Status of Lynx in Colorado

Jake Ivan, Colorado Parks & Wildlife

Historical Occurrence

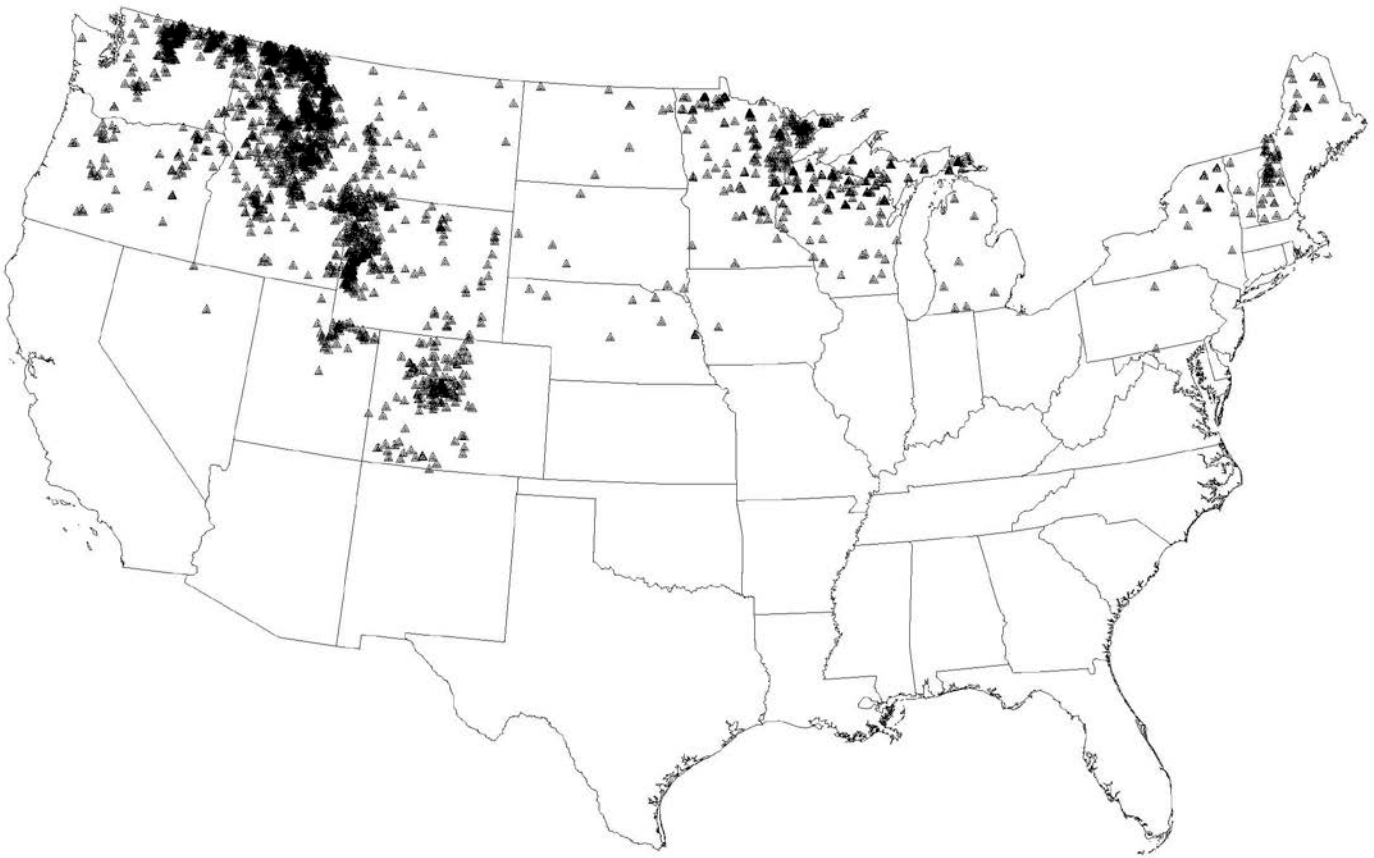


Figure 8.17—Spatial distribution of lynx occurrence data from 1842 to 1998 (Table 8.1).

McKelvey, K. S., K. B. Aubry, and Y. Ortega. 2000. History and distribution of lynx in the contiguous United States *in* Ecology and Conservation of Lynx. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Status in 1999

- 1973 - State Endangered (due largely to widespread predator control).
- 1974 - Last known lynx trapped in Colorado.
- 1978 – 1997 Statewide surveys (11) conducted to document presence in the state.
  - Some possible sign.
  - If present, only a handful of individuals – too few for a viable population.

Lynx Reintroduction (1999)

- Why?
  - Direction from Mission and Strategic Plan:

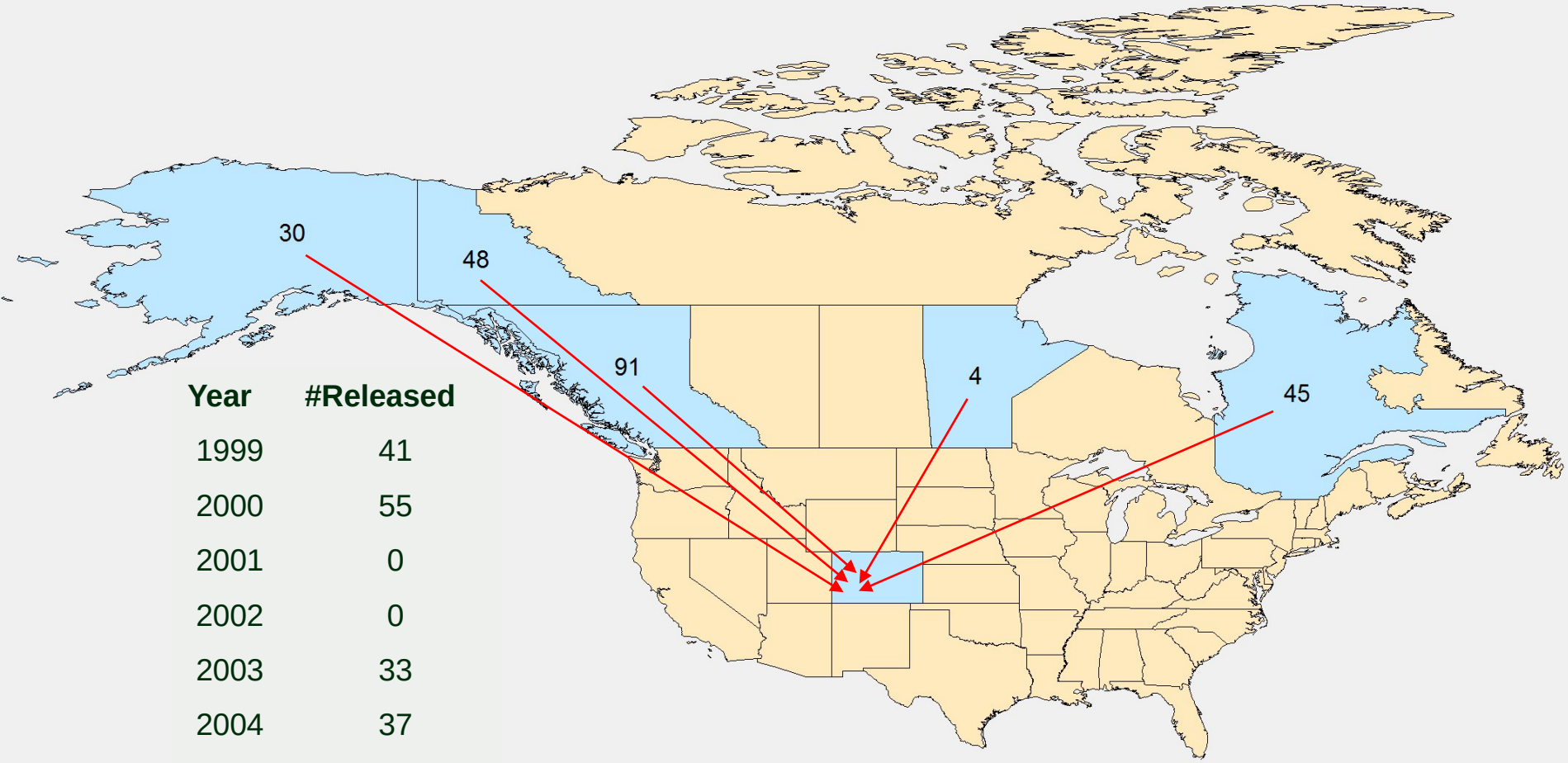
    "Ensure the long-term viability of native fish and wildlife and maintain the diversity of native wildlife across the state."
  - Threats that likely caused their demise (predator control) no longer an issue.
  - Natural re-colonization not likely due to geographic isolation.

