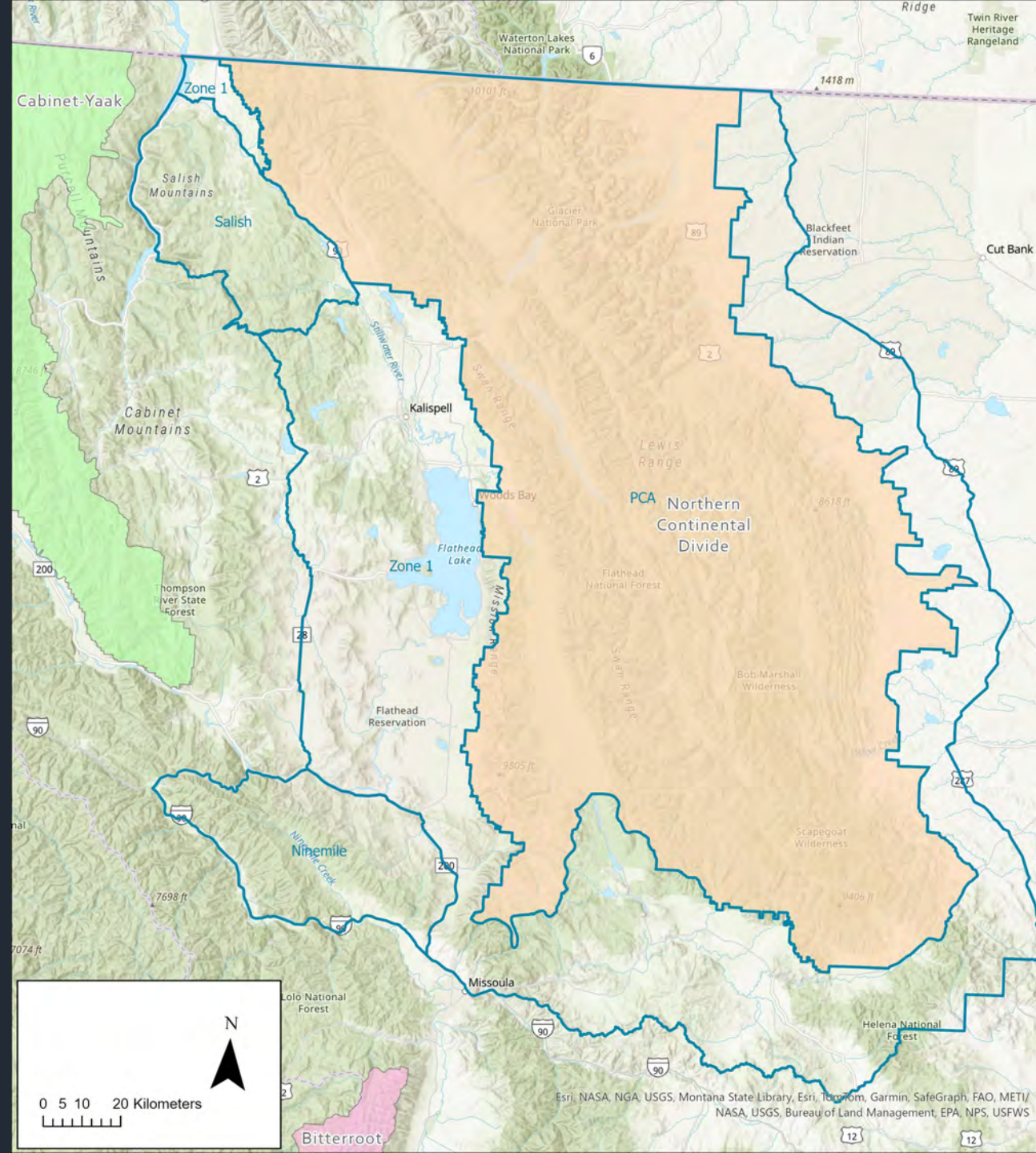
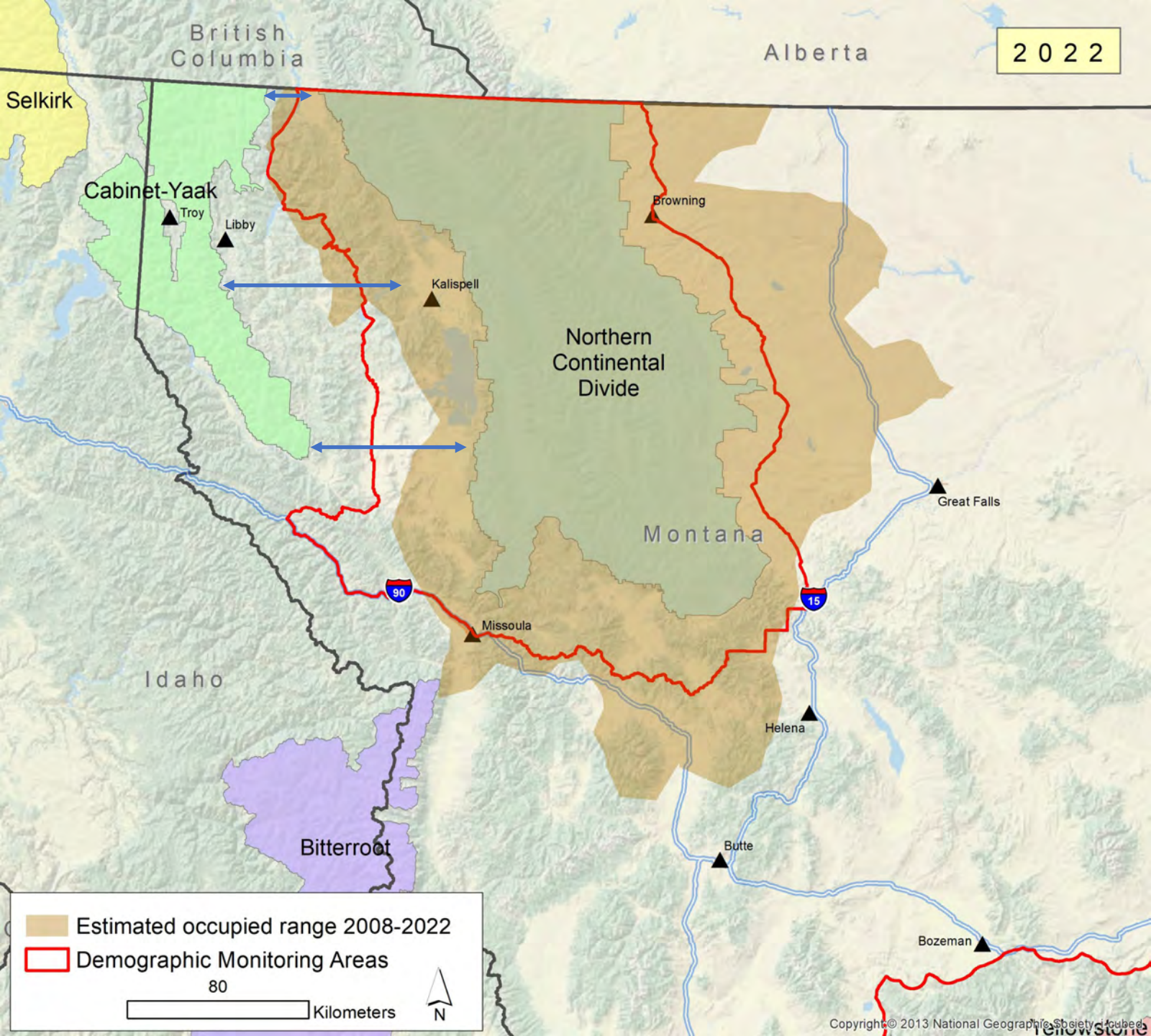


