



The SECAS Third Thursday Web Forum

Advancing the Southeast Conservation Blueprint through analysis
and integration of high-resolution distribution data for diverse
imperiled species

2-15-2024



Agenda

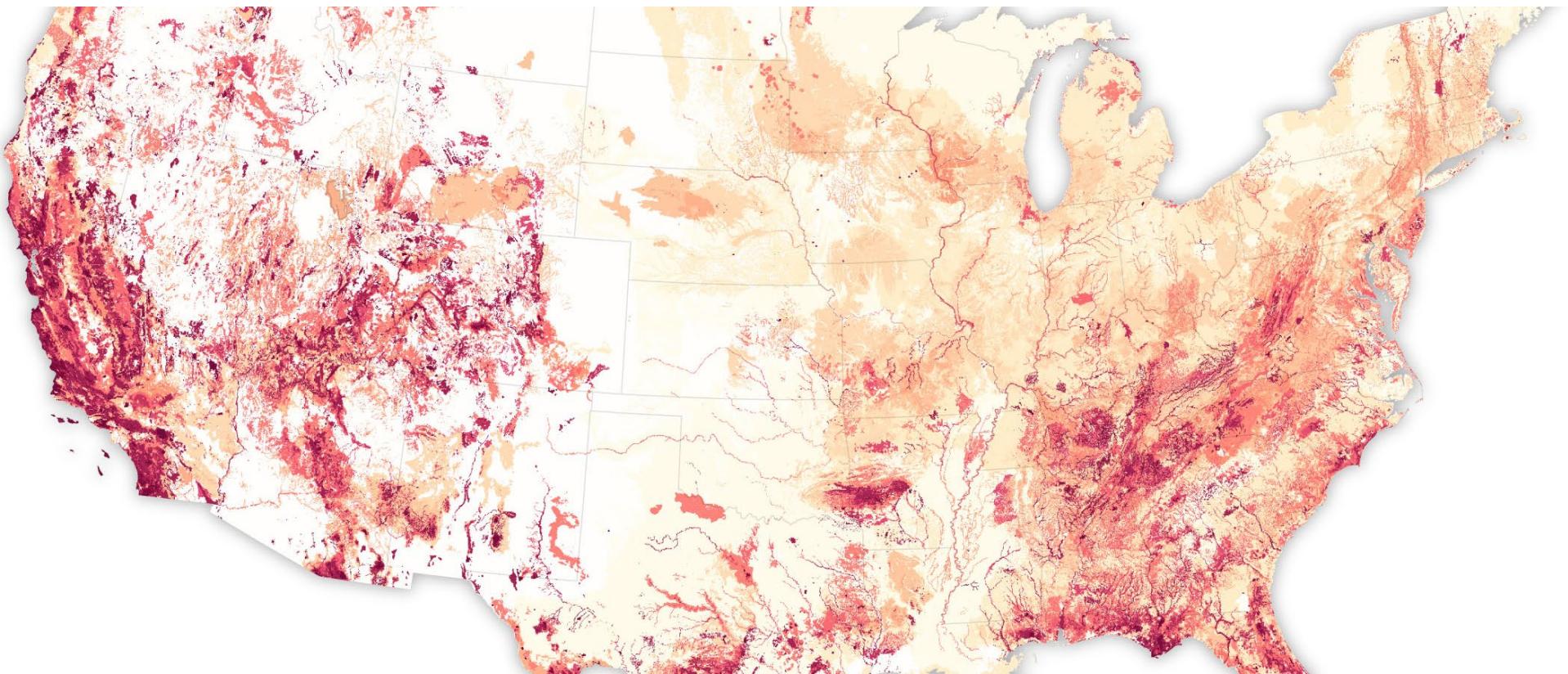
- Introduction
- Monthly topic
- Q&A and discussion
- Preview of next webinar
- Staff updates



Advancing the Southeast Conservation Blueprint through analysis and integration of high-resolution distribution data for diverse imperiled species

Chris Tracey & Regan Smyth, NatureServe

2-15-2024



Advancing the Southeast Conservation Blueprint through analysis and integration of high-resolution distribution data for diverse imperiled species

February 15, 2024



Regan Smyth – VP of Data & Methods
Christopher Tracey – Director of Spatial Analysis



Rua Mordecai – SE Conservation Blueprint Coordinator



THE POWER OF THE NETWORK

www.NatureServe.org

60+
NETWORK PROGRAMS
IN THE UNITED STATES
AND CANADA

OVER
1,000
CONSERVATION PROFESSIONALS

The network collects,
analyzes, and distributes
detailed scientific data
about plants, animals,
and ecosystems in their
jurisdictions

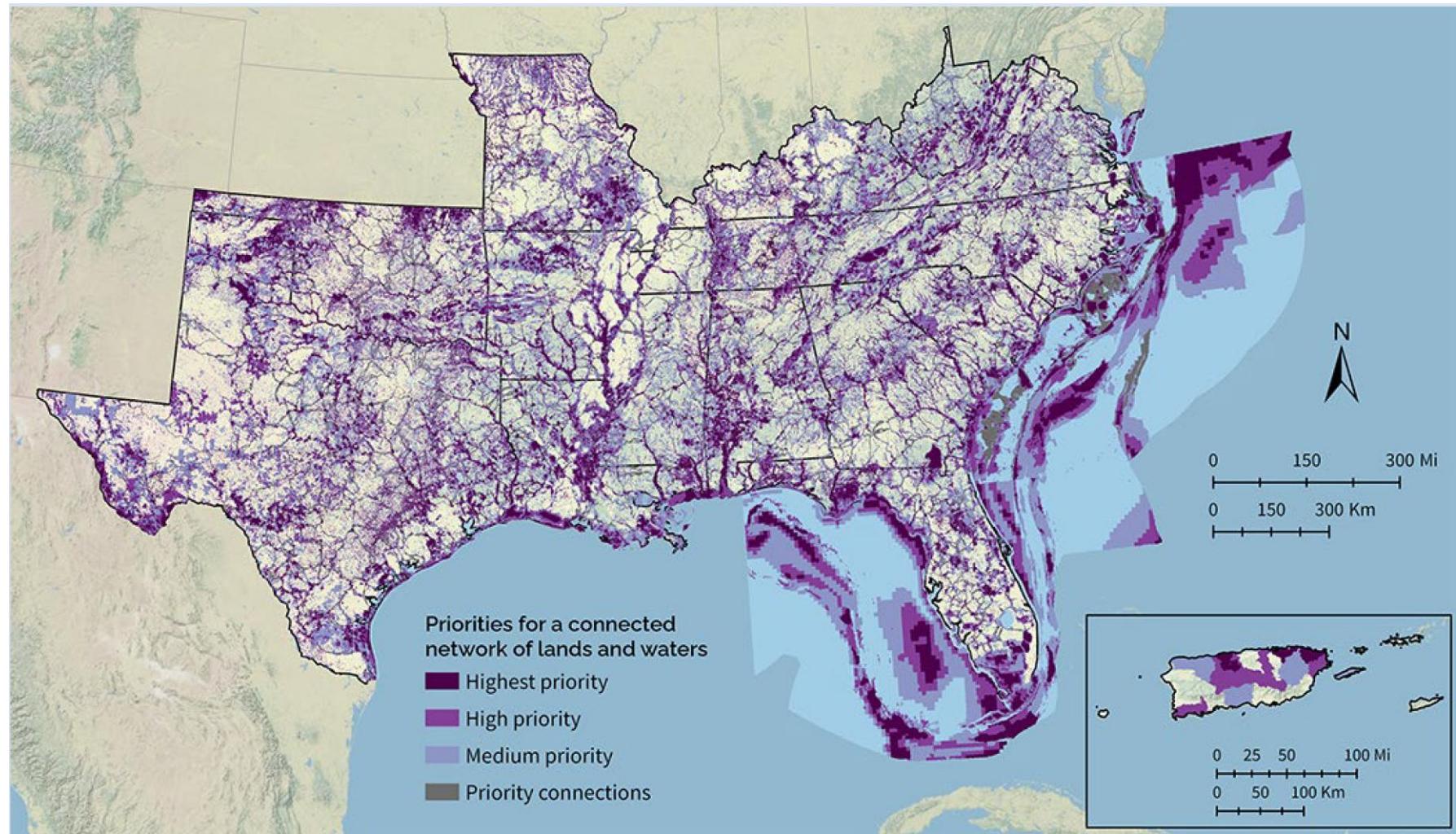
100,000
Species Assessed



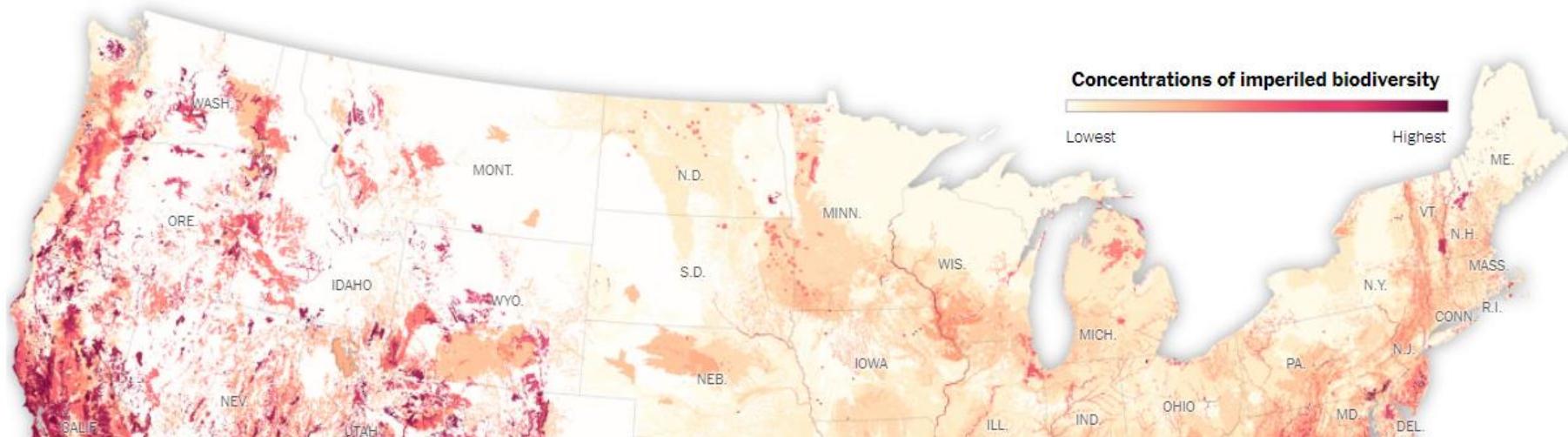
7,000
Ecosystem Types Classified



An Analysis of Imperiled Species and the Southeast Conservation Blueprint



This Map Shows Where Biodiversity Is Most at Risk in America



**ECOLOGICAL
APPLICATIONS**
ECOLOGICAL SOCIETY OF AMERICA

ARTICLE | [Open Access](#) |

Increasing taxonomic diversity and spatial resolution clarifies opportunities for protecting US imperiled species

Healy Hamilton, Regan L. Smyth, Bruce E. Young, Timothy G. Howard, Christopher Tracey, Sean Breyer, D. Richard Cameron, Anne Chazal, Amy K. Conley, Charlie Frye, Carrie Schloss

Agenda

- **Methods:** Does the Southeast Blueprint adequately capture imperiled species?
- **Results:** Where are there blind spots? Which species? Which geographies?
- **Next steps:** Where to go from here?

