State of Montana
Governor' Grizzly Bear Advisory Council
1st meeting – October 3 & 4, 2019

Photo: Rick Mace

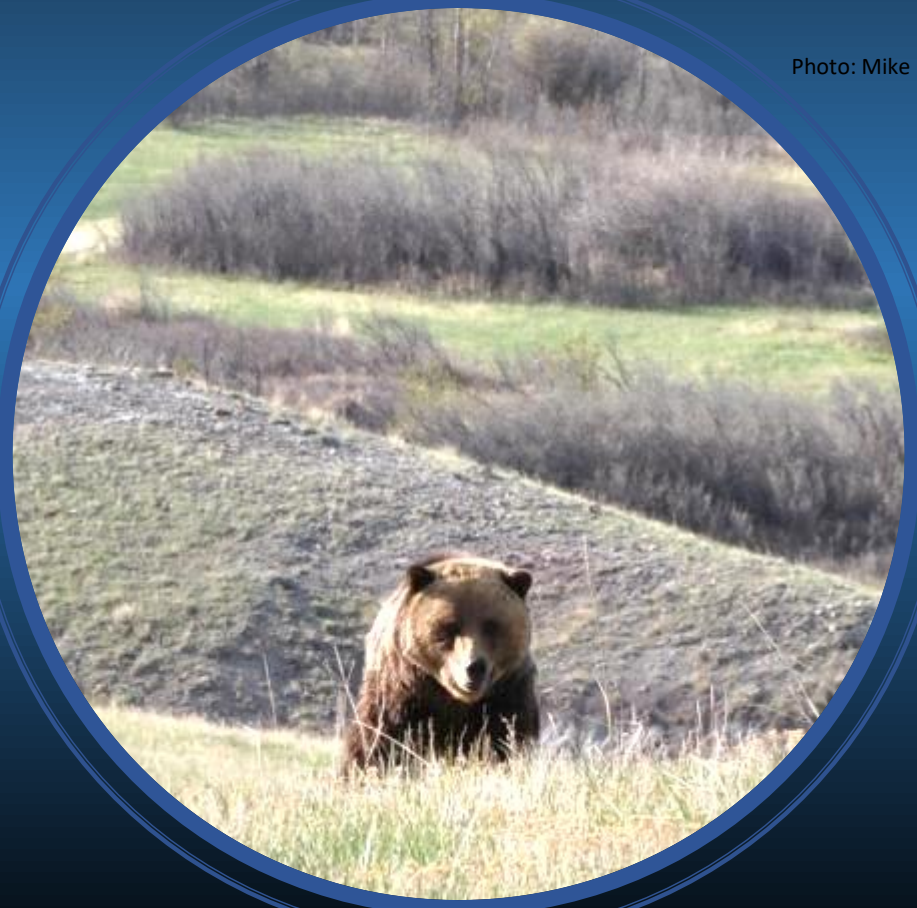


Photo: Mike Madel

Cecily Costello
Research Wildlife Biologist

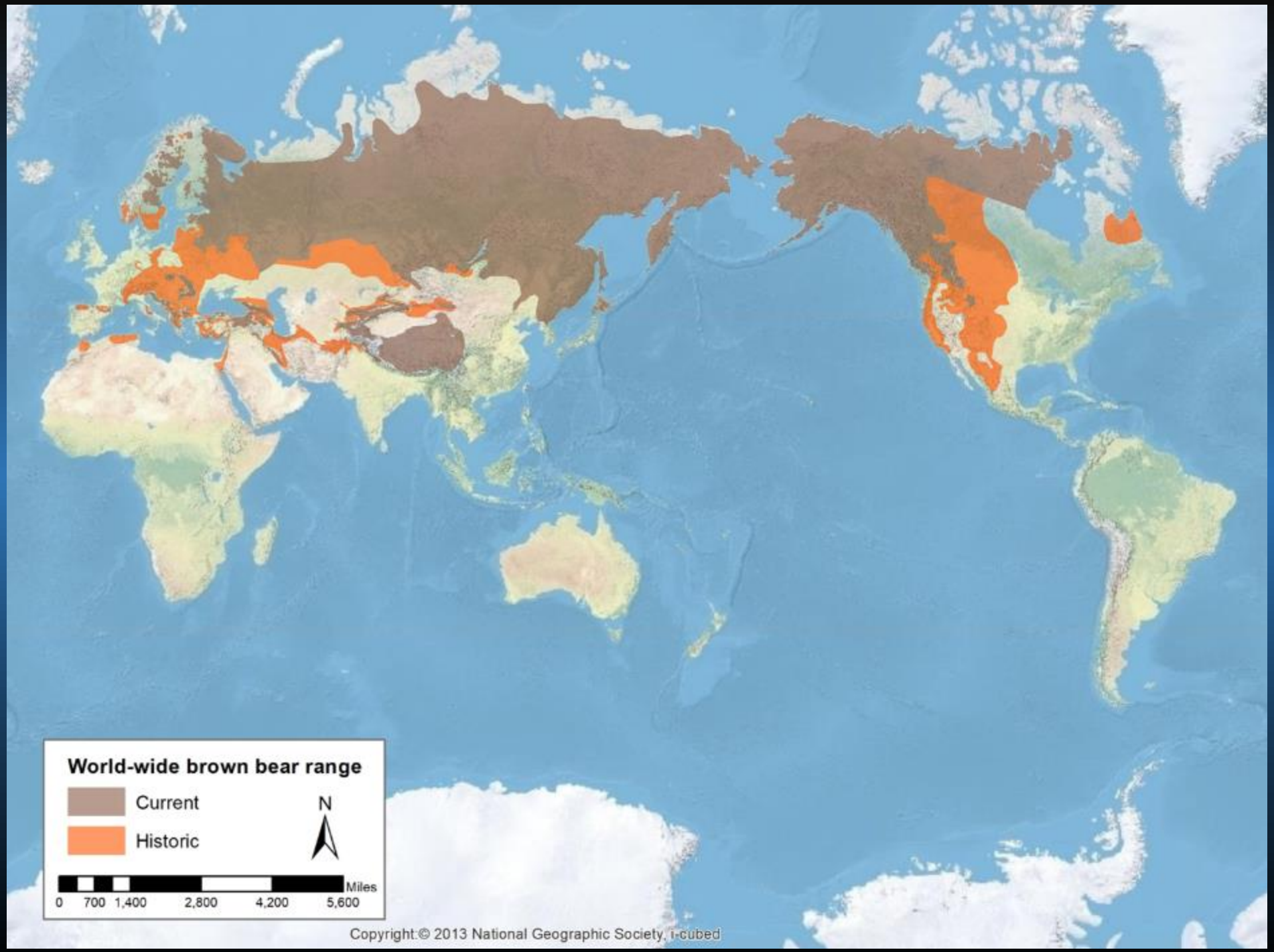
- ***A primer on grizzly bear ecology***
- A brief history of grizzly bears in Montana
- Topics and issues

Order Carnivora

Adapted for catching and eating other animals

- Cats
- Civets, mongooses, hyenas
- Dogs
- *Bears*
- Weasels, skunks, raccoons
- Seals, walruses

Pages et al. 2008. Combined analysis of fourteen nuclear genes refines the Ursidae phylogeny. Molecular phylogenetics and Evolution 47(1):73-83



- Grizzly bear = brown bear
- Largest range of all bears
- Extirpation on southern fringe of range worldwide

IUCN 2016. The IUCN Red List of Threatened Species. http://www.iucnredlist.org.

Habitat shaped behavior

Grizzly bears evolved in the open steppe

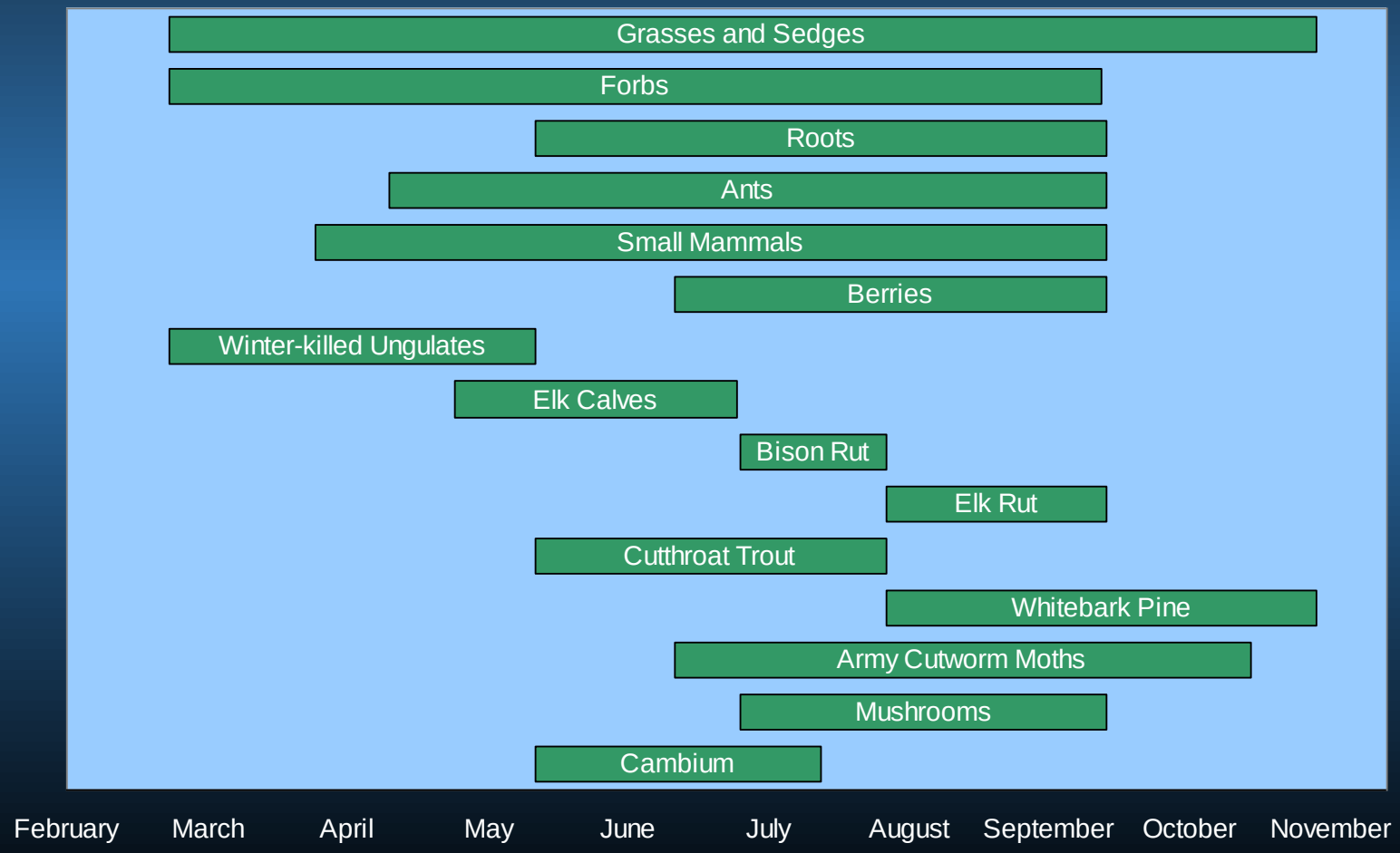
- More carnivorous
- Often react to threats with aggression

