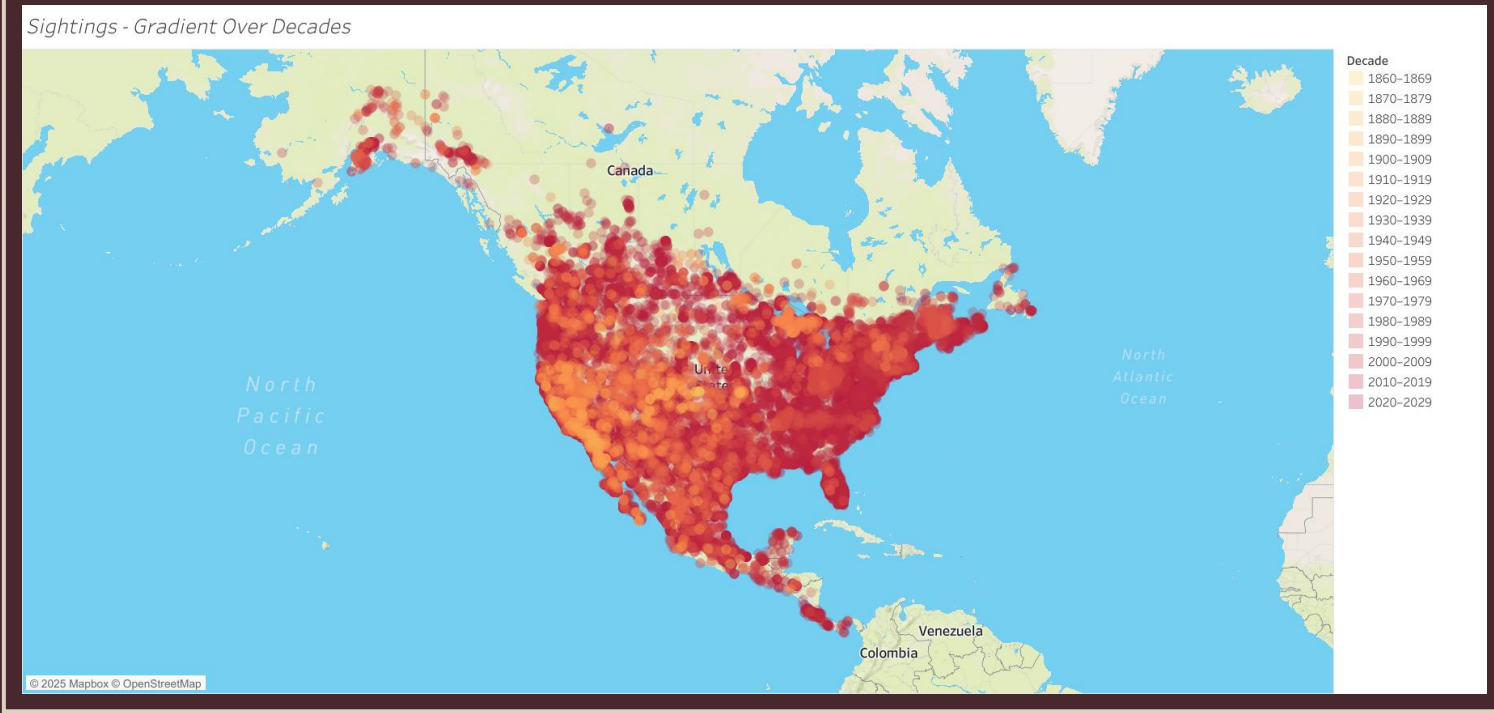
Expansion Across America and Beyond

Canis Latrans

The Adaptable : The Trickster : The Coyote

Van Cortlandt Park coyote statue

Executive Summary & Guiding Questions



Continental Expansion

Once restricted to the American West, coyotes now span to nearly every ecosystem.

Adaption & Resilience

How do the important periods from 1920 to the present reflect shifts in habitat, monetary impact, and data trends?

Patterns to Explore

How geography, data, and adaptation intersected to redefine this species' range and relationship with people.

How This Study Was Built

Data Sources & Approach

- Wildlife sighting records from government databases and museums (160+ years of data).
- USDA reports on livestock losses (2000-2015).
- Used Tableau to animate the expansion across time.

Study Focus

•Where did coyotes expand and when?

•What ecological and human factors enabled this spread?

•How do modern data practices reveal patterns invisible in historical records?