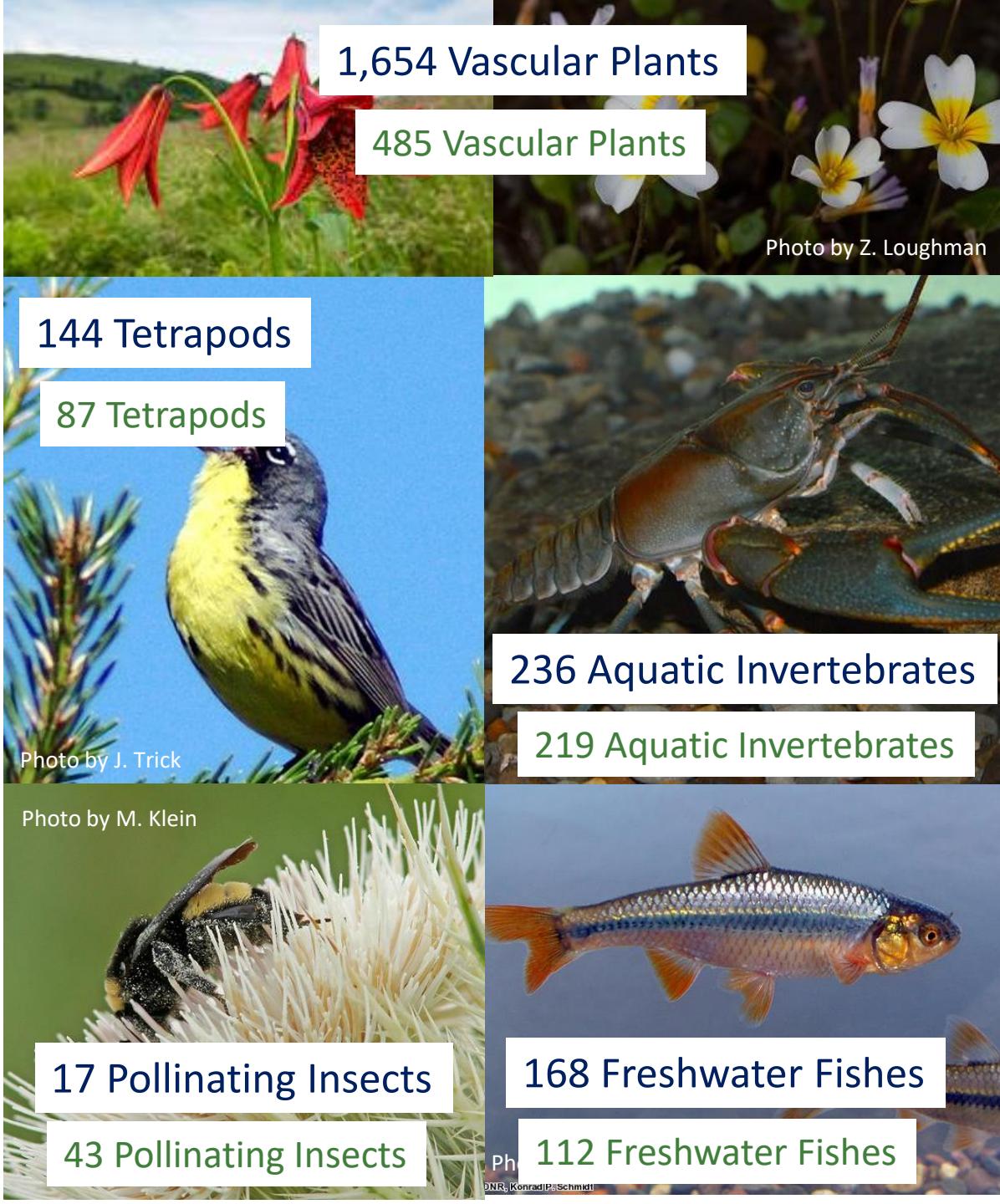




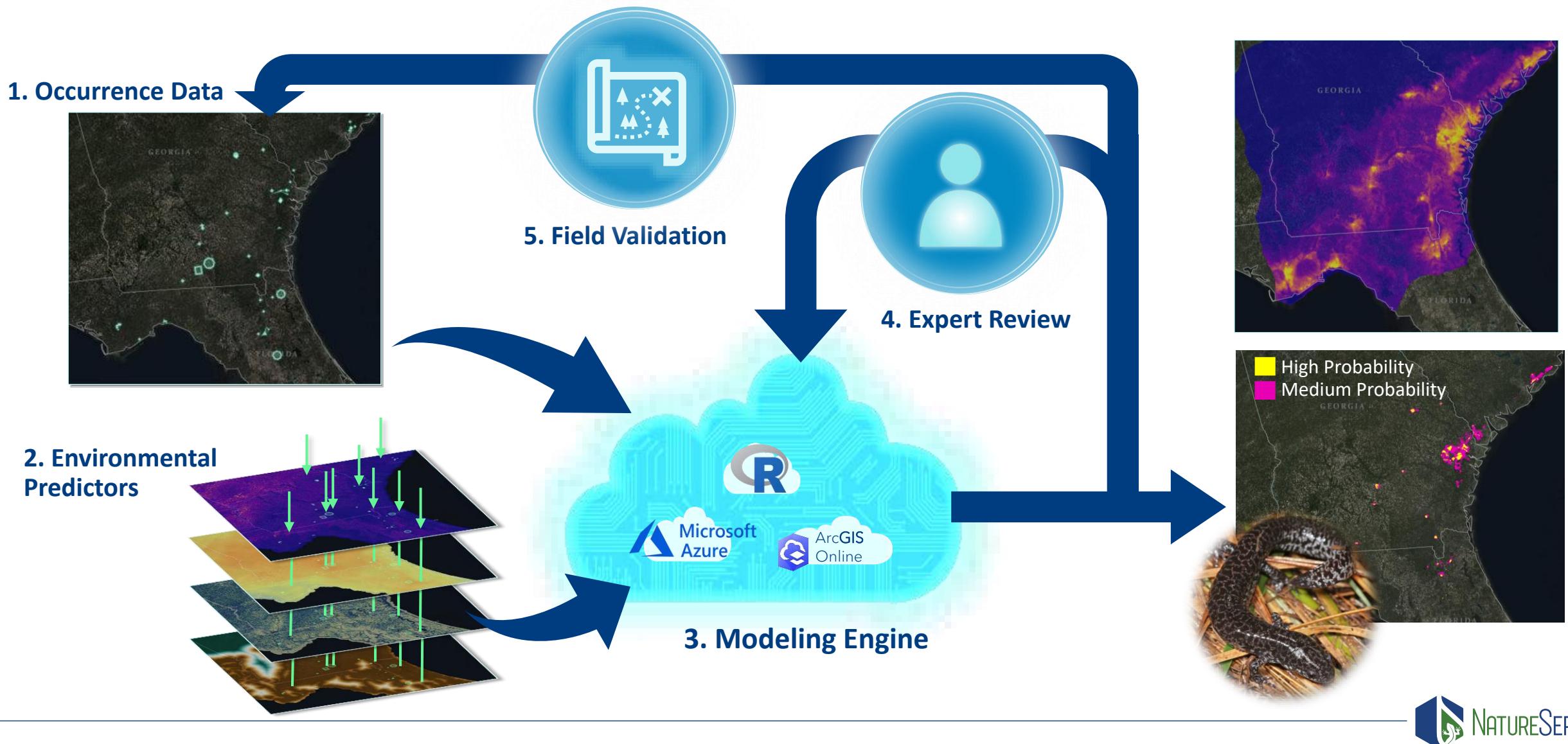
Conservation
Priorities

The Map of Biodiversity Importance +

Conservation priorities based on
habitat maps for 2000+
imperiled species

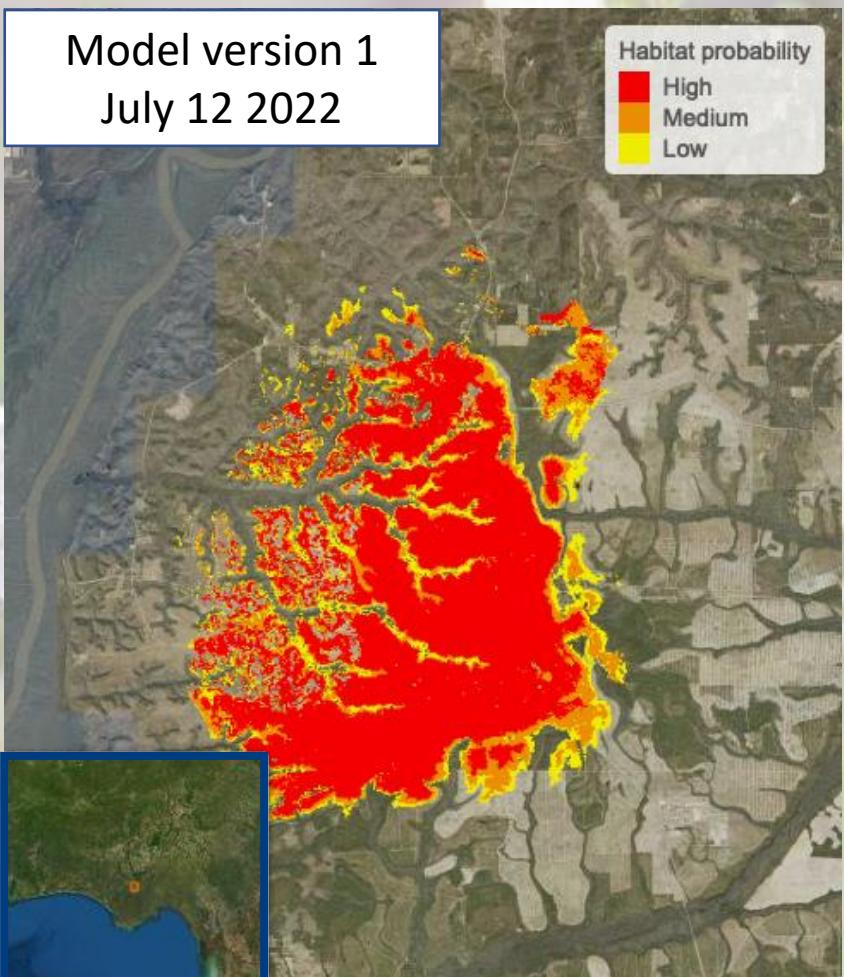


NatureServe Species Habitat Modeling

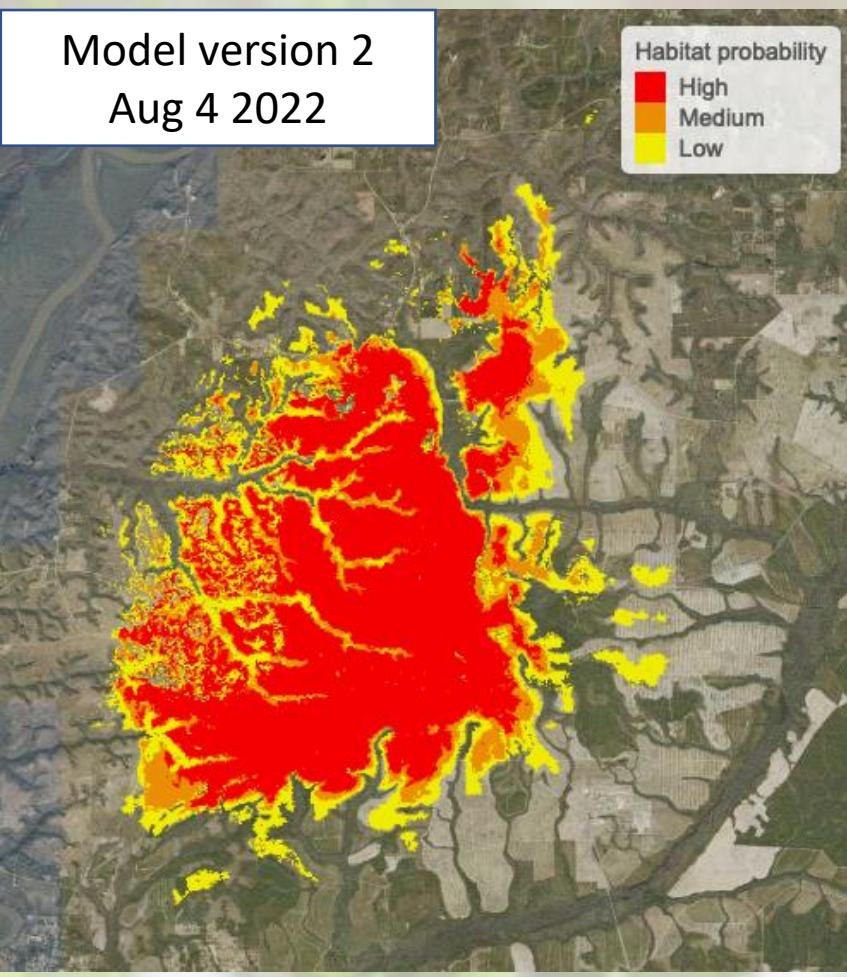


Model Review and Revision

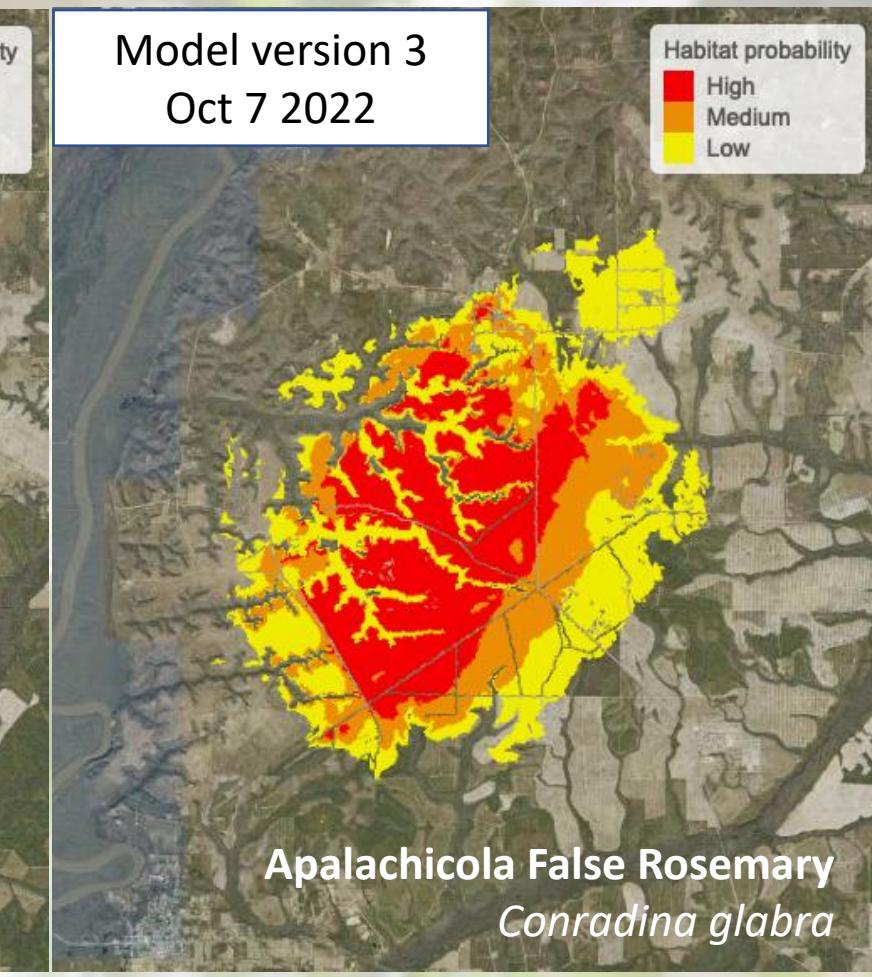
Model version 1
July 12 2022



Model version 2
Aug 4 2022



Model version 3
Oct 7 2022



Apalachicola False Rosemary
Conradina glabra

