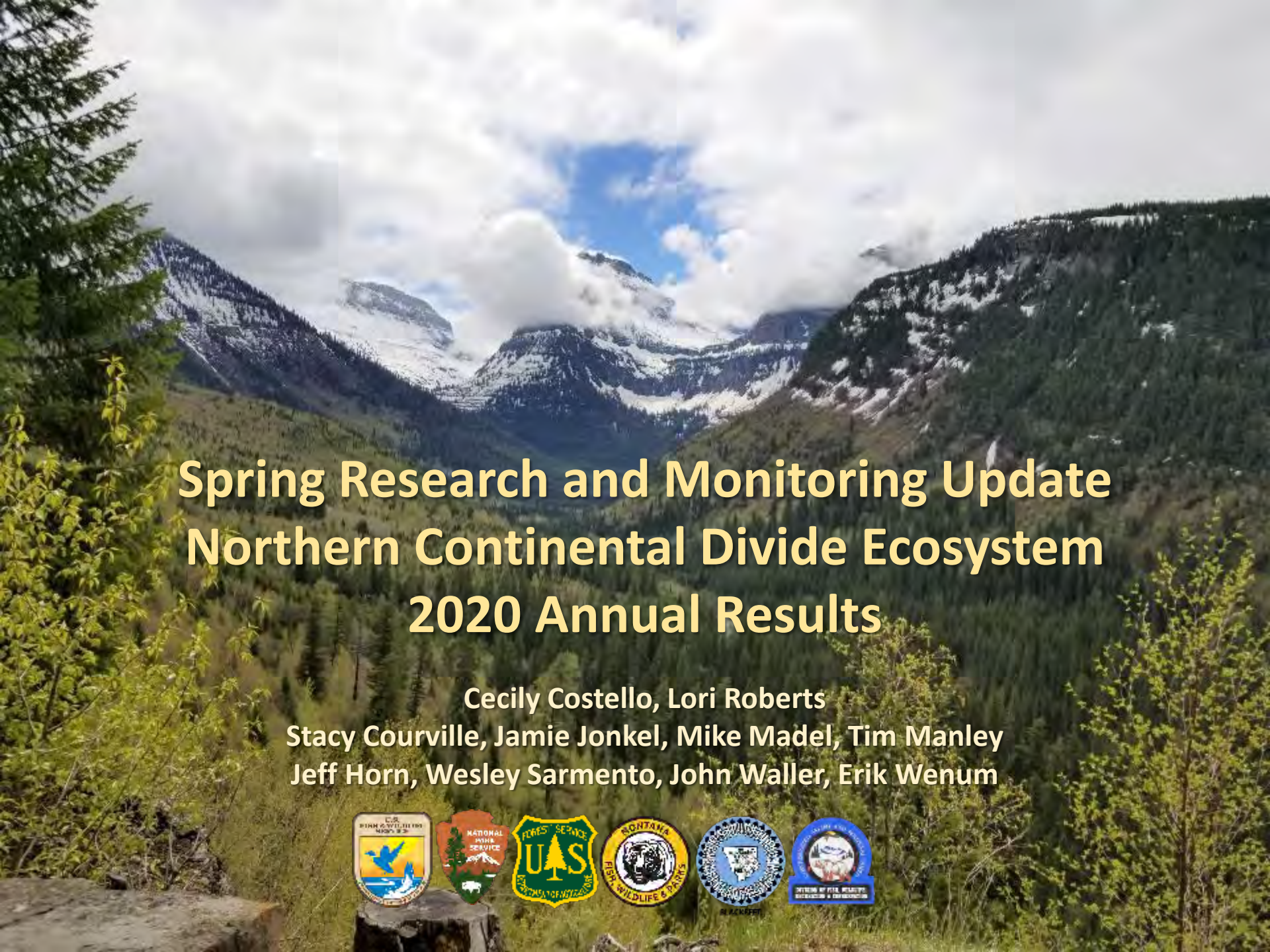

Spring Research and Monitoring Update Northern Continental Divide Ecosystem 2020 Annual Results

Cecily Costello, Lori Roberts
Stacy Courville, Jamie Jonkel, Mike Madel, Tim Manley
Jeff Horn, Wesley Sarmento, John Waller, Erik Wenum

Topics

Conservation Strategy Demographic Objectives

- Occupancy threshold
- Independent female survival threshold
- Independent female mortality threshold
- Independent male mortality threshold
- Monitor demographic and genetic connectivity

Opportunistic DNA Sampling

Research Projects

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


British Columbia
Alberta
Murphy Lake
Upper North Fork Flathead
Northeast Glacier
Salish Connectivity Area
Stillwater River
Lower North Fork Flathead
Southeast Glacier
Lower Middle Fork Flathead
Blackfeet Reservation
Zone 3
Hungry Horse
Badger Two Medicine
Flathead Valley
Upper Middle Fork Flathead
Sullivan
PCA
Continental Divide
Birch Teton
Zone 1
Bunker
North Fork Sun River
Teton Sun River
Big Salmon
East Front
Flathead Reservation
Mission Range
South Fork Sun Beaver Willow
Upper South Fork Flathead
Dearborn Elk Creek
Ninemile Connectivity Area
Rattlesnake
Monture Landers Fork
South End
Zone 2
Units
Units
DMA
N
60
Kilometers
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British Columbia
Alberta
Murphy Lake
Upper North Fork Flathead
Northeast Glacier
Salish Connectivity Area
Stillwater River
Lower North Fork Flathead
Southeast Glacier
Lower Middle Fork Flathead
Blackfeet Reservation
Zone 3
Hungry Horse
Badger Two Medicine
Flathead Valley
Upper Middle Fork Flathead
Sullivan
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Continental Divide
Birch Teton
Zone 1
Bunker
North Fork Sun River
Teton Sun River
East Front
Big Salmon
Flathead Reservation
South Fork Sun Beaver Willow
Mission Range
Upper South Fork Flathead
Dearborn Elk Creek
Ninemile Connectivity Area
Rattlesnake
Monture Landers Fork
South End
Zone 2
Occupied in 2020
Yes
No
DMA
N
60
Kilometers
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Occupancy thresholds

Bear Management Unit (PCA)	2015	2016	2017	2018	2019	2020	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