Black bears evolved in forests

- More herbivorous
- Typically react to threats by climbing trees

Omnivorous feeding ecology

Grizzly bears eat a variety of plant and animal foods depending on season, habitat, body size, and food availability



K-selected life history strategy

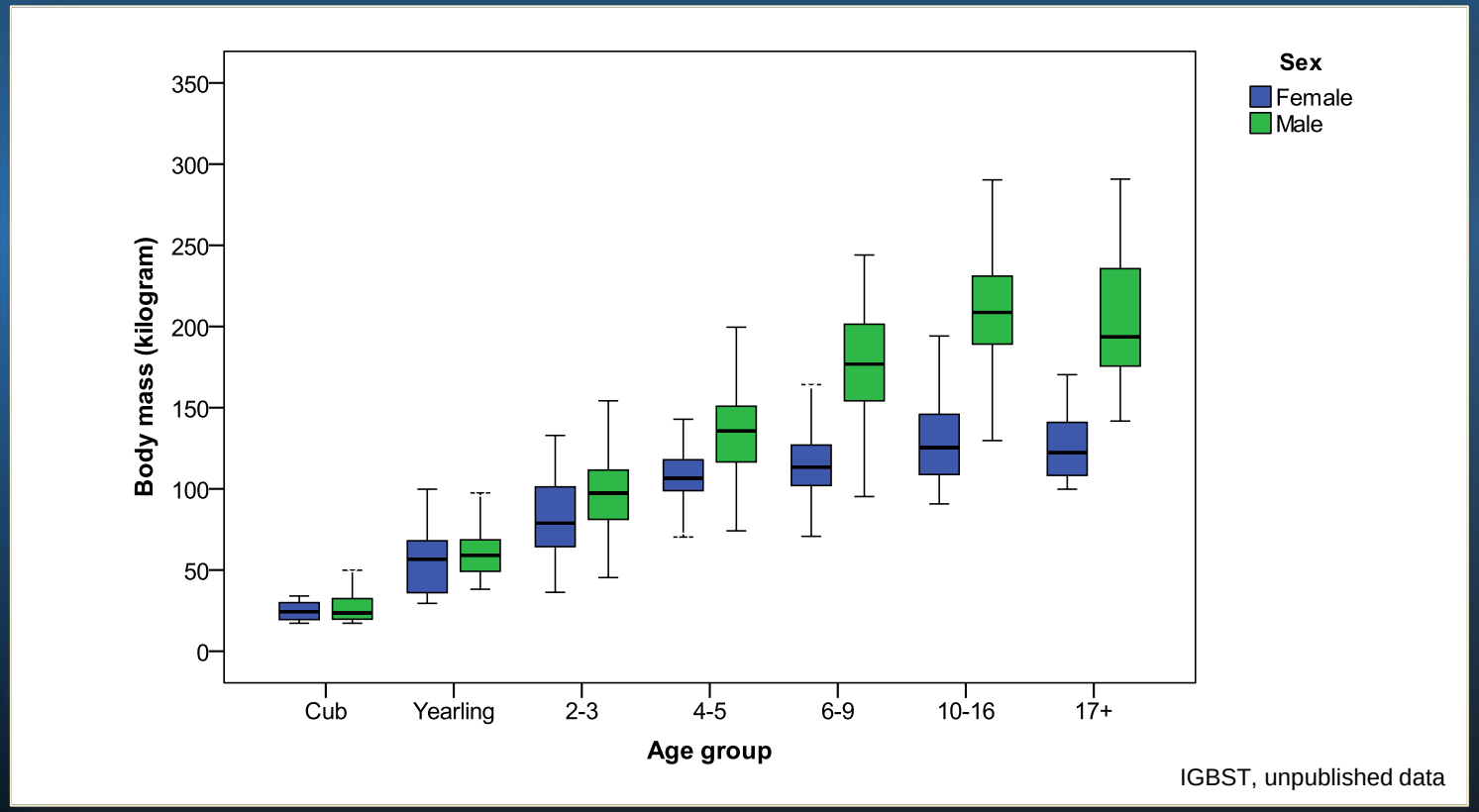
- Delayed maturity
- Small litter size
- Prolonged parental care
- Long lifespan

Photo: Rick Mace

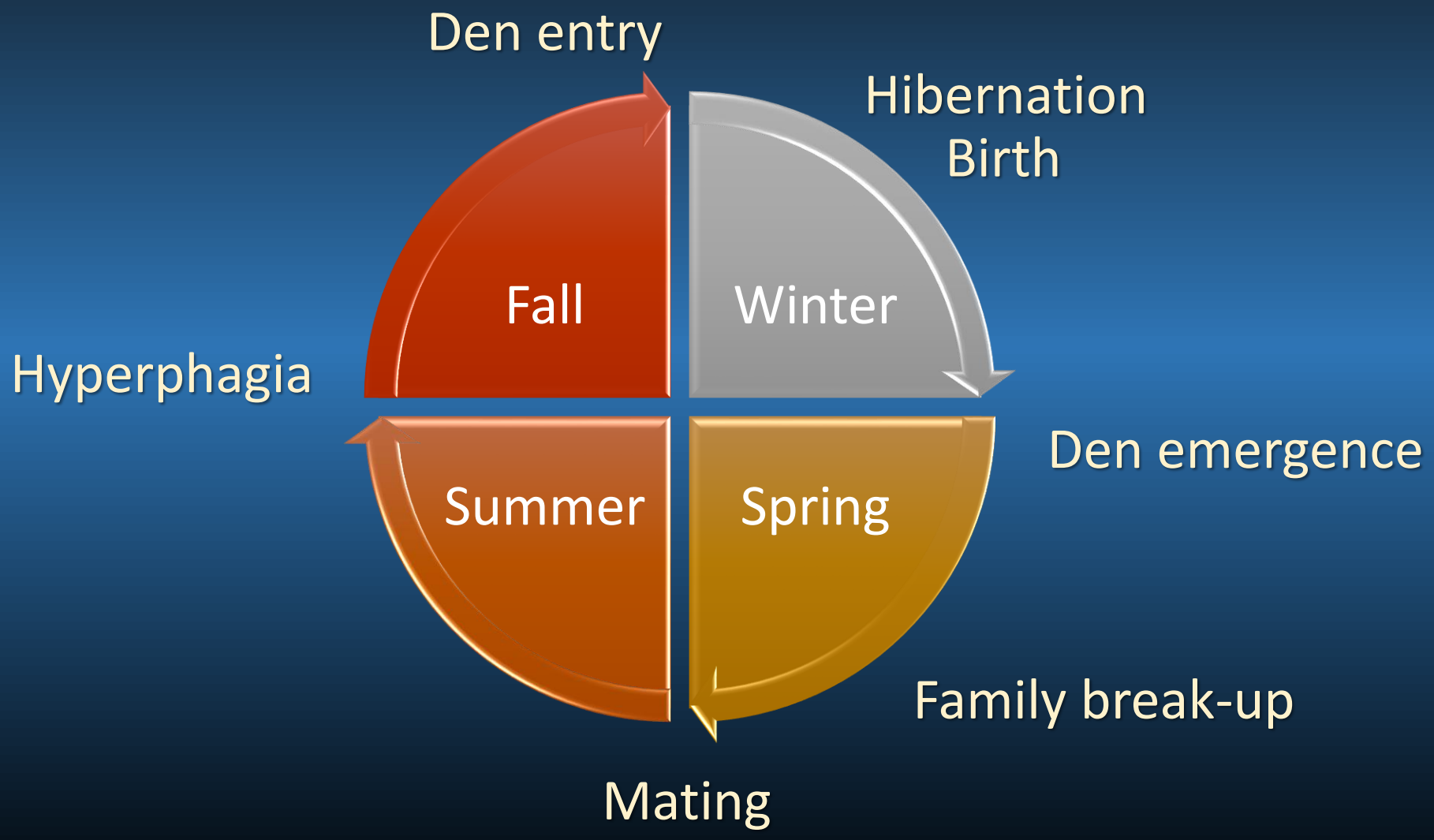
Natural death of 22-year-old grizzly bear
Photo: National Park Service

Large body size and sexual dimorphism

- Grizzly bears can attain weights >600 lbs in Montana
- Male bears typically twice size of females



