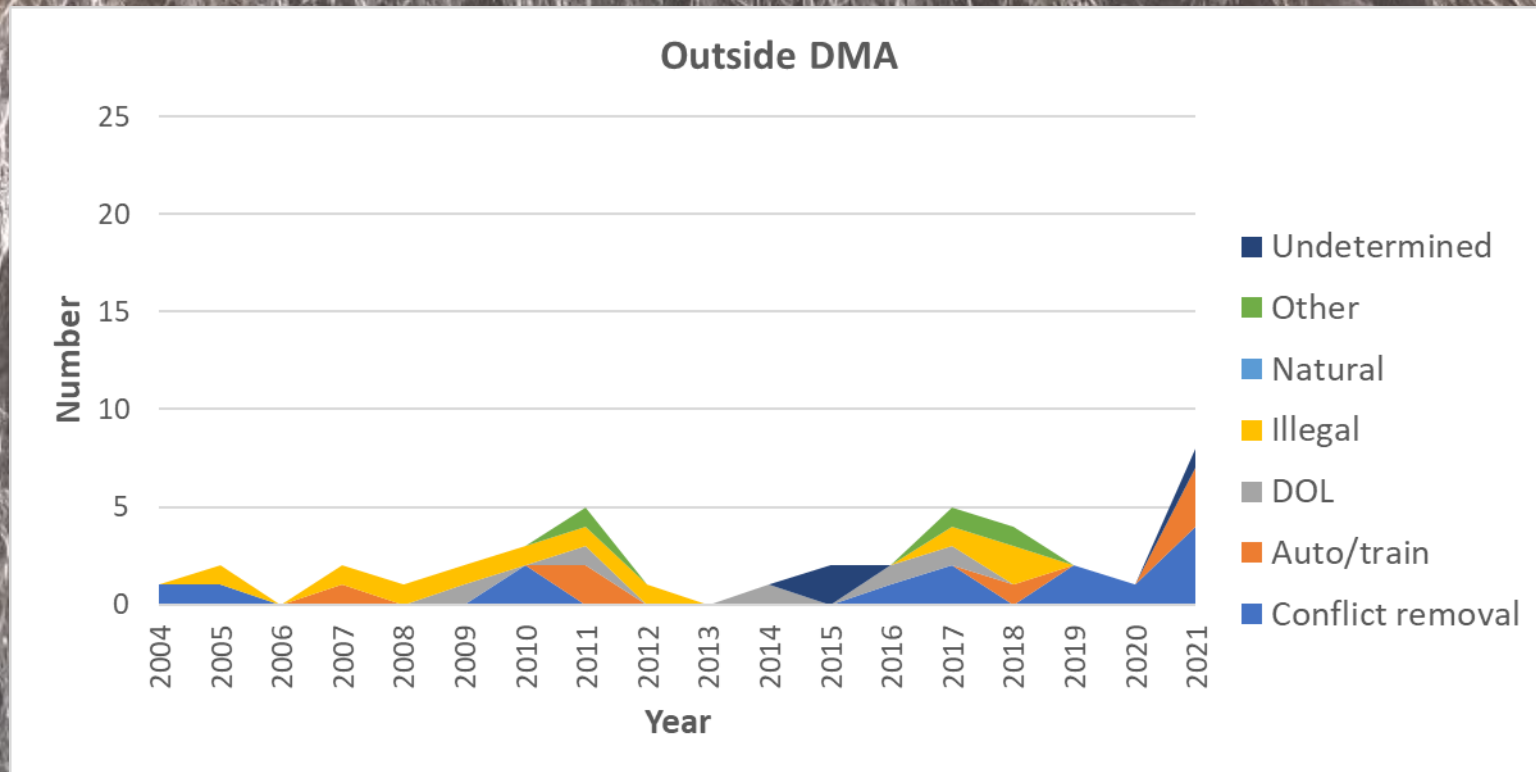
Cause of Death

Independent bears in Zone 1



Cause of Death

Independent bears outside DMA



British
Columbia

Alberta

Zone 3

Zone 1

Great Bear
PCA

Bob Marshall

Scapegoat

Zone 2

Wilderness Areas

DMA

60

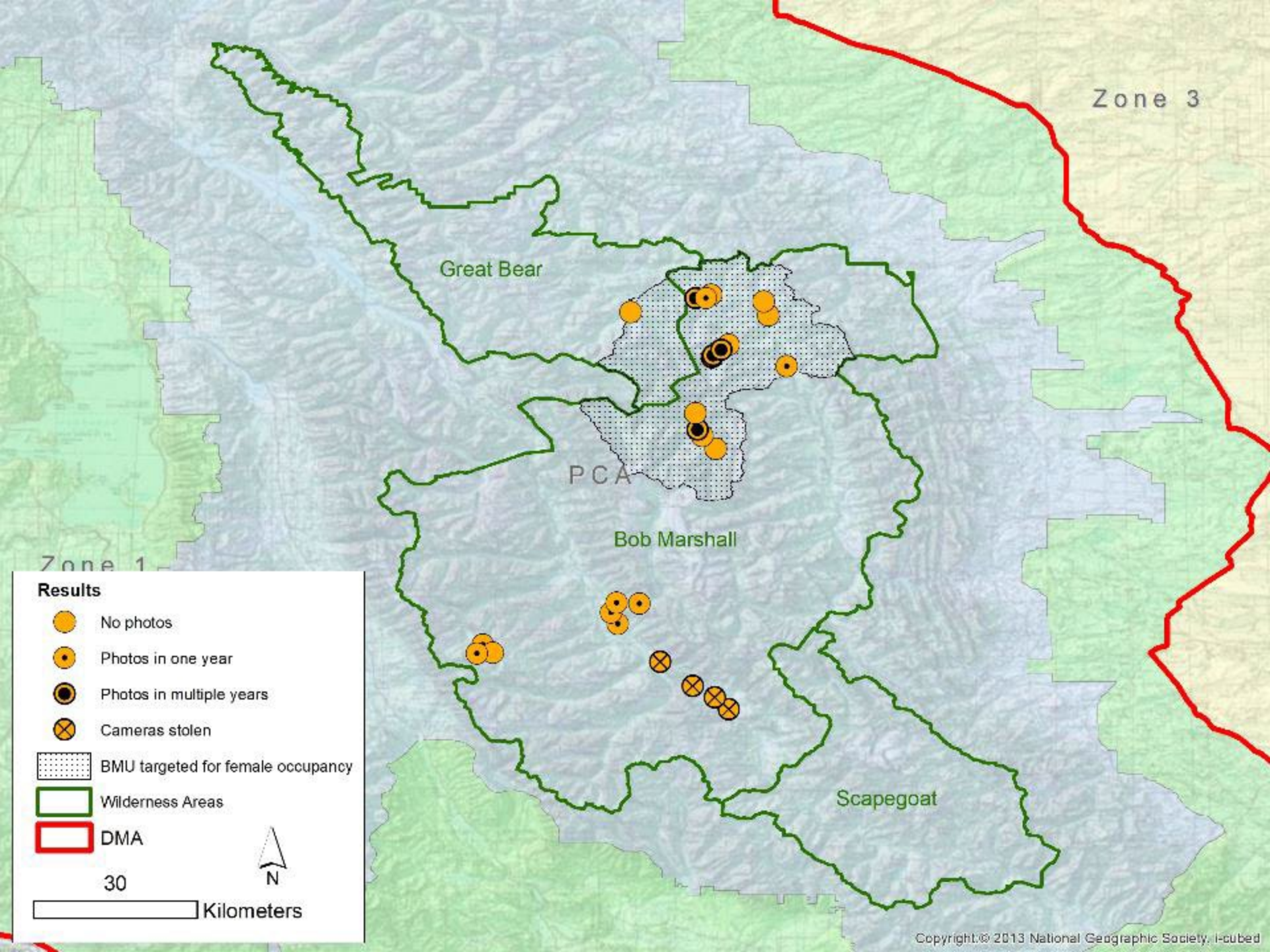


Kilometers

Wilderness Camera Effort

Year	Cameras	Days*	Grizzly Photos	Grizzly DNA
2018	11	580	4	2
2019	9	1229	7	0
2020	12	1708	6	0
2021	7	787	4	0
Total	39	4304	21	2