Lynx Reintroduction

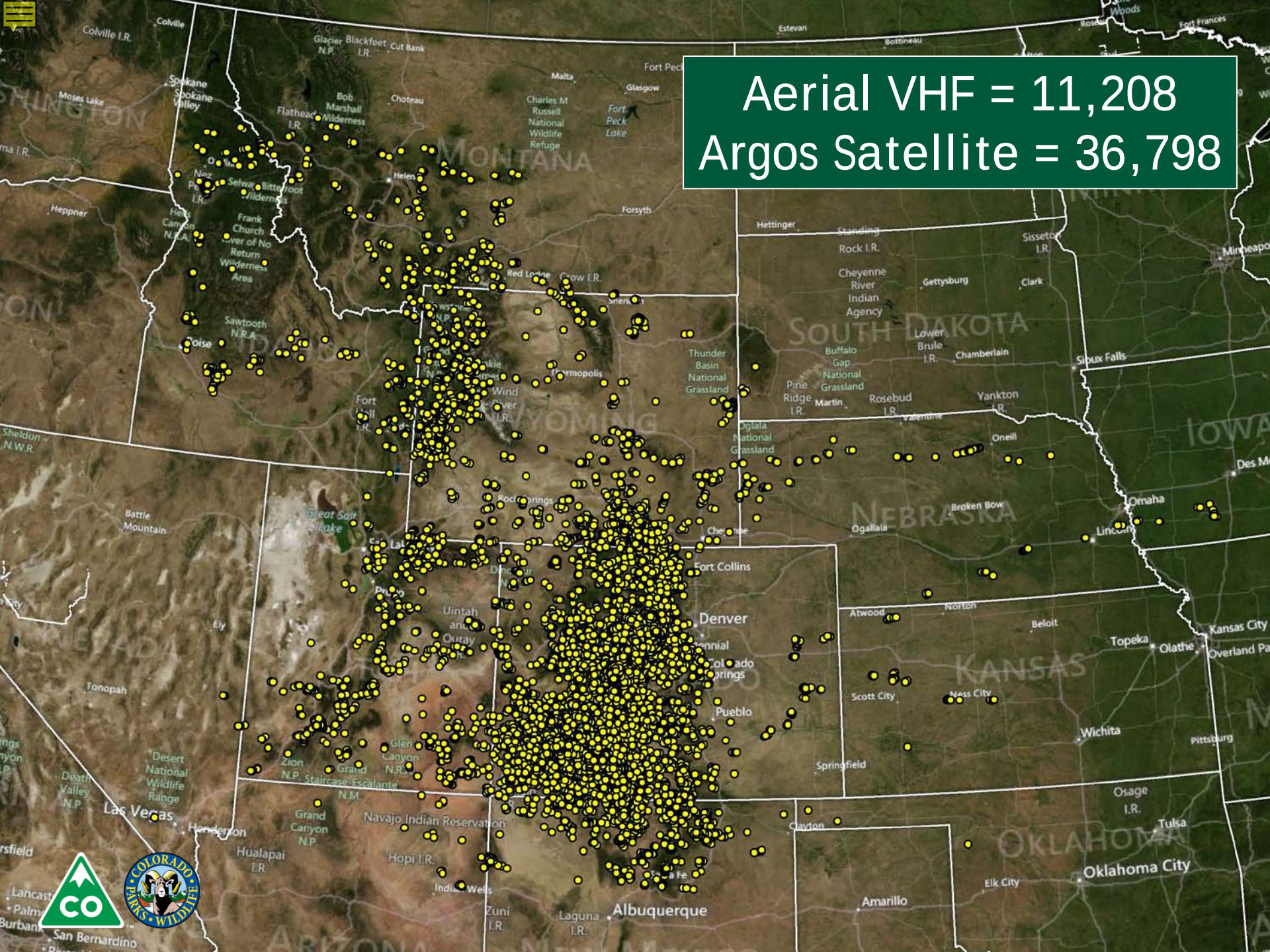
Primary Goal:

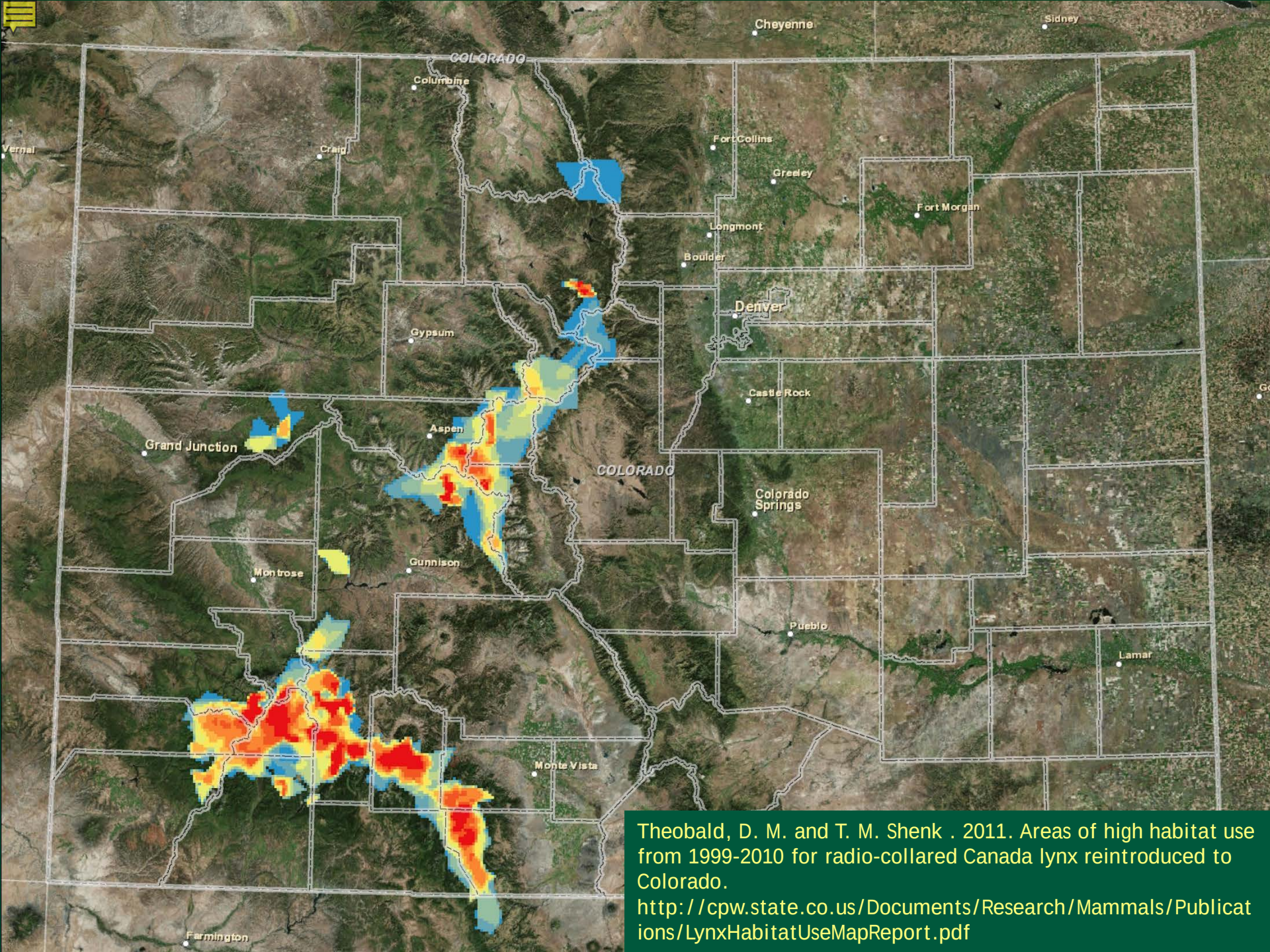
Establish a self-sustaining, viable population of lynx in the state.

Colorado Lynx Reintroduction



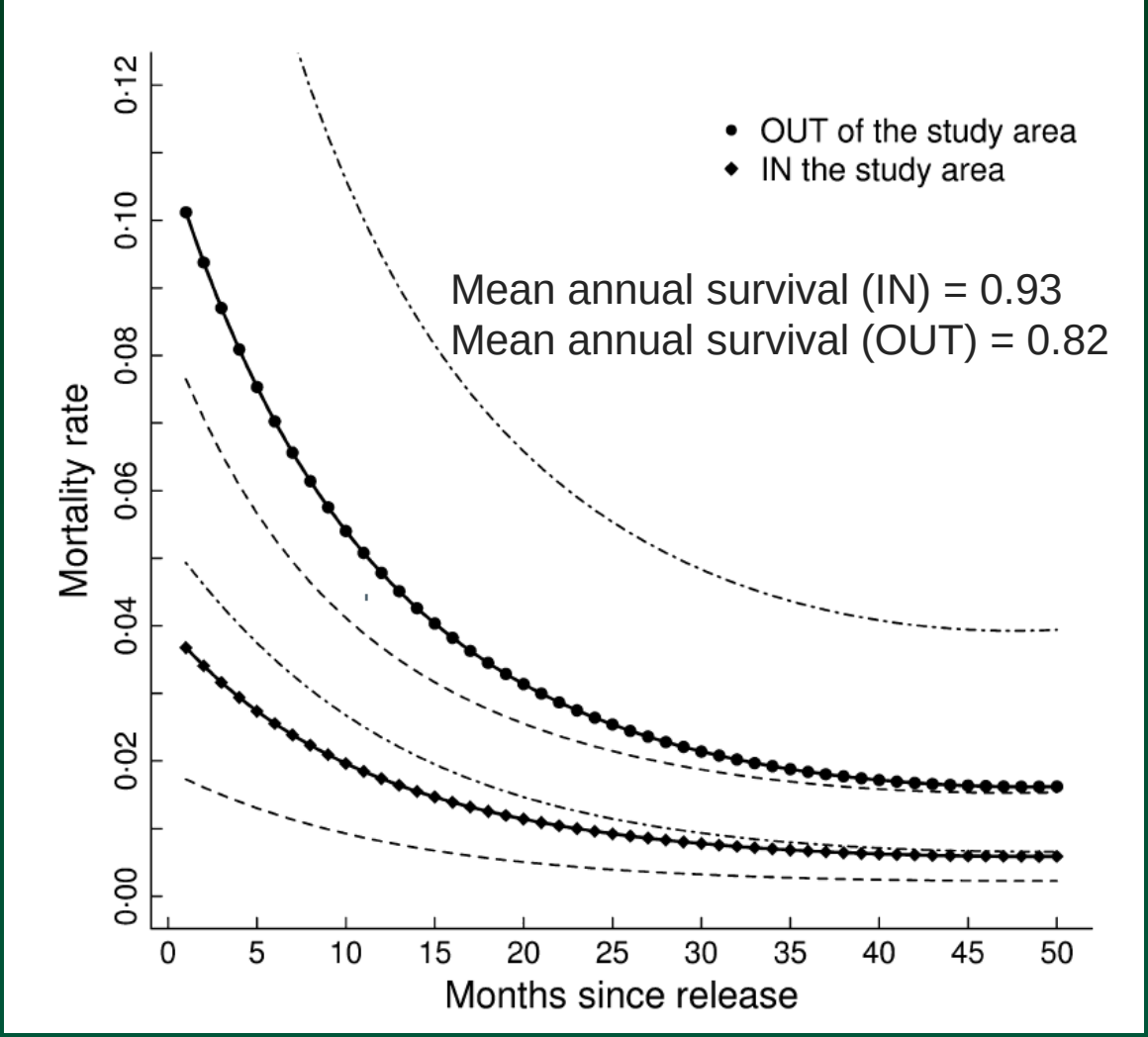
Year	#Released
1999	41
2000	55
2001	0
2002	0
2003	33
2004	37
2005	38
2006	14
Total	**218**