Annual cycle influenced by hibernation

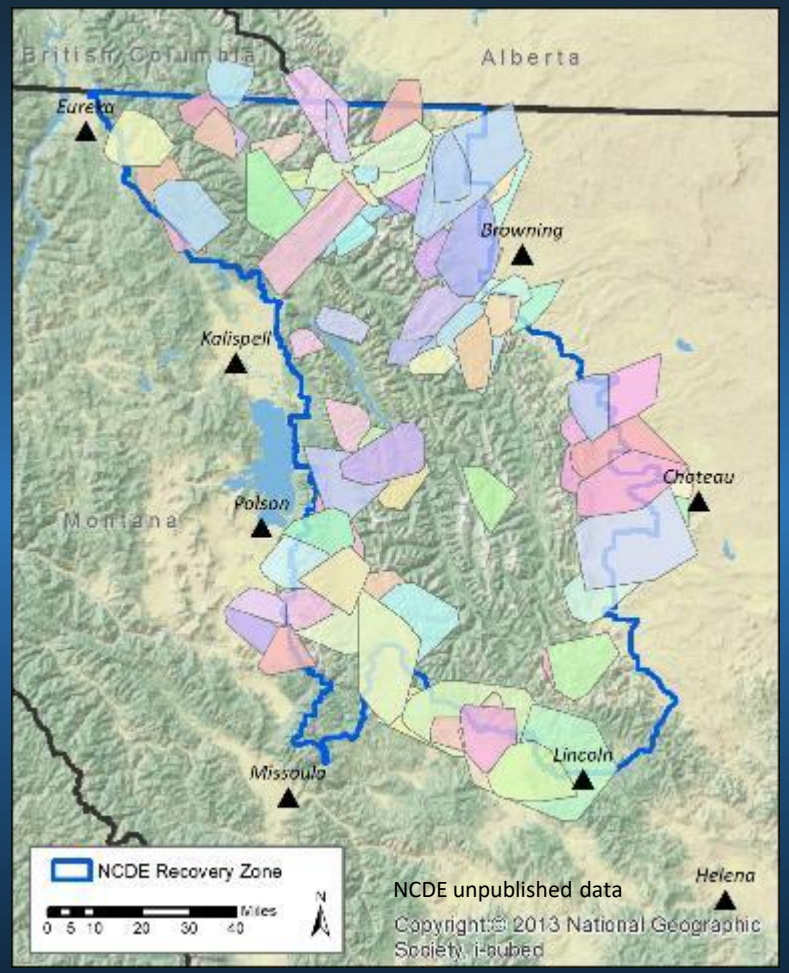


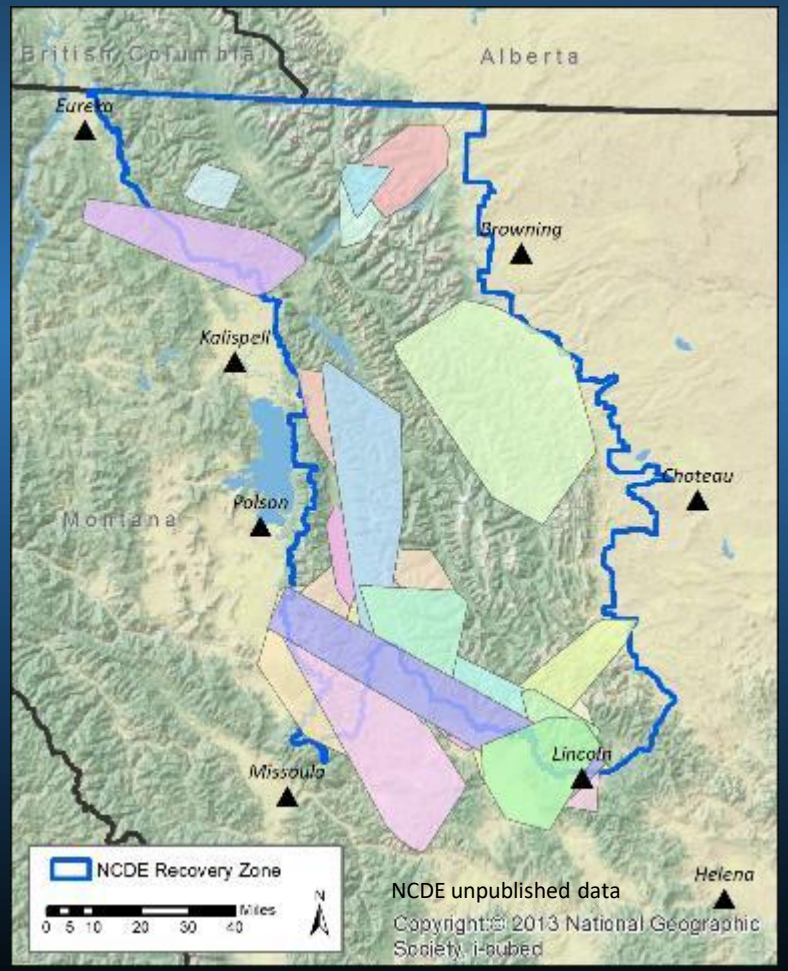
Denning duration is 4 to 6 months

- Most entry in November
- Range = September to December

- Most emergence in April
- Range = January to May

Bear reside within home ranges

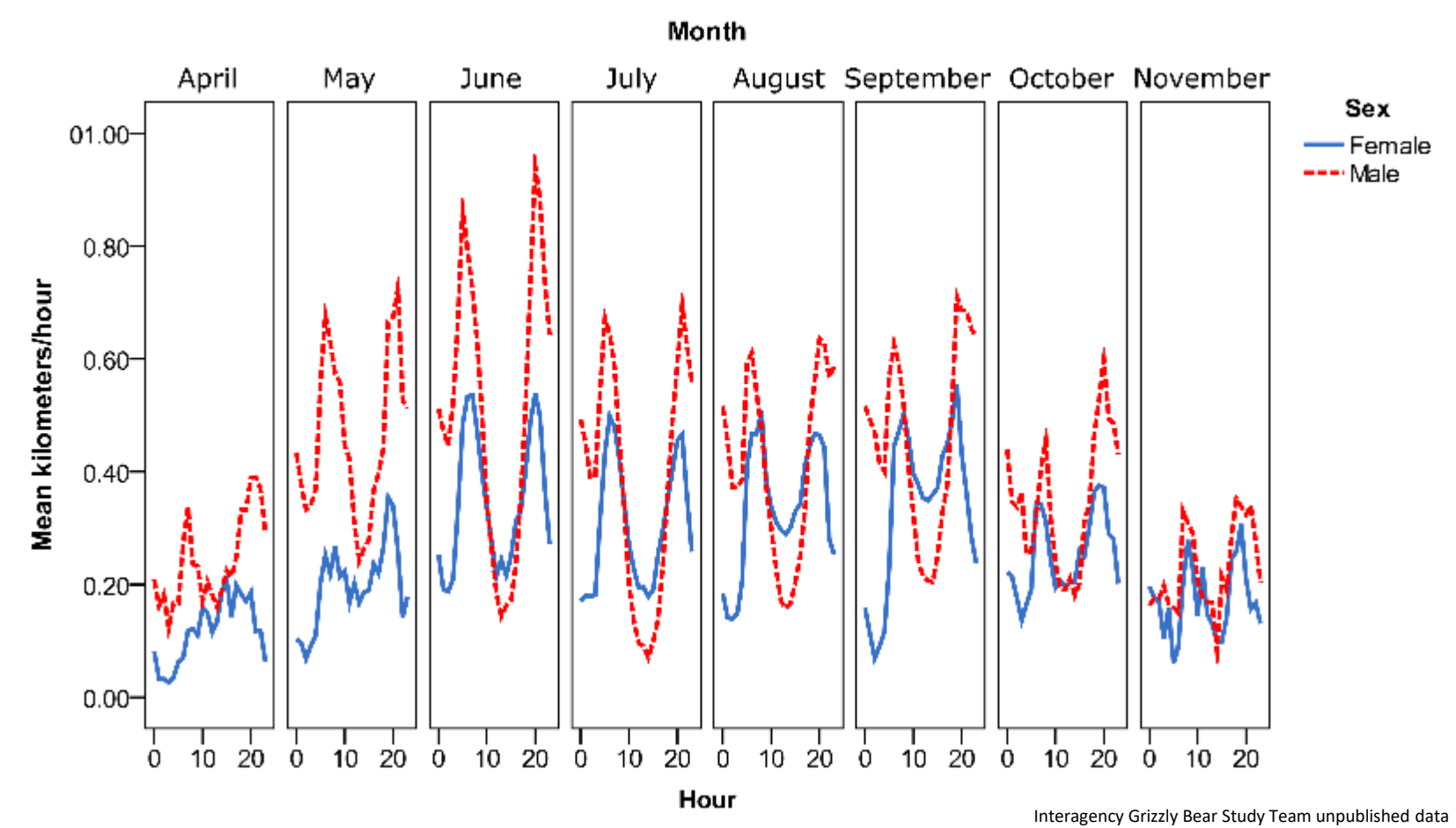




- Overlap within and between sexes
- Male ranges larger
- Sex-biased dispersal

Activity and movements

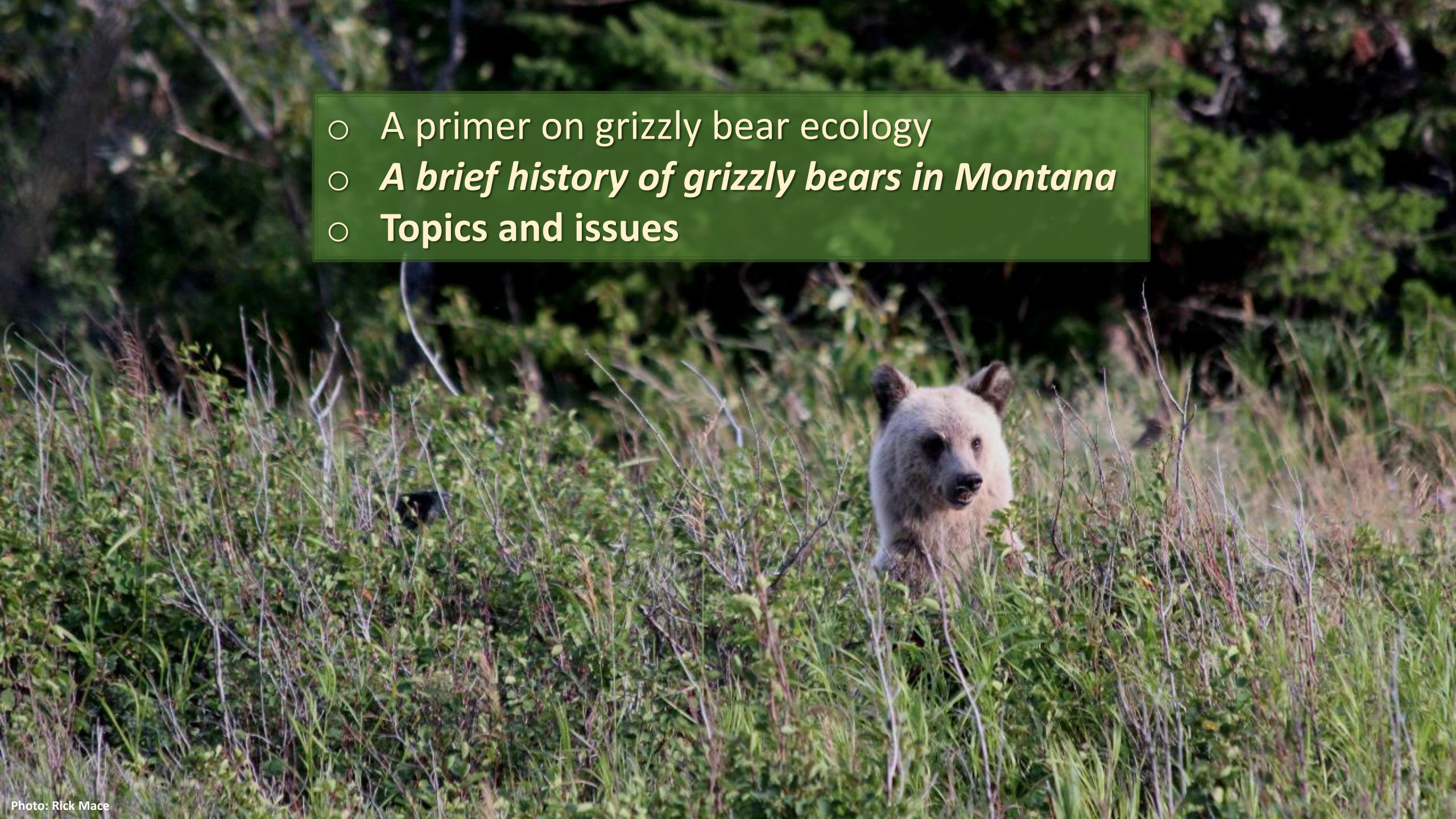
- Crepuscular
- Males movements greater than females
- Seasonal patterns



Interagency Grizzly Bear Study Team unpublished data

Vital Rates

- Montana vital rates consistent with population growth


A primer on grizzly bear ecology
A brief history of grizzly bears in Montana
Topics and issues
Photo: Rick Mace

Lower-48:

- Historically, ranged over parts of all western states
- Population size about 50,000

IUCN 2016. The IUCN Red List of Threatened Species. http://www.iucnredlist.org.