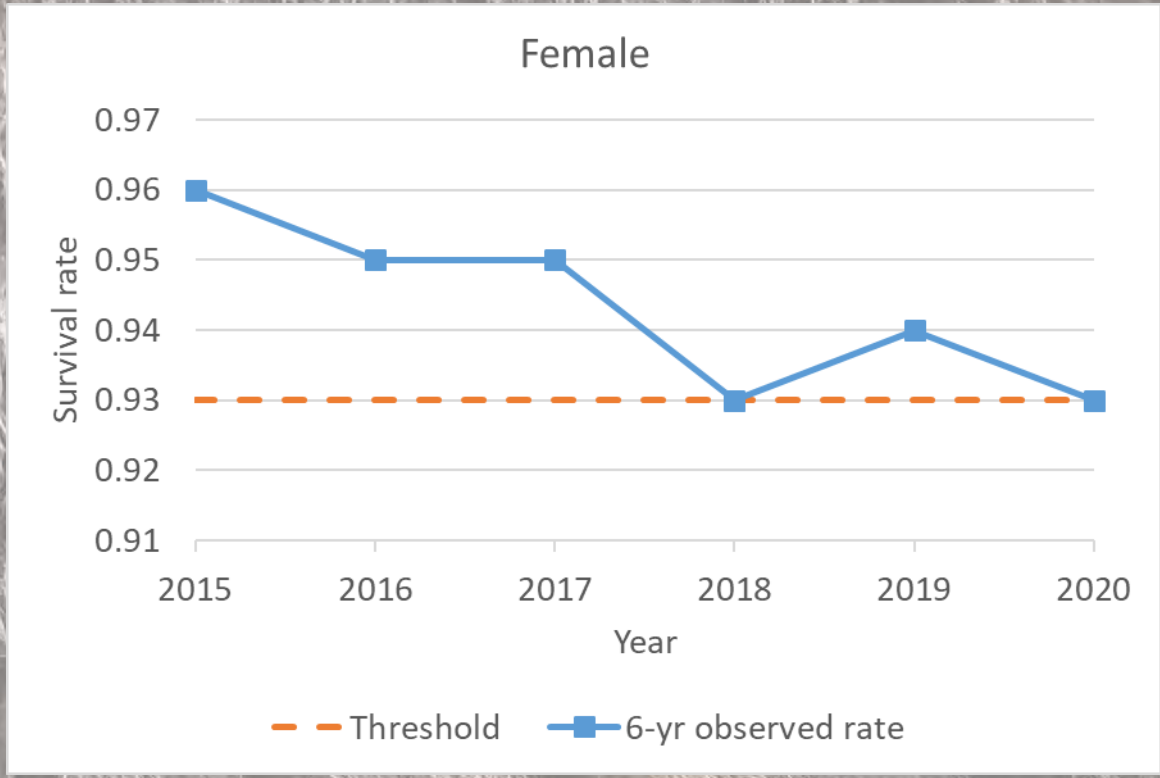
Occupancy Unit (Zone 1)	2015	2016	2018	2018	2019	2020	6-year
Salish Connectivity Area		×	×	×	×	×	×
Flathead Valley	×	×	×	×	×	×	×
Flathead Reservation	×	×	×	×	×	×	×
Ninemile Connectivity Area				×	×	×	×
South End	×	×	×	×	×	×	×
East Front	×	×	×	×	×	×	×
Blackfeet Reservation	×	×	×	×	×	×	×

Independent female survival threshold

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

≥ 0.93 = the 2020 threshold rate consistent with a projected 90% probability that the population within the DMA will remain above 800 bears

Independent female survival threshold



Independent mortality thresholds

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

Females

≤24 = the 2020 threshold number consistent with a projected 90% probability that the population within the DMA will remain above 800 bears

Males

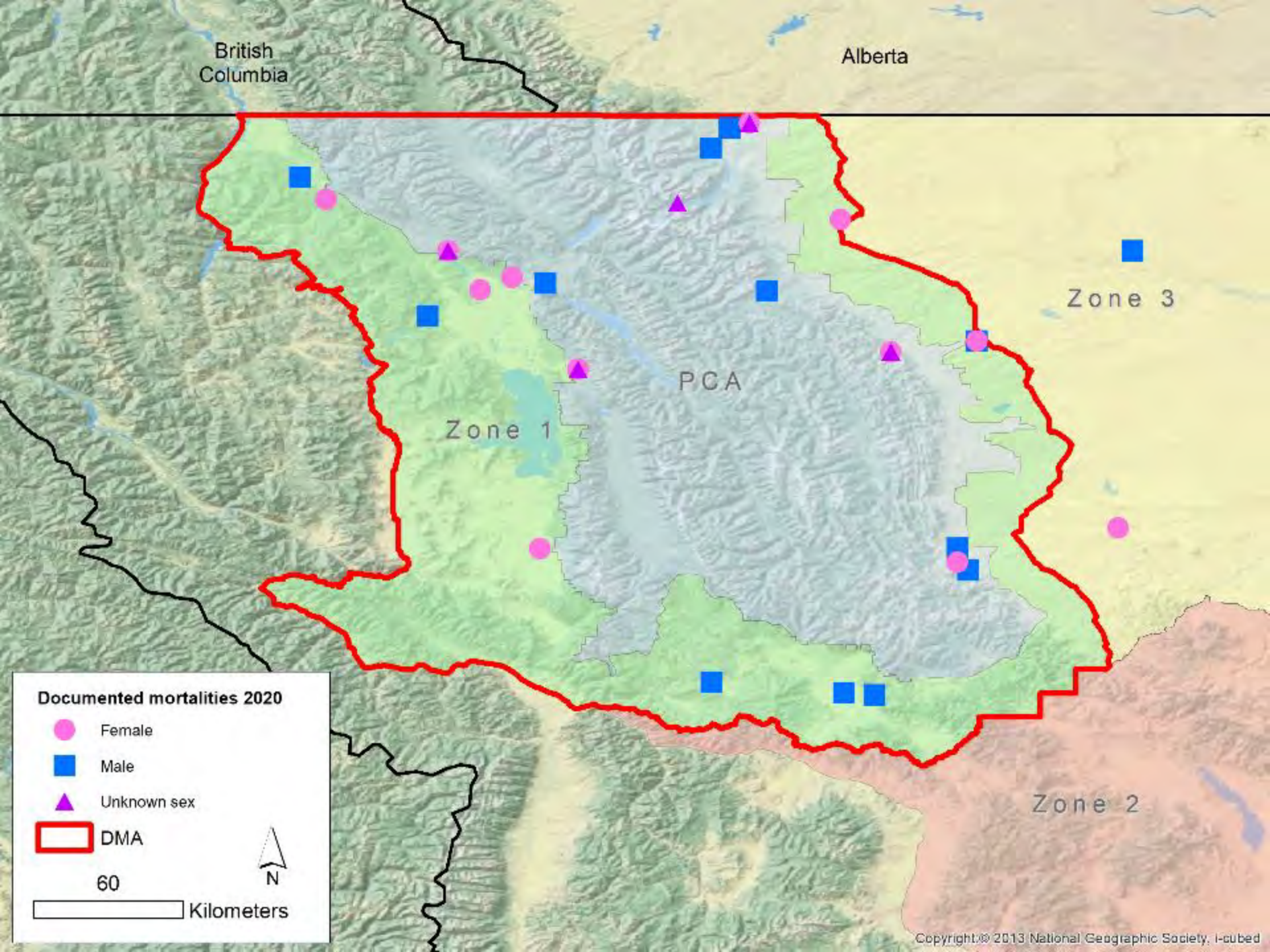
≤29 = the 2020 threshold number consistent with a projected 90% probability that the population within the DMA will remain above 800 bears

Documented mortalities

All zones, all age classes

Documented mortalities 2020

	Ageclass	Female	Male	Unknown sex	Total
Inside DMA	Dependent	5	1	6	12
	Independent	11	12	0	23
	Total	16	13	6	35
Outside DMA	Dependent	1	0	0	1
	Independent	0	1	0	1
	Total	1	1	0	2