Aerial VHF = 11,208
Argos Satellite = 36,798
Colville
Colville I.R.
Glacier N.P.
Blackfeet I.R.
Cut Bank
Estevan
Bottineau
Spokane
Spokane Valley
Moses Lake
Bob Marshall Wilderness
Flathead I.R.
Choteau
Malta
Glasgow
Fort Peck
Charles M Russell National Wildlife Refuge
Fort Peck Lake
MONTANA
Helena
Bitterroot
Selway
Nez Perce I.R.
Heppner
Hells Canyon N.R.A.
Frank Church River of No Return Wilderness Area
Forsyth
Hettinger
Standing Rock I.R.
Sisseton I.R.
Cheyenne River Indian Agency
Gettysburg
Clark
Red Lodge
Crow I.R.
Sawtooth N.R.A.
Boise
Thunder Basin National Grassland
SOUTH DAKOTA
Buffalo Gap National Grassland
Lower Brule I.R.
Chamberlain
Sioux Falls
Pine Ridge I.R.
Martin
Rosebud I.R.
Yankton I.R.
Oglala National Grassland
Oneill
Sheldon N.W.R.
Fort Hall I.R.
Wind River I.R.
Rock Springs
Great Salt Lake
Battle Mountain
Broken Bow
Omaha
Lincoln
Ogallala
NEBRASKA
Fort Collins
Denver
Uintah and Ouray
Ely
Tonopah
Atwood
Norton
Beloit
Topeka
Olathe
Kansas City
Overland Park
KANSAS
Scott City
Ness City
Pueblo
Wichita
Pittsburg
Springfield
Desert National Wildlife Range
Death Valley N.P.
Las Vegas
Henderson
Zion N.P.
Glen Canyon N.R.
Grand Staircase-Escalante N.M.
Grand Canyon N.P.
Navajo Indian Reservation
Hualapai I.R.
Hopi I.R.
Clayton
Osage I.R.
Tulsa
OKLAHOMA
Oklahoma City
Elk City
Amarillo
Albuquerque
Laguna I.R.
Zuni I.R.
Indian Wells
San Bernardino
Lancaster
Palmdale
Burbank
CO
COLORADO PARKS WILDLIFE



Theobald, D. M. and T. M. Shenk . 2011. Areas of high habitat use from 1999-2010 for radio-collared Canada lynx reintroduced to Colorado.
http://cpw.state.co.us/Documents/Research/Mammals/Publications/LynxHabitatUseMapReport.pdf

Survival

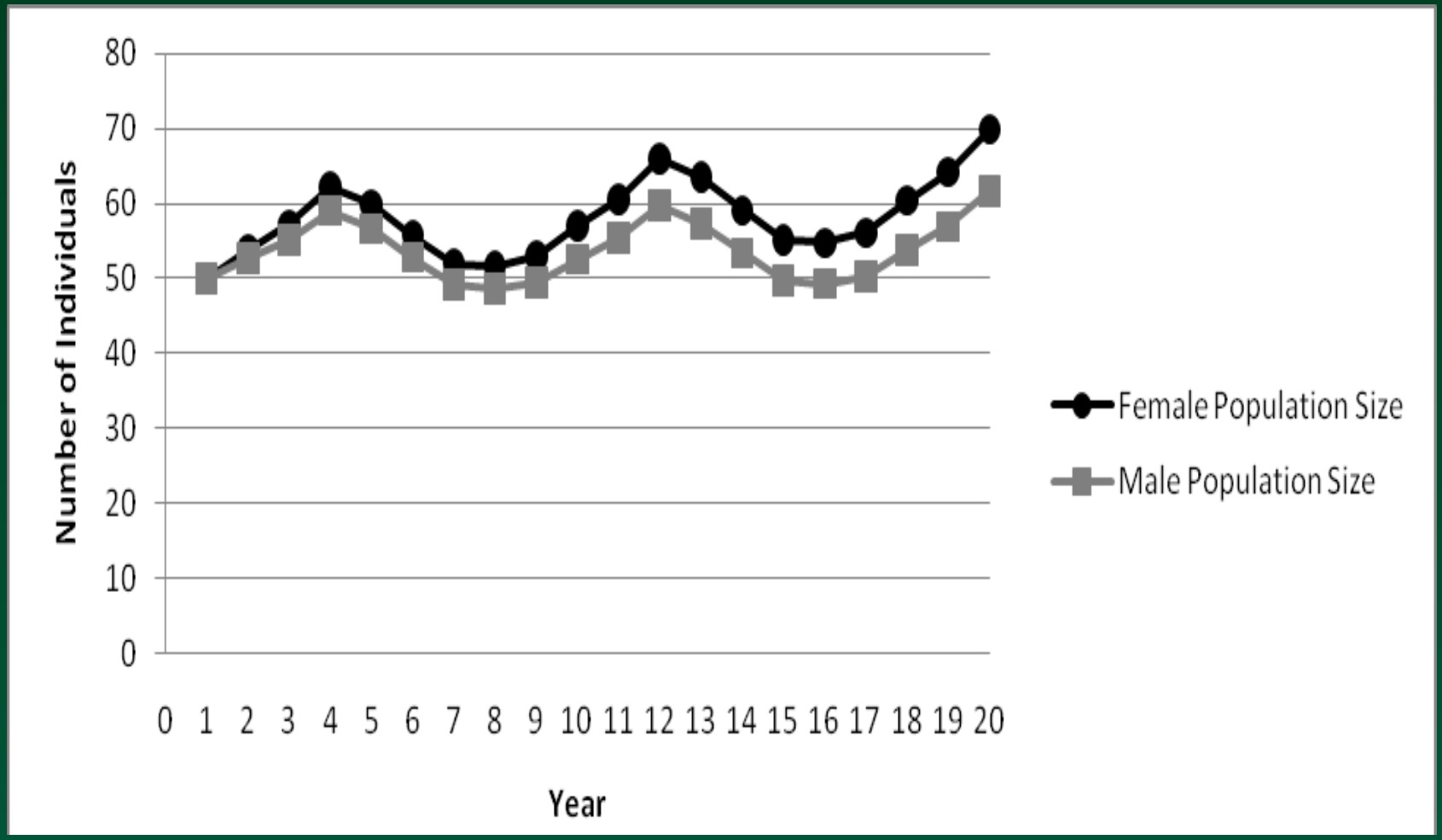


Devineau, O. T. M. Shenk, G. C. White, Doherty, P.F., Lucas, P. M., and R. H. Kahn. 2010. Journal of Applied Ecology 47:524-531.

Reproduction

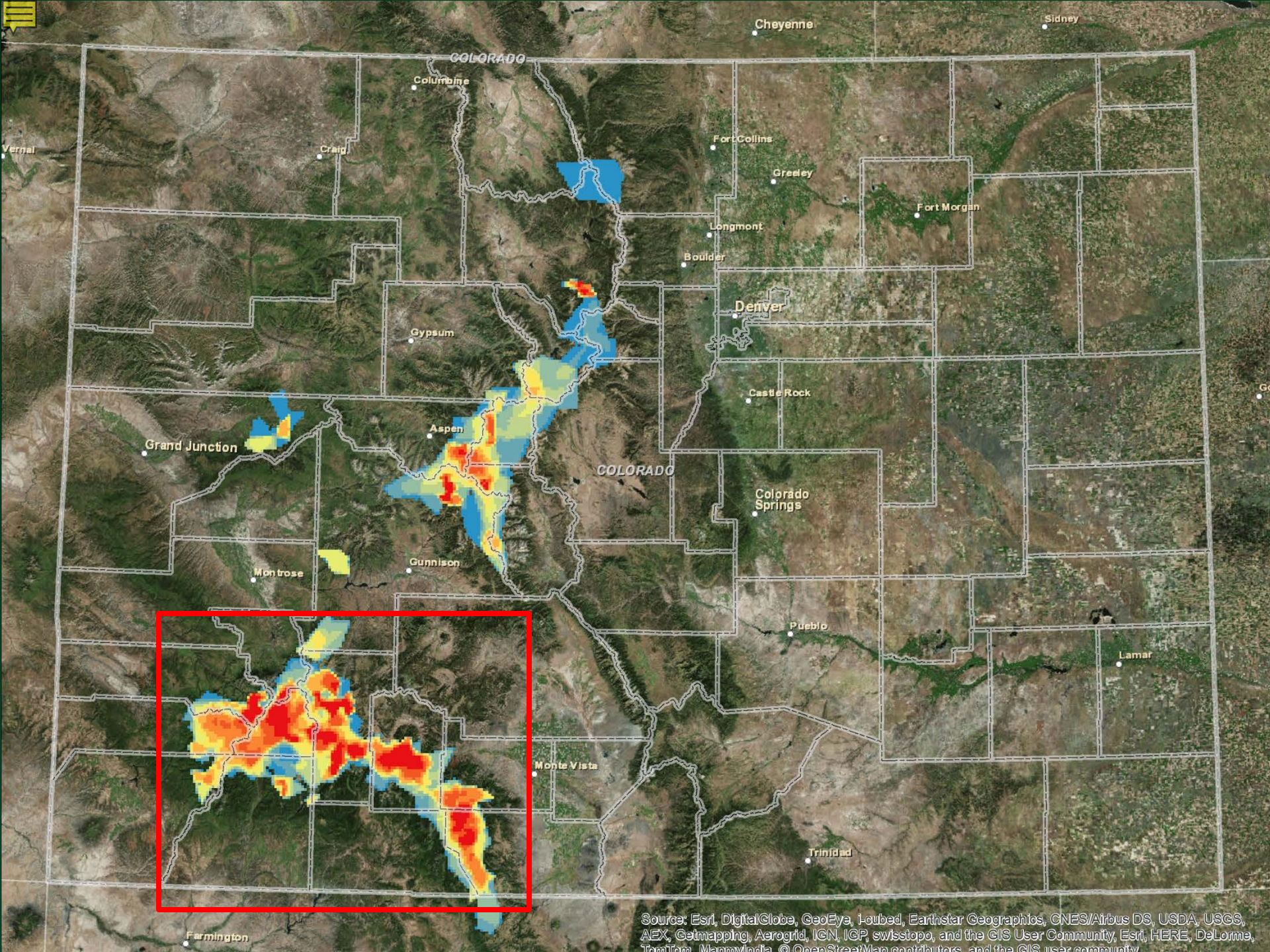
- First den found 2003; 48 total through 2010
- 3rd generation Colorado kittens

