



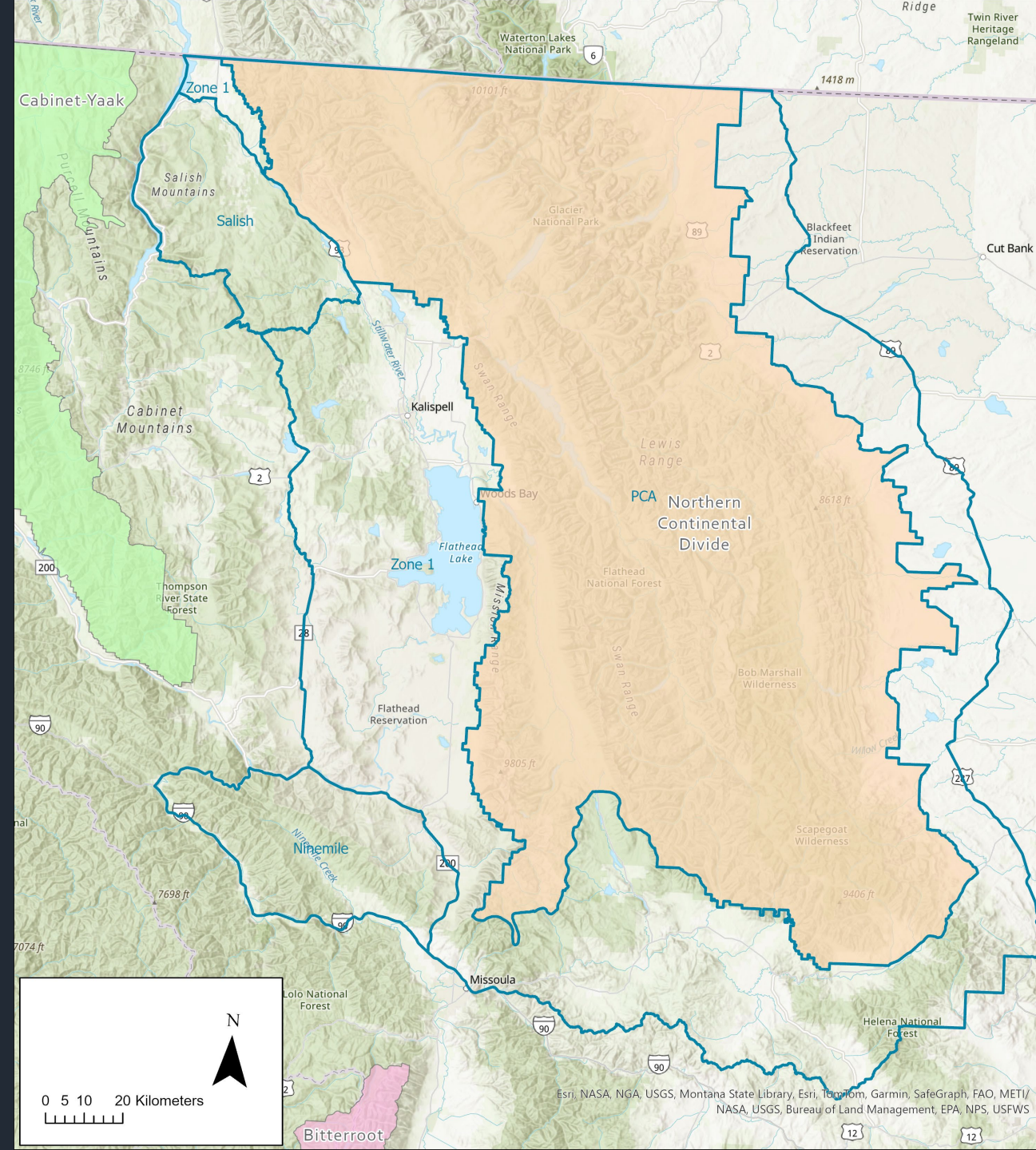
Status of Connectivity between the NCDE and the CYE





# NCDE Zones

- Primary Conservation Area
- Zone 1
- Demographic Connectivity Areas
  - Salish
  - Ninemile





## Distance from NCDE Occupied Range to CY Recovery Zone (km)

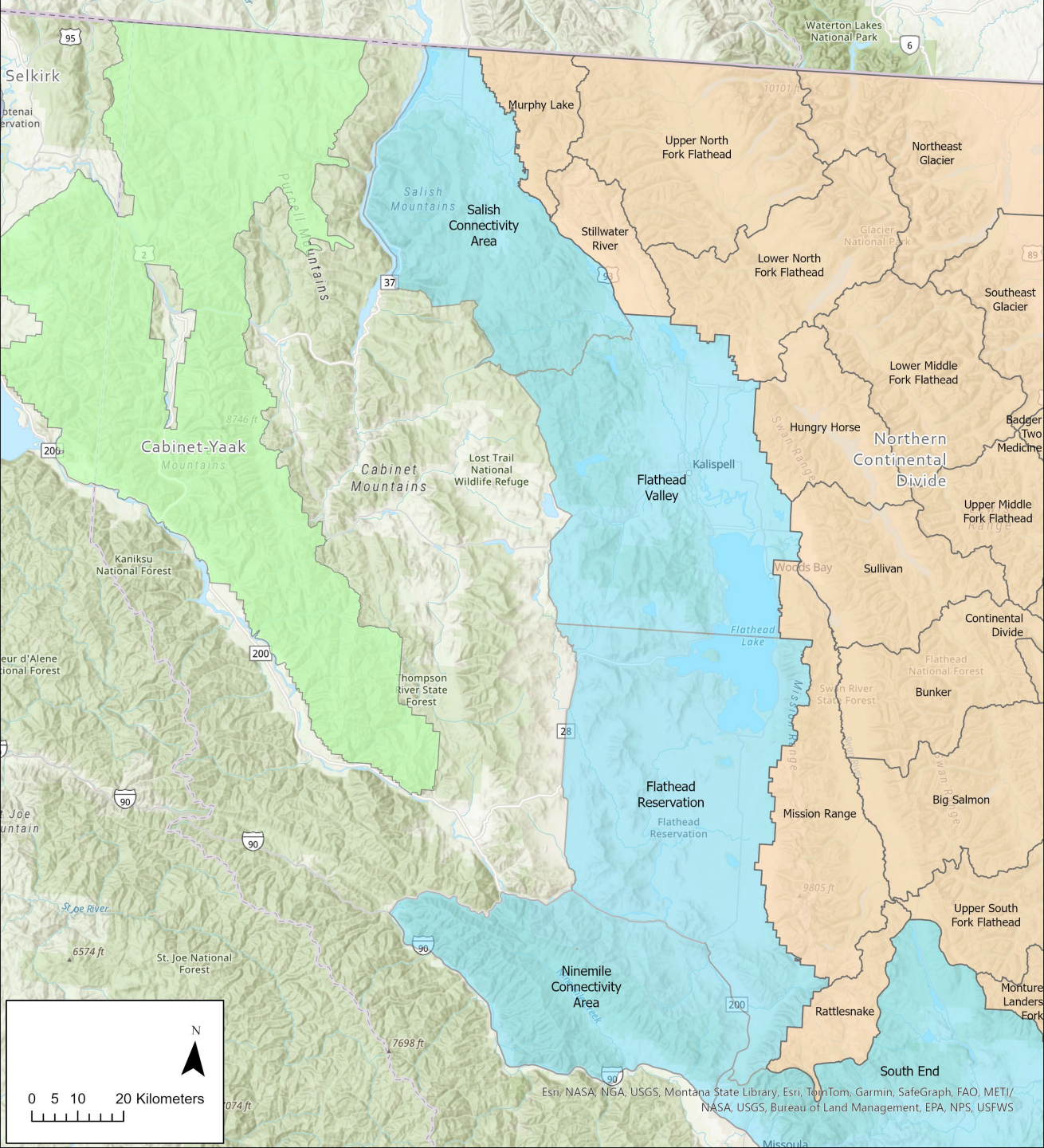
Area	2004	2022	% drop
North	21	7	66%
Central	74	45	39%
South	70	49	30%
Average	55	34	42%