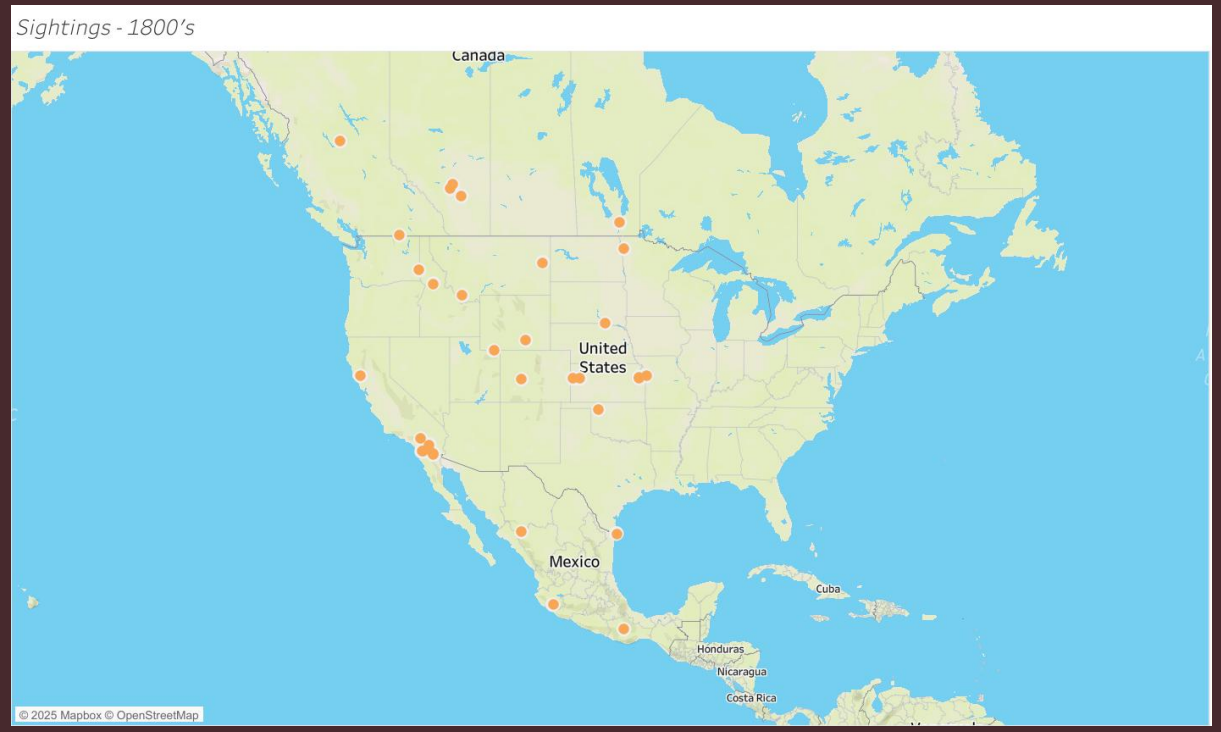
1800s: Origins & Opportunity

Open Home Range

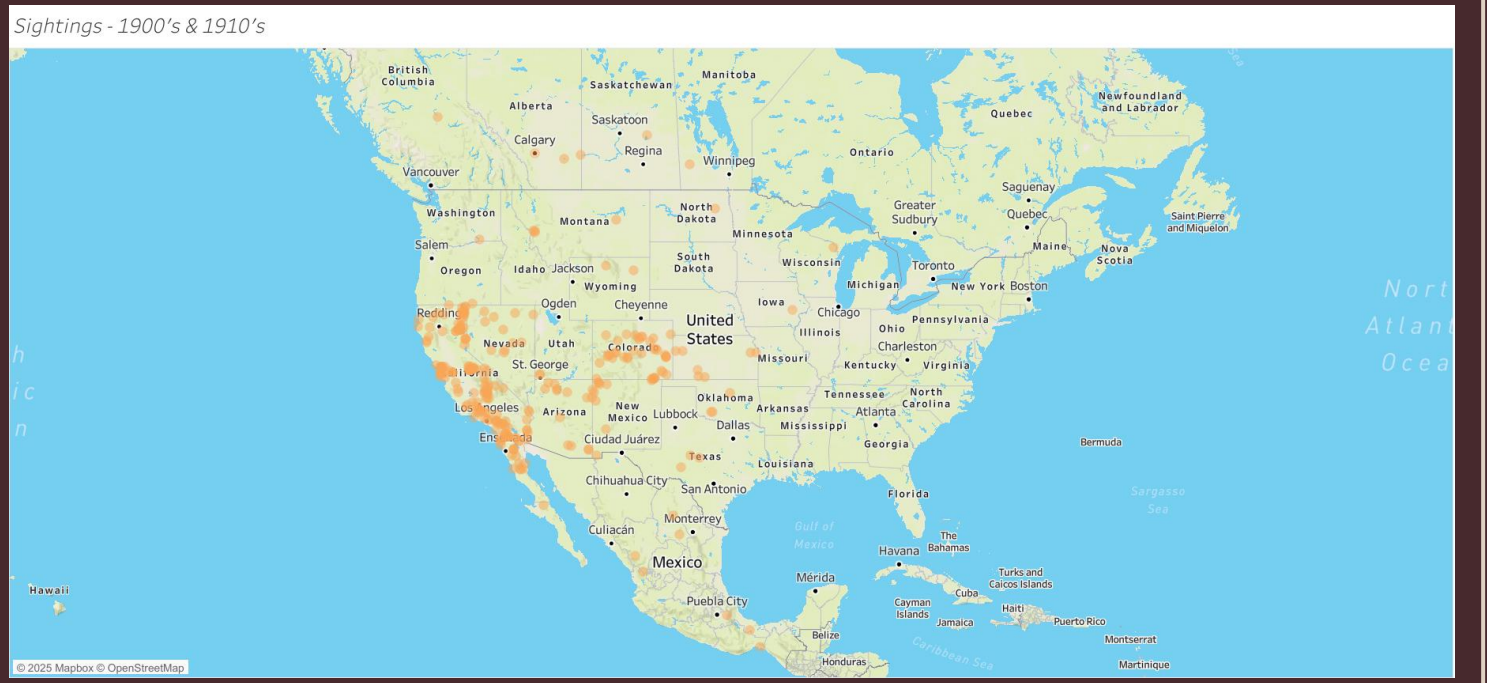
Core populations occupied open plains and western deserts.

Data Type Evolution

Early expansion began quietly across newly altered landscapes.



1900s: Crossing the Mississippi



First Eastern Footsteps

Verified east-of-Mississippi sightings mark the species' first leap forward.

