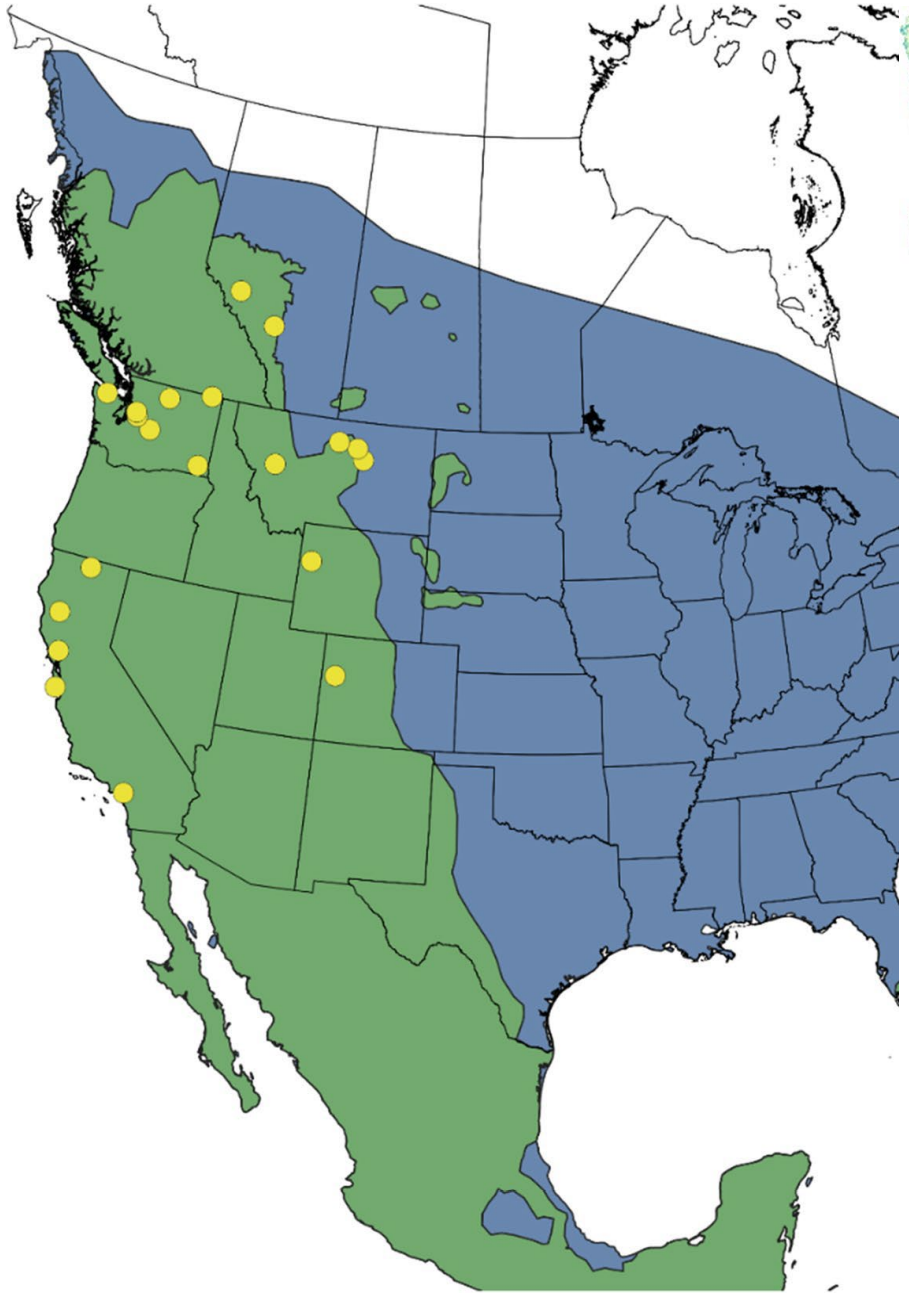
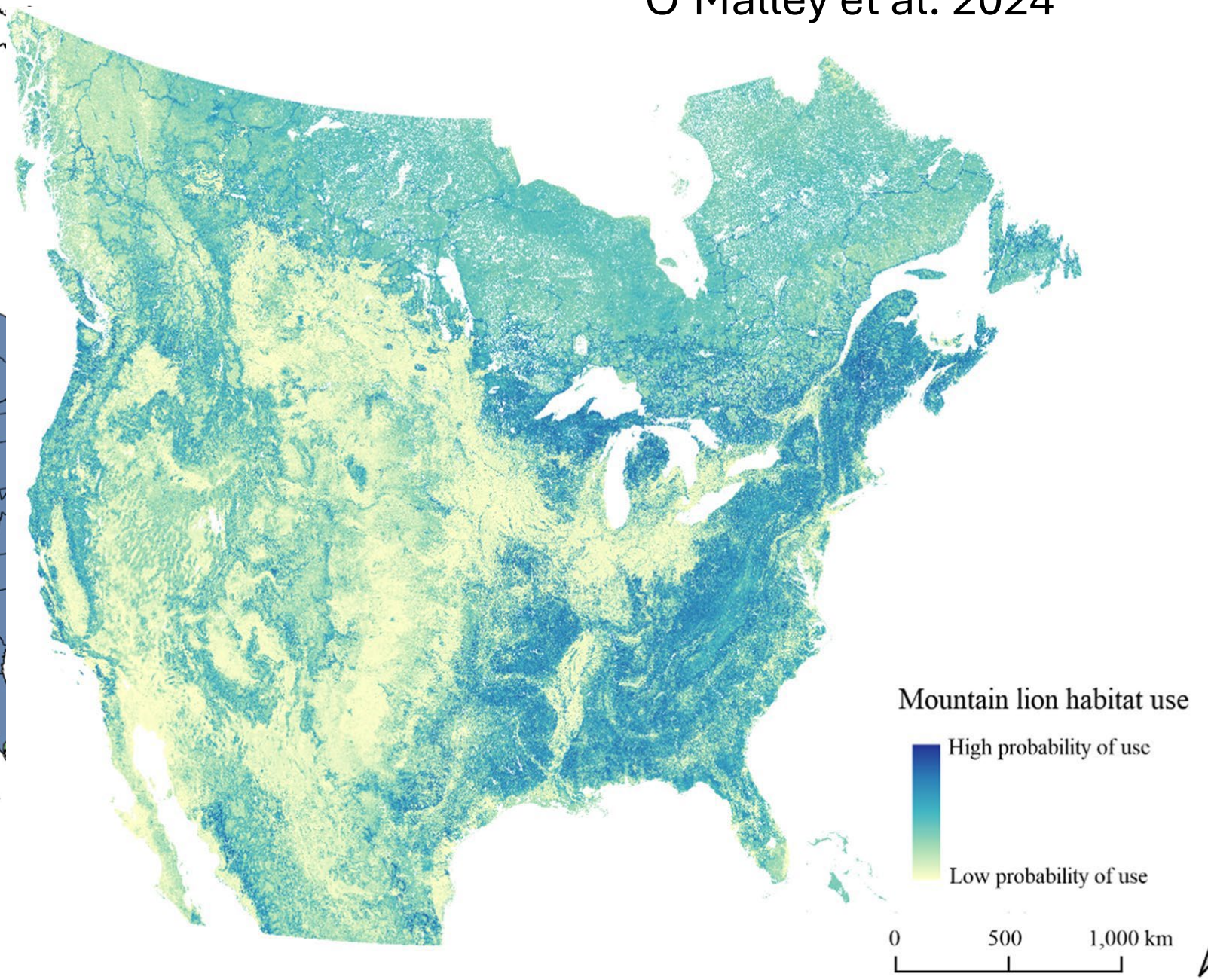
O’Malley et al. 2024