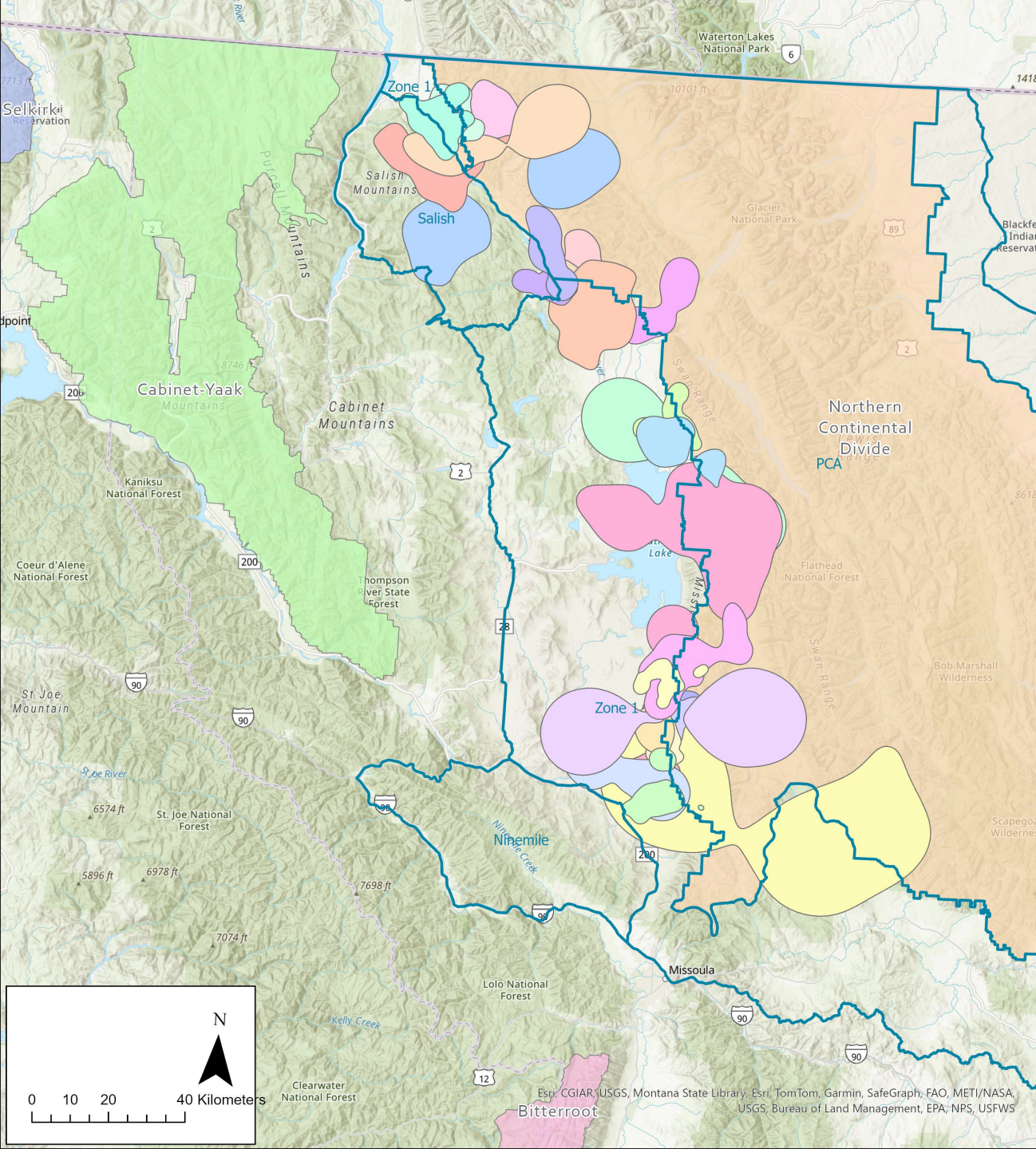
# Occupancy

## Females with offspring

Bear Management Unit (PCA)	2018	2019	2020	2021	2022	2023
Murphy Lake			×		×	×
Upper North Fork Flathead		×	×	×	×	×
Stillwater River	×	×	×	×	×	×
Lower North Fork Flathead	×	×	×	×	×	×
Hungry Horse	×	×	×	×		
Sullivan	×	×	×	×	×	×
Mission Range	×	×	×	×	×	×
Bunker	×	×	×	×		×
Big Salmon	×	×	×	×	×	×
Rattlesnake				×		
Upper South Fork Flathead				×		
Occupancy Unit (Zone 1)	2018	2019	2020	2021	2022	2023
Salish Connectivity Area	×	×	×	×	×	×
Flathead Valley	×	×	×	×	×	×
Flathead Reservation	×	×	×	×	×	×
Ninemile Connectivity Area	×	×	×			
South End	×	×	×	×	×	×