Status of Connectivity between the NCDE and the CYE

NCDE Zones

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



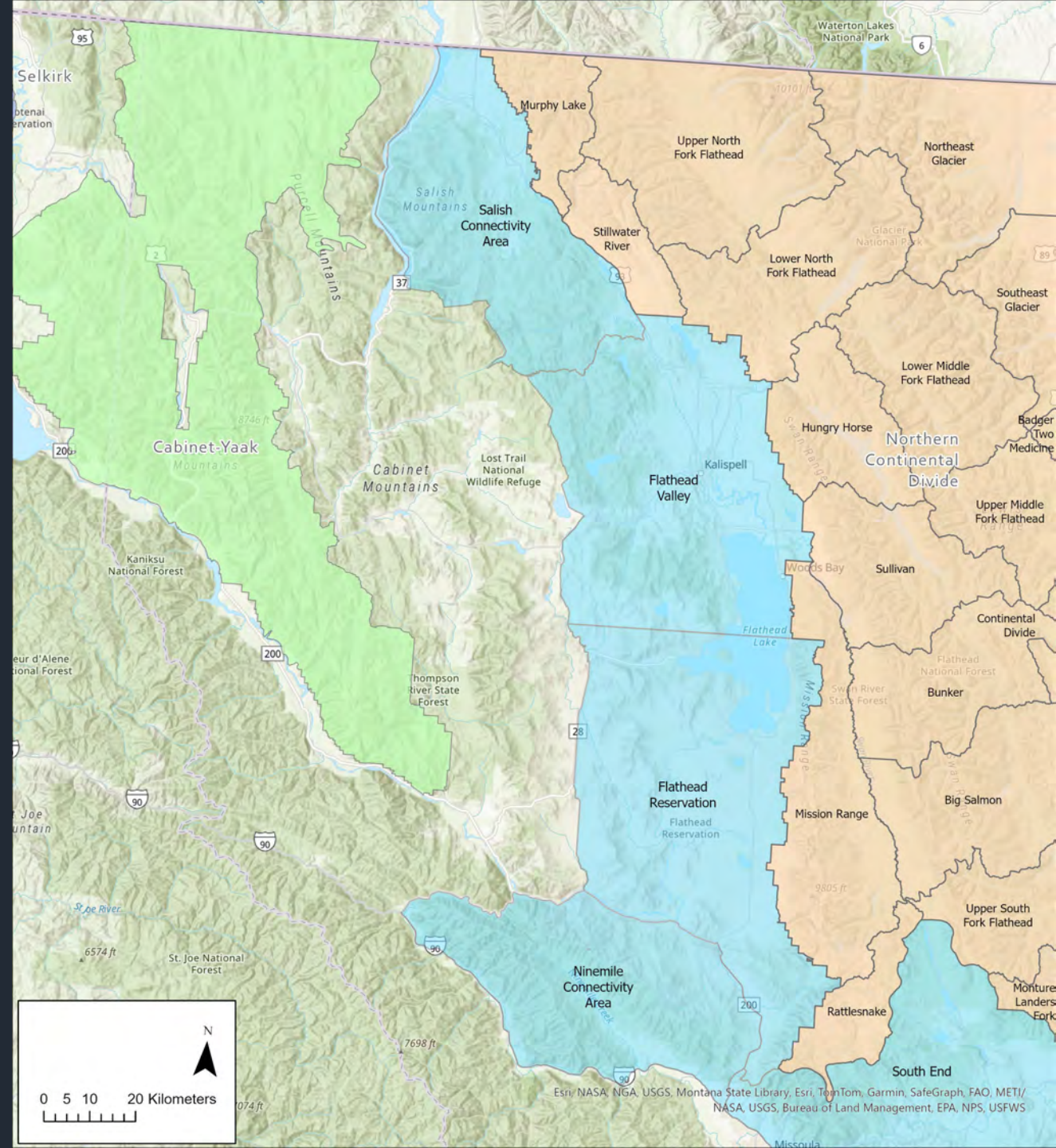


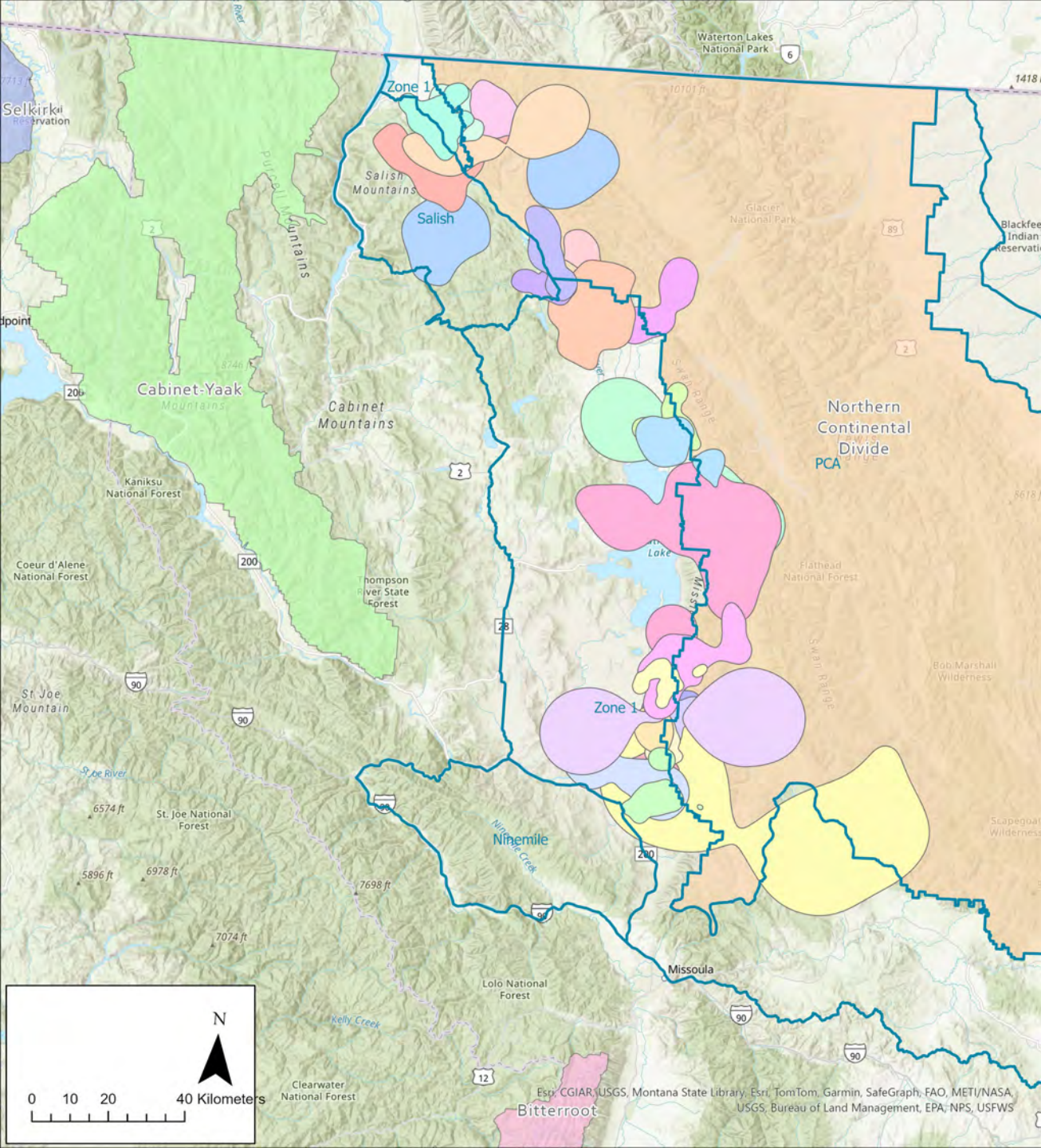
Distance from NCDE Occupied Range to CY Recovery Zone (km)

| 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 | × | × | × | × | × | × |