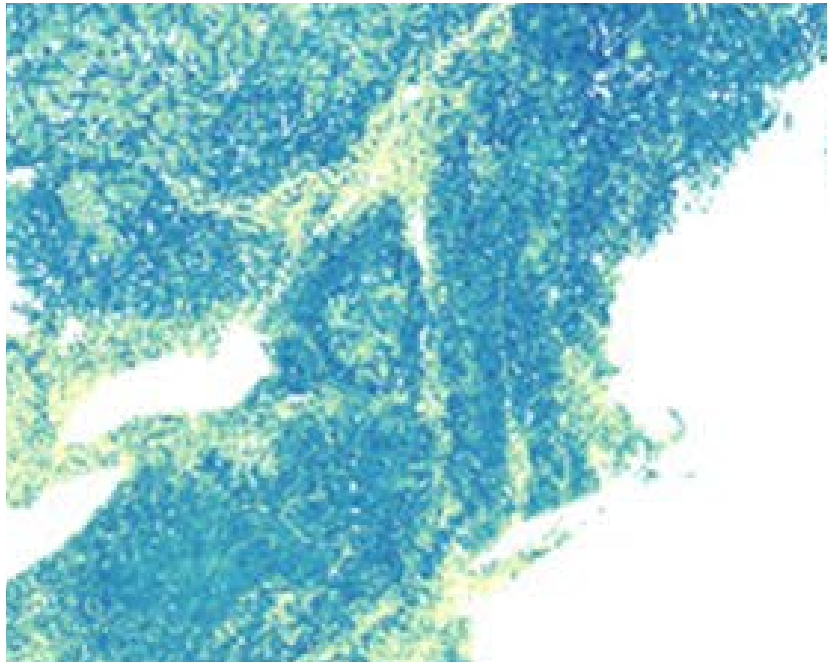




O’Malley et al. 2024

Most important:

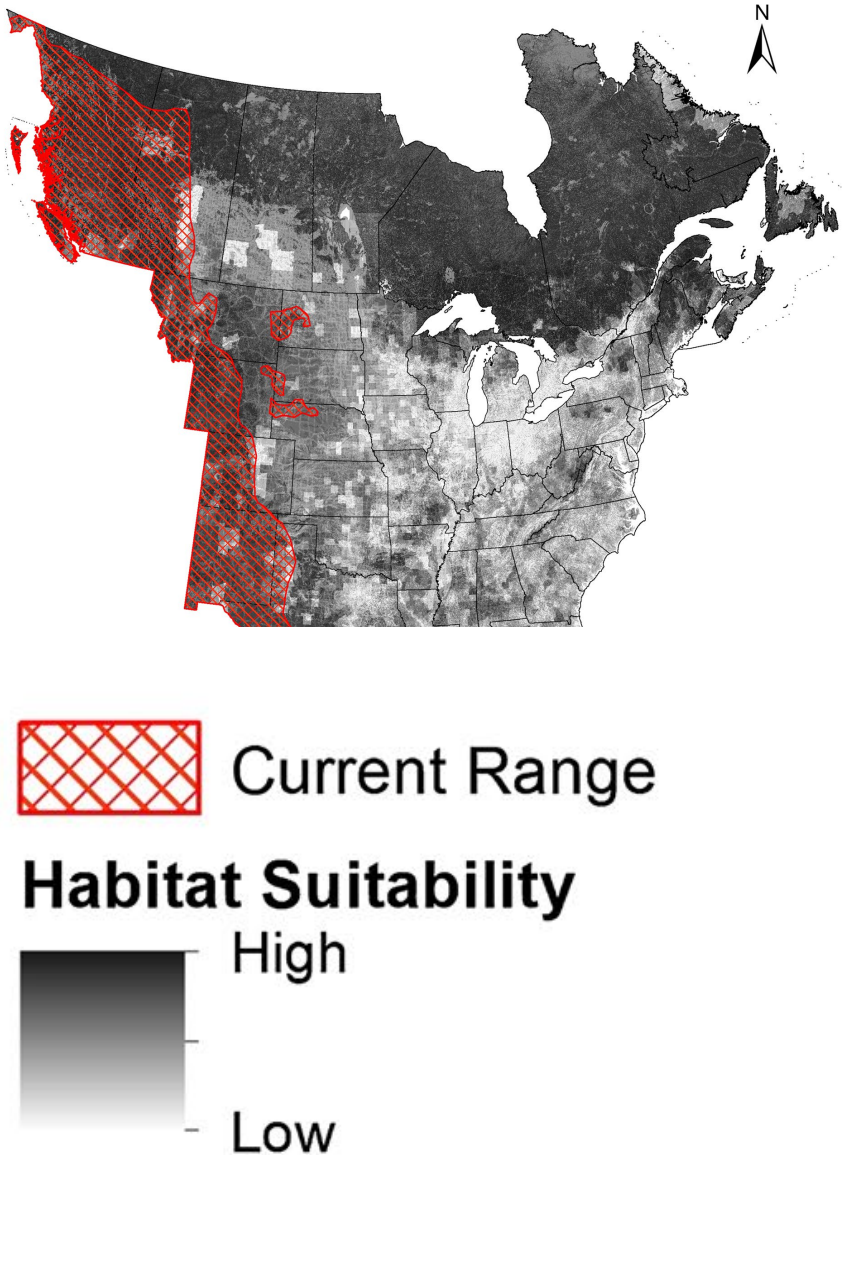
1. Normalized Difference Vegetation Index (NVDI)
2. Elevation (< 2500 ft, but <1000 ft is best)
3. Distance to water (within 5000m works)

