

The **Cornell** Lab  of Ornithology

Supporting information needs of State and Federal Agencies

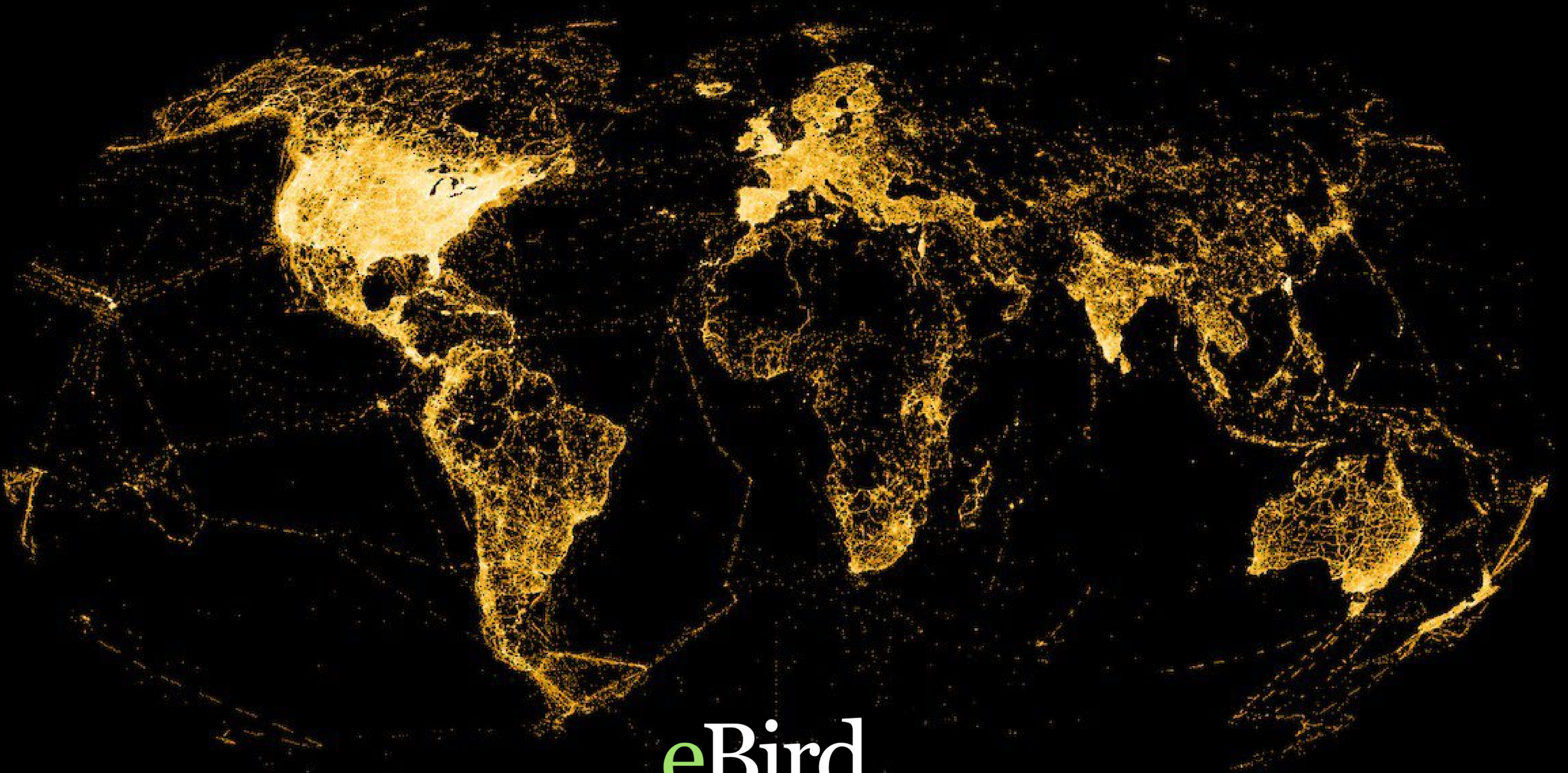
Viviana Ruiz-Gutierrez, PhD

Co-Director, Center for Avian Population Studies
Lead, Conservation Science Program
Cornell Lab of Ornithology, Cornell University

Andrew Stillman, PhD

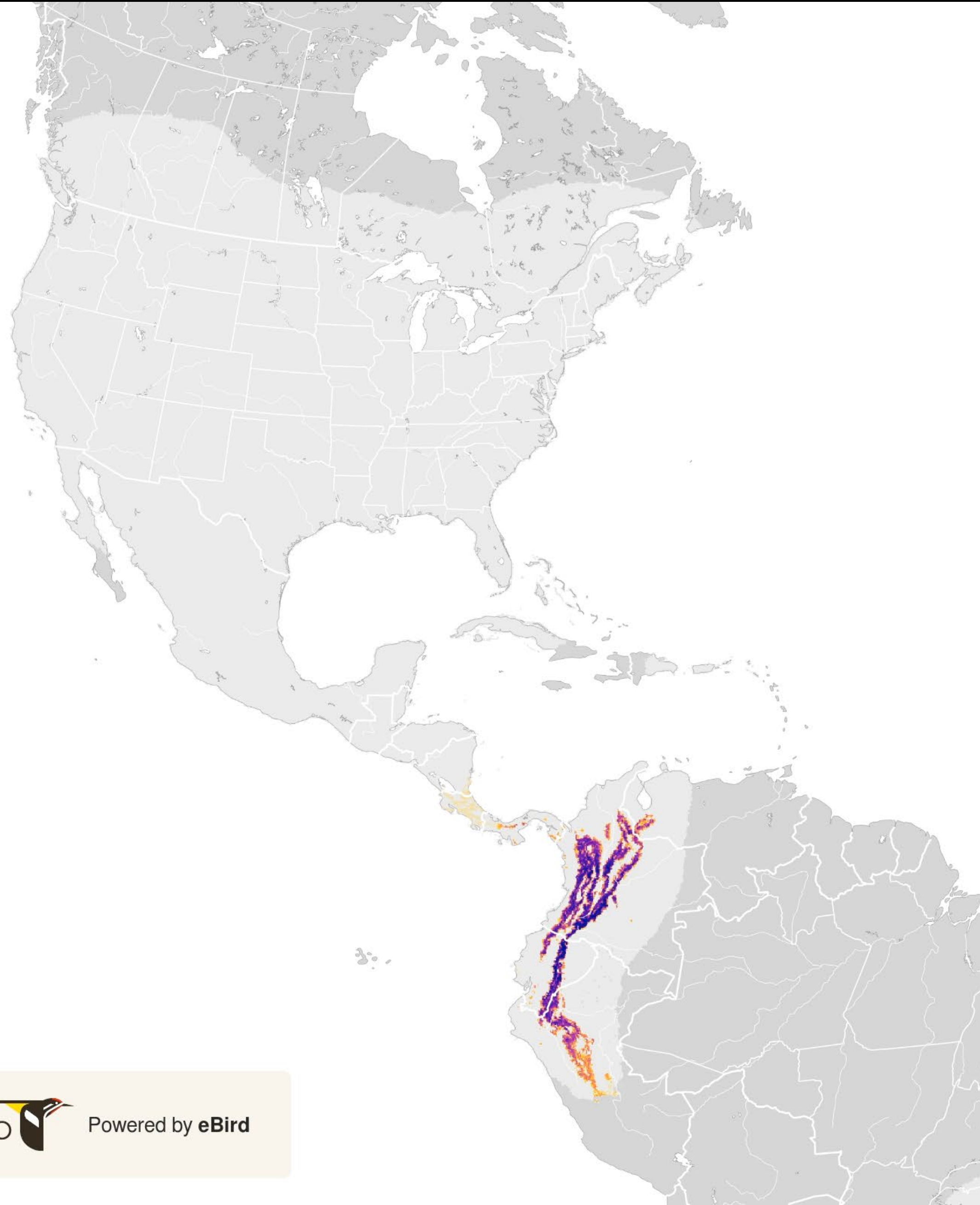
Postdoctoral Fellow, Conservation Science Program
Center for Avian Population Studies
Cornell Lab of Ornithology, Cornell University

GLOBAL REACH, LOCAL IMPACT



eBird

RELATIVE ABUNDANCE



Canada Warbler

Cardellina canadensis

Abundance

Estimates of relative abundance for every week of the year animated to show movement patterns. Relative abundance is the estimated average count of individuals detected by an eBirder during a 1 hour, 1 kilometer traveling checklist at the optimal time of day for each species.

Weekly relative abundance



Week of the year 4 Jan



Modeled area (0 abundance)
No prediction

eBird data from 2008-2022. Estimated for 2022.

Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, S. Ligoeki, O. Robinson, W. Hochachka, L. Jaromczyk, C. Crowley, K. Dunham, A. Stillman, I. Davies, A. Rodewald, V. Ruiz-Gutierrez, C. Wood. 2023. eBird Status and Trends, Data Version: 2022; Released: 2023. Cornell Lab of Ornithology, Ithaca, New York. <https://doi.org/10.2173/ebirdst.2022>

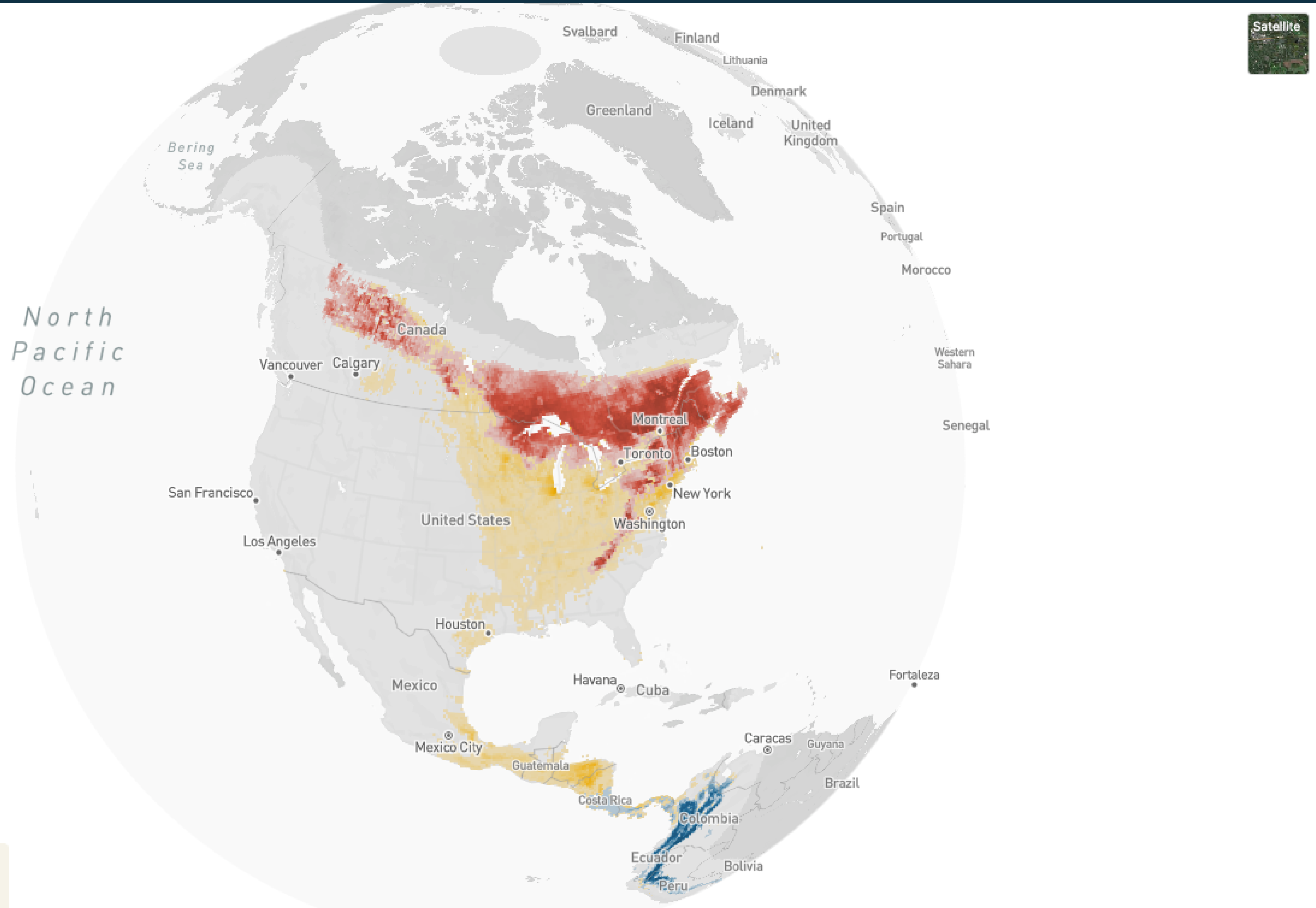
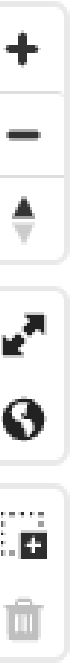
SEASONAL ABUNDANCE MAPS

Status and Trends > All species

Canada Warbler *Cardellina canadensis*

Abundance Weekly Trends Range

Static map Downloads



Learn more

Breeding season 14 Jun - 26 Jul

Non-breeding season 29 Nov - 15 Mar

Pre-breeding migratory season 22 Mar - 7 Jun

Post-breeding migratory season 2 Aug - 22 Nov

0 0.06 0.38

Layer opacity

Seasons timeline

J F M A M J J A S O N D

Regional stats

Countries, territories, and dependencies

United States

Subregions

Massachusetts

Stats ?	Non	Pre	Bre	Pos
Mean relative abundance	--	0.06	0.03	0.02
Percent of seasonal modeled population	--	0.8%	0.3%	0.3%
Percent of region occupied	--	81%	19%	62%
Percent of modeled range in region	--	0.6%	0.3%	0.4%
Days of occupation in region	--	35	49	56

WEEKLY RELATIVE ABUNDANCE

Status and Trends > All species

Canada Warbler *Cardellina canadensis*

Abundance

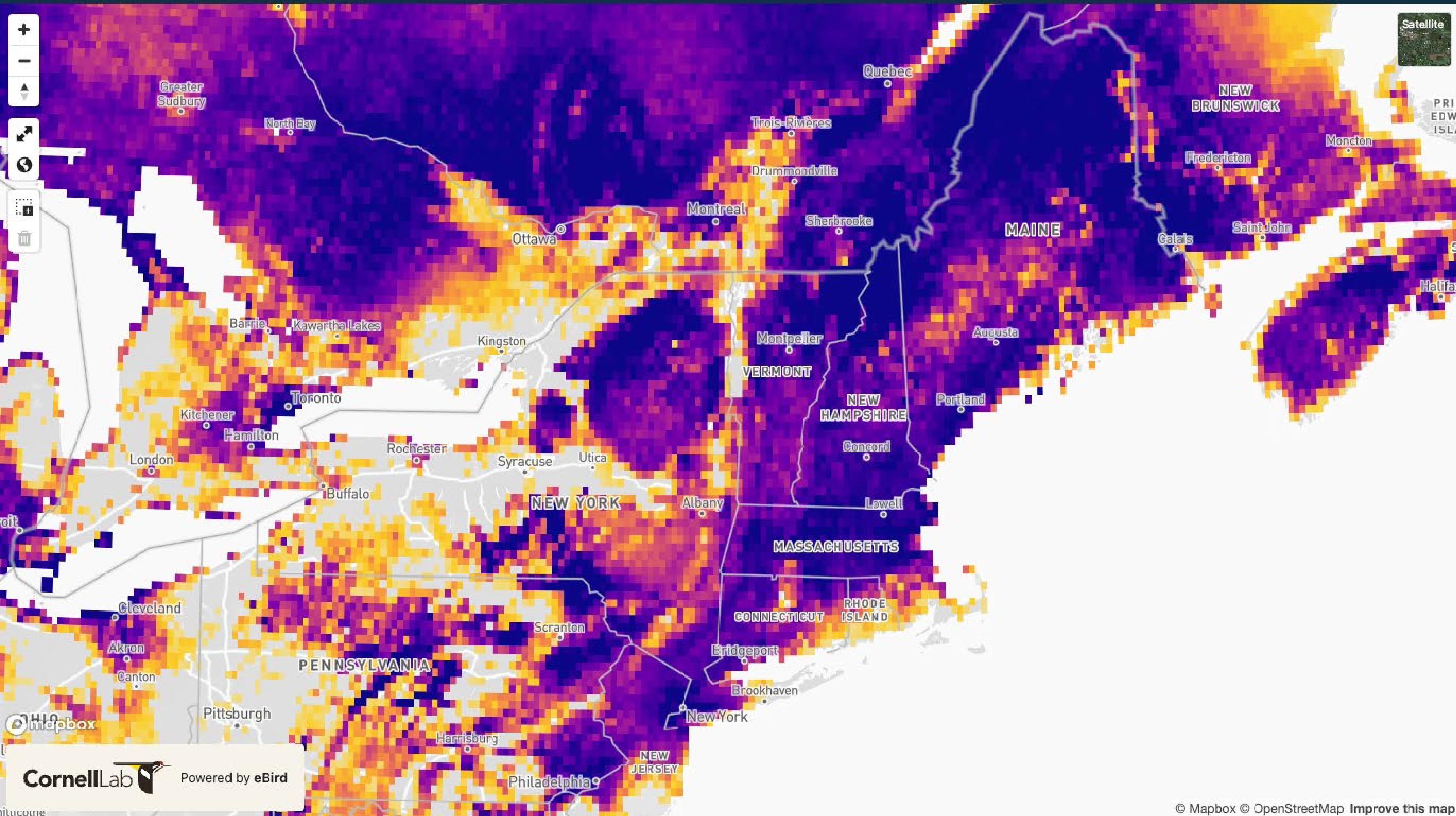
Weekly

Trends

Range

Static map

Downloads



Estimates of relative abundance for every week of the year animated to show movement patterns. Relative abundance is the estimated average count of...

[Learn more](#)

Weekly relative abundance



Layer opacity

Week of the year 24 May



0.25 sec

24 May

Custom shapes stats [Options](#)

Draw a shape on the map to generate a summary table or chart for that custom area of interest.