* Excludes Dec 1 to March 31



Zone 3

Great Bear

PCA

Bob Marshall

Scapegoat

Results

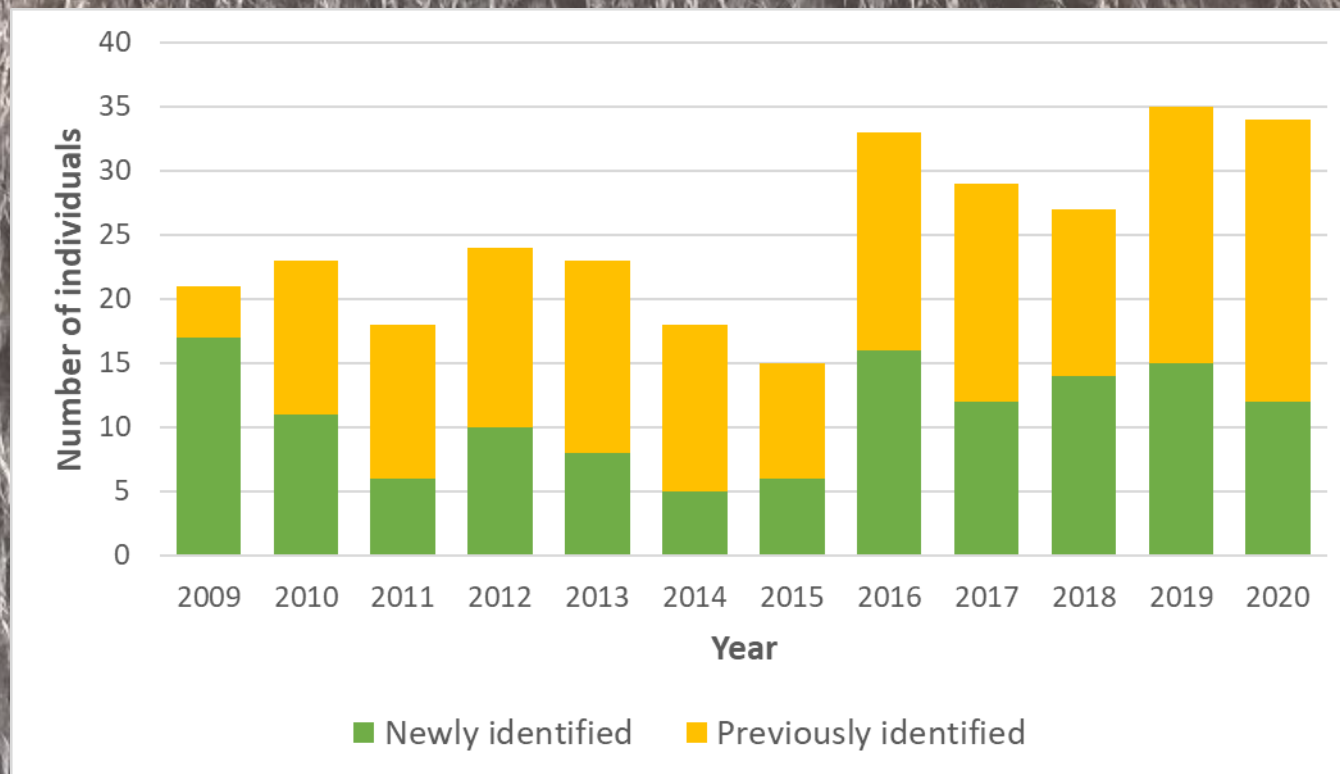
- No photos
- Photos in one year
- Photos in multiple years
- ⊗ Cameras stolen
- ▨ BMU targeted for female occupancy
- ▭ Wilderness Areas
- ▭ DMA

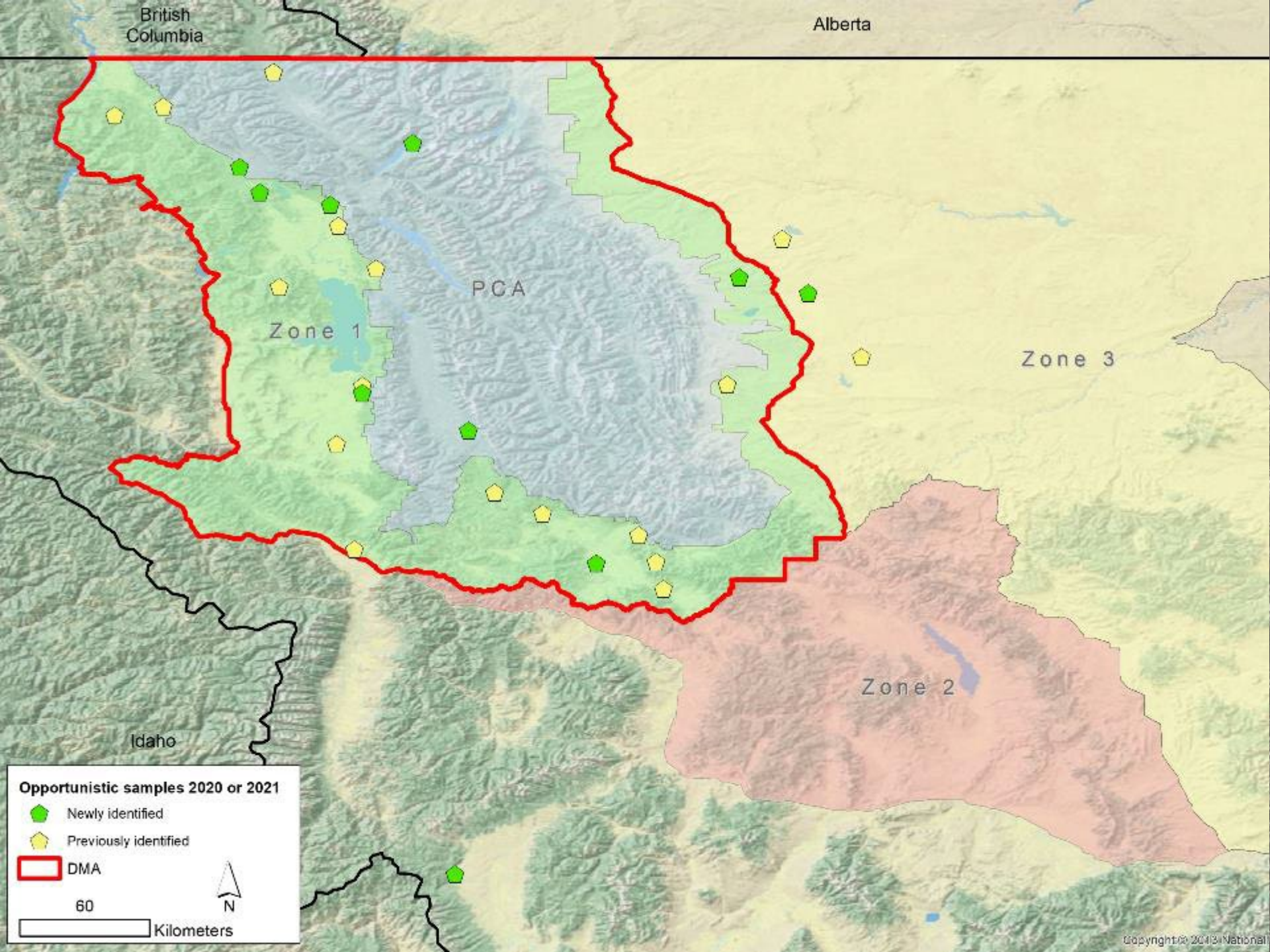
30



Kilometers

Opportunistic DNA Samples





Conservation Strategy Demographic Objectives

Occupancy thresholds - Maintain the documented presence of females with dependent offspring, at least every 6 years, in at least:

≥21 of 23 Bear Management Units of the PCA/Recovery Zone

≥6 of 7 Occupancy Units of Zone 1



Occupancy thresholds

Bear Management Unit (PCA)	2016	2017	2018	2019	2020	2021	6-year
Murphy Lake		×			×		×
Upper North Fork Flathead	×	×		×	×	×	×
Northeast Glacier	×	×	×	×	×	×	×
Stillwater River			×	×	×	×	×
Lower North Fork Flathead	×	×	×	×	×	×	×
Hungry Horse	×	×	×	×	×	×	×
Lower Middle Fork Flathead	×	×	×	×	×	×	×
Southeast Glacier	×	×	×	×	×	×	×
Sullivan	×	×	×	×	×	×	×
Upper Middle Fork Flathead	×	×	×				×
Badger Two Medicine	×	×	×	×	×		×
Mission Range	×	×	×	×	×	×	×
Bunker	×	×	×	×	×	×	×
Continental Divide					×		×
Birch Teton	×	×	×	×	×		×
Big Salmon			×	×	×	×	×
North Fork Sun River		×	×	×	×		×
Teton Sun River		×		×	×	×	×
Rattlesnake	×					×	×
Upper South Fork Flathead		×				×	×
South Fork Sun Beaver Willow		×	×	×	×	×	×
Monture Landers Fork	×	×		×	×	×	×
Dearborn Elk Creek		×		×	×	×	×