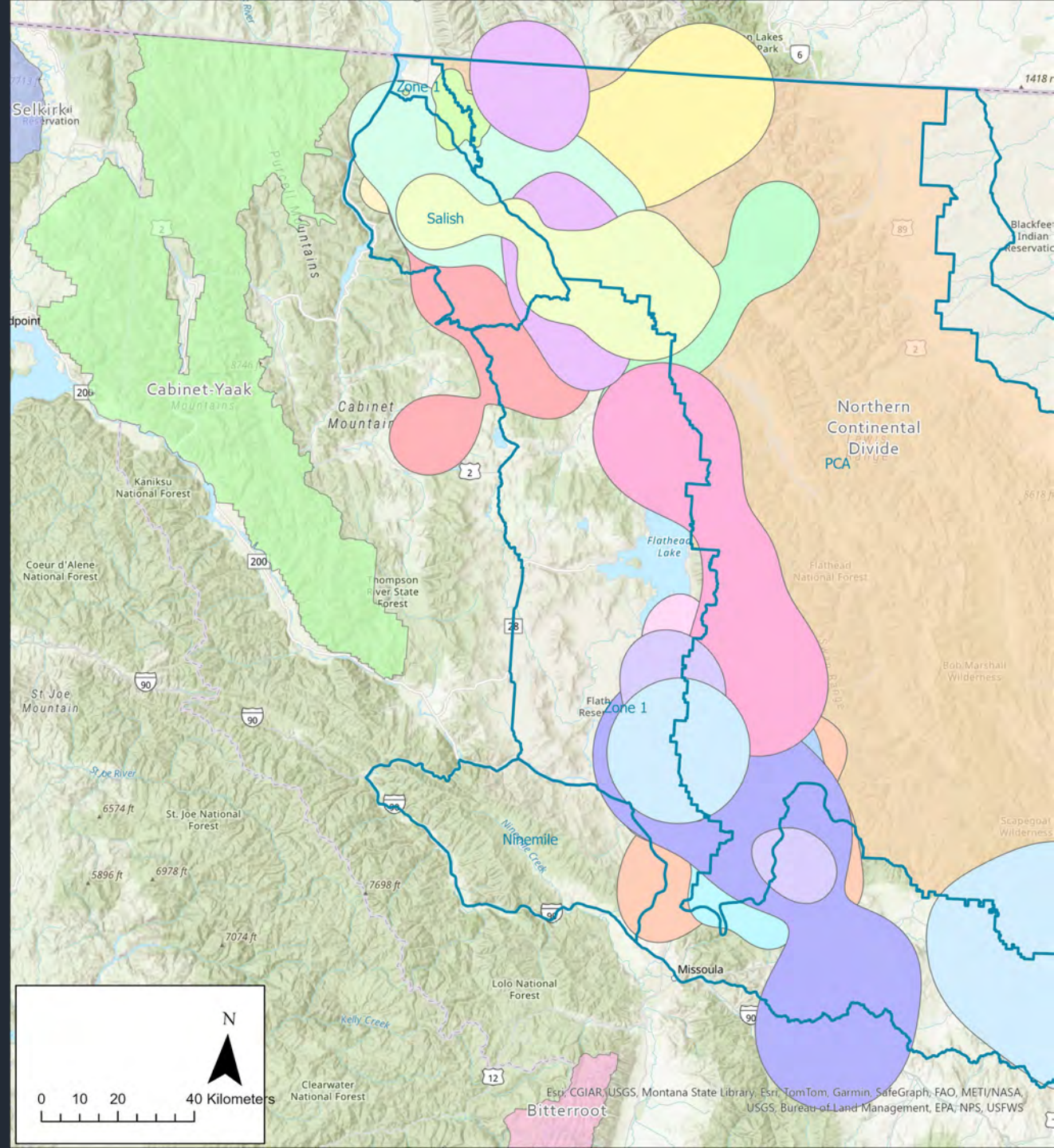
Occupancy Female Home Ranges

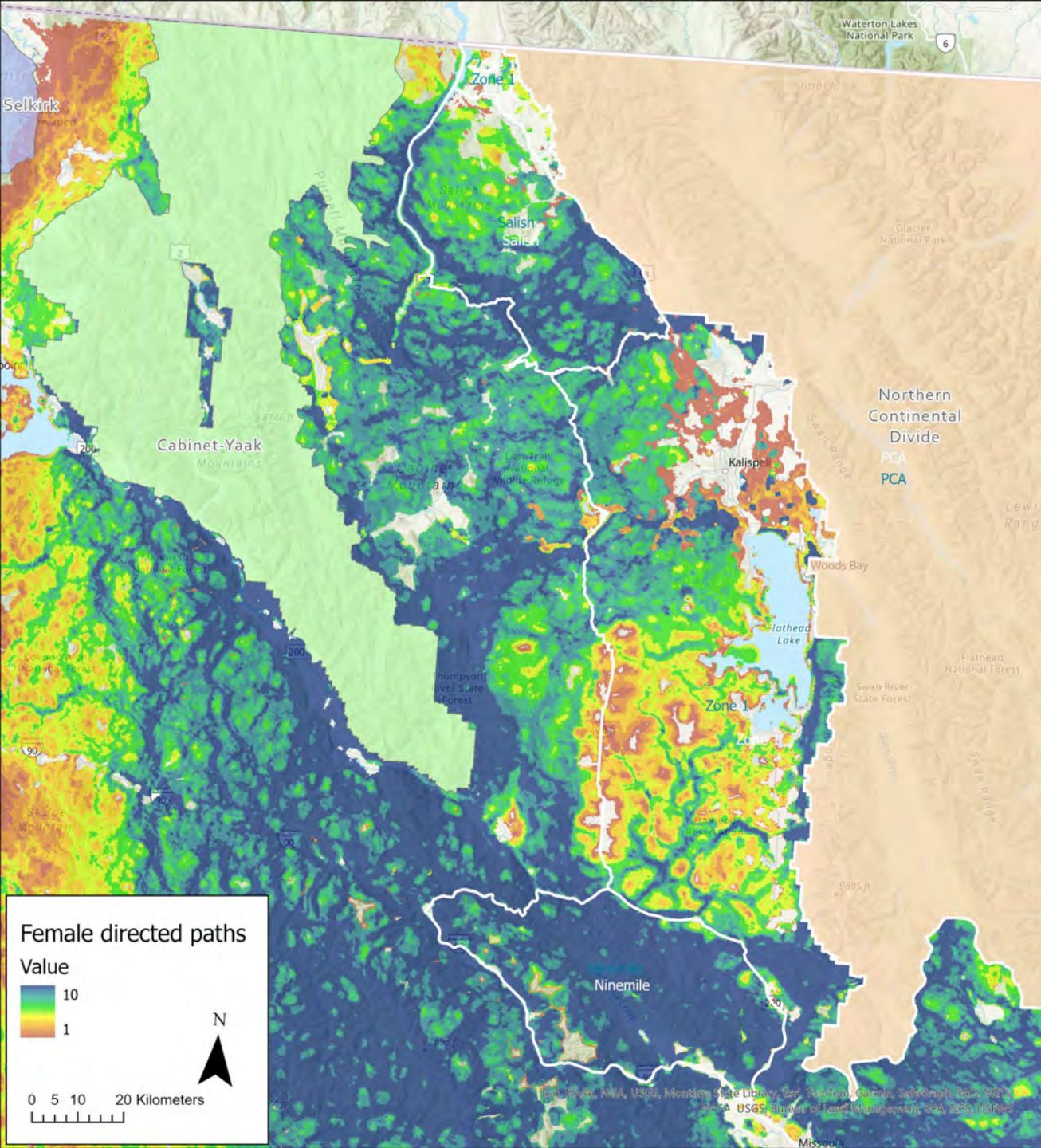
- GPS collars only
- Significant overlap with Zone 1
- 2005-2023
- N = 32

Esri, CGIAR, USGS, Montana State Library, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USFWS

Occupancy Male Home Ranges

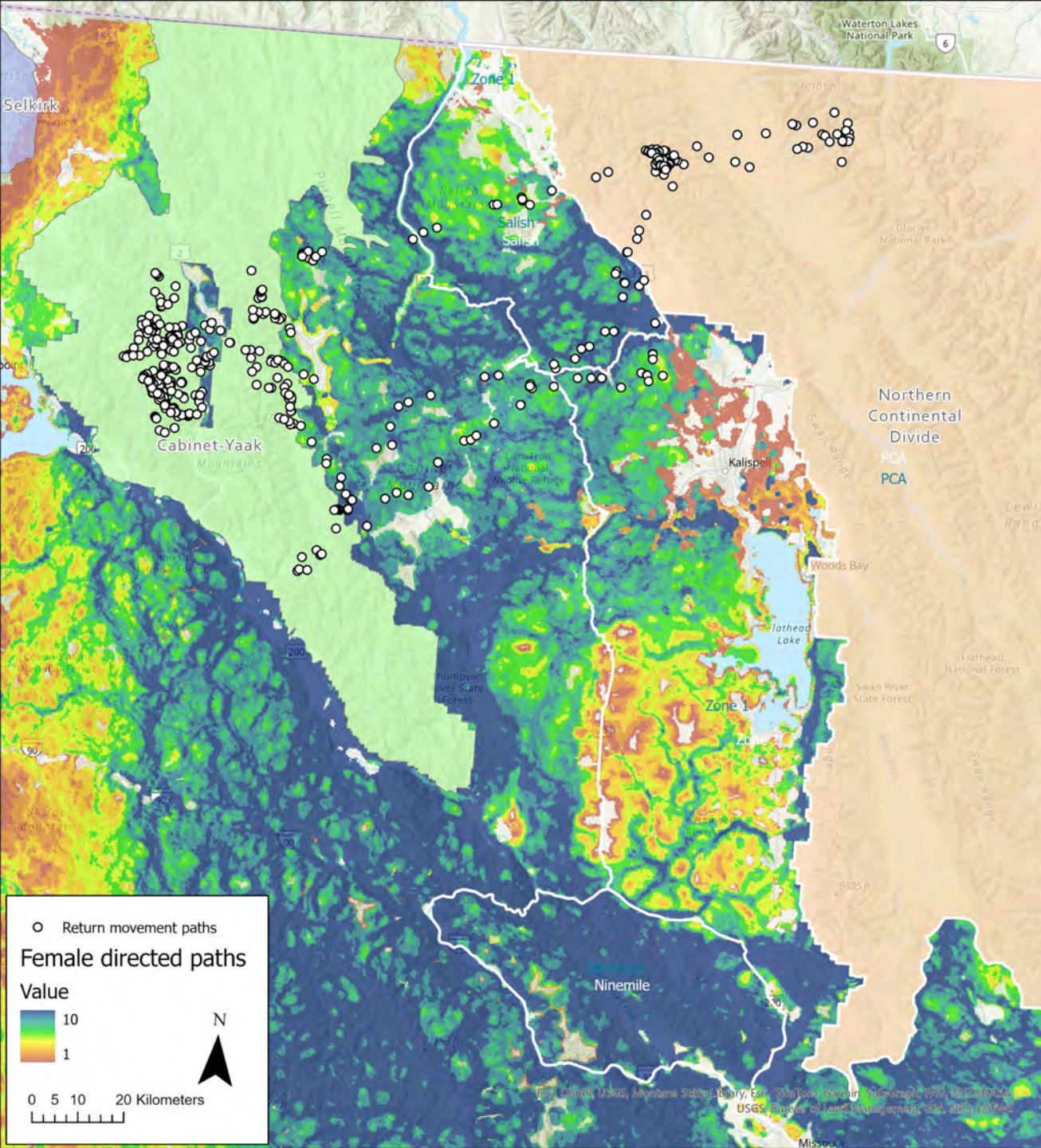
- GPS collars only
- Significant overlap with Zone 1
- 2001-2022
- N = 17