[Draw shape](#)

- Modeled area (0 abundance) [?](#)
- No prediction
- Hide map pop-up on hover
- Preserve map location on species change

eBird data from 2008-2022. Estimated for 2022.
Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, S. Ligocki, O. Robinson, W. Hochachka, L. Jaromczyk, C. Crowley, K. Dunham, A. Stillman, I. Davies, A. Rodewald, V. Ruiz-Gutierrez, C. Wood. 2023. eBird Status and Trends, Data Version: 2022; Released: 2023. Cornell Lab of Ornithology, Ithaca, New York. <https://doi.org/10.2173/ebirdst.2022>

TREND MAPS 2012-2022

Status and Trends > All species

Canada Warbler *Cardellina canadensis*

Abundance

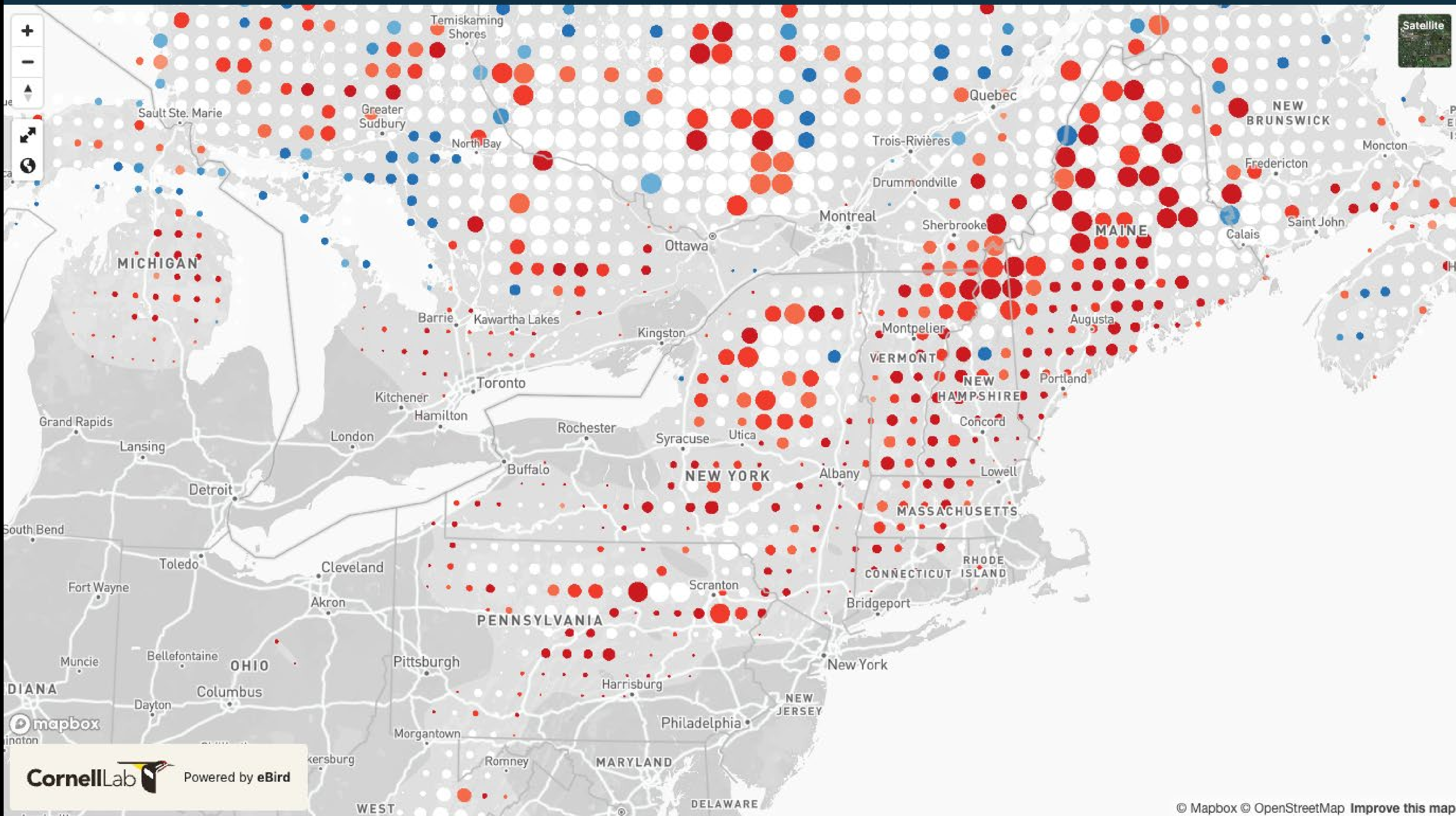
Weekly

Trends

Range

Static map

Downloads



This map depicts the cumulative change in estimated relative abundance from 2012 through 2022 with circles representing 27km x 27km regions. Red indicates decline and blue indicates increase. The darker the color, the stronger the trend. White circles represent locations where the trend estimate is not significantly different from zero (i.e., the 80% confidence interval contains zero). Circle sizes are scaled by the estimated relative abundance at the middle of the time period.

[Learn more](#)

Abundance trend Pct. change, 2012-2022



Show all trends (including those not significantly different from zero)

Relative abundance Middle year of range, 2017



Layer opacity

Regional trend

Countries, territories, and dependencies

United States

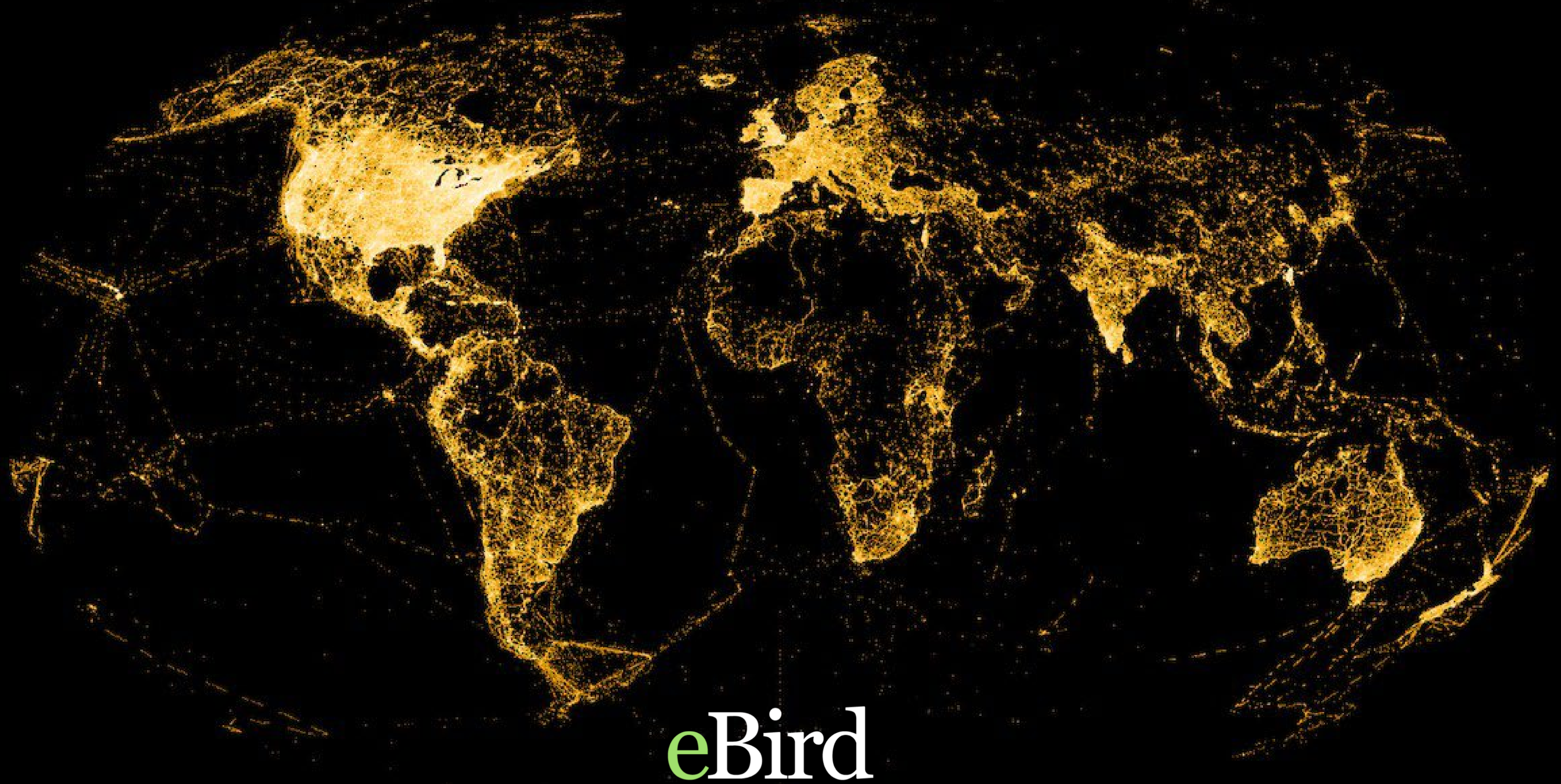
Subregions

Massachusetts

Trend (confidence intervals)

-18.7% Upper
↓ -27.9% Median
-29.4% Lower

APPLICATIONS: USFWS



eBird

WIND ENERGY DEVELOPMENT

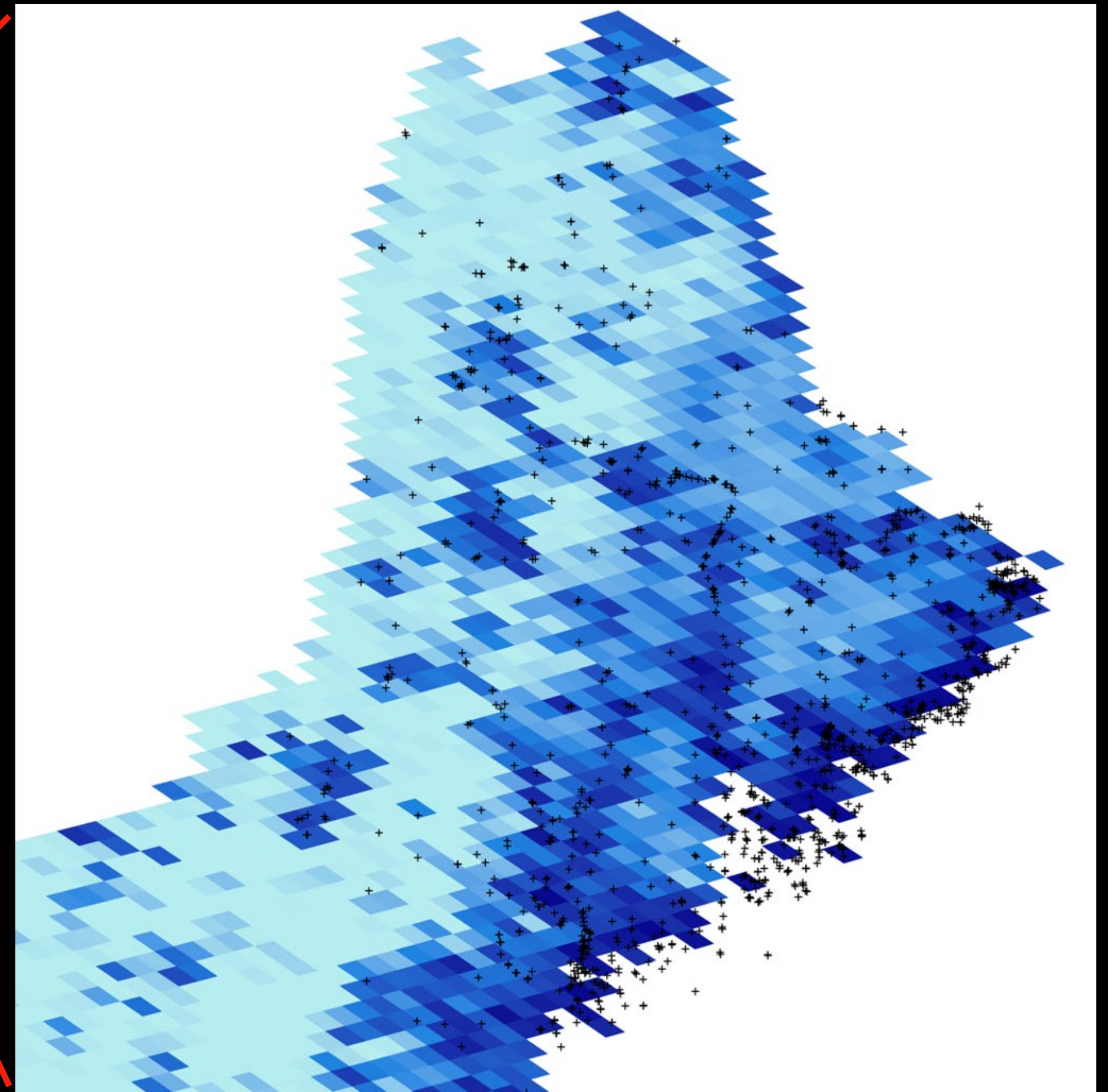
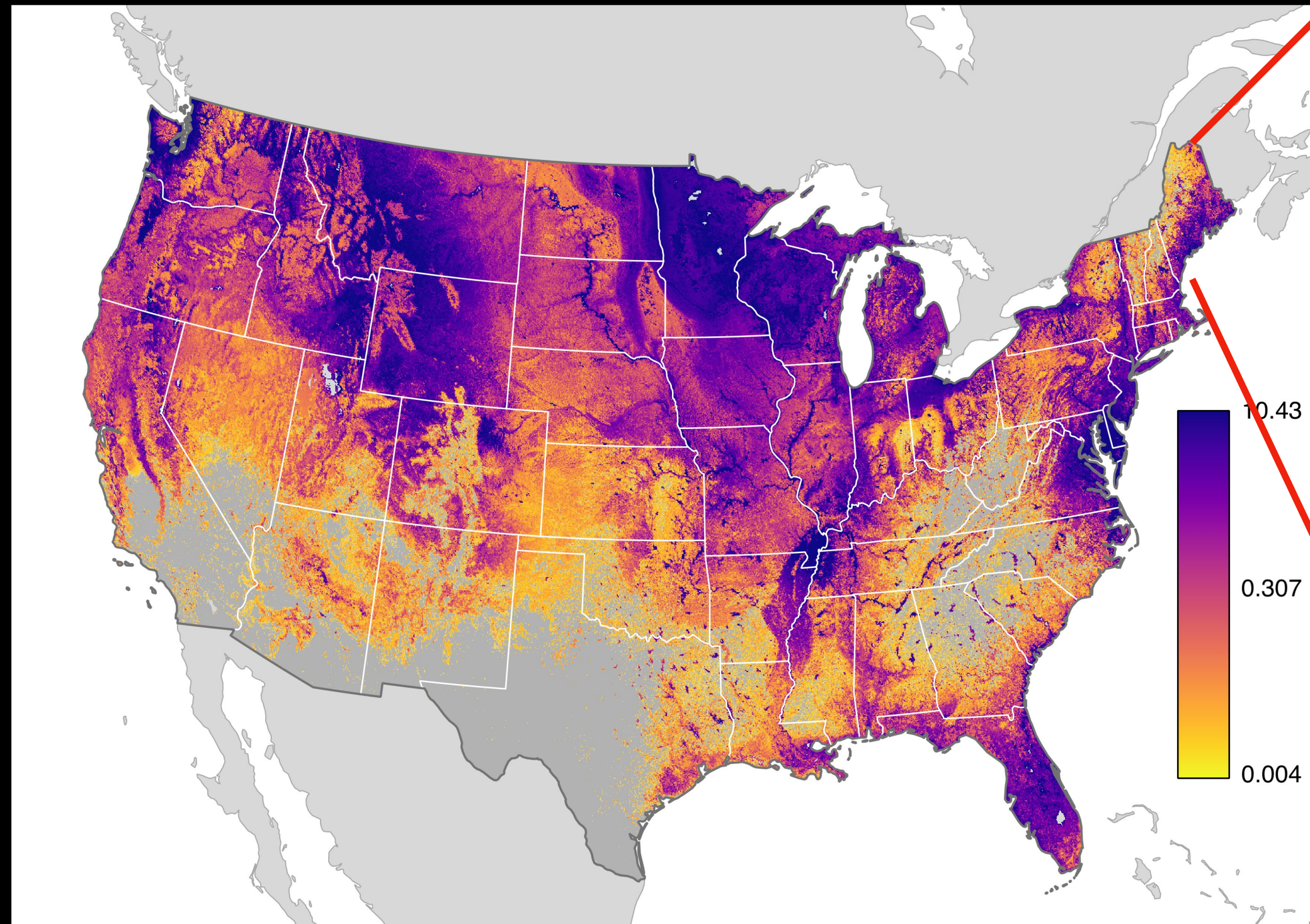