British Columbia
Alberta
Zone 3
PCA
Zone 1
Zone 2
Documented mortalities 2020
Female
Male
Unknown sex
DMA
N
60
Kilometers
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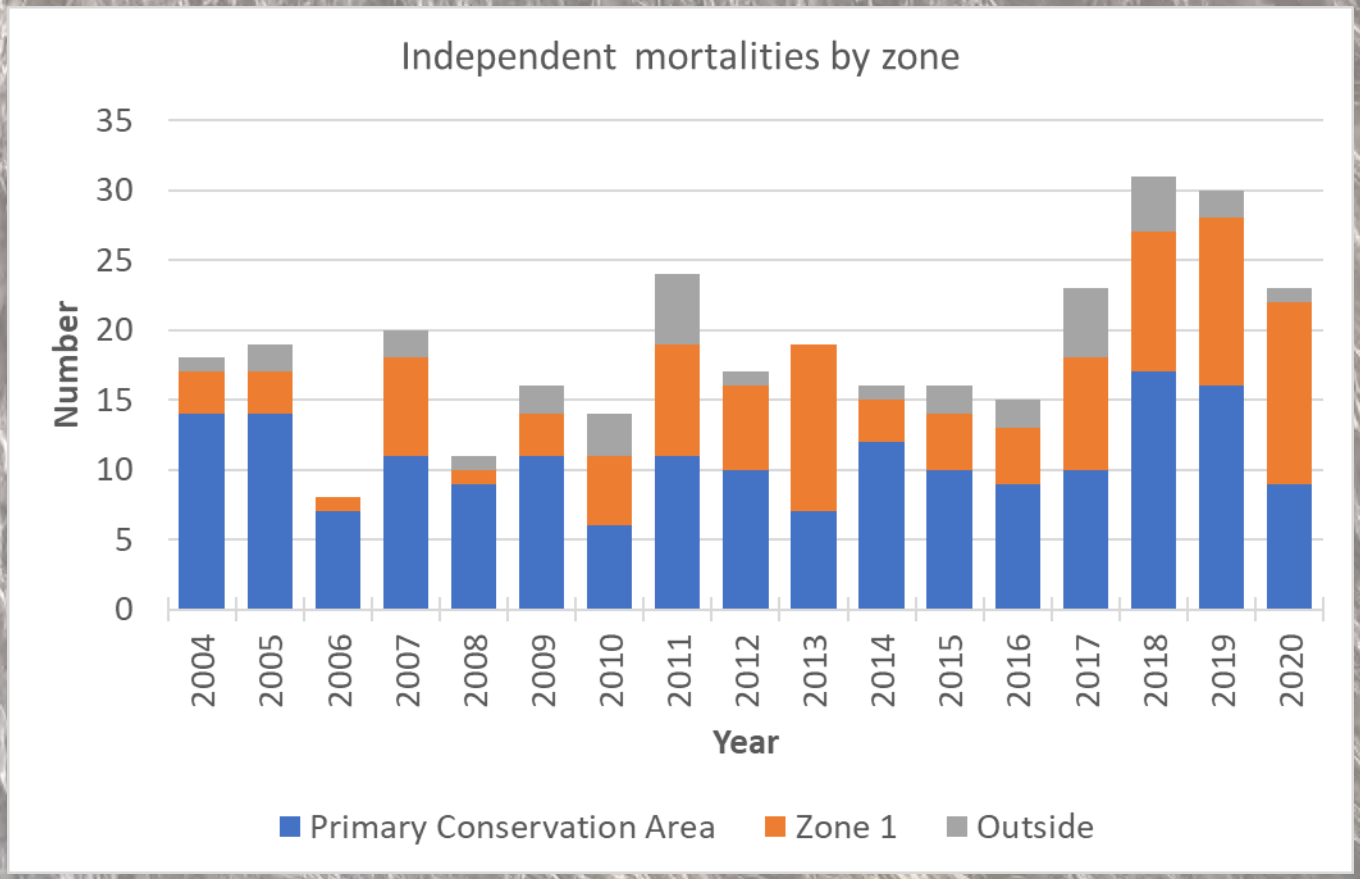
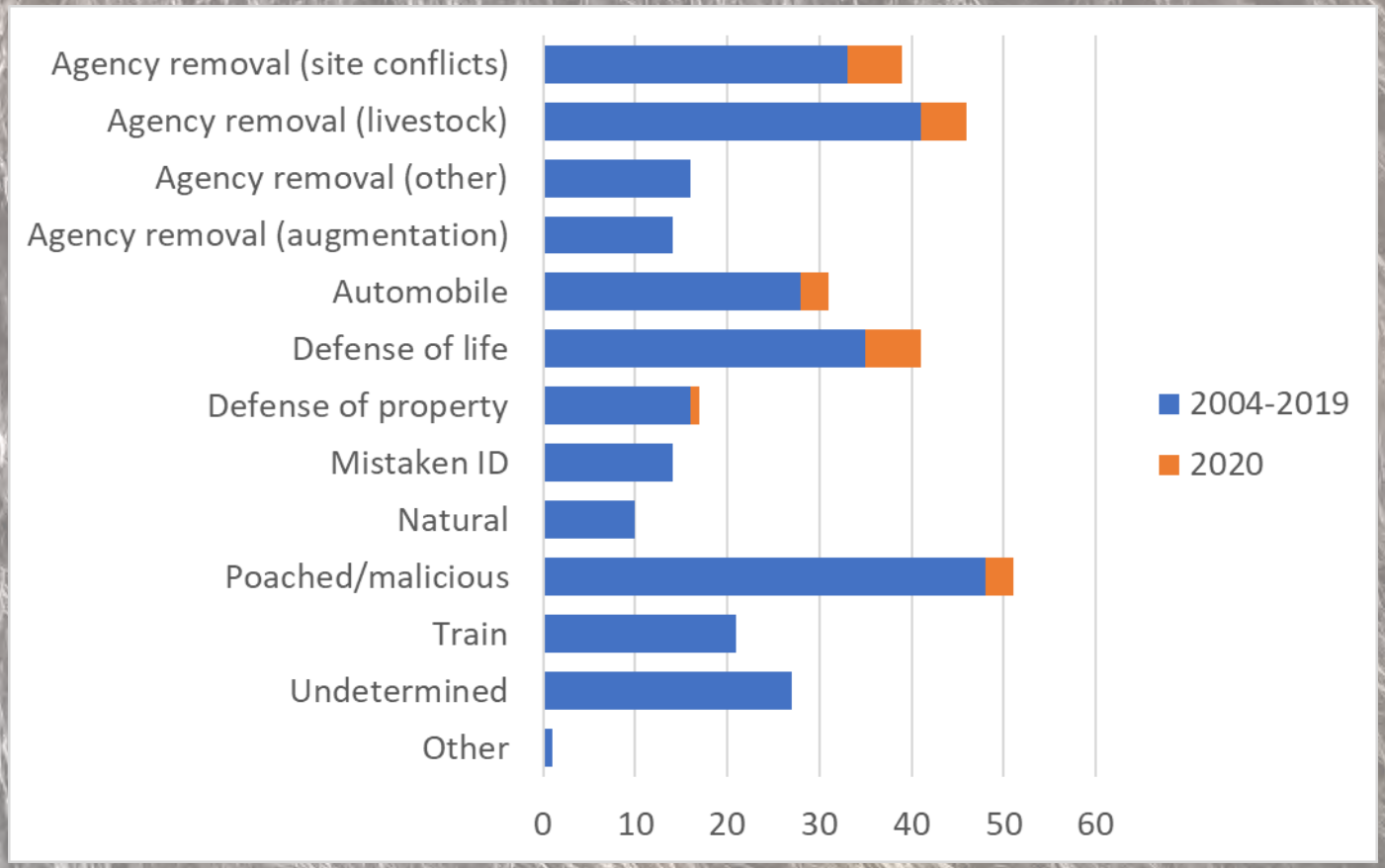
Documented independent mortalities

