Lynx Monitoring in Colorado

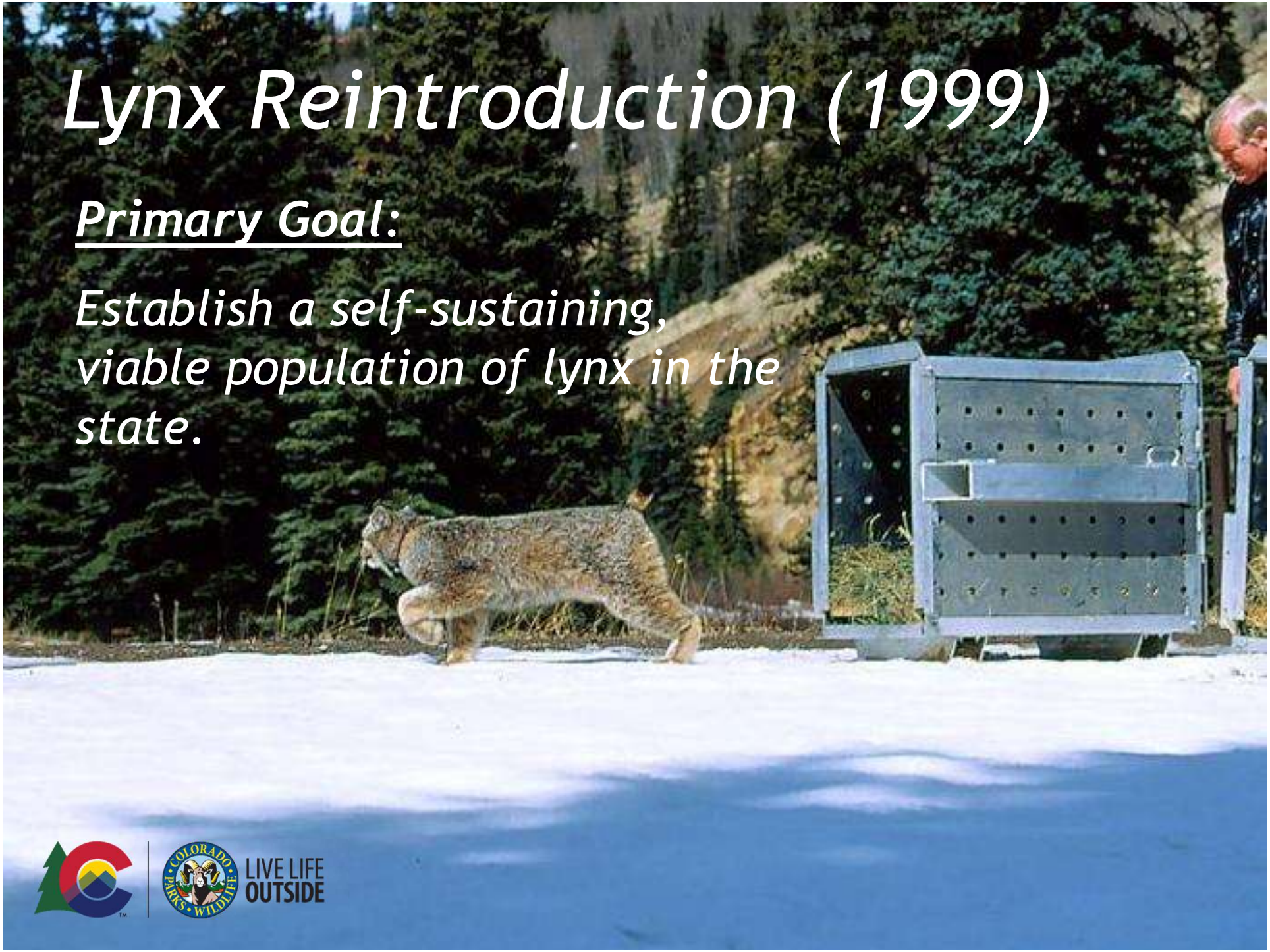
LIVE LIFE OUTSIDE

Photo by Steve Sunday

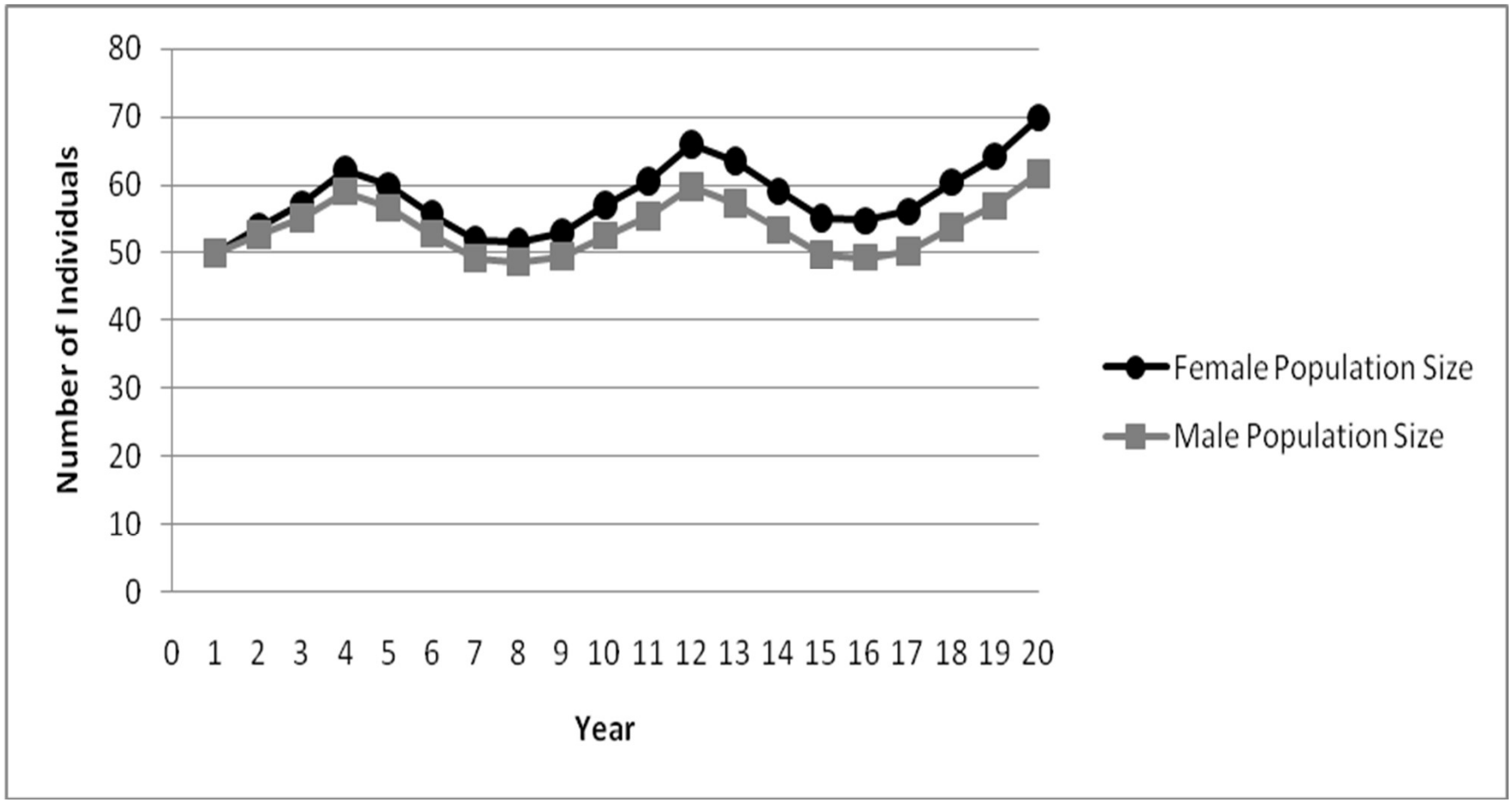
Lynx Reintroduction (1999)

