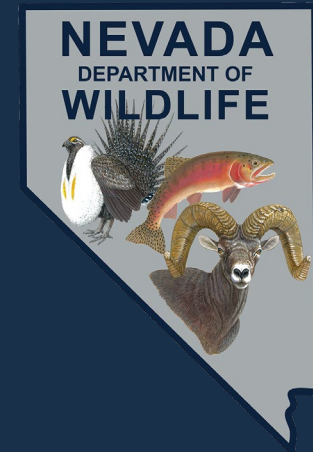


# Nevada's Black Bear

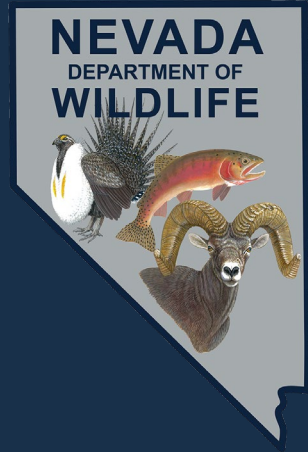
- ▶ Background
- ▶ Research Methods
- ▶ Population Estimates- Then and Now
- ▶ Conservation and Management



Presented to the Board of Wildlife Commissioners  
May 2024

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Nevada's Black Bear

▶ Background

The American black bear (*Ursus americanus*) is the only species of bear that occurs in Nevada and California in present time

There are several color phases but in Nevada >90% are some shade of brown

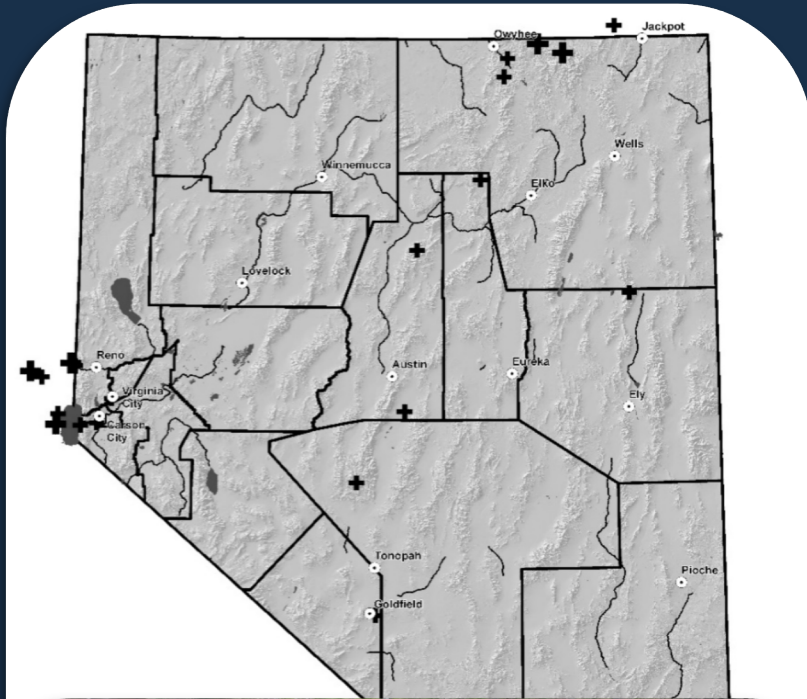
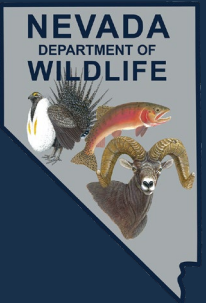
Grizzly bears and Brown bears are same species (*Ursus arctos*)

- Not currently found in Nevada or California -





# Other Bear Species Formally Found in Nevada



**Grizzly bear (*Ursus arctos*)**  
Records from 1800s



**Giant Short-Faced bear (*Arctodus simus*)**  
300,000 - 10,000 years ago





# General Biology

- Long-lived species
- Forest dependent
- Extremely adaptable
- Highly individualistic
- Omnivores - 85% of diet is plant matter
- Male home range is about 45 square miles
- Female home range is about 19 square miles
- Capable of moving very long distances



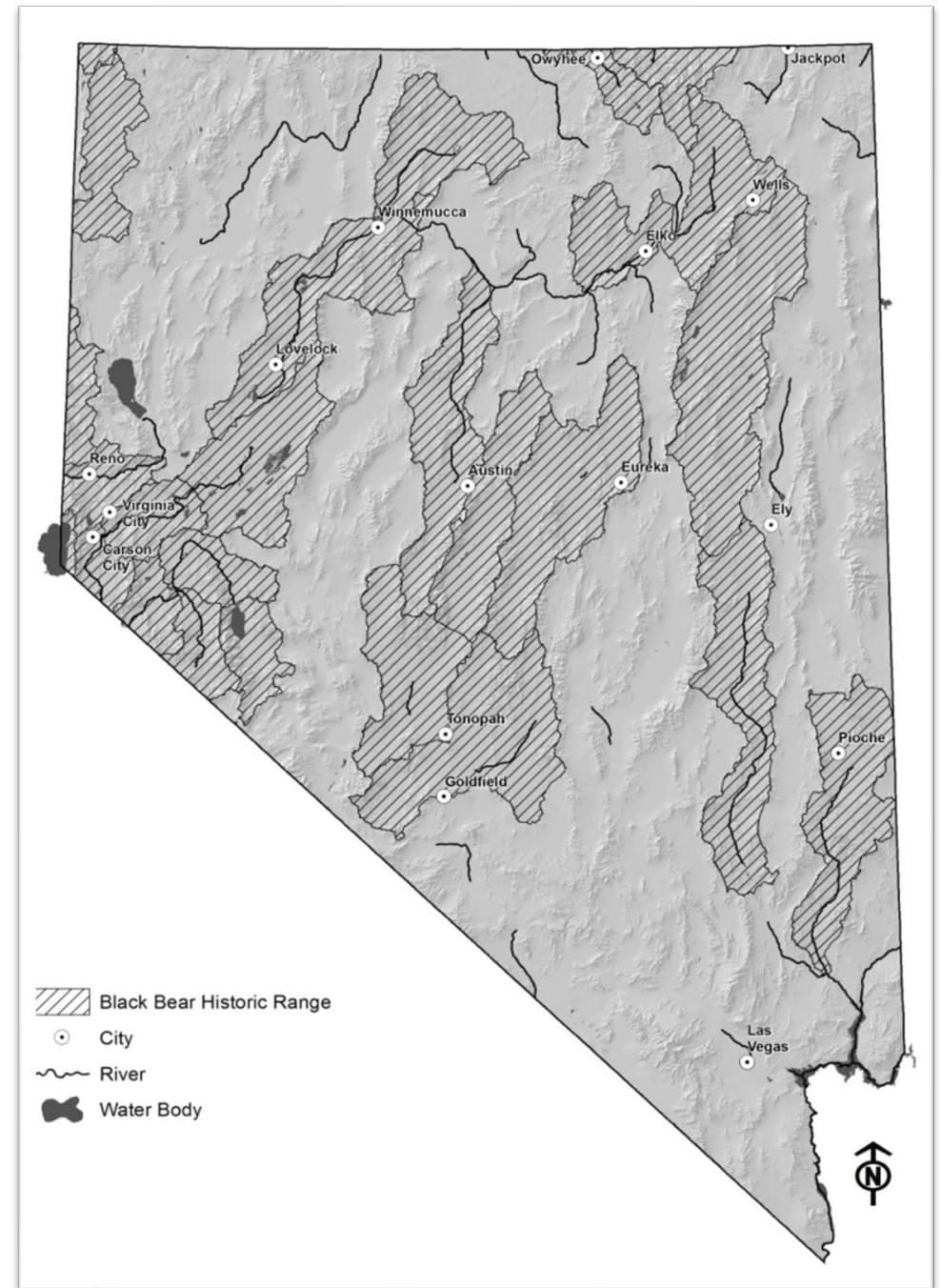
*John T. Humphrey*

Photo: John Humphrey



# Historical Distribution of Black Bears in Nevada

- Derived from articles and pioneer journals
- Believed to have been widely distributed at low densities
- Extirpated from State's interior by early 1900s





# Extirpation Caused By:

- Illicit, or unmanaged hunting
- Competition with domestic livestock (trapped, shot, and poisoned)
- Habitat loss at a landscape scale



Courtesy - Nevada Historical Society



Spoooner Summit - late 1800s



# Habitat Loss at a Landscape-Scale

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Square-set timbers Virginia City

West Carson City - south Carson St



- In a 20-year period the Comstock Lode consumed over 3 million cords of wood
  - = 265,000 semi-truck loads
- Viable populations could not persist without forests





# Habitat Regeneration

- End of mining booms and growing dependency on fossil fuels
- Took several decades, beginning around the early 1900s



# Recolonization

"Nevada has no bear, except for an occasional one that strays in along the Sierras adjacent to Lake Tahoe in California. Therefore, we have no management responsibilities"

Glen K. Griffith - NDOW Director - 1979

- Re-colonization occurring since probably early 1970s
- Growth was very slow

Malaney et al. 2017



## DEPARTMENT of the INTERIOR

news release

FISH AND WILDLIFE SERVICE

For Release August 14, 1979

Inez Connor 202/343-5634

\$10,000 FINES, YEAR'S PROBATION GIVEN TWO NEVADA MEN FOR  
INTERSTATE TRANSPORTATION OF ILLEGALLY KILLED BLACK BEARS

Two Nevada men have been fined a total of \$10,000, given 60-day suspended jail sentences, and placed on probation for a year following their conviction for interstate transportation of black bears killed in violation of Nevada law.

of Reno, pleaded guilty to violating the Lacey Act and were sentenced August 7 by U.S. District Court Judge Harry E. Claiborne in Las Vegas.