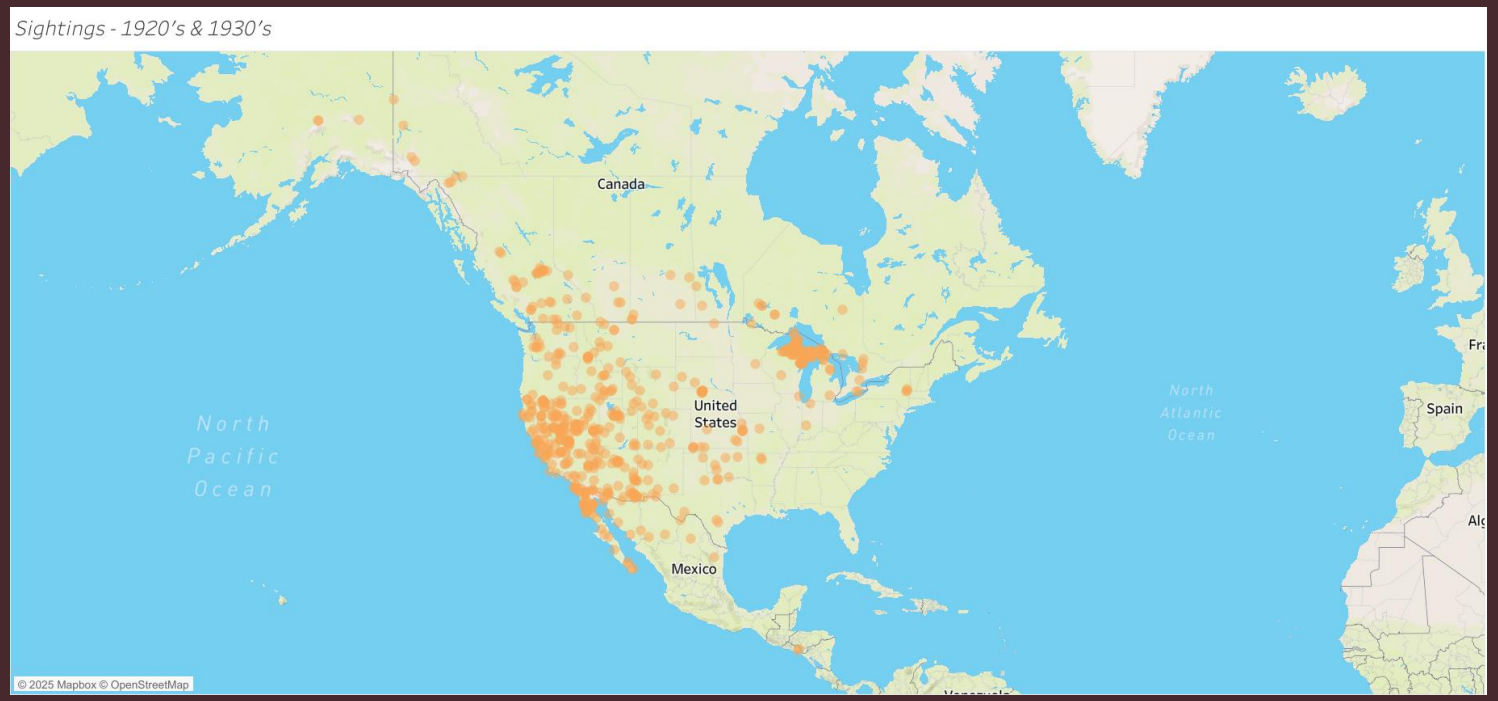
Great Lakes & Beyond

Records emerge in the Great Lakes and southern Canada by mid-century.

Persistence Under Fire

Gradual but persistent growth despite widespread predator control.

1930s: Consolidation in the West



Western Population Stronghold

Western populations stay strong even under removal programs.

Limited Eastern Presence

Scattered records begin appearing in Appalachia and the Northeast.

Onset of Eastward Expansion

Coyotes expand into flexible generalist predator roles.

1900–1960: Early Urban Edge Dwellers

Patterns of Early Expansion

Sightings cluster near rail lines, small towns, and early suburbs.

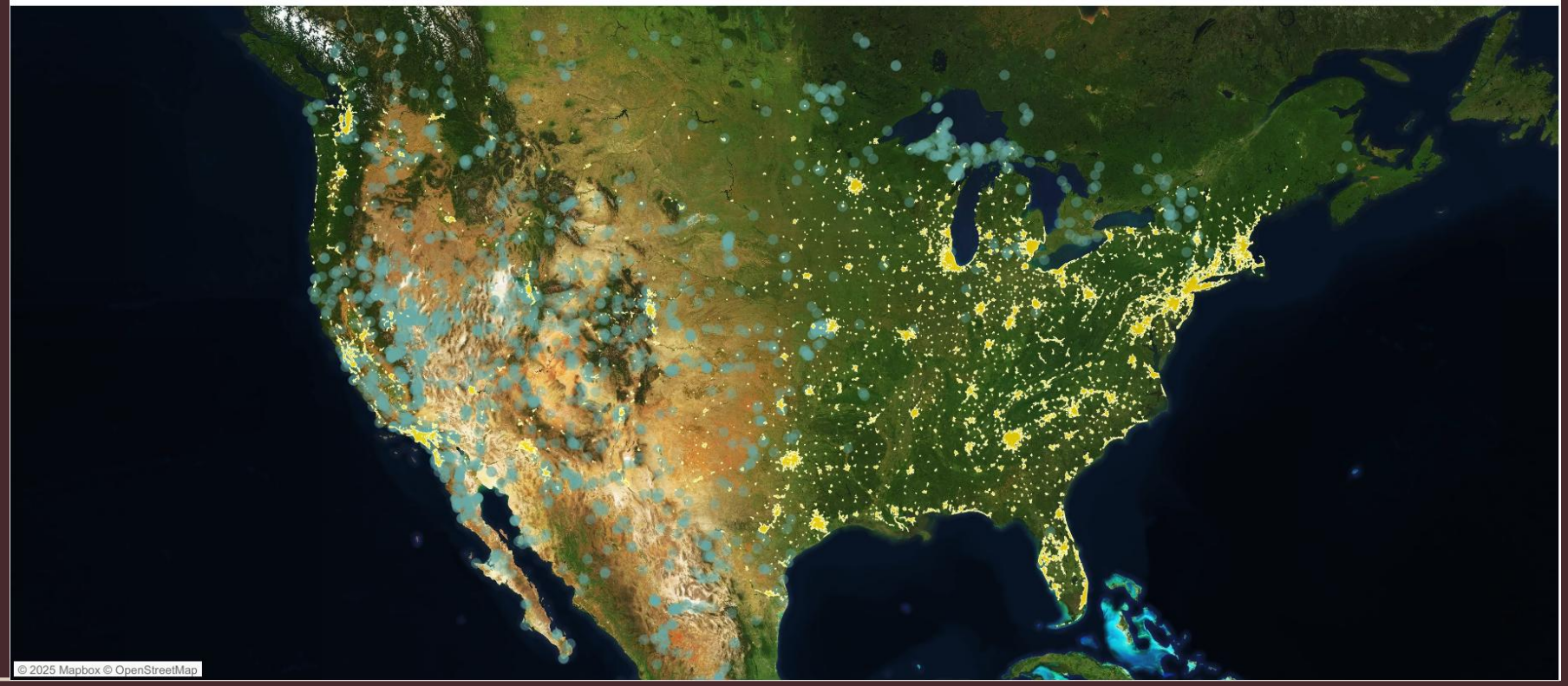
Habitat Opportunism

Behavioral flexibility allows survival within disturbed habitats.

The Urban Pivot

Seeds of modern urban adaptation begin to appear.