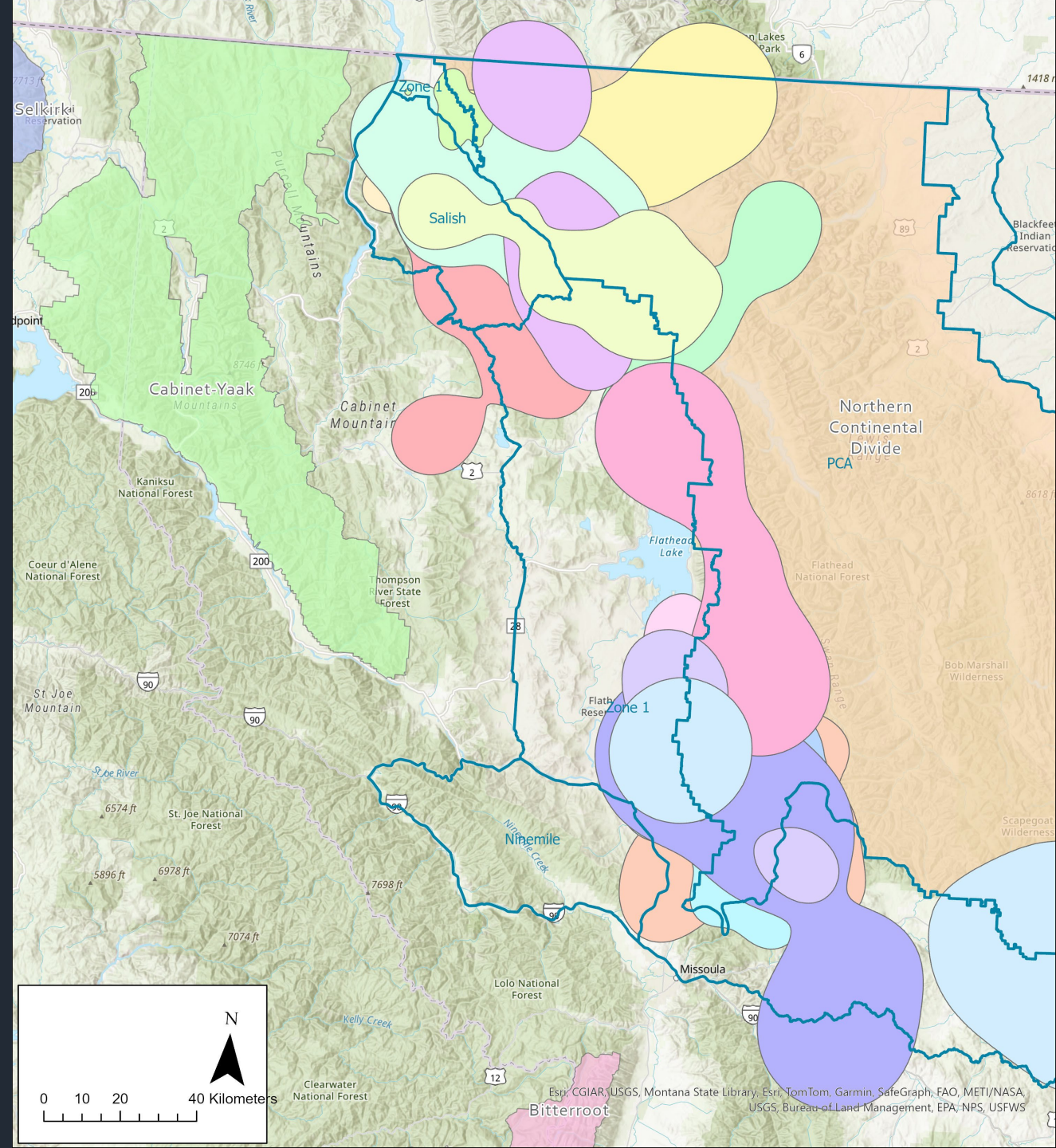
## Occupancy Female Home Ranges

- GPS collars only
- Significant overlap with Zone 1
- 2005-2023
- N = 32

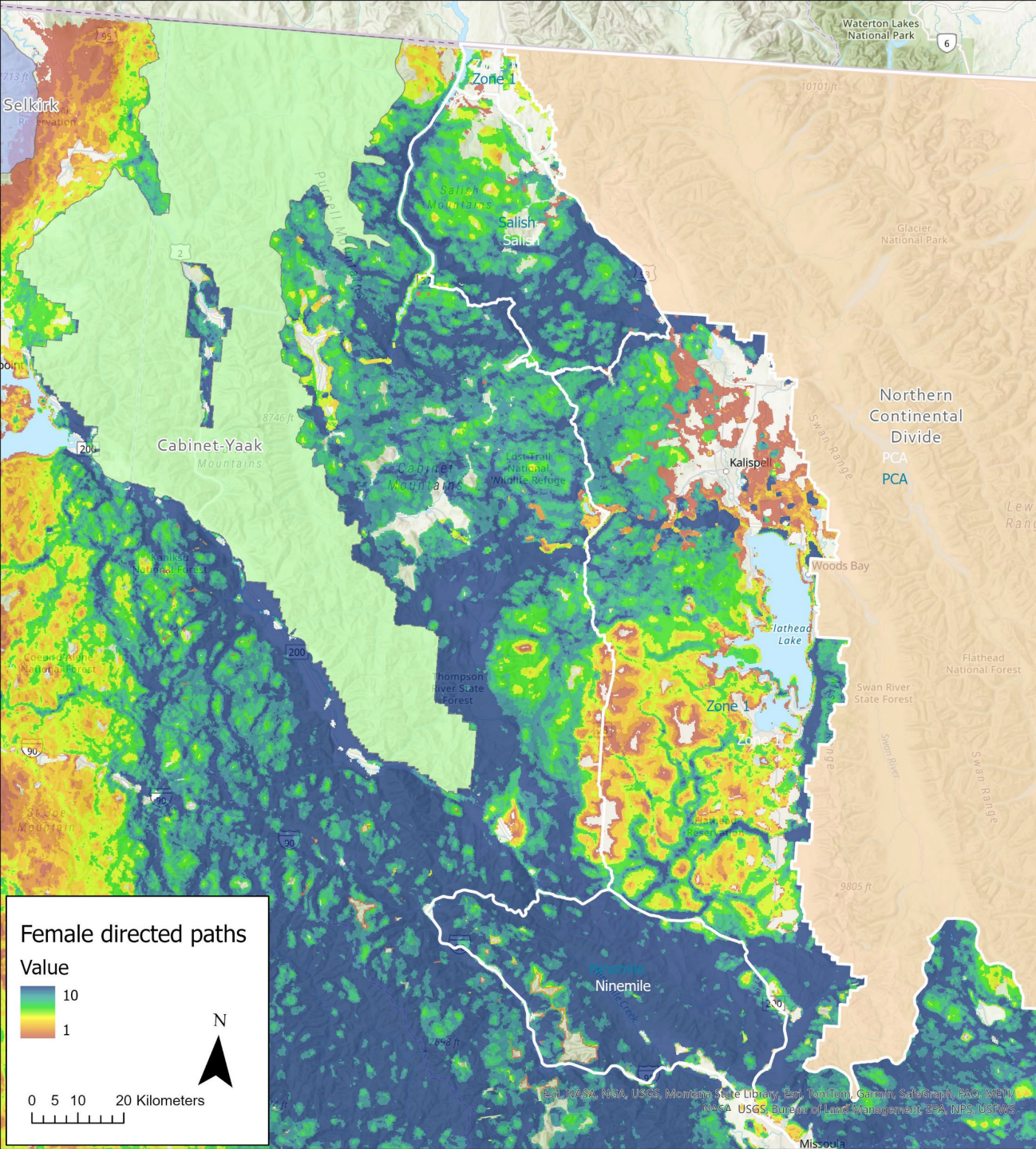


# Occupancy Male Home Ranges

- GPS collars only
- Significant overlap with Zone 1
- 2001-2022
- N = 17



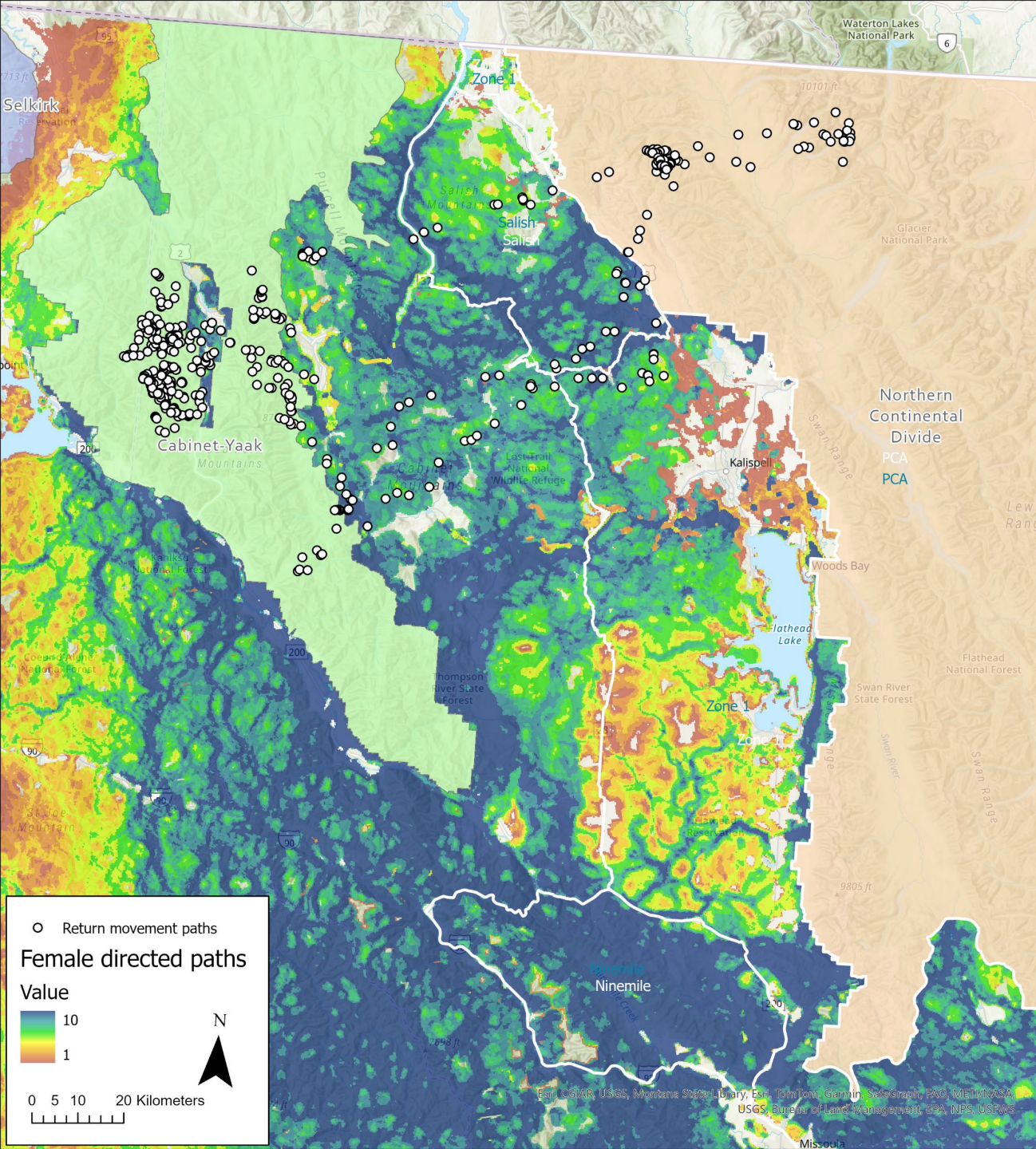




## Connectivity Modeling Sells et al. 2022, 2023a, 2023b

- Blue/green areas for higher predicted movements
- High potential for movements between NCDE and CYE





## Connectivity Modeling Sells et al. 2022, 2023a, 2023b)

- Blue/green areas for higher predicted movements
- High potential for movements between NCDE and CYE
- Paths of augmentation bears that returned to NCDE



## Natural immigration or temporary movement events between NCDE and CYE

- Mothers identified by genetic parentage analyses
- Movement estimated from natal range to location(s) in opposite ecosystem
- Home range establishment judged by age and locations





# NCDE to CYE

- Male CYE-737
- Born in NCDE in 2006
- Present in CYE when 4-9 years old (2010-15)
- Established home range, permanent immigrant
- 65 km from natal range center
- Fate unknown
- No documented offspring in CYE