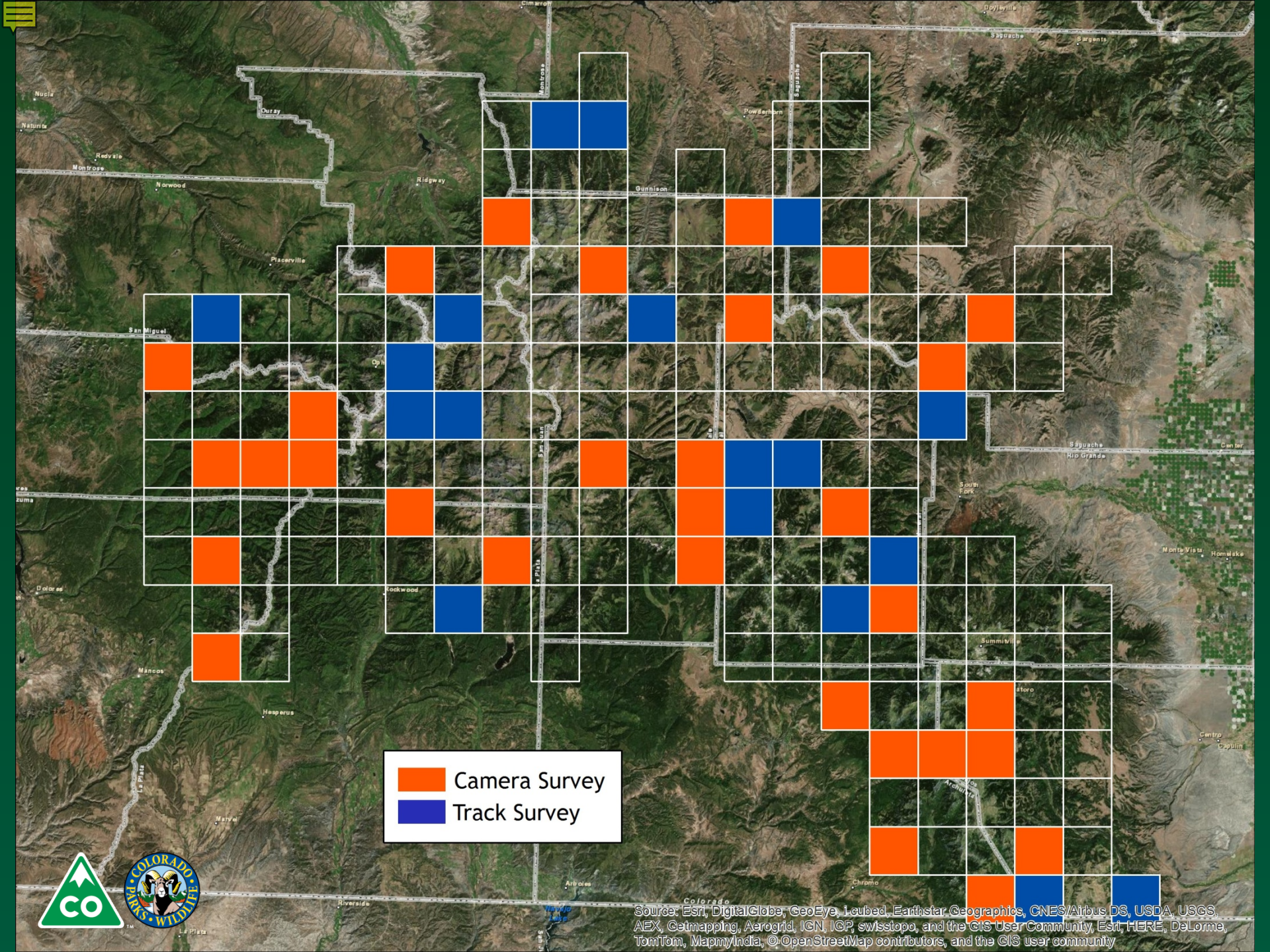
Population Model

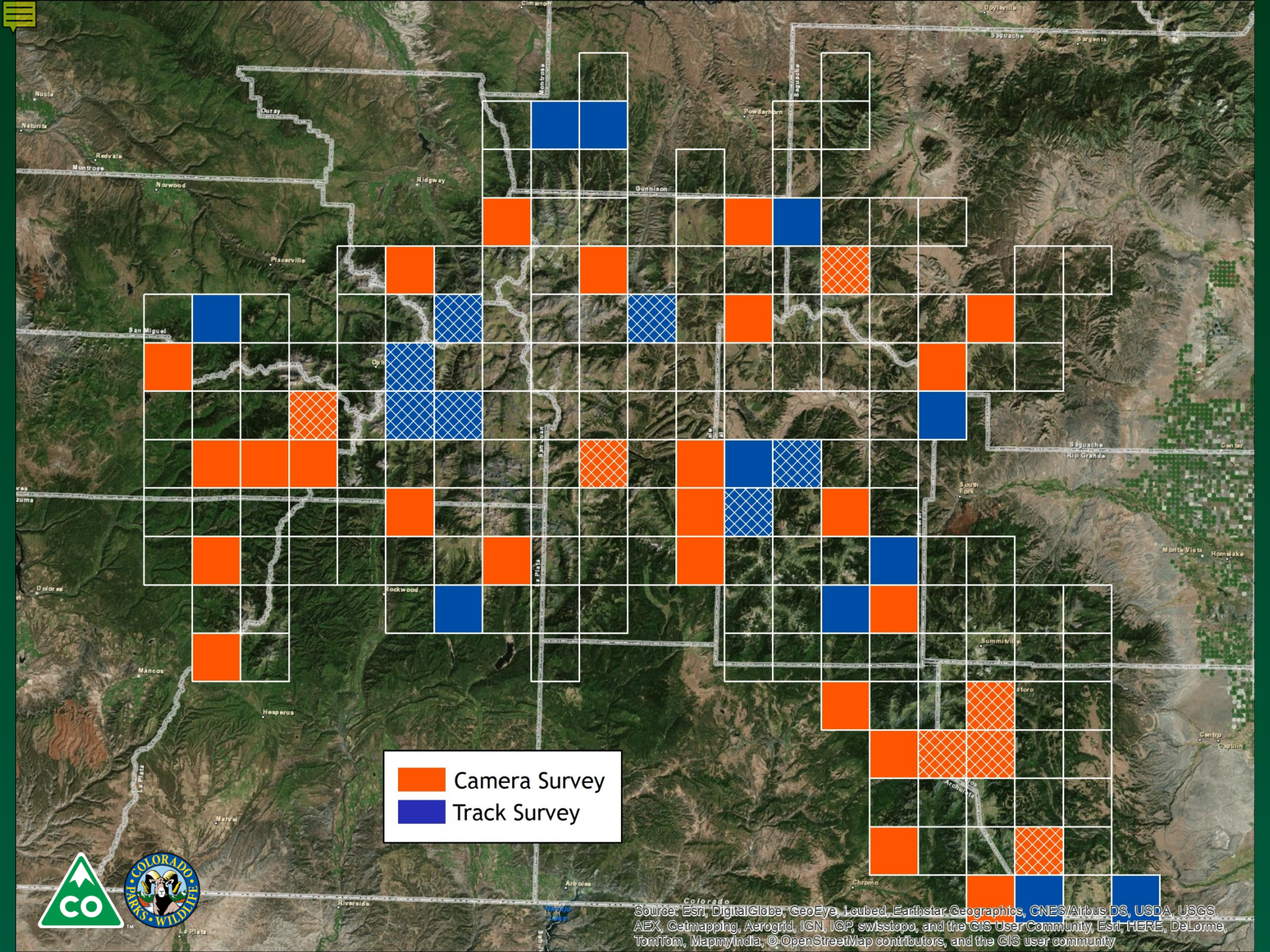


Status in 2015

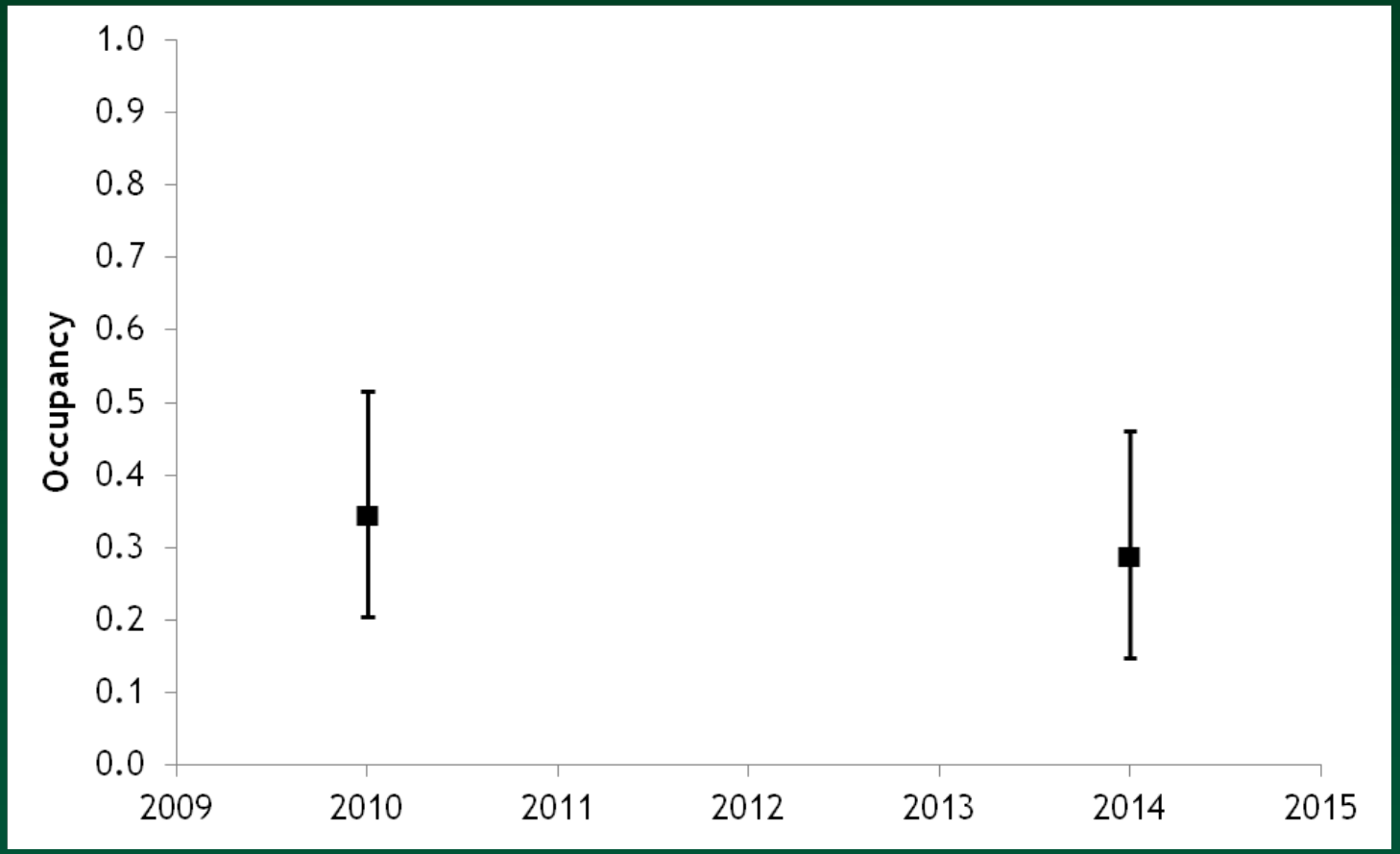
- Occupancy monitoring
- Currently San Juans only; future potentially includes entire state
- Snow tracking surveys where possible; camera surveys otherwise
- Joint effort - Colorado Parks & Wildlife, U.S. Forest Service (83 people)


Cheyenne
Sidney
COLORADO
Columbine
Vernal
Craig
Fort Collins
Greeley
Fort Morgan
Longmont
Boulder
Denver
Gypsum
Castle Rock
Aspen
Grand Junction
COLORADO
Colorado Springs
Gunnison
Montrose
Pueblo
Lamar
Monte Vista
Trinidad
Farmington
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS user community


Camera Survey
Track Survey
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS user community


Camera Survey
Track Survey
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Status in 2015



Status in 2015

- Evidence of continued reproduction:
  - Kittens captured on camera (with female) at 3 sample units during 2014-15 monitoring effort.
  - 38% of lynx captured during recent (2010-2015) USFS RMRS research projects in Colorado have been young and/or unmarked cats.
- Current survival: Unknown
- Status: Holding steady???

Threats

- Climate Change
- Bark beetle epidemics
- Fire
- Recreation
- Highways

Threats - Climate Change

- Colorado State Wildlife Action Plan:
- Climate modeling: USGS Fort Collins Science Center, North Central Climate Science Center
- Based on 2nd-highest emissions scenario (RCP6)
- Used 12 climate models
  - averaged over 1980-2005 = historic normal
  - averaged over 2035-2060 = mid-century projection

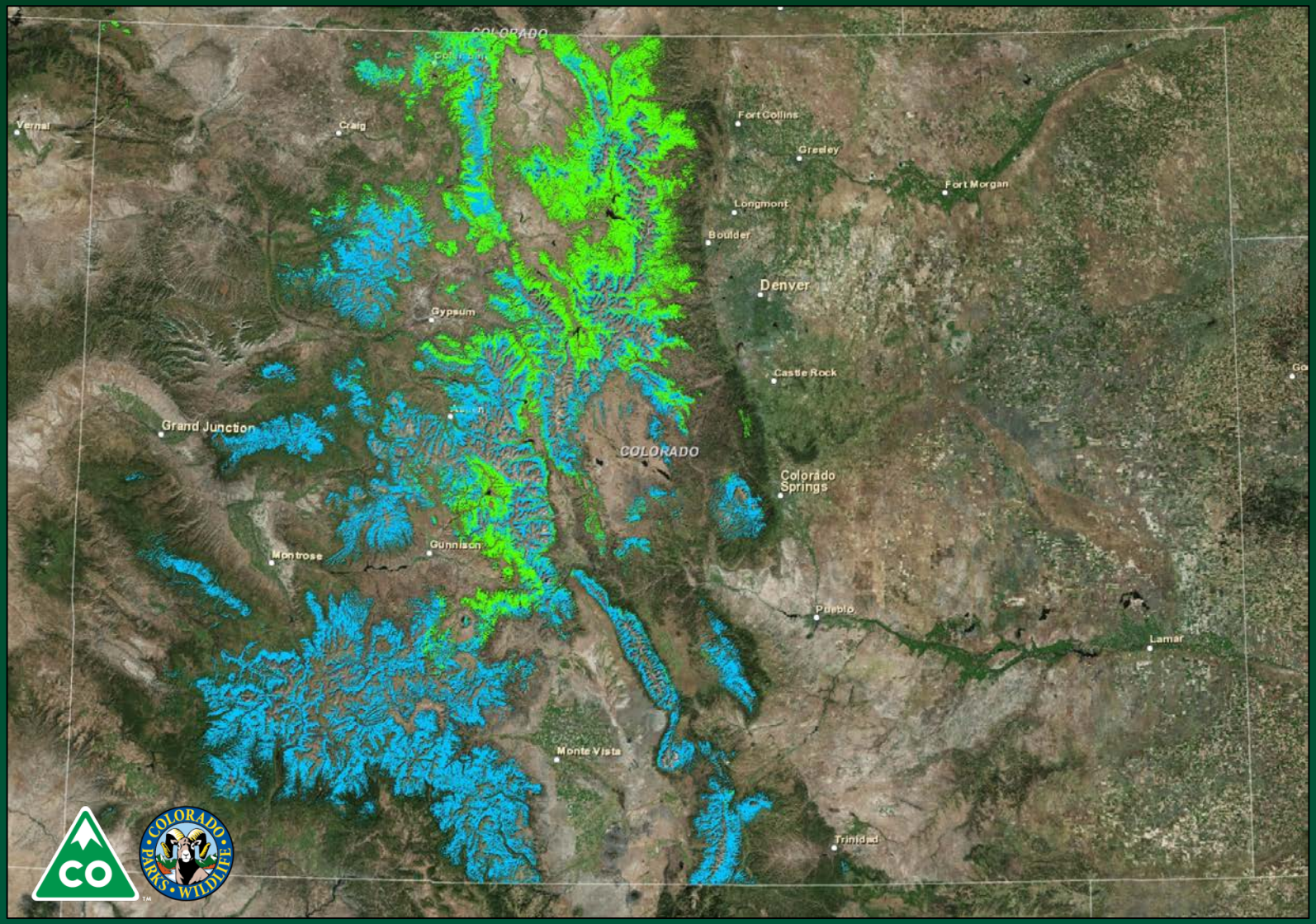
Threats - Climate Change

- System rankings:
  - exposure-sensitivity
  - resilience-adaptive capacity
- Overall vulnerability ranks:
  - Low
  - Moderate
  - High
  - Very high