1900-1960 Overall Range of Coyotes, Proximity to Urban Locations (US)



1970s–1990s: The Continental Expanse

Dominant Brush Habitat

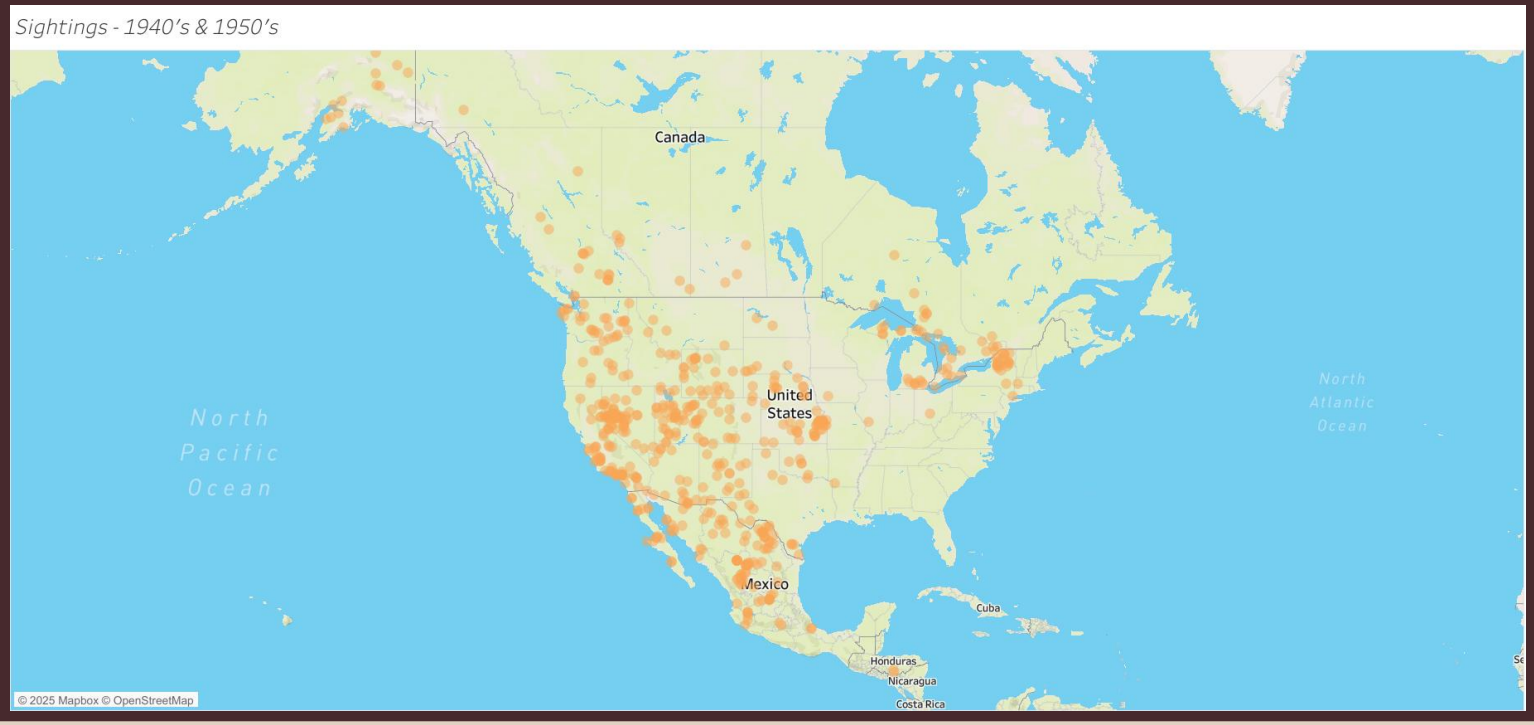
Coyotes reach nearly every U.S. biome, from coasts to highlands.

Secondary Habitats

Populations stabilize across the Midwest, Great Lakes, and Northeast.

Ecological Context

Ecosystems rebalance as coyotes replace lost apex predators.



Population Dynamics

Who's on the Landscape

Age-structure data show adult bias but healthy juvenile recruitment.

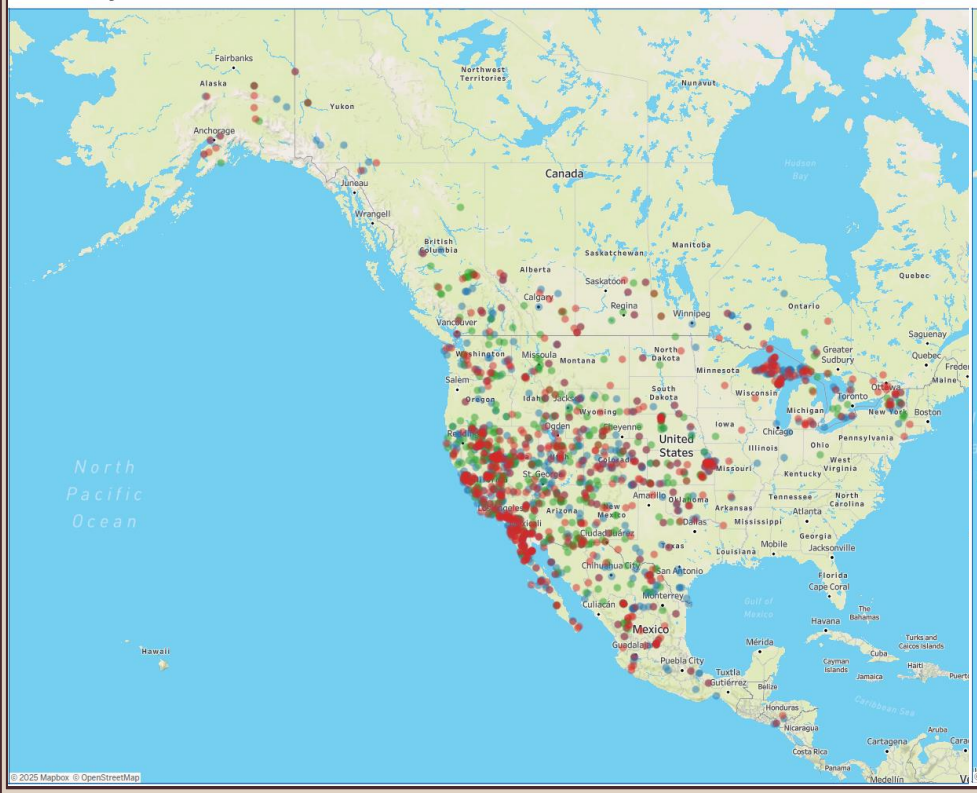
Breeding Through Pressure

Indicates ongoing breeding success under diverse conditions.