Reasons for extirpation

- Indiscriminate killing
- Government predator control programs
- Habitat loss
  - Human settlement
  - Farming/ranching
  - Logging
  - Mining

Photo: www.santafenewmexican.com

Lower-48

- Eliminated from Plains
- 5% of historic range
- Fragmented habitat patches

Merriam 1922. Distribution of grizzly bears in the U.S. Outdoor Life 50: 405-406

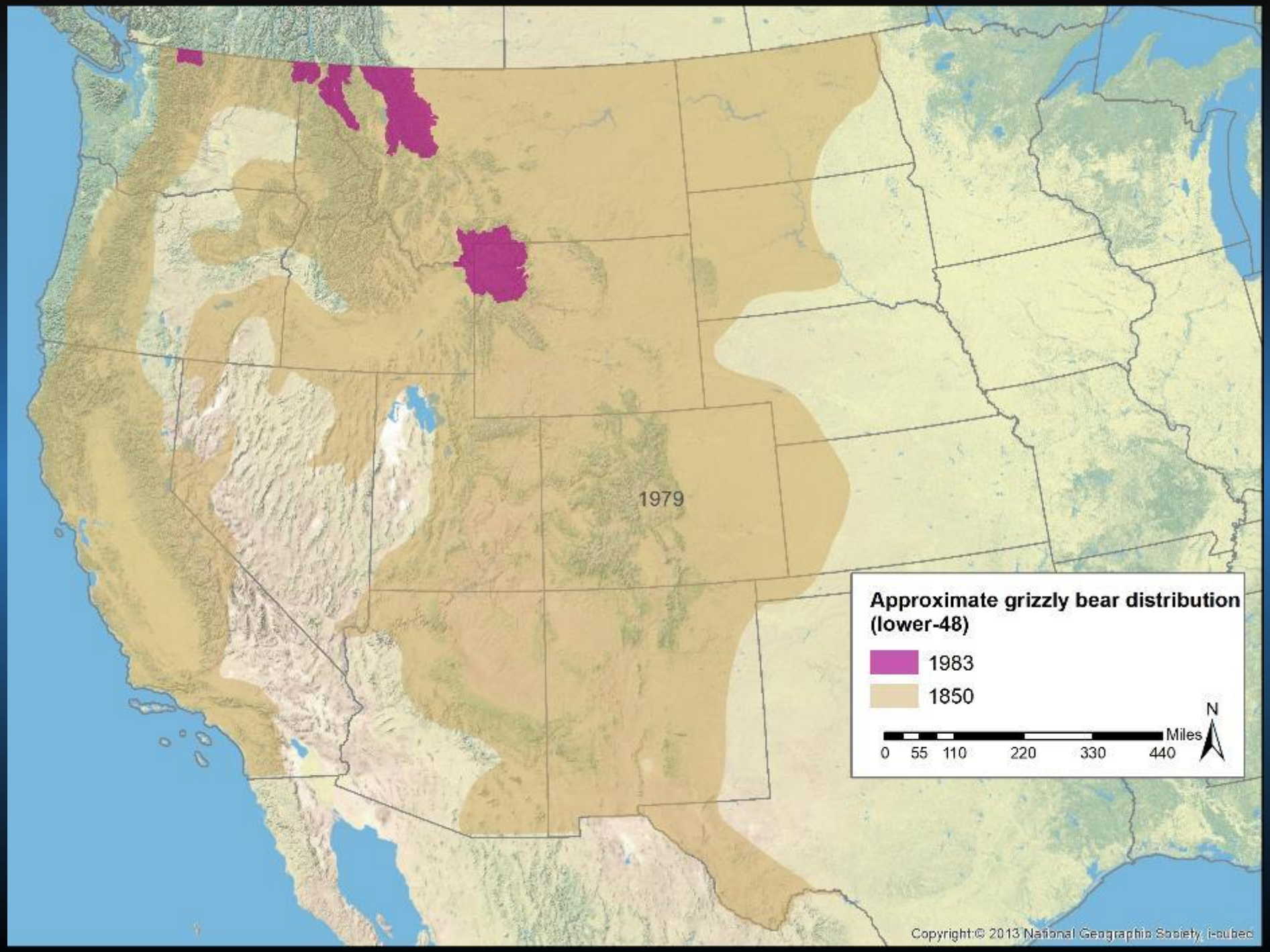
Reproduced in

Mattson and Merrill. 2002. Extirpations of grizzly bears in the contiguous United States. Conservation Biology 16: 1123-1136.

Lower-48

- 2% of historic range
- Eliminated from another 6 states
- Montana = 564
- Wyoming = 150
- Idaho = 60
- Washington <10
- Colorado = 10

Cooney. 1956. Wilderness Monarch. Montana Outdoors 6: 14-17.



Lower-48

- 2% of historic range
- Fewer habitat patches
- Eliminated from Colorado

USFWS. 1993. Grizzly Bear Recover Plan. U.S. Fish and Wildlife Service, Grizzly Bear Recovery Office, Missoula, MT.