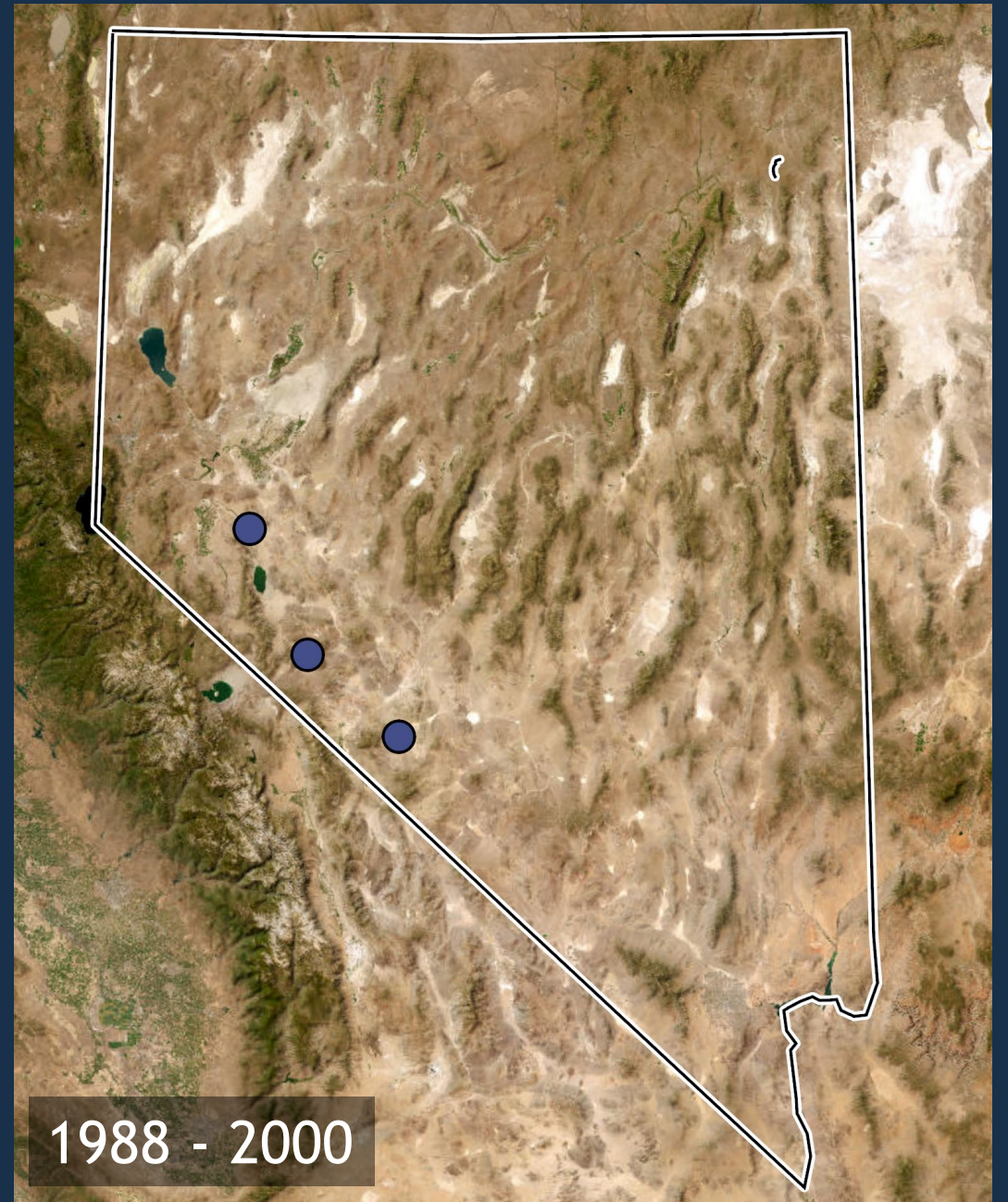
The Lacey Act makes it a Federal crime to transport across State lines any wildlife that was hunted or trapped in violation of State laws. In Nevada it is illegal to kill black bear, where at least a dozen of the estimated population of 30 have been killed in recent years.

"Two Nevada men have been fined...black bears killed in violation of Nevada law"

- 1979



# Sightings/Captures/Tracks/Scat in Historic Habitat

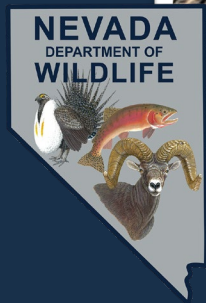
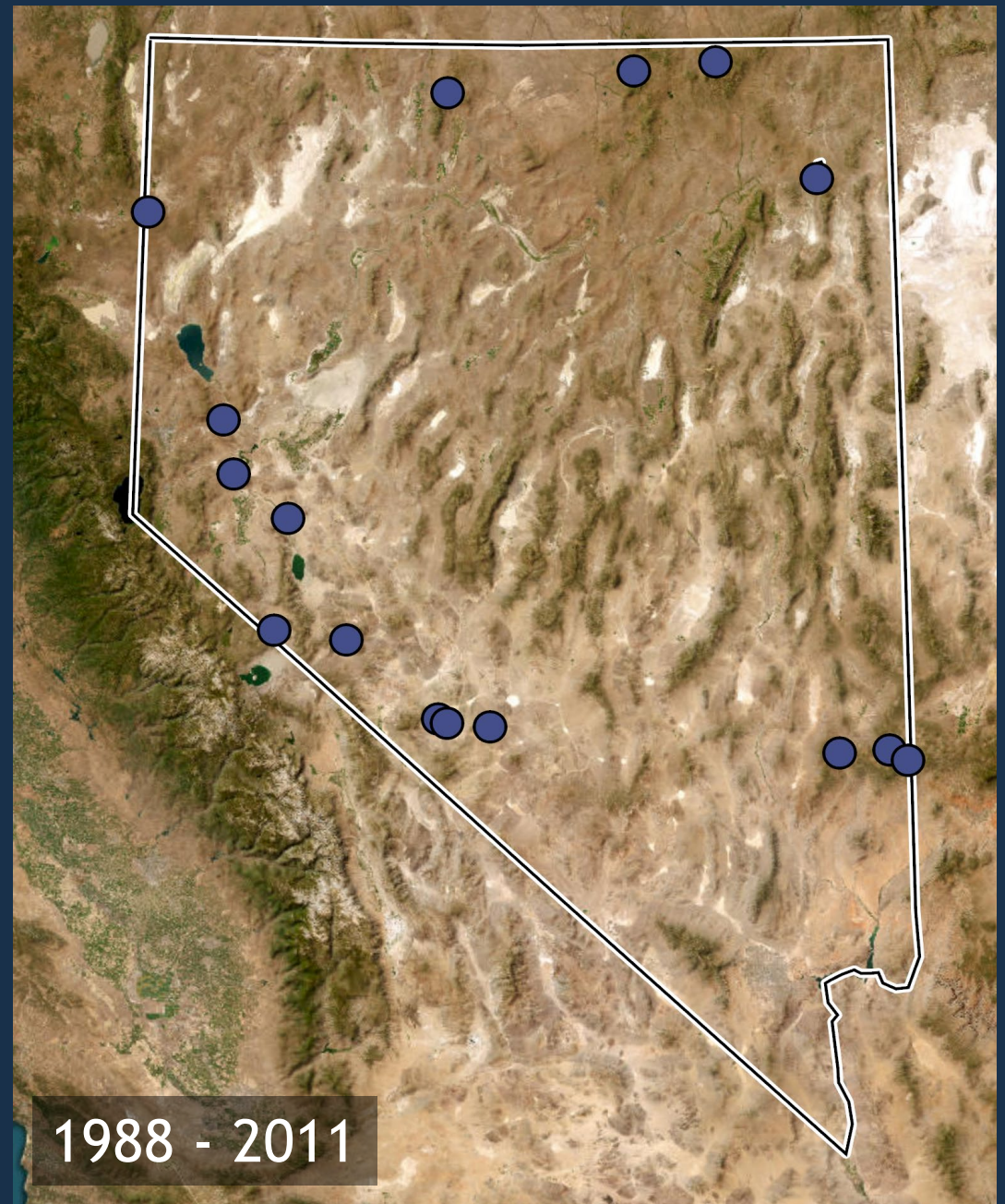


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# Sightings/Captures/Tracks/Scat in Historic Habitat