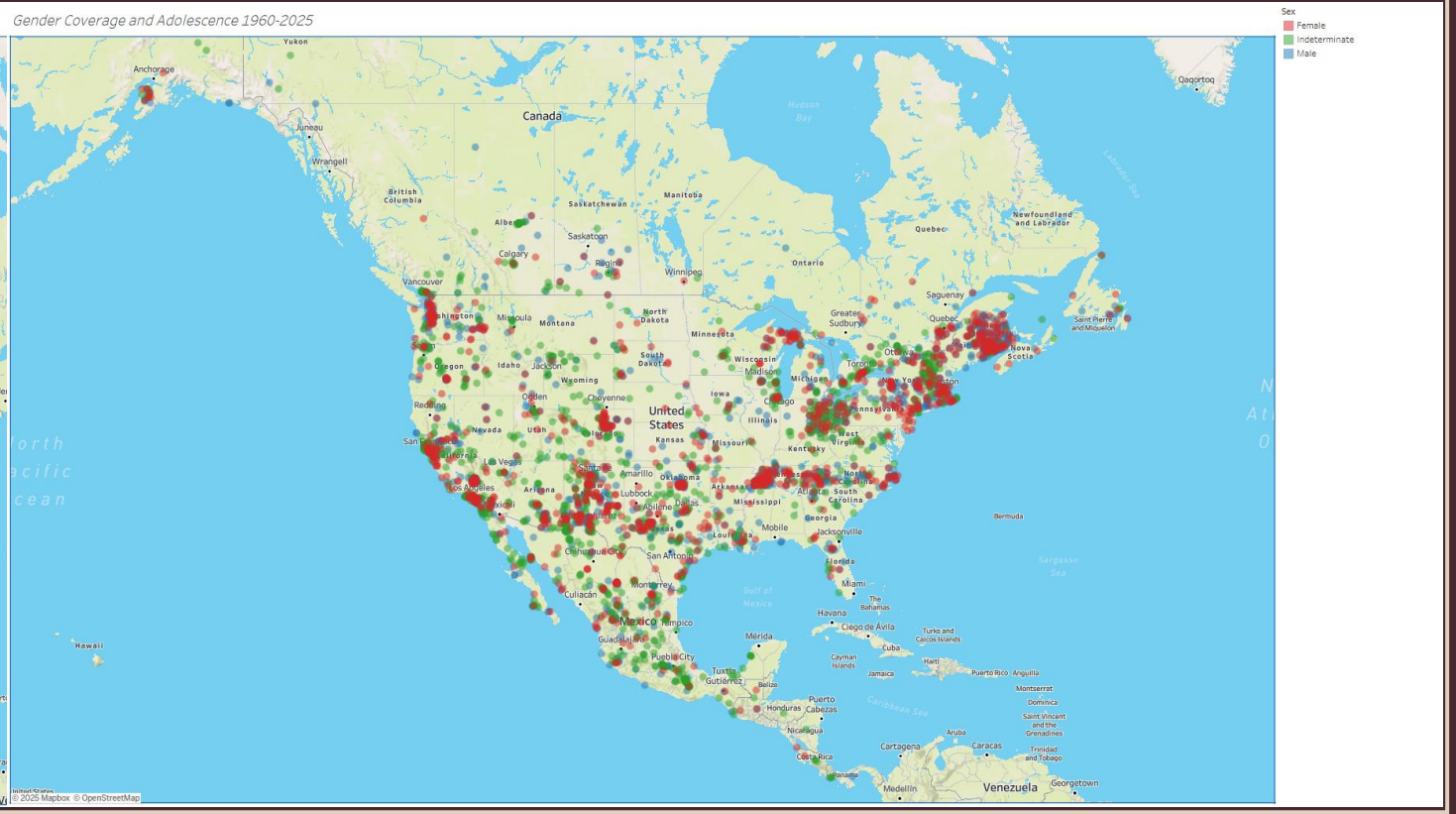
Resilience in the Numbers

Population stability reflects strong resilience to human pressure.

Gender Coverage and Adolescence 1900-1959



Gender Coverage and Adolescence 1960-2025



Predator at the Pasture Edge

Predator	Number	Percent
Grizzly bears	1,810	0.8
Black bears	3,130	1.3
Bobcats or lynx	2,080	0.9
Coyotes	126,810	53.1
Dogs	15,740	6.6
Foxes	82	0.0
Wolves	8,110	3.4
Ravens	1,157	0.5
Eagles	6,680	2.8
Vultures	24,600	10.3
Mountain lions, cougars, or pumas	11,500	4.8
Other predators	7,510	3.1
Unknown predators	29,680	12.4
Total	238,890	100.0

(D)=Number suppressed to avoid potential disclosure of respondent.

Top Predator of Concern

Coyotes account for over half of all predator livestock losses.

Most at Risk

Sheep, calves, and goats most vulnerable in open rangelands.

Where Conflict Peaks

Conflict greatest where wildland and ranchland overlap.

https://www.aphis.usda.gov/

Counting the Cost Over 40 Years

Dollars on the Ground

Annual livestock losses reach tens of millions of dollars nationwide.

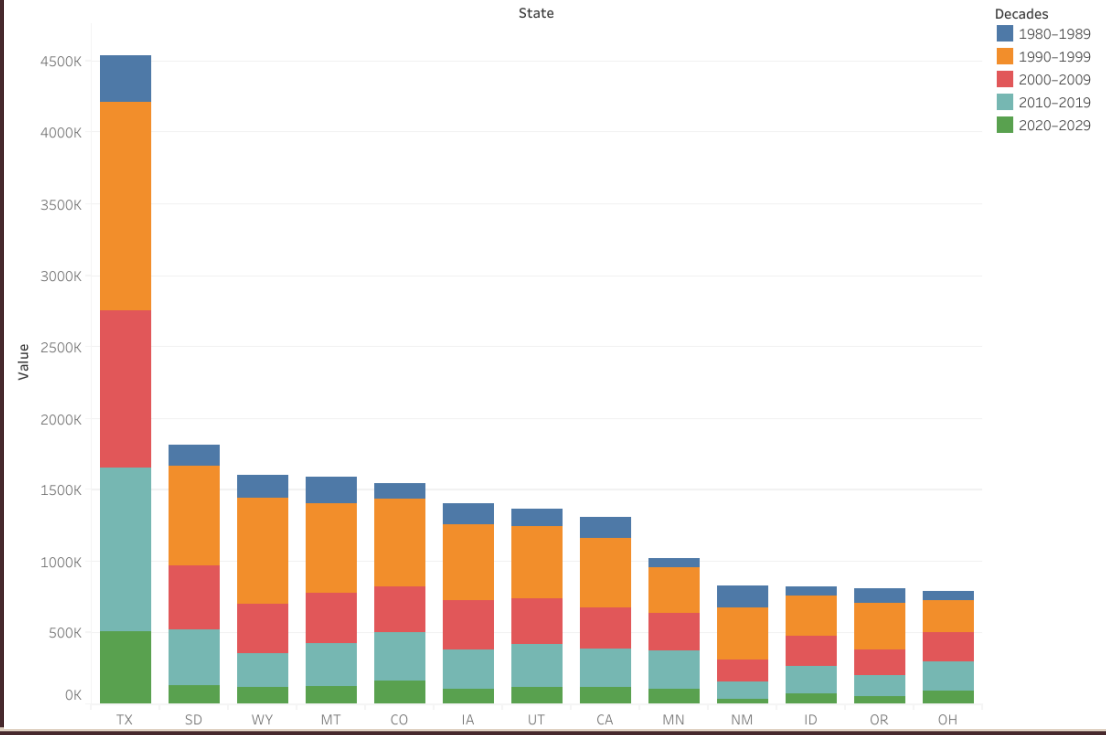
Regional Hotspots

Texas, Western and Mountain states sustain the highest regional costs.