Model rating



Model rating

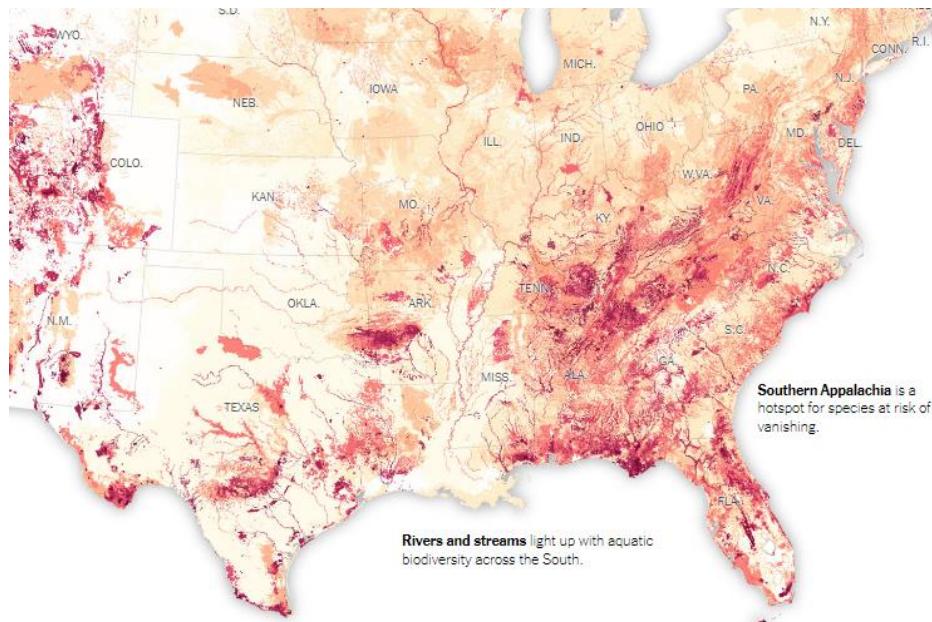


Model rating

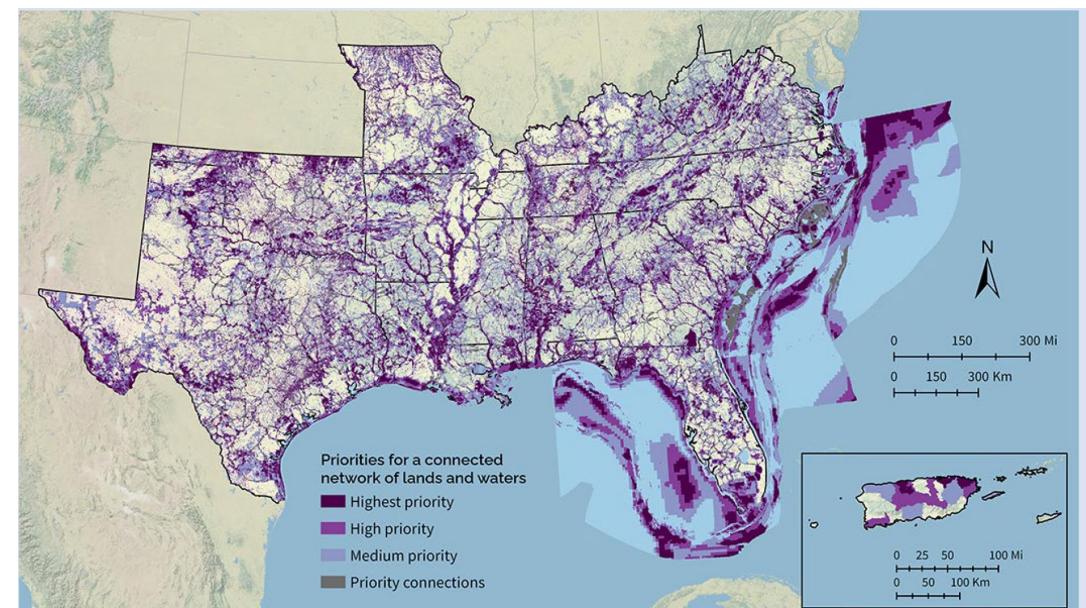


Objective

Evaluate the extent to which existing Blueprint conservation priority coincide with areas of importance for imperiled species



NatureServe Map of Biodiversity Importance

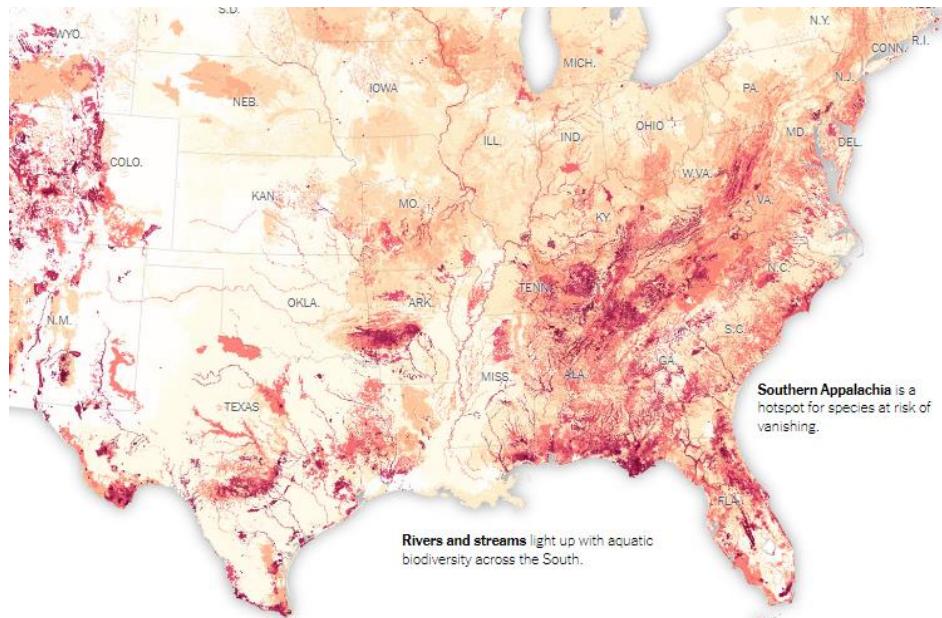


Southeast Blueprint Priority Areas

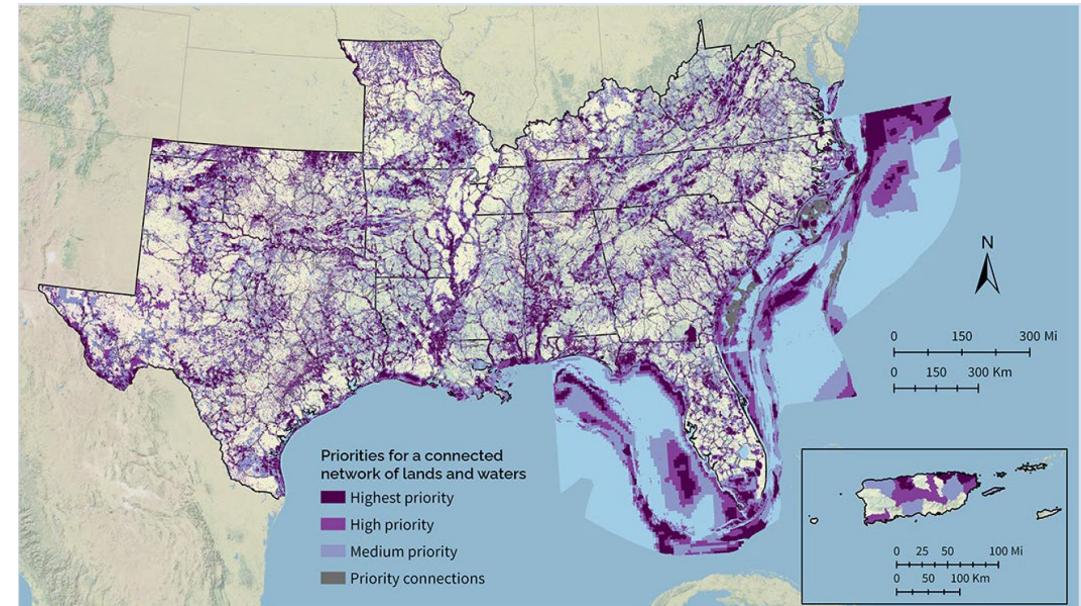
Approach

Individual Species: Overlay NatureServe habitat models with Blueprint priority areas to understand what is left out