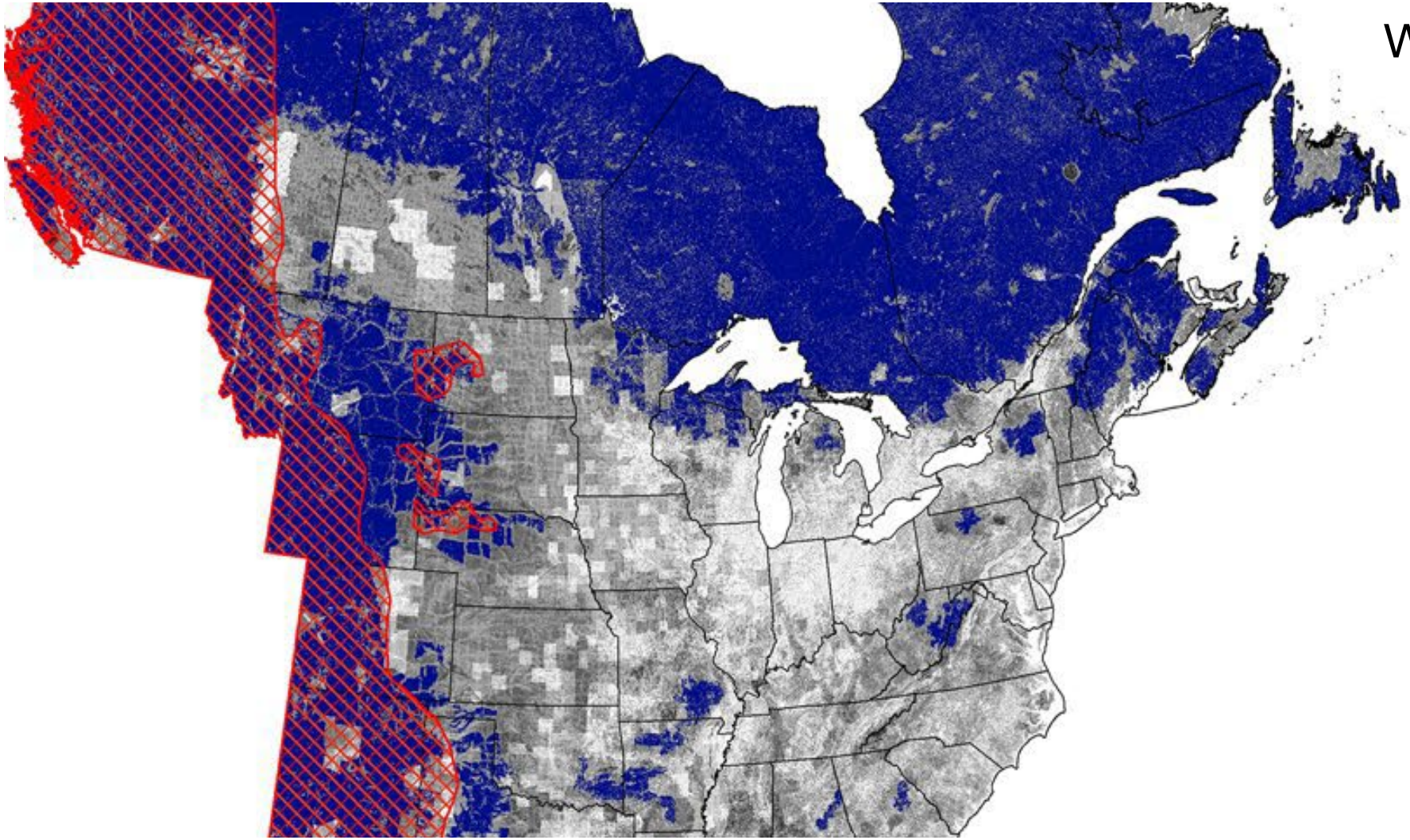


Normalized Difference Vegetation Index (NVDI): a widely used metric for quantifying the health and density of vegetation from satellite imagery.