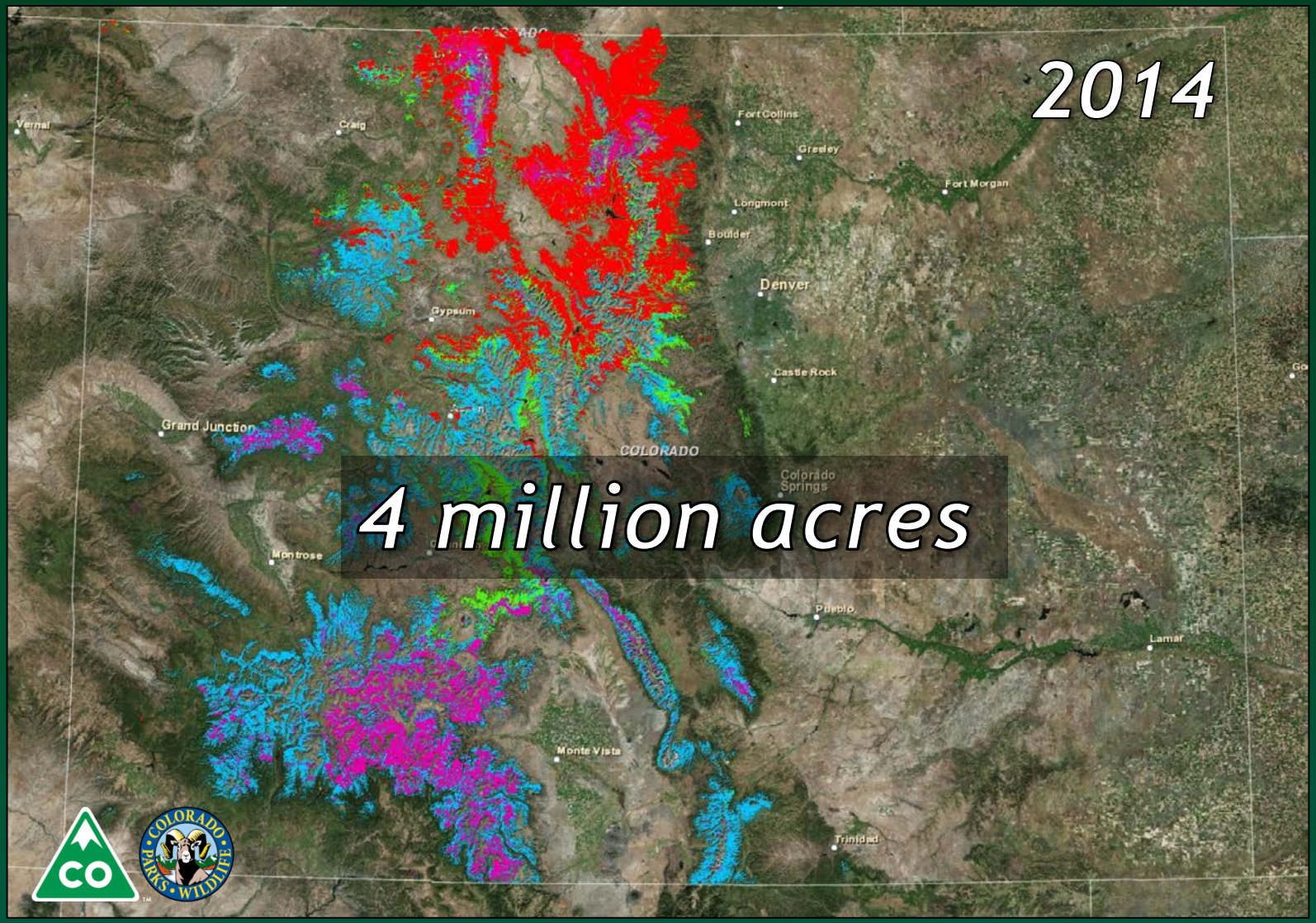
Threats - Climate Change

- RESULTS (Spruce/Fir):
  - Overall vulnerability = moderate
  - Mean temps expected to increase 2°C
  - Decreased precipitation in San Juans & southern mountains
  - Increased precipitation in north-central mountains
  - Habitat will migrate upslope, 50-100 year lag behind climate conditions