WIND ENERGY DEVELOPMENT

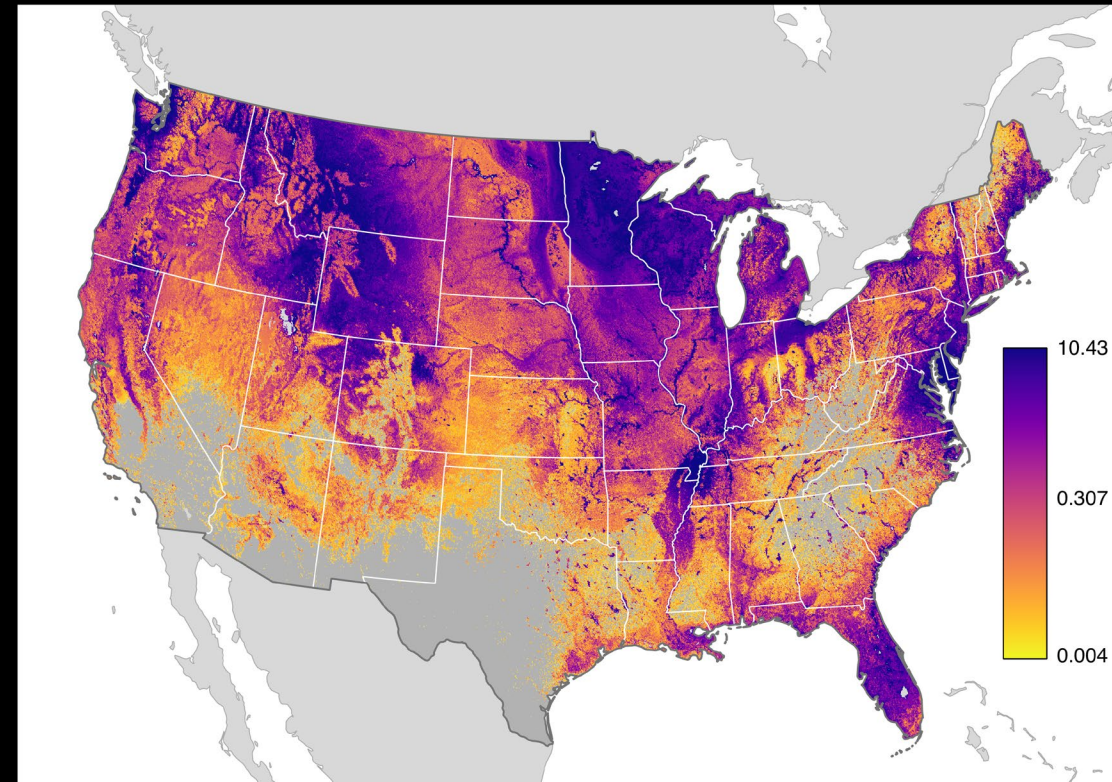


Max annual relative abundance
eBird

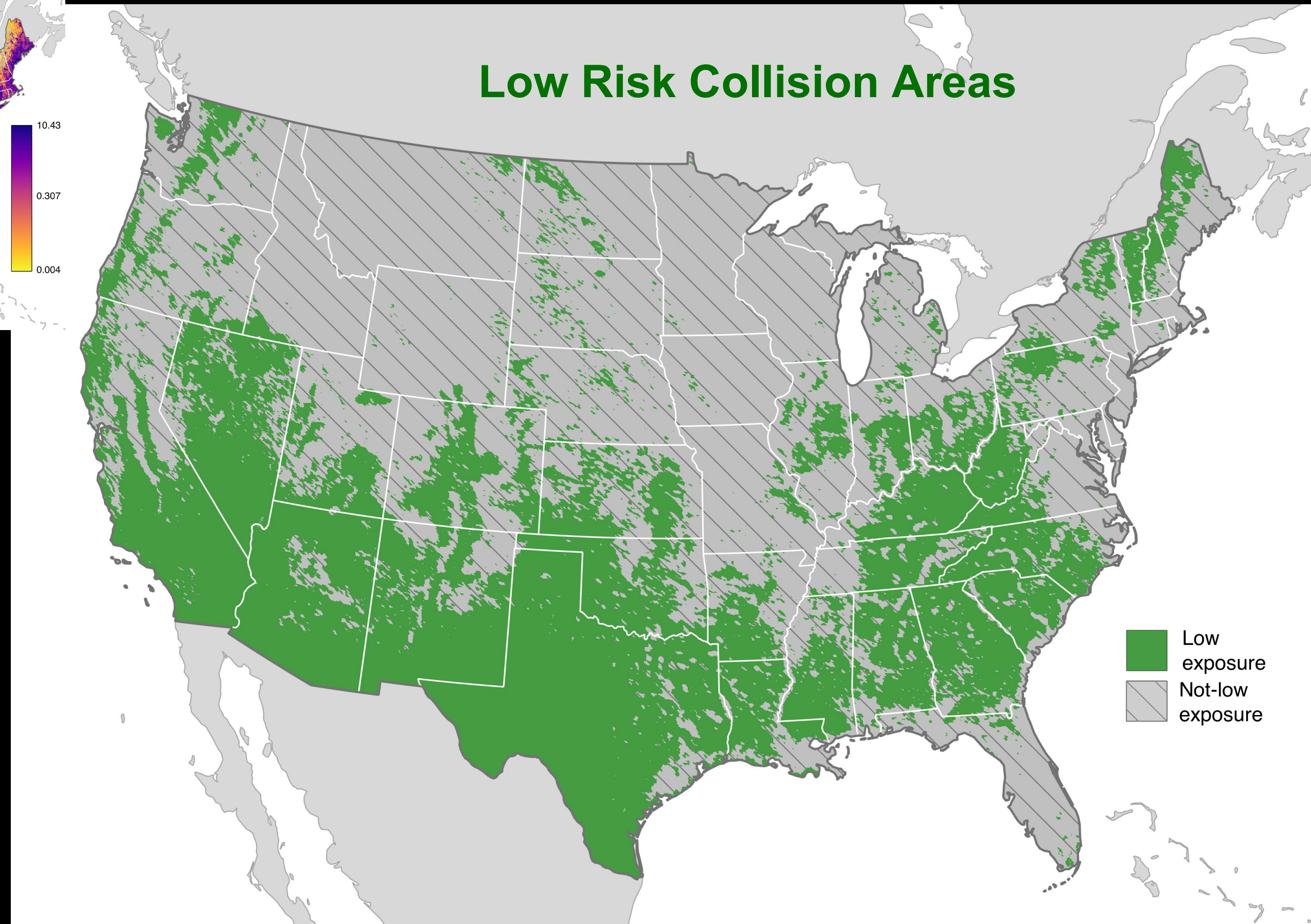


Ruiz-Gutierrez et al, 2021

WIND ENERGY DEVELOPMENT



eBird



POPULATION UPDATE 2020

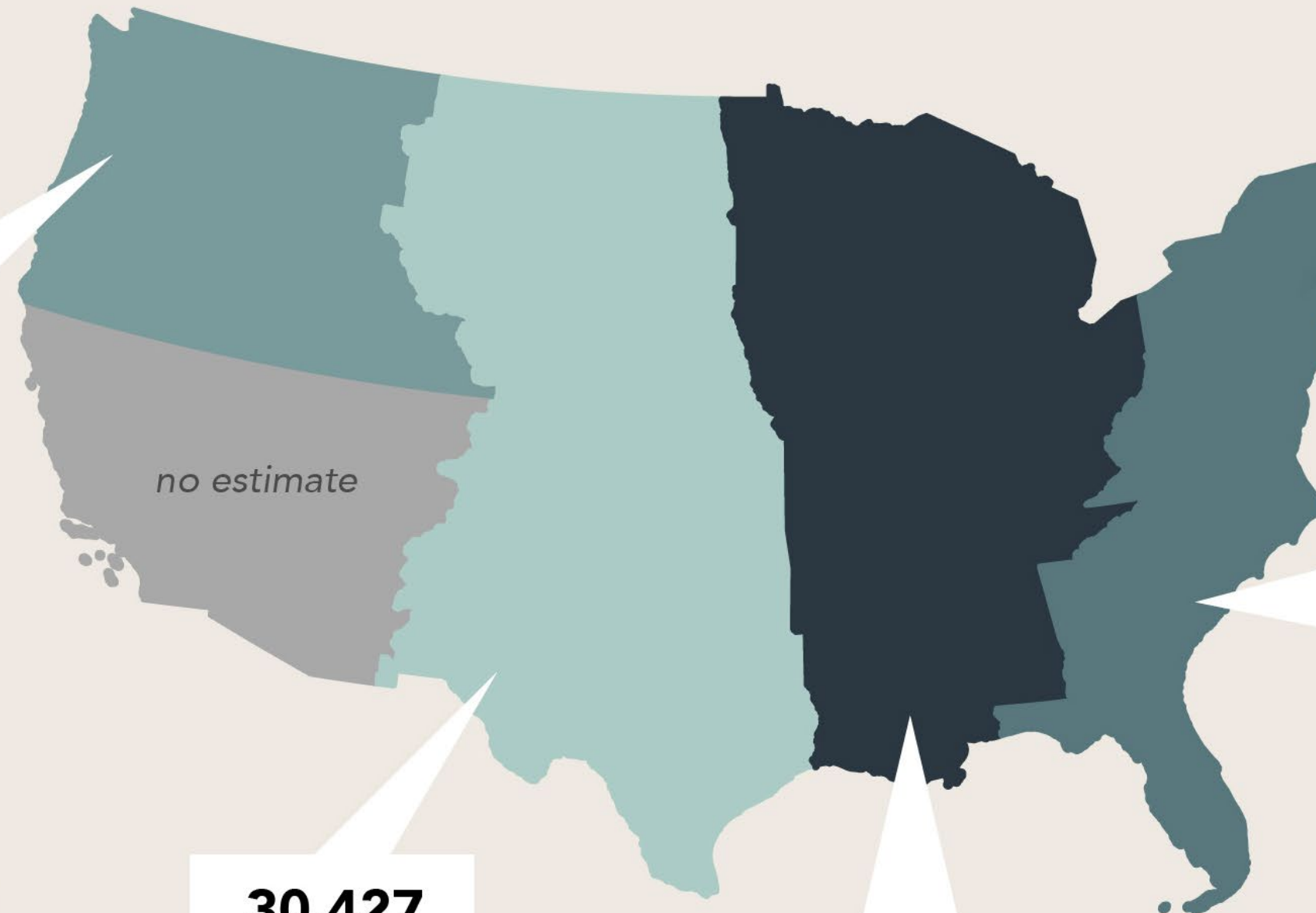


Estimate of population size 2018-2019

316,708
BALD EAGLES



42,068
Pacific (North)
Flyway



84,541
Atlantic Flyway

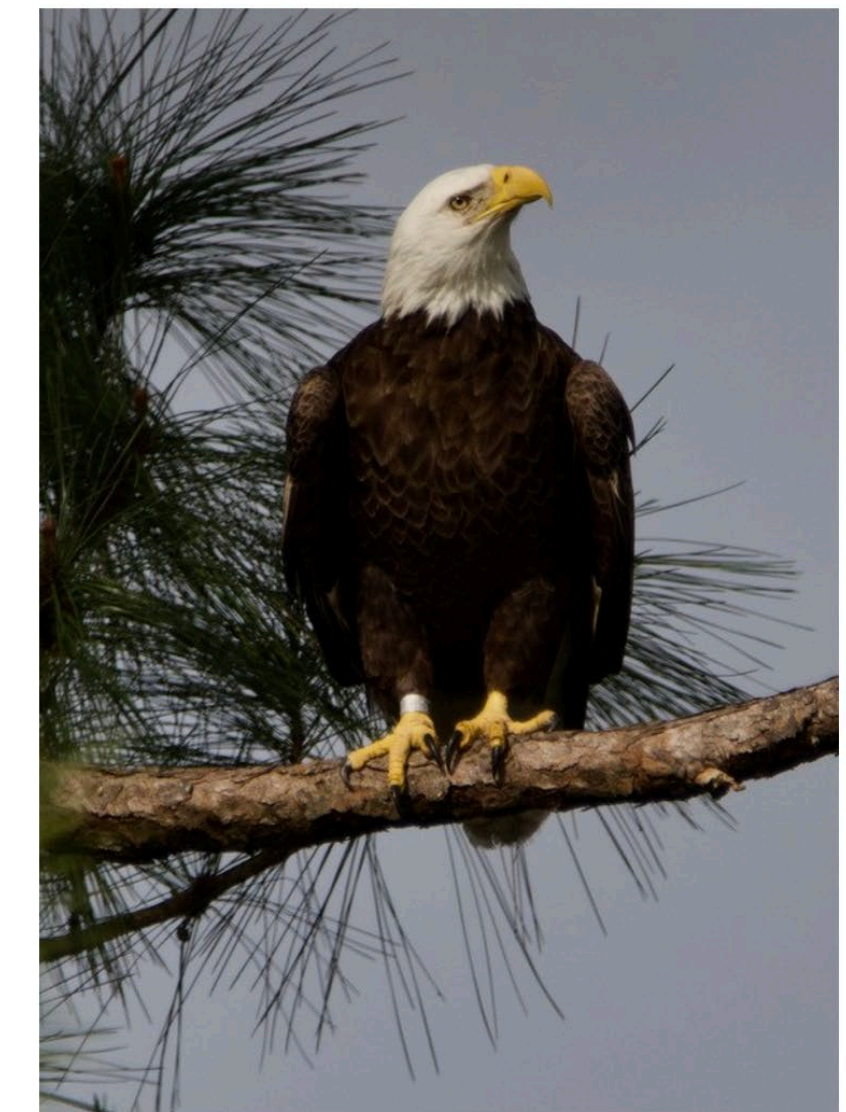
30,427
Central Flyway

159,772
Mississippi Flyway

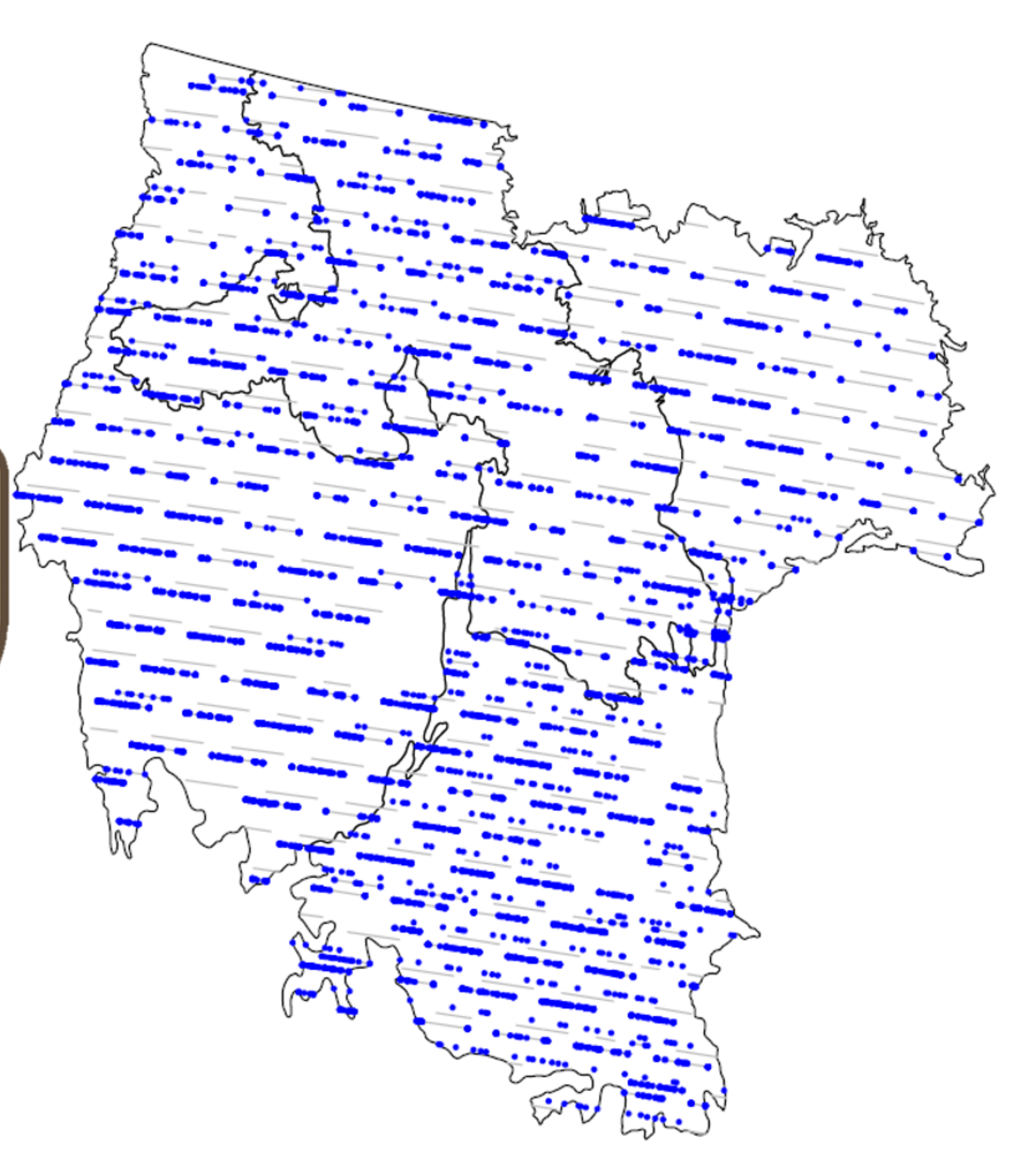
4X
Increase in
10 years based
on population
recovery and new
eBird estimation
methods