Occupancy thresholds

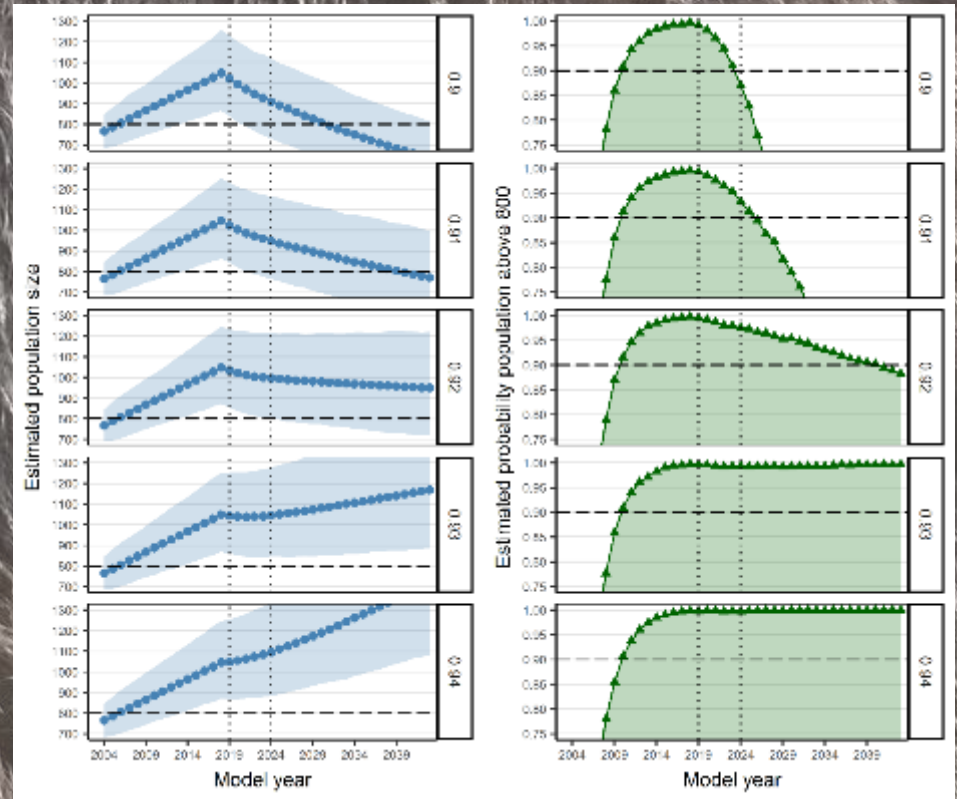
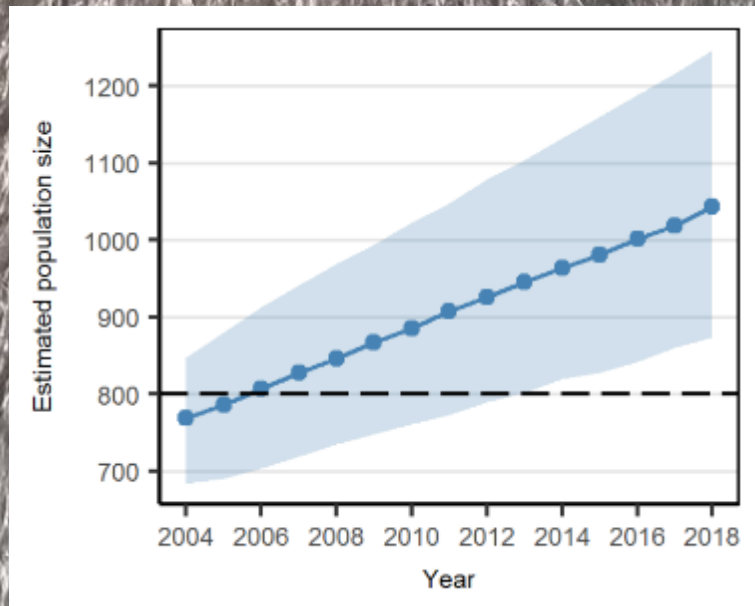
Occupancy Unit (Zone 1)	2016	2017	2018	2019	2020	2021	6-year
Salish Connectivity Area	x	x	x	x	x	x	x
Flathead Valley	x	x	x	x	x	x	x
Flathead Reservation	x	x	x	x	x	x	x
Ninemile Connectivity Area			x	x	x		x
South End	x	x	x	x	x	x	x
East Front	x	x	x	x	x	x	x
Blackfoot Reservation	x	x	x	x	x	x	x

Conservation Strategy Demographic Objectives

Independent female survival threshold - Using a six-year running average, maintain estimated annual survival of independent females of:

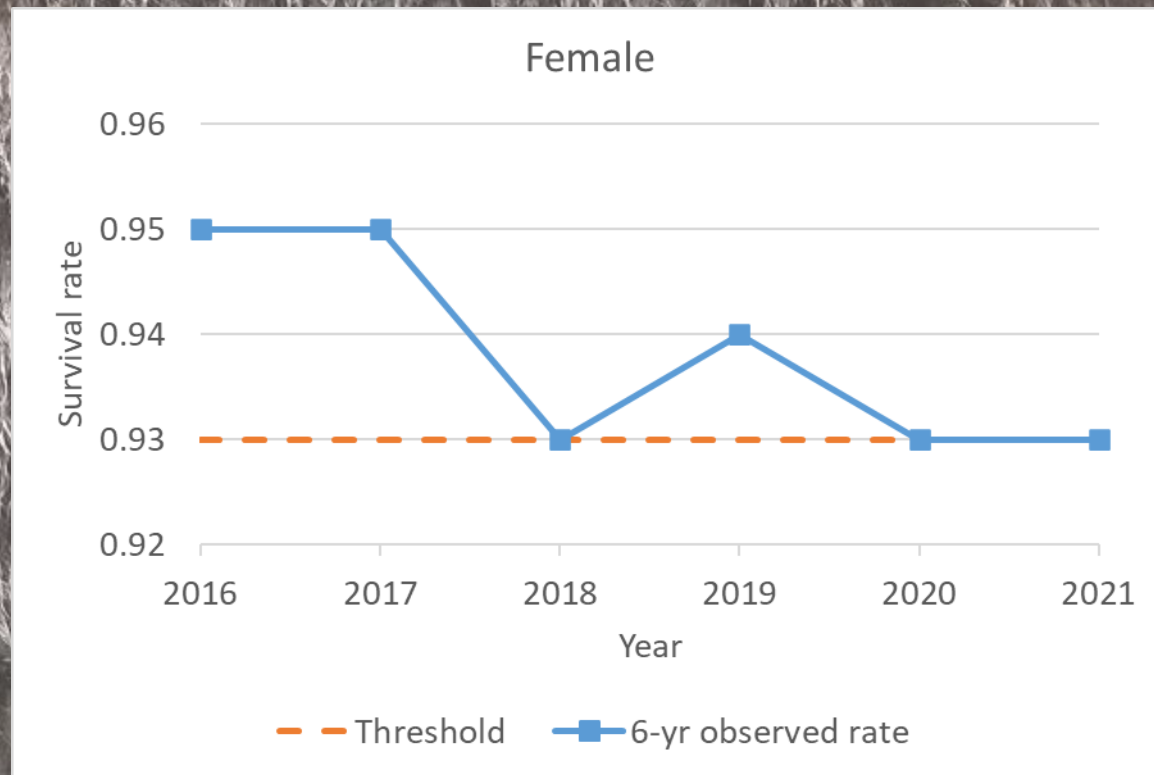
≥ 0.93 = the 2021 threshold rate consistent with a projected 90% probability that the population within the DMA will remain above 800 bears

Conservation Strategy Demographic Objectives



2021 population estimate within DMA = 1114 grizzly bears

Independent female survival threshold



Conservation Strategy Demographic Objectives

Independent mortality thresholds Using a 6-year running average, limit annual estimated number of total reported and unreported mortalities (TRU mortalities) to:

Females

≤ 25 = the 2021 threshold number consistent with a projected 90% probability that the population within the DMA will remain above 800 bears

Males

≤ 30 = the 2021 threshold number consistent with a projected 90% probability that the population within the DMA will remain above 800 bears

Independent mortality thresholds

Documented mortalities 2021

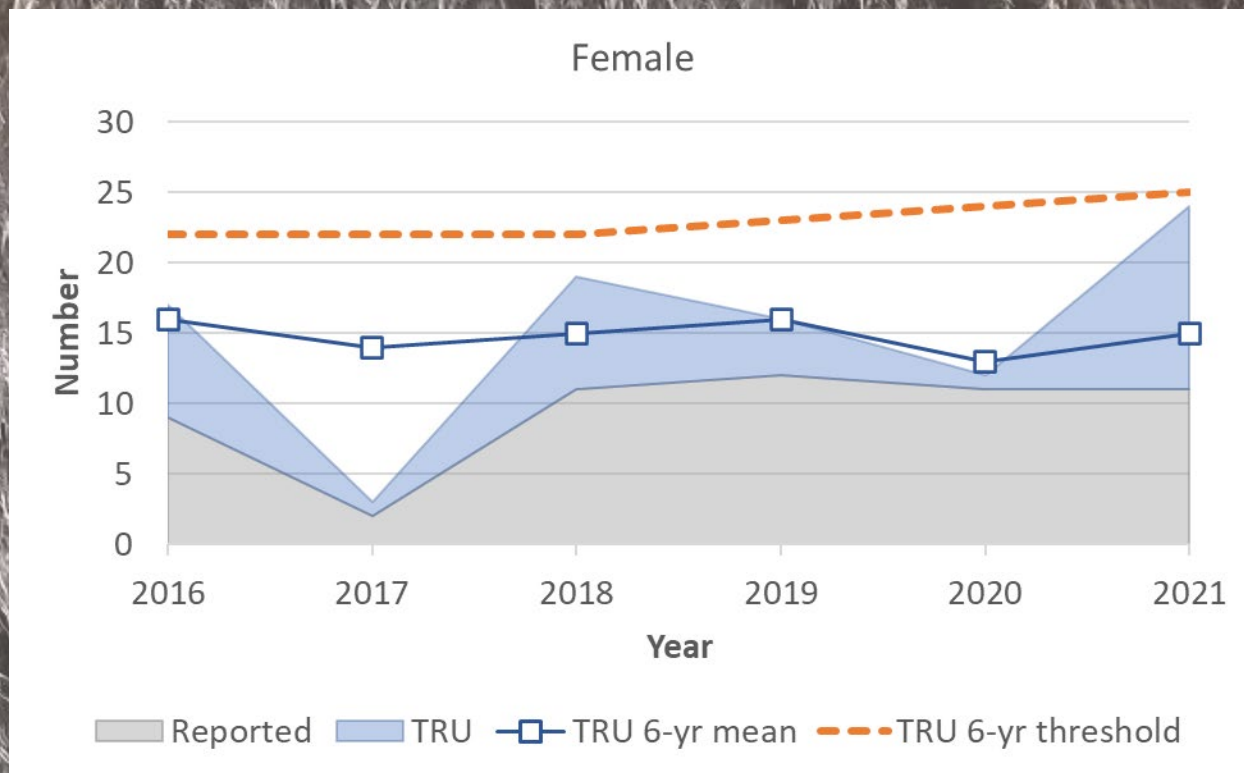
	Ageclass	Female	Male	Unknown sex	Total
Inside DMA	Independent	10	22	1	33