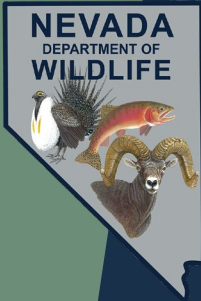




# Sightings/Captures/Tracks/Scat in Historic Habitat

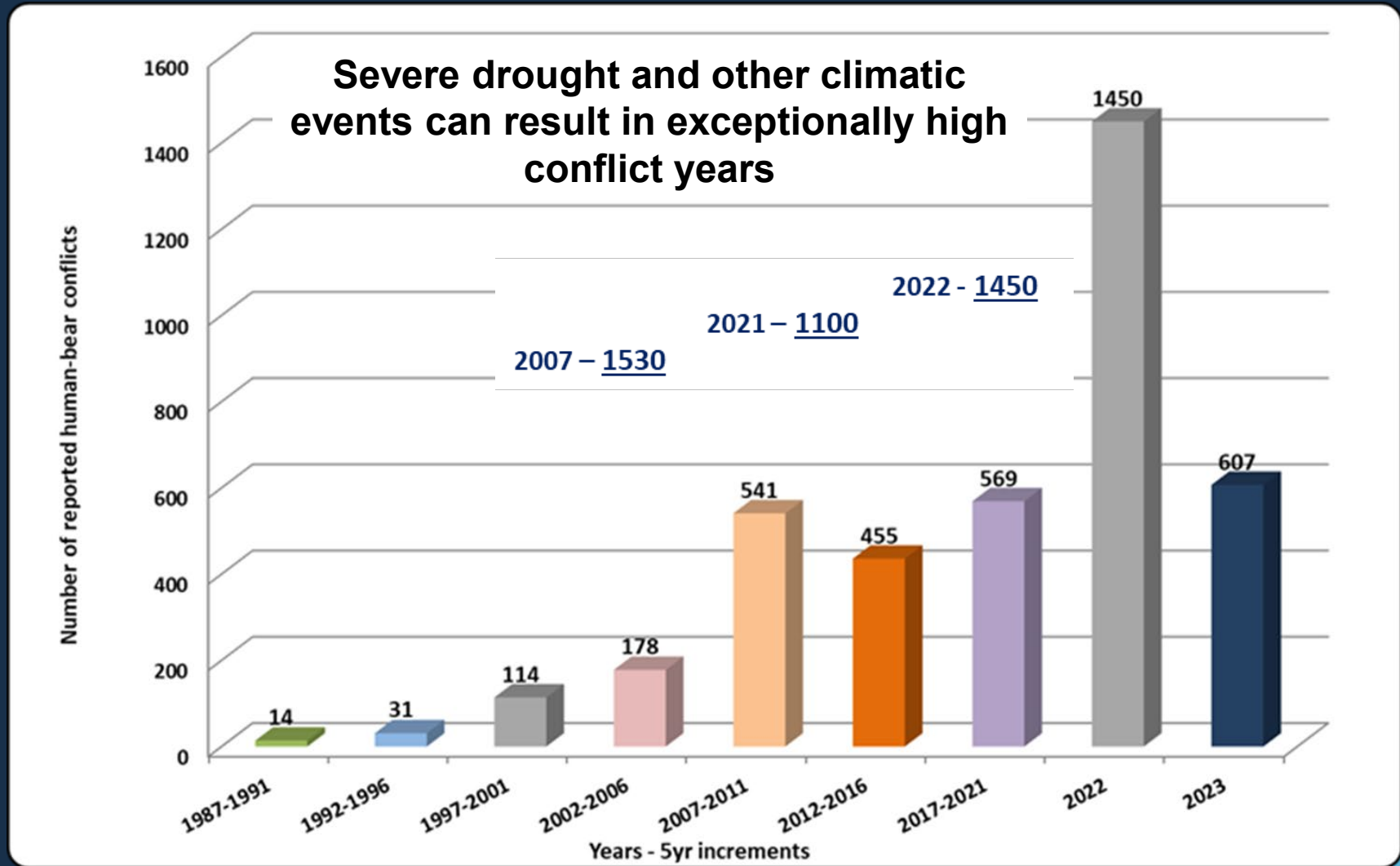






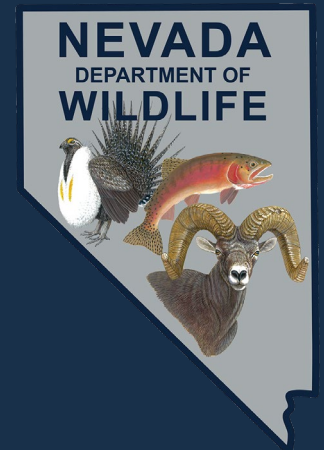
# Increasing Human-Bear Conflicts

- #1 reason we are called is for garbage related issues



Nevada's Black Bear

▶ Research Methods



# Capture and Handling

- Bears are captured for research or human-bear conflict purposes
- While immobilized body condition is assessed, and blood is drawn
- Marks include three ear tags, a tattoo on the inner lip, a PIT tag, and they may be fit with a GPS collar
- Provides information on the health of individual bears, survival, reproduction, habitat use, movement, and behavior
- Bears captured for human-bear conflict purposes can be hazed upon release
  - **\*Important to haze at lower levels of conflict to prevent the escalation of behaviors\***





# CMR Models (capture-mark-recapture)



- Estimates parameters from marked animals when they are re-encountered
  - Re-encounters include dead animals, live captures, radio-tracking, DNA, or combination
- Estimates survival from disappearance of marked individuals and per capita recruitment from appearance of new individuals.
- The sum of survival and per capita recruitment produces the rate of population change, or ( $\lambda$ ) Lambda
  - If recruitment rates exceed mortality rates, then  $\lambda$  is  $>1.0$
- Lambda is not constant - varies year to year (habitat conditions, reproductive success, fecundity rates, emigration and immigration rates, etc.)

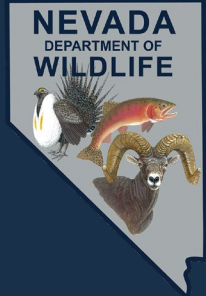
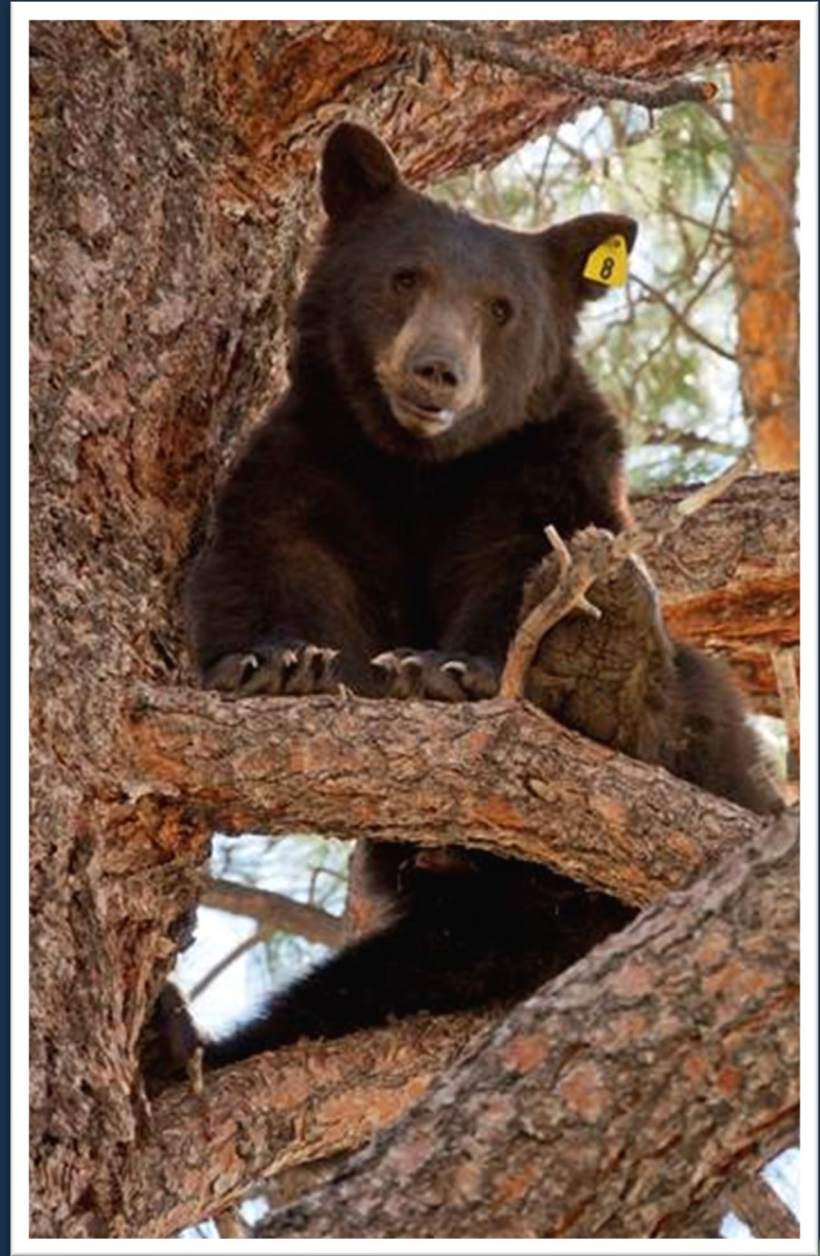