Yellowstone
1970

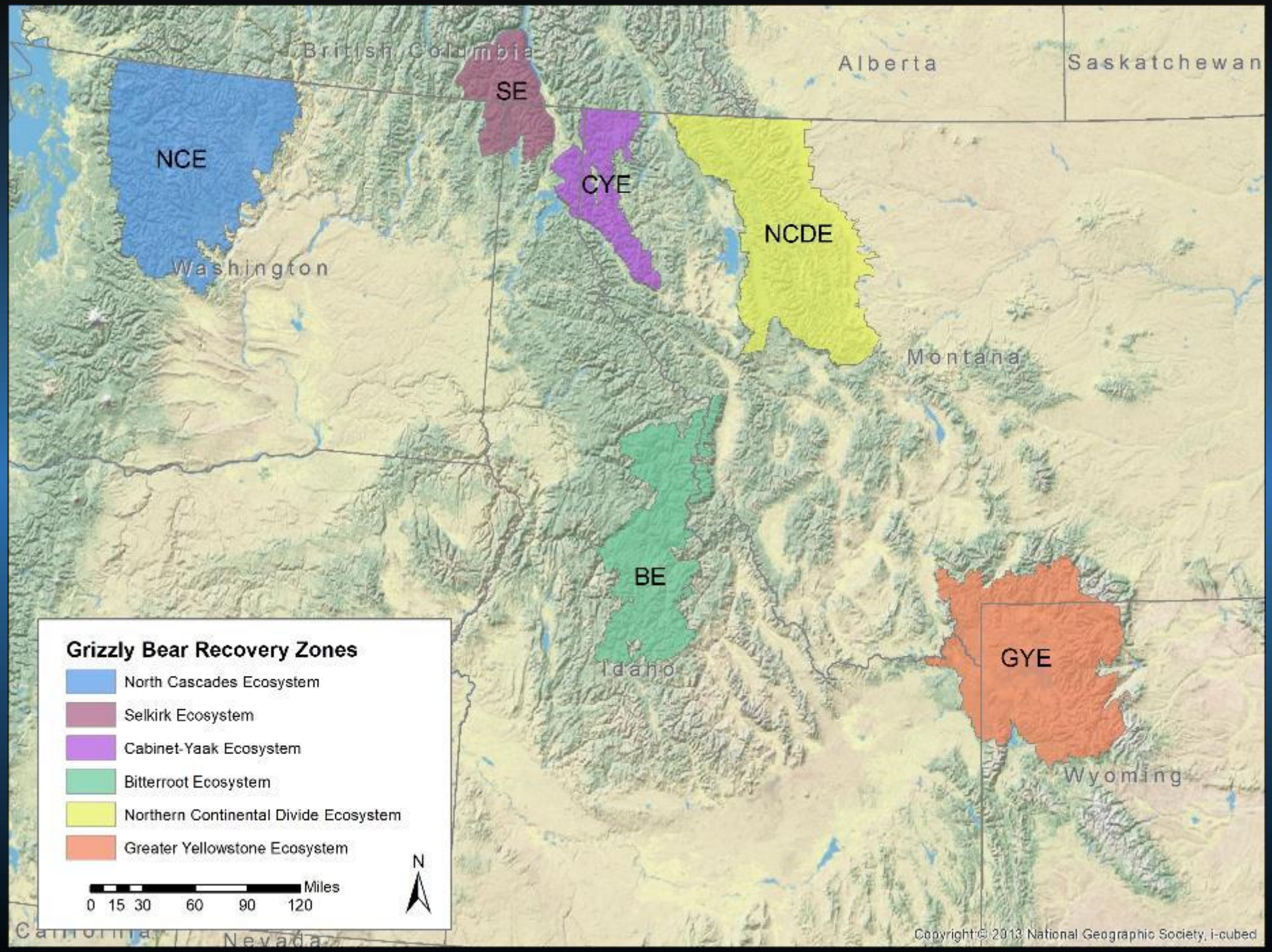
Glacier
1948

Yellowstone
1970s

Backcountry camp
1970s

Endangered Species Act

- Listed as threatened in 1975
- 6 Recovery Zones



USFWS. 1993. Grizzly Bear Recover Plan. U.S. Fish and Wildlife Service, Grizzly Bear Recovery Office, Missoula, MT.

Conservation about limits on human-caused mortality

- Food-related conflict
  - *Food storage regulations*
  - *Conflict response & outreach*

Photo: Cecily Costello

Photo: National Park Service

Conservation about limits on human-caused mortality

- Food-related conflict
  - *Food storage regulations*
  - *Conflict response & outreach*
- Livestock conflict
  - *Reduce grazing in RZs*
  - *Deterrents*
  - *Conflict response & outreach*

Photo: Tim Manley

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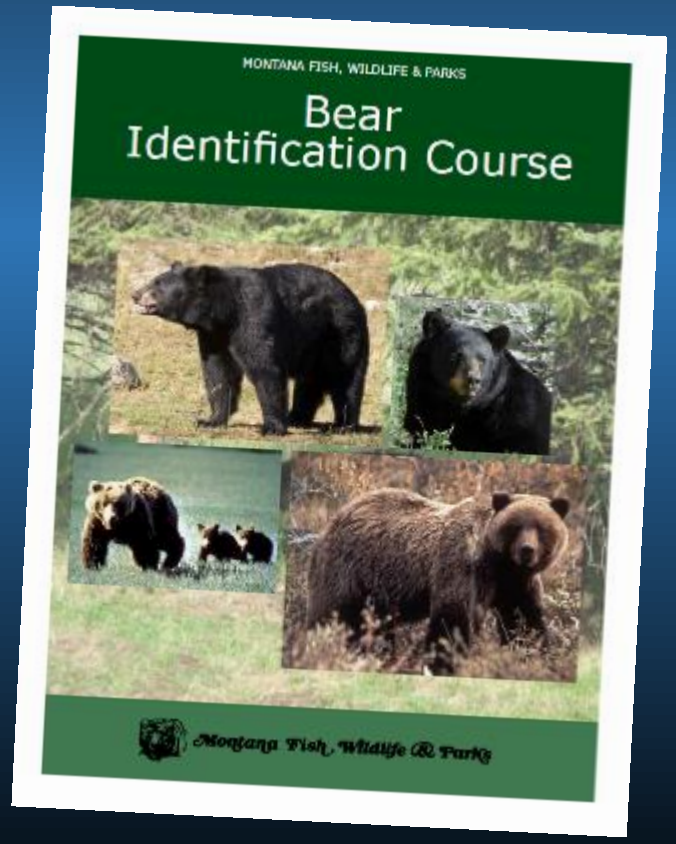
  - *Deterrents*
  - *Conflict response & outreach*
- Illegal kills
  - *Enforcement*
  - *Hunter bear ID requirement*



Conservation about limits on human-caused mortality

- Food-related conflict
  - Food storage regulations
  - Conflict response & outreach
- Livestock conflict
  - Reduce grazing in RZs
  - Deterrents
  - Conflict response & outreach
- Illegal kills
  - Enforcement
  - Hunter bear ID requirement
- Secure habitat

Photo: USFS

Recovery Goals established for GYE, NCDE, CYE, and SE (1993); updated for GYE (2007, 2017)

- Counts of females with cubs
- Occupancy of BMUs by females with offspring
- Mortality limits

Habitat-based recovery criteria established for GYE (2007) and NCDE(2018)

- Secure habitat standard
- Developed site standard
- Livestock allotment standard

Photo: Cecily Costello

Photo: Frank van Manen

Greater Yellowstone Ecosystem

- Studied since 1959
- 1975: 250 bears?
- 2002: at least 557 (497-618)

  High growth rate (4-7%) during 1990s
- 2018: at least 718 (640-796)

  Continued growth but at lower rate
- Population has met goals in Recovery Plan

Northern Continental Divide Ecosystem

- Studied since 2004
- 1975: 400 bears?
- 2004: Population estimate 765 (715-831)

  DNA mark-recapture study
- 2019: Population estimate 1069 (906-1242)

  Stochastic modeling (2.3% growth rate)
- Population has met goals in Recovery Plan

Photo: Rick Mace

Photo: U.S. Fish and Wildlife Service

Cabinet-Yaak Ecosystem

- Studied since 1983
- 1975: Number unknown

  Breeding population thought to exist
- 1978: 12 bears in Cabinets

  Survey based on sign
- 1990: Augmentation began
- 2012: 48 to 50

  DNA mark-recapture study
- Population has not met goals in Recovery Plan

Selkirk Ecosystem

- 1975: Number unknown

  Breeding population thought to exist
- 2004: Population estimate 105 (91-119)
- Population has not met goals in Recovery Plan

Photo: U.S. Fish and Wildlife Service

Birchdale Ecological Consulting

Photo: Vital Ground

Bitterroot Ecosystem

- 1975: Status unknown

  Only unverified sightings at that time
- Surveys did not detect breeding population
- 2000: USFWS completed plan for reintroduction
- 2001: Plan abandoned due to local opposition
- Recent verified observations within and near
- Natural recolonization considered best option for recovery

North Cascades Ecosystem

- 1975: Status unknown

  Only occasional sightings
- Last verified sighting in 1996
- 2012: Only 6 bears in nearby Canada
- 2017: USFWS completed EIS for reintroduction
- 2019: USFWS reopened EIS to public comment