By Zone



Documented independent mortalities

Causes



Independent mortality thresholds

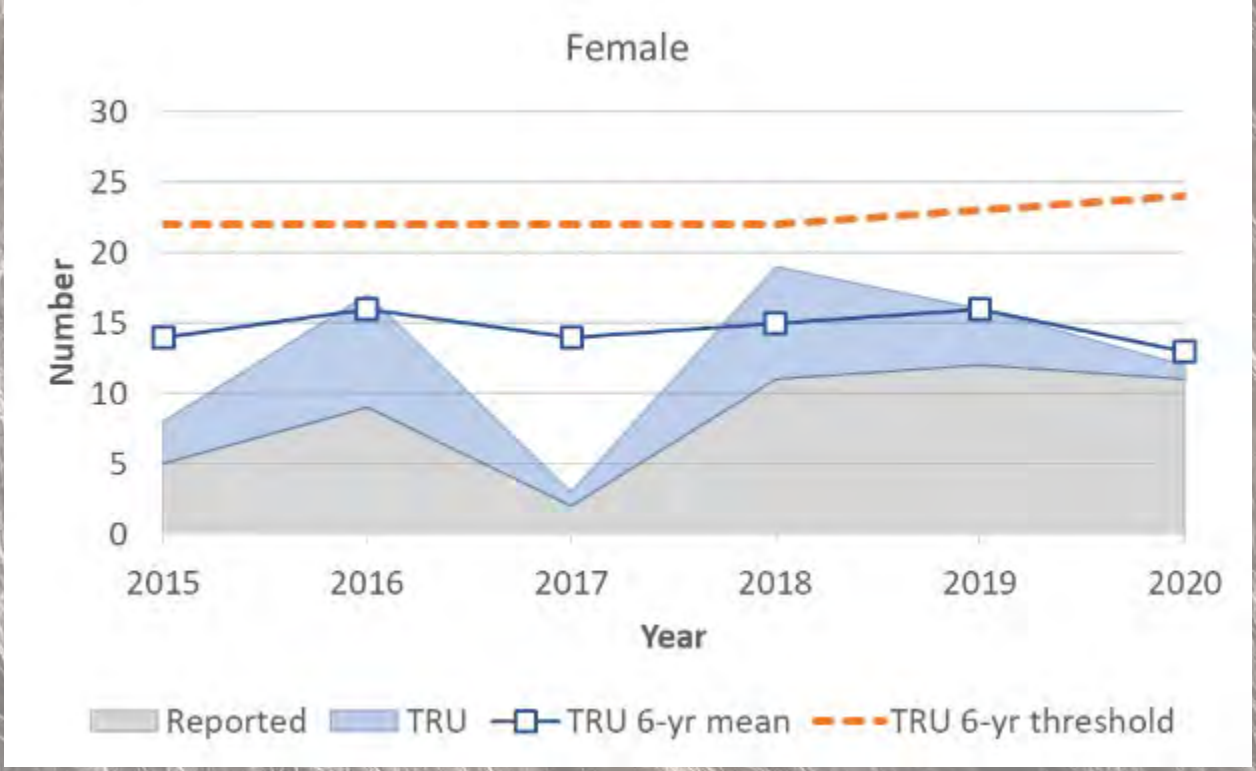
Documented mortalities 2020

	Ageclass	Female	Male	Unknown sex	Total
Inside DMA	Independent	11	12	0	23

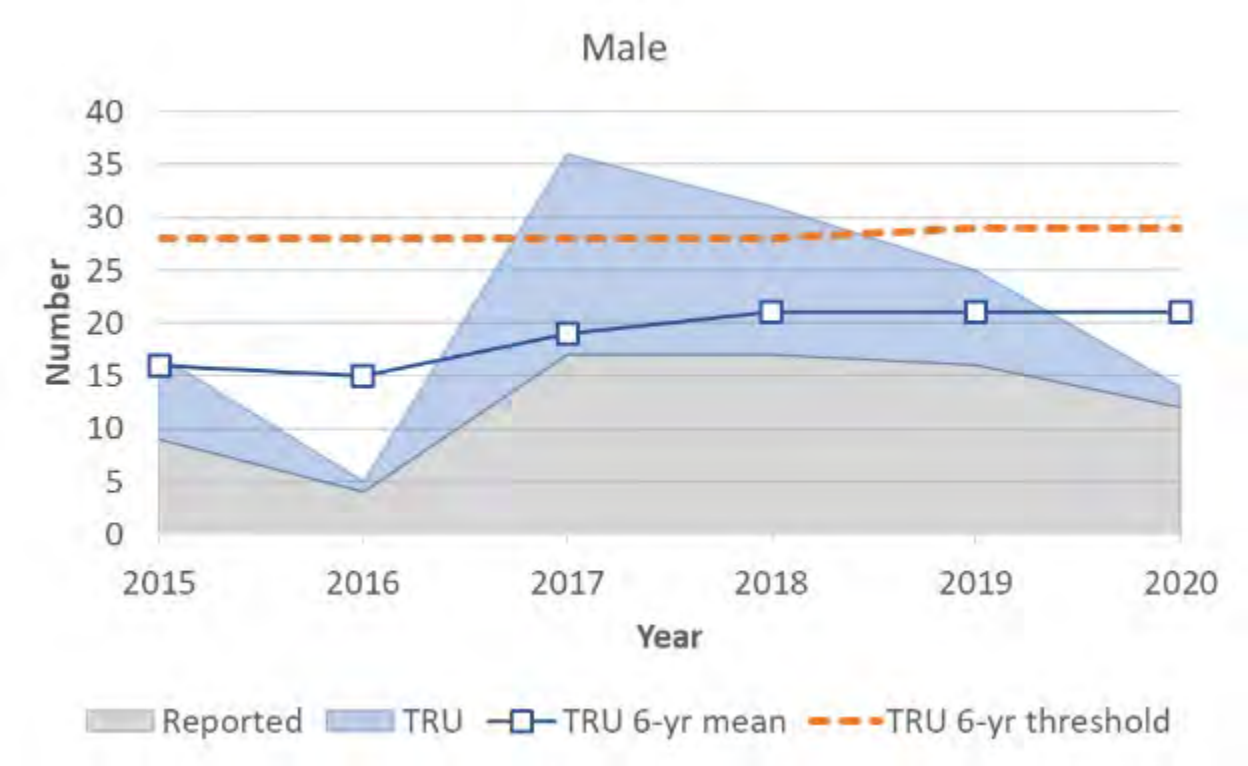
Estimated total reported & unreported (TRU) mortality 2020