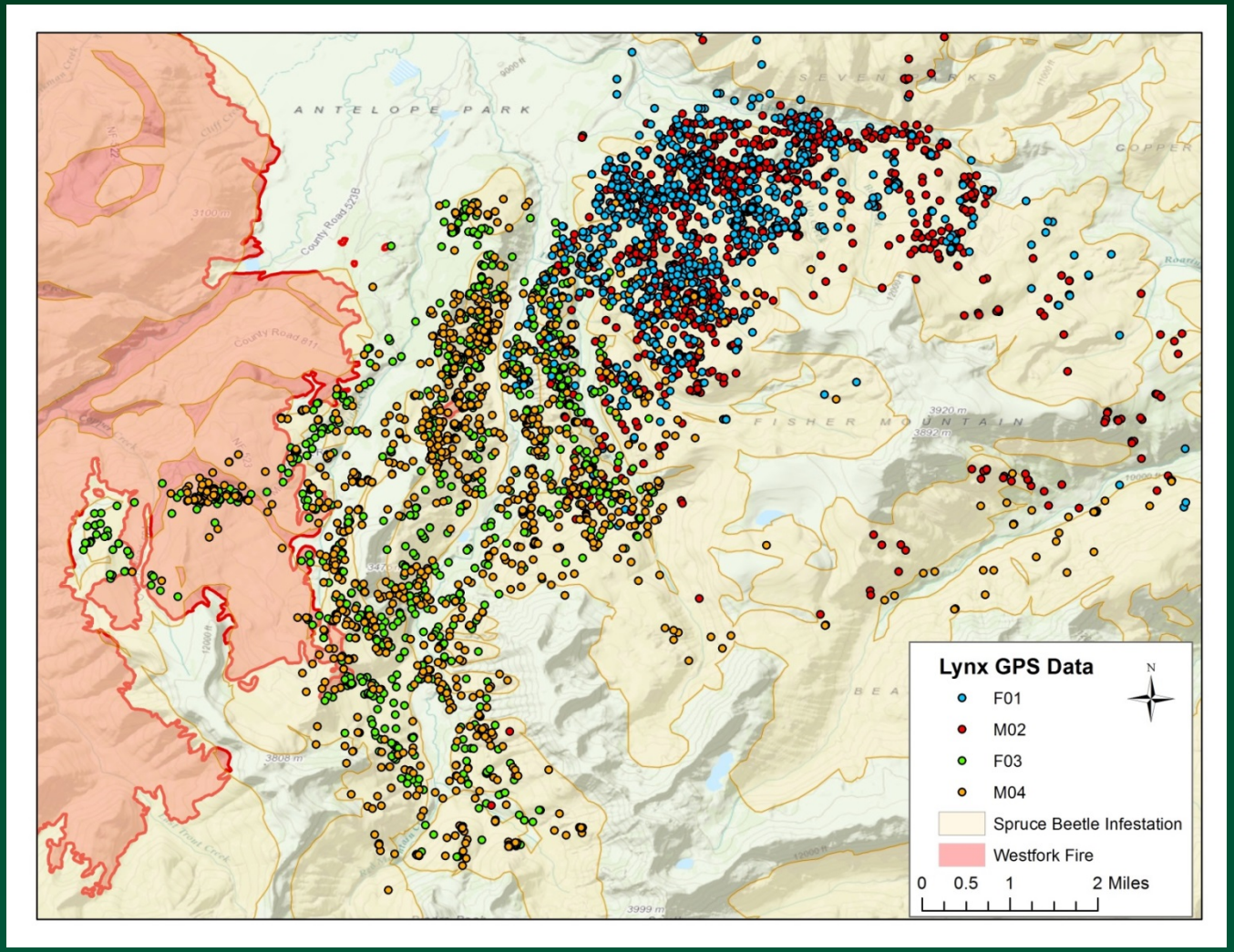
Threats - Bark Beetles



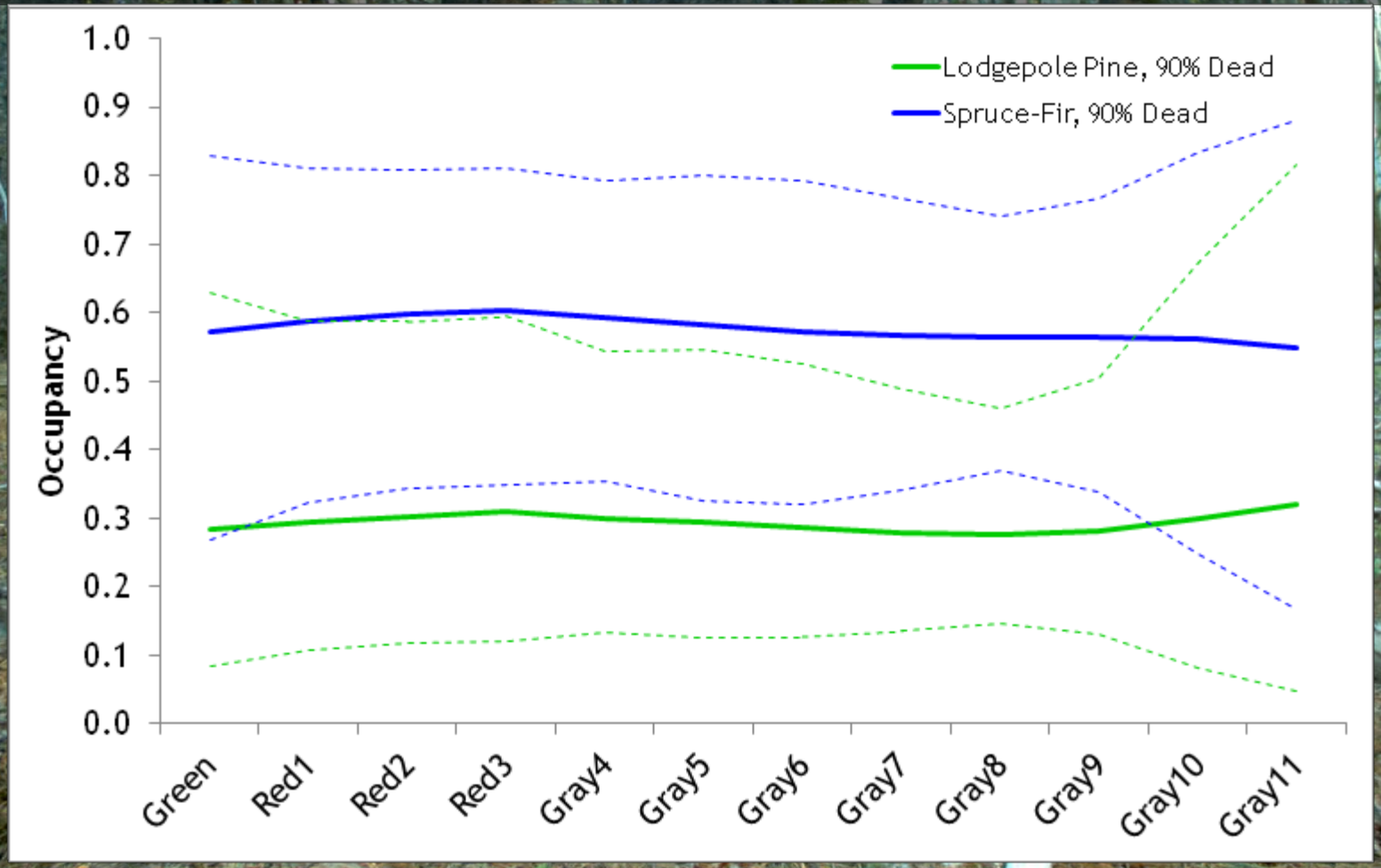
Threats - Bark Beetles



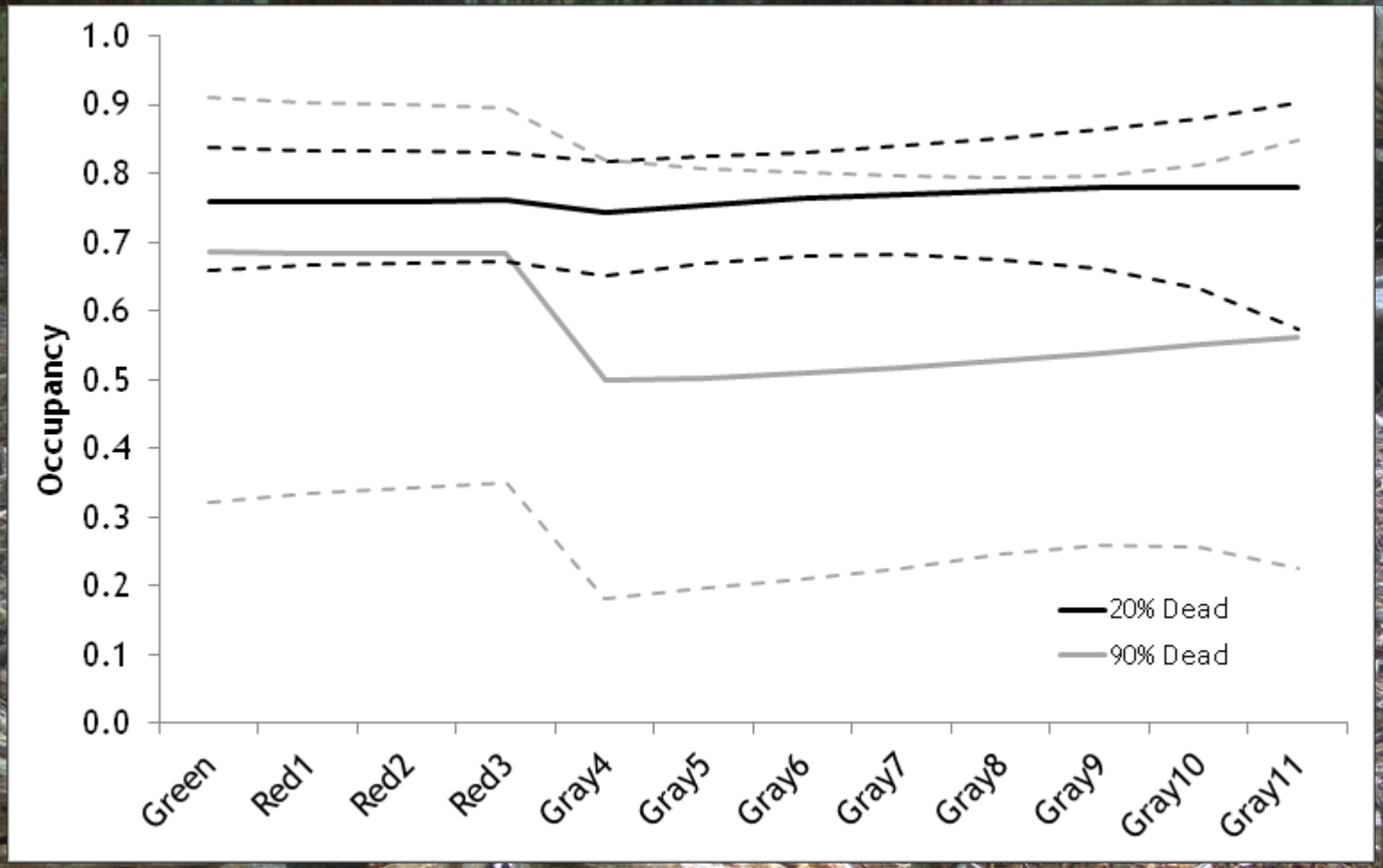
Threats - Bark Beetles



Snowshoe Hare

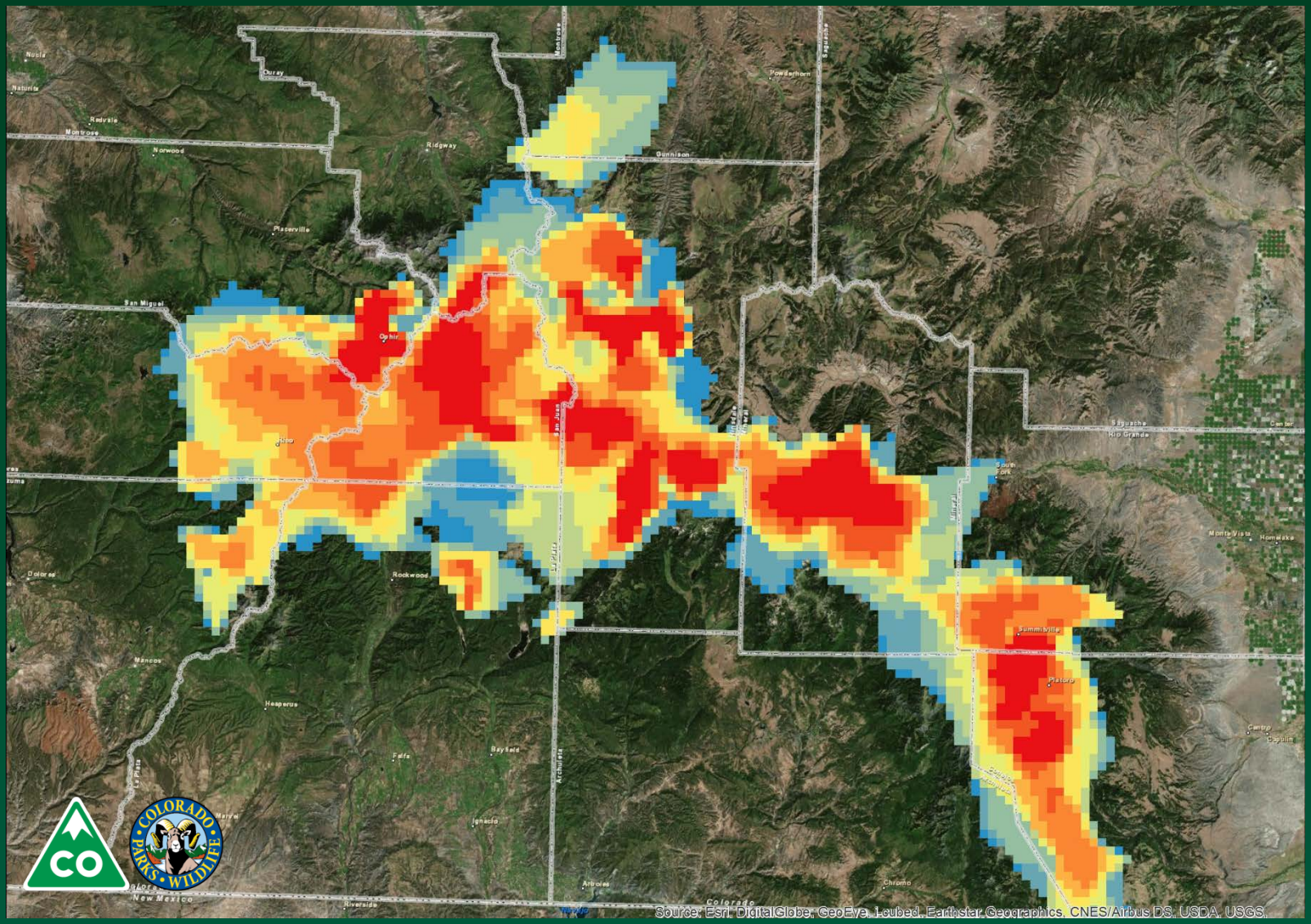


Red Squirrel

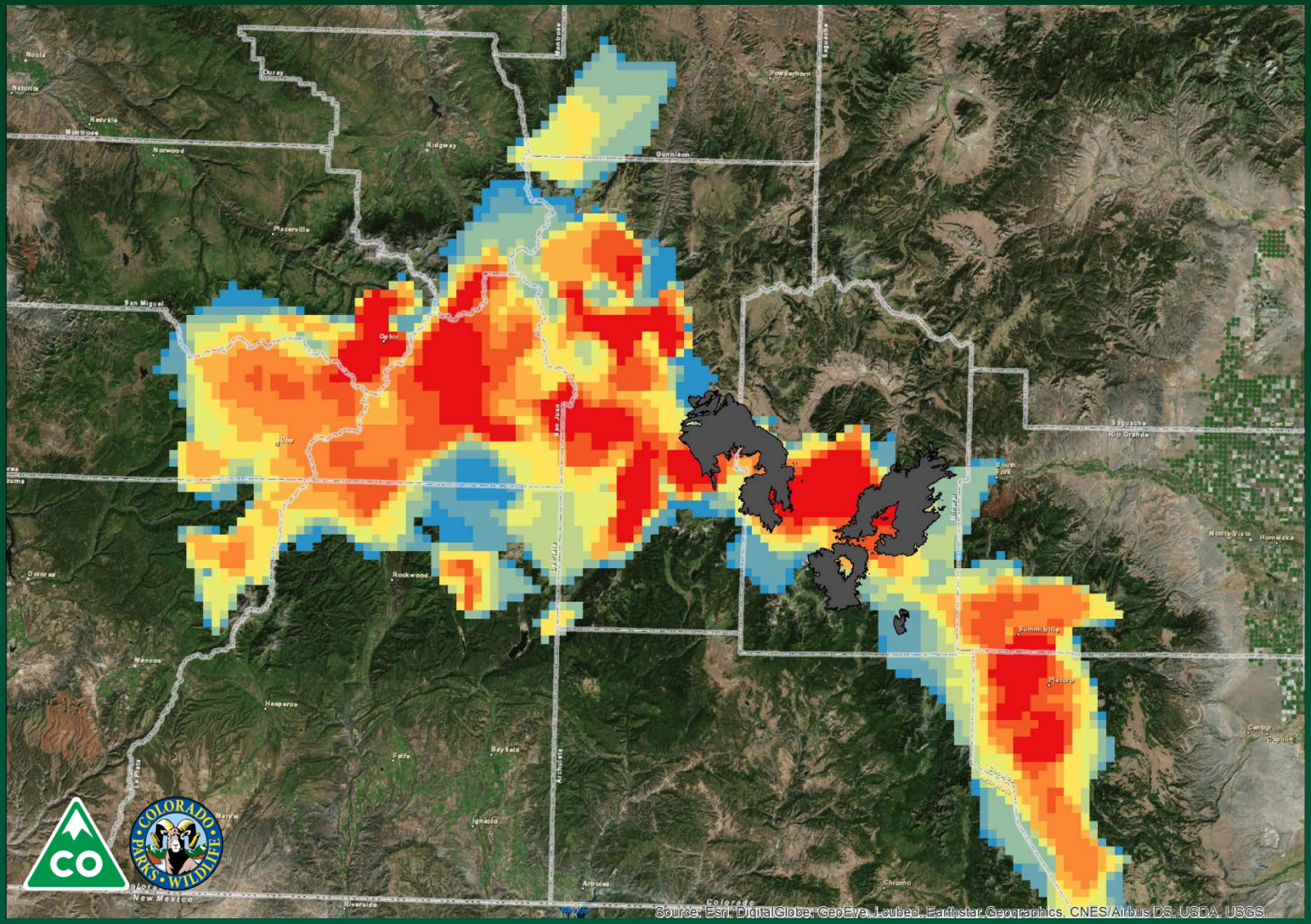


Threats - Fire

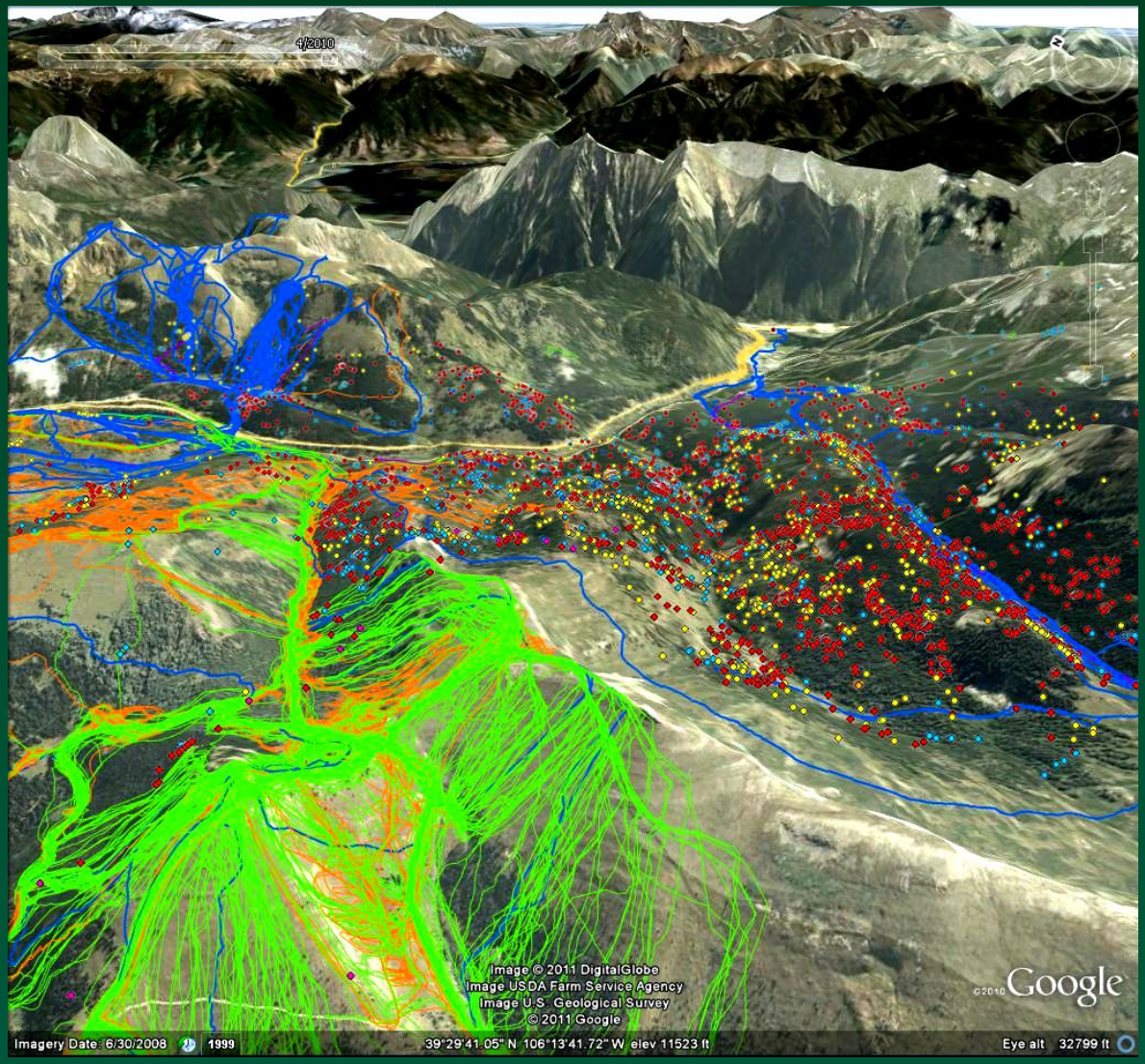