In Aggregate: Map areas where multiple species have habitat outside priority areas



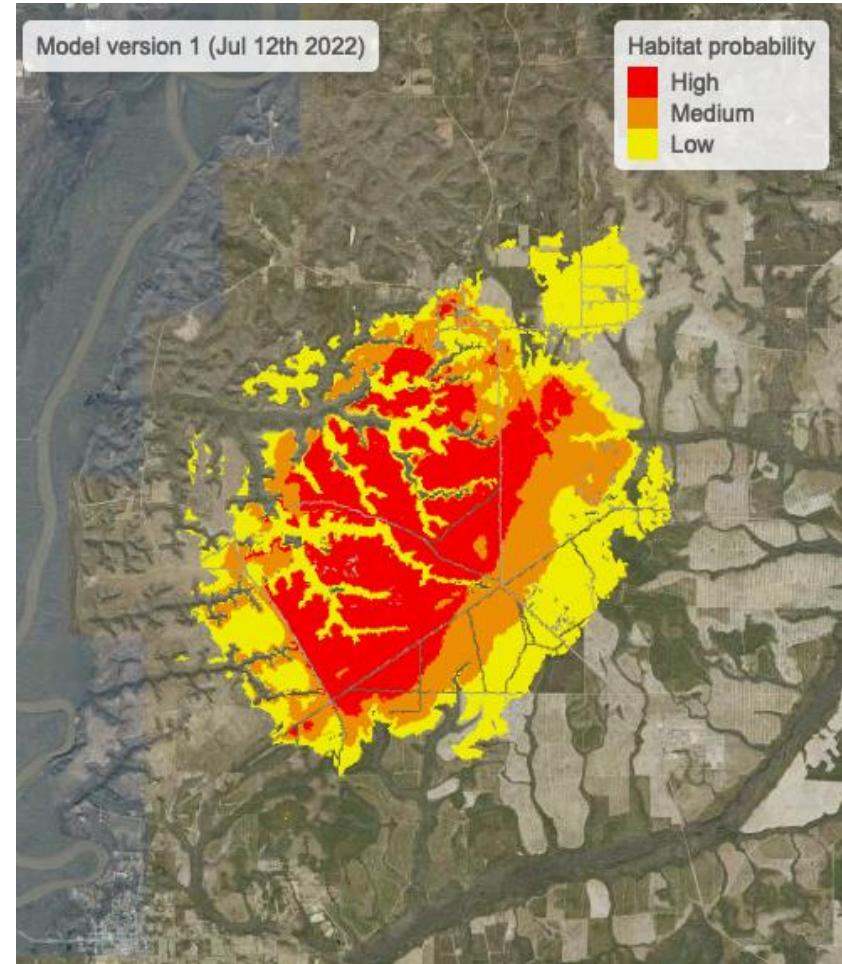
NatureServe Map of Biodiversity Importance



Southeast Blueprint Priority Areas

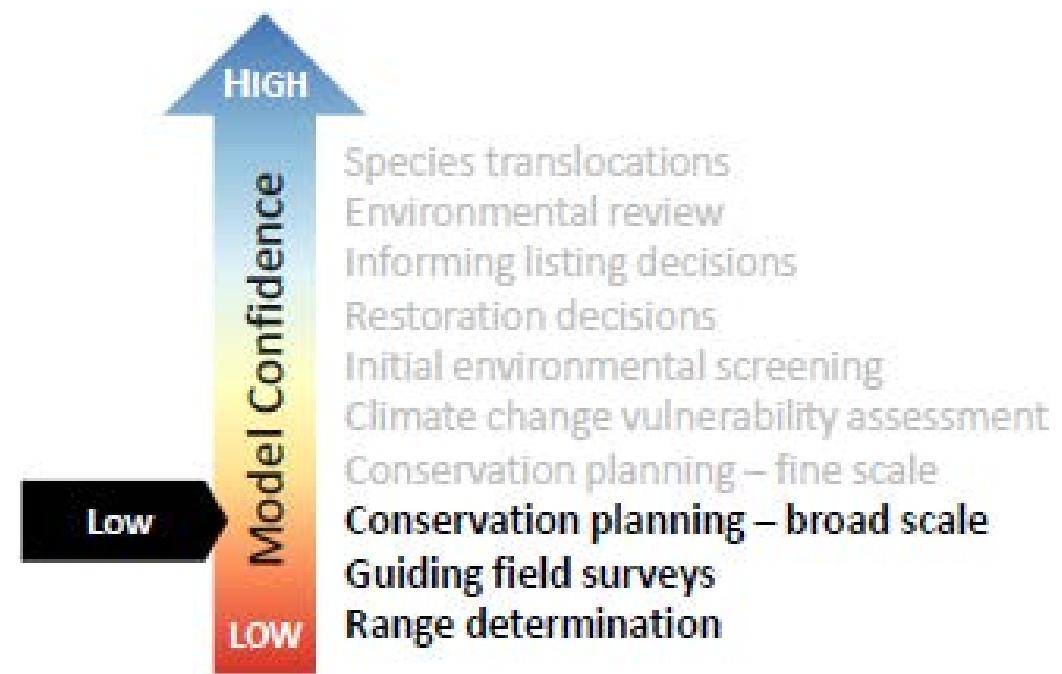
A Note on Model Probabilities

- NatureServe habitat models classify all pixels within the species range as either:
 - Non-habitat
 - Low probability habitat
 - Medium probability habitat
 - High probability habitat
- For the Blueprint analyses, we focus only on **High Probability** habitat



A Note on Habitat Model Confidence

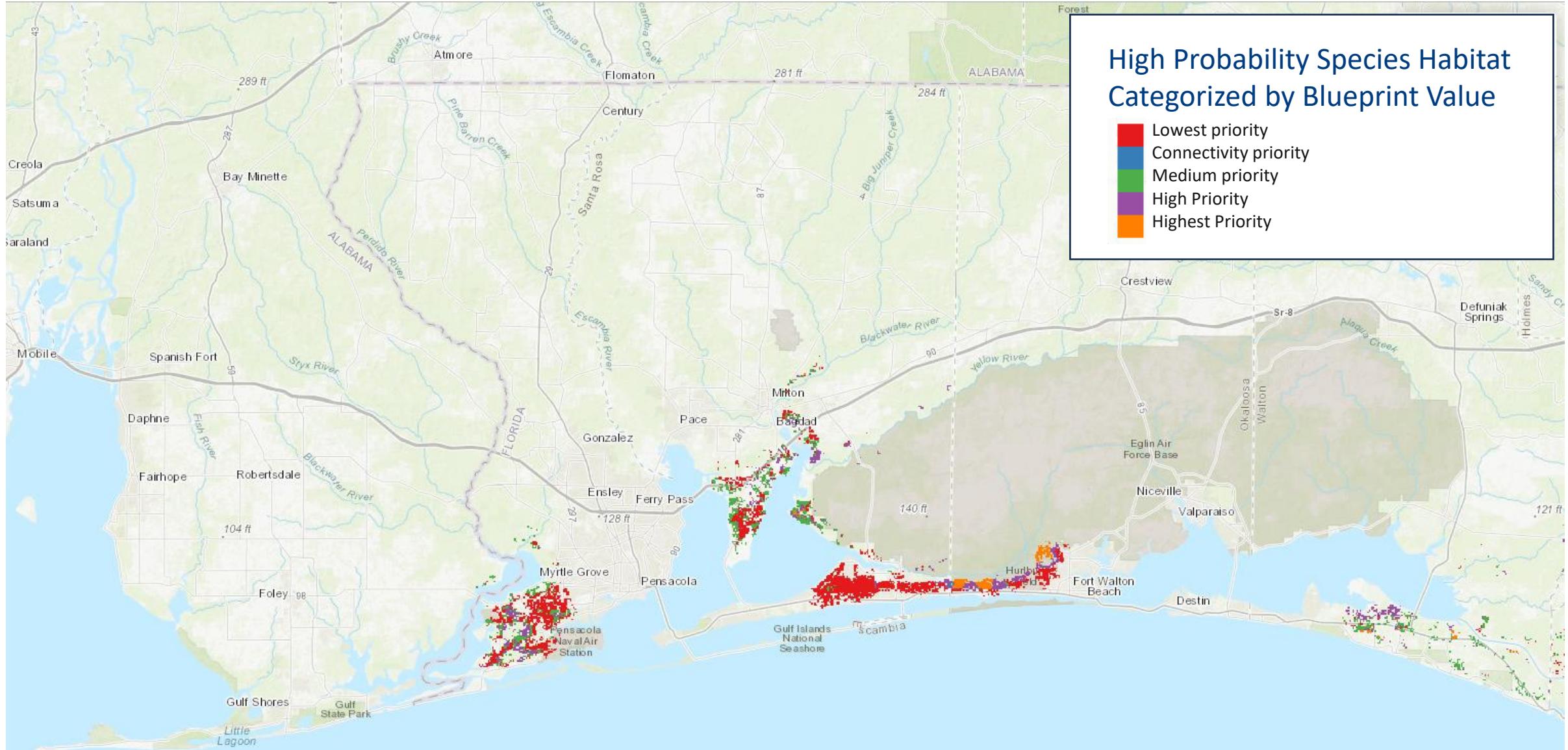
- Habitat models are predictions; some perform better than others
- All NatureServe models are classified as either low, medium, or high confidence based on
 - (1) inputs,
 - (2) validation stats
 - (3) expert review
- For the blueprint analysis, we focus mostly on **medium and high confidence** models



The Specifics (Technical Approach)

1. Extract the high probability pixels for each model. Reclassify to the corresponding Southeast Conservation Blueprint category (0-4).
2. For each species, summarize:
 1. Total area
 2. Total area within the blueprint boundary area overlapping blueprint category 0 (lowest priority), category 1 (connectivity priority), category 2 (medium priority), category 3 (high priority), category 4 (highest priority)
3. For low priority Southeast Conservation Blueprint areas (value = 0) sum the number of species predicted in each pixel. This provides a map of “difference hotspots” for all species.
4. Replicate the previous step with the following additional filters applied:
 1. Medium and High confidence models all taxa
 2. Medium and High confidence plant models
 3. Medium and High confidence freshwater models
 4. Medium and High confidence vertebrate models
 5. Medium and High confidence pollinator models