# CMR Models (capture-mark-recapture)

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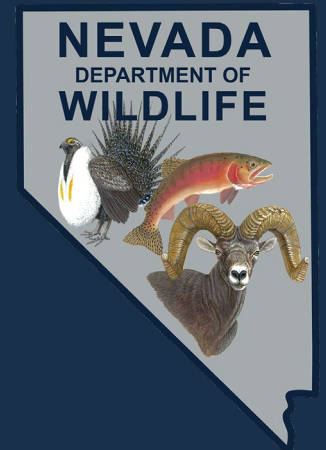
- Are not novel techniques, well-studied and utilized in a wide variety of wildlife populations
- Used to estimate a variety of demographic parameters such as:
  - capture probability, survival, mortality, recruitment, population size and rate of population increase
- Long-term studies produce more data which contributes to more accurate population estimates and reveals changes in system demographics and behavioral traits
  - Entering our 27<sup>th</sup> year of data collection



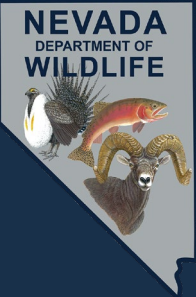
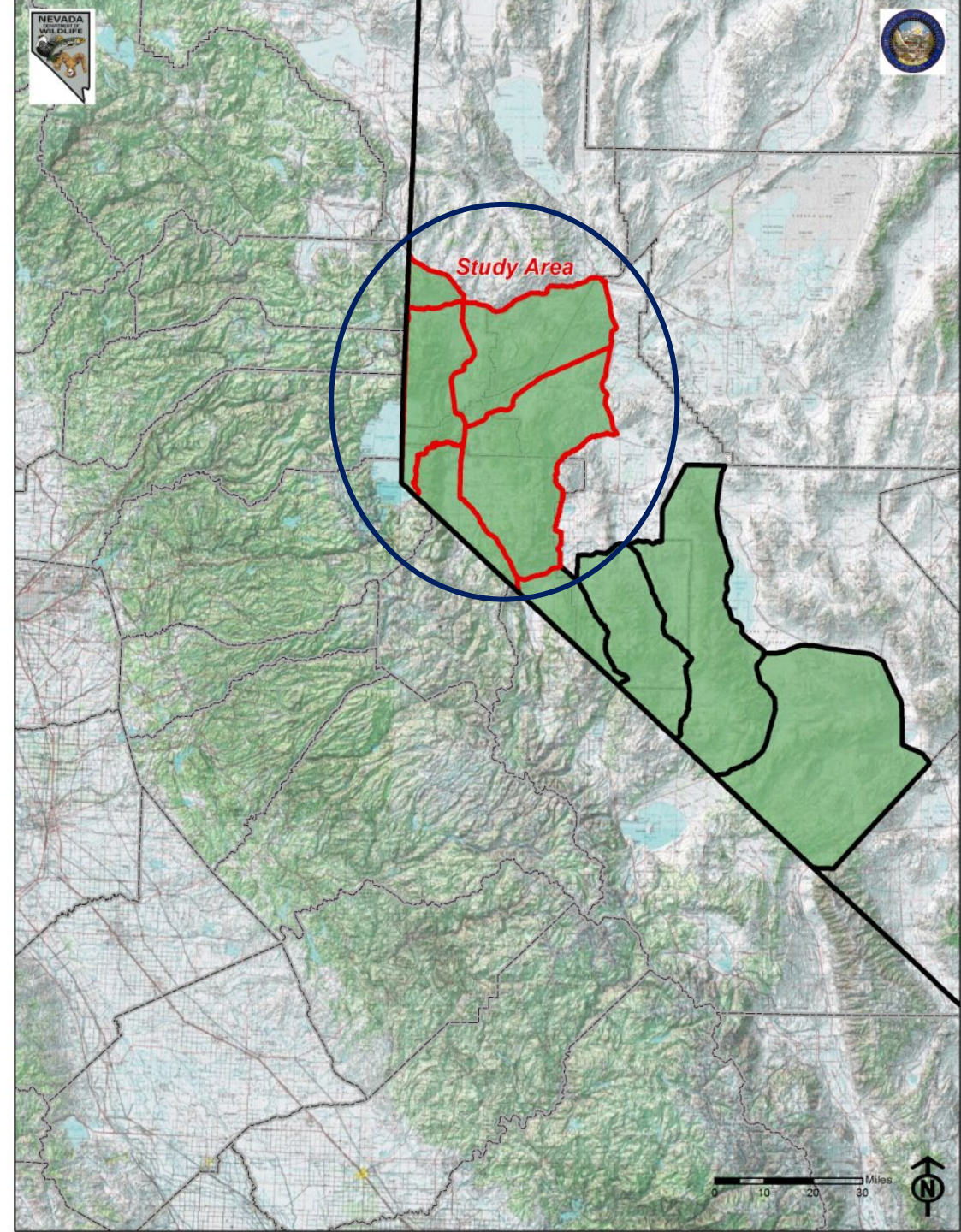


Nevada's Black Bear

▶ Population Estimates  
Then and Now



- All CMR estimates represent adult bears primarily in the study area





# First bear research in Nevada (1987)

John Goodrich - UNR

- Two capture periods, total of 3 months
- Captured 30 individuals
  - (22 in Carson Range, 8 in Sweetwaters)
- Calculated density and estimated 24 adult bears in Carson Range
- Not a single urban bear included in study







## Beckmann- 2002

- Capture period - July 1997-June 2001, 4 years
- Sample size  $n = 99$  (124 capture events)
- Population estimate -  $180 \pm 117$  (95% CI) - CMR





## Sedinger - 2008

- Capture period - July 1997- November 2008, 11 years
- Sample size  $n = 420$  (698 capture events)
- Population estimate -  $253 \pm 27$  (95% CI) - CMR

## Sedinger - 2014

- Capture period - July 1997- through 2014, 17 years
- Sample size  $n = 601$  (1,215 capture events)
- Population estimate -  $445 \pm 14$  (95% CI) - CMR

## Sedinger - 2018

- Capture period - July 1997- through 2018, 21 years
- Sample size  $n = 836$  (1,616 capture events)
- Population estimate -  $431 \pm 33$  (95% CI) - CMR

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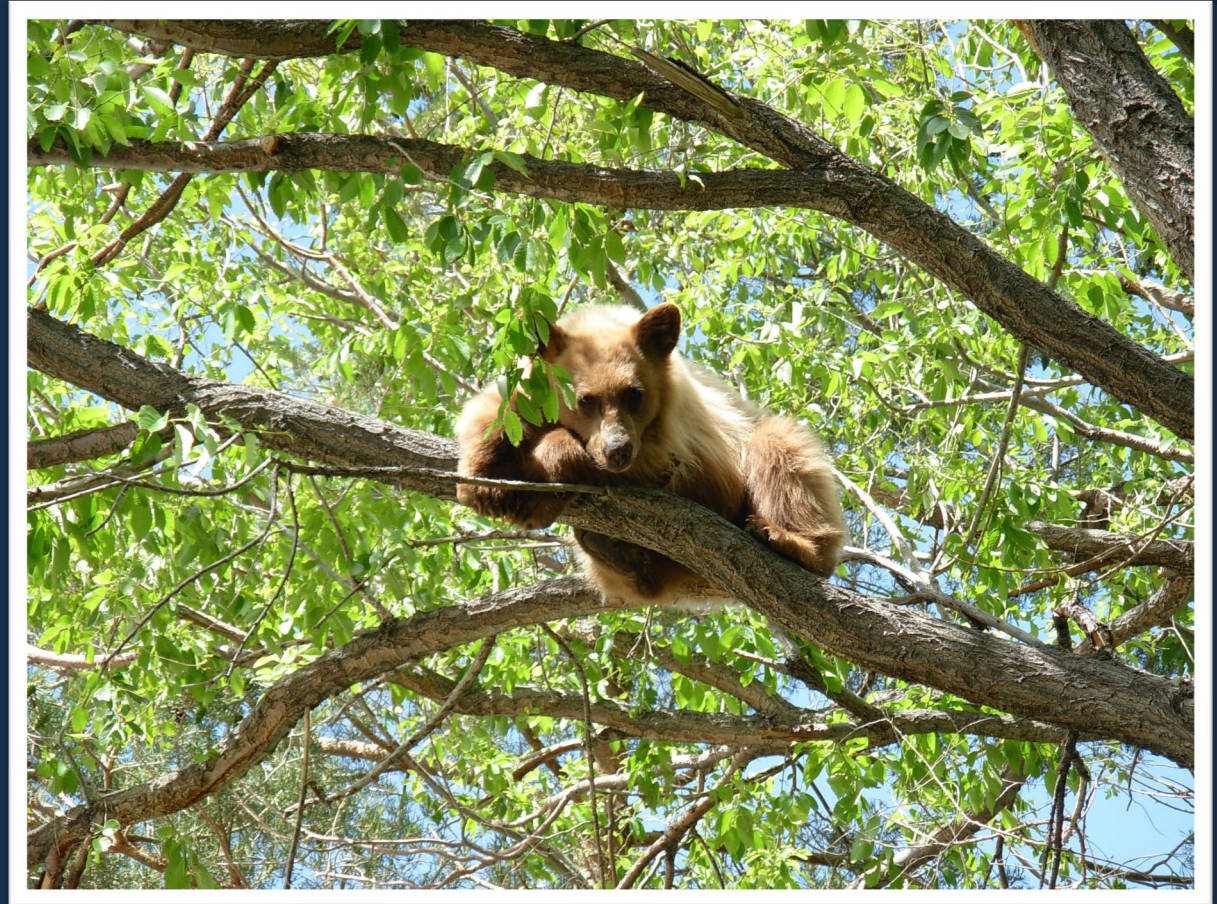