Primary Goal:

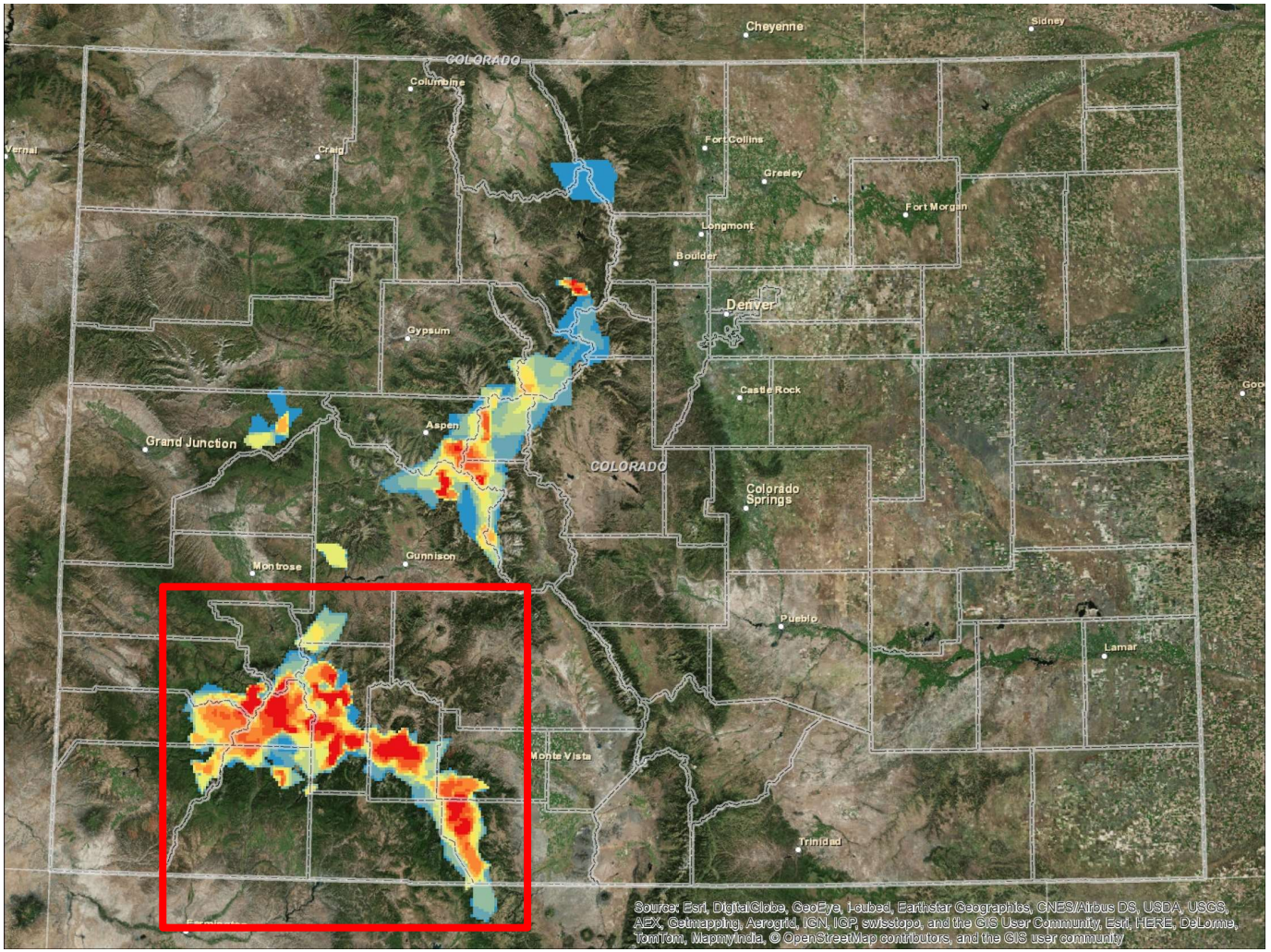
Establish a self-sustaining, viable population of lynx in the state.