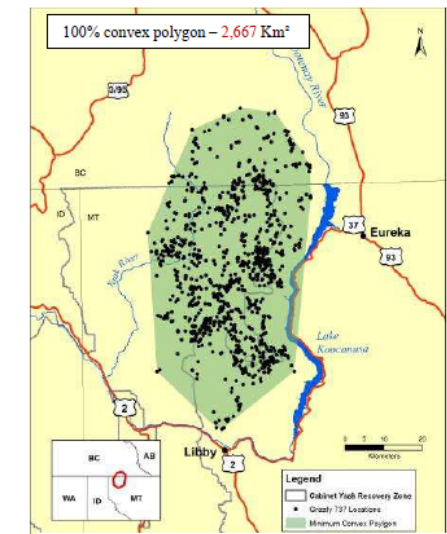
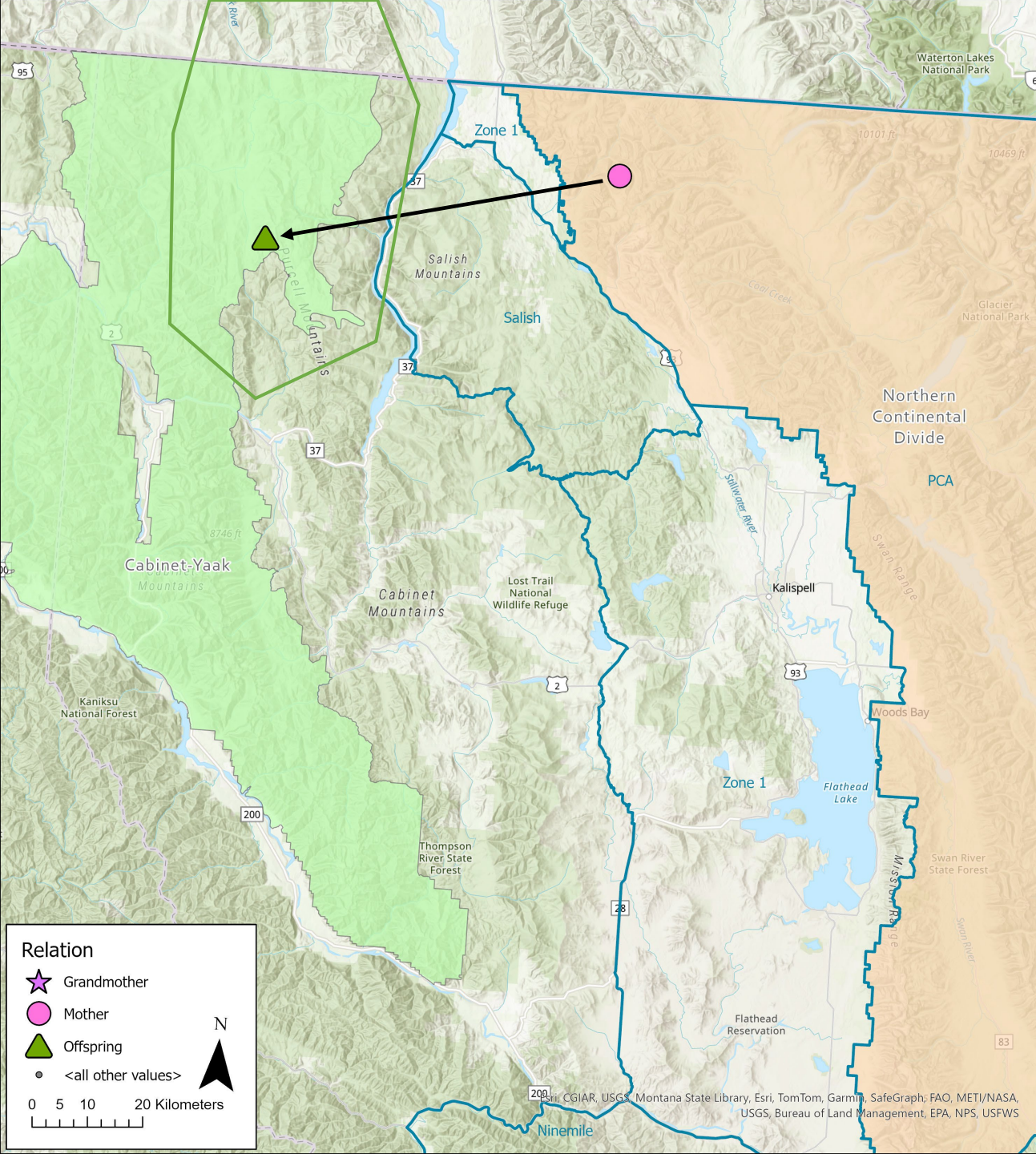
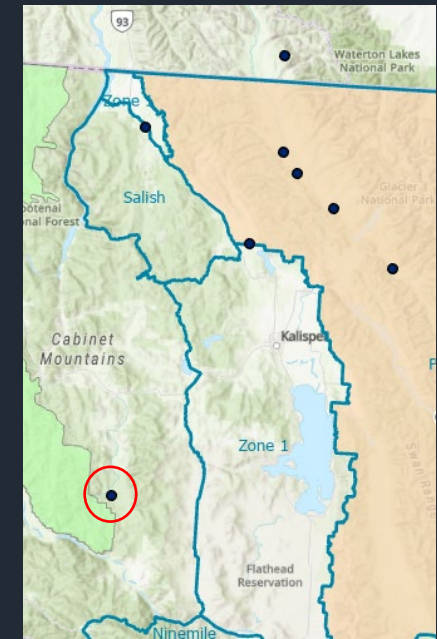
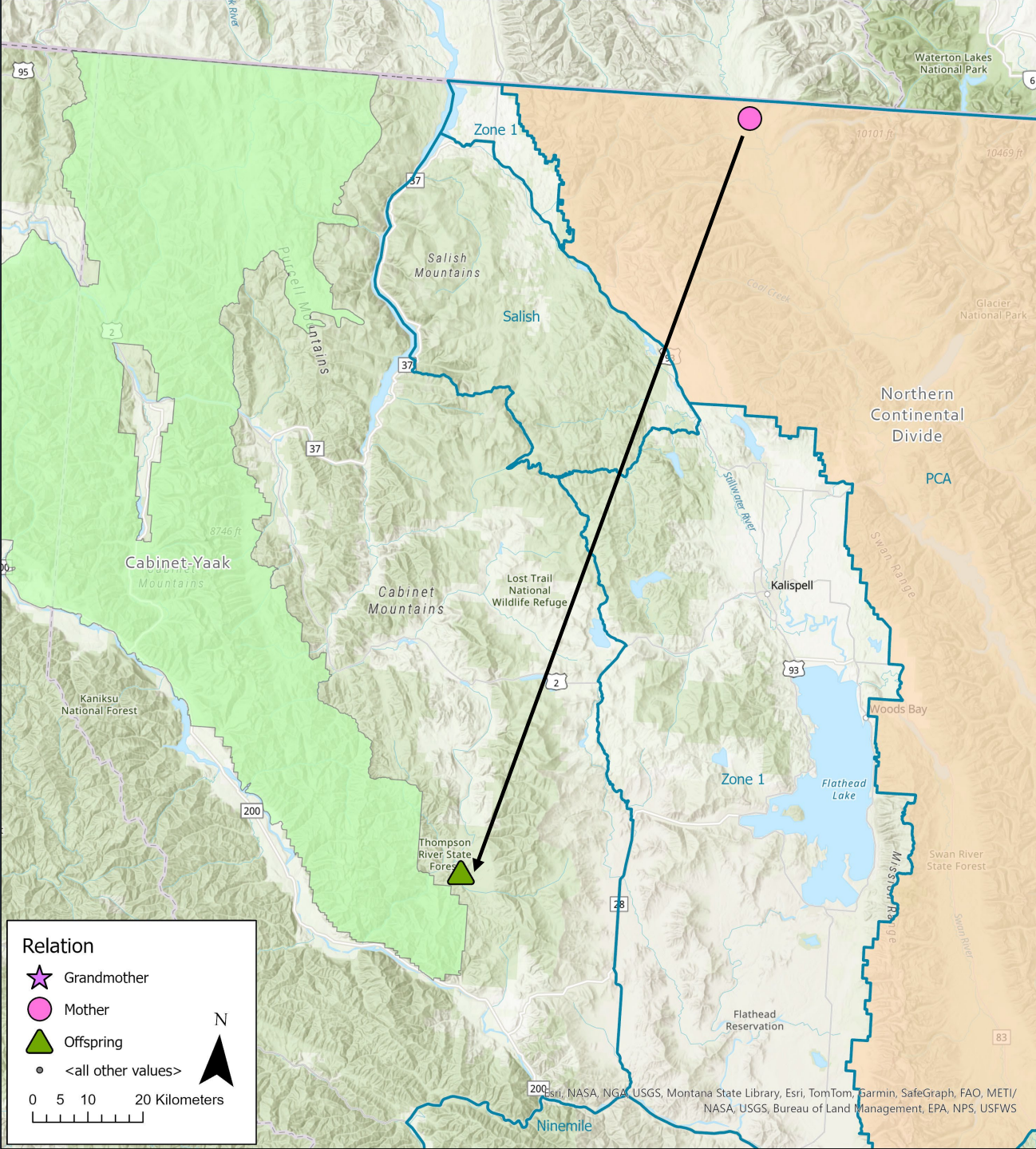


Figure A71. Radio locations and minimum convex (shaded) life range of male grizzly bear 737 in the Yaak River, 2010-2013.