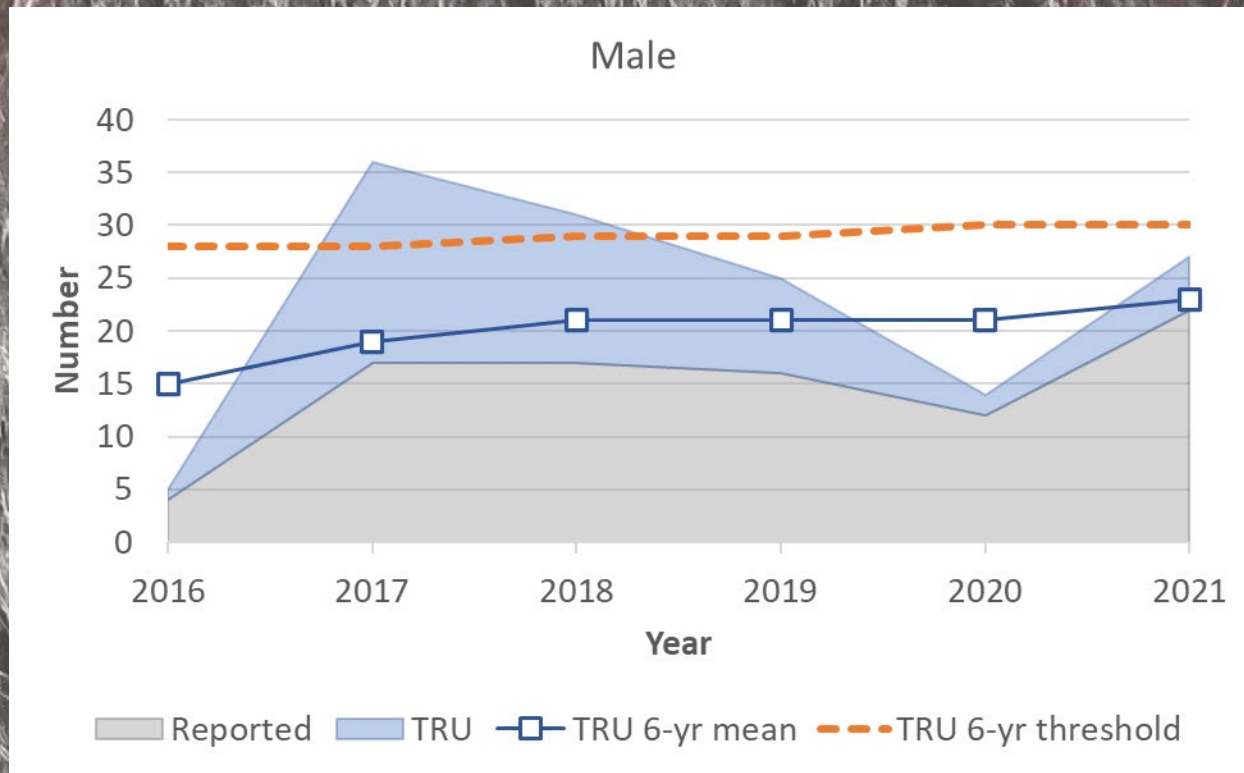
Estimated total reported & unreported (TRU) mortality 2021

	Agency removal (A)	Telemetry (B)	Reported (high)	Reported (low)	Estimated reported and unreported (C)	Estimated total mortality (A+B+C)
Female	5	2	1	3	17	24
Male	8	2	11	1	17	27

Independent mortality thresholds



Independent mortality thresholds



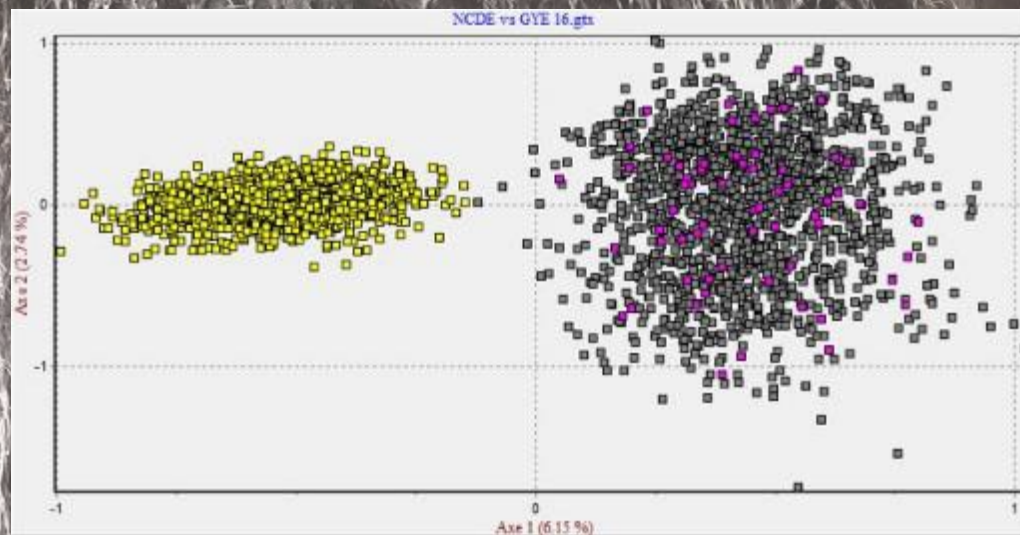
Preliminary Information-Subject to Revision.

Monitor genetic and demographic connectivity

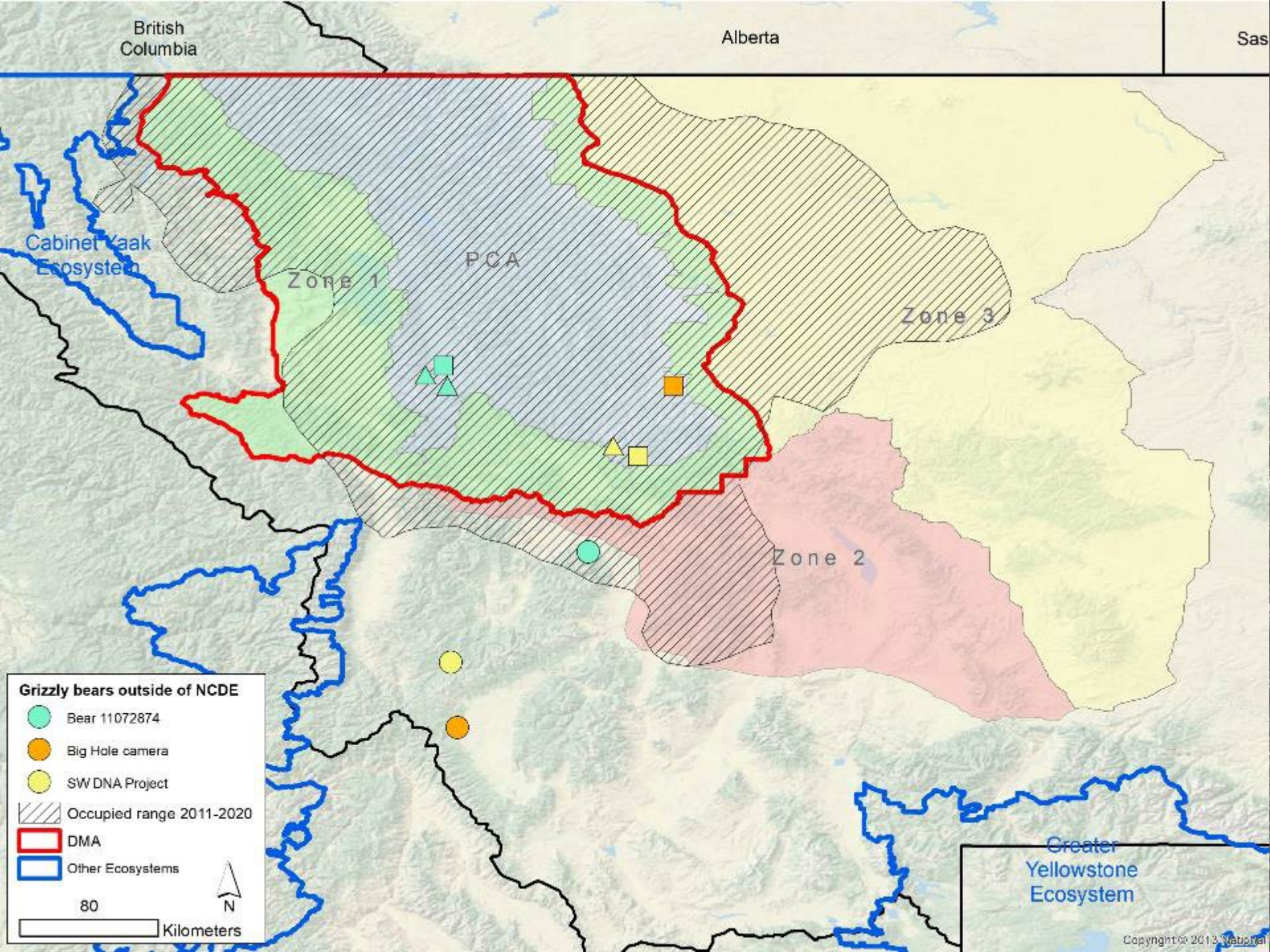
Estimate spatial distribution of the population
biennially