Indicates healthier, denser vegetation, or “greenness” = primary productivity

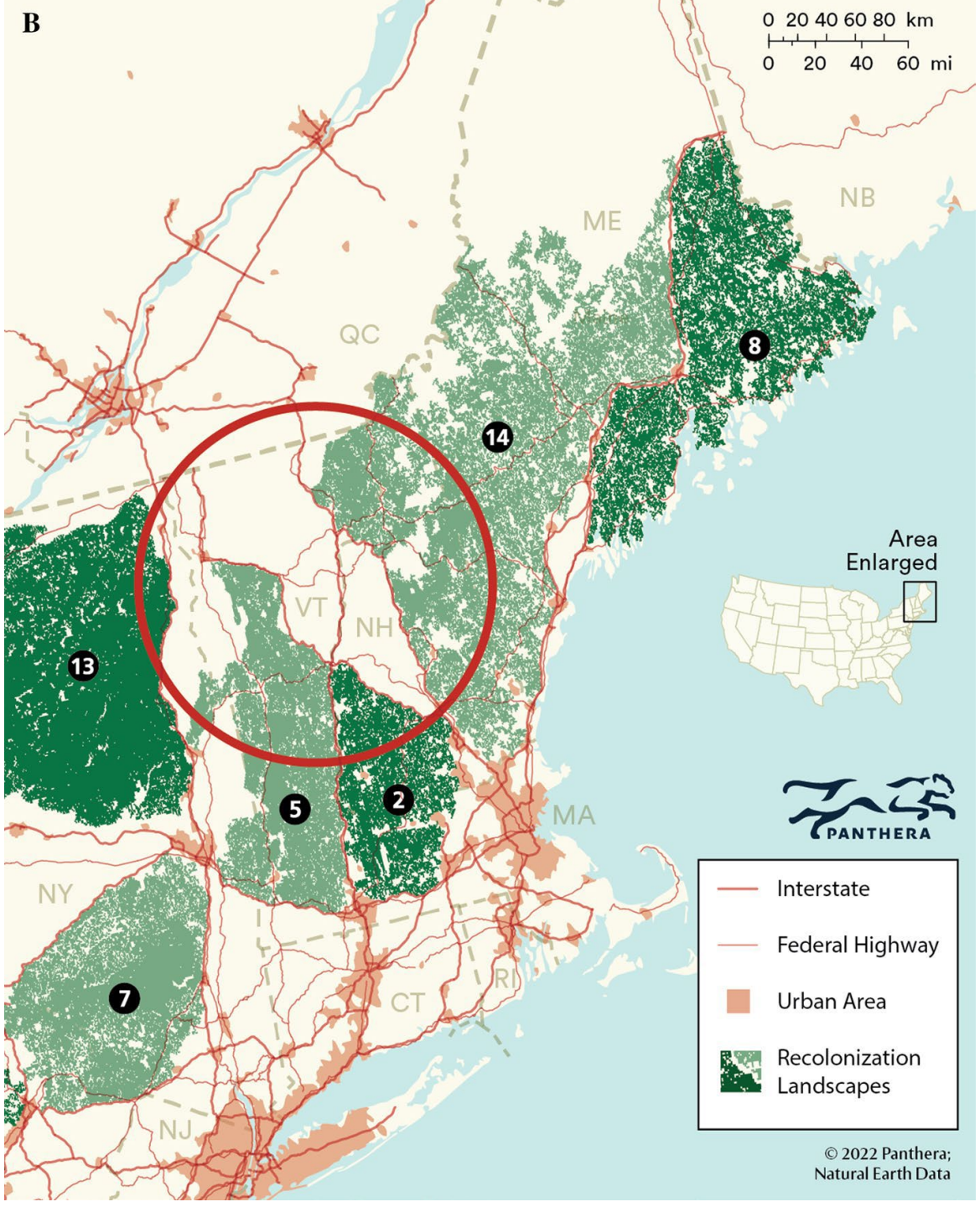
Winkel et al. 2023



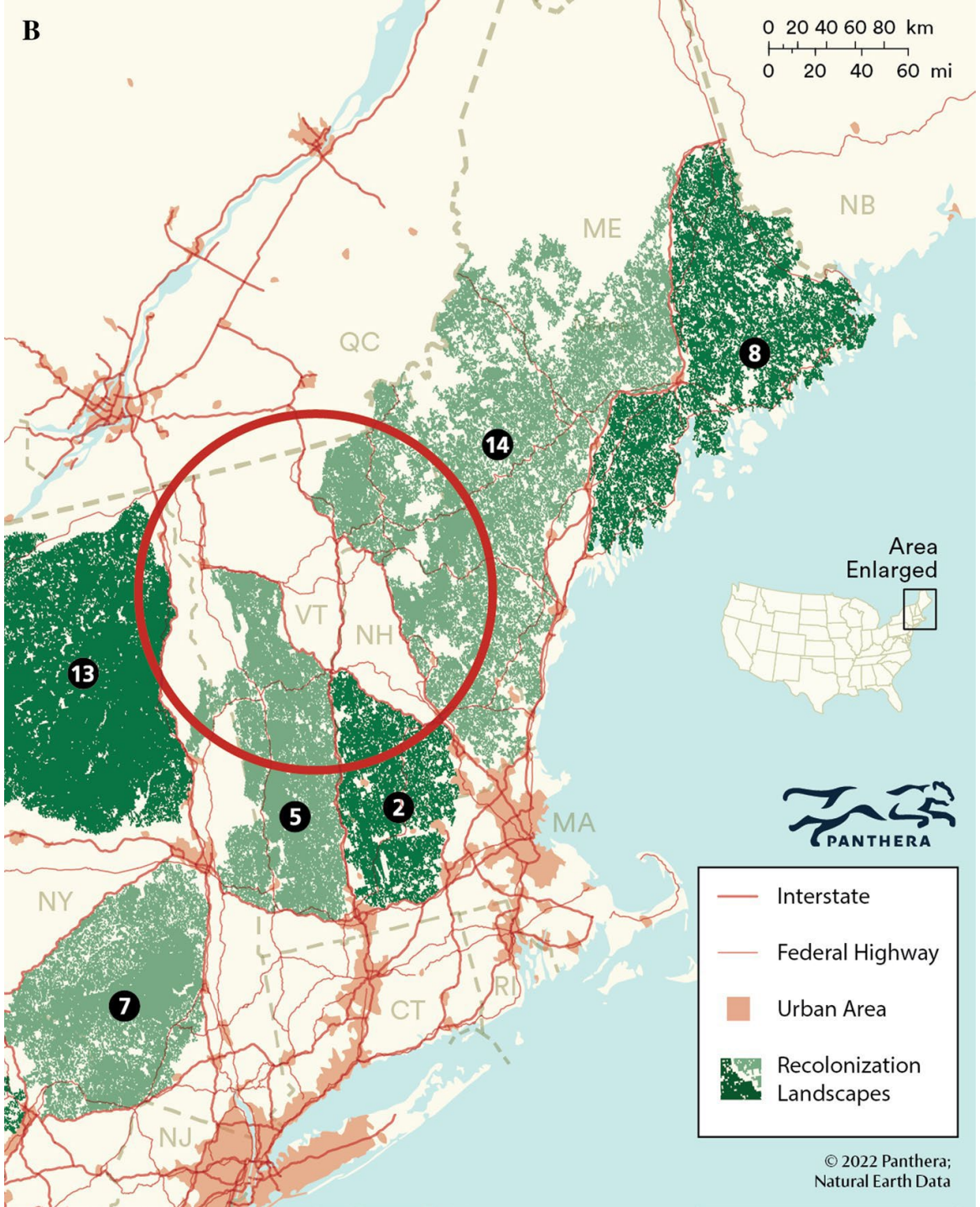


Winkel et al. 2023

69% suitability and ≥ 2500 km2 area threshold



Yovovich et al. 2023


B
0 20 40 60 80 km
0 20 40 60 mi
NB
ME
QC
VT
NH
NY
MA
CT
RI
NJ
8
14
13
5
2
7
Area Enlarged
PANTHERA
Interstate
Federal Highway
Urban Area
Recolonization Landscapes
© 2022 Panthera; Natural Earth Data