U.S. Fish & Wildlife Service

**U.S. Fish and Wildlife Service Final
Report: Bald Eagle Population Size:
2020 Update**

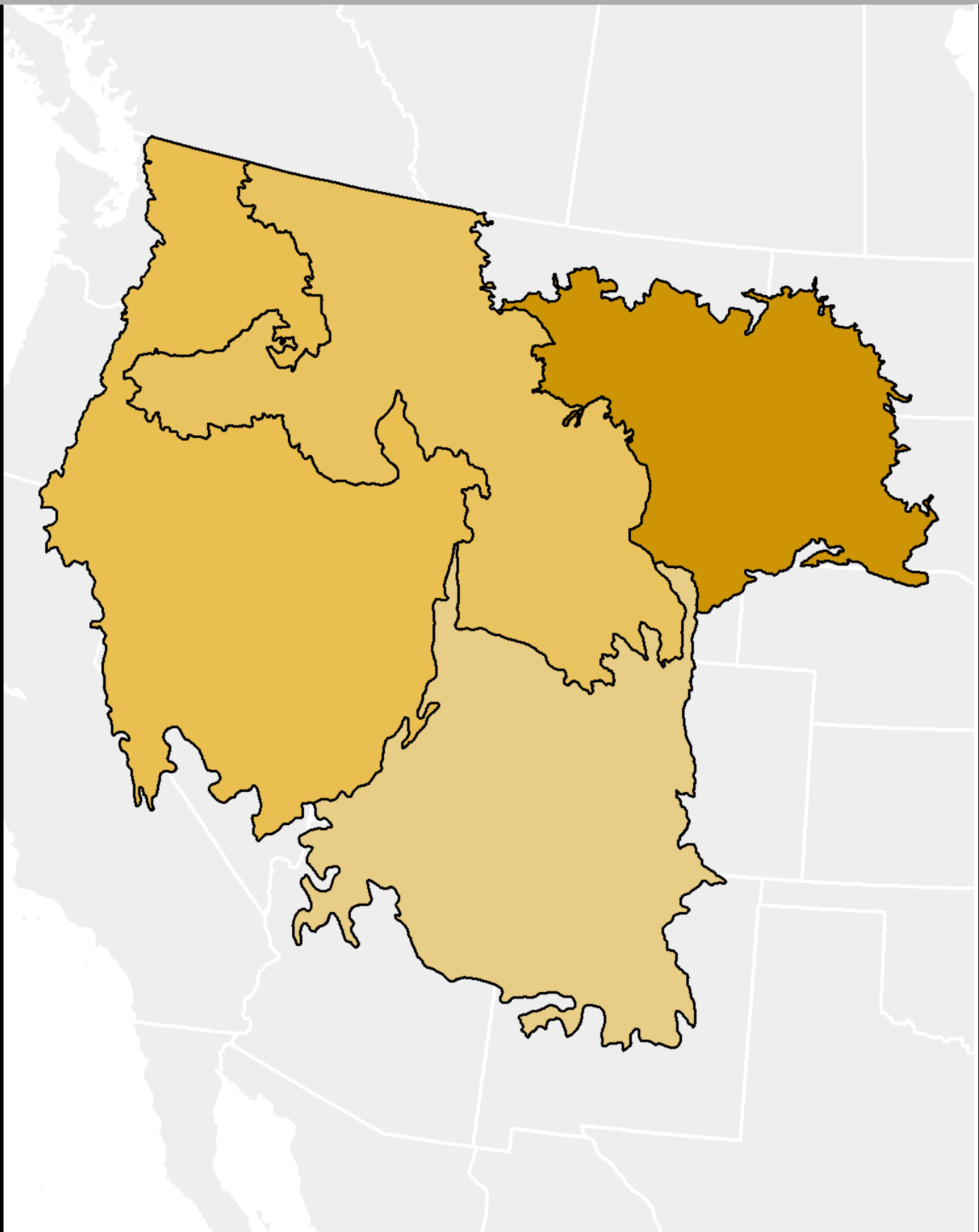


POPULATION SIZE FOR GOLDEN EAGLES

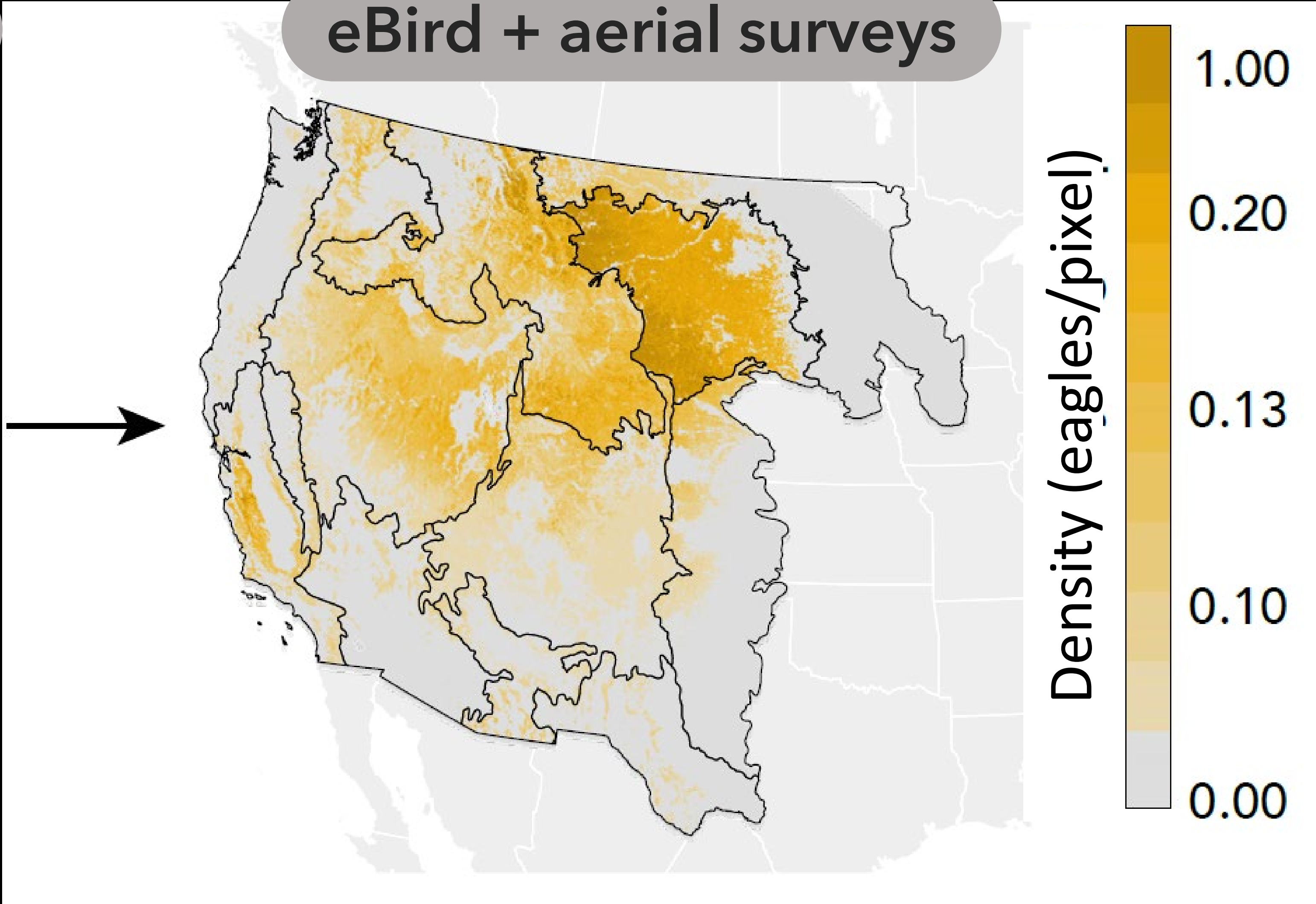


POPULATION SIZE FOR GOLDEN EAGLES

Aerial surveys only



eBird + aerial surveys



Density (eagles/pixel)

1.00

0.20

0.13

0.10

0.00



Permits for Incidental Take of Eagles and Eagle Nests

A Rule by the [Fish and Wildlife Service](#) on 02/12/2024



Eagle Incidental Take Permits for Wind Energy

With this rulemaking, the Service seeks to implement efficiencies in authorizing incidental take associated with wind energy projects. This final rule creates a general permit option for projects in areas that are low risk to eagles. We also revise the specific permit process to provide clarity to applicants and ensure processing is efficient and consistent with the preservation standard. With broader participation in permitting, the Service anticipates increased benefits to eagle populations as more projects implement avoidance, minimization, and mitigation measures.

The Service uses a combination of eagle relative abundance and proximity to eagle nests as eligibility criteria for wind energy general permits. The Service uses the Cornell Status and Trends definition of relative abundance and relative abundance products (Cornell Lab of Ornithology, Ithaca, New York, available at: <https://science.ebird.org/en/status-and-trends>). Relative abundance values determined for a project must be based on these publicly available Status and Trends relative abundance products for bald eagles and golden eagles. To help project proponents quickly determine eagle relative abundance, the Service will maintain an online mapping tool (<https://areg.is/CKLKy1>).

DOCUMENT DETAILS

Printed version:

[PDF](#)

Publication Date:

02/12/2024

Agencies:

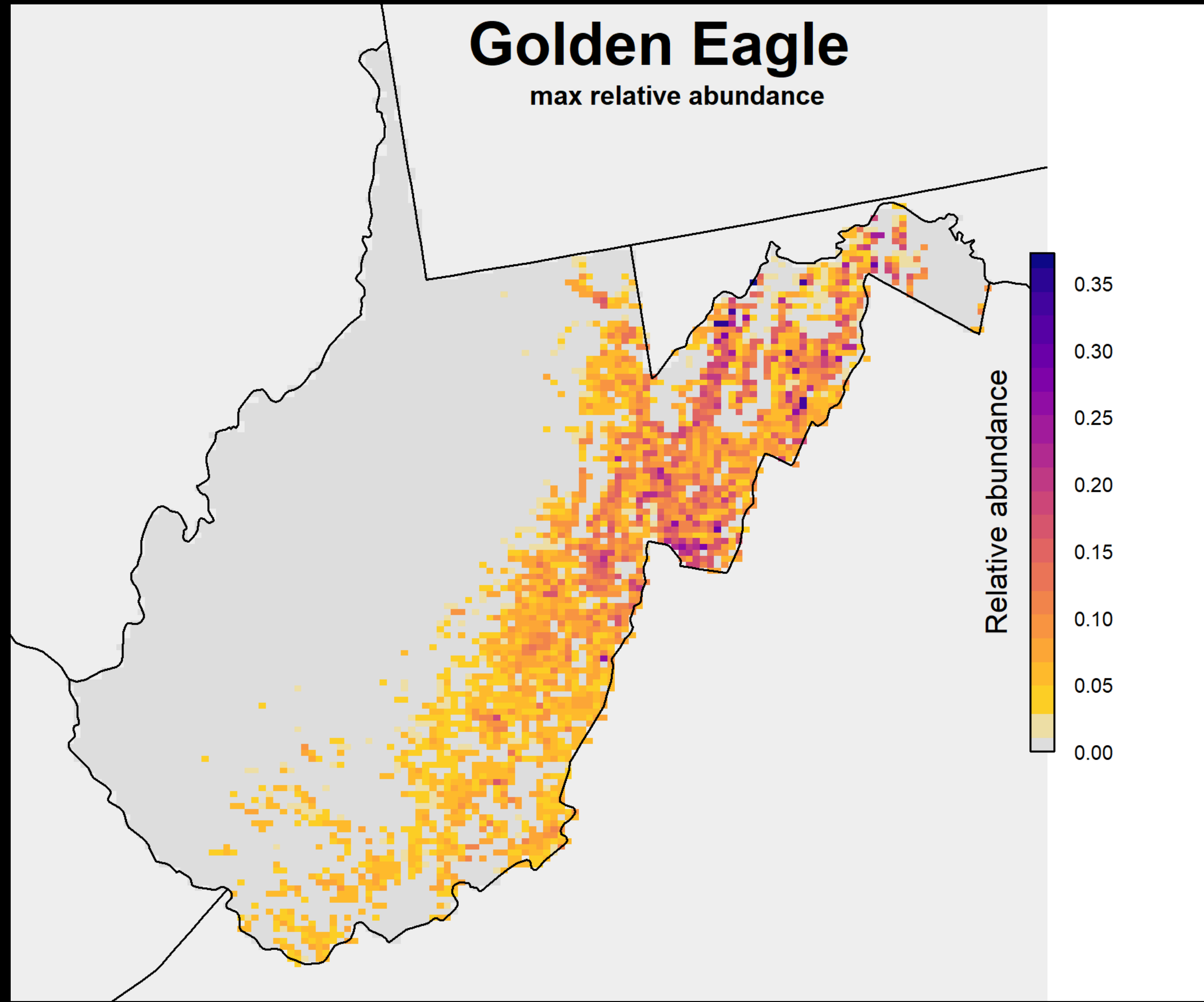
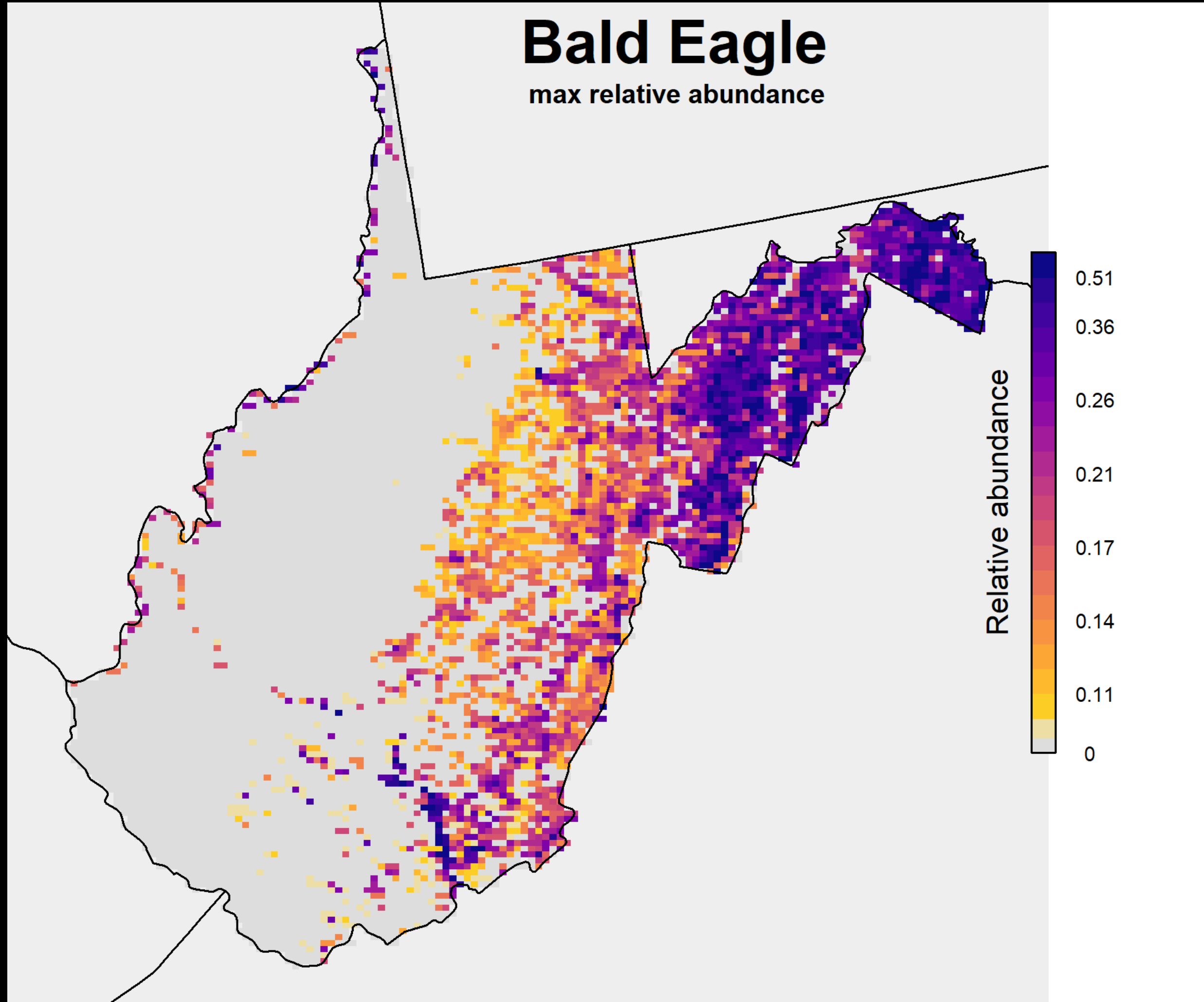
[Department of the Interior](#)
[Fish and Wildlife Service](#)

Dates:

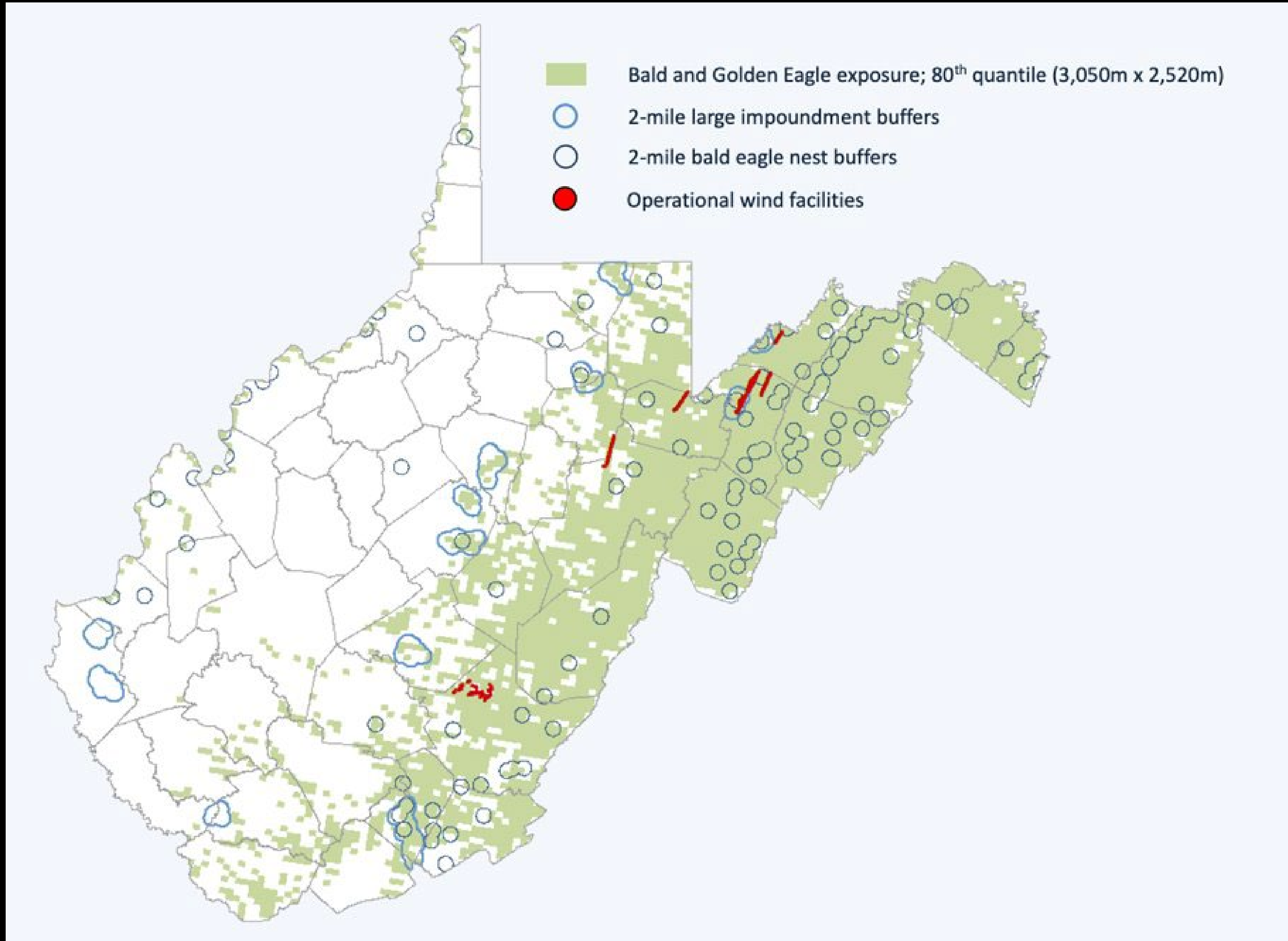
Effective April 12, 2024.



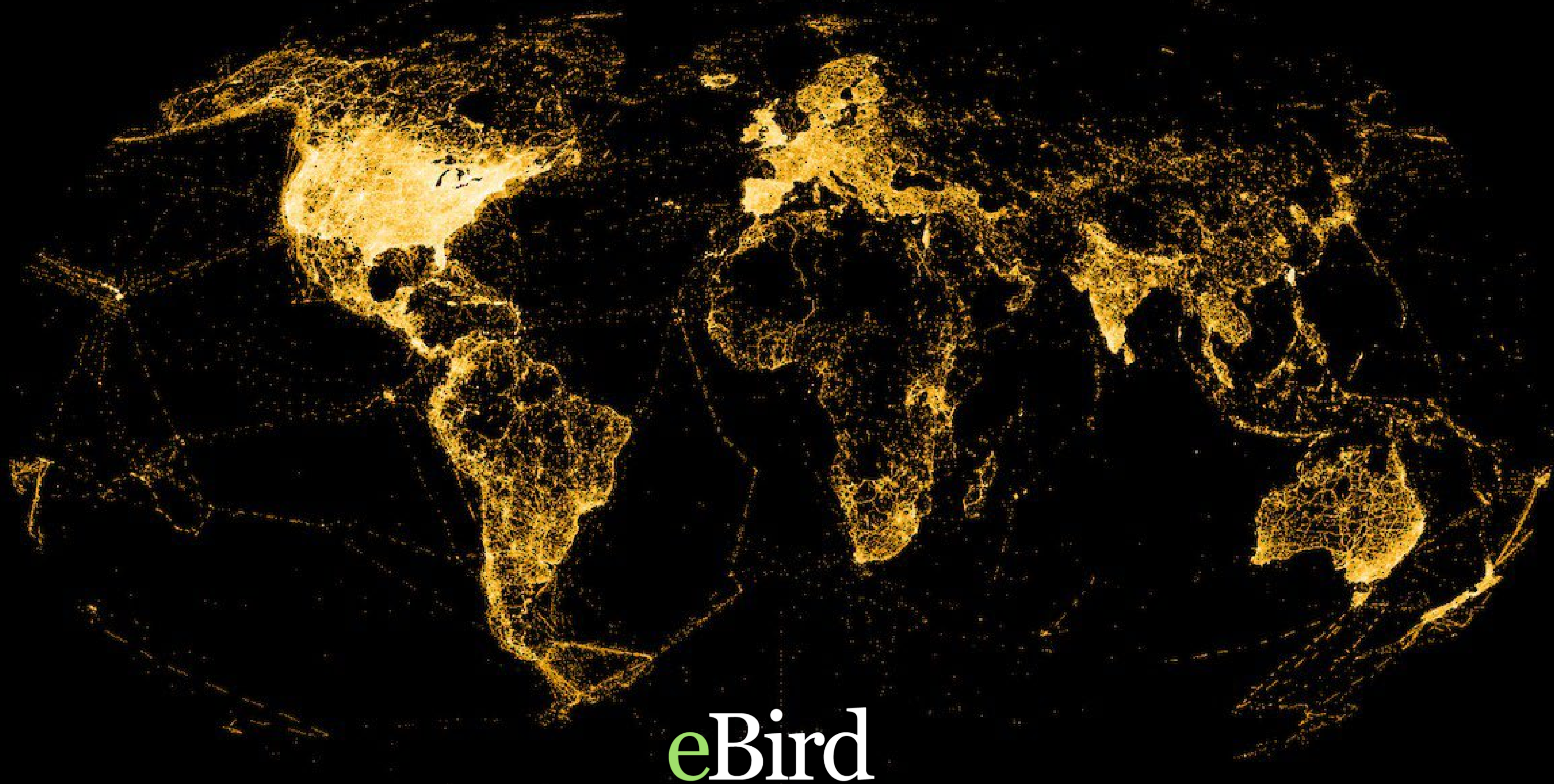
PROTECTING BALD AND GOLDEN EAGLES



IMPACT ASSESSMENTS FOR DEVELOPMENT



ACCESS TO DATA PRODUCTS



eBird

DOWNLOADS

Data Products

Relative abundance: 624 US (2,424 World)
3x3 km
Weekly and summaries
Standardized across species
Metrics for CI

Trends: 593 US (856 World)
27 x 27km
Metrics for CI
Past 10yrs

The screenshot shows the eBird website interface for the Canada Warbler (*Cardellina canadensis*). The navigation bar includes links for Submit, Explore, My eBird, Science (highlighted), About, News, and Help. The breadcrumb trail is Status and Trends > All species. The main header for the species page includes the name 'Canada Warbler' and a dropdown menu for *Cardellina canadensis*, with tabs for Abundance, Weekly, Trends, and Range. The 'Abundance' tab is selected, leading to the 'Abundance downloads' section. This section explains that relative abundance is the estimated average count of individuals detected by an eBirder during a 1-hour, 1-kilometer traveling checklist at the optimal time of day. It then lists download options under three categories: 'Abundance map images' (PNG), 'Weekly abundance animation' (MP4), and 'Abundance geospatial data (raster)' (TIF). Each category contains several links for different seasons and metrics (Mean and Max abundance).