## Williams - 2022 (Most recent CMR estimate)

- Capture period - July 1997- through 2022, 25 years
- Sample size  $n = 1,219$  (2,094 capture events)
- Population estimate - 467 (95% CI 368-592) - CMR
- $\lambda$  has averaged 5% since 2007







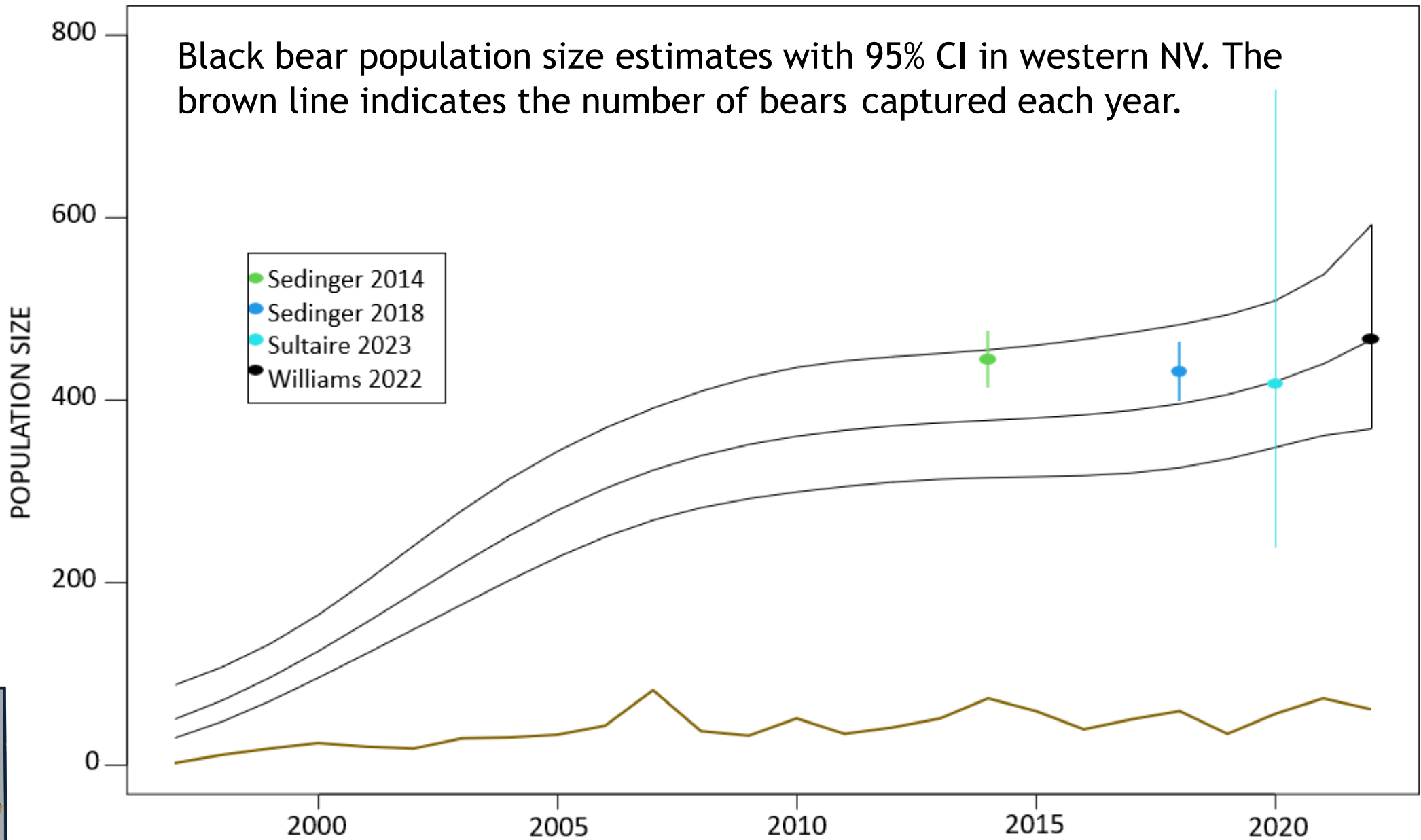
## Sultaire - 2023

- Used integrated SCR (spatial-capture-recapture)
  - GPS collar data + photos + DNA from hair snares
  - Estimated spatial variation in density
  - Estimated abundance
- Capture period - Three summers for DNA, 9+ months
- Primarily hair snares (9 mos) and camera traps (year-round)
- Sample size  $n = 508$  photos; 121 DNA samples; 184 GPS points
- Population estimate - 418 (95% CI 239-740)



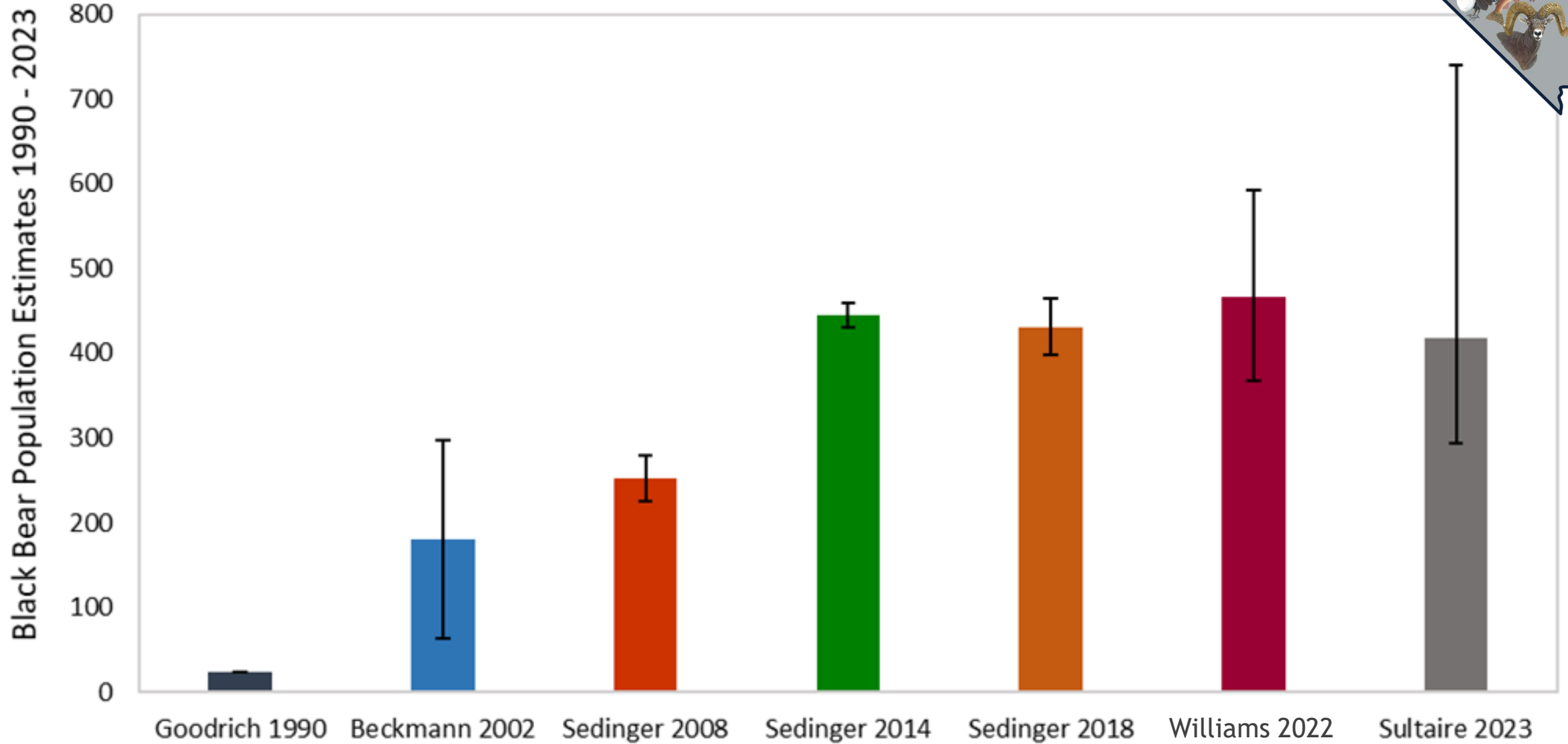
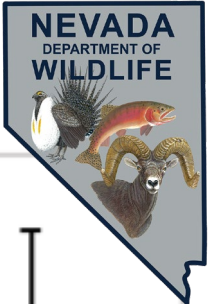
Photo: Alexander Kopatz

Black bear population size estimates with 95% CI in western NV. The brown line indicates the number of bears captured each year.