Sex	Agency removal (A)	Telemetry (B)	Reported (high)	Reported (low)	Estimated reported and unreported (C)	Estimated total mortality (A+B+C)
Female	5	3	3	0	4	12
Male	6	1	5	0	7	14

Independent mortality thresholds



Independent mortality thresholds

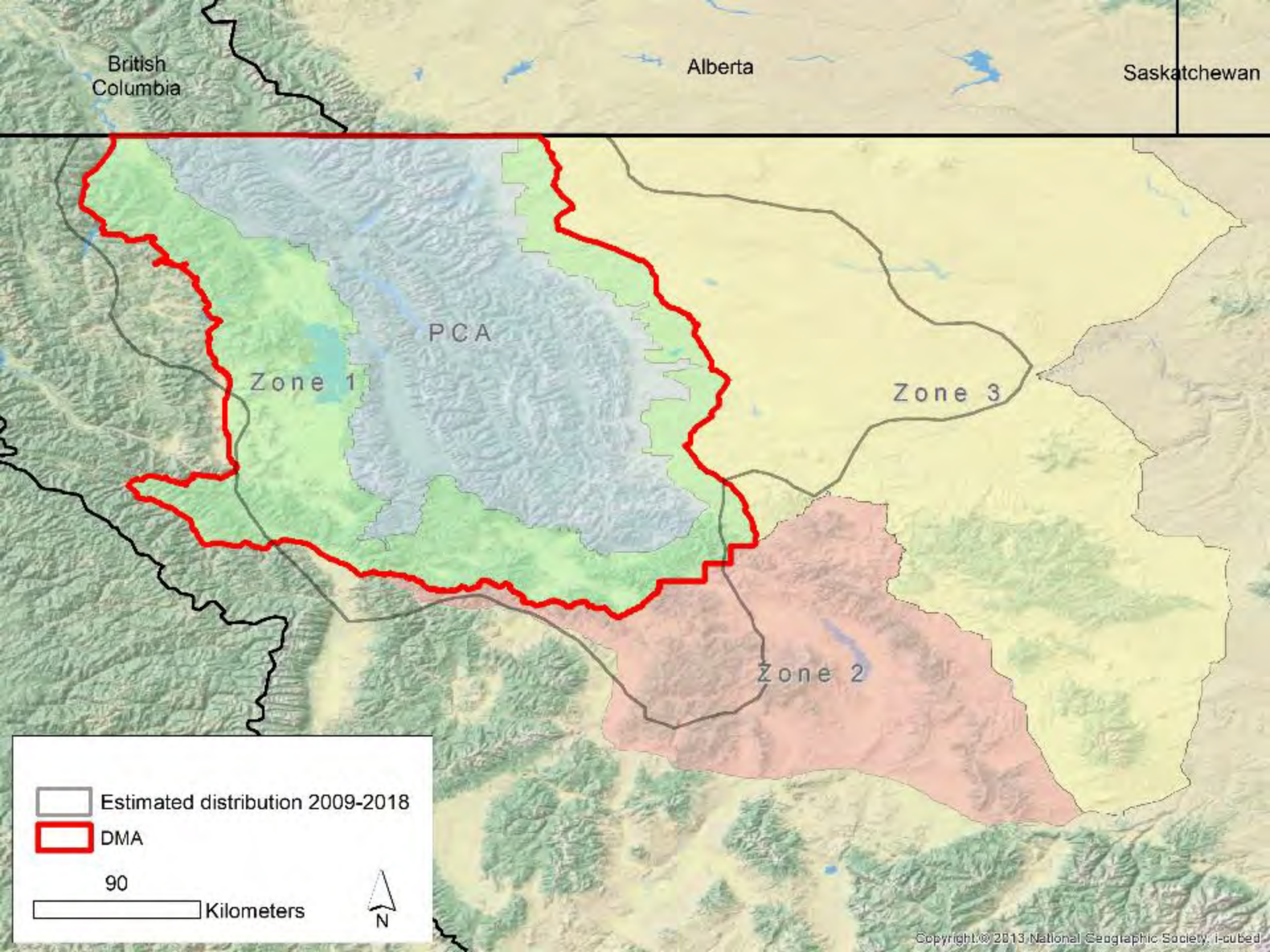


Preliminary Information-Subject to Revision.