Abundance downloads

Relative abundance is the estimated average count of individuals detected by an eBirder during a 1 hour, 1 kilometer traveling checklist at the optimal time of day for each species.

Abundance map images PNG

- [Abundance map \(All seasons\)](#)
- [Abundance map \(Breeding season\)](#)
- [Abundance map \(Non-breeding season\)](#)
- [Abundance map \(Pre-breeding migration season\)](#)
- [Abundance map \(Post-breeding migration season\)](#)

Weekly abundance animation MP4

- [Weekly abundance animation](#)

Abundance geospatial data (raster) TIF

- [Mean abundance raster \(All seasons\)](#)
- [Max abundance raster \(All seasons\)](#)
- [Mean abundance raster \(Breeding season\)](#)
- [Max abundance raster \(Breeding season\)](#)
- [Mean abundance raster \(Non-breeding season\)](#)
- [Max abundance raster \(Non-breeding season\)](#)
- [Mean abundance raster \(Pre-breeding migration season\)](#)
- [Max abundance raster \(Pre-breeding migration season\)](#)
- [Mean abundance raster \(Post-breeding migration season\)](#)
- [Max abundance raster \(Post-breeding migration season\)](#)

U.S. State-Level eBird Data Summaries

An eBird data portal for use in State Wildlife
Action Plans

Get Your State Data



<https://www.birds.cornell.edu/home/us-state-level-conservation-data-summaries/#state-data>

INSTRUCTIONAL VIDEOS

Learn More About the Project



[SHOW TRANSCRIPT](#) +

Introduction to the Project

This is a short introductory video for our project to support the information needs of state wildlife agencies using data and results from eBird. We will introduce the team and share a brief overview of the project. Along the way, we'll share examples of current ways eBird Status and Trends results are applied to conservation and management.

Video by Viviana Ruiz-Gutierrez.



Introduction to eBird Status & Trends Data Products

The eBird Status and Trends (S&T) Project has been working for the past 15 years to develop robust, accurate, and scalable inferences on the occurrence, abundance, distribution, and trends of North American birds. Currently, the S&T project has generated estimates of relative abundance for every week of the year, at high

DATA DOWNLOAD PAGE

Data by State

Click the links to **download zipped files** of helpful eBird data by state

U.S. State	Download eBird State Table Data	Download All eBird State Data
Alabama	Alabama Tabular Data Summary	Alabama All data
Alaska	Alaska Tabular Data Summary	Alaska All Data
Arizona	Arizona Tabular Data Summary	Arizona All Data
Arkansas	Arkansas Tabular Data Summary	Arkansas All Data
California	California Tabular Data Summary	California All Data
Colorado	Colorado Tabular Data Summary	Colorado All Data
Connecticut	Connecticut Tabular Data Summary	Connecticut All Data
Delaware	Delaware Tabular Data Summary	Delaware All Data
Florida	Florida Tabular Data Summary	Florida All Data
Georgia	Georgia Tabular Data Summary	Georgia All Data
Hawaii	Hawaii Tabular Data Summary	Hawaii All Data

EXAMPLE OF AVAILABLE DATA

Passeriformes > Passerellidae

Saltmarsh Sparrow

Ammospiza caudacuta

EN Endangered



SEEN PHOTO AUDIO YEAR



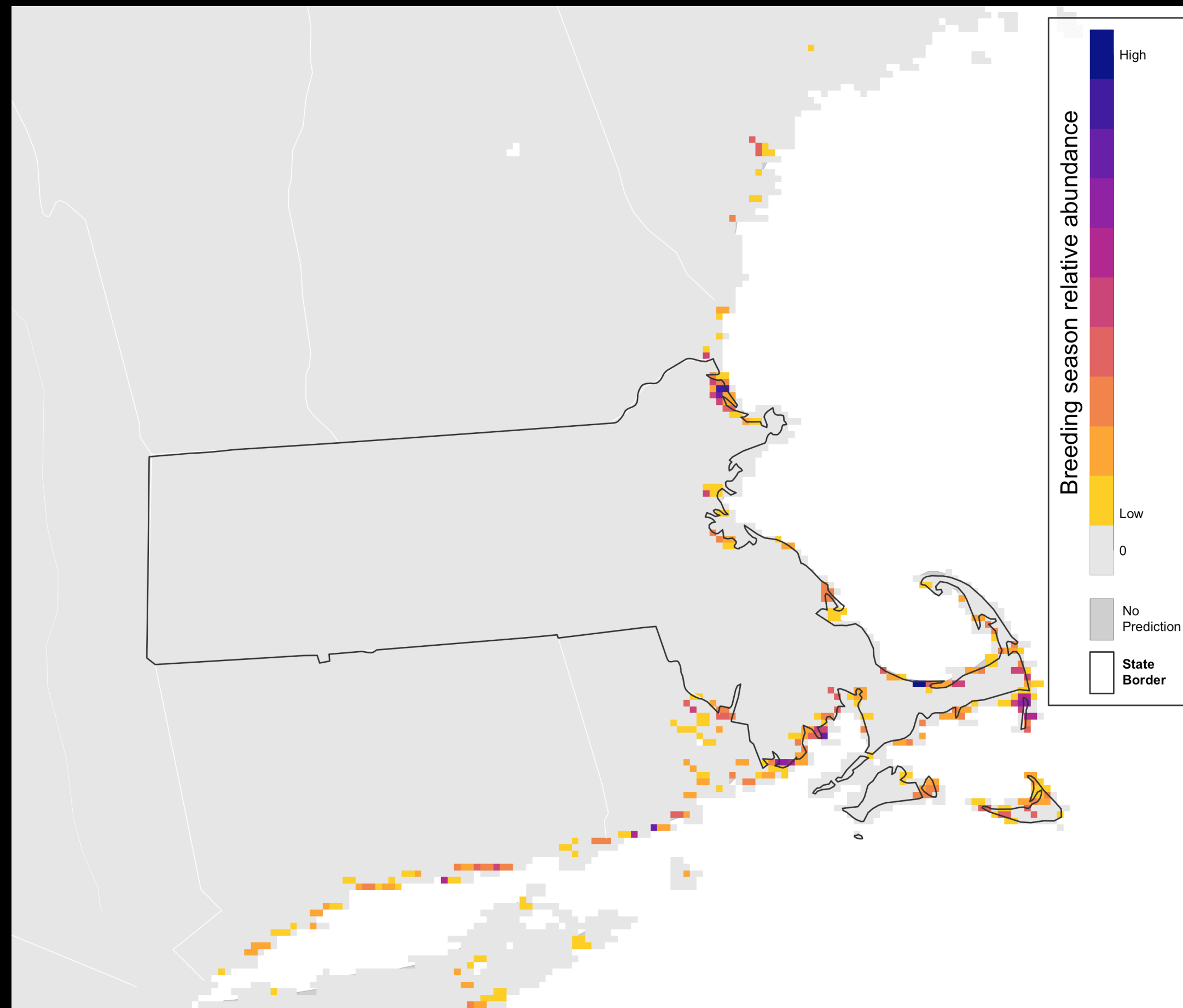
ADULT © Evan Lipton eBird 537508971 Macaulay Library ML 60716171

EBIRD STATE TABLE DATA

status_and_trends_MA					
species	swap	sgcn	pct_brd_pop	max_week_pct_pop	max_abd_week
Saltmarsh Sparrow	NA	1	18.0848917	19.2025394	28
Piping Plover	NA	1	5.0813385	6.3375138	29
Blue-winged Warbler	NA	1	4.3564063	2.8067703	19
Virginia Rail	NA	1	3.3866494	6.3899955	19
Roseate Tern	NA	1	2.4530389	13.8489971	32
American Woodcock	NA	1	2.3938261	2.5296891	11
Prairie Warbler	NA	1	2.3264965	2.4398006	19

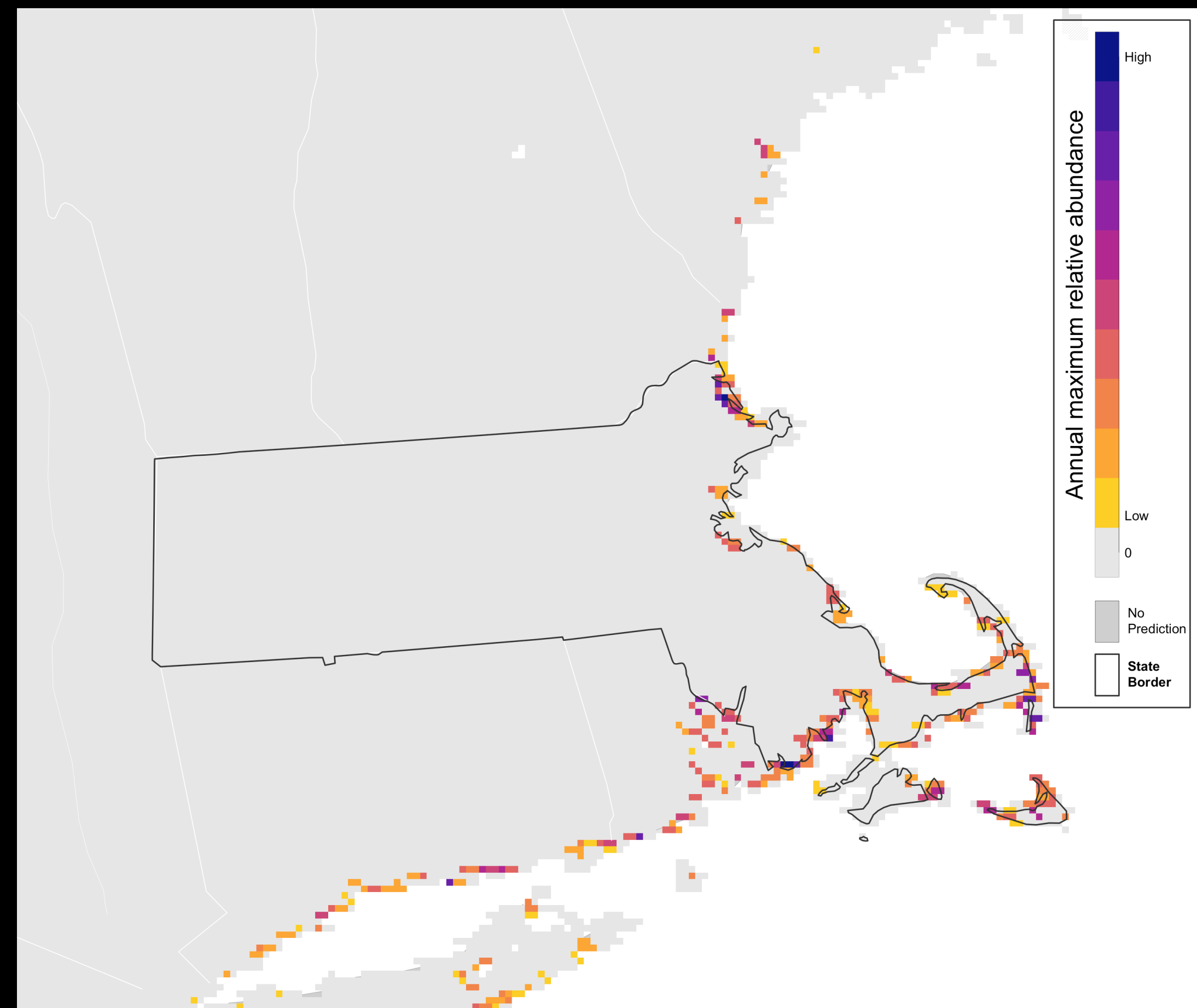
Column	Interpretation
pct_brd_pop	Percent of the population in North America that is found in the state during the breeding season
max_week_pct_pop	The maximum. Year-round value of percent of the population in North America that is found in the state
max_abd_week	The week of the year where we find the maximum percentage of the population in the state

EBIRD STATE VISUALIZATIONS



Massachusetts - Saltmarsh Sparrow

18.08% of modeled population (breeding season)



Massachusetts - Saltmarsh Sparrow

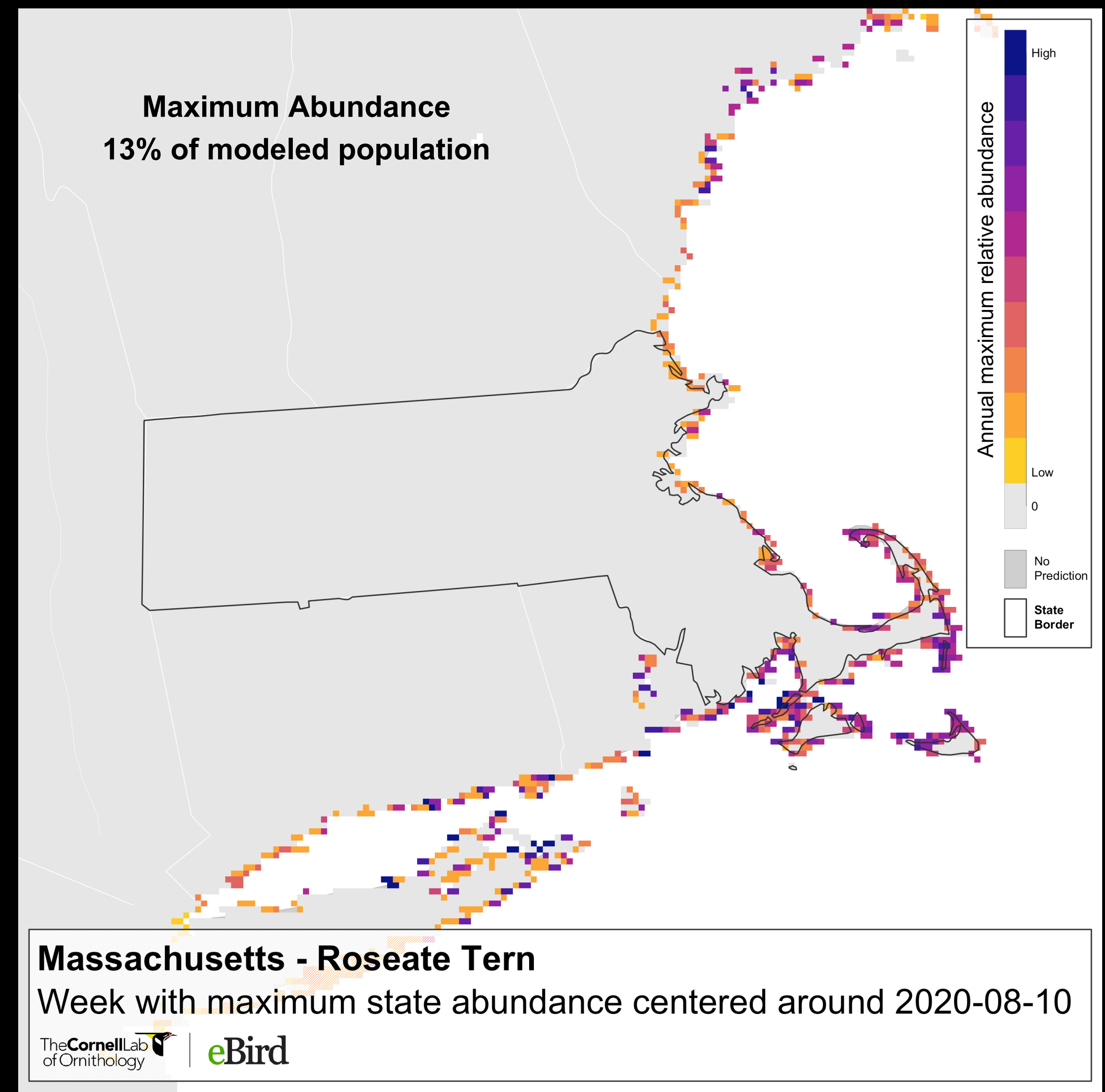
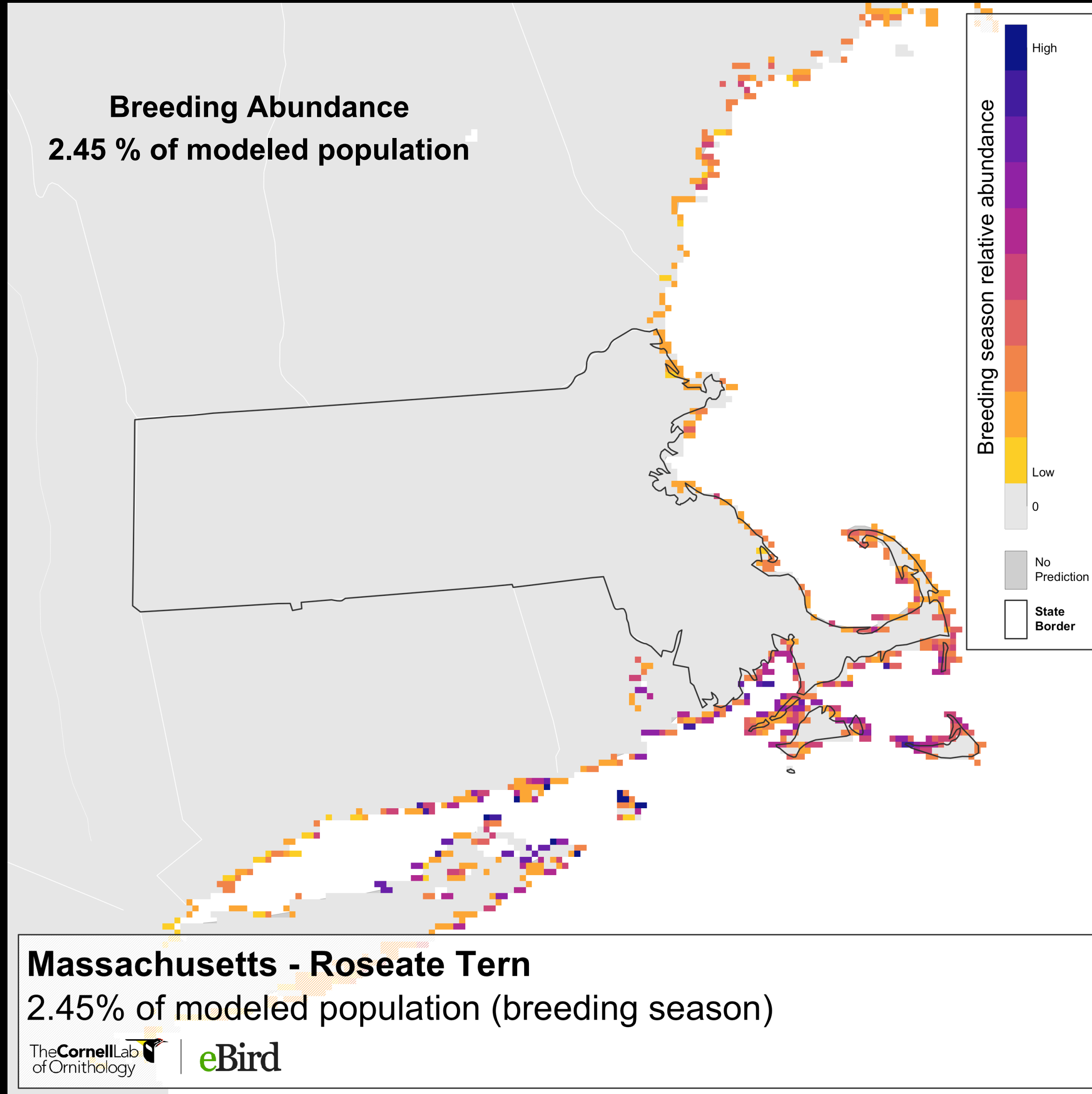
Week with maximum state abundance centered around 2020-07-13