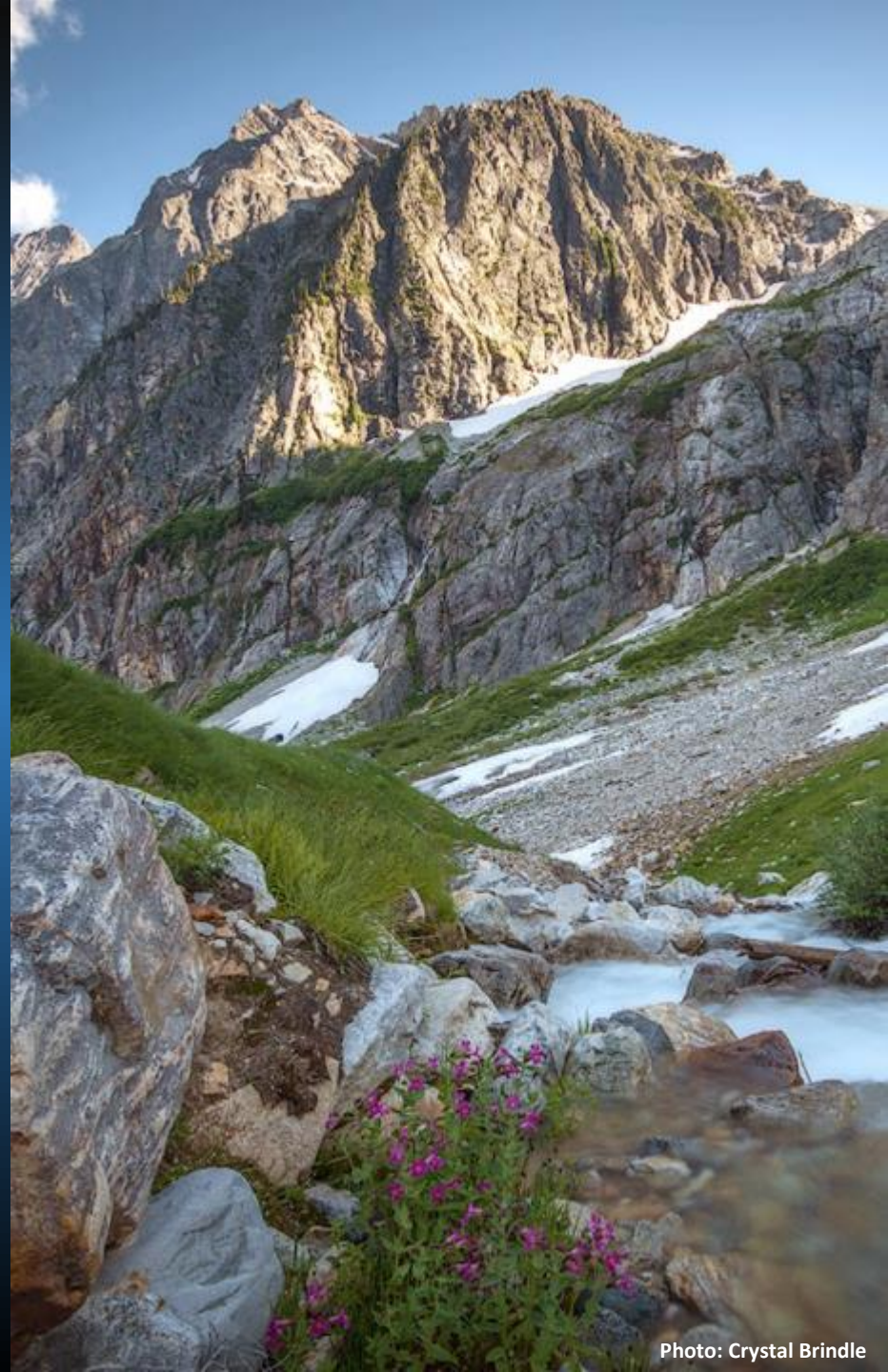


Photo: Crystal Brindle

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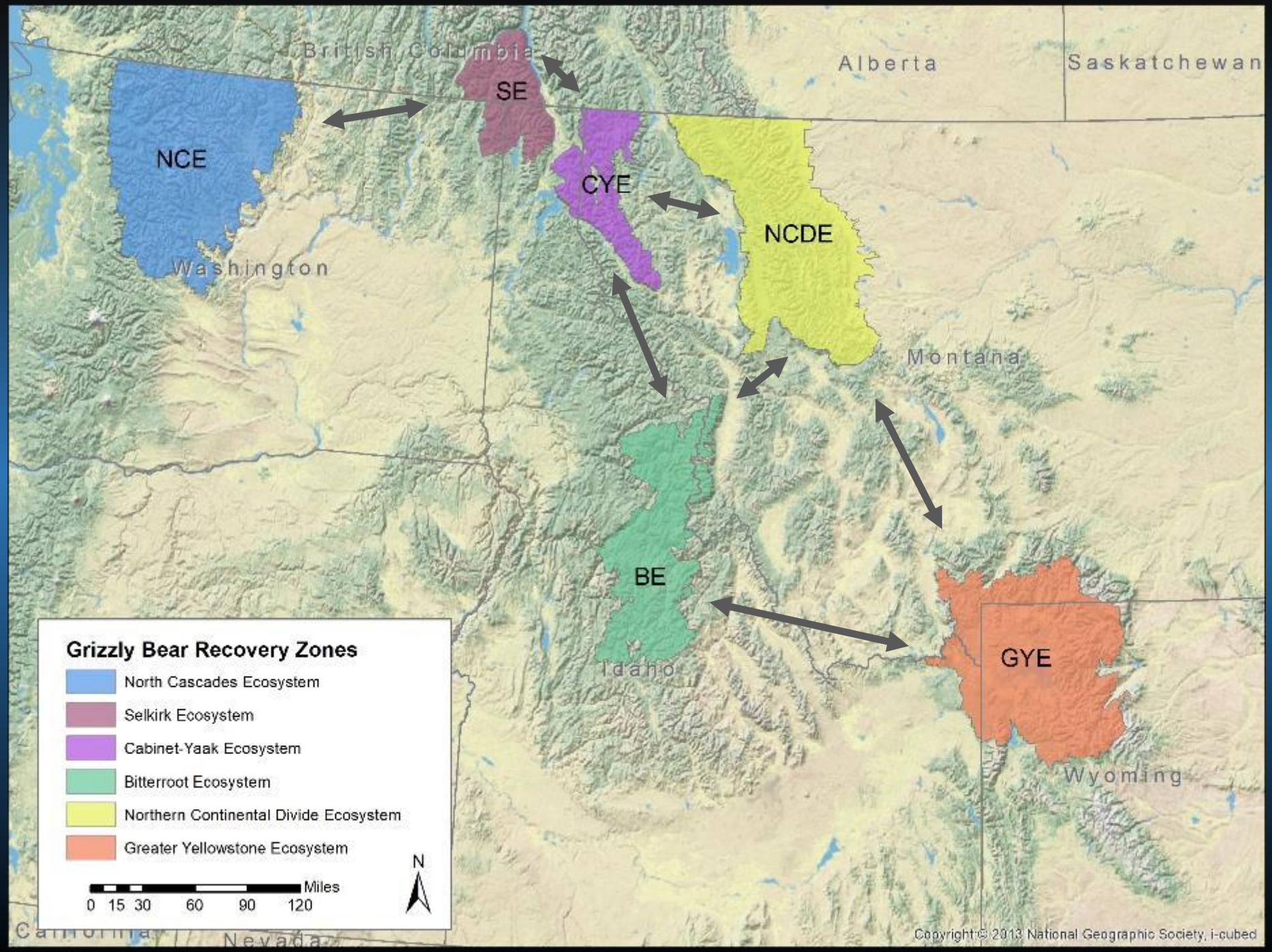
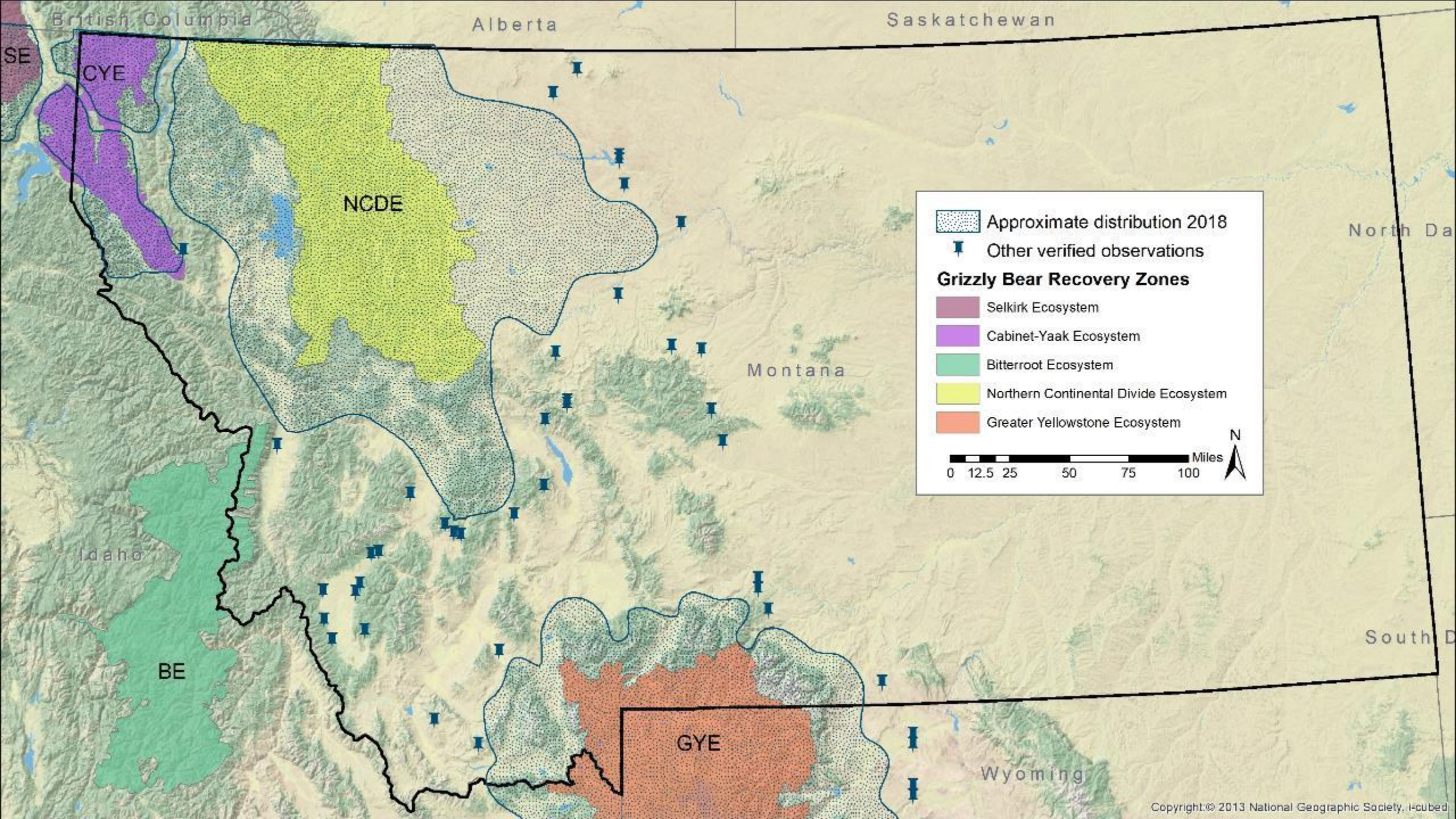
Connectivity