Identify population of origin for individuals sampled
inside and outside of the DMA

Movements between ecosystems



- No evidence of movements of individuals between the NCDE and GYE from DNA data through 2020
- Bear 842012037, captured at age 3 in the Stillwater watershed of the NCDE in 2020, was identified as an offspring of C20072F from the Cabinet Mountains.

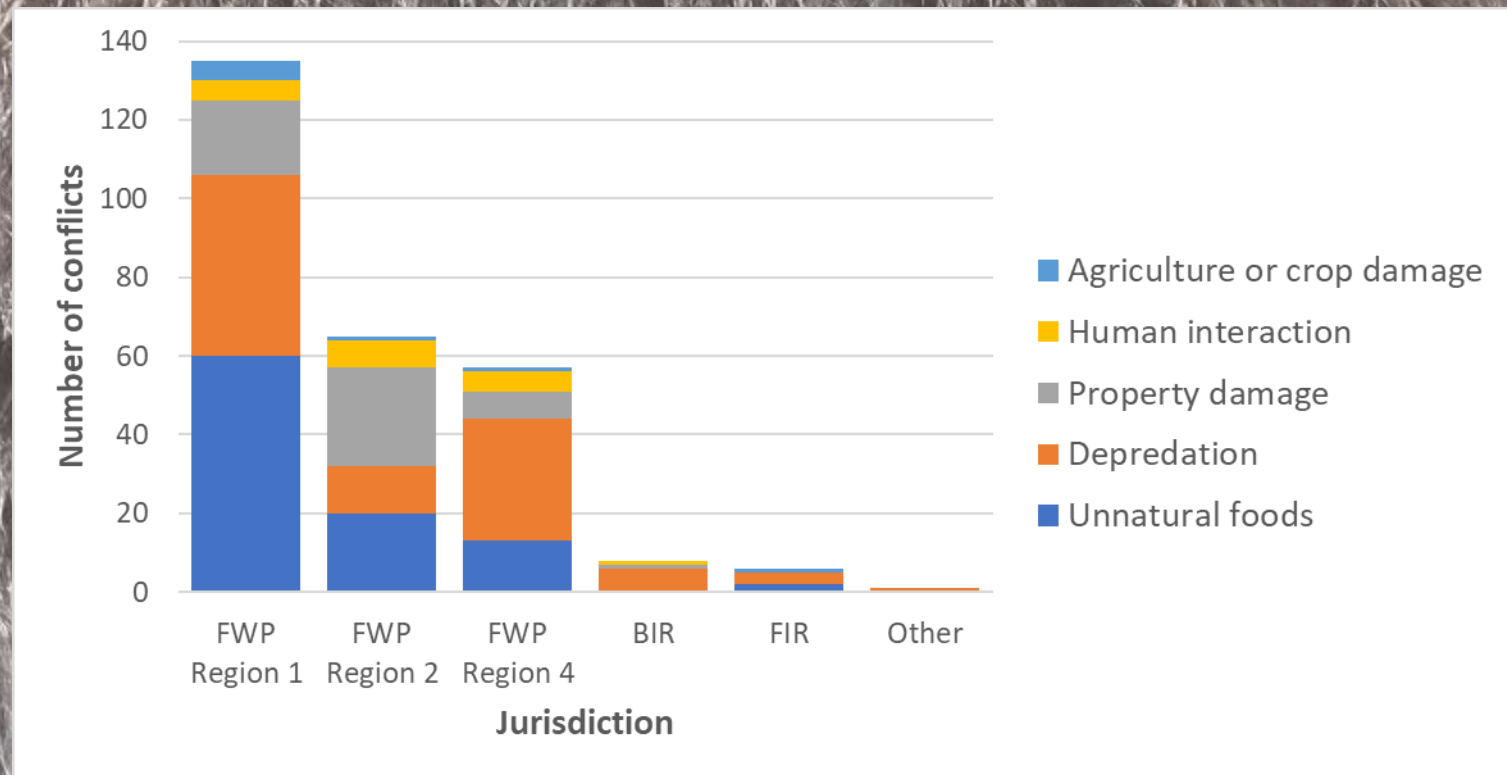


Management Summary

Interagency management database, started in 2020

- Record human-grizzly bear conflicts
- Record preventative actions
- Records observations, including females with offspring and outliers
- Record opportunistic DNA samples obtained