EBIRD STATE TABLE DATA

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species	swap	sgcn	pct_brd_pop	max_week_pct_pop	max_abd_week
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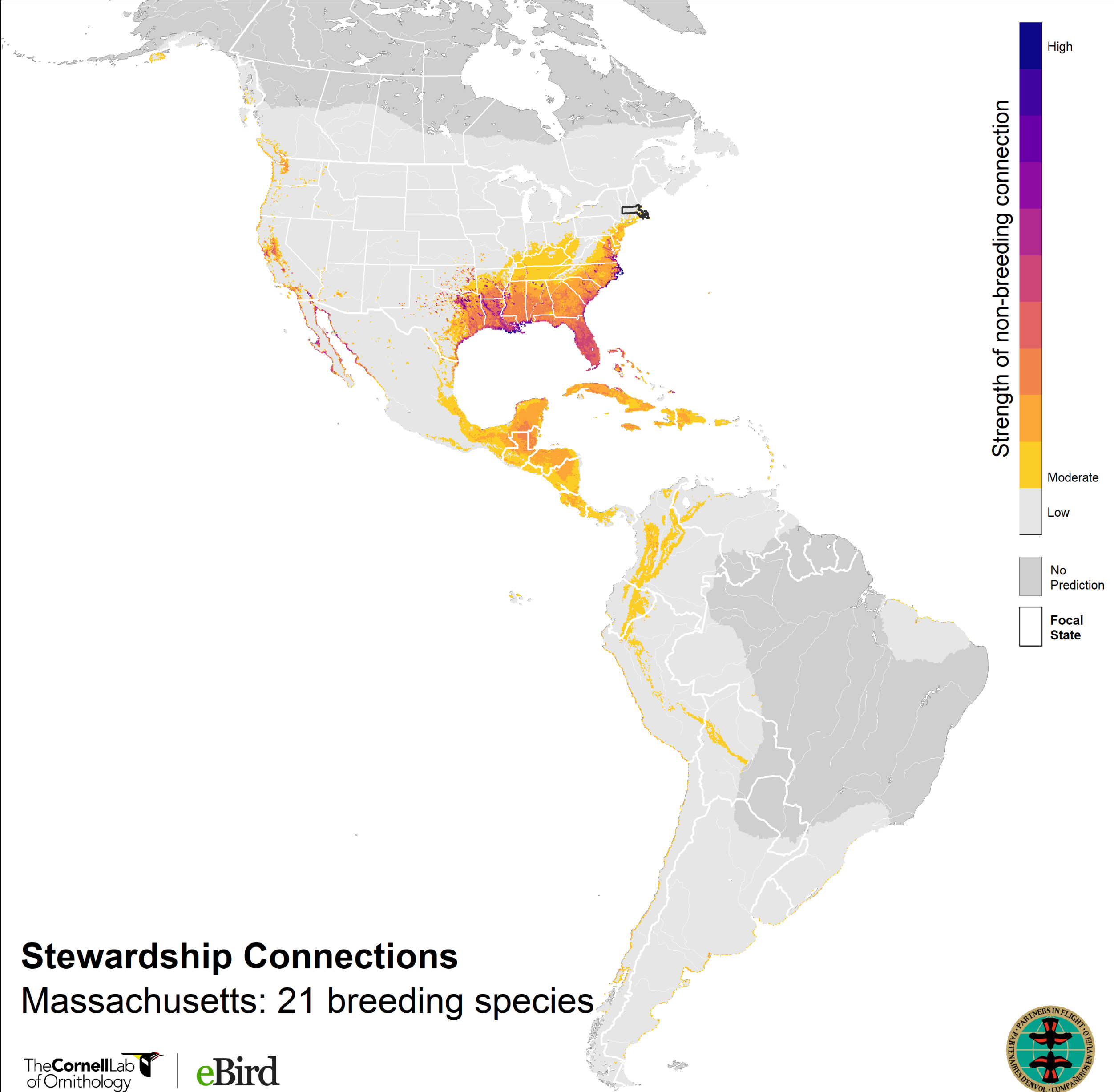
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EBIRD STATE VISUALIZATIONS



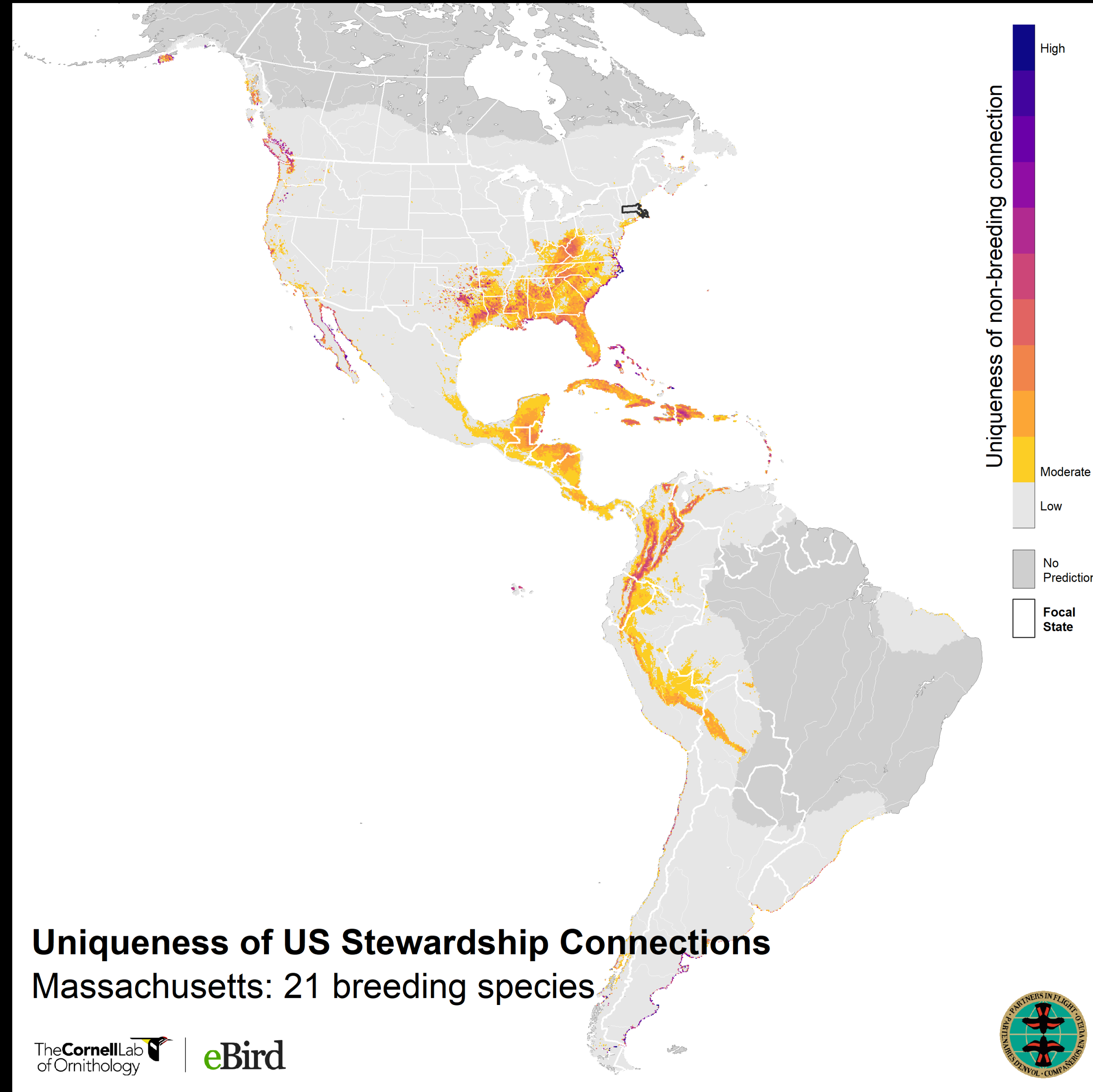
SHARED STEWARDSHIP CONNECTIONS

common name
Wood Duck
American Oystercatcher
Piping Plover
American Woodcock
Double-crested Cormorant
Broad-winged Hawk
Gray Catbird
Wood Thrush
Saltmarsh Sparrow
Eastern Towhee
Baltimore Oriole
Ovenbird
Worm-eating Warbler
Louisiana Waterthrush
Blue-winged Warbler
Blackburnian Warbler
Black-throated Blue Warbler
Pine Warbler
Prairie Warbler
Scarlet Tanager
Rose-breasted Grosbeak

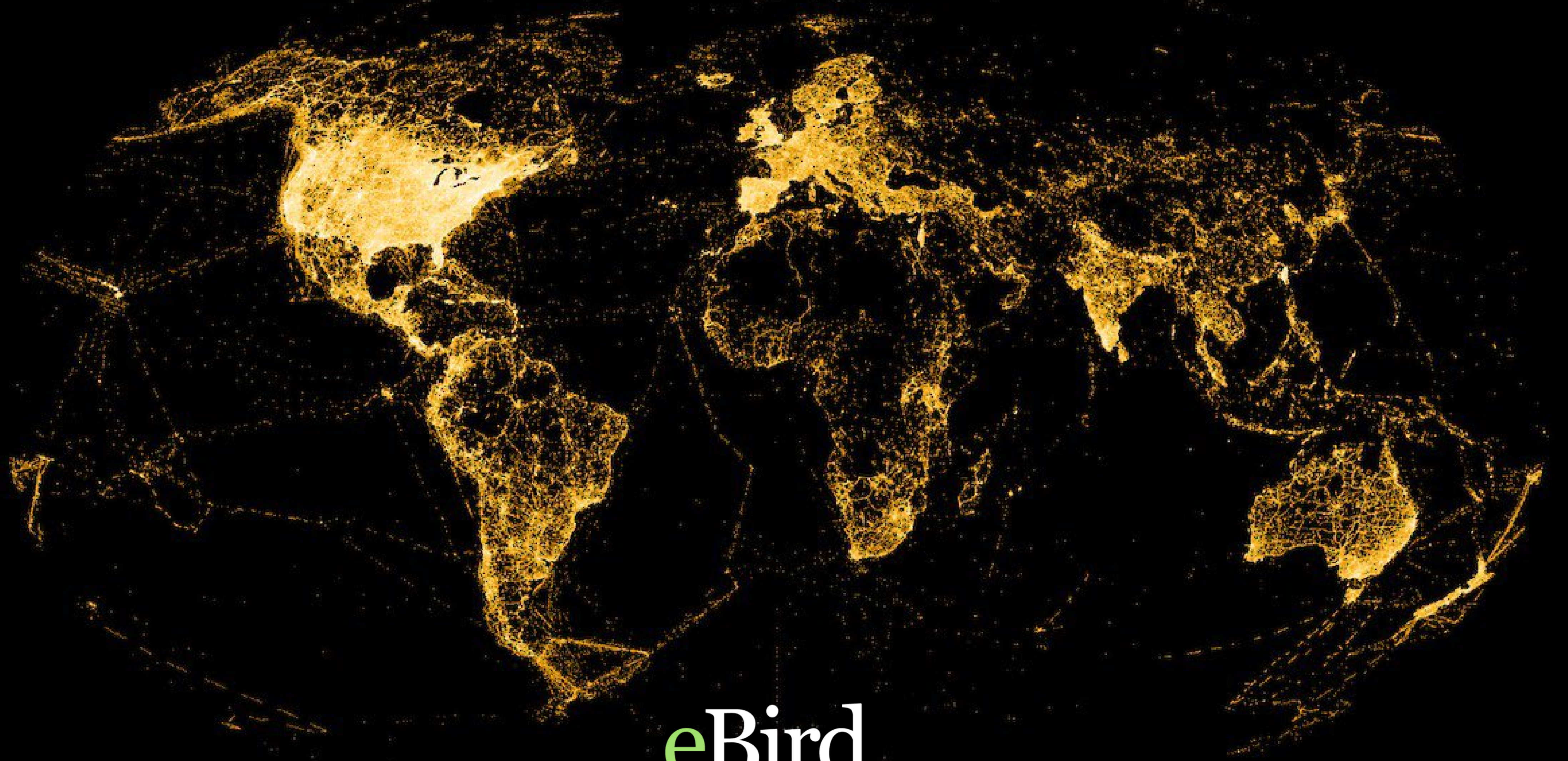


SHARED STEWARDSHIP CONNECTIONS

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Wood Duck
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Baltimore Oriole
Ovenbird
Worm-eating Warbler
Louisiana Waterthrush
Blue-winged Warbler
Blackburnian Warbler
Black-throated Blue Warbler
Pine Warbler
Prairie Warbler
Scarlet Tanager
Rose-breasted Grosbeak



NEXT STEPS




eBird

EBIRD STATE TABLE DATA

Column	Interpretation
pct_brd_pop	Percent of the population in North America that is found in the state during the breeding season
max_week_pct_pop	The maximum. Year-round value of percent of the population in North America that is found in the state
max_abd_week	The week of the year where we find the maximum percentage of the population in the state
reg_trend	Regional population trend 2002-2022
st_trend	Mean population trend for the State 2002-2022
Hab_assoc	Habitat association for each species
Other?	

EBIRD STATE TABLE DATA

 **eBird** [Submit](#) [Explore](#) [My eBird](#) [Science](#) [About](#) [News](#) [Help](#)

Status and Trends > All species

Canada Warbler *Cardellina canadensis* [Abundance](#) [Weekly](#) [Trends](#) [Range](#)

Abundance downloads

Relative abundance is the estimated average count of individuals detected by an eBirder during a 1 hour, 1 kilometer traveling checklist at the optimal time of day for each species.

Abundance map images PNG

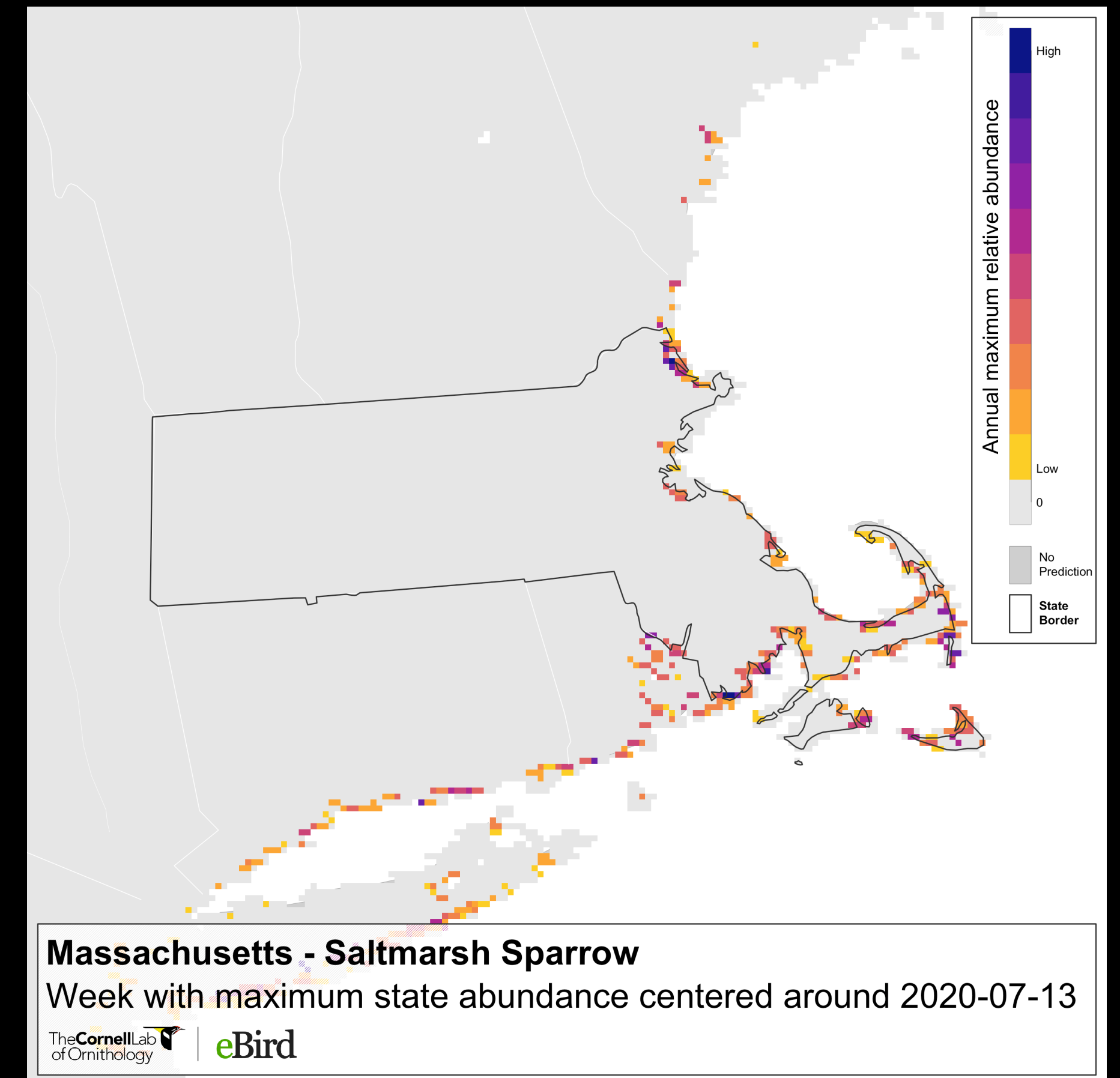
- [Abundance map \(All seasons\)](#)
- [Abundance map \(Breeding season\)](#)
- [Abundance map \(Non-breeding season\)](#)
- [Abundance map \(Pre-breeding migration season\)](#)
- [Abundance map \(Post-breeding migration season\)](#)