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*

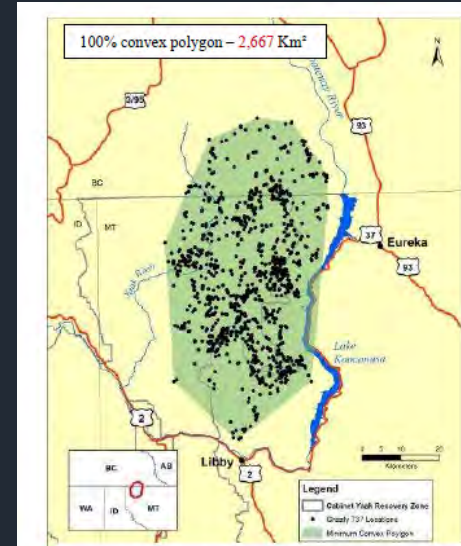
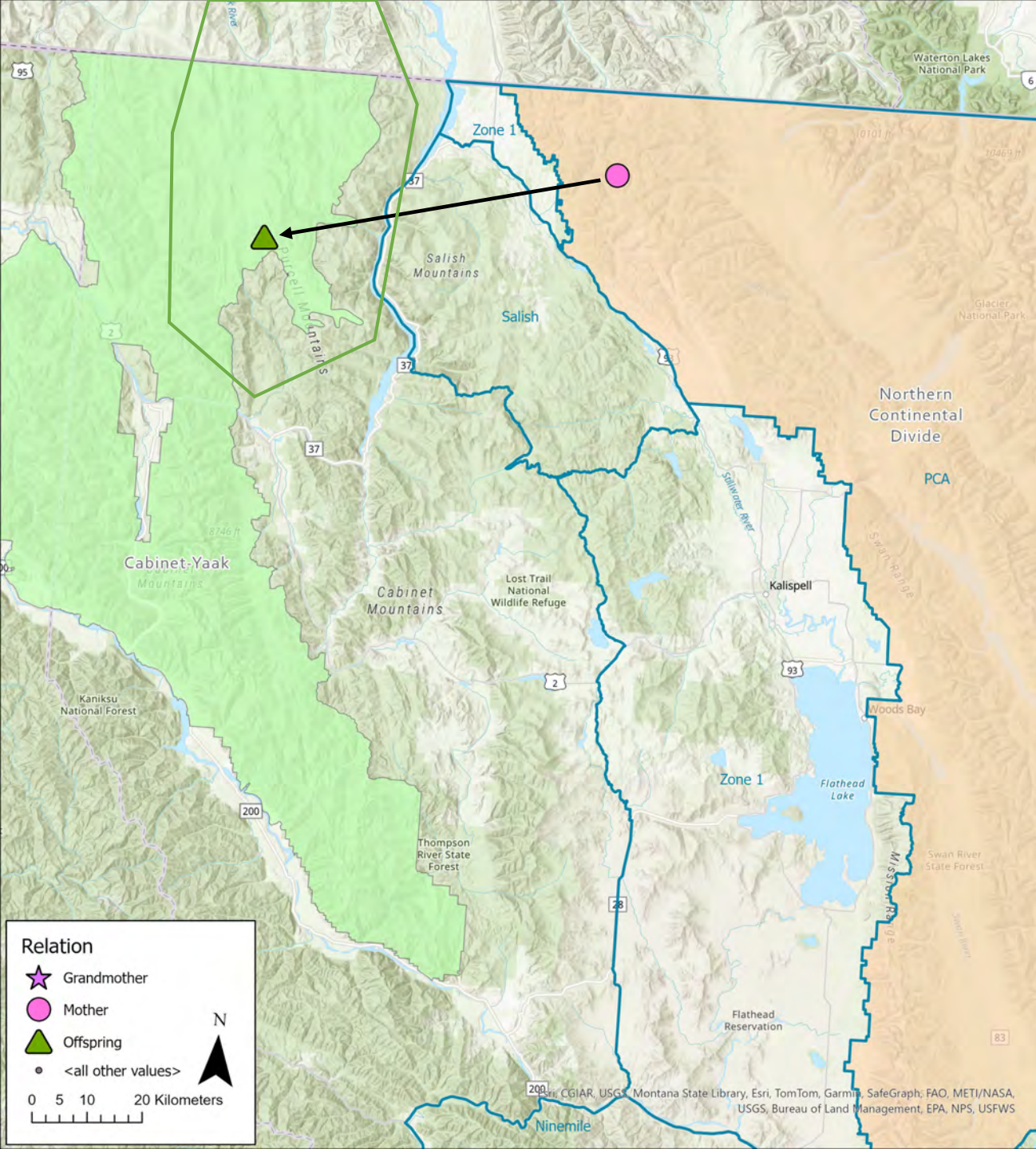
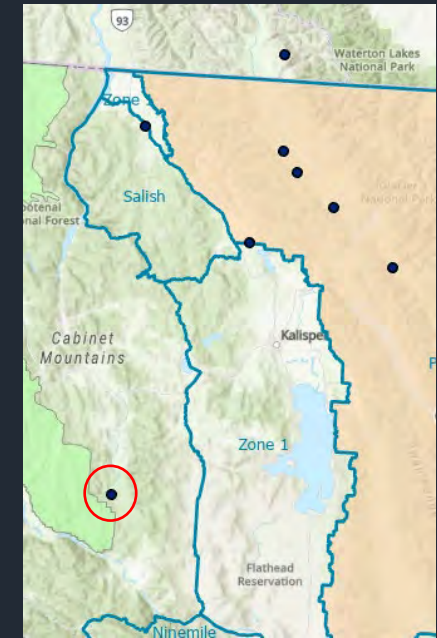
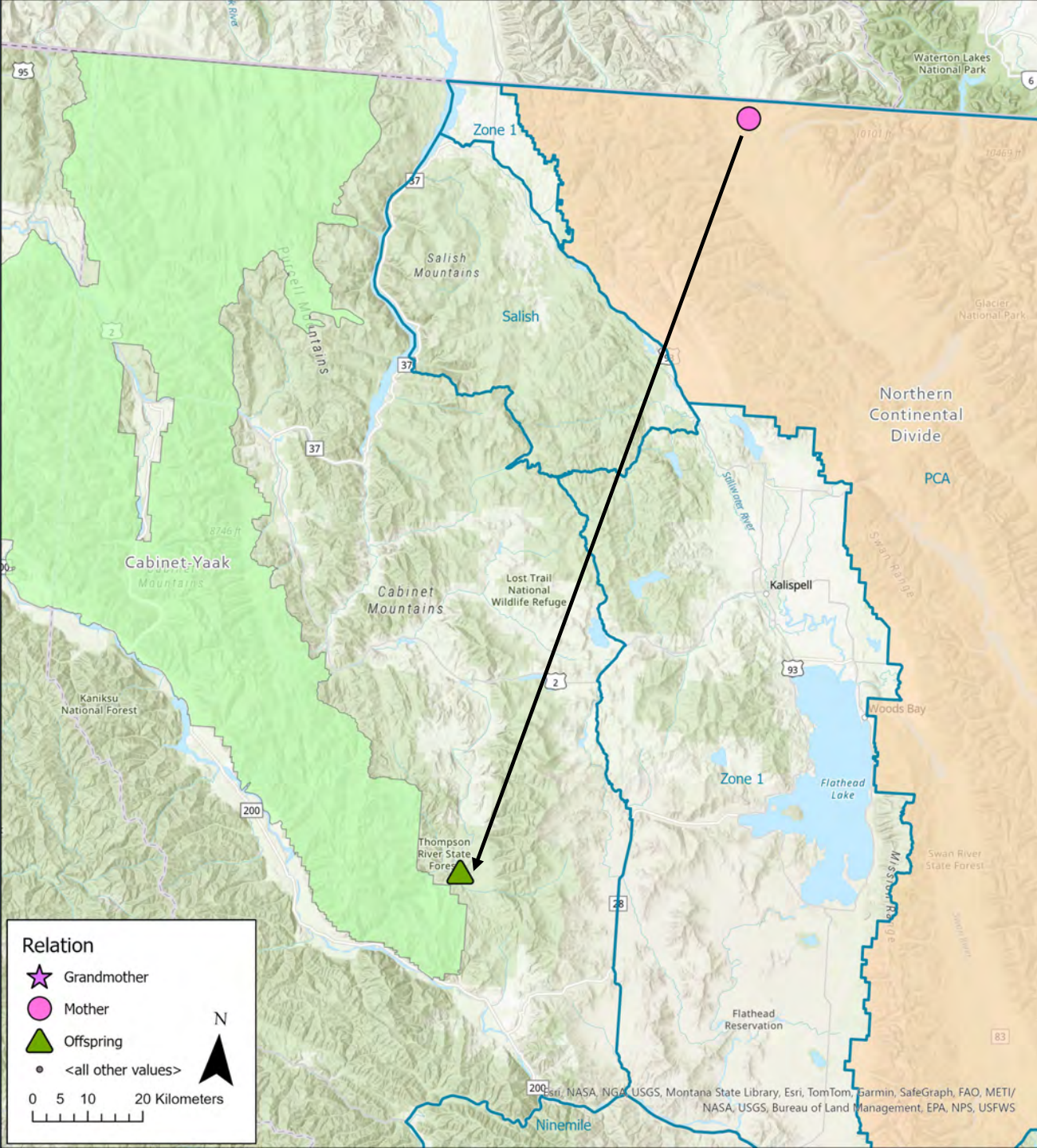