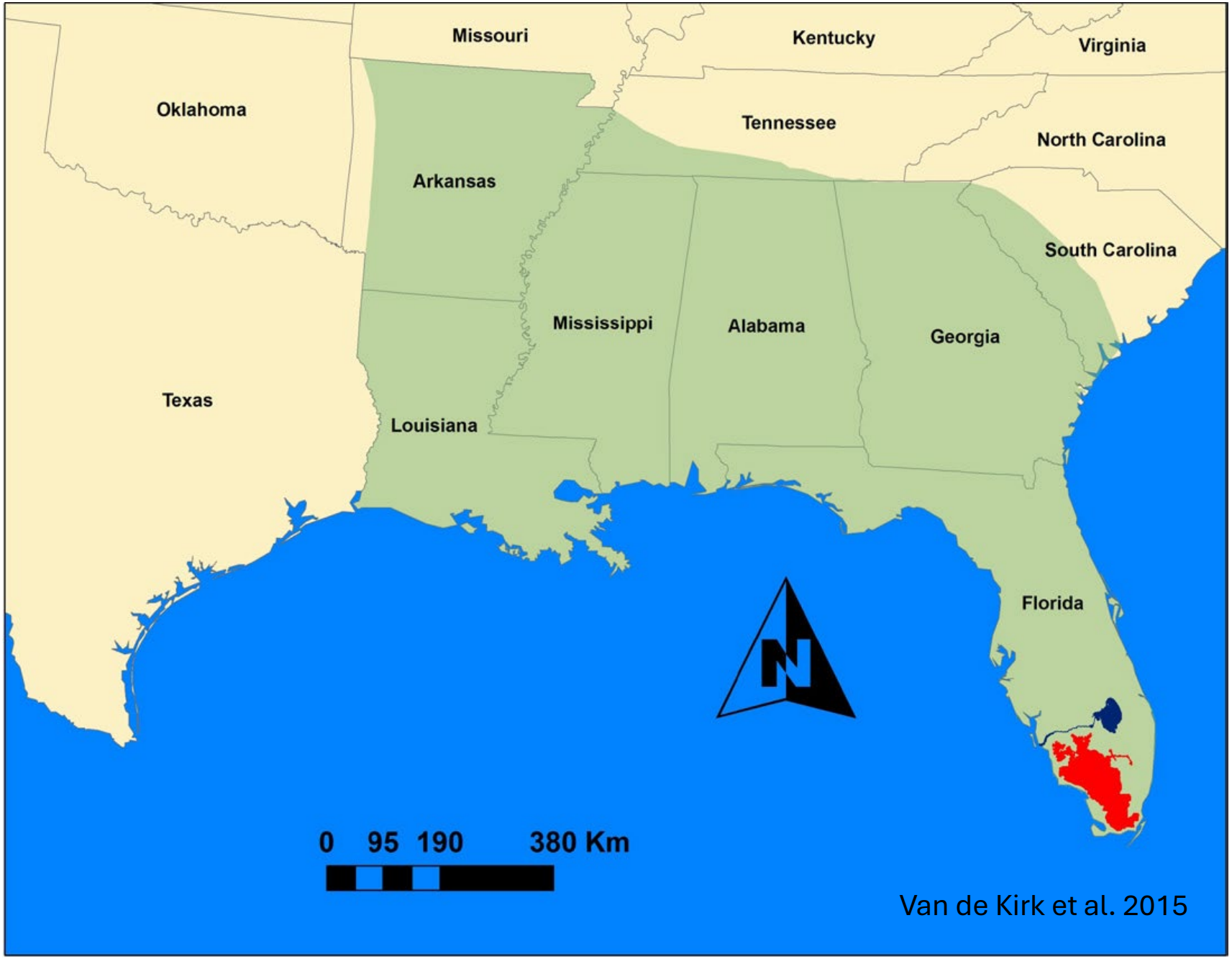

CANADA
U.S.
QUÉBEC
VERMONT
Montpelier
Burlington
Concord
WHITE MOUNTAIN NATIONAL FOREST
GREEN MOUNTAIN NATIONAL FOREST
NEW YORK
VERMONT