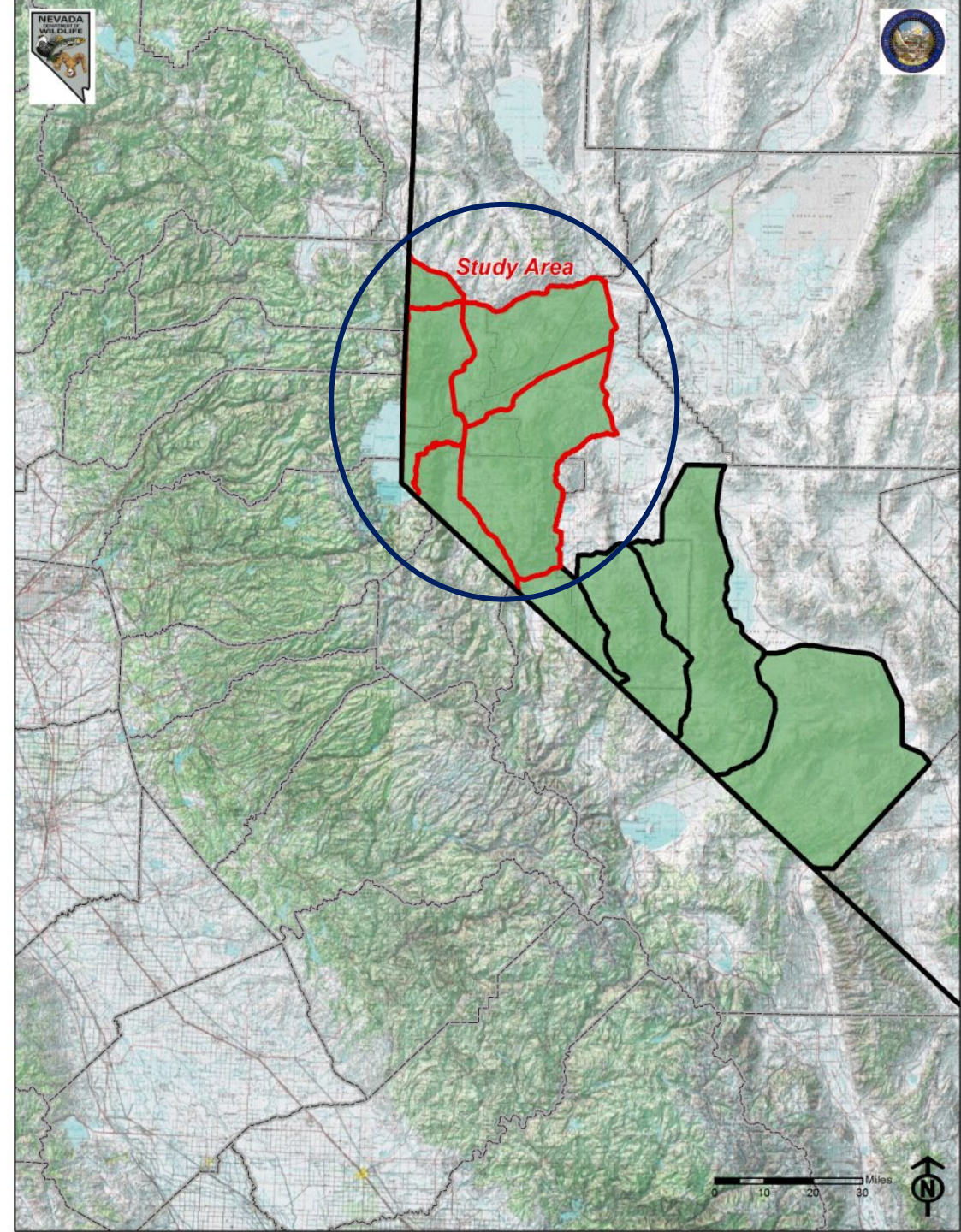




# Neavada black bear population estimates 1990-2023 (95% CI)



- All CMR estimates represent adult bears primarily in the study area
- Modeled state estimate is higher at  $\approx 700$  adult bears
- Male : Female ratio is 2 : 1



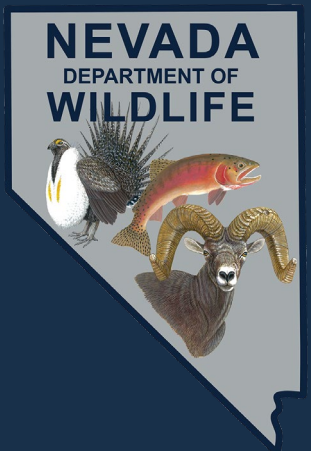
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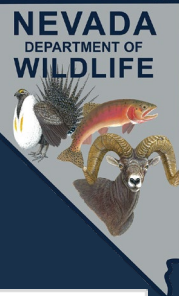


Nevada's Black Bear

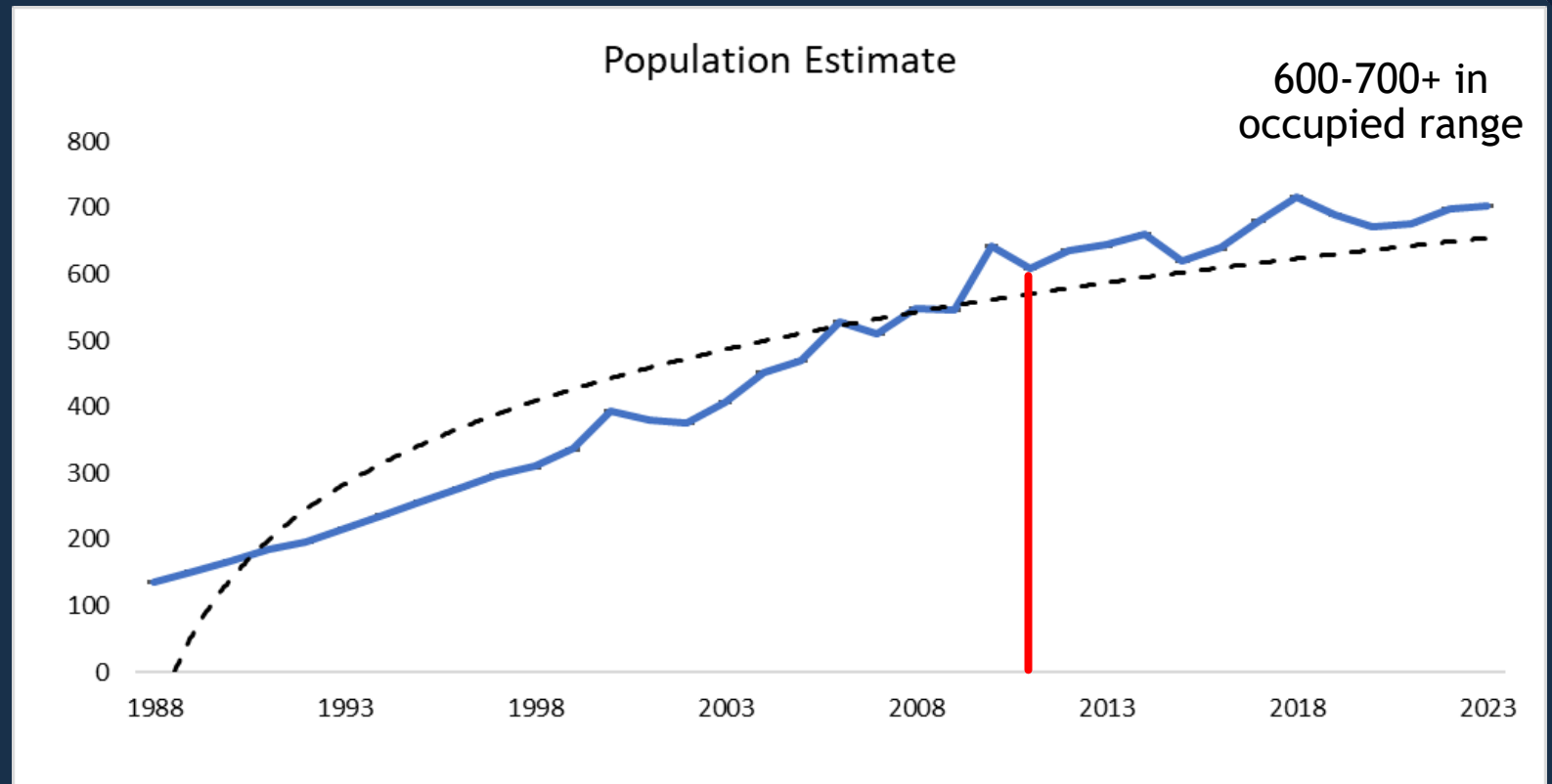
► Conservation and Management



# Black Bear Conservation Measures in Nevada



- Game Mammal - 1929
- Protected Species - 1970
- Human-Bear Conflict Policy - 1998
- County ordinances - 2001
- Management Plan - 2010
- **Managed Hunt - 2011**