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


British Columbia
Alberta
Saskatchewan
PCA
Zone 1
Zone 3
Zone 2
Estimated distribution 2009-2018
DMA
90
Kilometers
N
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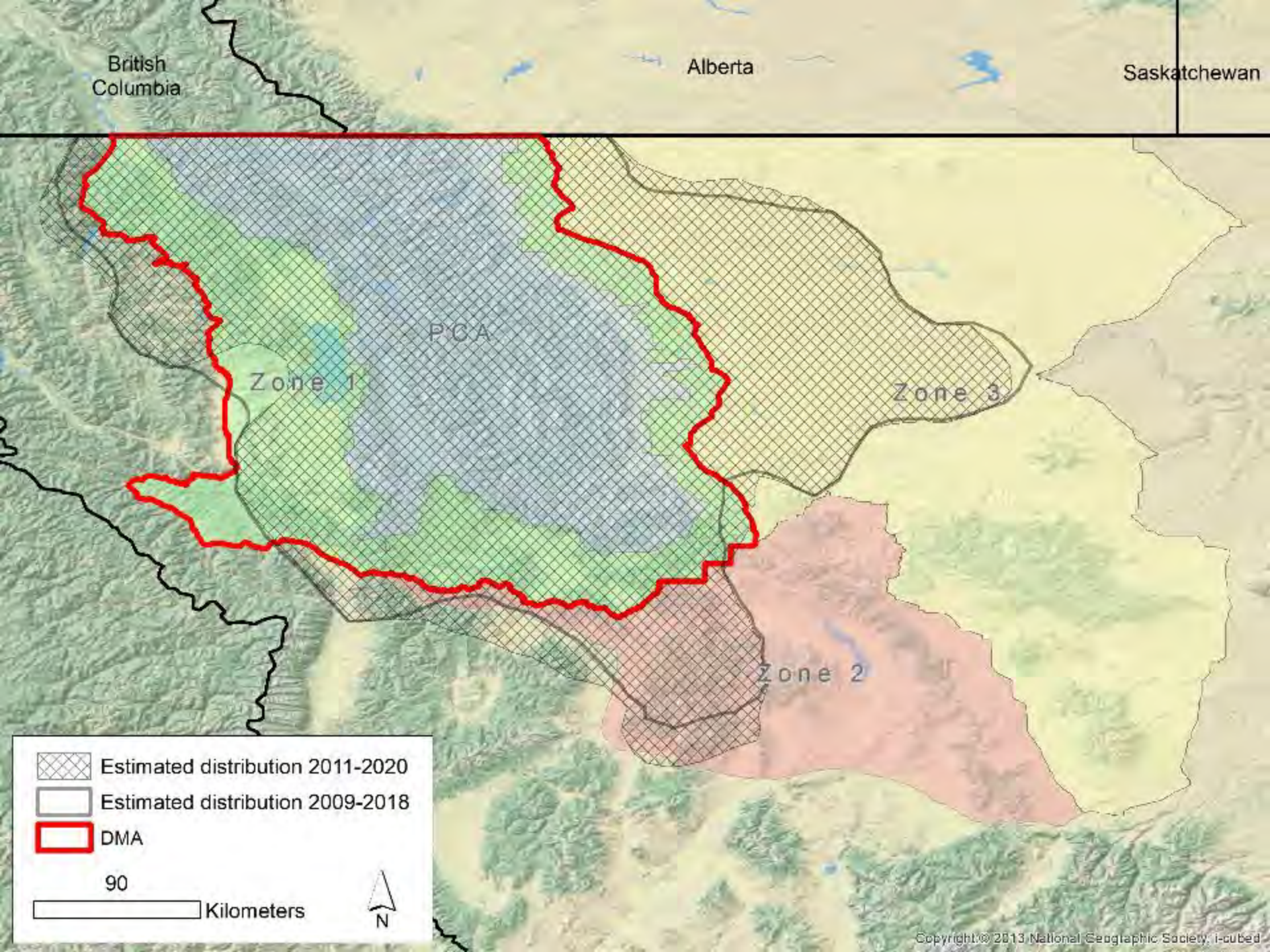
British Columbia
Alberta
Saskatchewan
PCA
Zone 1
Zone 2
Zone 3
Estimated distribution 2011-2020
Estimated distribution 2009-2018
DMA
90
Kilometers
N
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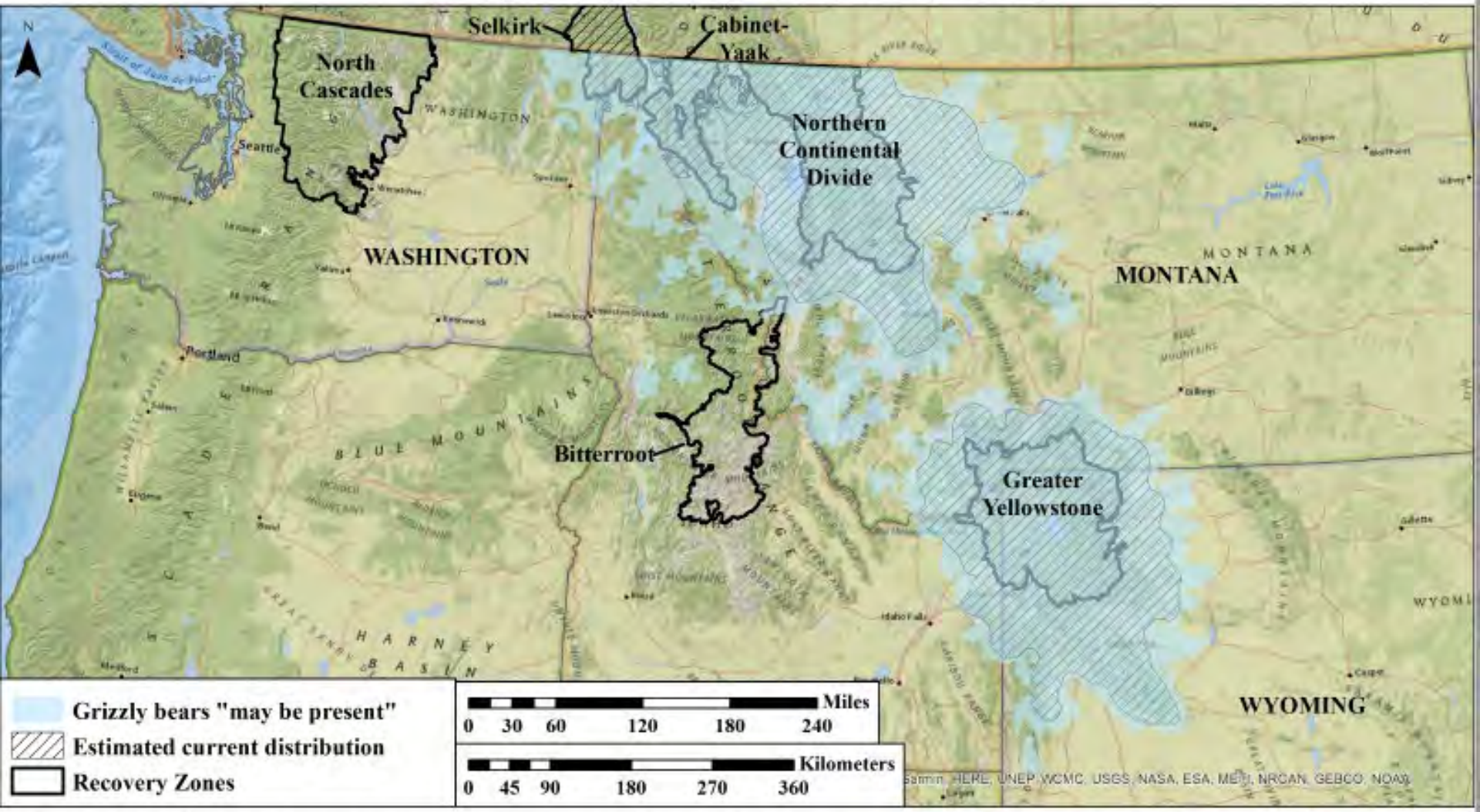
"May Be Present" Map for Grizzly Bears