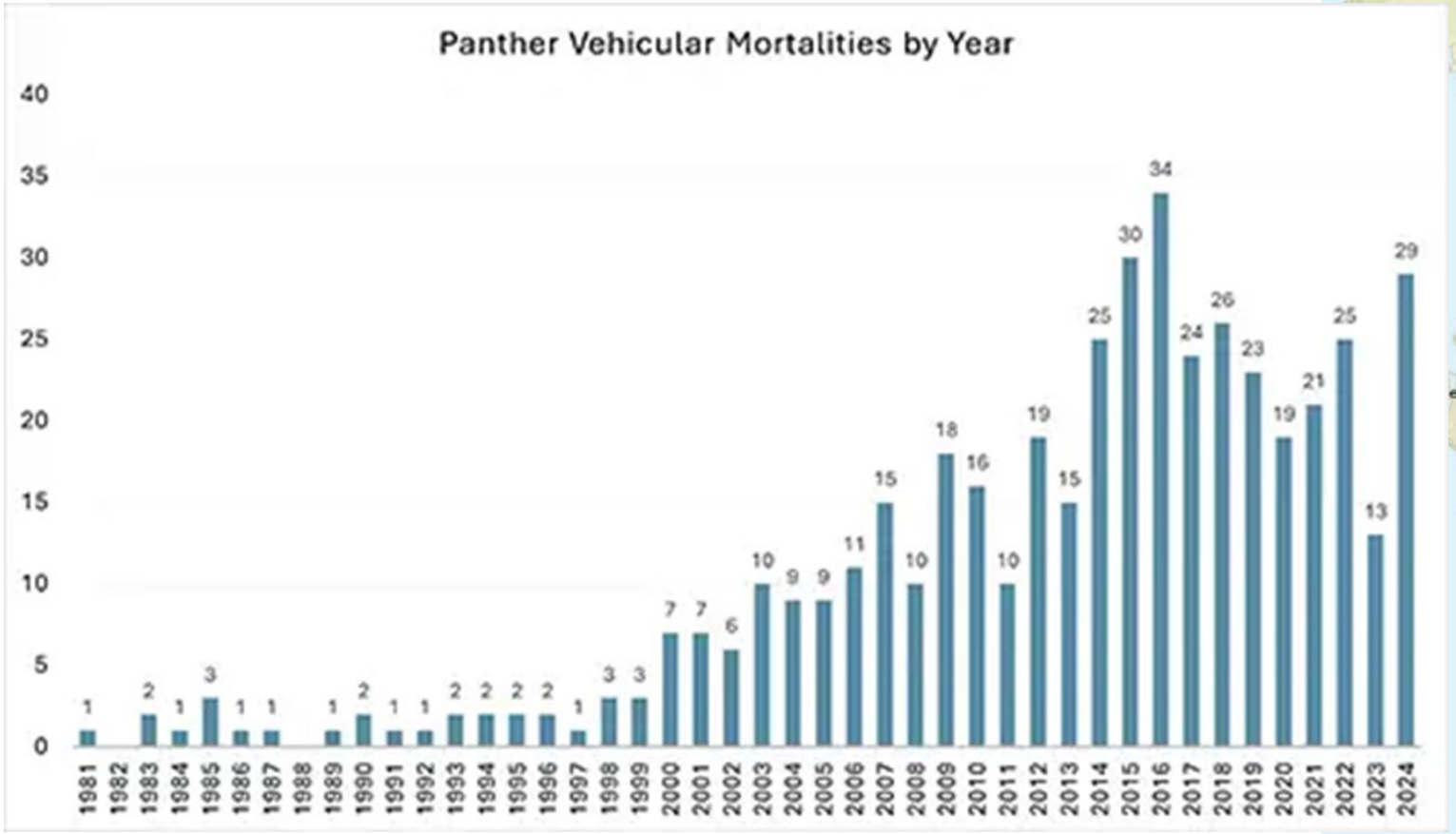
Yovovich et al. 2023

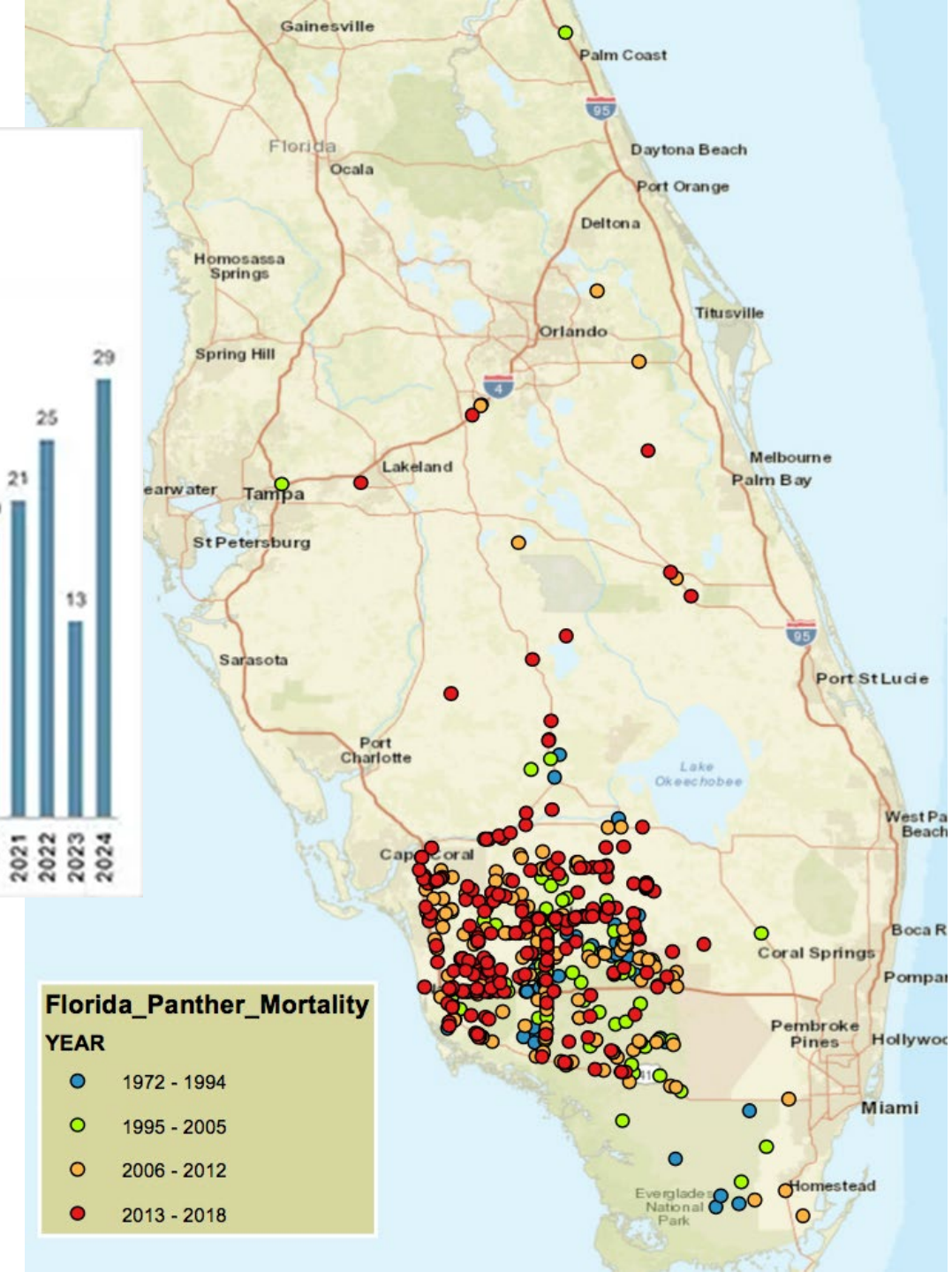
Table 2 Potential puma habitat patches and habitat suitability values, listed in order of increasing size

Patch number	Area name	Patch size (km^2)	Percent public land	Human density (people/km2)	Sociocultural index	Livestock density (animals/km^2)
1	Ouachita Mountains	6024	80	1.76	0.31	8.83
2	Green Mountains East	6517	14	35.78	0.522	3.28
3	Michigan East	7773	45	4.76	0.346	2.93
4	Michigan West	9639	46	9.75	0.383	4.01
5	Green Mountains West	11.874	22	13.69	0.548	5.55
6	Allegheny Plateau	12.040	3	11.55	0.35	7.34
7	Catskill Mountains	12.451	15	18.34	0.427	4.77
8	Maine East	12.831	5	8.87	0.445	1.48
9	Ozark Plateau	14.341	34	8.11	0.317	8.05
10	Great Smoky South	17.099	53	19.23	0.394	4.23
11	Appalachian North	21.204	29	9.1	0.353	6.39
12	Allegheny North	21.582	42	7.75	0.367	4.96
13	Adirondack Mountains	25.162	42	5.74	0.397	3.78
14	Maine West	25.857	13	14.55	0.423	1.88
15	Appalachian South	29.481	9	17.43	0.351	3.38