Individual Species - Blueprint Overlays

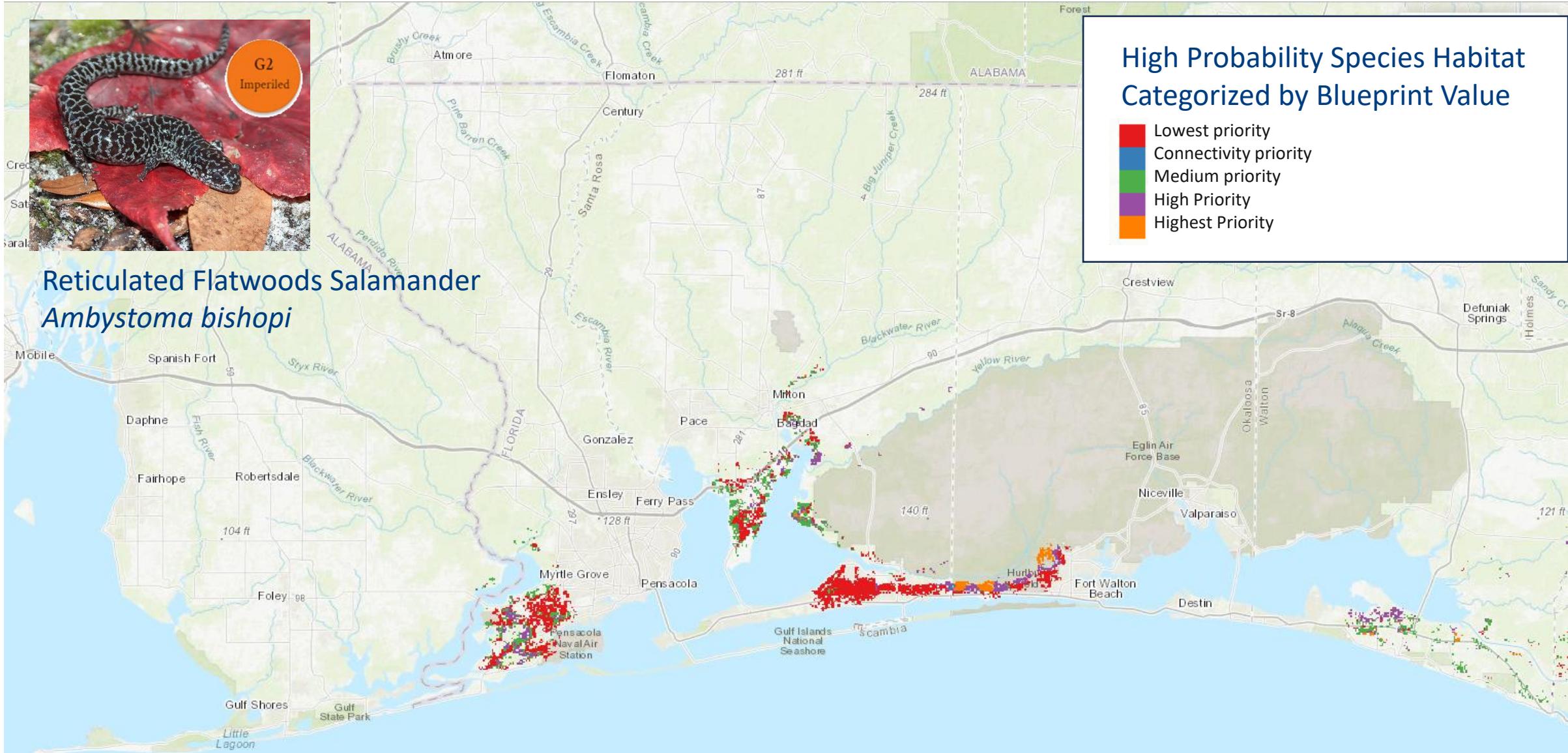


A Few Numbers

- **903** models from the Map of Biodiversity Importance and subsequent projects overlap the Southeast Blueprint
- Of those, **125** are classified as medium or high confidence*
- **For all species (n=903):**
 - **52** imperiled species had >80% of their modeled distribution in low priority areas. **10** species had >99%.
 - **64%** of species had at least 50% of modeled habitat in Blueprint priority areas (connectivity, medium, high, highest priority)
- **For species with medium/high confidence models (n=125):**
 - **5** imperiled species had >80% of their modeled distribution in low priority areas. **1** species had >99%.
 - **84%** of species had at least 50% of modeled habitat in Blueprint priority areas (connectivity, medium, high, highest priority)

* others are classified as low confidence primarily because they have not received adequate expert review

Individual Species - Blueprint Overlays



Results

Individual Species

- Summary table showing area of overlap of each species with each blueprint category.

Aggregate

- Rasters showing areas of low Blueprint priority (category 0) where there are 1 or more species with predicted high probability habitat.
- Pixel values contain the count of species in each pixel.
- Separate rasters for:
 - all species models
 - medium/high confidence models only
 - medium/high confidence models broken out by groups (plant, freshwater, vertebrates and pollinators).

Species With Predicted Habitat *Entirely* Included in Blueprint Highest Priority Areas



Pyne's Ground Plum
Astragalus bibullatus



Big Bend Gambusia
Gambusia gaigei



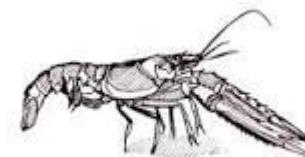
Chisos Skipperling
Piruna haferniki



Cahaba Torch
Liatris oligocephala



Fire Ladies'-tresses
Spiranthes igniorchis



Cypress Crayfish
Cambarellus blacki



A Sampling of Species With Predicted Habitat Largely *Outside* Blueprint Priority Areas



Plethobasus cicatricosus
White Wartyback

G1
Critically Imperiled



Acleisanthes wrightii
Wright's Trumpets

G2
Imperiled



Trillium tennesseense
Tennessee Trillium

G1
Critically Imperiled



Fallicambarus harpi
Ouachita Burrowing Crayfish

G2
Imperiled



Sceloporus woodi
Florida Scrub Lizard

G2
Imperiled



Harrisia fragrans
Fragrant Prickly-apple

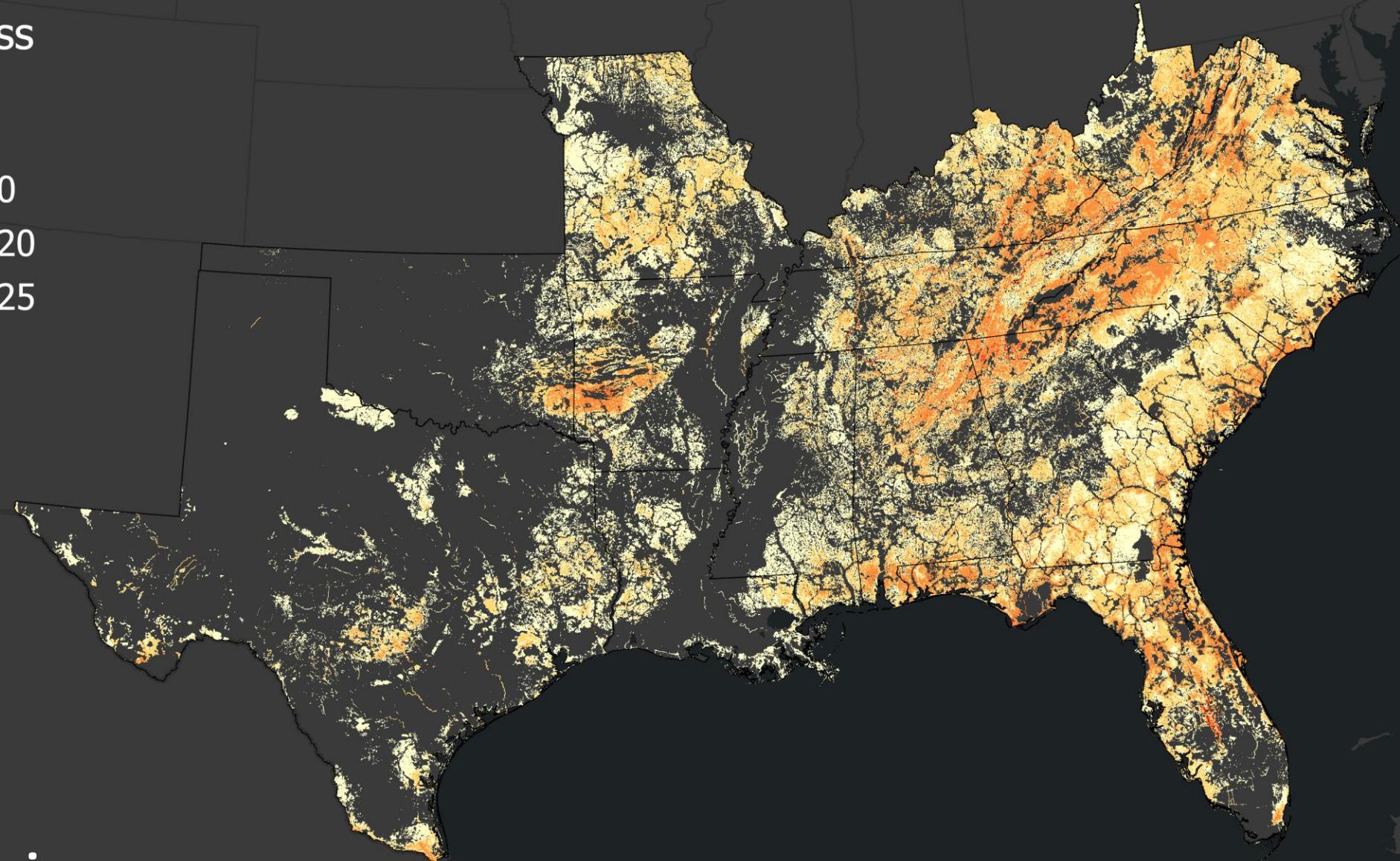
G1
Critically Imperiled

Results for Individual Species

Scientific Name	Common Name	Taxon Group	Model confidence	Percent of Habitat in Blueprint Low Priority Areas
<i>Cambarus laconensis</i>	Lacon Exit Cave Crayfish	Crayfishes	low	100%
<i>Chamaesyce jejuna</i>	Dwarf Broomspurge	Flowering Plants	low	100%
<i>Gambusia heterochir</i>	Clear Creek Gambusia	Anadromous Fishes	low	100%
<i>Houstonia correllii</i>	Correll's Bluet	Flowering Plants	low	100%
<i>Mespilus canescens</i>	Stern's Medlar	Flowering Plants	low	100%
<i>Xyris spathifolia</i>	NA	Flowering Plants	low	100%
<i>Plethobasus cicatricosus</i>	White Wartyback	Freshwater Mussels	low	100%
<i>Epioblasma obliquata</i>	Catspaw	Freshwater Mussels	low	100%
<i>Bourreria radula</i>	Rough Strongbark	Flowering Plants	medium	99%
<i>Acleisanthes wrightii</i>	Wright's Trumpets	Flowering Plants	low	99%
<i>Jacquemontia reclinata</i>	Reclined Clustervine	Flowering Plants	medium	98%
<i>Heteranthera mexicana</i>	Mexican Mud-plantain	Flowering Plants	low	97%
<i>Fallicambarus strawni</i>	Saline Burrowing Crayfish	Crayfishes	low	96%
<i>Chloris texensis</i>	Texas Windmill Grass	Flowering Plants	low	96%
<i>Stallingsia maculosus</i>	Manfreda Giant-Skipper	Butterflies and Skippers	low	96%
<i>Bouchardina robisoni</i>	Bayou Bodcau Crayfish	Crayfishes	low	94%
<i>Fallicambarus gilpini</i>	Jefferson County Crayfish	Crayfishes	low	94%
<i>Trillium tennesseense</i>	NA	Flowering Plants	medium	93%
<i>Machaeranthera aurea</i>	Houston Machaeranthera	Flowering Plants	low	93%
<i>Satan eurystomus</i>	Widemouth Blindcat	Anadromous Fishes	low	92%
<i>Orconectes hartfieldi</i>	Yazoo Crayfish	Crayfishes	low	92%
<i>Matelea texensis</i>	Trans Pecos Matelea	Flowering Plants	low	92%
<i>Allium speculae</i>	Little River Canyon Onion	Flowering Plants	low	91%