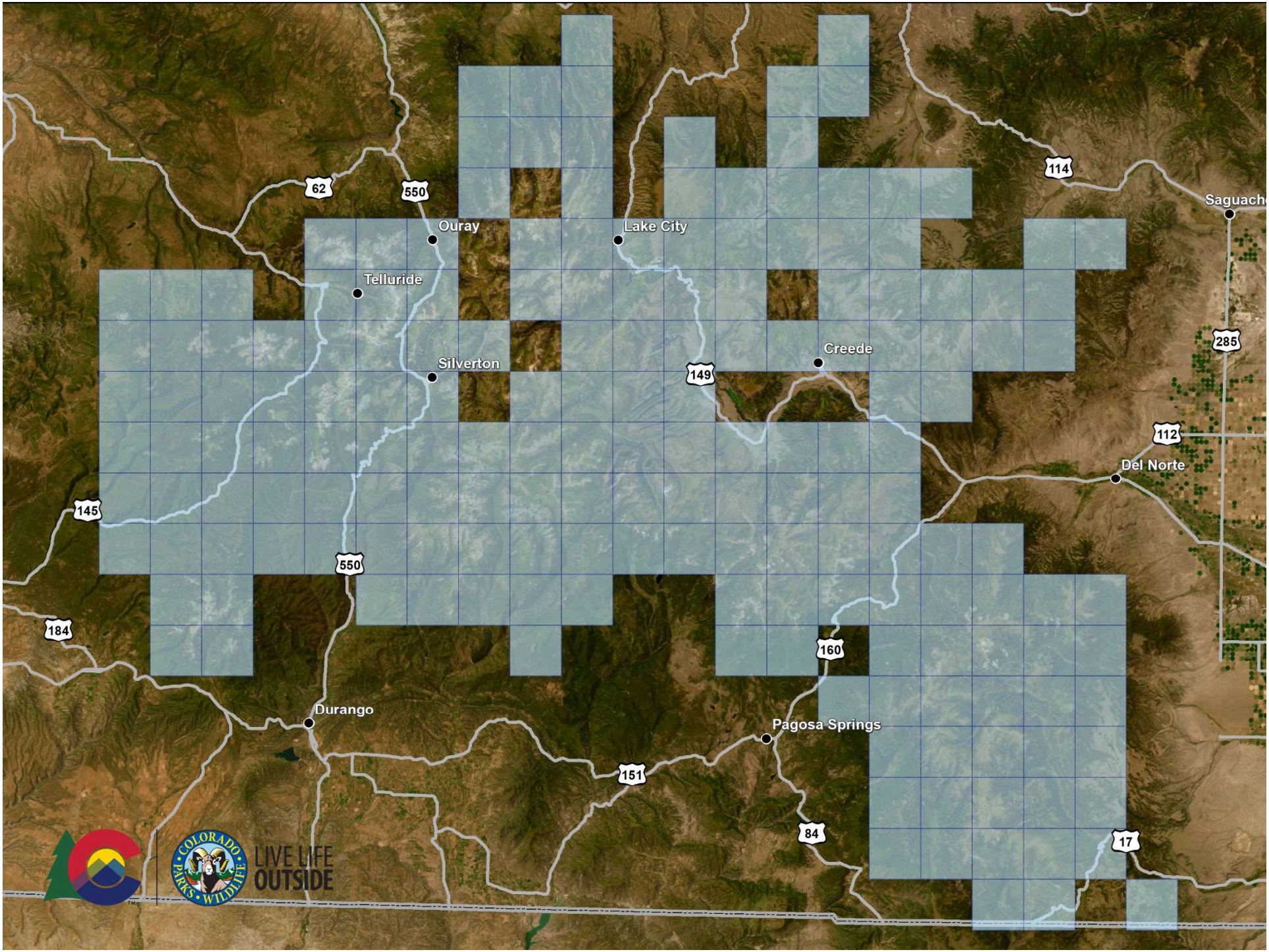


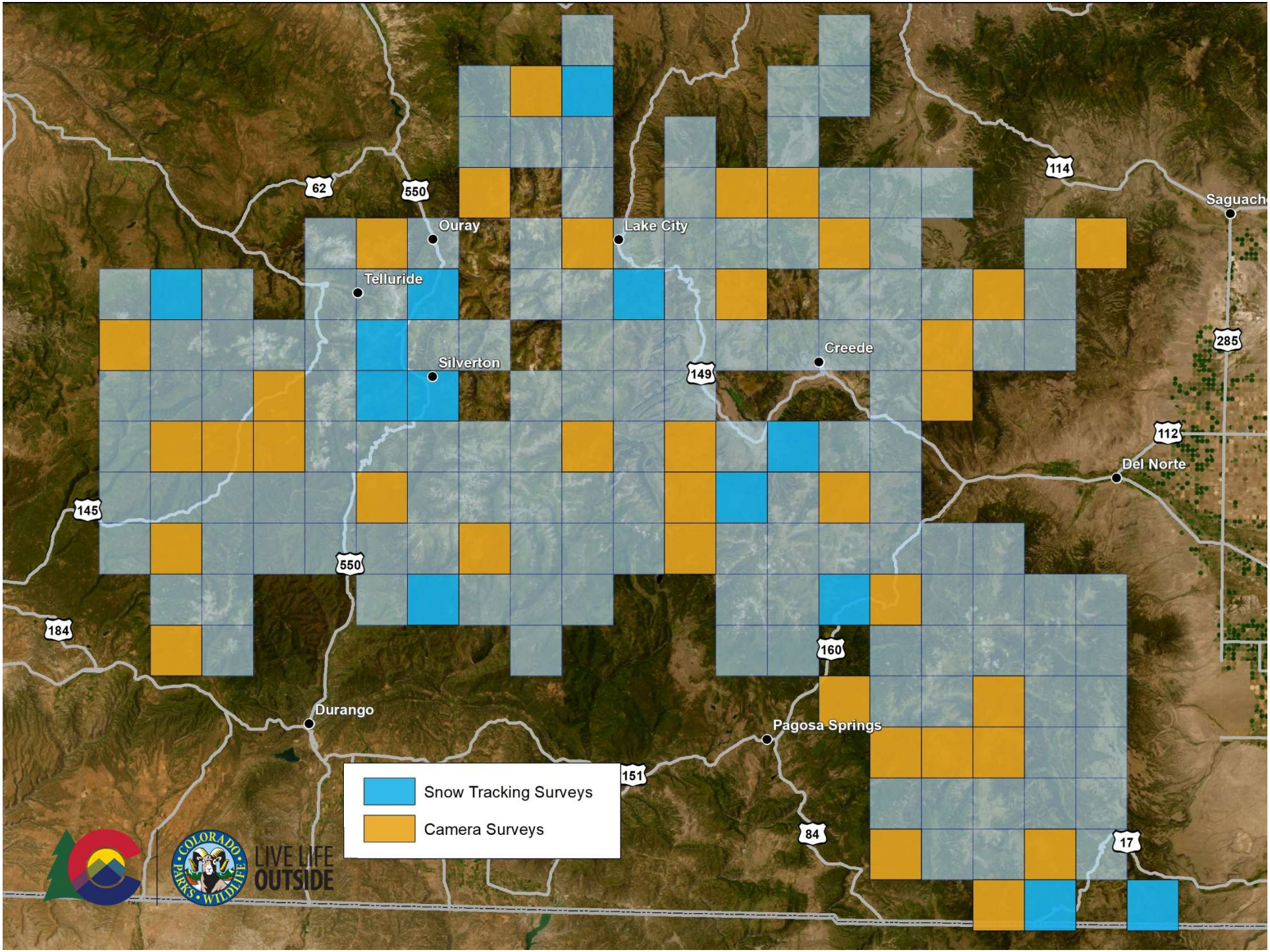
Population Projection:



Monitoring


Cheyenne
Sidney
COLORADO
Columbine
Vernal
Craig
Fort Collins
Greeley
Fort Morgan
Longmont
Boulder
Denver
Gypsum
Castle Rock
Grand Junction
Aspen
COLORADO
Colorado Springs
Gunnison
Montrose
Pueblo
Lamar
Monte Vista
Trinidad
Source: Esri, DigitalGlobe, GeoEye, 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


62
550
Ouray
Lake City
114
Saguache
Telluride
285
Creede
Silverton
149
112
Del Norte
145
550
184
160
Durango
Pagosa Springs
151
84
17
COLORADO PARKS • WILDLIFE
LIVE LIFE OUTSIDE