16	Minnesota North Woods	39.831	54	2.66	0.42	1.69
17	Wisconsin-UP	59.462	43	2.95	0.38	2.55

Each patch identified meets the minimum thresholds for areas that could support a sufficiently large puma population to avoid genetic drift and inbreeding depression


Missouri
Kentucky
Virginia
Oklahoma
Tennessee
North Carolina
Arkansas
South Carolina
Mississippi
Alabama
Georgia
Texas
Louisiana
Florida
N
0 95 190 380 Km
Van de Kirk et al. 2015


Panther Vehicular Mortalities by Year
40
35
30
25
20
15
10
5
0
1 0 2 1 3 1 1 0 1 2 1 1 2 2 2 2 1 3 3 7 7 6 10 9 9 11 15 10 18 16 10 19 15 25 30 34 24 26 23 19 21 25 13 29
1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024


Gainesville
Palm Coast
Florida
Ocala
Daytona Beach
Port Orange
Deltona
Homosassa Springs
Titusville
Orlando
Spring Hill
Melbourne
Palm Bay
Lakeland
Tampa
St Petersburg
Sarasota
Port St Lucie
Port Charlotte
Lake Okeechobee
Cape Coral
Coral Springs
Pembroke Pines
Miami
Everglades National Park
Homestead
Florida_Panther_Mortality
YEAR
1972 - 1994
1995 - 2005
2006 - 2012
2013 - 2018