Figure A71. Radio locations and minimum convex (shaded) life range of male grizzly bear 737 in the Yaak River, 2010–2013.

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



Relation

- ☆ Grandmother
- Mother
- ▲ Offspring
- <all other values>

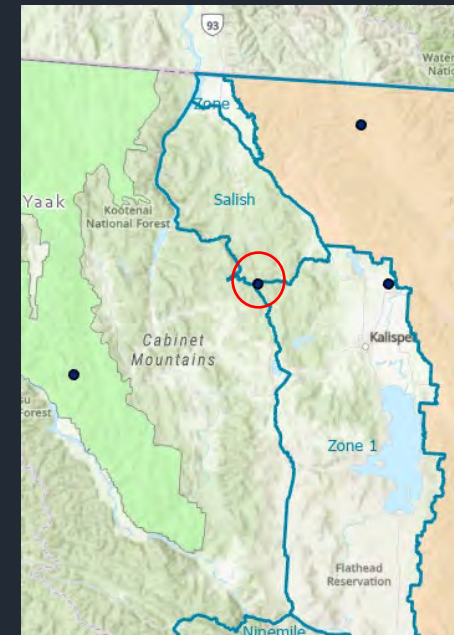
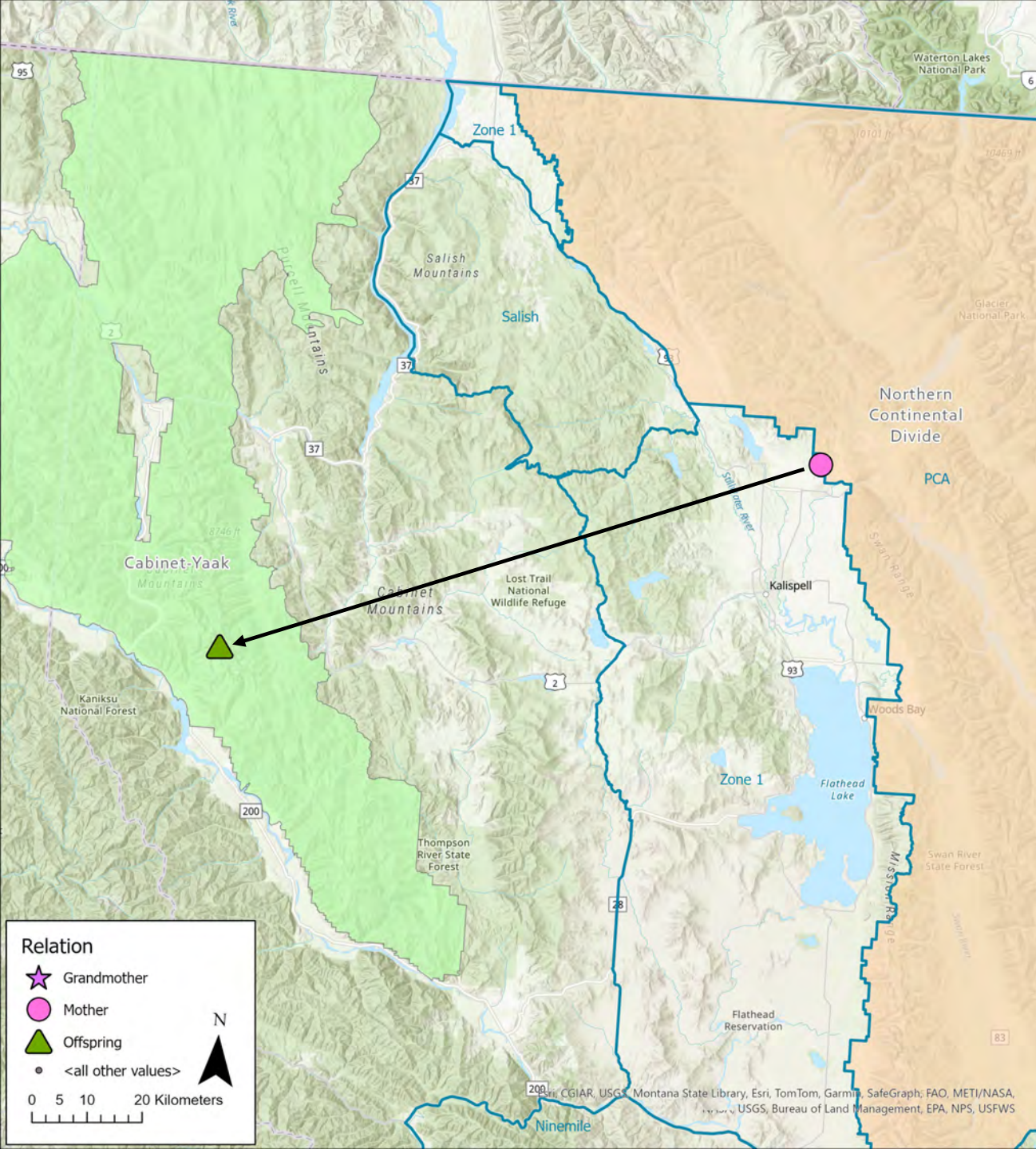
0 5 10 20 Kilometers

N

© 2014 Esri, NASA, USGS, Montana State Library, Esri, TomTom, Garmin, SafeGraph, FAO, METI/ NASA, USGS, Bureau of Land Management, EPA, NPS, USFWS