# NCDE to CYE

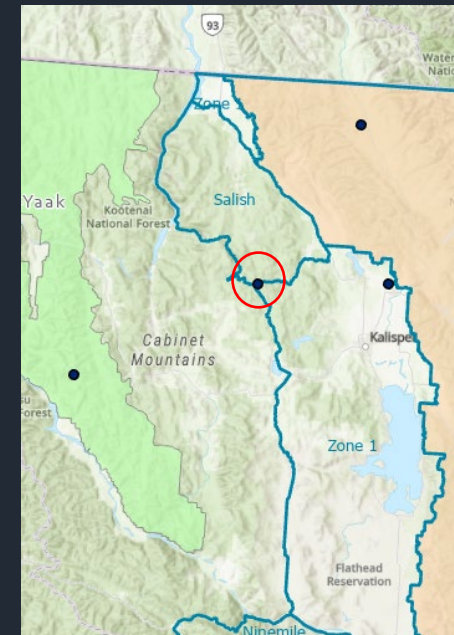
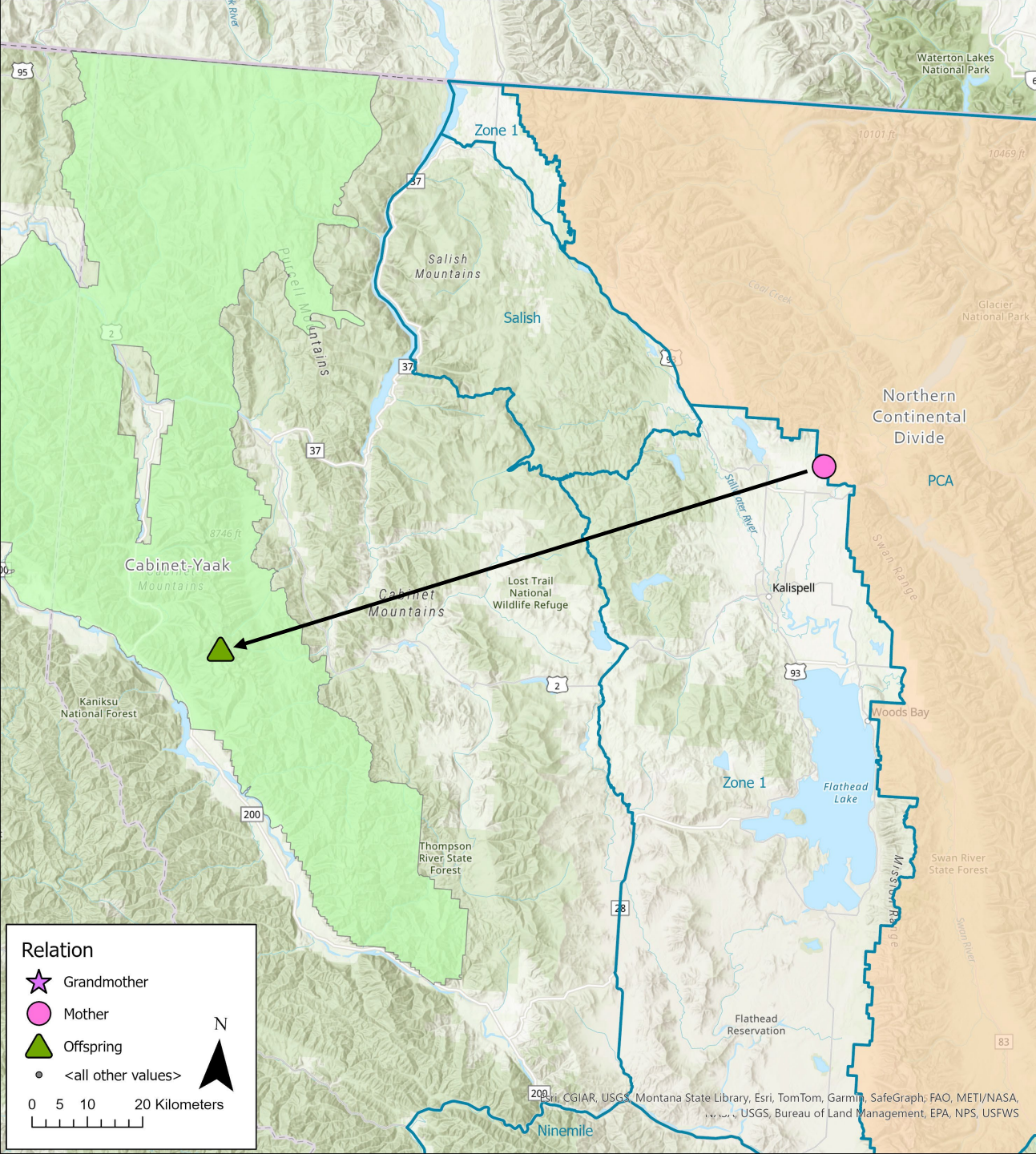
- Male NCDE-79575279
- Born in NCDE in 2008
- Present in CYE when 6 years old (2014)
- Only one detection (mortality)
- 148 km from natal range center
- Died as 6-year-old, CYE, DOL
- No documented offspring in CYE





# NCDE to CYE

- Male NCDE-41311375
- Born in NCDE in 2013
- Present in CYE when 3 or 4 years old (2016 or 2017)
- One DNA detection, returned to NCDE
- 115 km from natal range center
- Died as 4-year-old, in NCDE, poaching
- No documented offspring





# NCDE to CYE

- Male CYE-866
- Born in NCDE in 2014
- Present in CYE when 5-6 years old (2019-20)
- Establishing home range?
- 80 km from natal range center
- Fate unknown
- No documented offspring in CYE