Richness

- 1
- 2 - 3
- 4 - 10
- 11 - 20
- 21 - 25

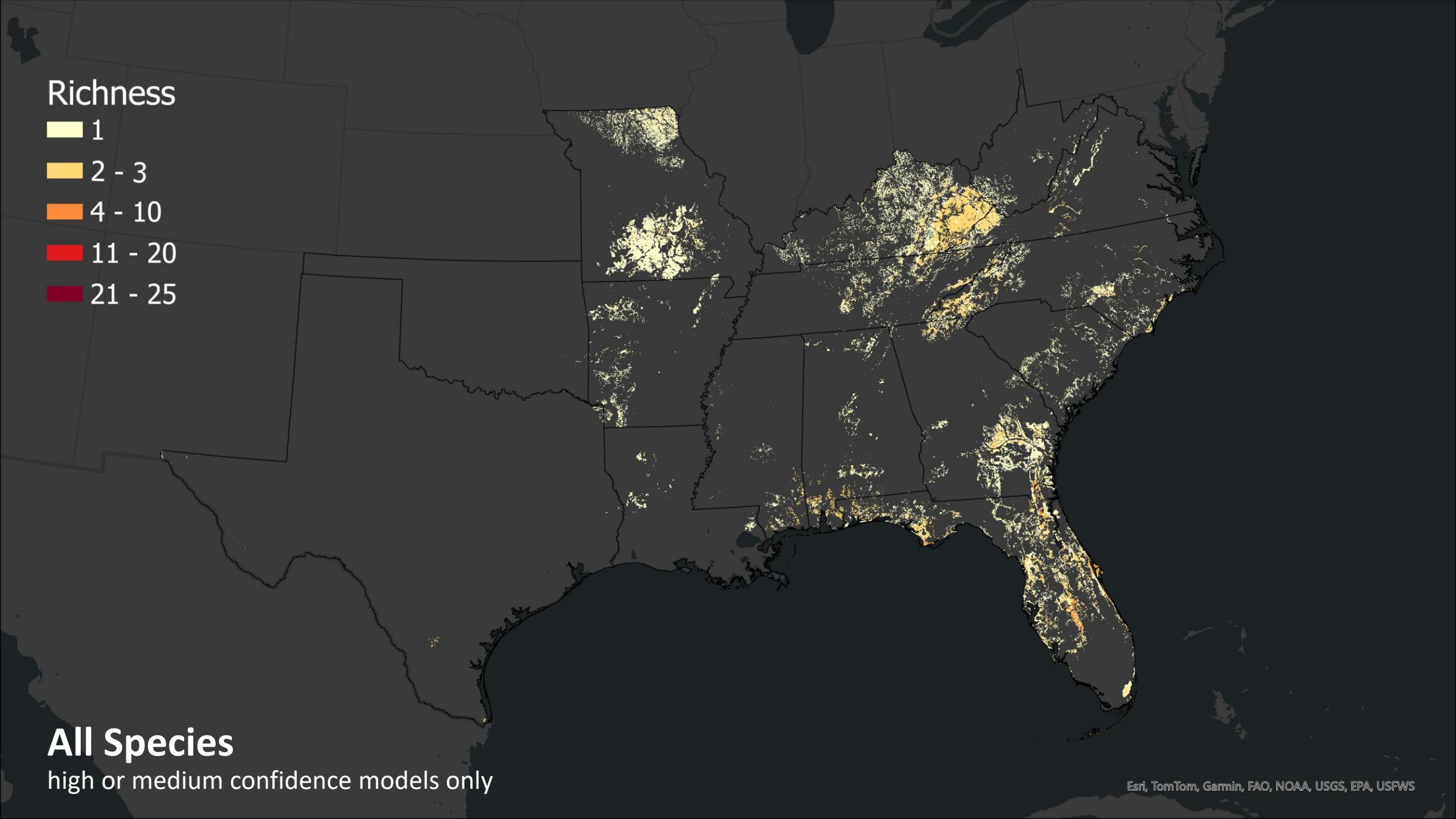


All Species

all model confidence levels

Richness

- 1
- 2 - 3
- 4 - 10
- 11 - 20
- 21 - 25



All Species

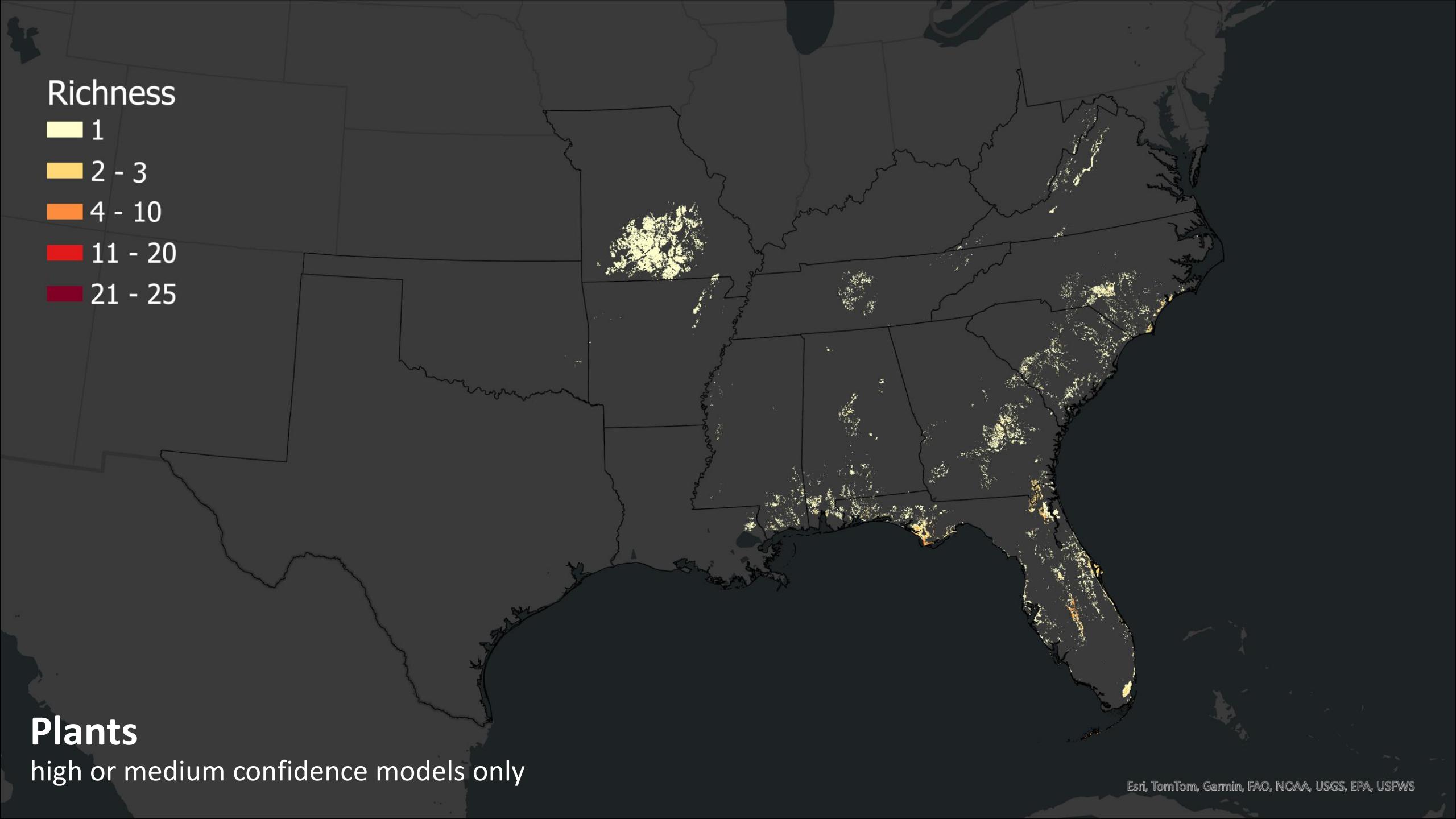
high or medium confidence models only

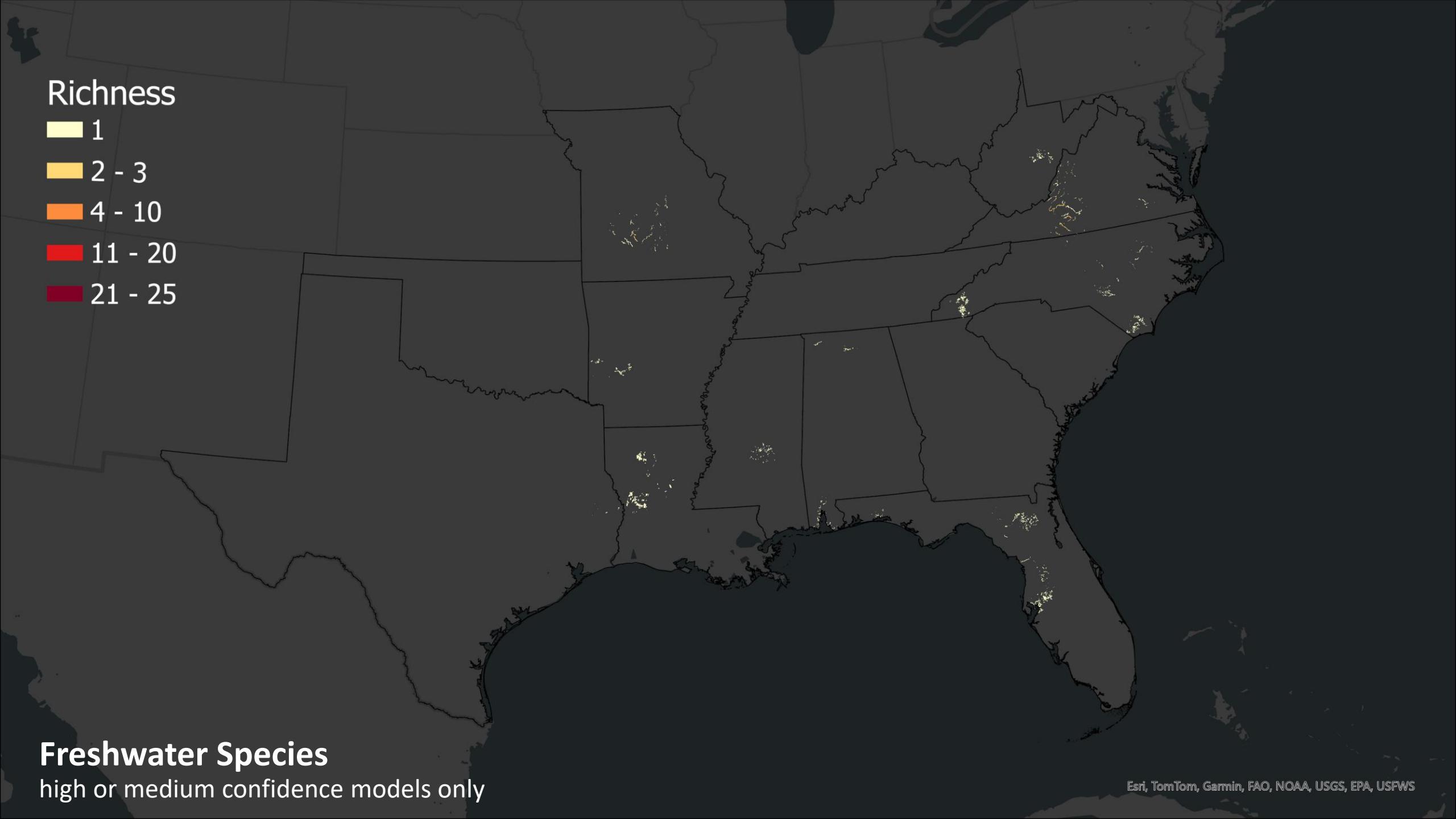
Richness

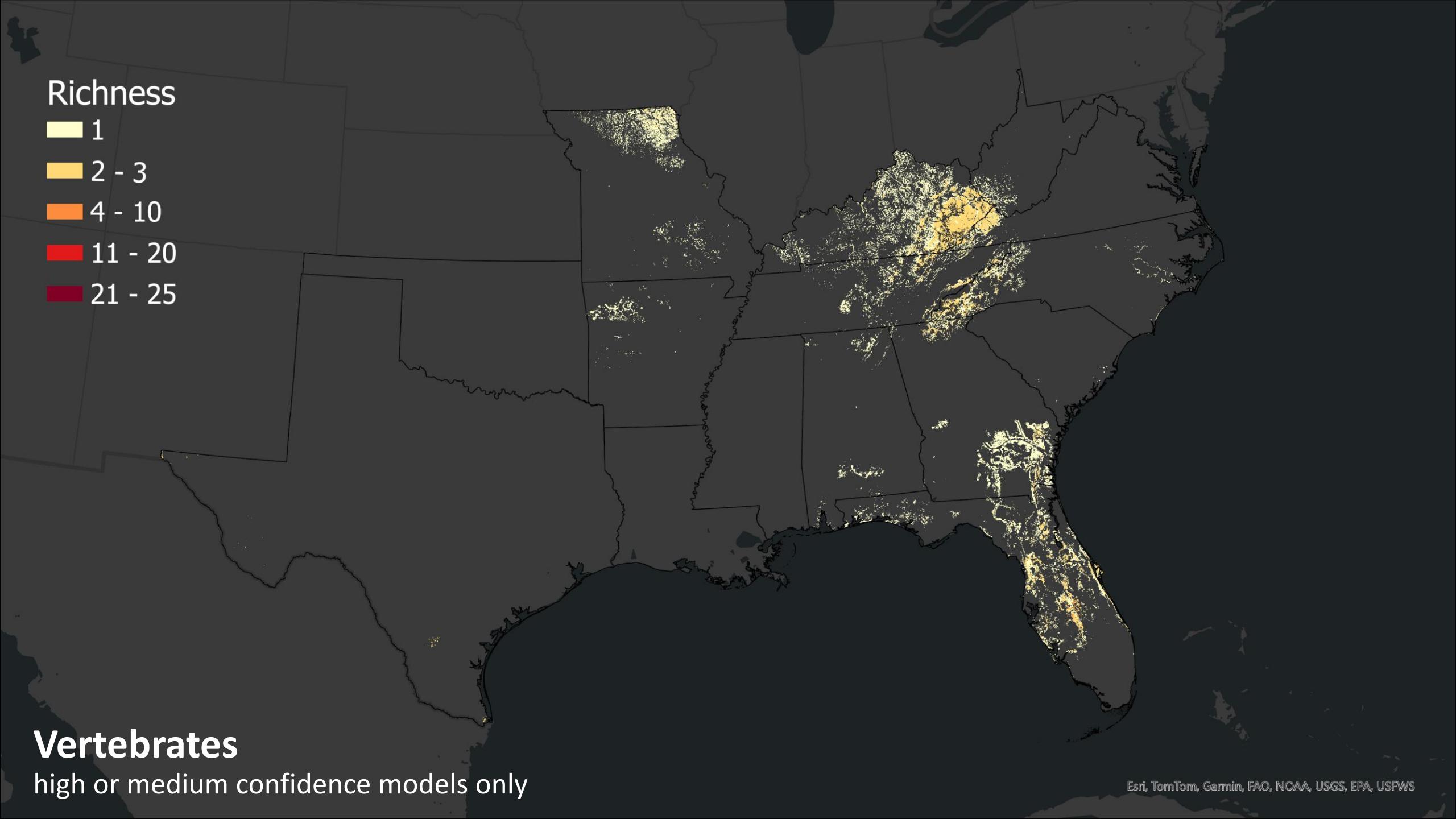
- 1
- 2 - 3
- 4 - 10
- 11 - 20
- 21 - 25