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

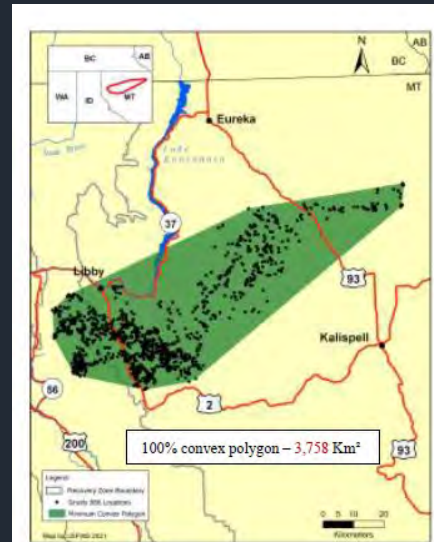
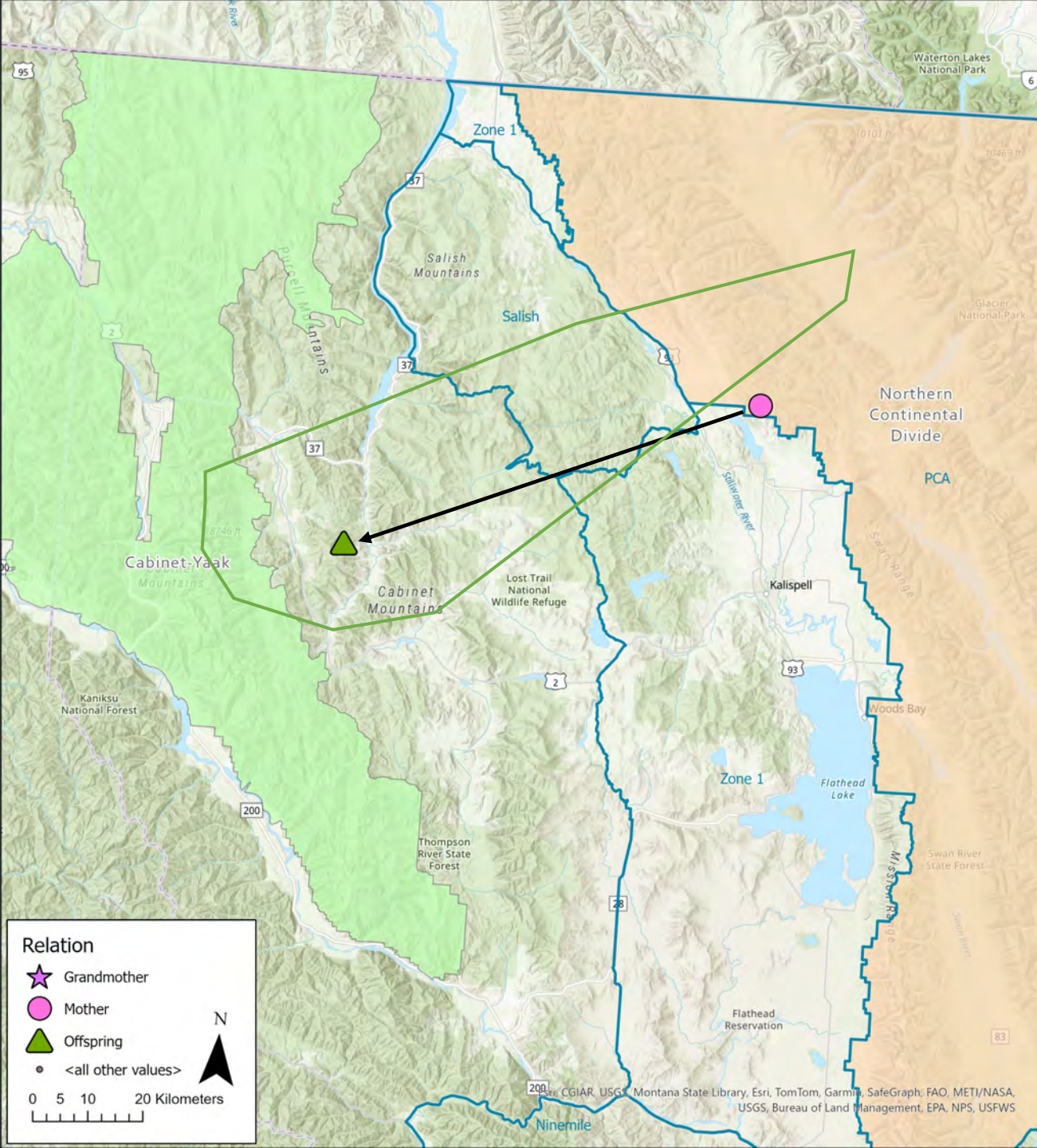
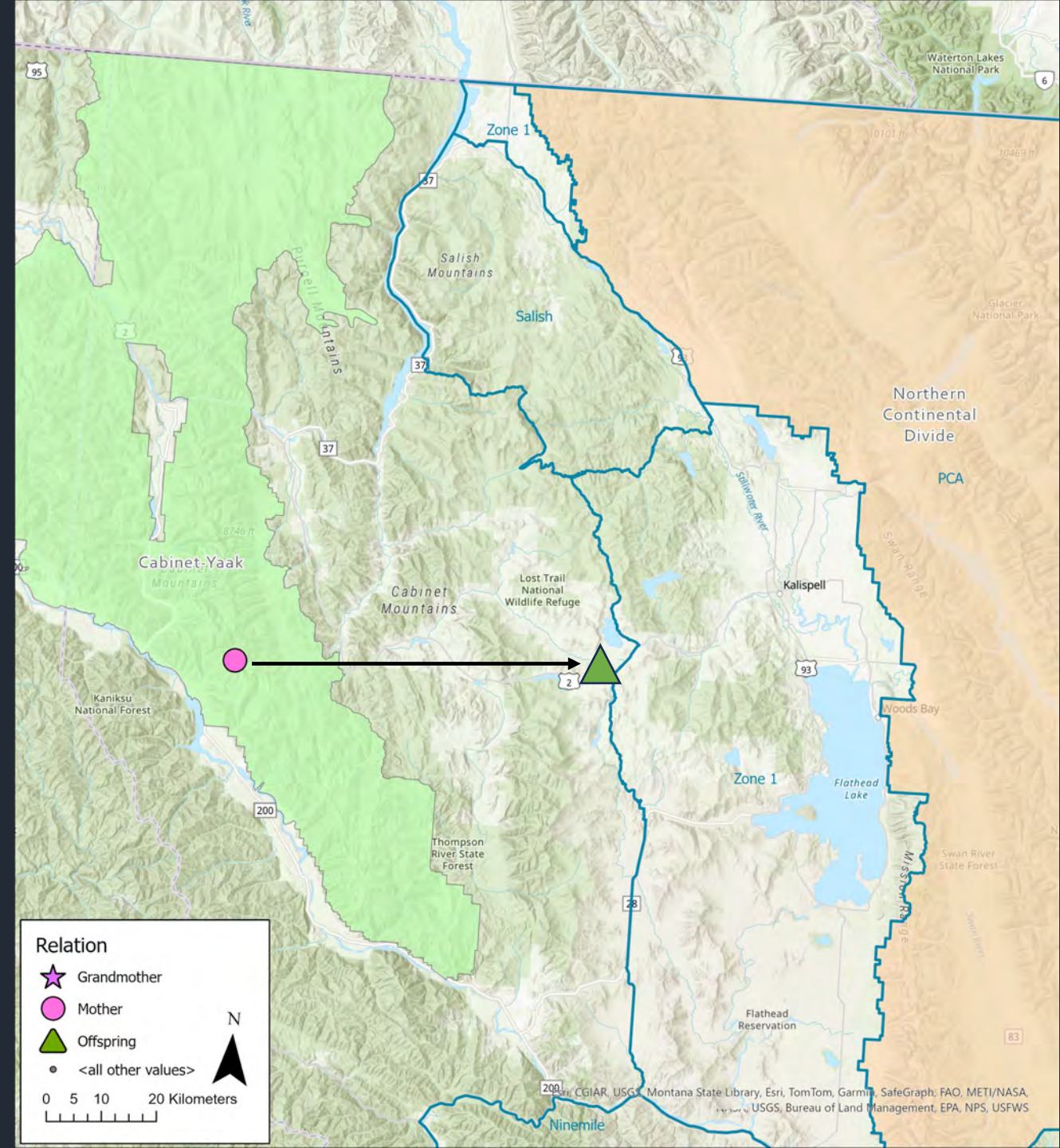


Figure A106. Radio locations and minimum convex (shaded) life range of male grizzly bear 866 in the Cabinet Mountains, 2019–2020.