Weekly abundance animation MP4

- [Weekly abundance animation](#)

Abundance geospatial data (raster) TIF

- [Mean abundance raster \(All seasons\)](#)
- [Max abundance raster \(All seasons\)](#)
- [Mean abundance raster \(Breeding season\)](#)
- [Max abundance raster \(Breeding season\)](#)
- [Mean abundance raster \(Non-breeding season\)](#)
- [Max abundance raster \(Non-breeding season\)](#)
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- [Max abundance raster \(Pre-breeding migration season\)](#)
- [Mean abundance raster \(Post-breeding migration season\)](#)
- [Max abundance raster \(Post-breeding migration season\)](#)



DATA DOWNLOAD PAGE

Data by State

Click the links to **download zipped files** of helpful eBird data by state

U.S. State	Download eBird State Table Data	Breeding tiff	Max tiff	Images	Stewardship
Alabama	Alabama Tabular Data Summary				
Alaska	Alaska Tabular Data Summary				
Arizona	Arizona Tabular Data Summary				
Arkansas	Arkansas Tabular Data Summary				
California	California Tabular Data Summary				
Colorado	Colorado Tabular Data Summary				
Connecticut	Connecticut Tabular Data Summary				
Delaware	Delaware Tabular Data Summary				
Florida	Florida Tabular Data Summary				
Georgia	Georgia Tabular Data Summary				
Hawaii	Hawaii Tabular Data Summary				

The **Cornell** Lab  of Ornithology

Thank you!

vr45@cornell.edu

Stewardship Connections & Uniqueness of Stewardship Connections Maps



SPECIES SELECTION

- Migratory species with high quality eBird Status and Trends data for both breeding and nonbreeding seasons
 - At least 1% of the species' total breeding population breeds in a given state
 - At least 85% of the breeding population in the state migrates out during the nonbreeding season
- Same folder as maps



Missouri's species list

common_name
Wood Duck
Yellow-billed Cuckoo
Ruby-throated Hummingbird
Green Heron
Mississippi Kite
Broad-winged Hawk
Eastern Wood-Pewee
Acadian Flycatcher
Eastern Phoebe

⋮

STEWARDSHIP CONNECTIONS MAPS

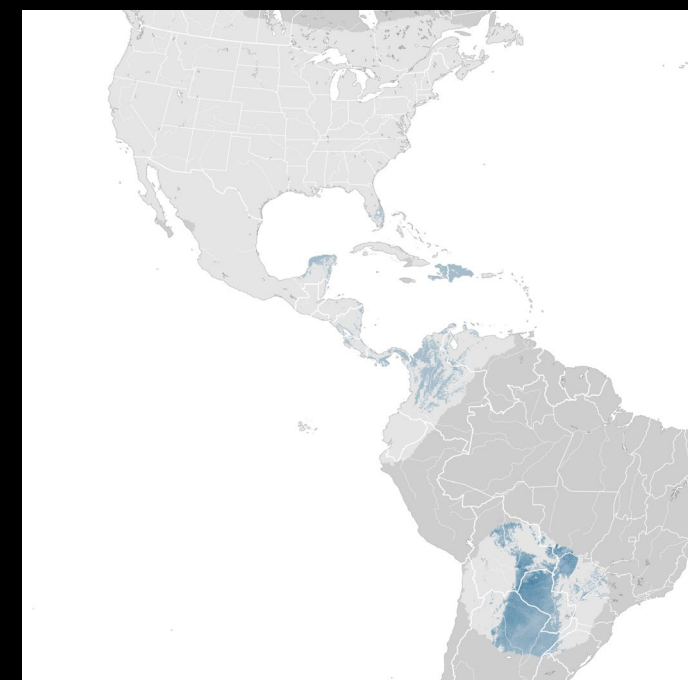
- Weighted Sum by species

common_name
Wood Duck
Yellow-billed Cuckoo
Ruby-throated Hummingbird
Green Heron
Mississippi Kite
Broad-winged Hawk
Eastern Wood-Pewee
Acadian Flycatcher
Eastern Phoebe

⋮

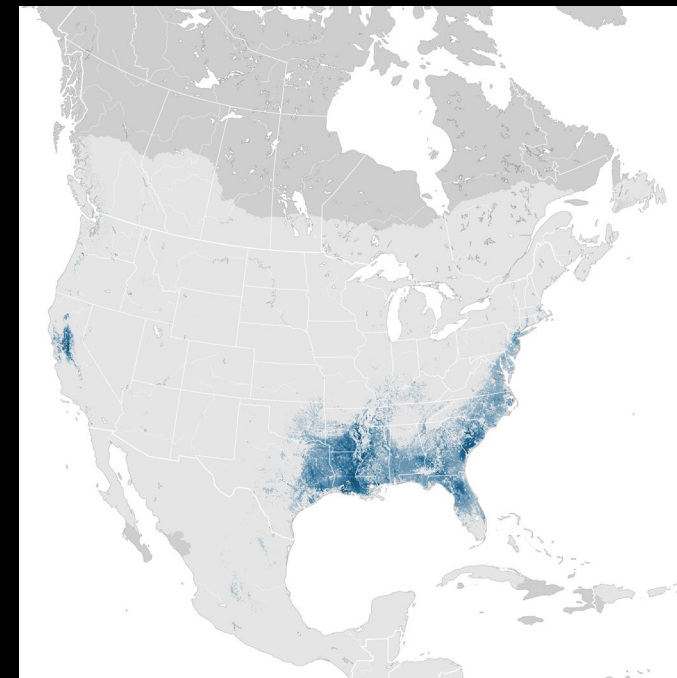
Yellow-billed Cuckoo

state %
breeding population



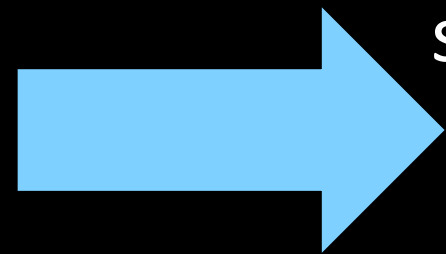
nonbreeding
abundance

Wood Duck

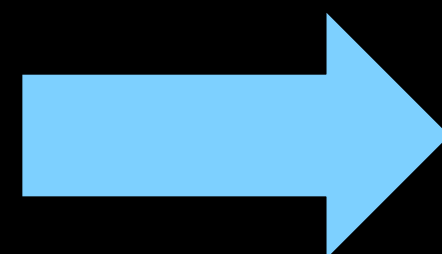


nonbreeding
abundance

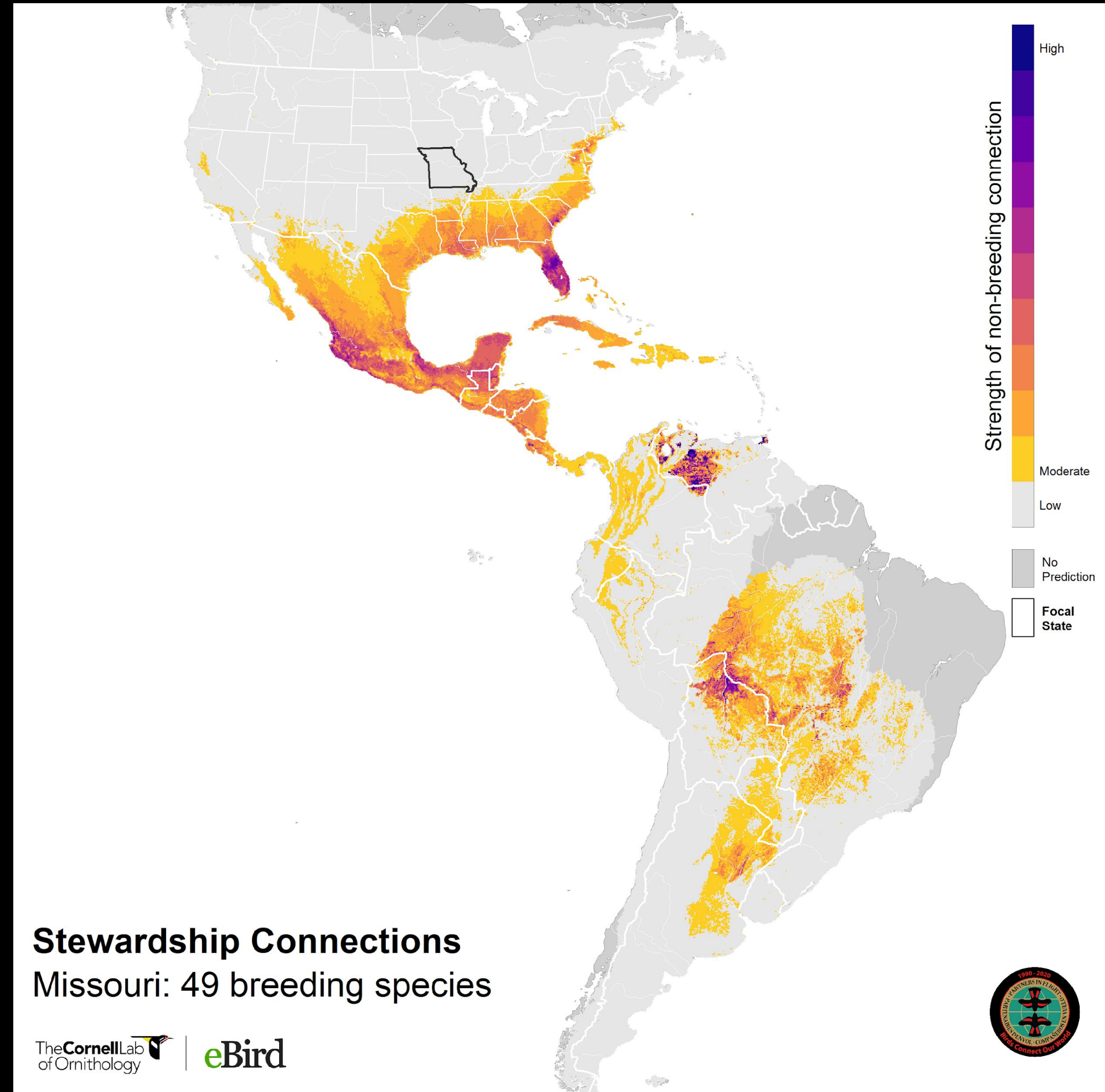
state % breeding
population *



+ ...