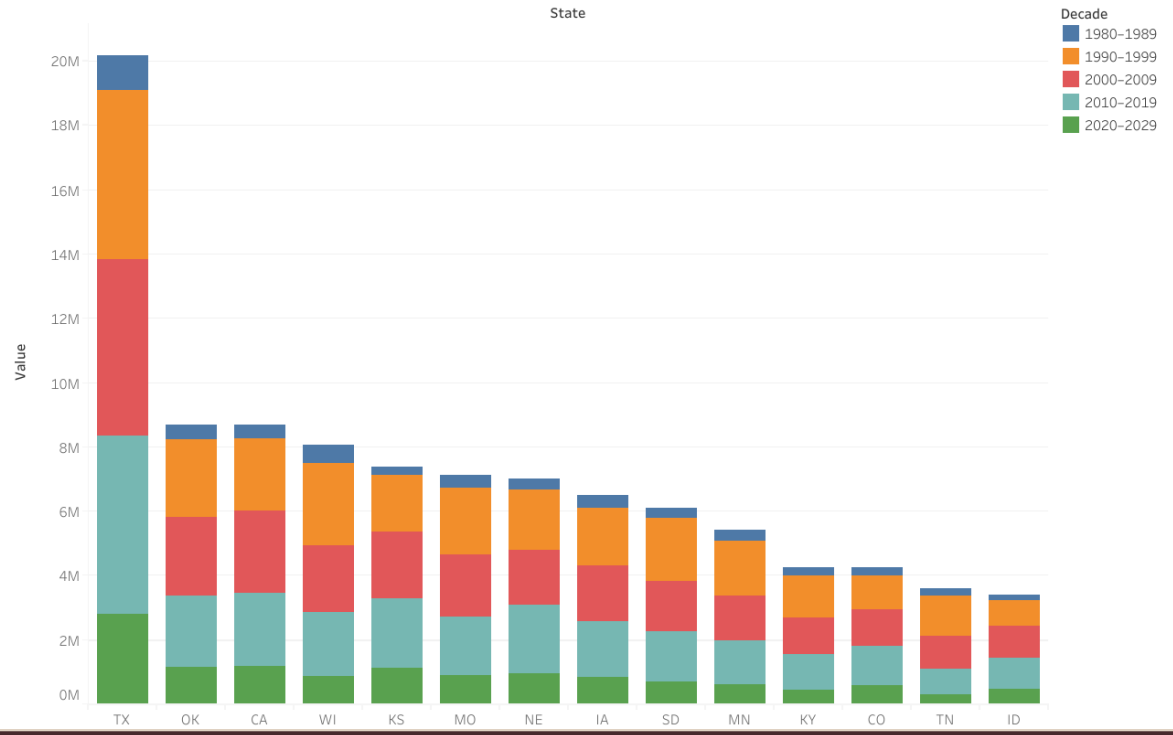
Balancing Books and Beings

Highlights need for balanced coexistence and compensation strategies.

US Economic Impact Sheep Deaths - NASS USDA



US Economic Impact Cattle Deaths - NASS USDA



Managing Conflict 2000–2015

Shifting the Toolbox

Non-lethal deterrents increasingly replace older lethal controls.

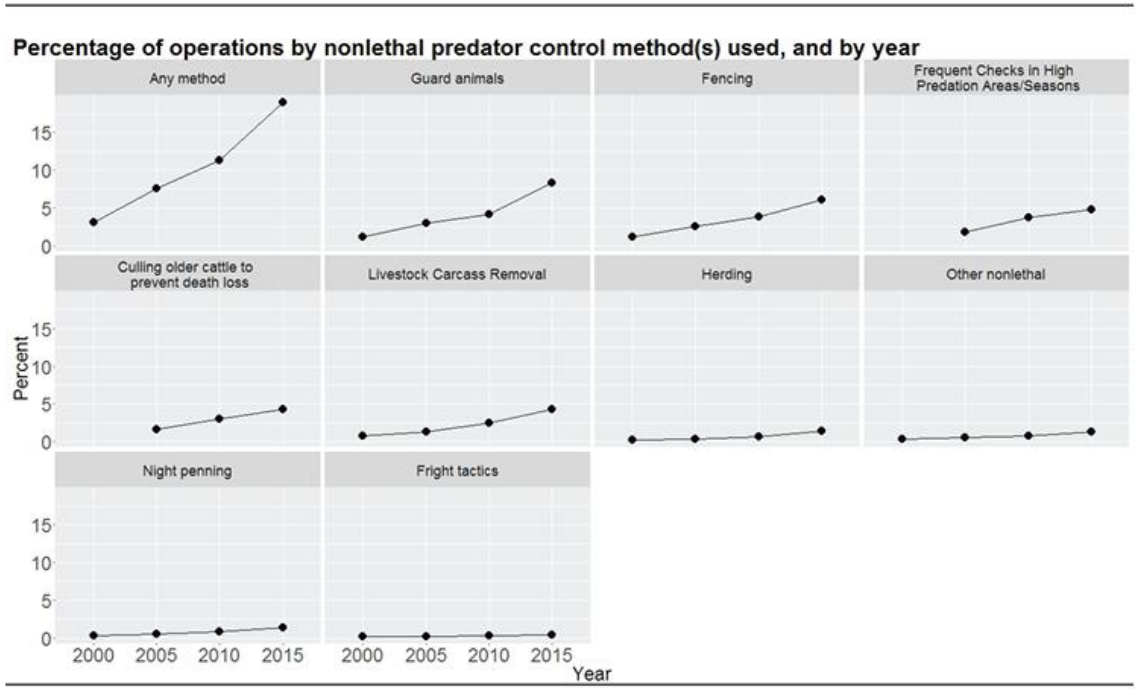
What Works Where

Guard animals, secure fencing, and lighting gain widespread use.

No One-Size Solution

Results vary by livestock type, terrain, and regional policy.