Human-Grizzly Bear Conflicts



* Data incomplete for Blackfeet Reservation

British
Columbia

Alberta

Saskatchewan

Glacier NP

Blackfeet
Reservation

FWP Region 1

PCA

Zone 1

Flathead
Reservation

Zone 3

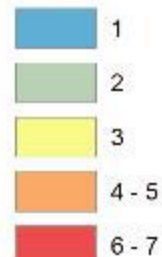
FWP Region 4

FWP Region 2

Zone 2

FWP Region 3

Number of conflicts 2021



Jurisdictions

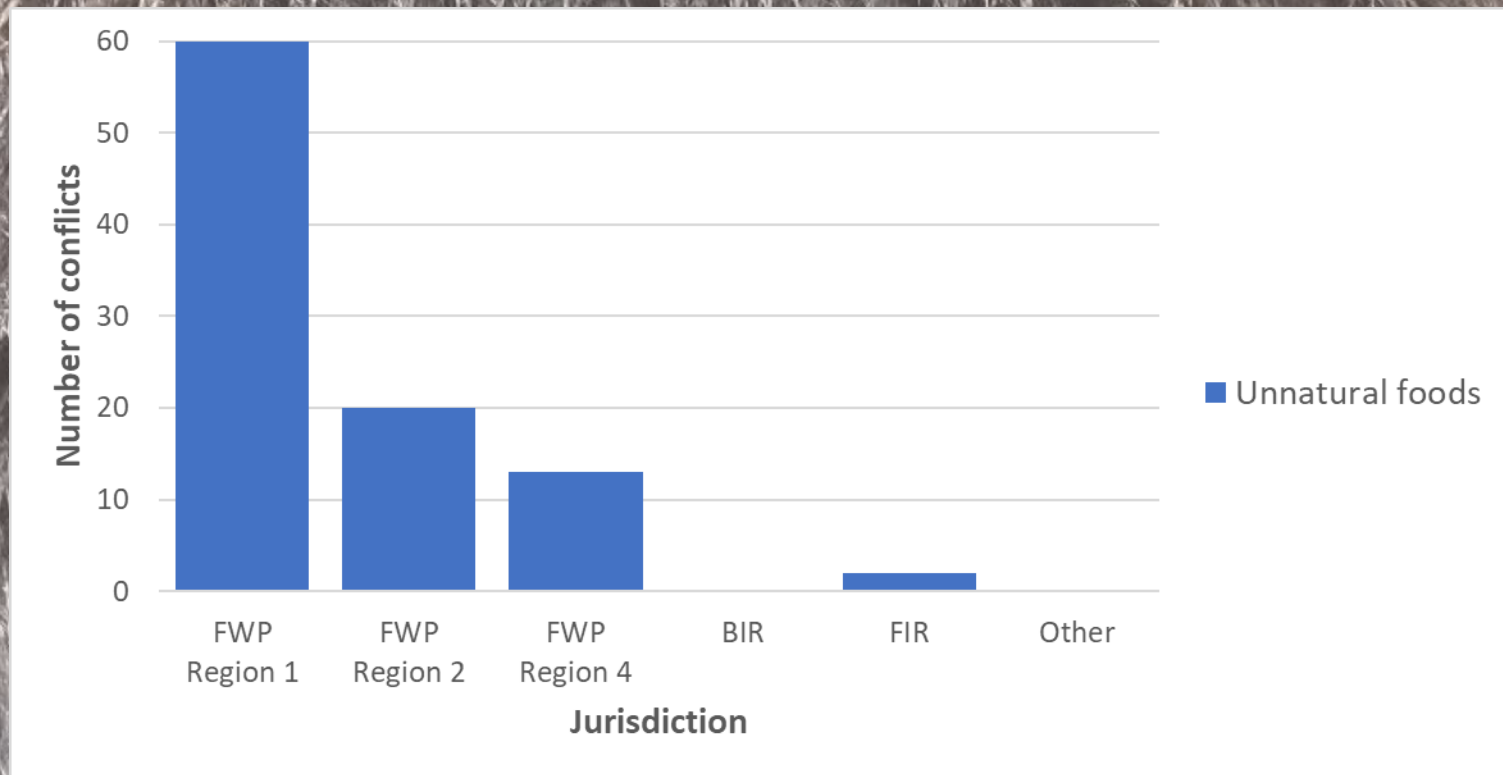
DMA

90



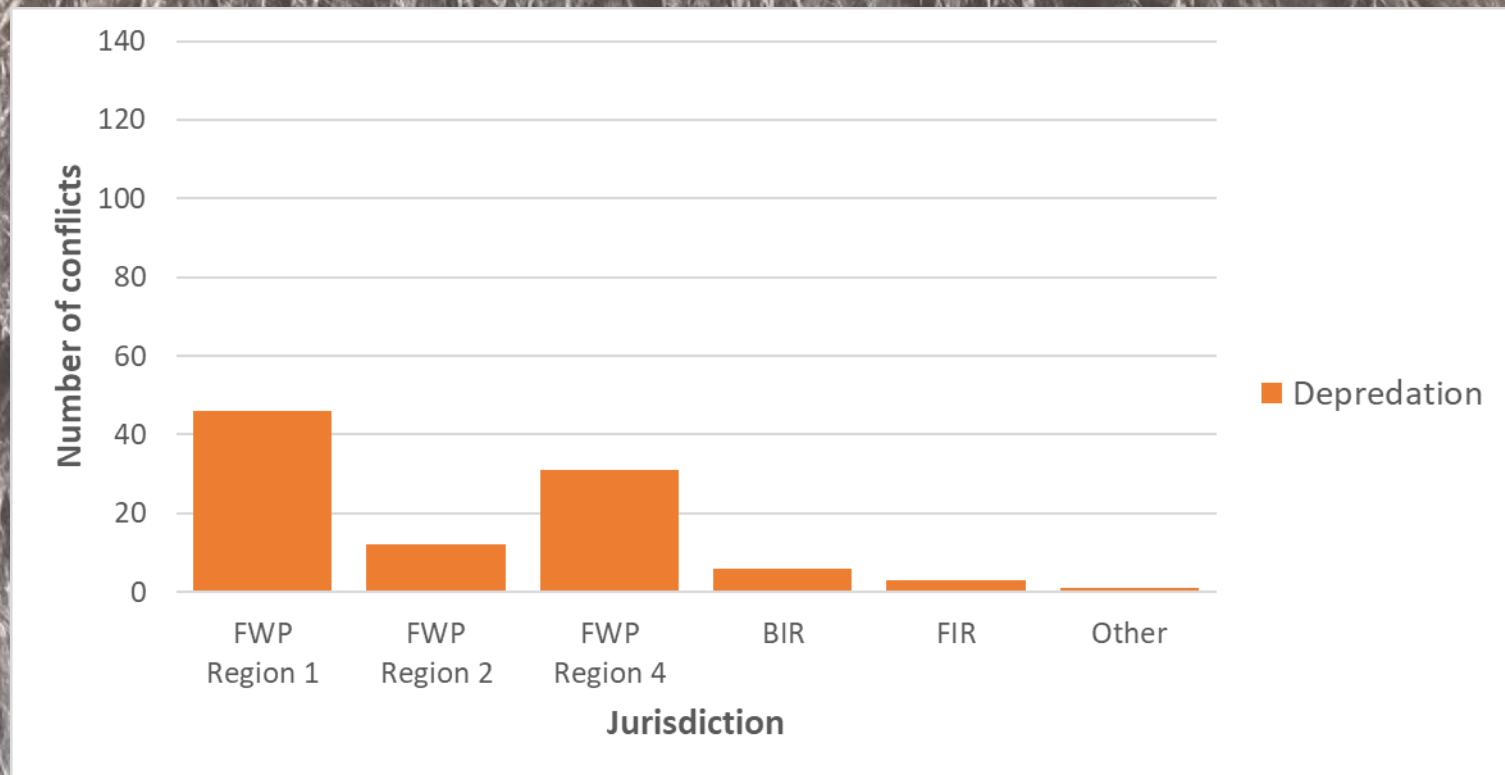
Kilometers

Human-Grizzly Bear Conflicts



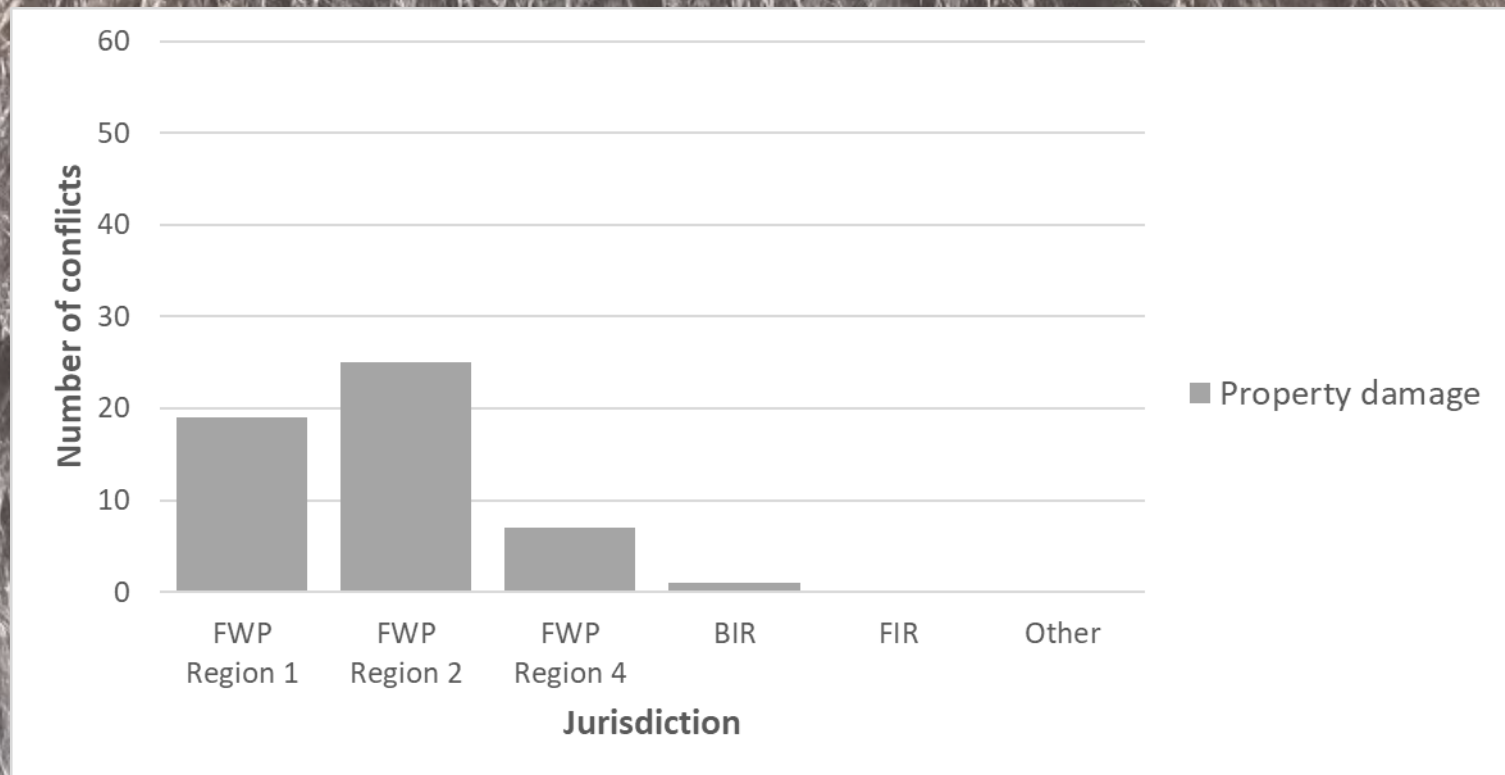
Garbage (50%), Pet or animal feed (24%), Human foods (10%)