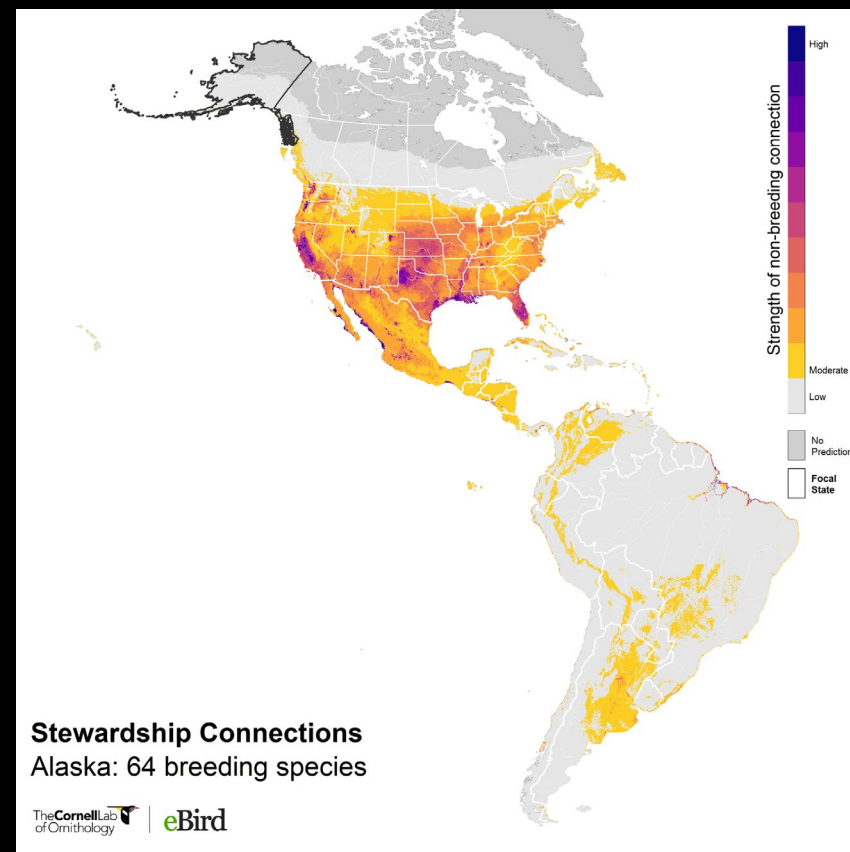


Stewardship Connections
Missouri: 49 breeding species

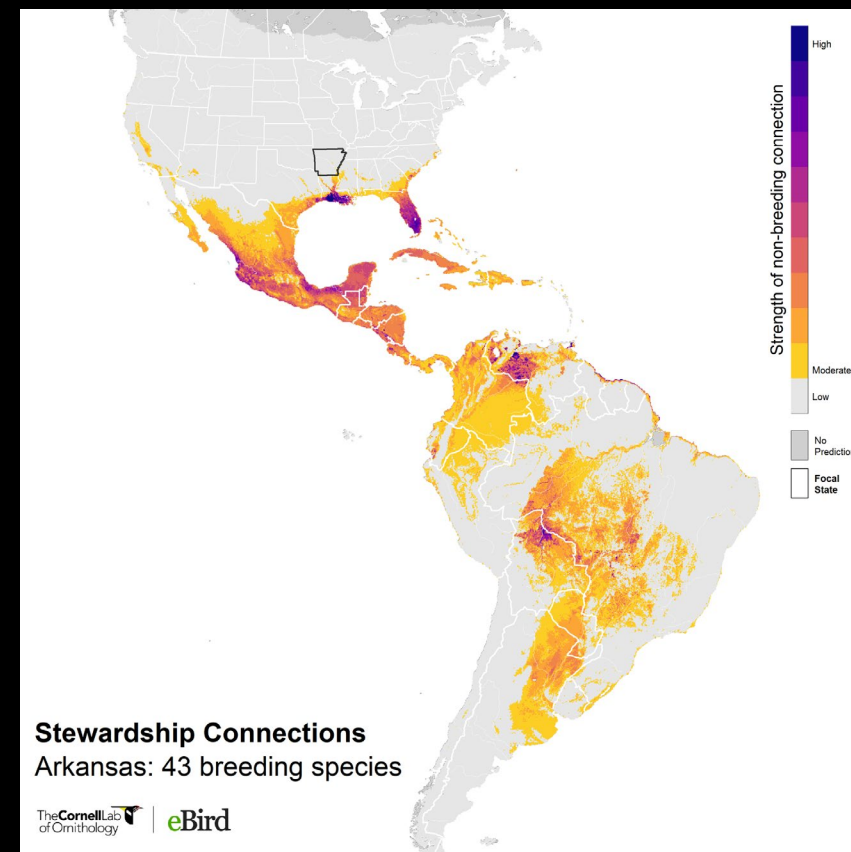


UNIQUENESS OF STEWARDSHIP CONNECTIONS MAPS

- Proportion of stewardship connections
- Relative to US states

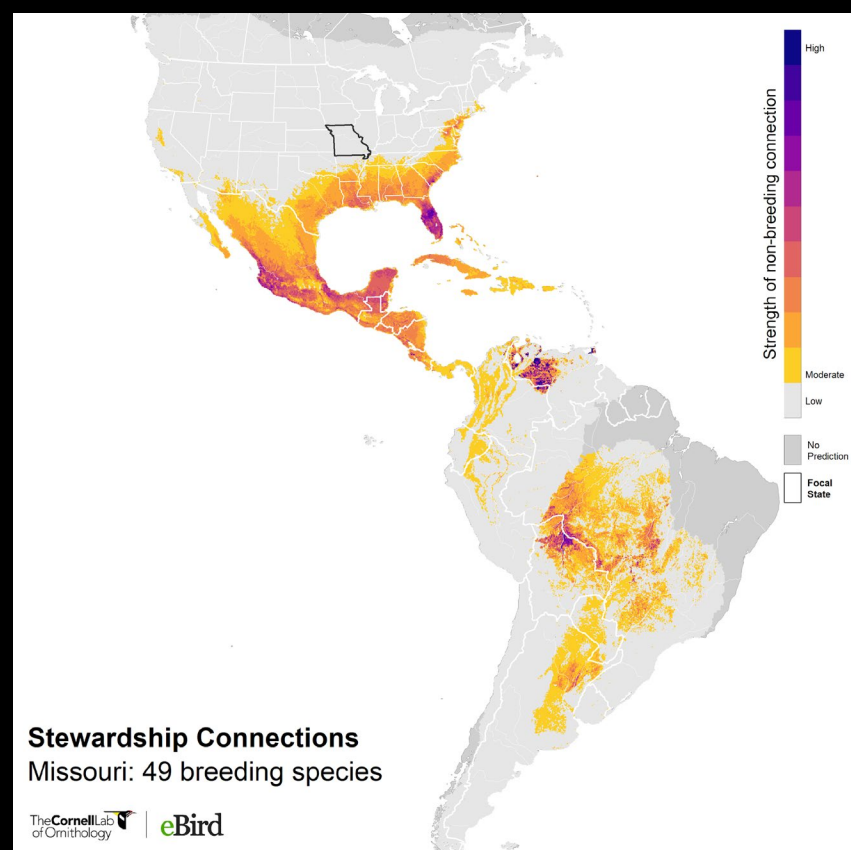


State 1: Alaska



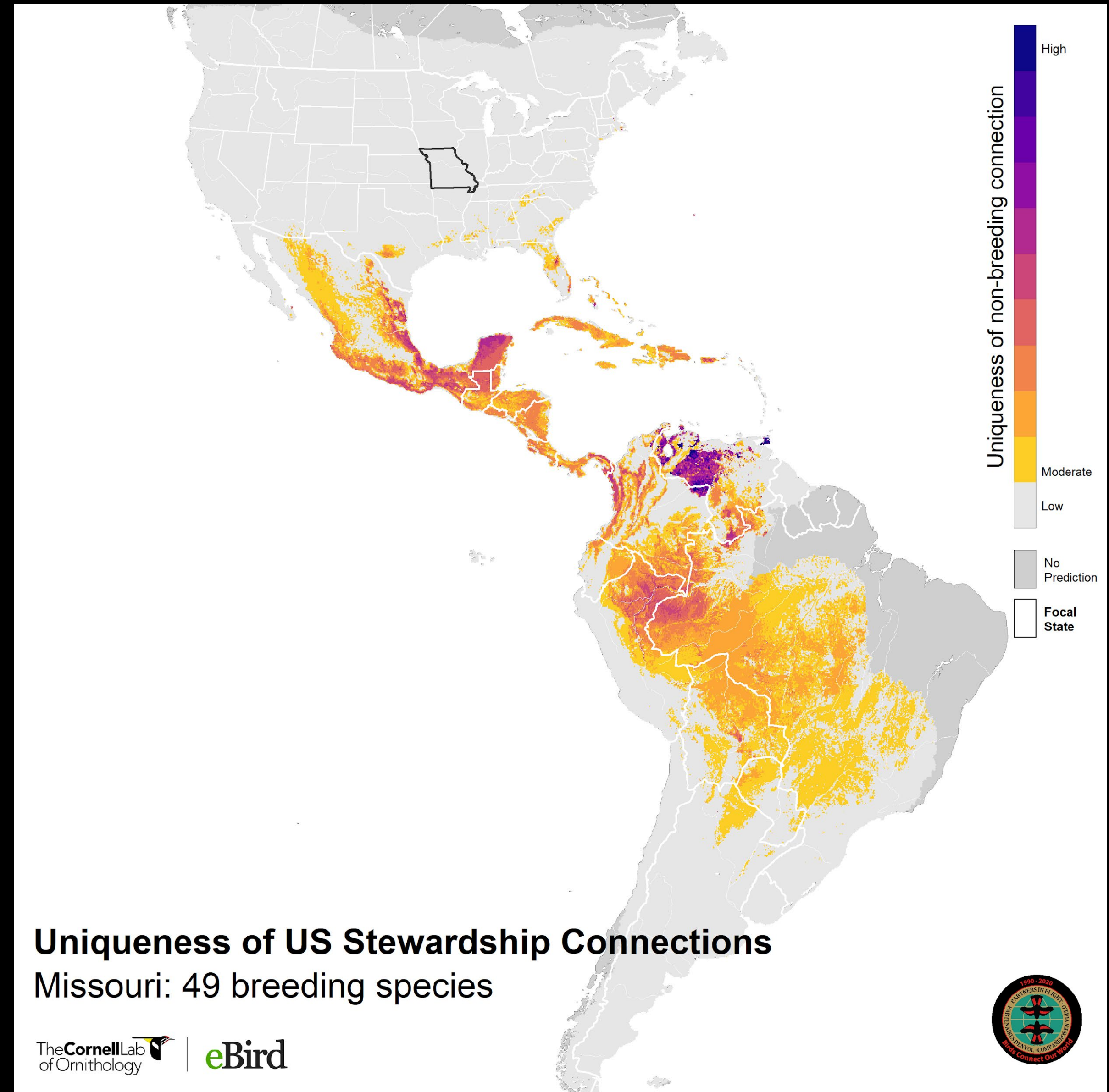
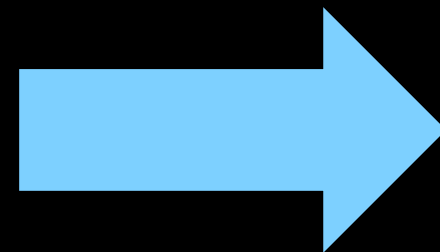
State 2: Arkansas

+ ...
= TOTAL

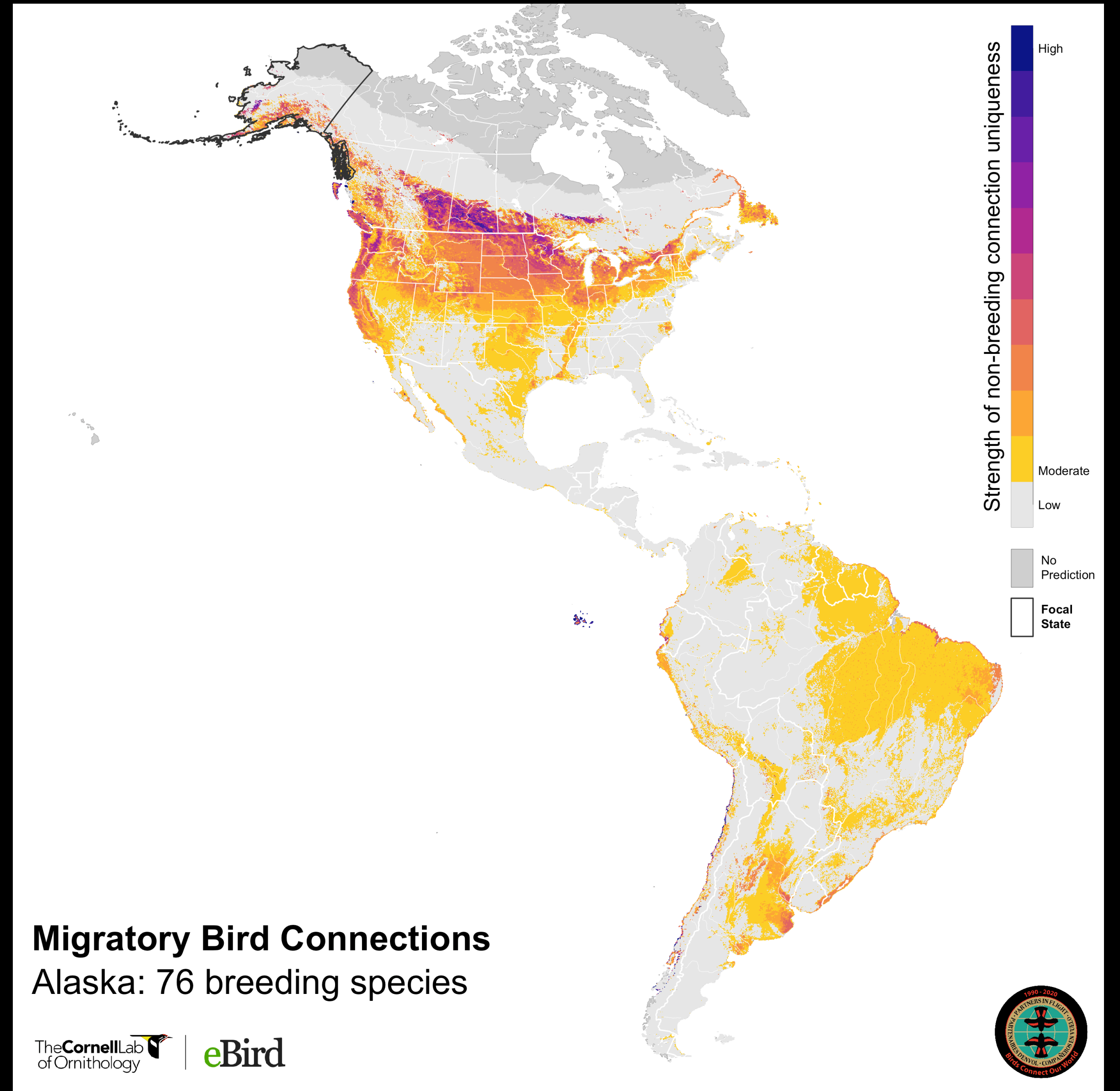
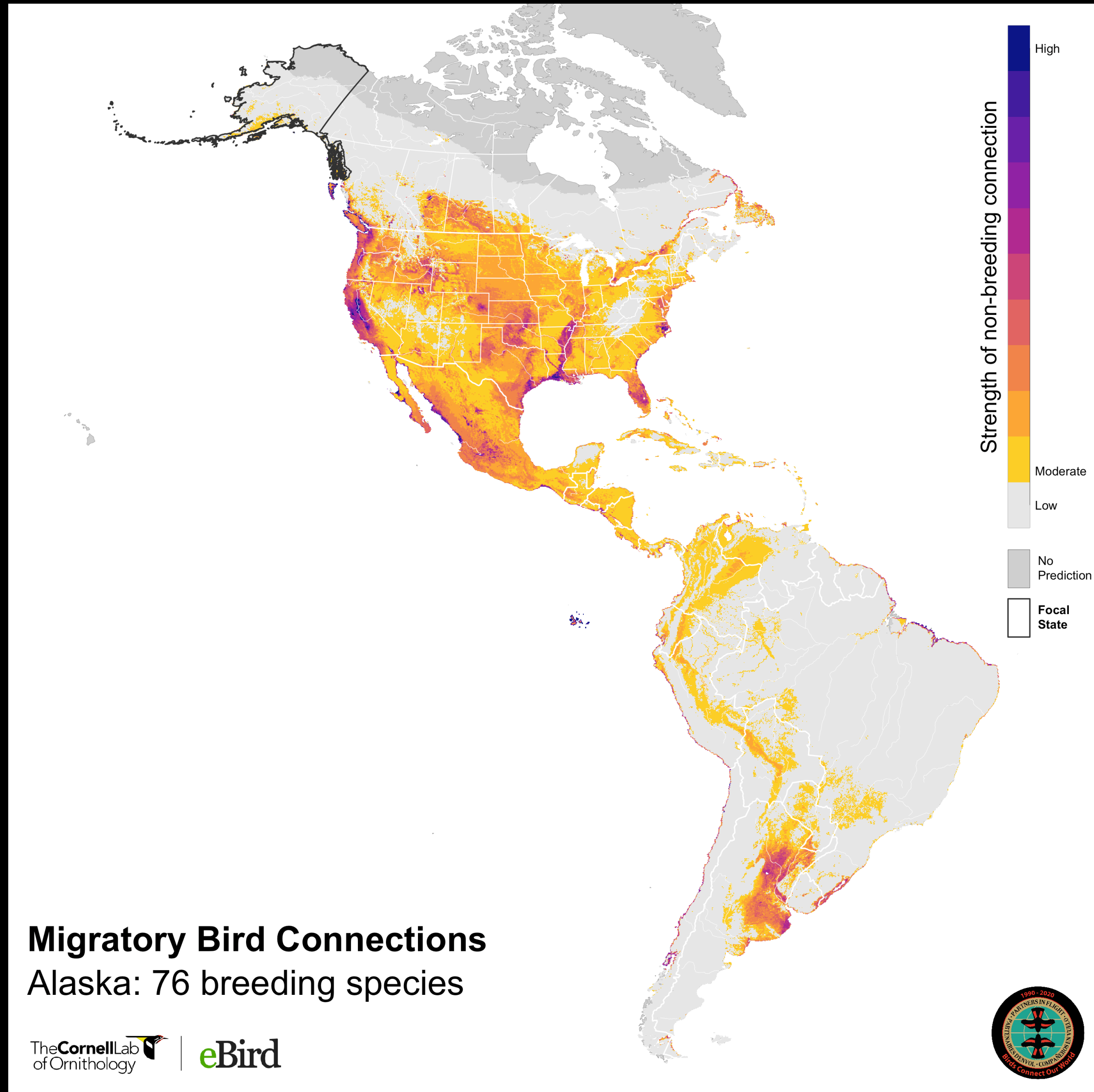


Given State: Missouri

/ TOTAL

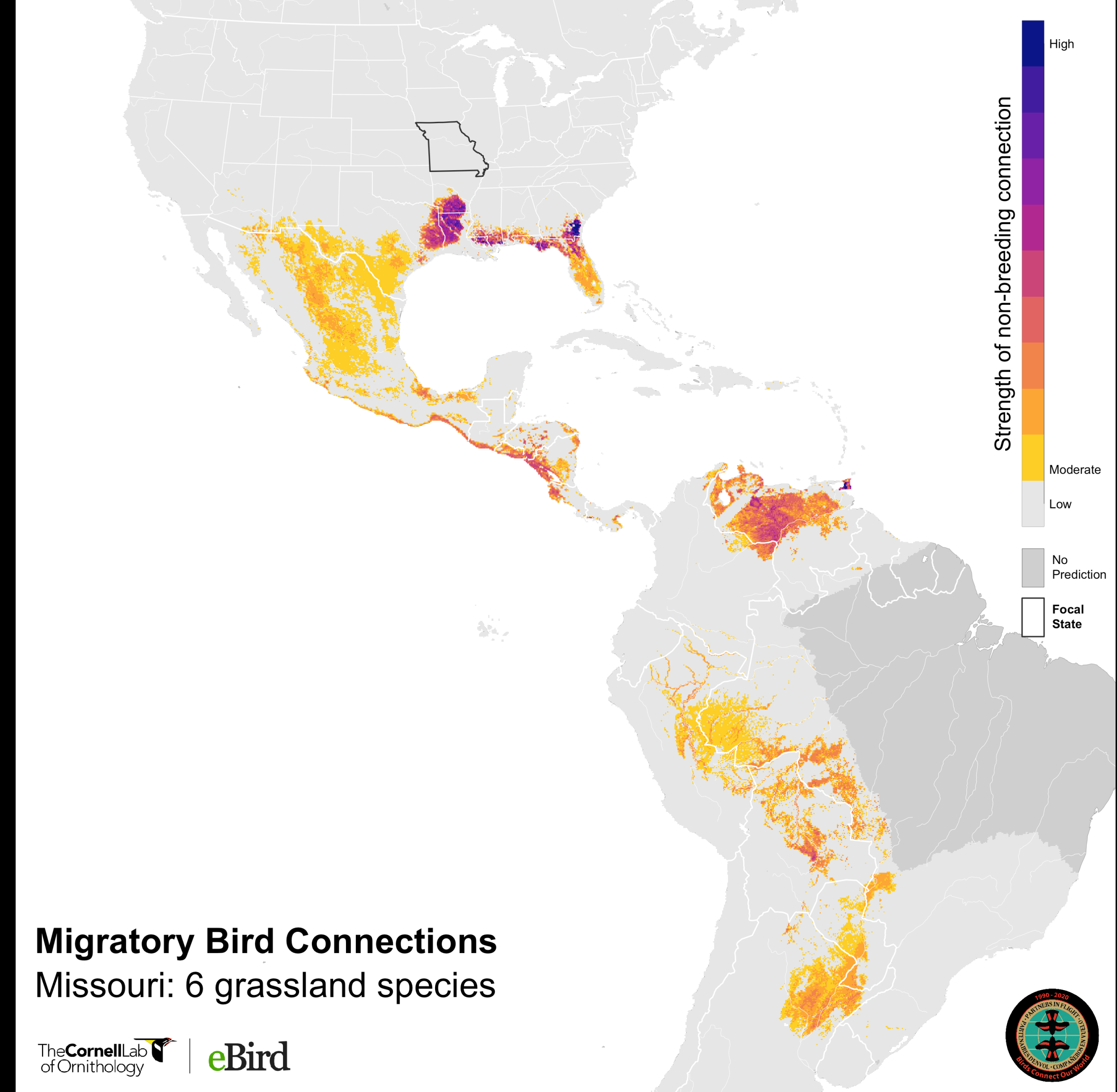
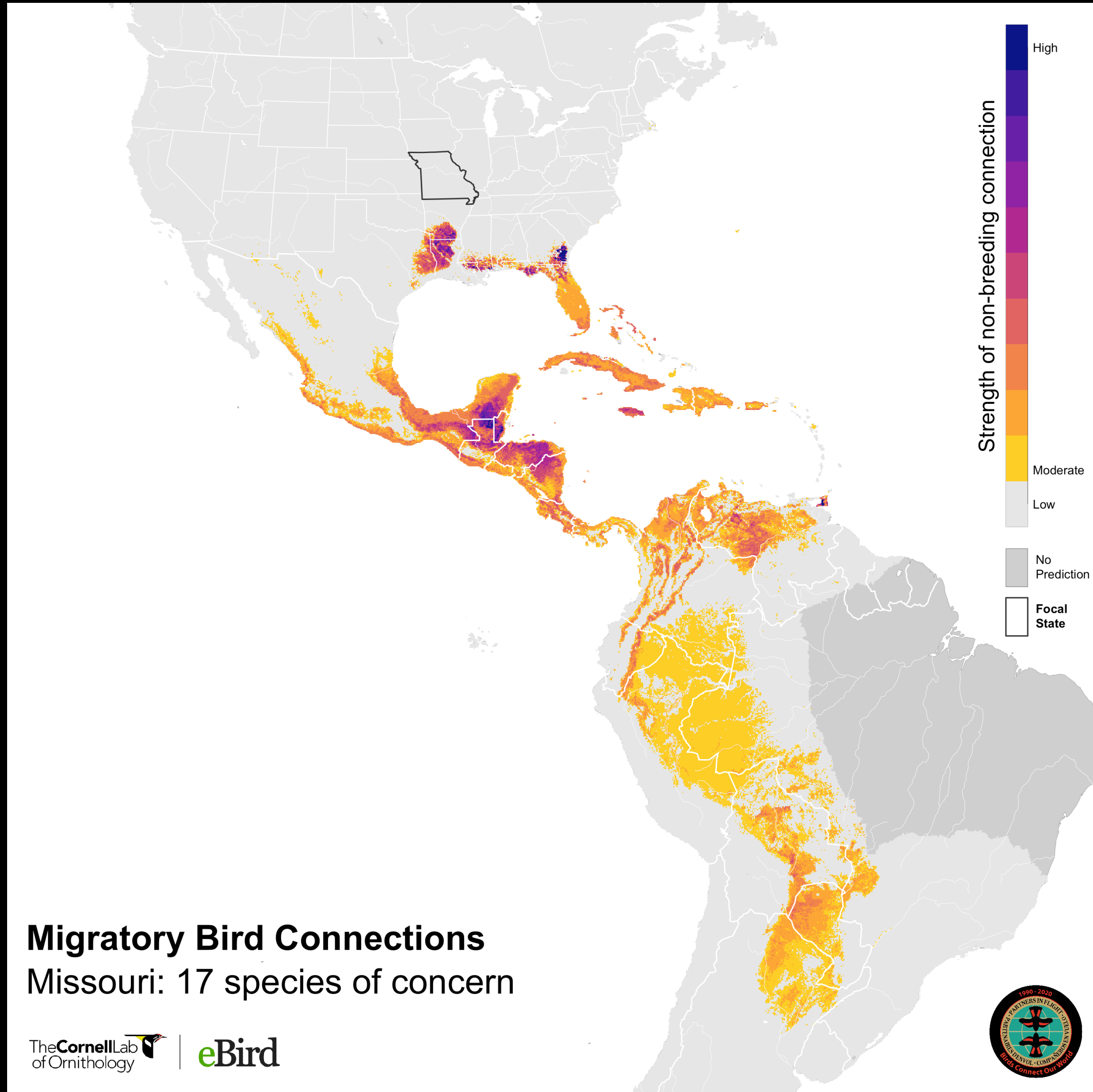


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