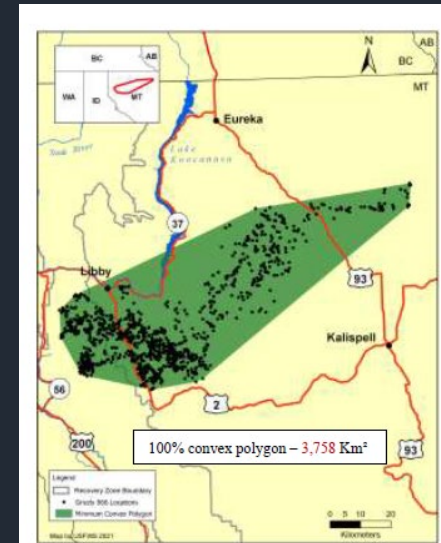
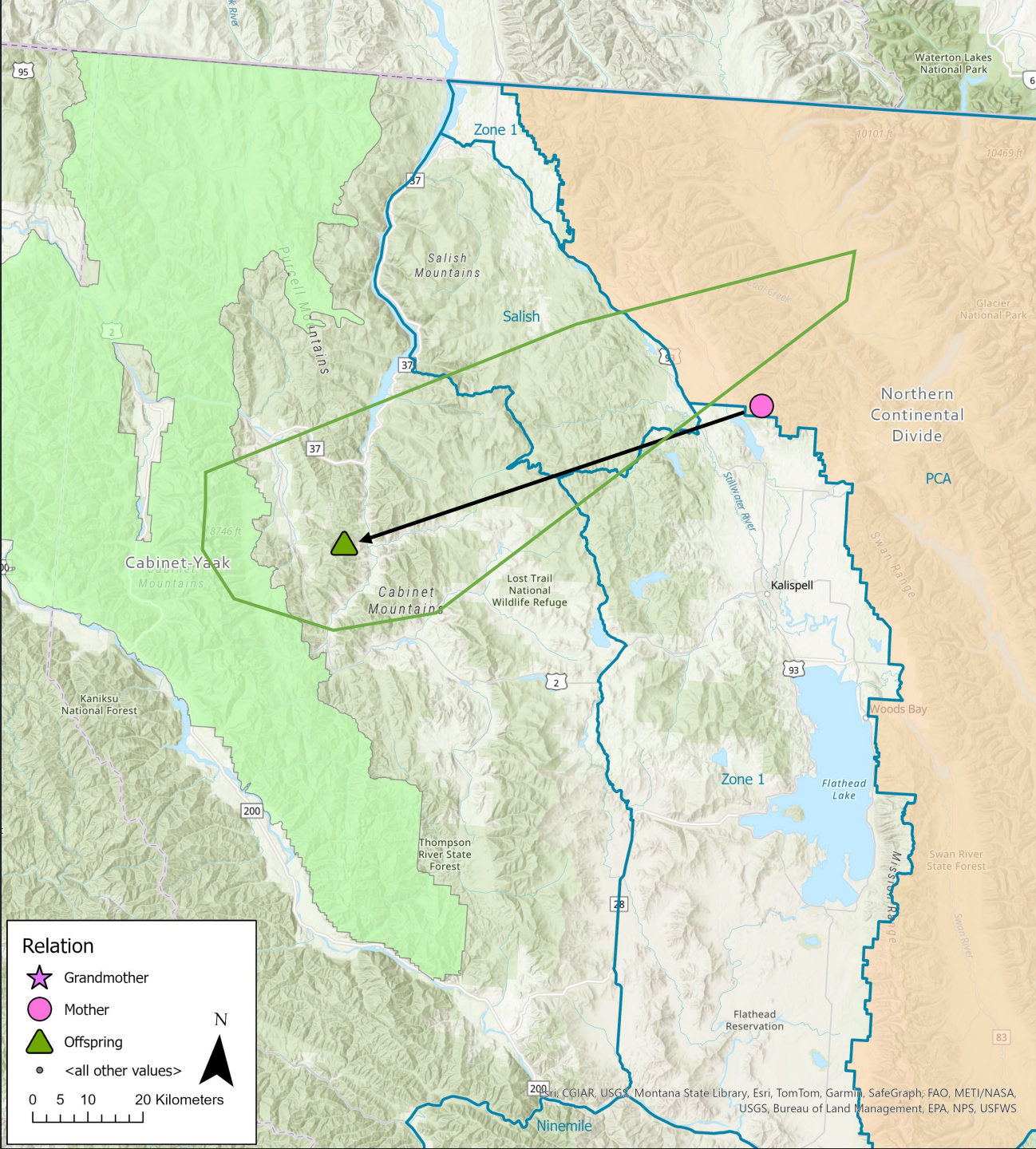
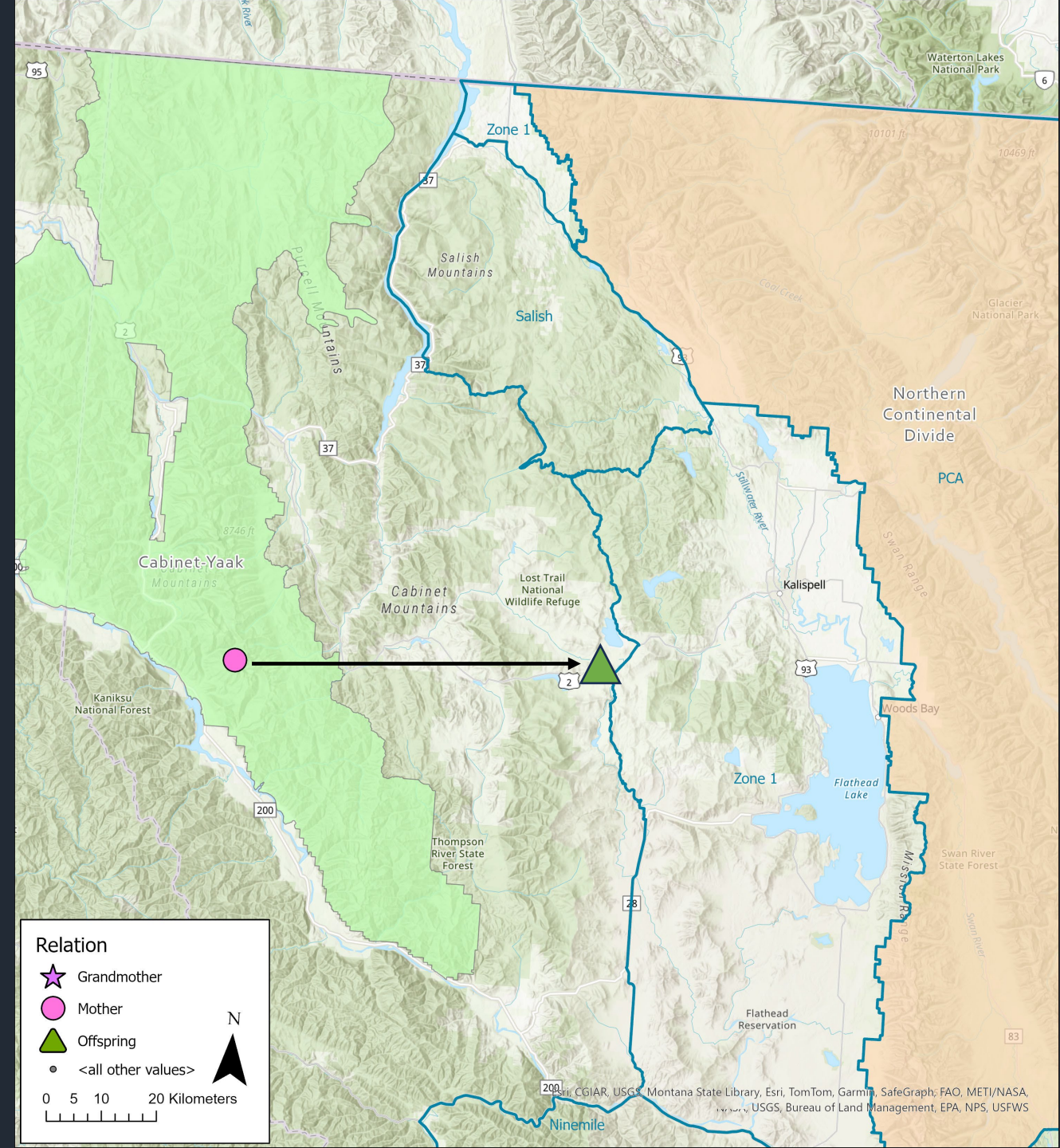
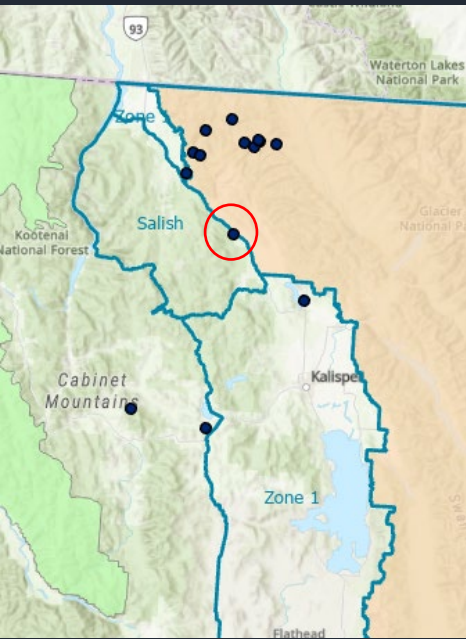


Figure A106. Radio locations and minimum convex (shaded) life range of male grizzly bear 866 in the Cabinet Mountains, 2019–2020.



# CYE to NCDE

- Male NCDE-82033565
- Born in CYE in 2004
- Present in NCDE when 2-3 years old (2006-07)
- NCDE movements were relocation-influenced
- 67 km from natal range center
- Died as 3-year-old, NCDE, train
- No known offspring in NCDE





# CYE to NCDE

- Male CYE 839
- Born in CYE in 2012
- Present in NCDE when 3-4 years old (2015-16)
- Establishing home range?
- 95 km from natal range
- Fate unknown
- No documented offspring in NCDE