- Enhances long-term persistence
- Improves genetic health




British Columbia
Alberta
Saskatchewan
SE
CYE
NCDE
Montana
Idaho
BE
GYE
Wyoming
North Da
South D
Approximate distribution 2018
Other verified observations
Grizzly Bear Recovery Zones
Selkirk Ecosystem
Cabinet-Yaak Ecosystem
Bitterroot Ecosystem
Northern Continental Divide Ecosystem
Greater Yellowstone Ecosystem
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0 12.5 25 50 75 100
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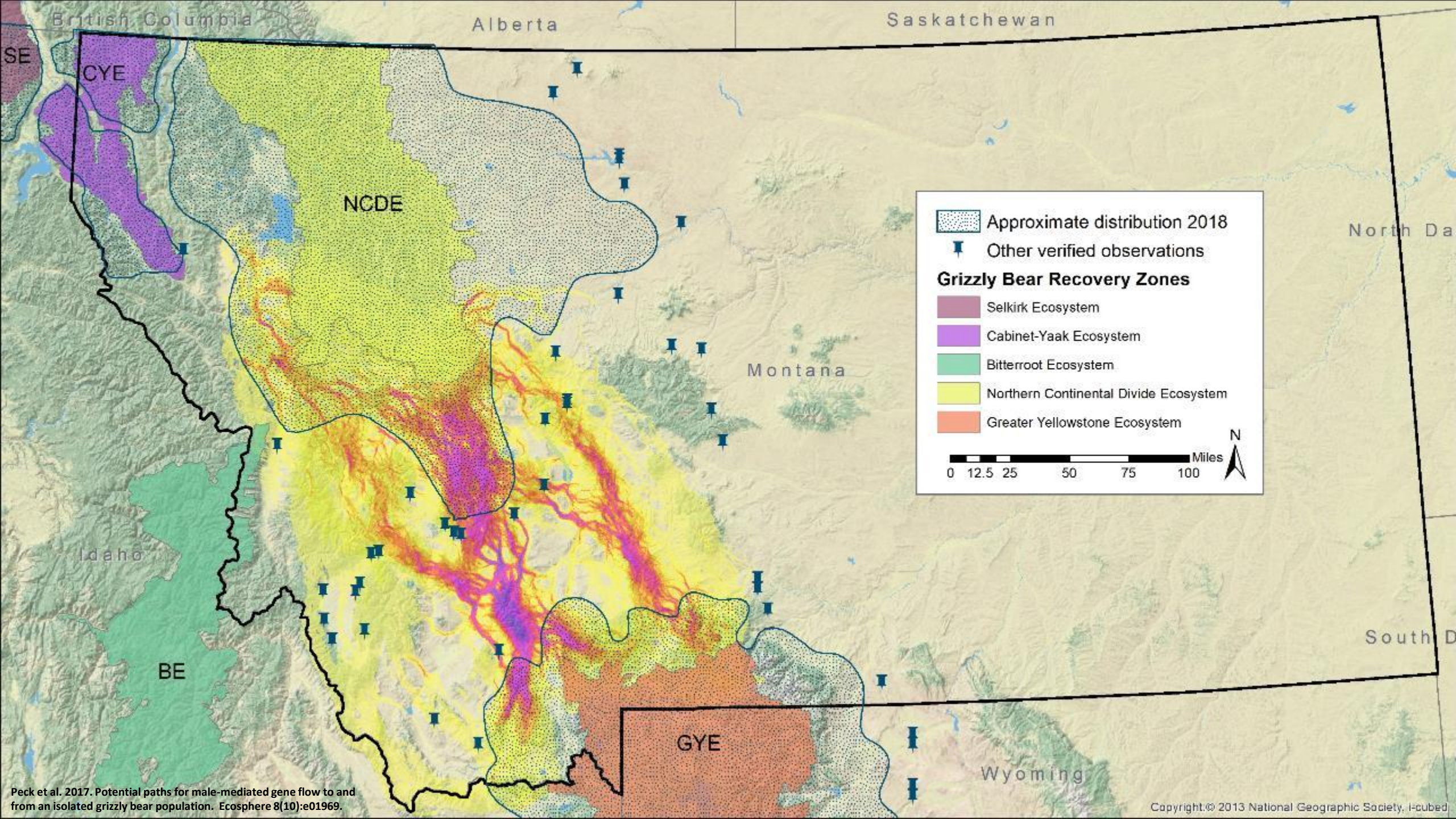


Peck et al. 2017. Potential paths for male-mediated gene flow to and from an isolated grizzly bear population. Ecosphere 8(10):e01969.

Grizzly bear-human conflict

Their varied diet, curiosity, and intelligence sometimes leads grizzly bears to seek foods associated with humans

Photo: Tim Manley

Photo: Tim Manley

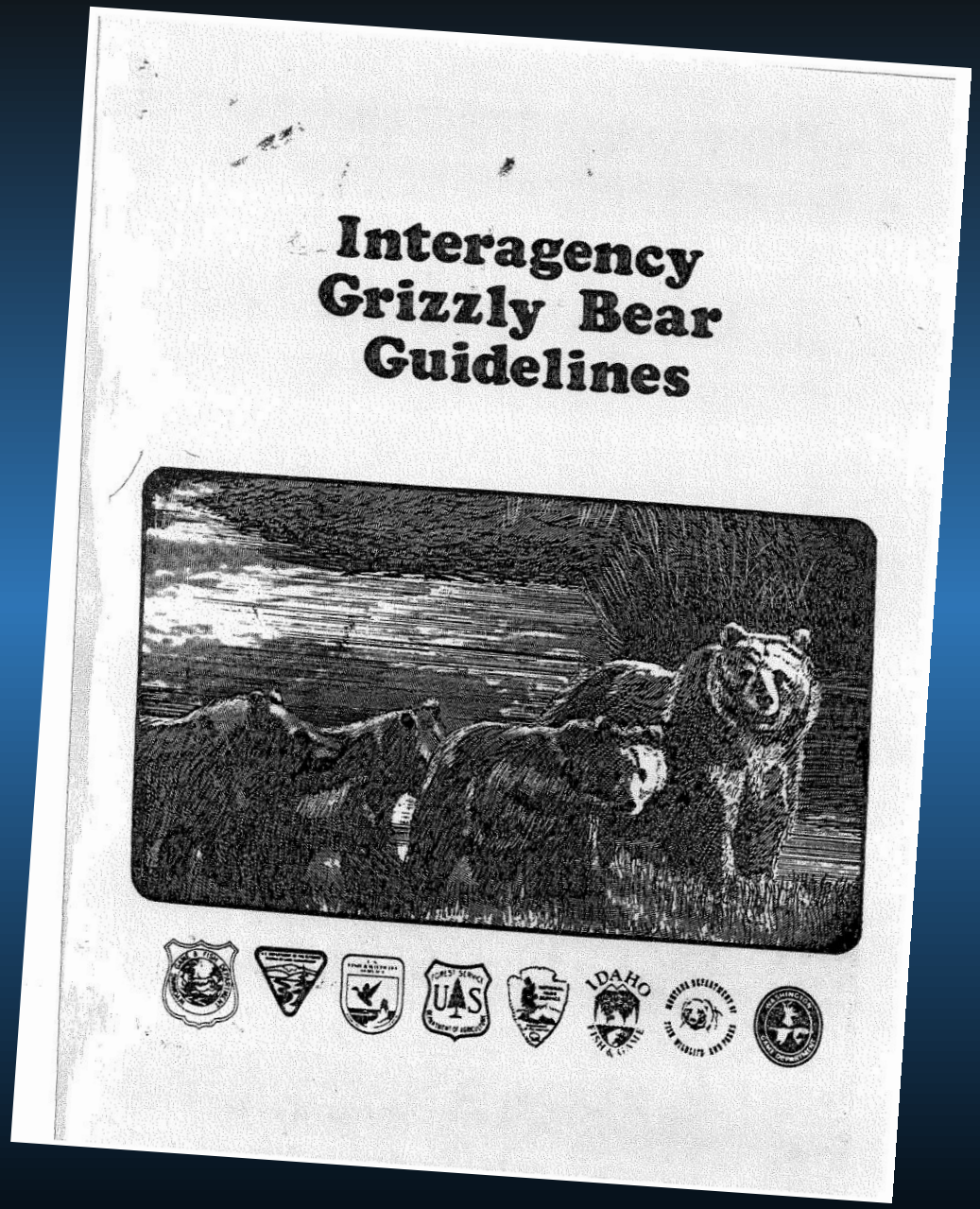
Photo: Kevin Frey

Photo: Tim Manley

Grizzly bear-human conflict response is handled by state, tribal, and park agencies

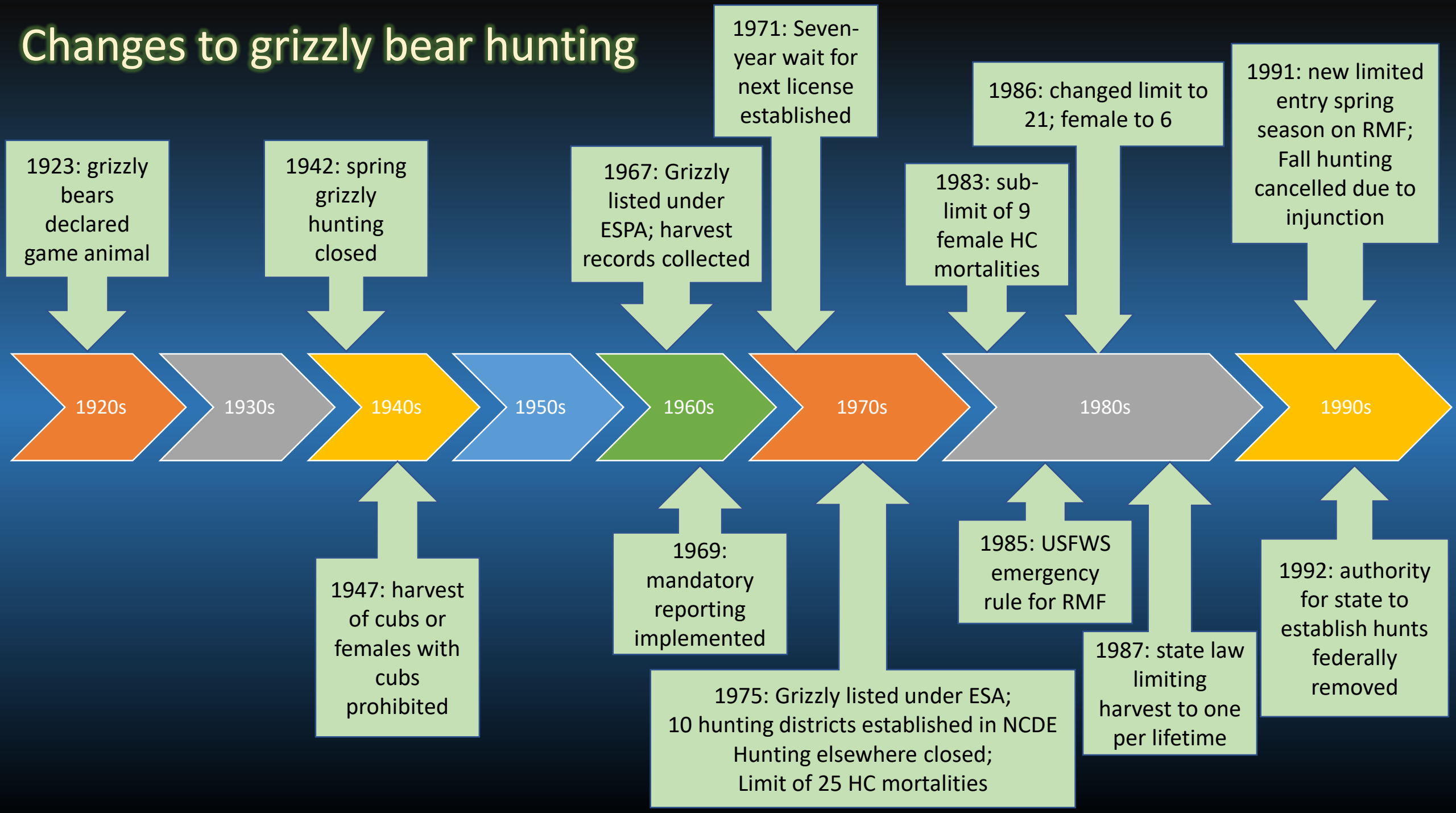
- FWP (9 management specialists in 5 regions)
- Confederated Salish & Kootenai Tribes
- Blackfeet Nation
- Glacier National Park
- Yellowstone National Park