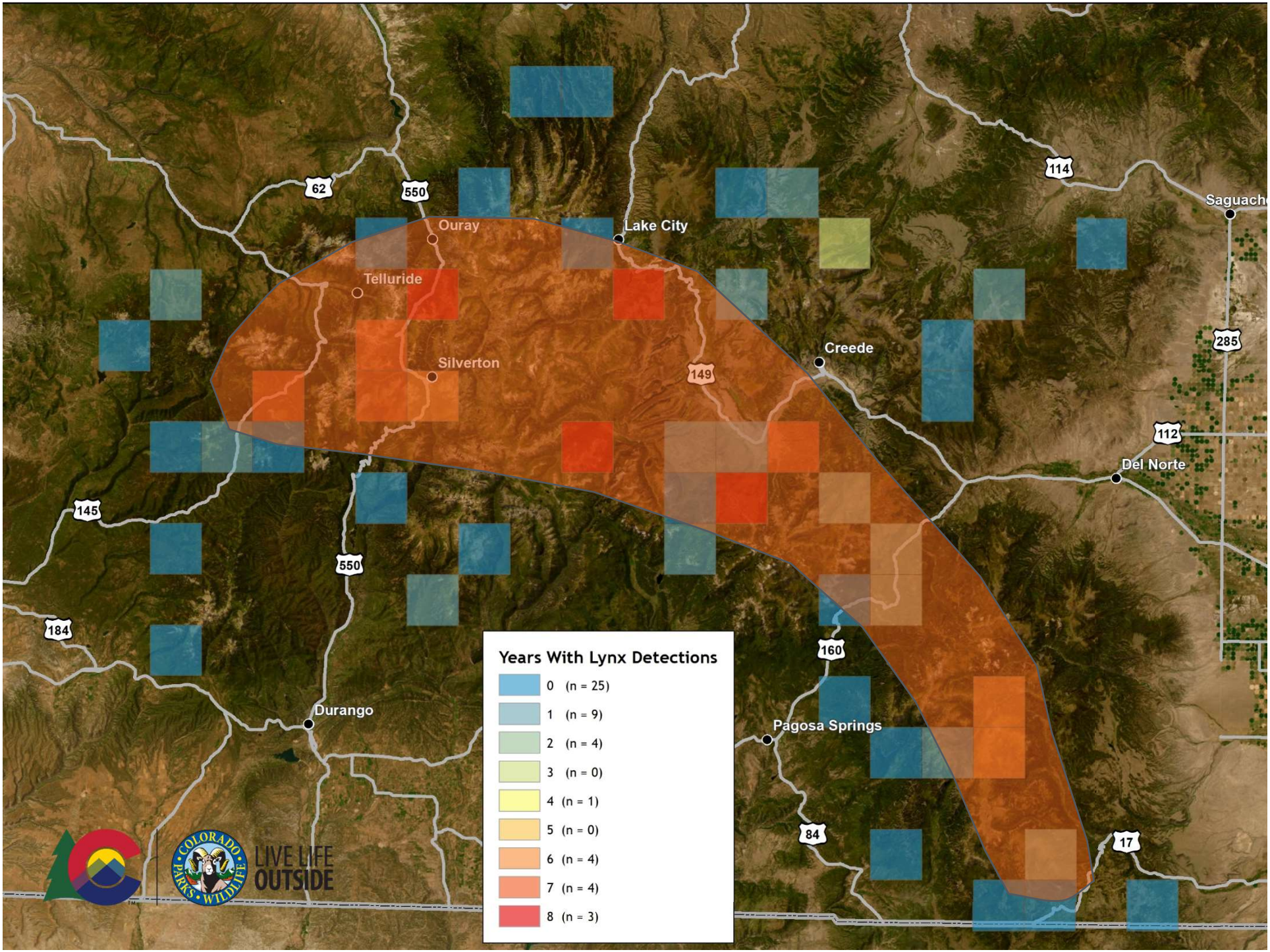

62
550
114
Ouray
Lake City
Saguache
Telluride
285
Silverton
149
Creede
112
Del Norte
145
550
184
160
Durango
Pagosa Springs
151
84
17
Snow Tracking Surveys
Camera Surveys
COLORADO PARKS • WILDLIFE
LIVE LIFE OUTSIDE

Parameters

- Ψ - probability a unit is used by lynx
- p – probability detecting a lynx, given unit is used
- ε - probability a unit goes "extinct" given that it was used the previous year
- γ - probability a unit is "colonized" given that it was unused the previous year

Model Set

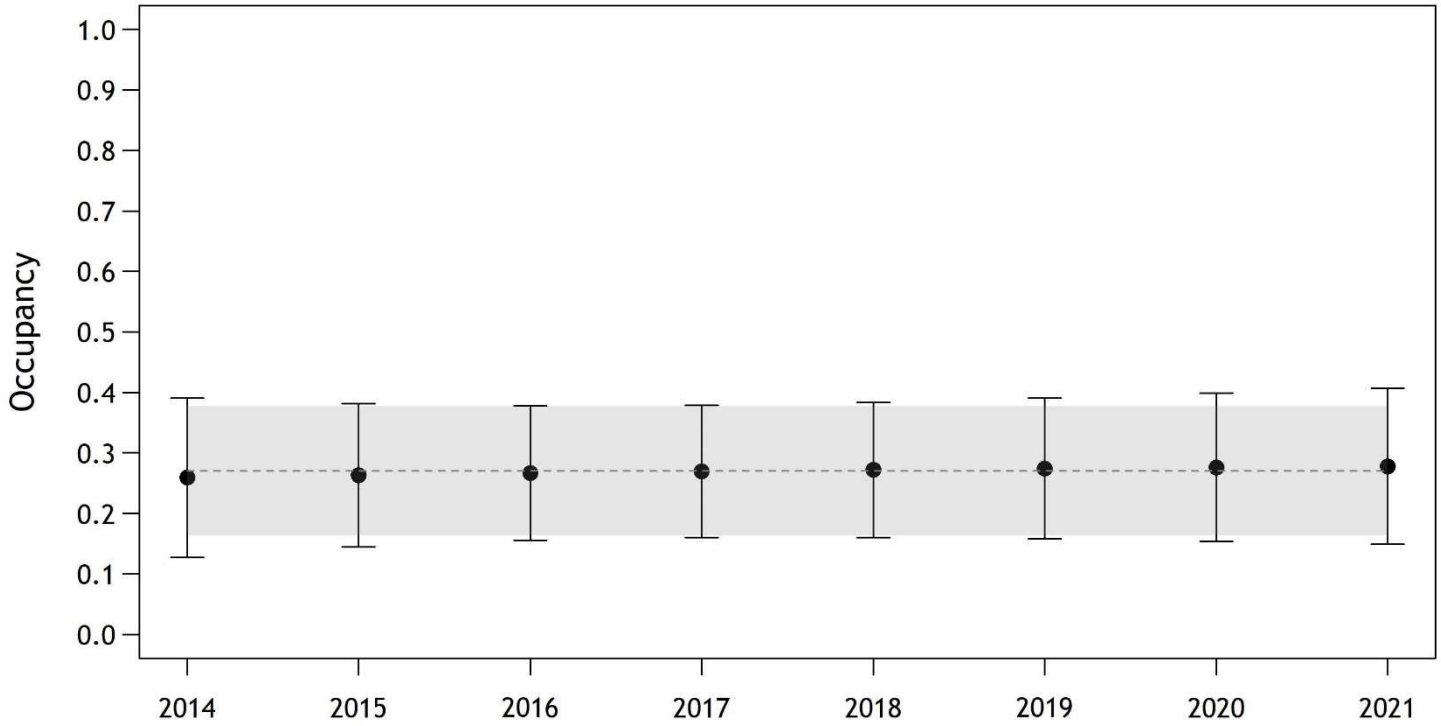
- ***Completely stable (use of units** does not change)*
  - Ψ(PropSpruceFir) ε(0) γ(0) p(surveytype*lure)
- ***Equilibrium***
  - Ψ(PropSpruceFir) ε(.) γ(.) p(surveytype*lure)
- ***Non-equilibrium***
  - Ψ(PropSpruceFir) ε(t) γ(t) p(surveytype*lure)
- ~~***Random***~~
  - ~~Ψ(PropSpruceFir) ε(–1- γ) γ(t) p(surveytype*lure)~~