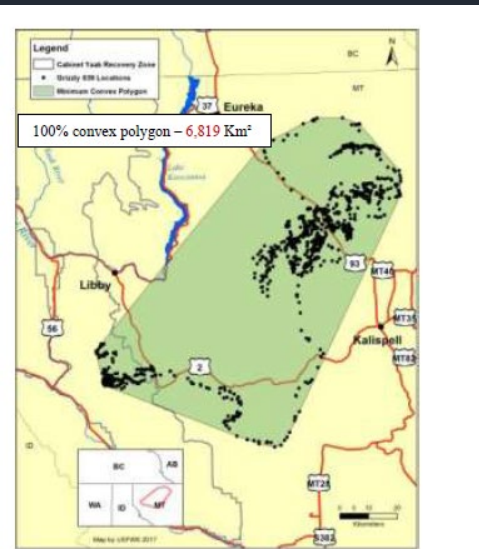
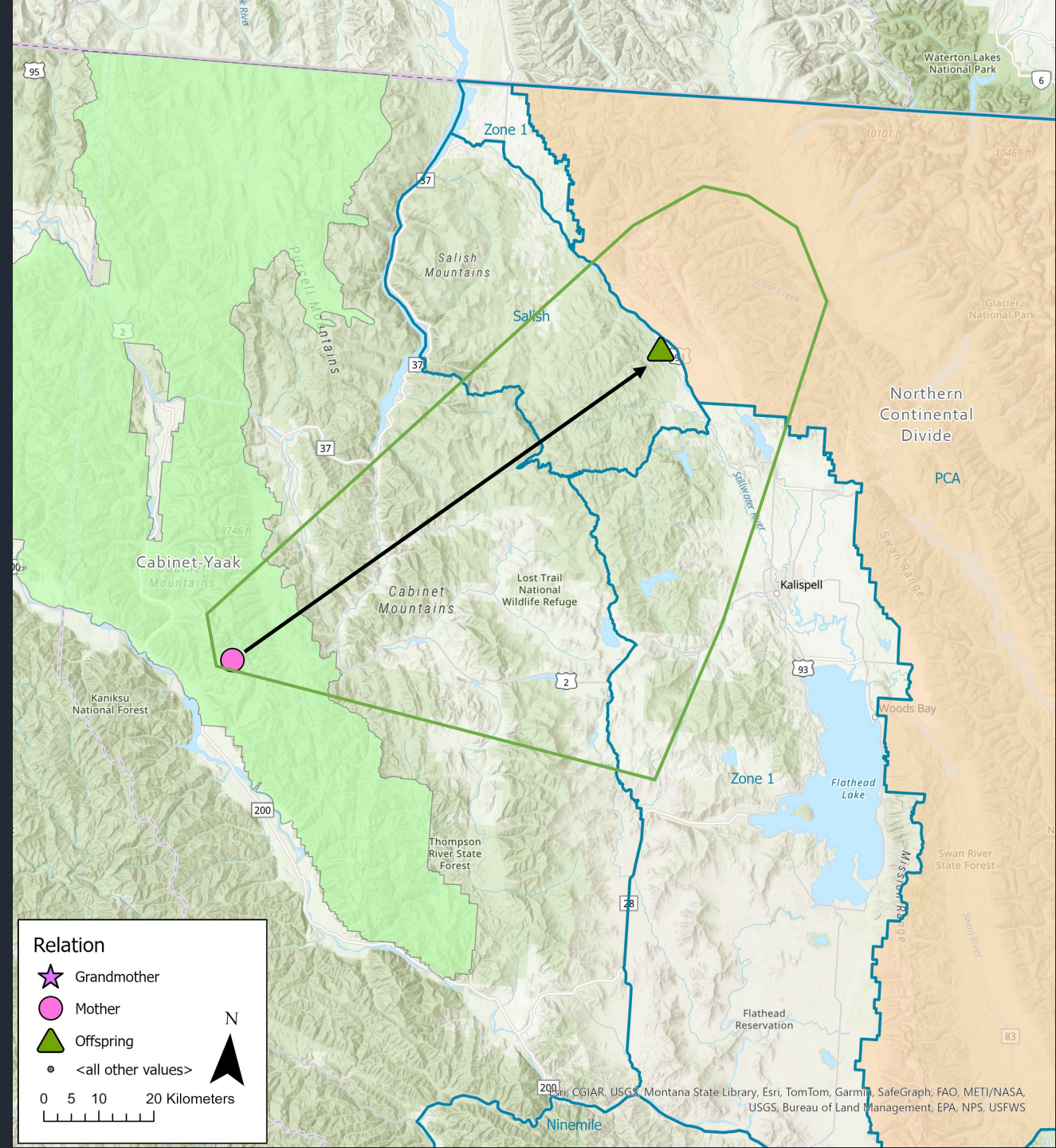


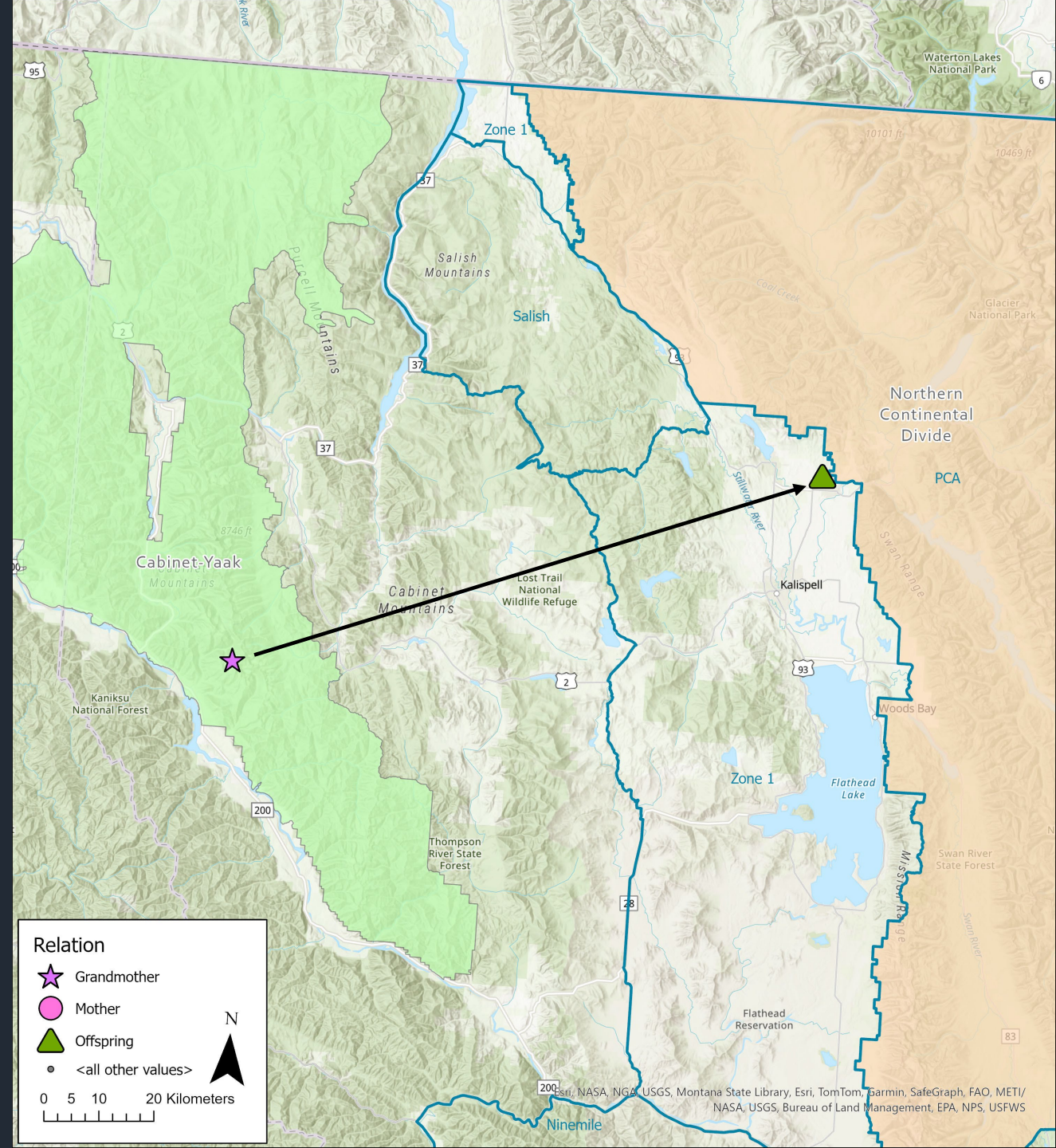
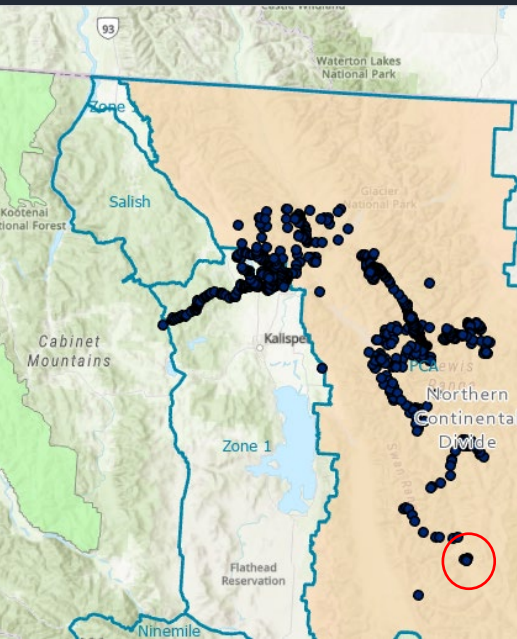
Figure A86. Radio locations and minimum convex (shaded) life range of male grizzly bear 839 in the Cabinet Mountains, 2015–2016.