Photo: FWP

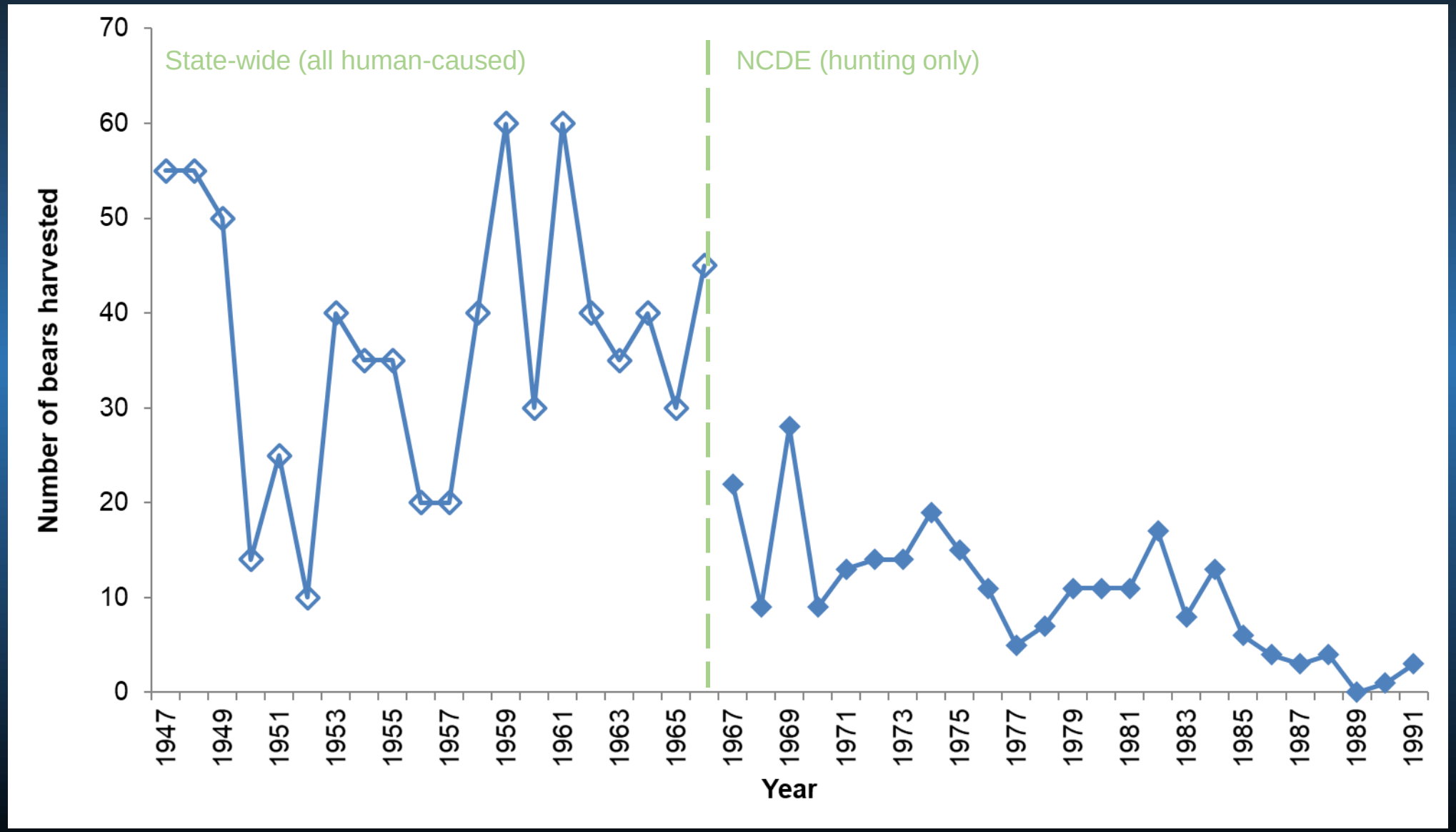


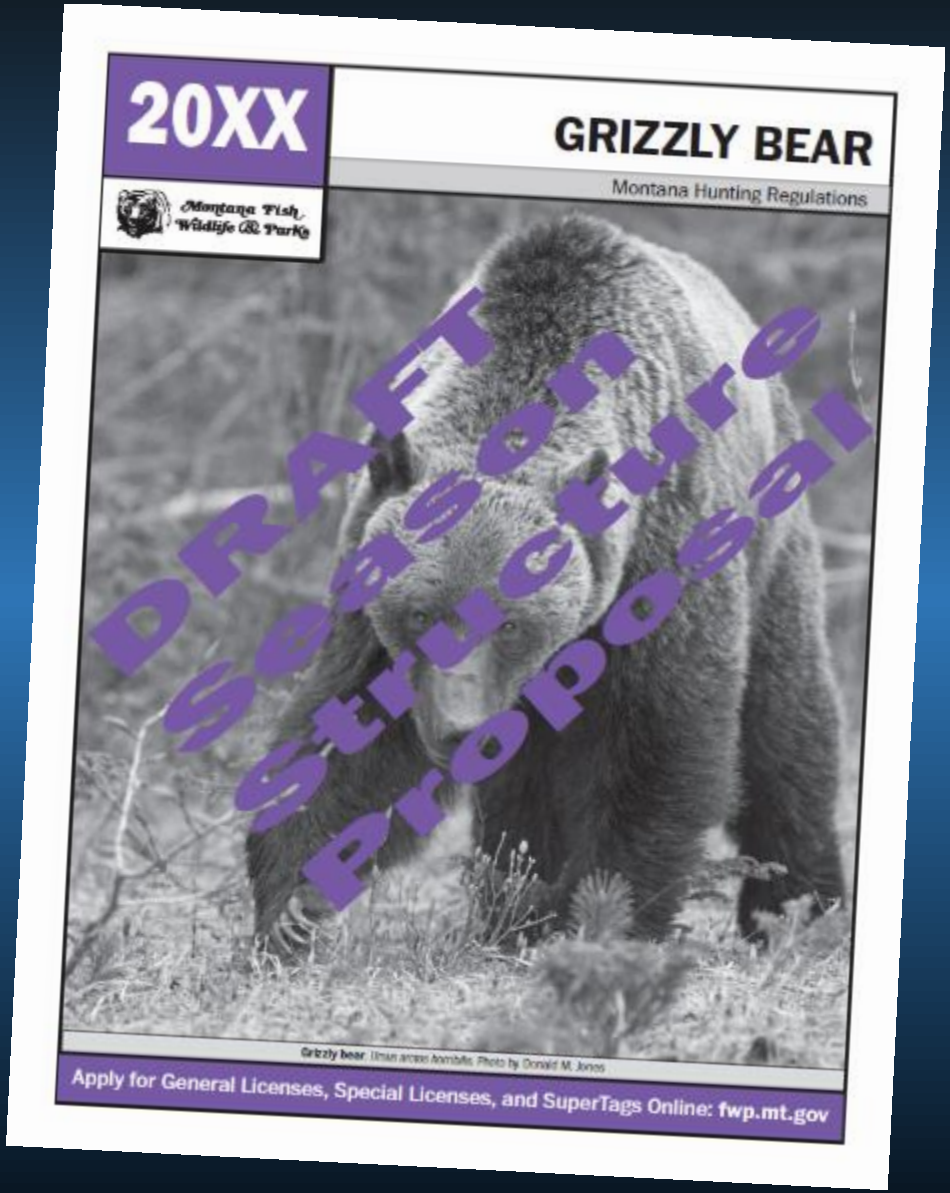
- Consult with USFWS
- Follow IGBC guidelines (1983)
- Education and prevention
- Secure attractants
- Options for dealing with conflict bears
  - Hazing
  - Capture, collar, release on-site
  - Capture, collar, translocate
  - Capture, remove from population

Changes to grizzly bear hunting



Grizzly bear harvest records





Seasonal Structure proposal developed by request of USFWS

- Limited draw permit
- Quota and female subquota
- Mandatory reporting within 12 hours
- Permits limited to number of females under mortality limits

IDAHO FISH & GAME

WYOMING GAME & FISH DEPARTMENT

MONTANA FISH, WILDLIFE & PARKS

THE BLACKFEET NATION PIKUNI

BLACKFEET

CONFEDERATED SALISH AND KOOTENAI TRIBES

DIVISION OF FISH, WILDLIFE, RECREATION & CONSERVATION

U.S. FISH & WILDLIFE SERVICE

DEPARTMENT OF THE INTERIOR

USGS

science for a changing world

NATIONAL PARK SERVICE

FOREST SERVICE

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DEPARTMENT OF AGRICULTURE