	Percent Operations							
	2000		2005		2010		2015	
Method	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Guard animals	1.1	(0.1)	2.9	(0.2)	4.1	(0.2)	8.3	(0.5)
Fencing	1.1	(0.1)	2.5	(0.2)	3.8	(0.2)	6.1	(0.4)
Herding	0.2	(0.0)	0.3	(0.1)	0.6	(0.1)	1.4	(0.3)
Night penning	0.3	(0.0)	0.5	(0.1)	0.8	(0.1)	1.3	(0.2)
Fright tactics	0.2	(0.2)	0.2	(0.0)	0.3	(0.1)	0.4	(0.1)
Livestock carcass removal	0.8	(0.1)	1.3	(0.1)	2.5	(0.1)	4.3	(0.3)
Culling older cattle to prevent death loss	—		1.6	(0.1)	3.0	(0.2)	4.3	(0.3)
Frequent checks in high predation areas/seasons	—		1.8	(0.1)	3.7	(0.3)	4.8	(0.3)
Other nonlethal	0.3	(0.1)	0.5	(0.1)	0.8	(0.1)	1.3	(0.2)
Any method	3.1	(0.2)	7.5	(0.3)	11.3	(0.4)	19.0	(0.7)



How We Know What We Know

Early Records & Specimens

Early data relied on trappers, naturalists, and museum records.

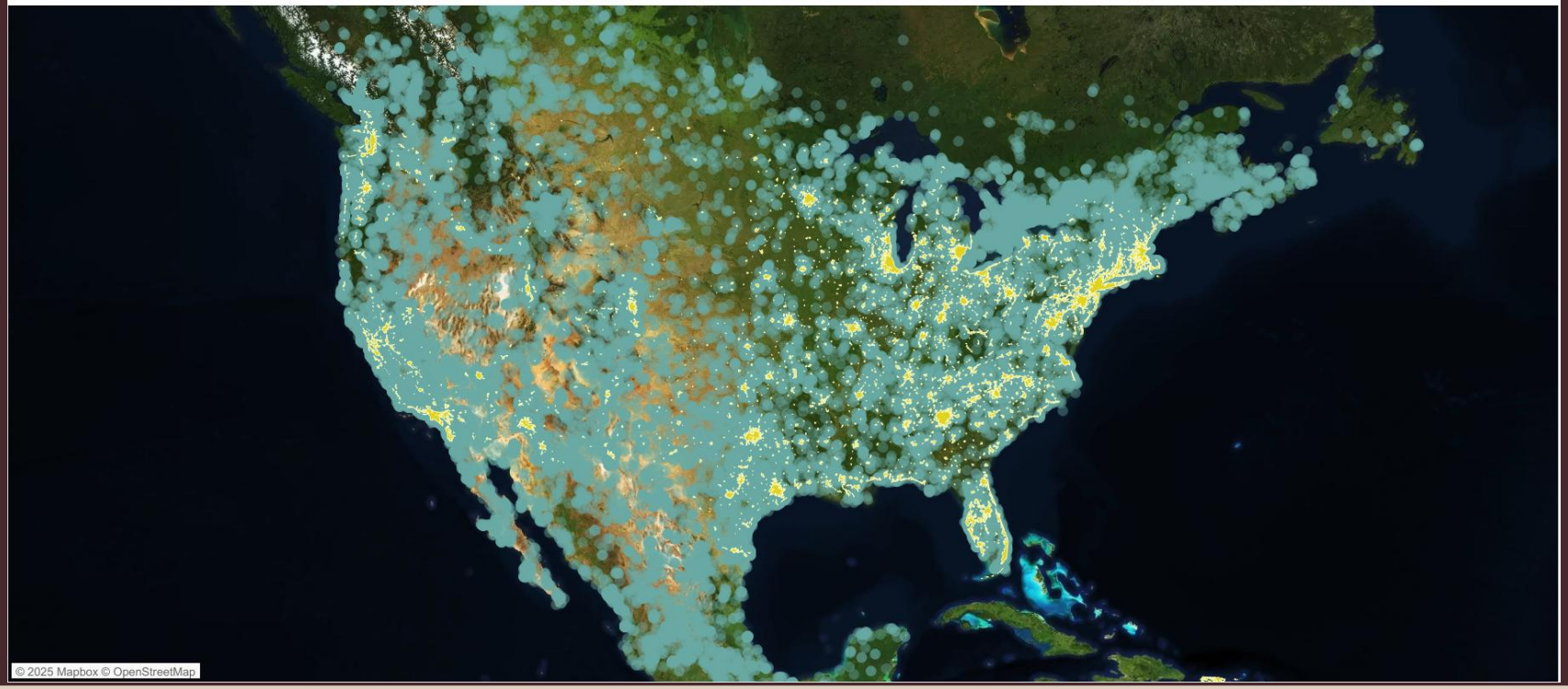
Survey Era

Late-20th-century surveys and tagging improved regional accuracy.

Real-Time Coyotes

GPS and citizen science now drive real-time wildlife mapping.

1960-2025 Overall Range of Coyotes, Proximity to Urban Locations (US)



2020s: A Continental Species

Mainland North America

Confirmed in 49 states minus Hawaii and southern Canada.