Plants

high or medium confidence models only

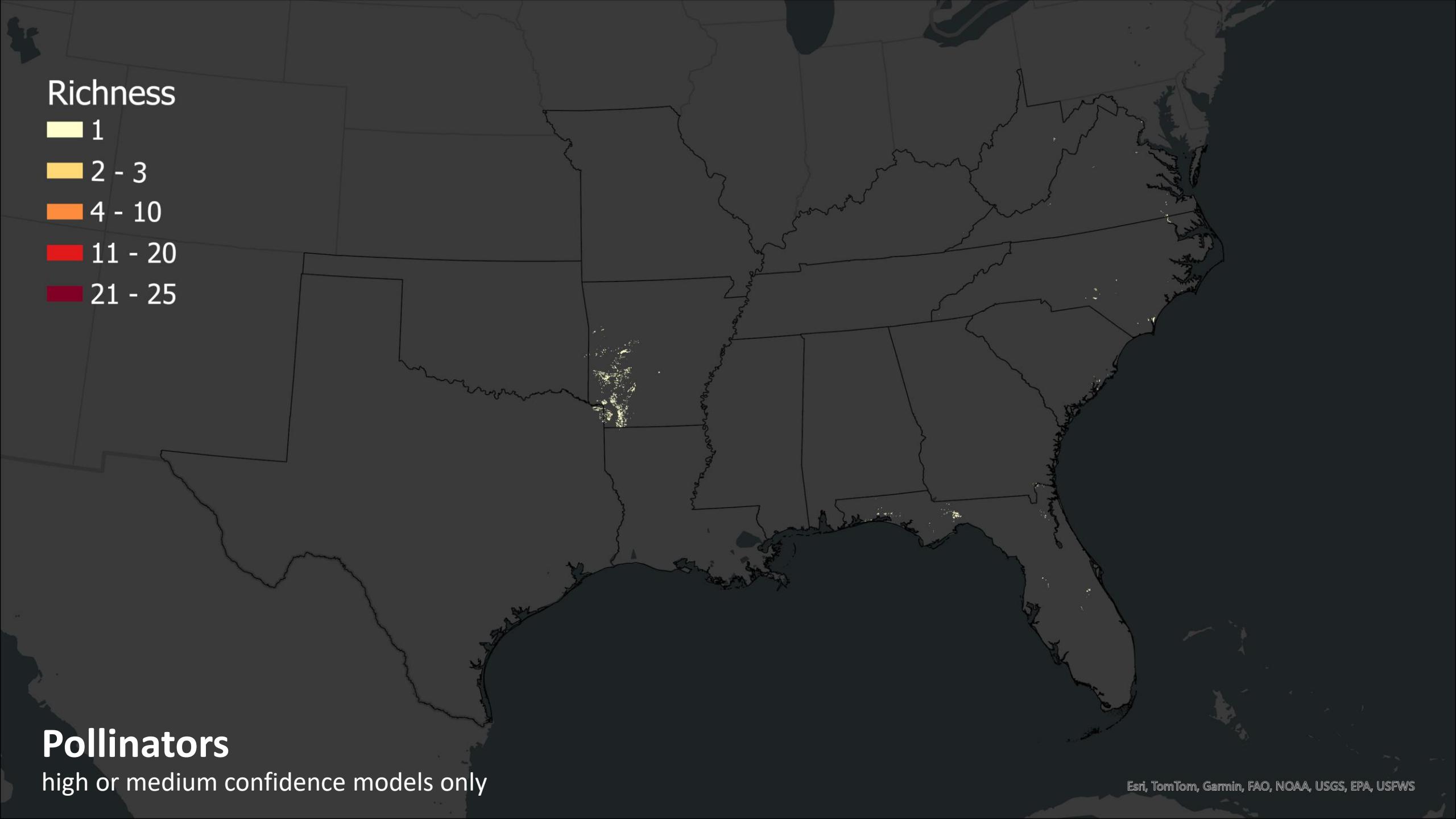






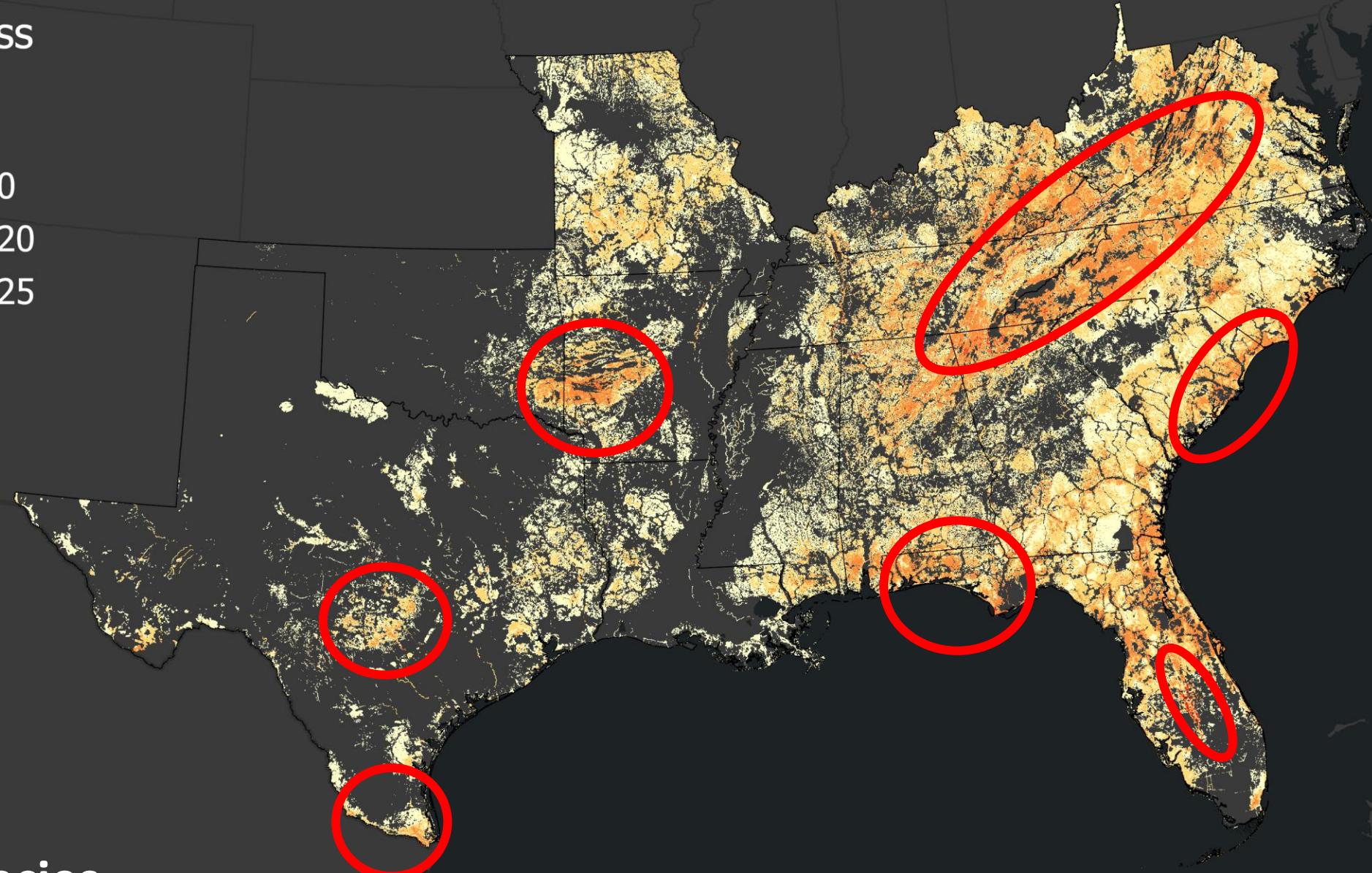
Vertebrates

high or medium confidence models only



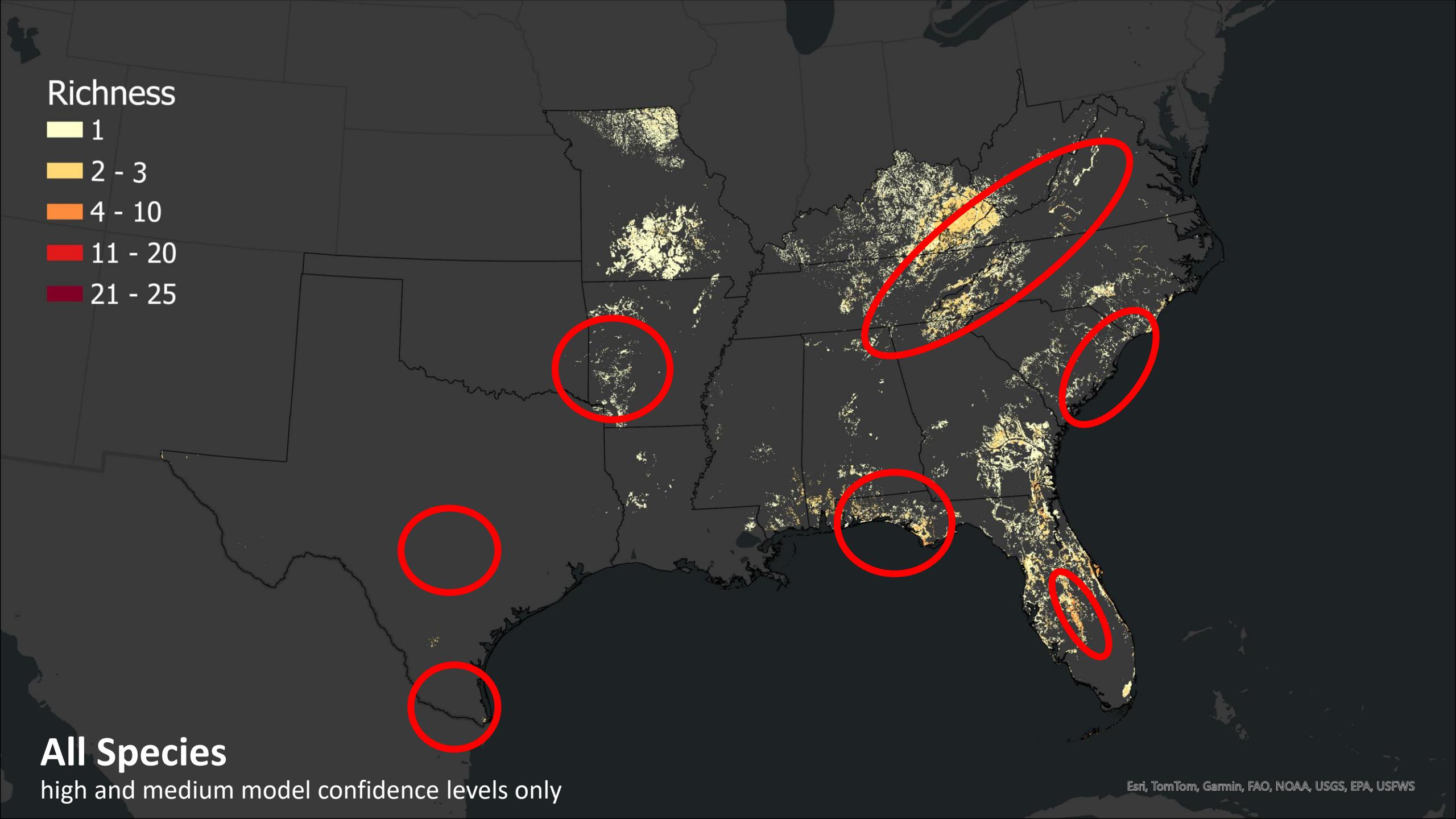
Richness

- 1
- 2 - 3
- 4 - 10
- 11 - 20
- 21 - 25



All Species

all model confidence levels



Apalachicola:
High imperiled species
diversity, partial blueprint
coverage

Lake Wales Ridge:
Hotspot for rare plants
(e.g. wide-leaf warea),
Florida scrub lizard

All Species
high and medium model confidence levels only

Takeaways

- The Blueprint does well in capturing habitat for many imperiled species
- Areas where the Blueprint did not provide good coverage for imperiled species include:
 - Key ecological features (e.g. Ouchitas, Lake Wales Ridge)
 - Highly altered areas where rare species are hanging on (e.g. Texas prairie spp)



Lake Wales Ridge



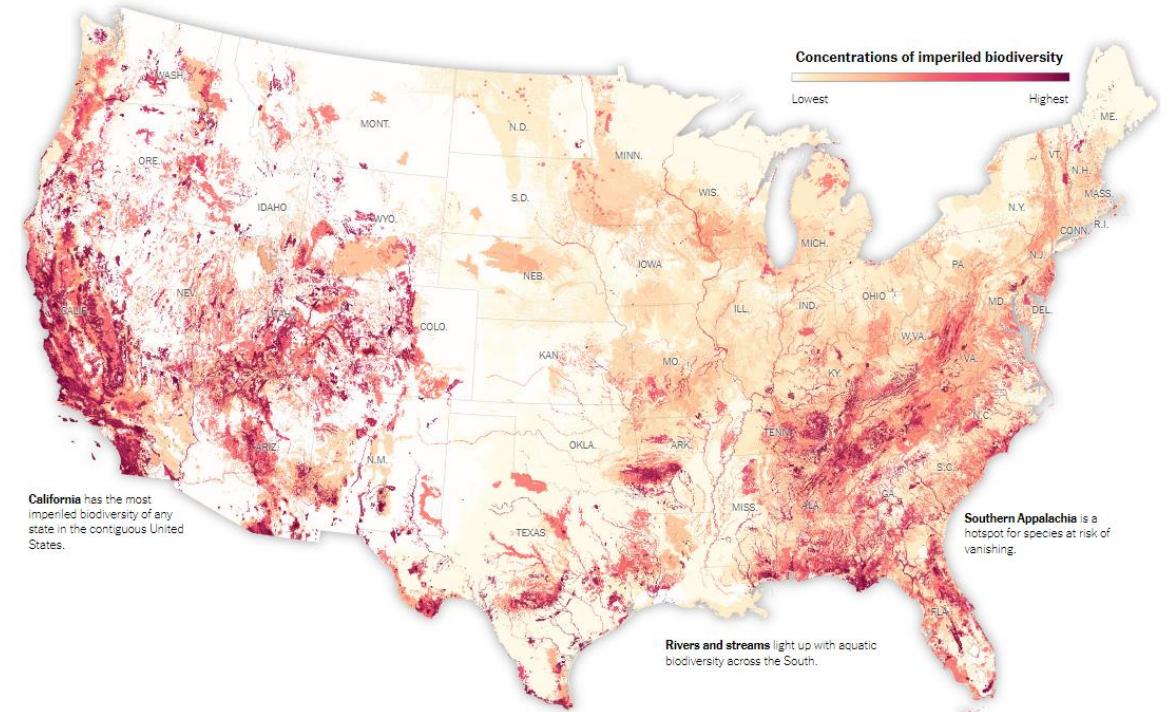
Texas Prairie Remnant

What Next?

- Updates to the Map of Biodiversity Importance – could support Blueprint revisions
- Finer resolution (30m) Map of Biodiversity Importance layers could support Blueprint revisions
- Greater scrutiny of geographies of difference could support Blueprint revisions
- Your thoughts?

Moving into the Future – Dynamic MoBI

- Currently updating the MoBI datasets
 - Expanded set of species (~27% increase)



2018 – 2023 MoBI eligible species comparison.

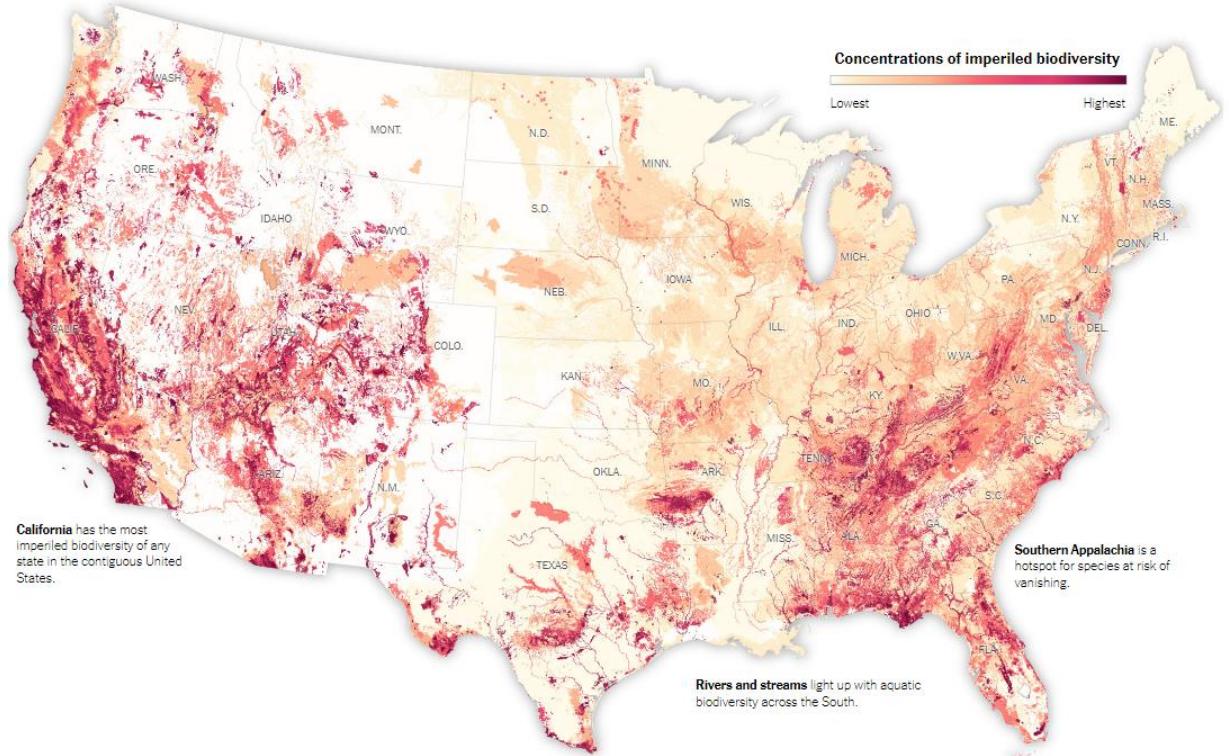