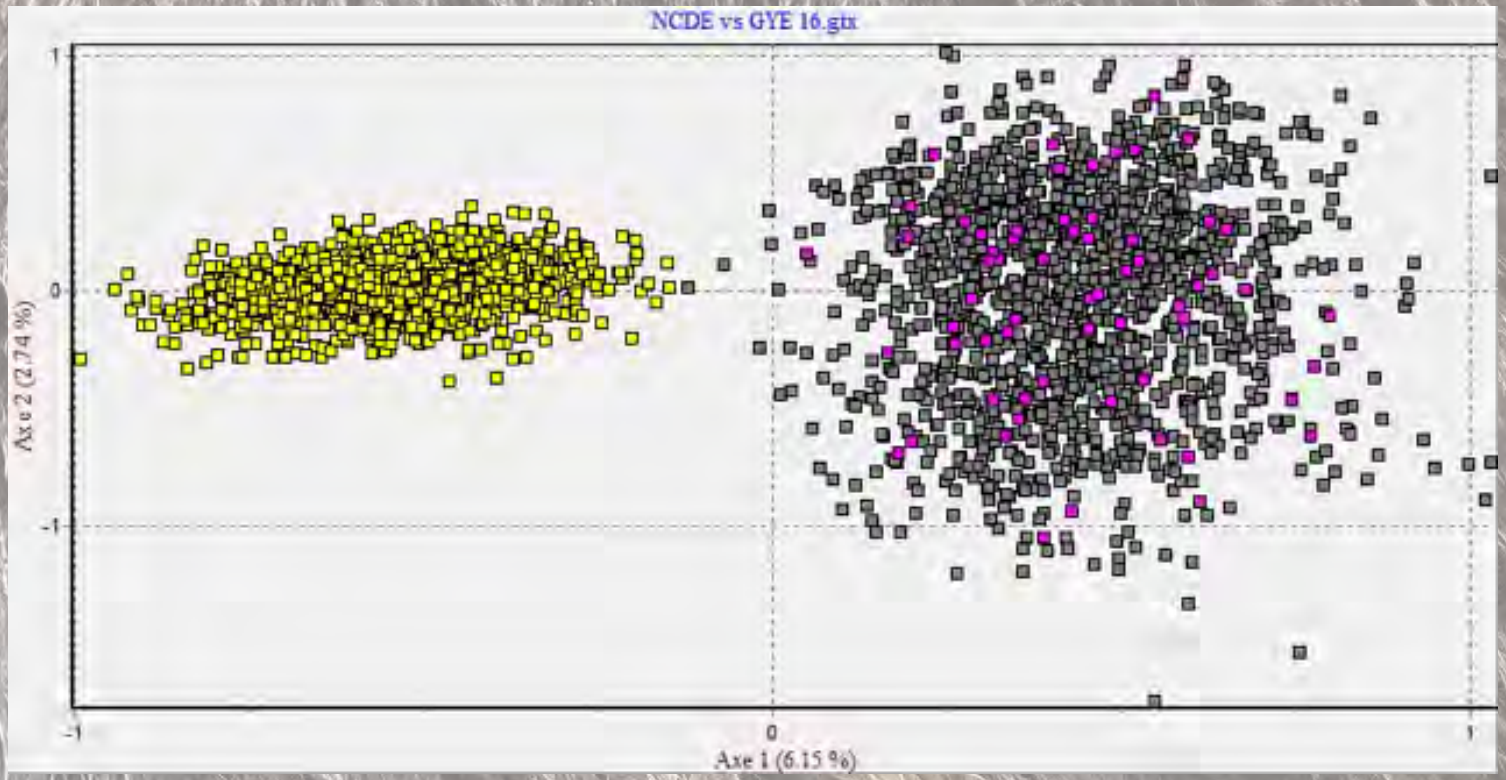


The U.S. Fish and Wildlife Service, in close coordination with state and federal partners, has developed a methodology for the grizzly bear "may be present" map to meet requirements under Section 7(a) of the Endangered Species Act (ESA). "May be present" maps help federal agencies determine where effects to listed species should be considered for consultation from actions they carry out, fund, or permit. As grizzly bears expand their range, maps are intended to be spatially inclusive of all areas that meet the "may be present" methodology for grizzly bears. The "may be present" methodology is derived from current distributions and verified location data outside of current distributions; not all areas that are designated as "may be present" meet the criteria to be included in current distributions. Local evaluation is needed by federal Level 1 ESA Streamlining Teams to determine potential effects of agency actions where grizzly bears "may be present." Identifying locations where grizzly bears "may be present" will facilitate project planning activities that promote grizzly bear conservation and recovery. Last updated December 16, 2020.

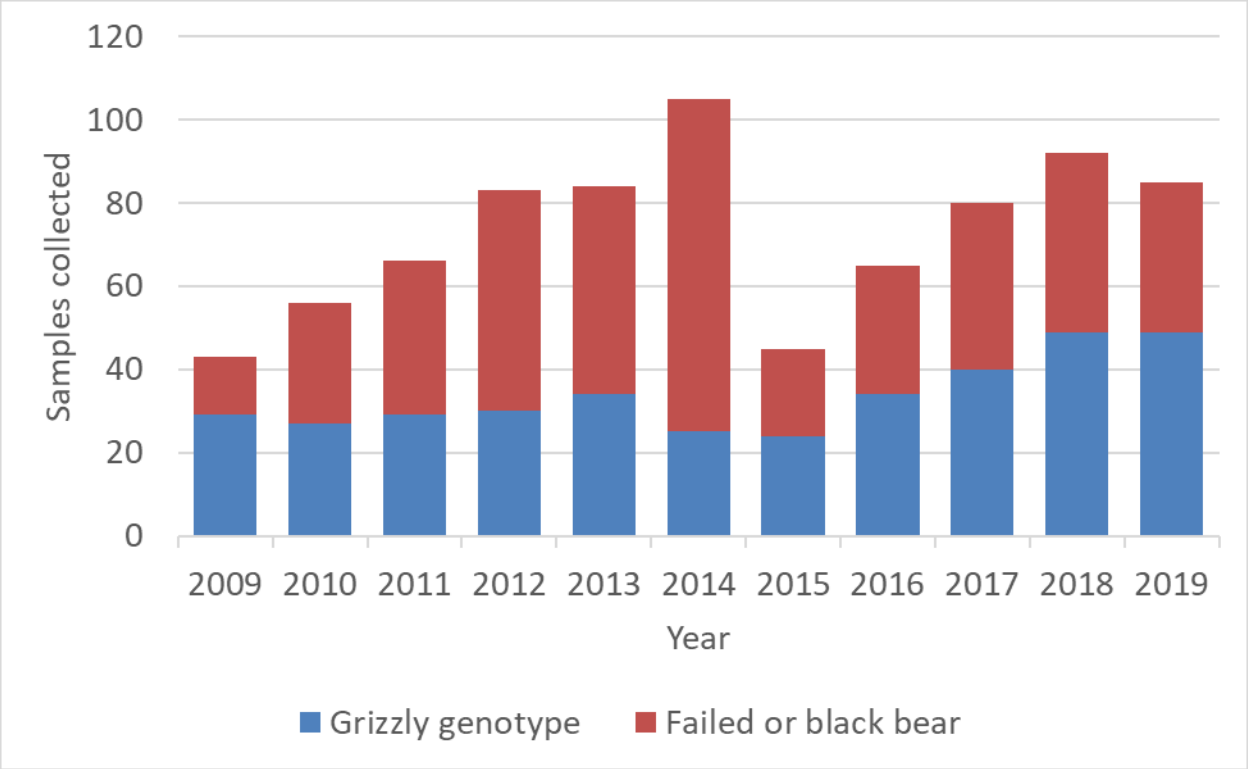
Verified observation outside of distribution

Watershed	Number of verified observations in 2020
Bitterroot	3
Big Hole	5
Gallatin	2
Red Rock	1