Human-Grizzly Bear Conflicts



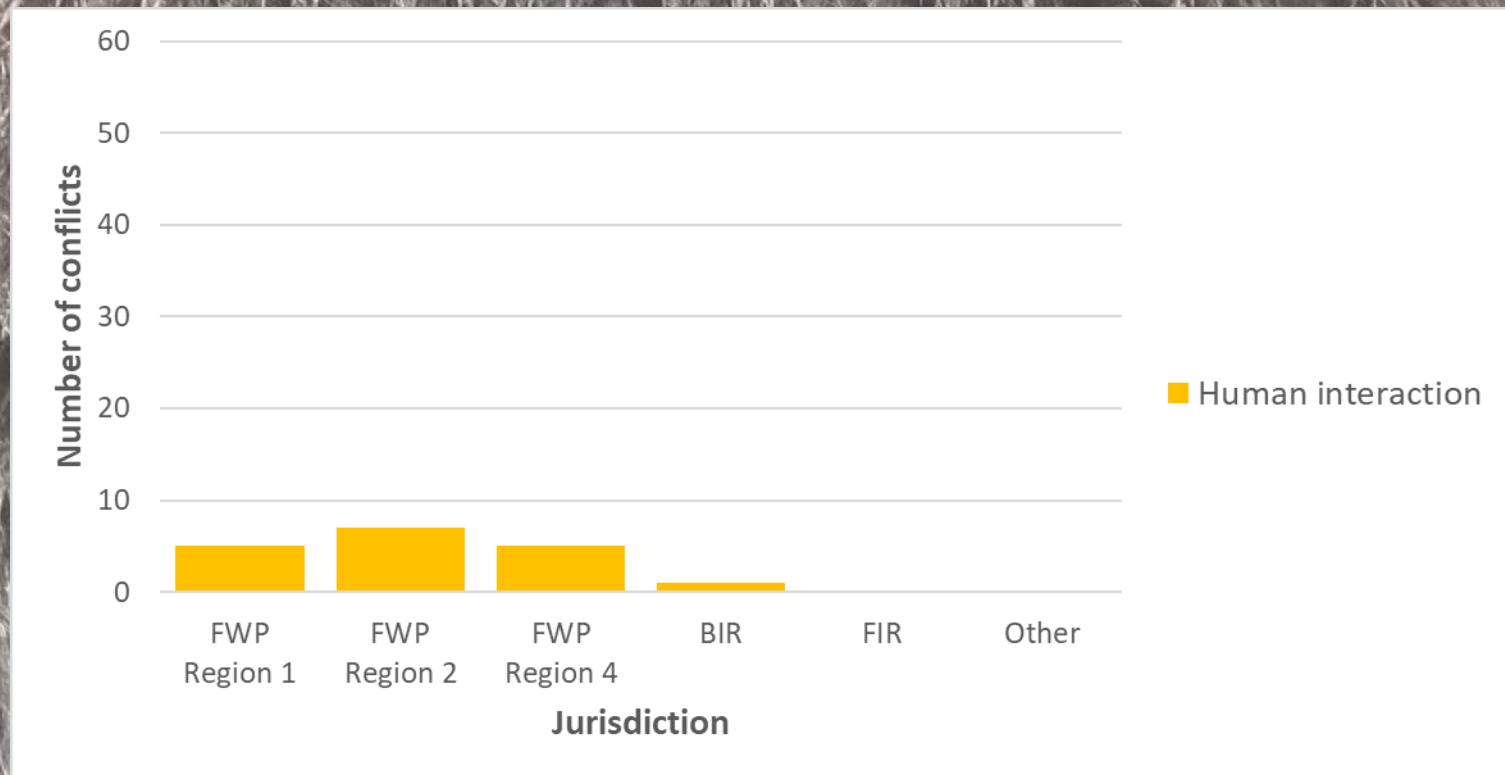
Chickens (43%), Cattle (36%), Sheep (7%)

Human-Grizzly Bear Conflicts



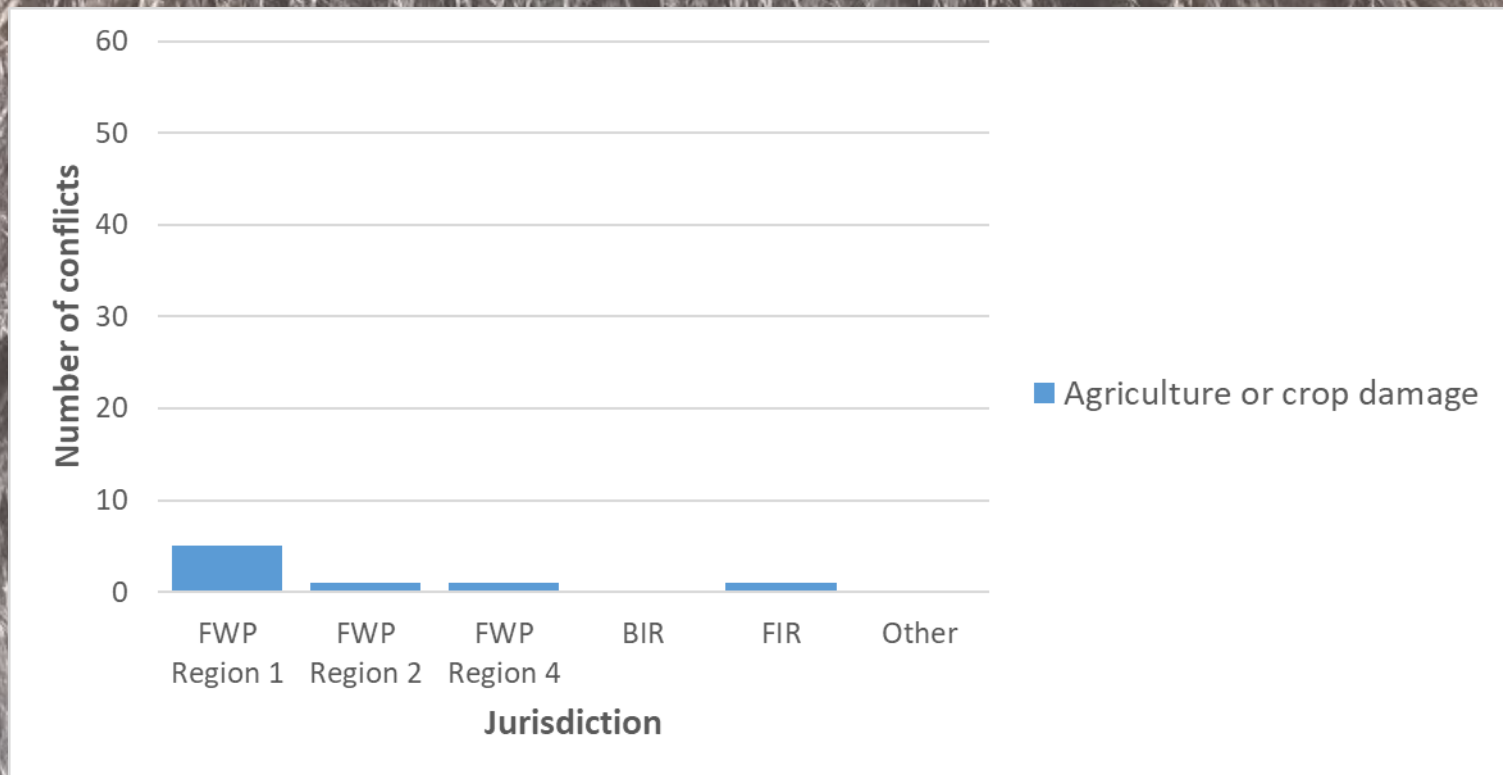
Building (55%), Other (29%), Vehicle (10%), Camp (8%)