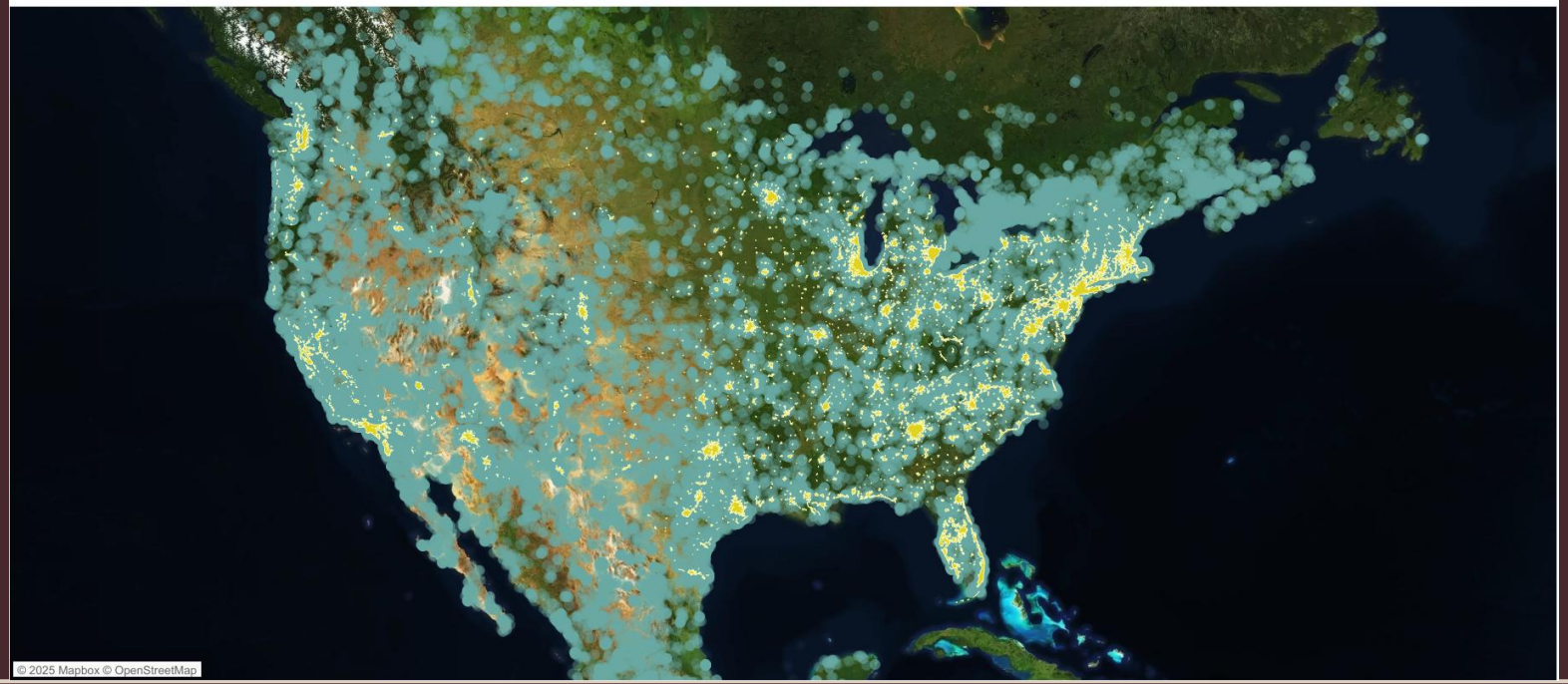
Moving Southward

Expansion continues south through Central America into Panama, approaching Colombia, a transcontinental leap.

Beyond Any One Biome

Exemplifies adaptability across climates and cultural boundaries.

Overall Range of Coyotes, Proximity to Urban Locations (US)



Frontiers & Corridors

New Centers of Density

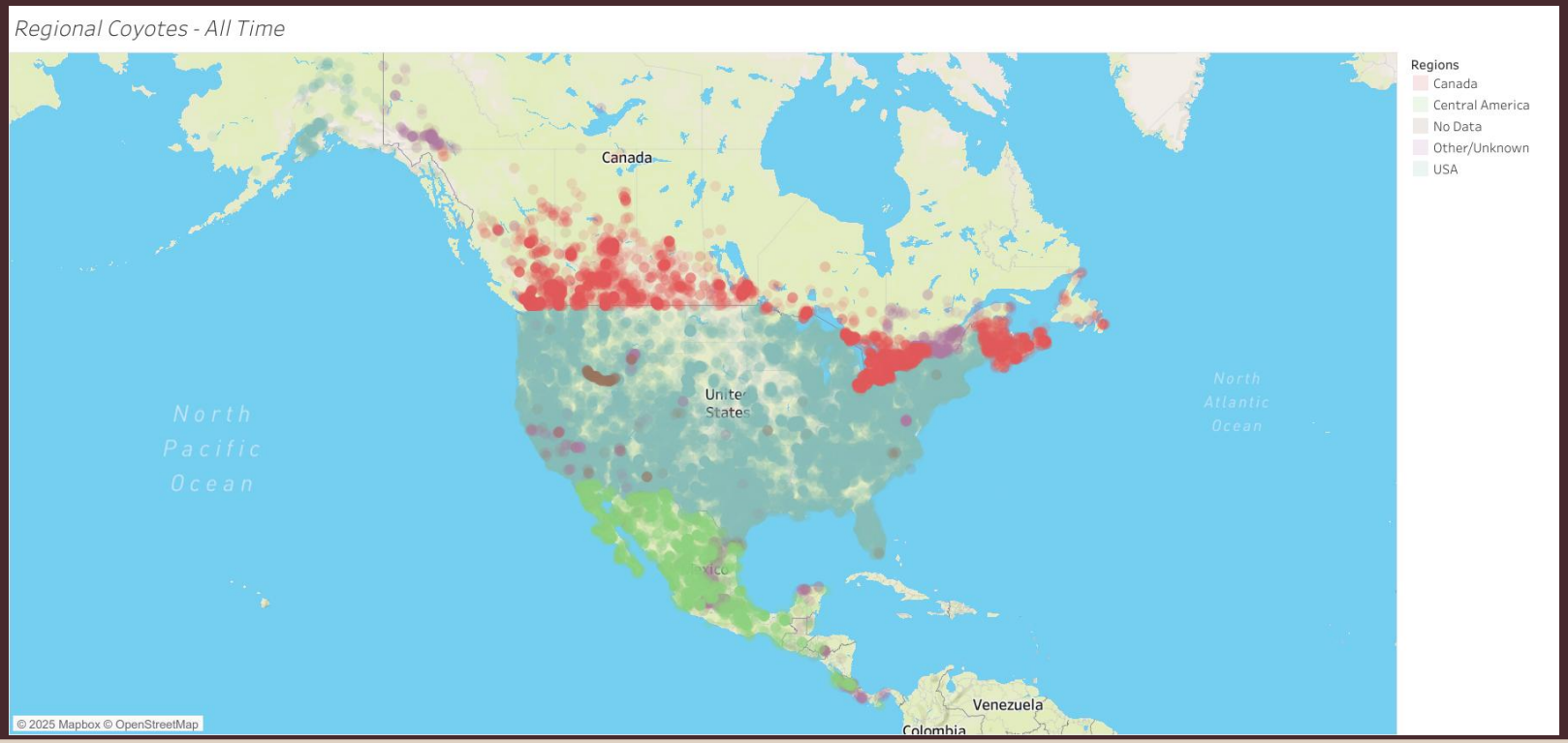
Densest populations now found in the Northeast and Appalachians.

Active Edges of the Map

Alaska and Panama mark active frontiers of range expansion.

One Connected Spine

Continental corridor links North and Central American ecosystems.



Resilience in Real Time

Watching the Spread

Animated map visualizes two centuries of range growth and impact.

Seeing the Edges Change

Shows spread, urban presence, and changing ecological boundaries.

Coyotes in Our Image

Demonstrates resilience and adaptation in human-shaped landscapes.