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

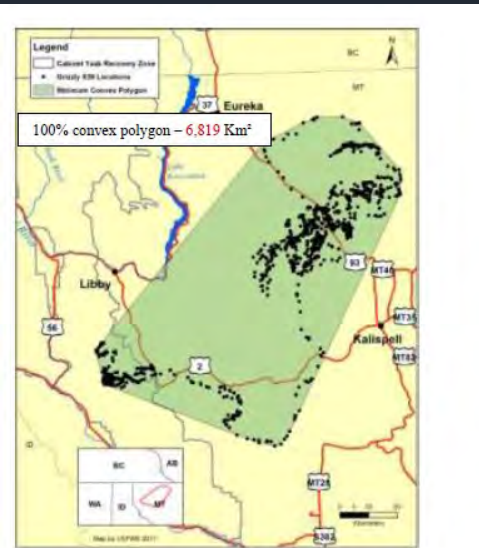
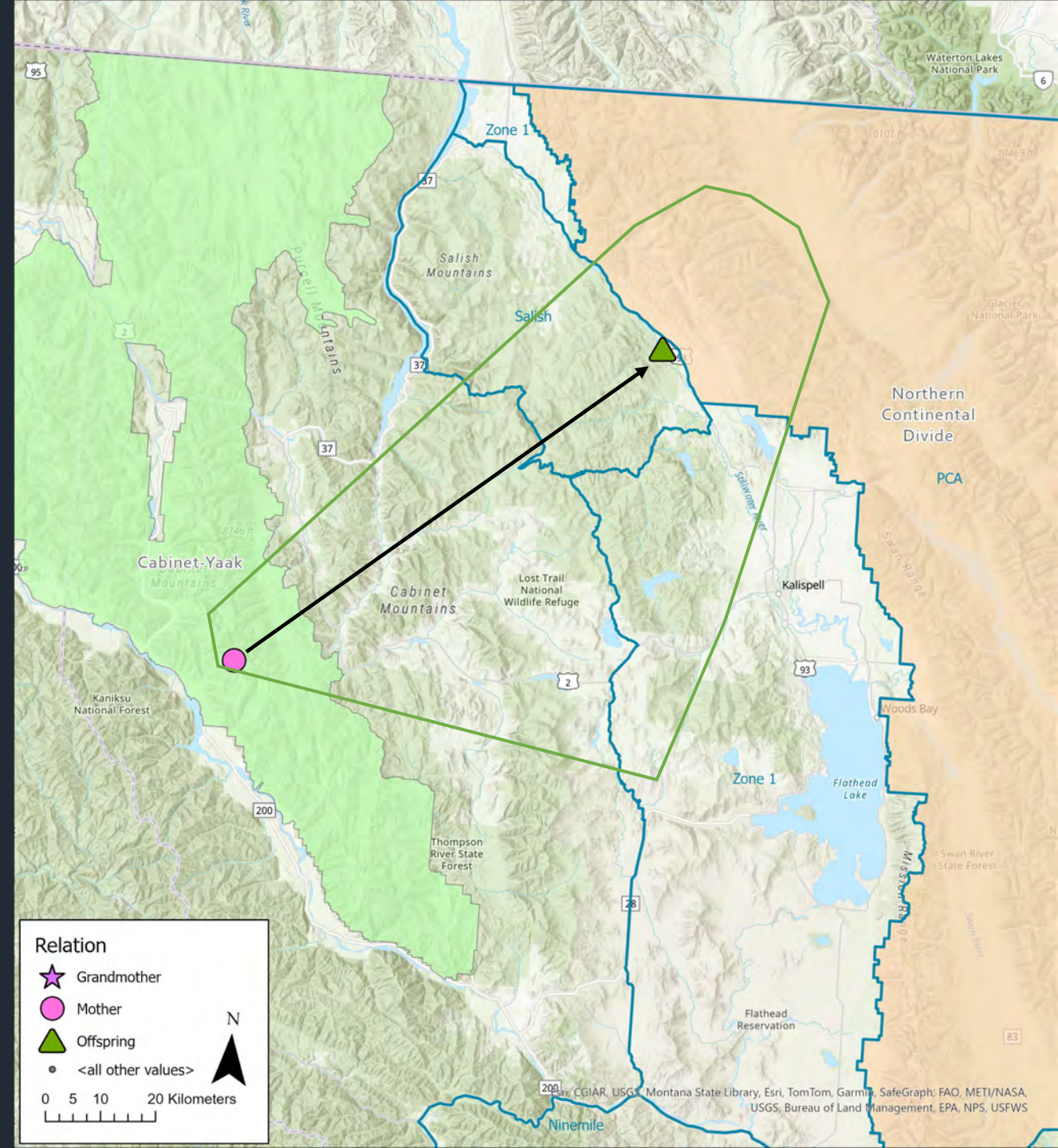


Figure A86. Radio locations and minimum convex (shaded) life range of male grizzly bear 839 in the Cabinet Mountains, 2015-2016.



Relation

- ★ Grandmother
- Mother
- ▲ Offspring
- <all other values>

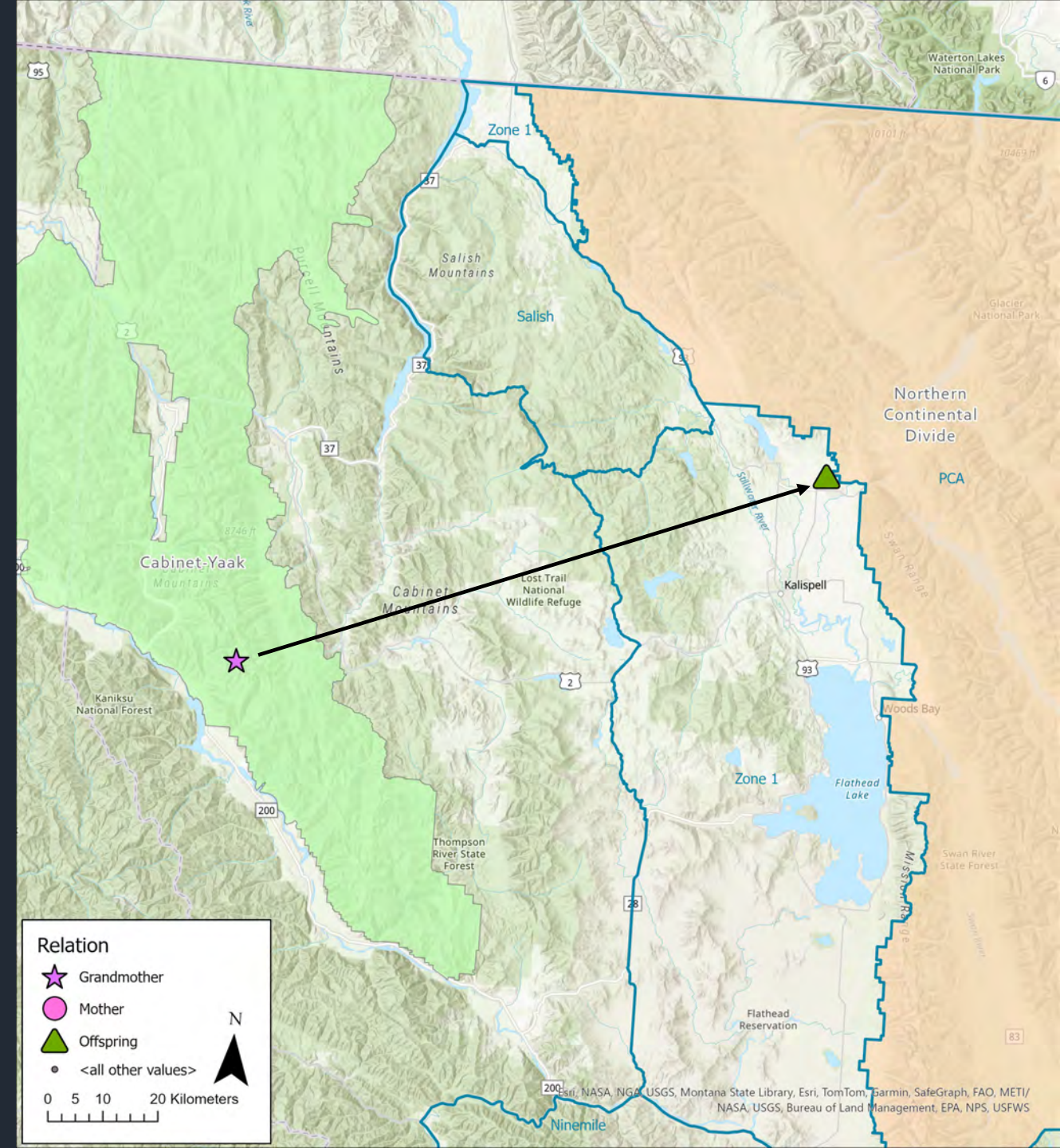
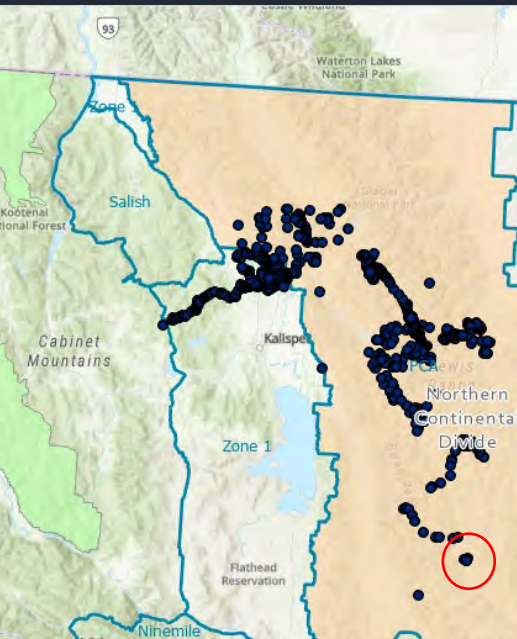
0 5 10 20 Kilometers

N

CGIAR, USGS, Montana State Library, Esri, TomTom, Garmin, SafeGraph; FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USFWS