# CYE to NCDE

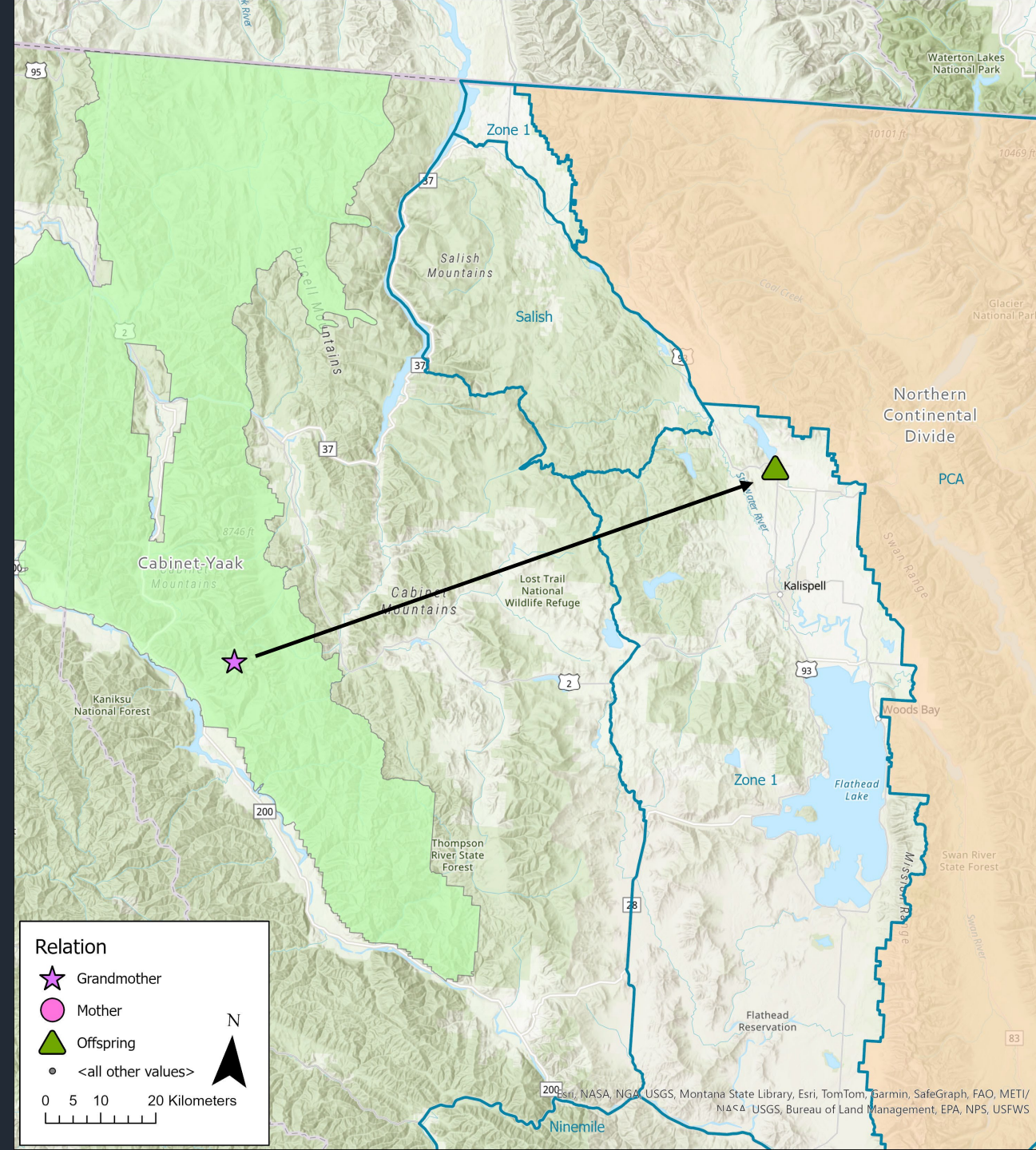
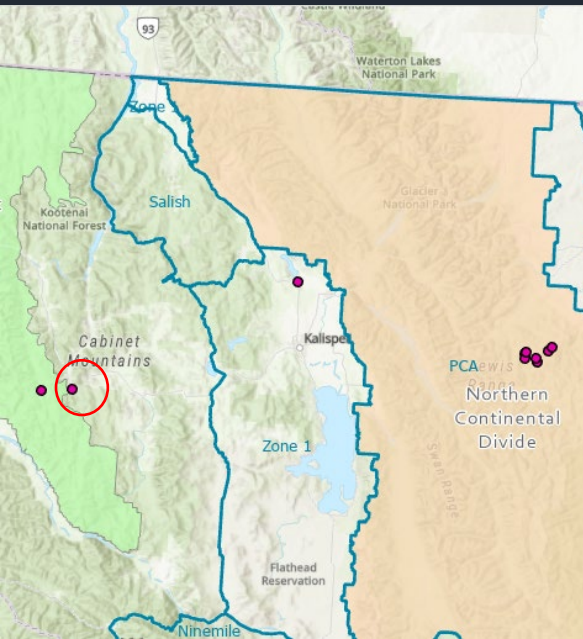
- Male NCDE-842012037
- Likely born in CYE in 2017
- Present in NCDE when 3-5 years old (2020-22)
- NCDE movements were relocation-influenced
- Potential dispersal distance 112 km
- Died as 5-year-old, in NCDE, DOL
- No documented offspring in NCDE





# CYE to NCDE

- Female NCDE-842014086
- Born in CYE in 2019
- Present in NCDE when 2 years old (2021)
- Movements within NCDE were relocation-influenced, returned to CYE by 2022
- Movement distance 105 km
- Died as 3-year-old, CYE, management removal



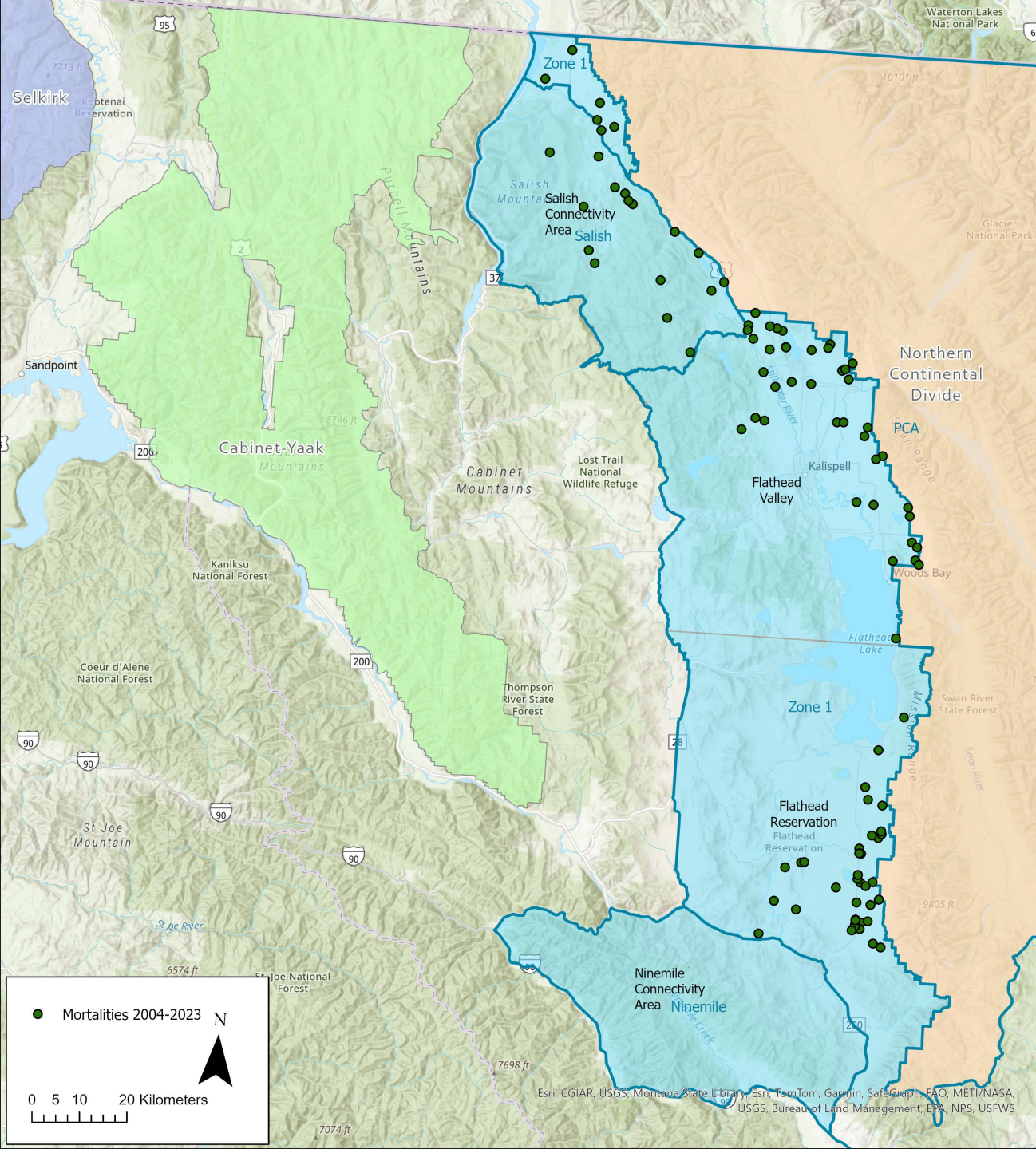




## Natural immigration or temporary movement events between NCDE and CYE

- No gene flow observed
- 4 movements from NCDE to CYE
  - 2 possible immigrants, not known dead, potentially reproducing
  - 2 dead, likely before reproducing
- 4 movements from CYE to NCDE
  - 1 possible immigrant, not known dead, potentially reproducing
  - 2 dead before reproductive maturity
  - 1 dead as adult, may have reproduced
- All deaths human-caused
  - 4 outside Recovery Zone, between ecosystems
  - 2 DOL, train, management removal, poaching





## NCDE known or probable mortalities in Zone 1 (west) or DCAs, 2004-2023

- $n = 130$
- 87% on private land
- 7% on state land
- 5% on US Forest Service land
- 2% on other federal land





Questions?