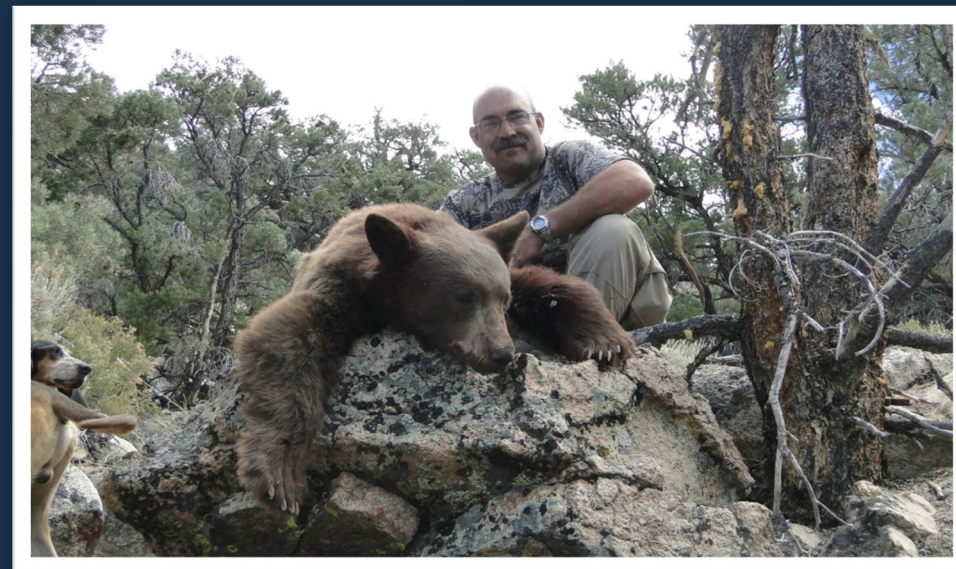
Nevada's black bear population continues to grow at  $\approx 5\%$  annually





# Black Bear Conservation Measures in Nevada Managed Hunt

- Controlling unwanted and unsustainable killing of black bears helped build populations across the U.S. and Canada
- Black bears are legally harvested as a game species in 12 Canadian provinces and territories and 32 U.S. states
- Two-thirds of states with black bears have increasing populations



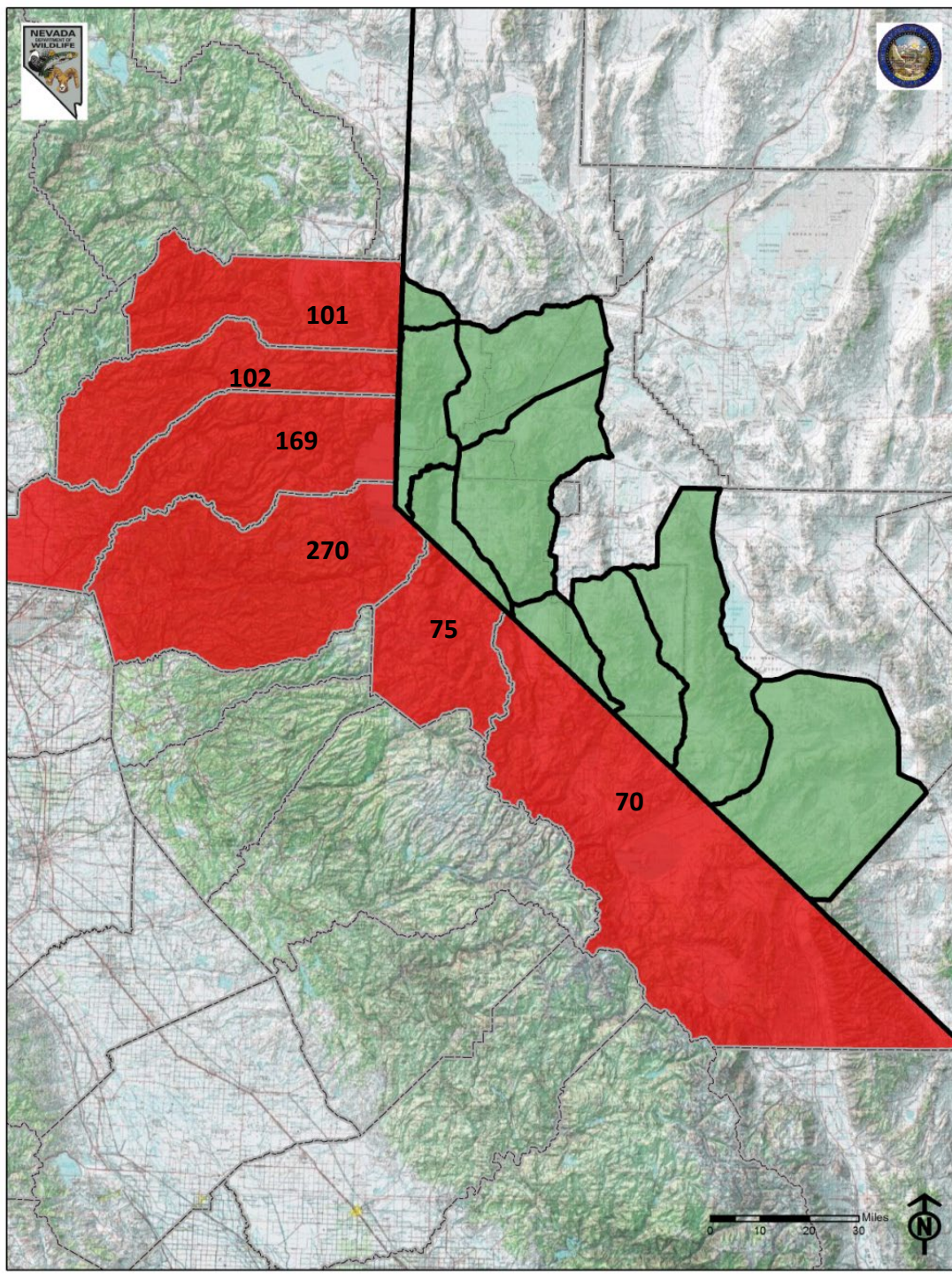
Successful hunter - Nevada 2011

# Conservative Harvest

- Maximum sustainable hunting mortality estimated at 14.2% for black bears
  - 14.2% of current population estimate would = 100 bears harvested
- Pennsylvania, Virginia, and Wisconsin report increasing bear populations with harvest rates >20%
- Nevada 5 year average = 2.3%



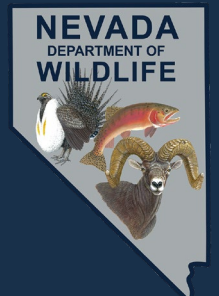




## Number of bears harvested by California hunters in counties bordering Nevada hunt units, 2019-2023 (5 years)

Sierra	101
Nevada	102
Placer	169
El Dorado	270
Alpine	75
Mono	70
<b>Total</b>	<b>787, <u>44% Female</u></b>

- During the same period Nevada hunters harvested 79 bears, 32% female
- 188, 32% female since hunts inception in 2011



- CDFW estimates a total statewide black bear population of 65,405 (90% CI 49,549-80,935)
- Northern Sierra estimated at 15,420
  - 279 average annual harvest in Northern Sierra
  - 1.3-2.9% harvest rate