Years With Lynx Detections
0 (n = 25)
1 (n = 9)
2 (n = 4)
3 (n = 0)
4 (n = 1)
5 (n = 0)
6 (n = 4)
7 (n = 4)
8 (n = 3)
Ouray
Lake City
Telluride
Silverton
Creede
Del Norte
Durango
Pagosa Springs
62
550
114
149
285
112
145
184
160
84
17
LIVE LIFE OUTSIDE

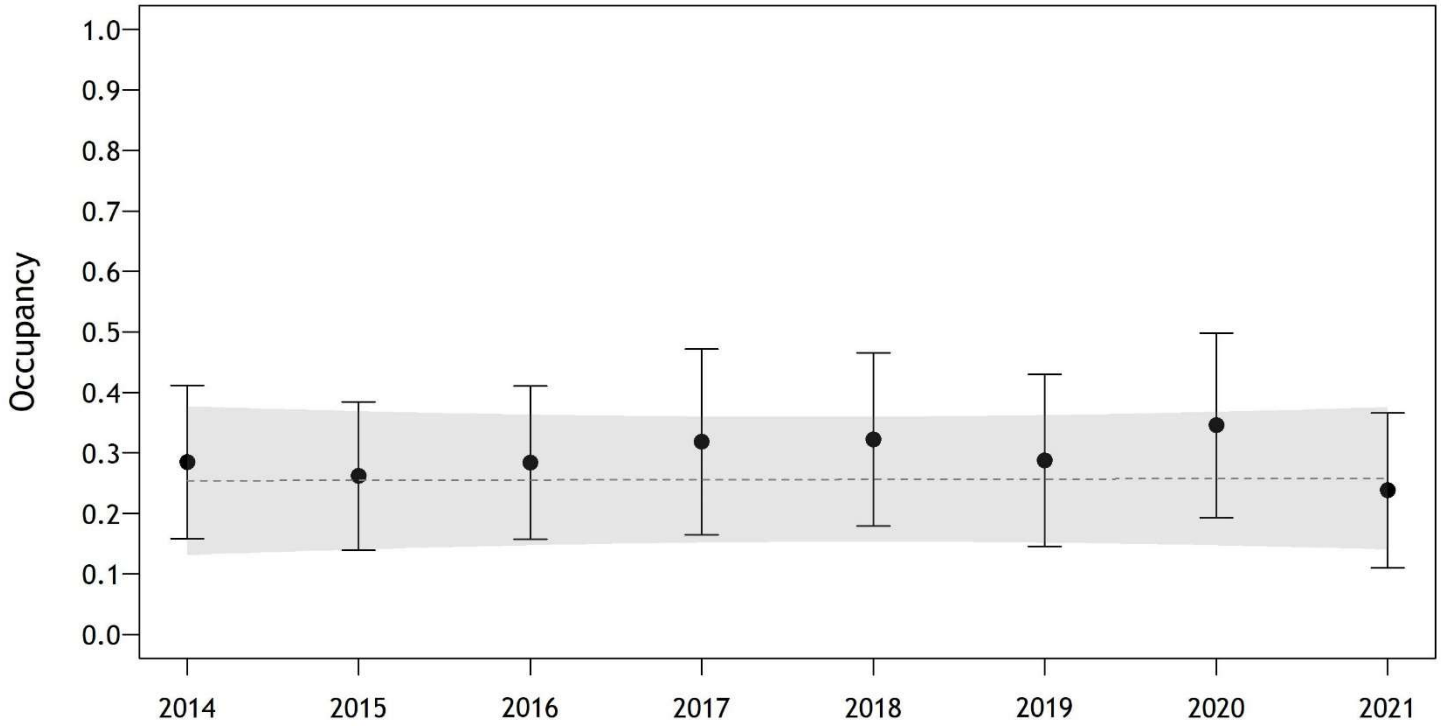
Model Selection Table