Threats - Fire



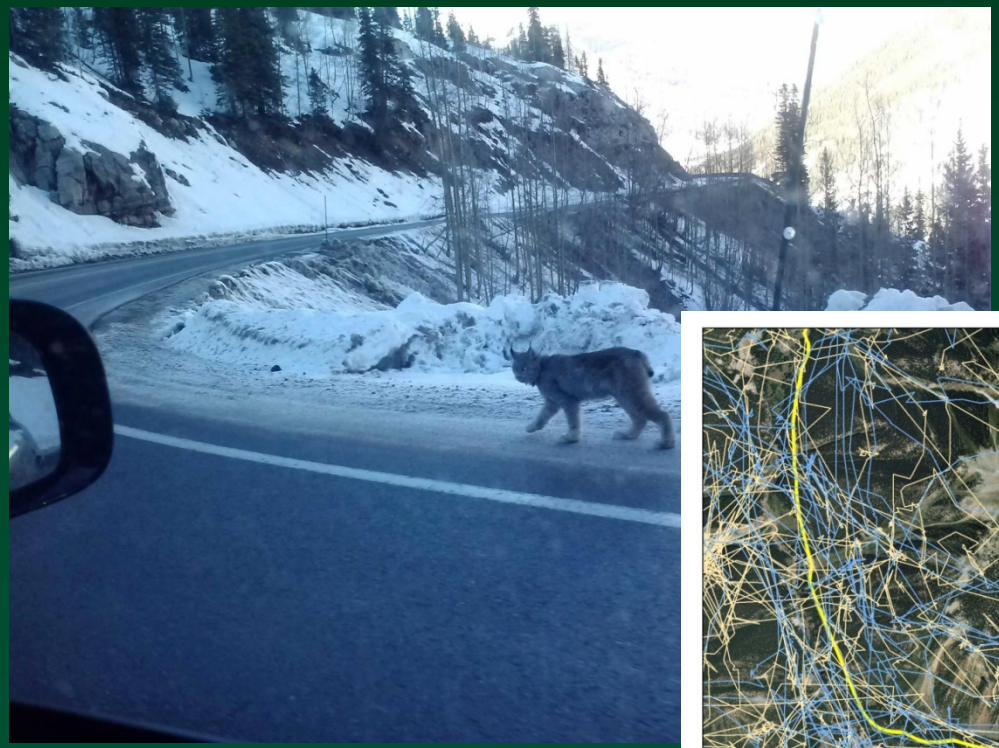
Threats - Fire

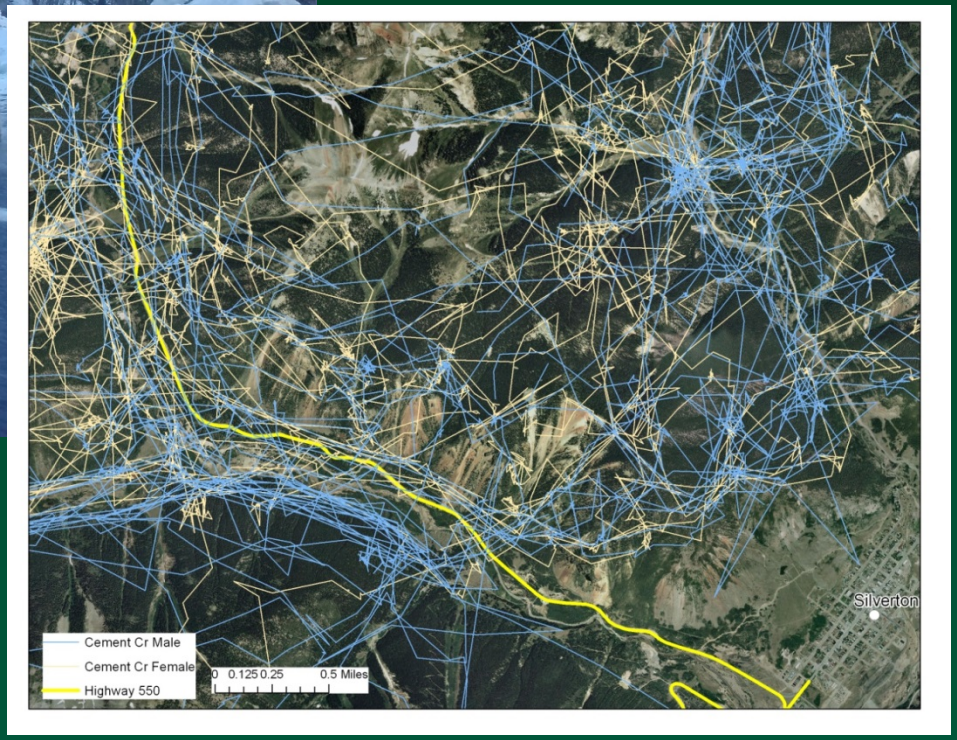


Threats - Recreation



Threats - Highways





Threats - Highways

- Lynx frequently crossed 2-lane paved highways in home ranges (0.6 crossings/day).
- Lynx cross roads more at dusk and night, coincident with lower traffic volumes.
- Forest was predictive of lynx highway crossings at fine and landscape scales.
- Remotely-sensed covariates predicted lynx highway crossings validated with independent data.

Baigas, P.E., J. R. Squires, L. E. Olson, J. S. Ivan, and E. K. Roberts. In Review. Landscape and Urban Planning.


2011-05-12 1:43:26 PM M 3/3
33°F
Questions?
GRID35-C114
RECONYX