Human-Grizzly Bear Conflicts



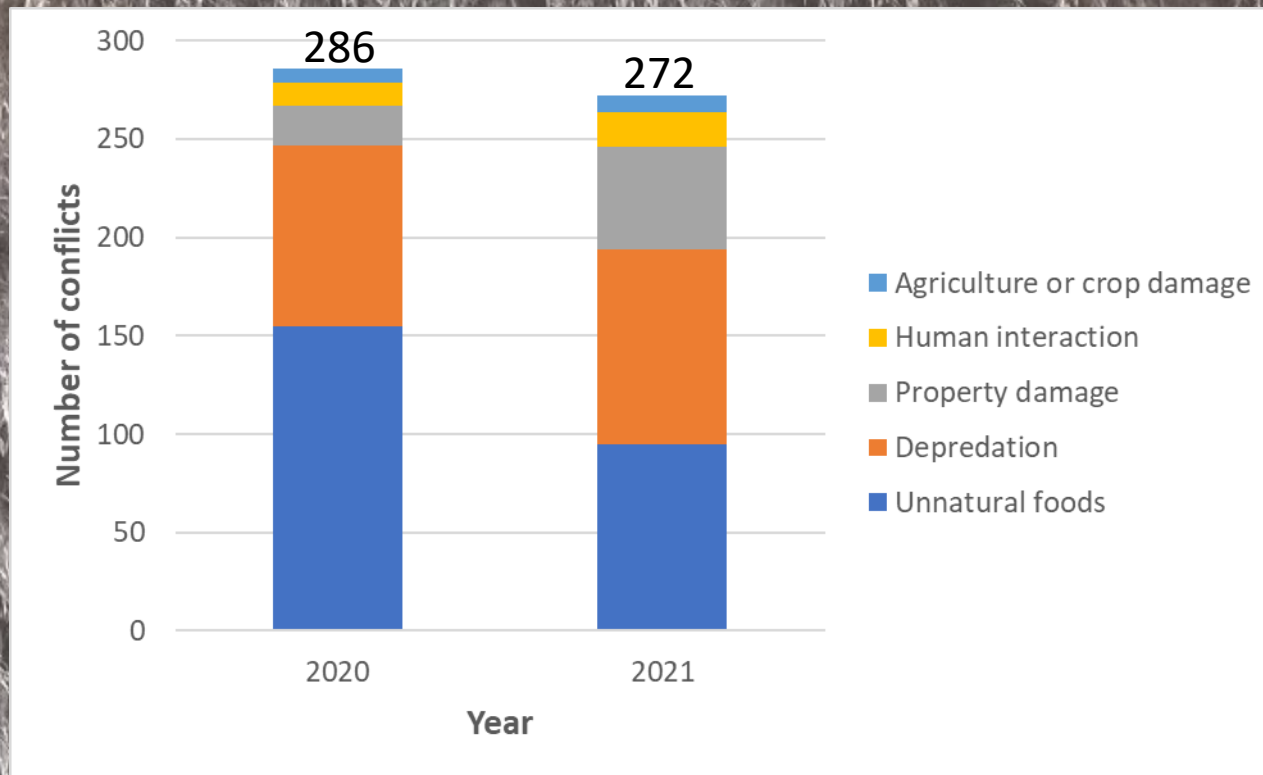
Aggressive encounter (72%), Habituation (27%), Fatality (6%)

Human-Grizzly Bear Conflicts



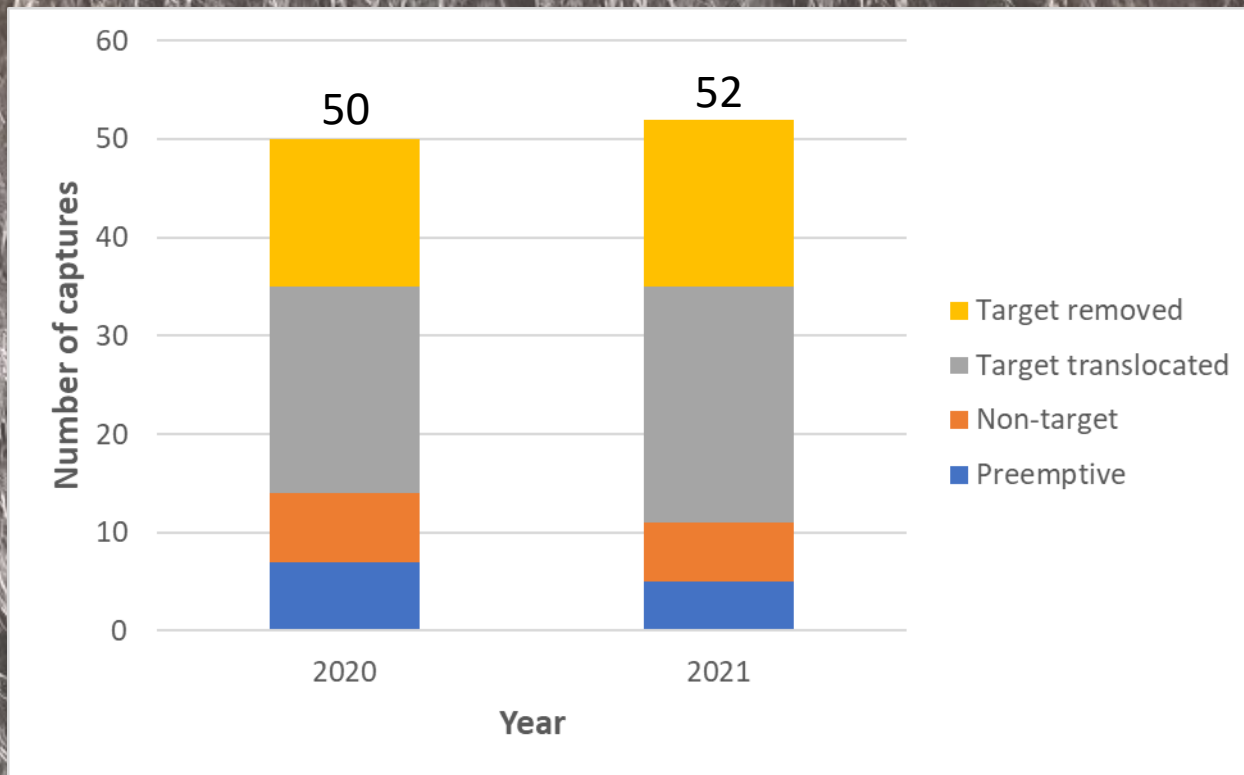
Orchard (50%), Beehives (38%), Crop (13%)

Human-Grizzly Bear Conflicts 2020-2021

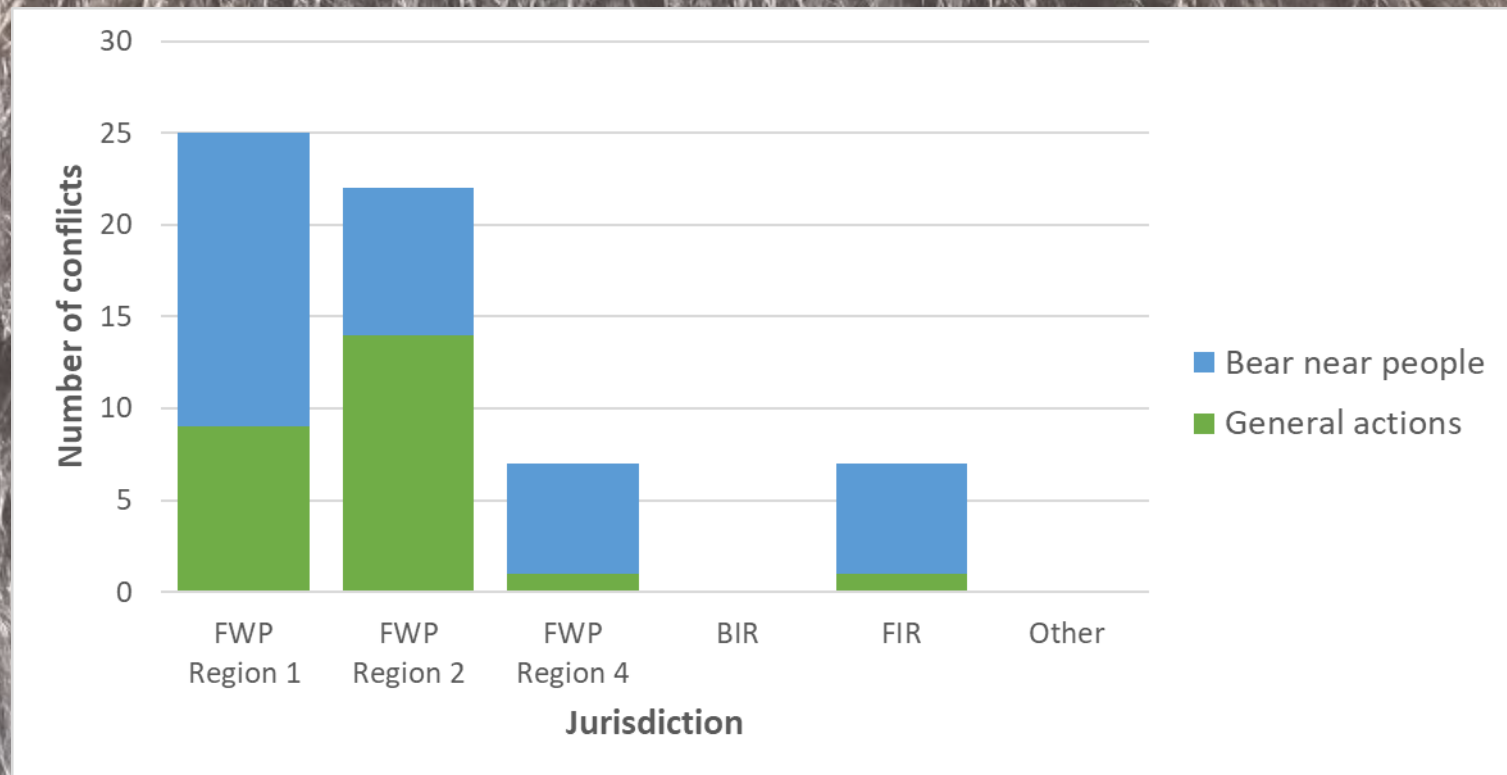


* Data incomplete for Blackfeet Reservation

Conflict or Preventative Captures



Preventative Actions



* Data incomplete for Blackfeet Reservation

Acknowledgements

Payton Adams	Rob Davies
Lee Anderson	Mark Ruby
Jack Austin	Scott Snelson
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Justine Vallieres	and many others...
Kyle Yorke	