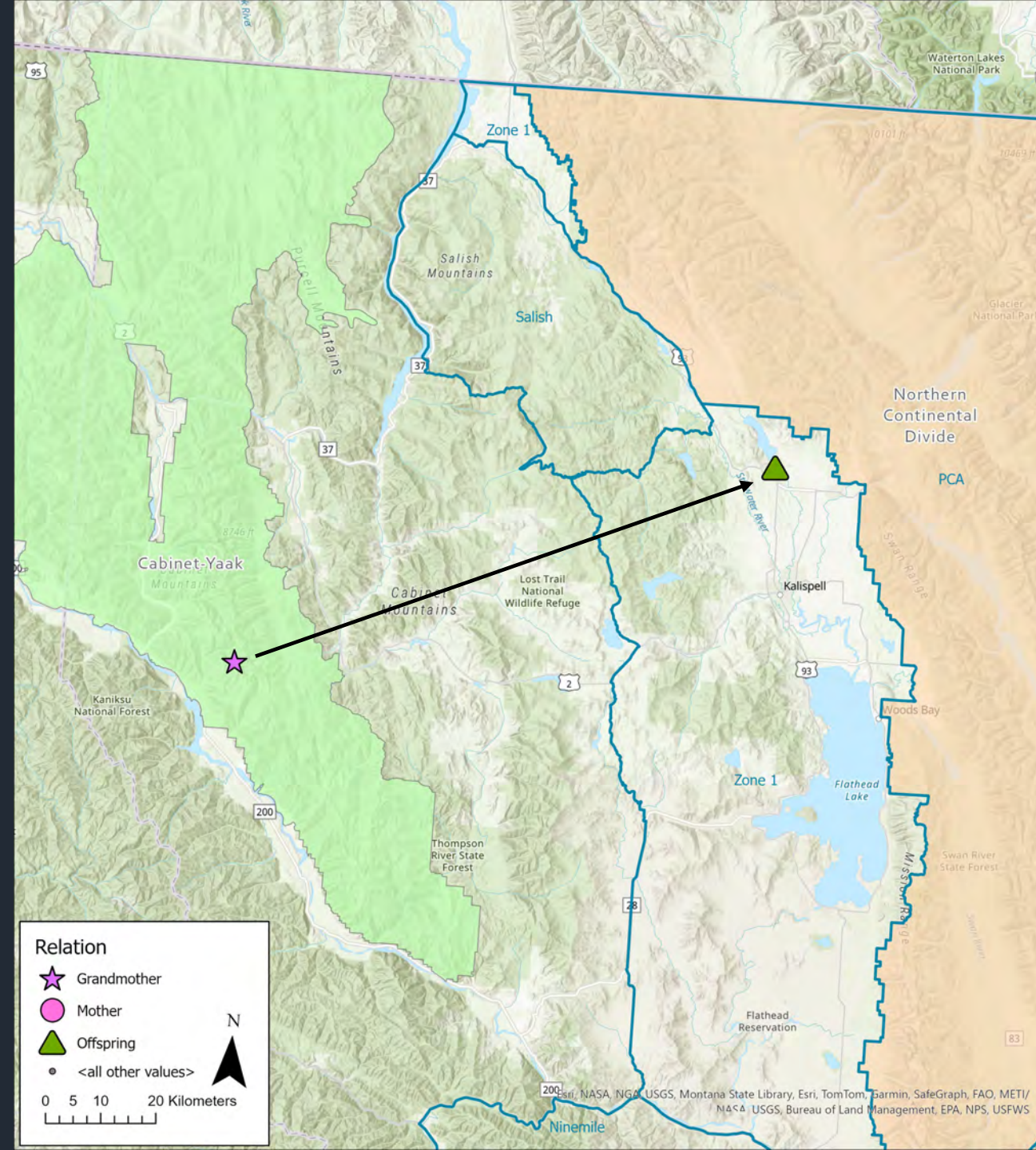
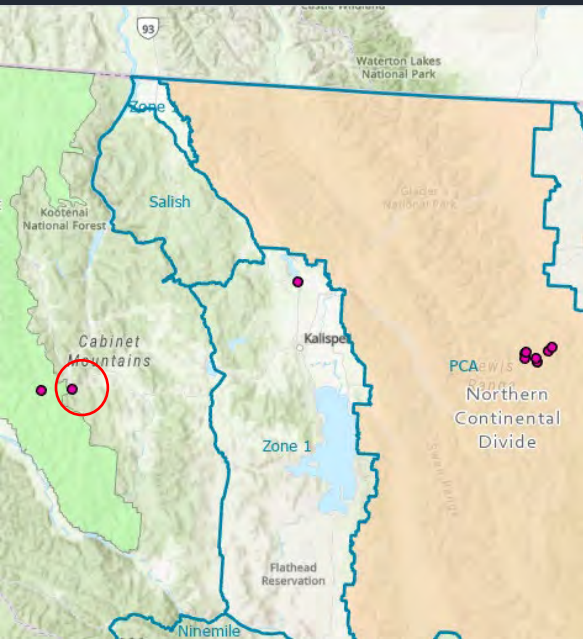
CYE to NCDE

- 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

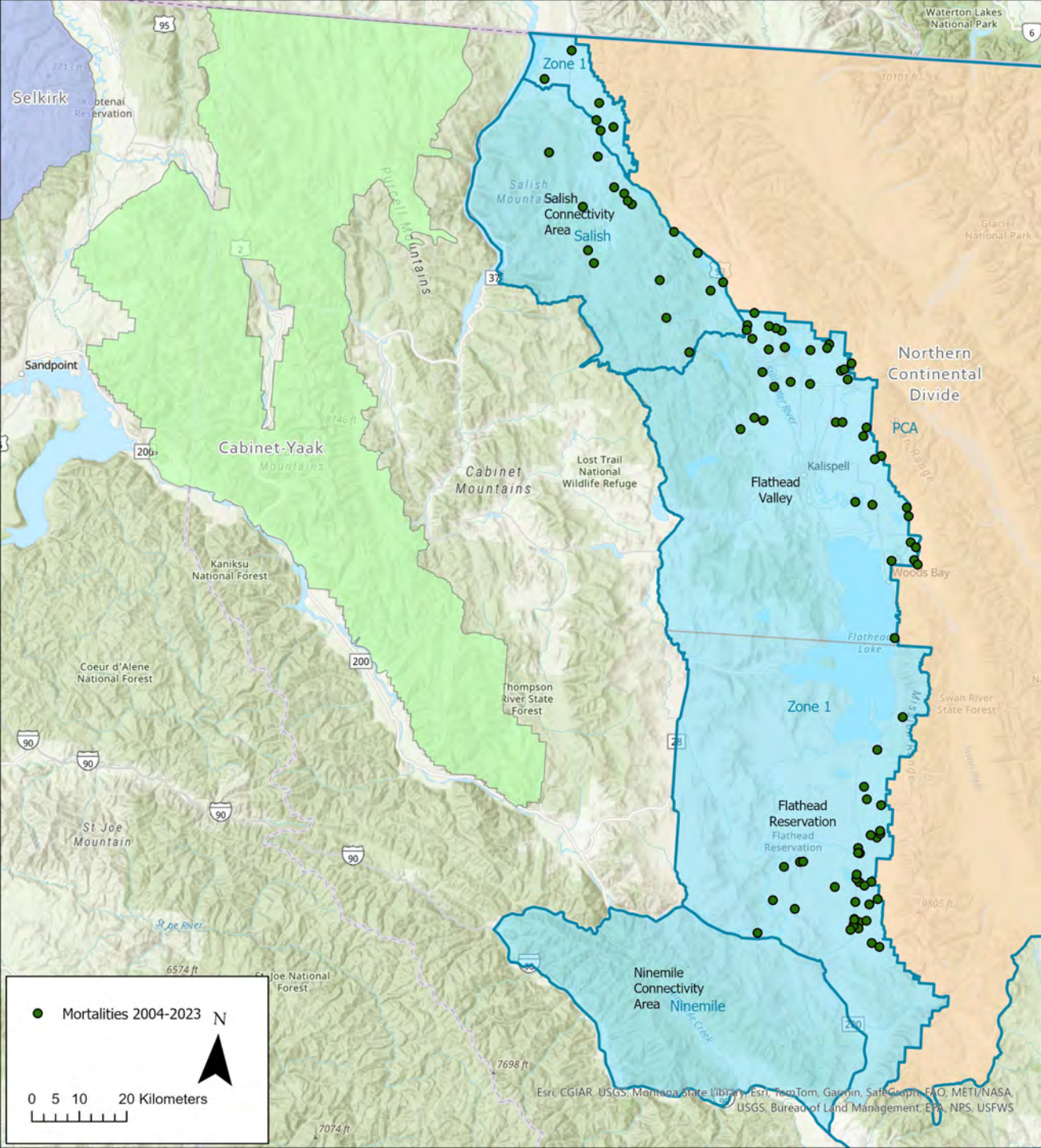
- Female NCDE-842014086
- Born in CYE in 2019
- Present in NCDE when 2 years old (2021)
- Movements within NCDE were relocation-influenced, returned to CYE by 2022
- Movement distance 105 km
- Died as 3-year-old, CYE, management removal



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?