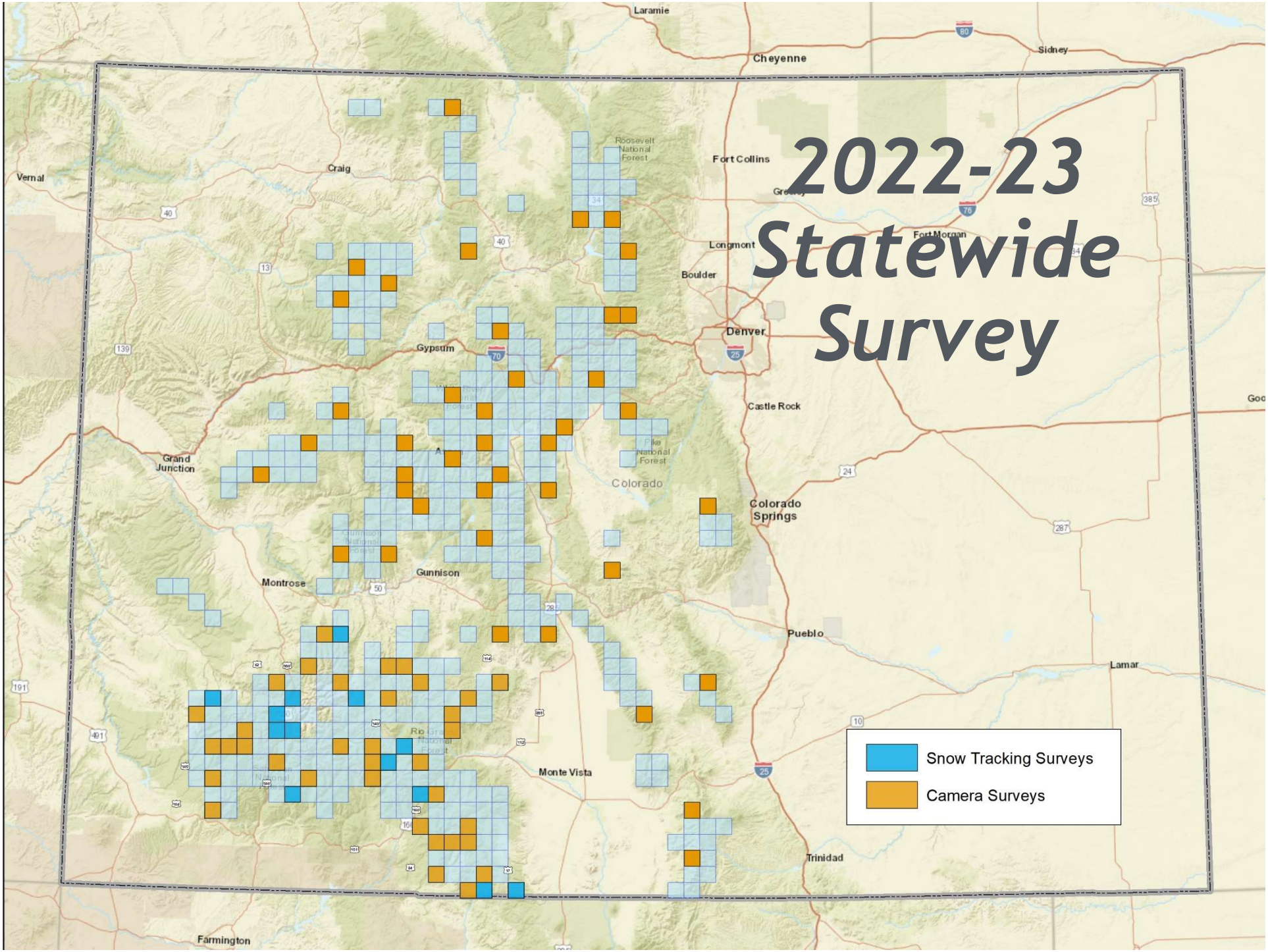
Model	AIC_c	ΔAIC_c	AIC_c Wts	No. Par.
Equilibrium	768.7	0.0	0.999	8
Non-equilibrium	783.4	14.7	0.001	20
Completely Stable	827.9	59.2	0.000	6

Occupancy (Population?) Trend:

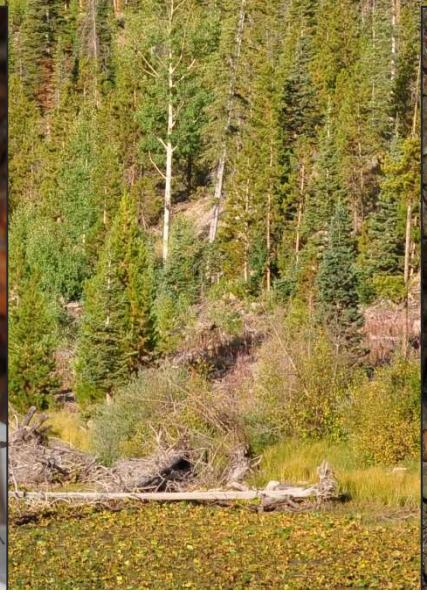


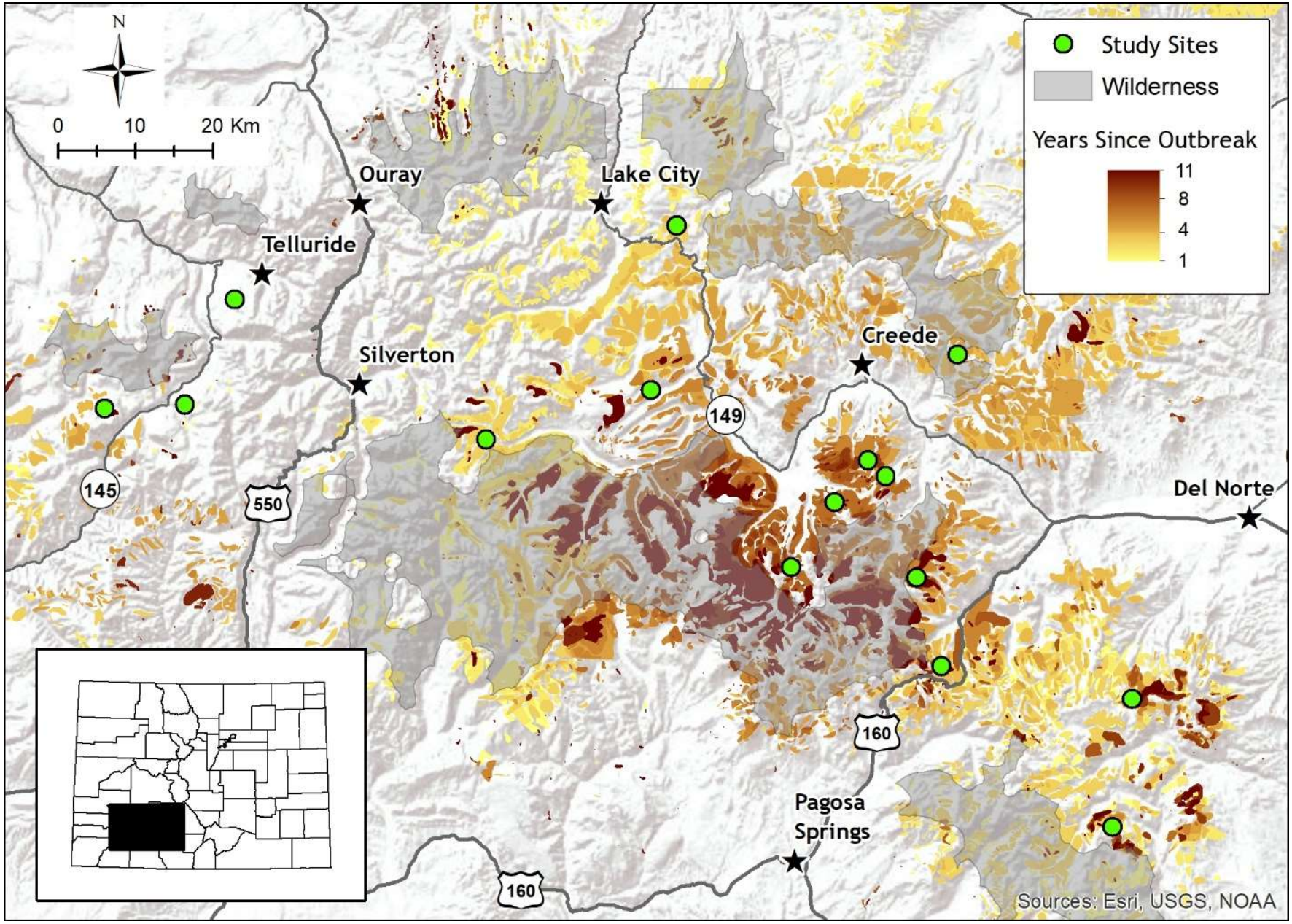
Occupancy (Population?) Trend:



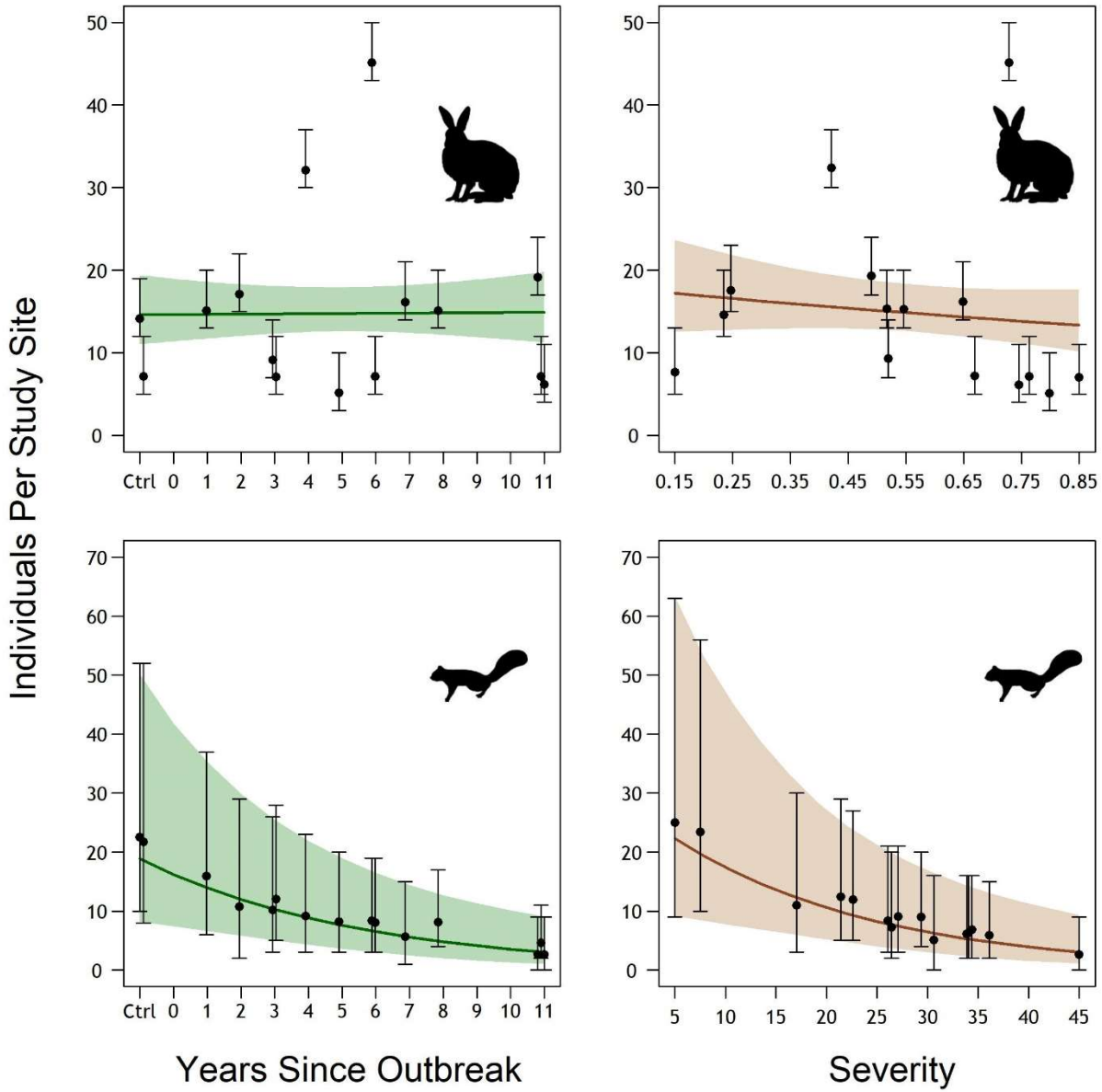

2022-23
Statewide
Survey
Laramie
Cheyenne
Sidney
Fort Collins
Craig
Vernal
Roosevelt National Forest
Longmont
Fort Morgan
Boulder
Denver
Gypsum
Castle Rock
Grand Junction
Pike National Forest
Colorado
Colorado Springs
Gunnison
Montrose
Pueblo
Lamar
Monte Vista
Trinidad
Farmington
Snow Tracking Surveys
Camera Surveys