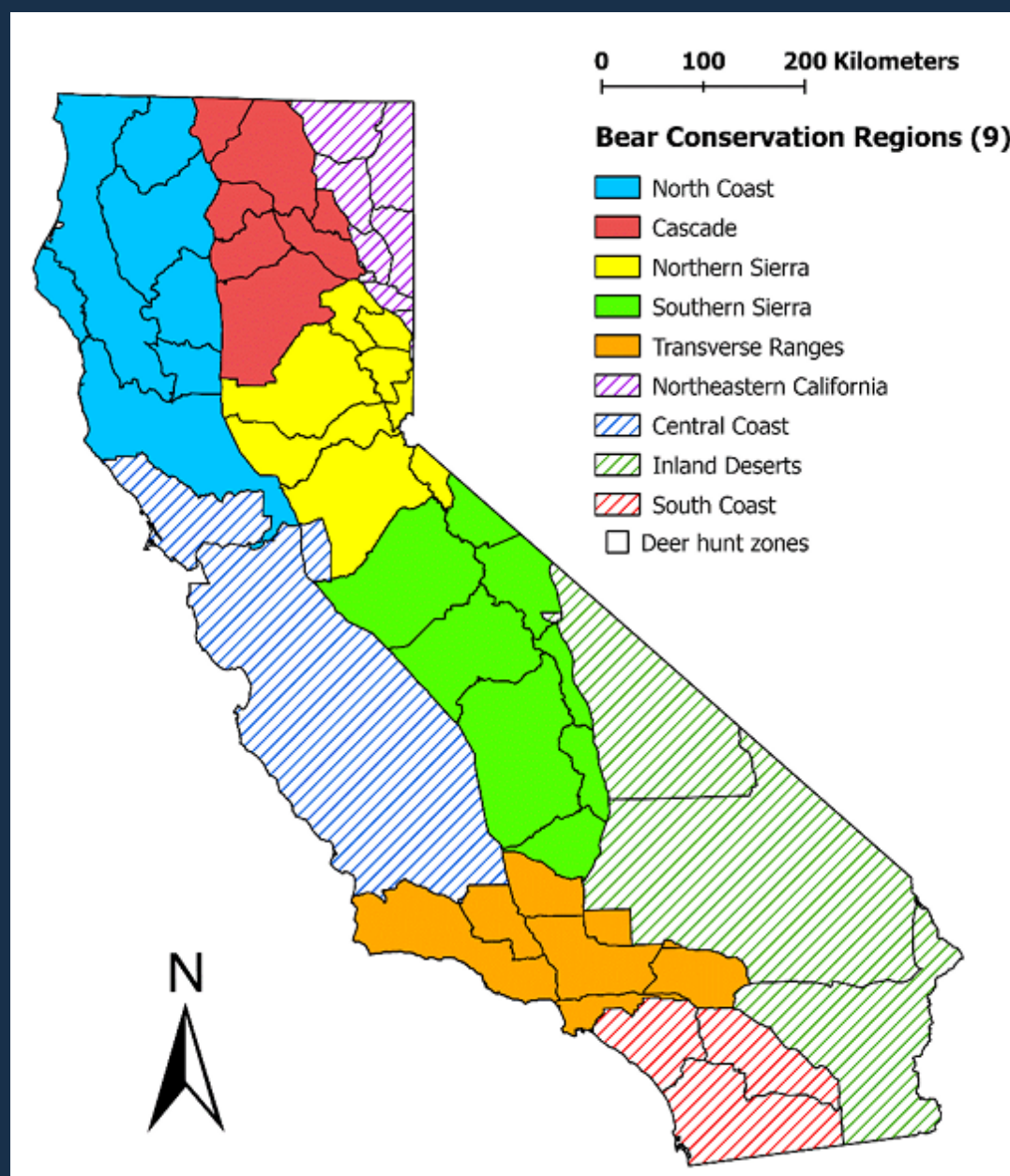


Figure from CDFW Black Bear Conservation Draft Plan depicting Bear Conservation Regions



# Black Bear Conservation Measures in Nevada

## Local Trash Ordinances

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### Douglas County and Carson

- Wildlife Resistant Bins required after 2 violations within 2 years, additional violations at least \$100 fine

### Washoe County

- Wildlife Resistant Bins required after 2 violations within 1 year or less

### Incline Village General Improvement District

- Wildlife Resistant container required and fine after first offence, fines raised to \$1,000 for 2<sup>nd</sup> and additional offenses



# California (Tahoe Basin) Trash Ordinances



## El Dorado and Placer Counties

- Require installation of approved bear boxes on properties when:
  - Permitting new residential constructions or additions over 500 sq ft
  - Within 30 days of notification by approved agent or organization that a site has been determined to be a bear access problem





# Black Bear Conservation Measures in Nevada

## Education



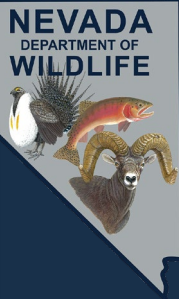
- Respond to all inquiries (in person, over phone, etc.)
- Community presentations on coexistence with black bears
- Distribute informational material
- BearWise member agency
- Place information in high bear activity areas
- NextDoor posts
- Tahoe Interagency Bear Team (TIBT)



**TAHOE  
INTERAGENCY  
BEAR TEAM**

# Black Bear Conservation Measures in Nevada

## Hazing



Nevada was one of the first state agencies (2001) to use Karelain Bear Dogs as a non-lethal management tool

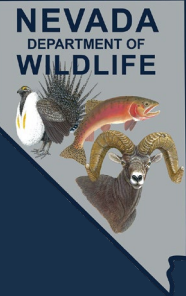
Benefits to the bear:

- Remain in their home range
- Best chance of survival
- Receive a powerful yet negative message



# Black Bear Conservation Measures in Nevada

## Non-lethal Deterrents







# Black Bear Conservation Measures in Nevada

## Population Monitoring and Research

- Long-term capture-mark-recapture study
- Total sample size of 1,349 individual bears to date, not including recaptures
- Marked 765 bears and deployed 200+ collars



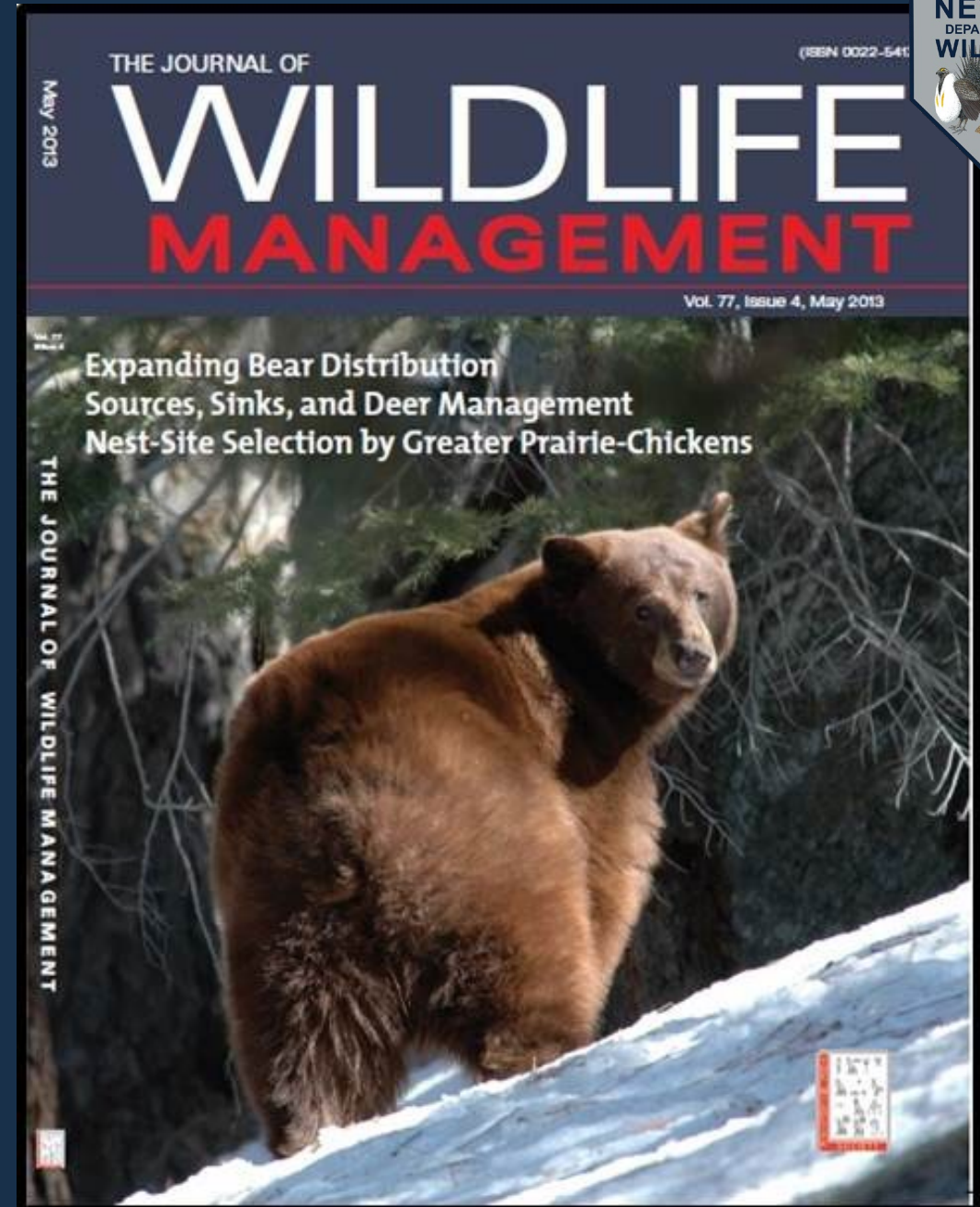


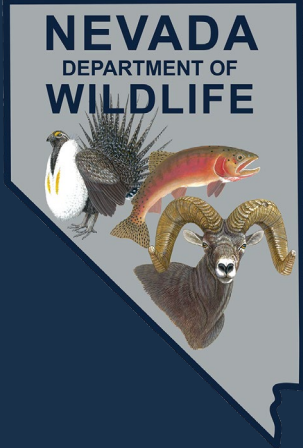
15 peer-reviewed publications  
in professional journals

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Topics include:

- Urban bears/wildland bears
- Relocation Effectiveness
- Aversive Conditioning non-lethal management
- DNA-immigration/emigration
- Habitat use
- Denning chronology and characteristics
- Home range sizes
- Abundance
- Population structure
- Mortality & survival rates





Any  
Questions?