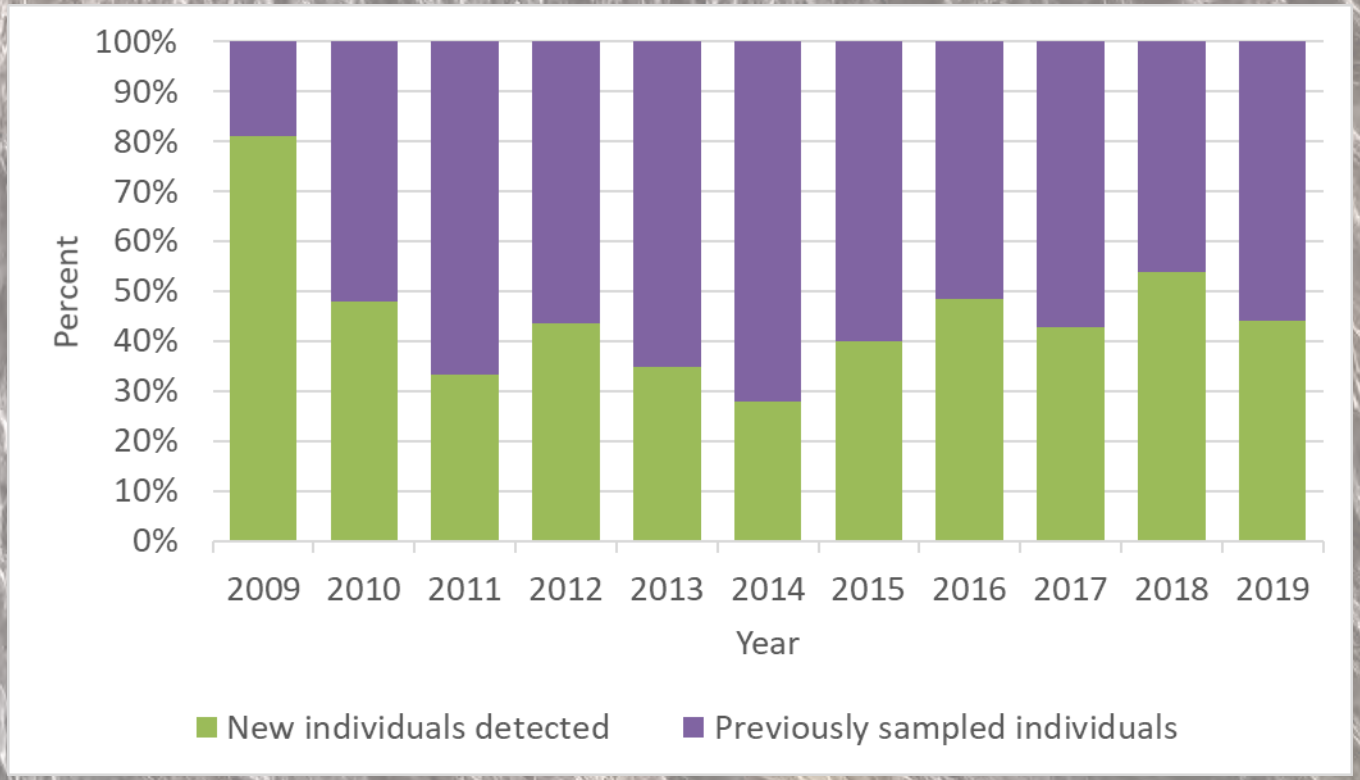
Genetic clustering analysis

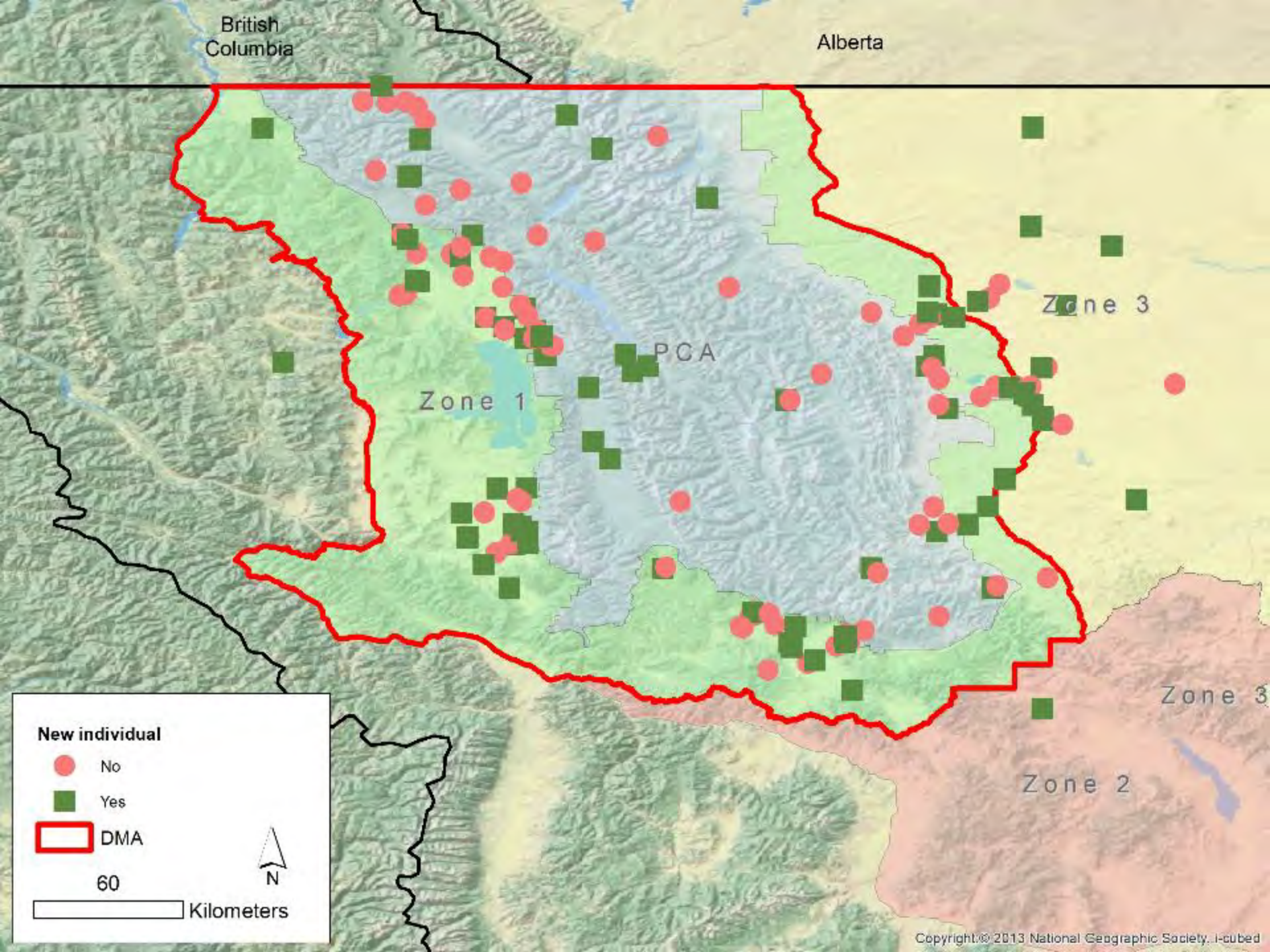


Opportunistic DNA Sampling



Opportunistic DNA Sampling




British Columbia
Alberta
PCA
Zone 1
Zone 3
Zone 3
Zone 2
New individual
No
Yes
DMA
N
60
Kilometers
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Research Projects

- Grizzly bear use of grain bins (FWP)
- Post doctorate Sarah Sells has begun work on the phase II population expansion and connectivity analysis (NCDE, UM)
- Parturition timing study nearing completion (NCDE, CY, IGBST, Alaska National Parks)
- Denning chronology study progressing (NCDE, CY, IGBST)
- Integrated Population Model (IPM) project progressing (UM, NCDE, IGBST, USFWS)
- Completing home range analyses (NCDE)
- Proposing research on dispersal, conflict, and habitat use related to fire/forest management

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Trever Throop
Joe Rahn
Ken Justus
Jim Pierce
Red Eagle Aviation
Two Bear Air
and many others…