Spruce Beetle Impacts to Snowshoe Hares & Red Squirrels

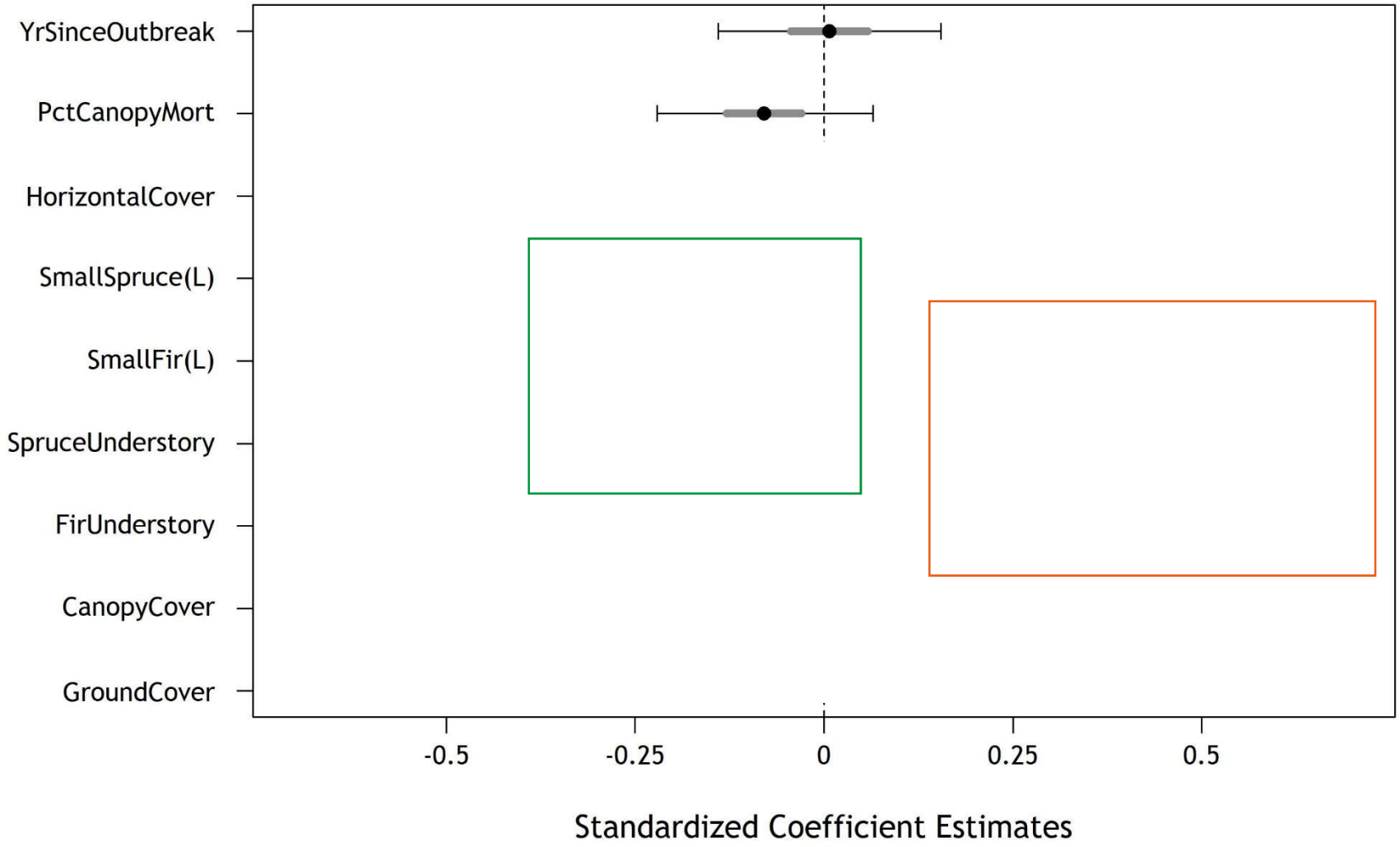




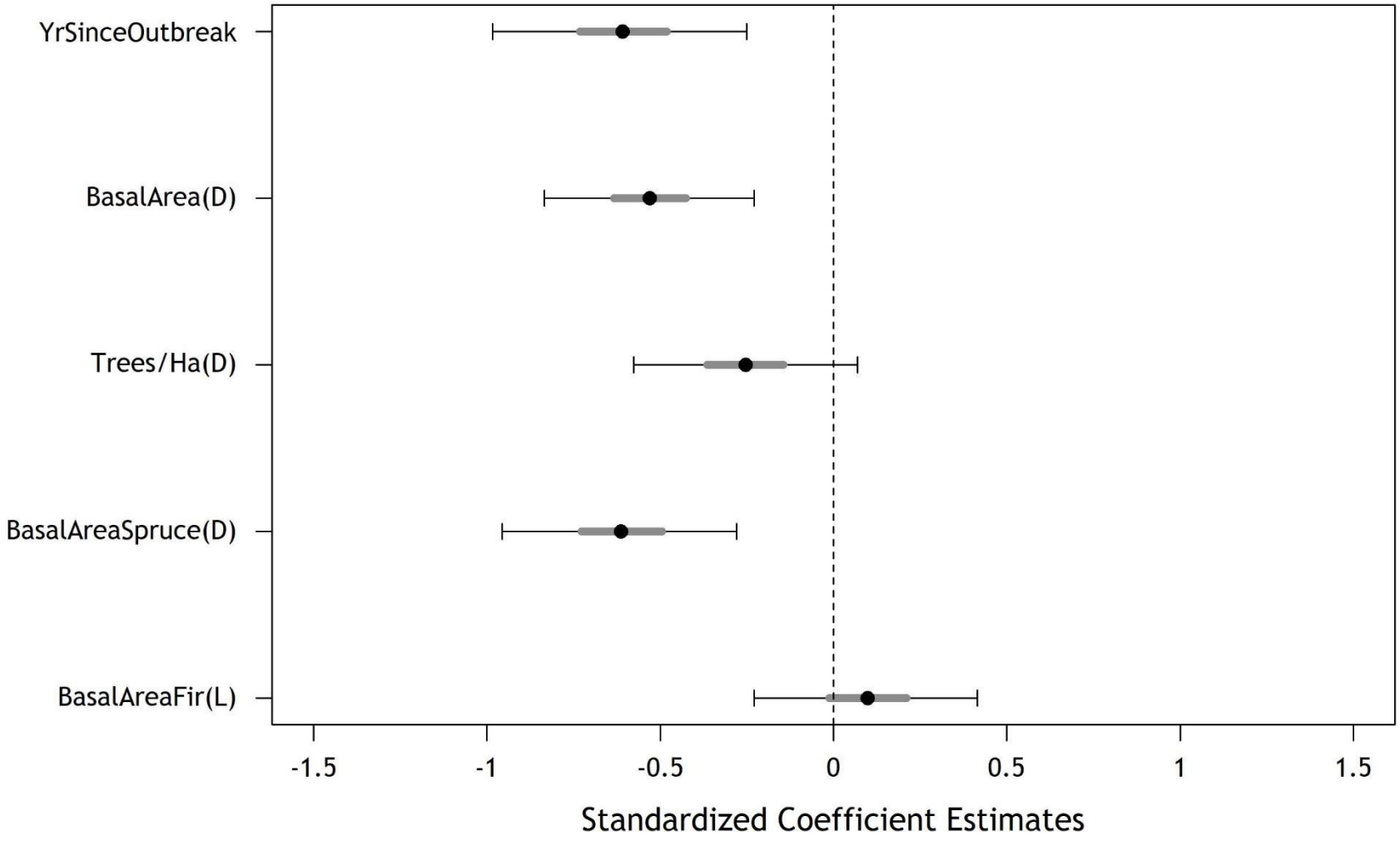
LIVE LIFE OUTSIDE


Individuals Per Study Site
Years Since Outbreak
Severity
Ctrl 0 1 2 3 4 5 6 7 8 9 10 11
0.15 0.25 0.35 0.45 0.55 0.65 0.75 0.85
5 10 15 20 25 30 35 40 45

Snowshoe Hares



Red Squirrels



Take Home:

- *Lynx population appears to be relatively stable*
- *A statewide "snapshot" of modeled lynx distribution is coming*
- *Snowshoe hares don't care about bark beetles*
- *Snowshoe hares do care about horizontal cover (especially fir), and ground cover*
- *Red squirrels respond negatively to beetle outbreaks (Years since outbreak & severity)*
- *For squirrels, dead spruce more important than live fir*

2011-05-12 1:43:26 PM M 3/3
33°F
QUESTIONS?
LIVE LIFE OUTSIDE
GRID35-C114
RECONYX