G1/G2+ESA vertebrates, crayfish, freshwater mussels, bumble bees, butterflies/skippers, plants

	MoBI 2018 only	MATCH	new in 2023	2018 Count	2023 Count	Percent Retained	Percent Dropped	Percent Added
Amphibians	3	63	10	66	73	95%	5%	15%
Birds	2	13	5	15	18	87%	13%	33%
Crocodilians		1		1	1	100%	0%	0%
Mammals	2	22	7	24	29	92%	8%	29%
Reptiles	1	23	5	24	28	96%	4%	21%
Turtles		11	1	11	12	100%	0%	9%
Freshwater and Anadromous								
Fishes		168	10	168	178	100%	0%	6%
Vertebrates	8	301	38	309	339	97%	3%	12%
Crayfishes	10	110	4	120	114	92%	8%	3%
Freshwater Mussels	3	105	20	108	125	97%	3%	19%
Freshwater Invertebrates	13	215	24	228	239	94%	6%	11%
Bumble Bees		6	1	6	7	100%	0%	17%
Butterflies and Skippers	14	23	9	37	32	62%	38%	24%
Pollinators	14	29	10	43	39	67%	33%	23%
Conifers and relatives	1	8	4	9	12	89%	11%	44%
Ferns and relatives	1	20		21	20	95%	5%	0%
Flowering Plants	139	1467	527	1606	1994	91%	9%	33%
Plants	141	1495	531	1636	2026	91%	9%	32%
Grand Total	176	2040	603	2216	2643	92%	8%	27%

*Adding 41 “non-bumblebee” bees to boost the pollinator numbers

Moving into the Future – Dynamic MoBI

- Currently updating the MoBI datasets
- Expanded set of species (~27% increase)
- Proposed annual updates to the MoBI richness maps
- Potential customized MoBI datasets





Rusty-patched bumble bee (*Bombus affinis*)
NatureServe Global Status: Imperiled (G2)
Photo by Jessica Petersen

Thank You



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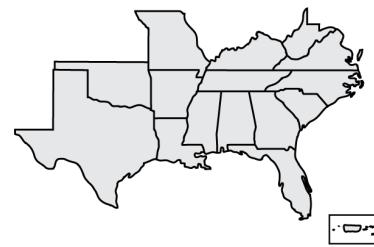
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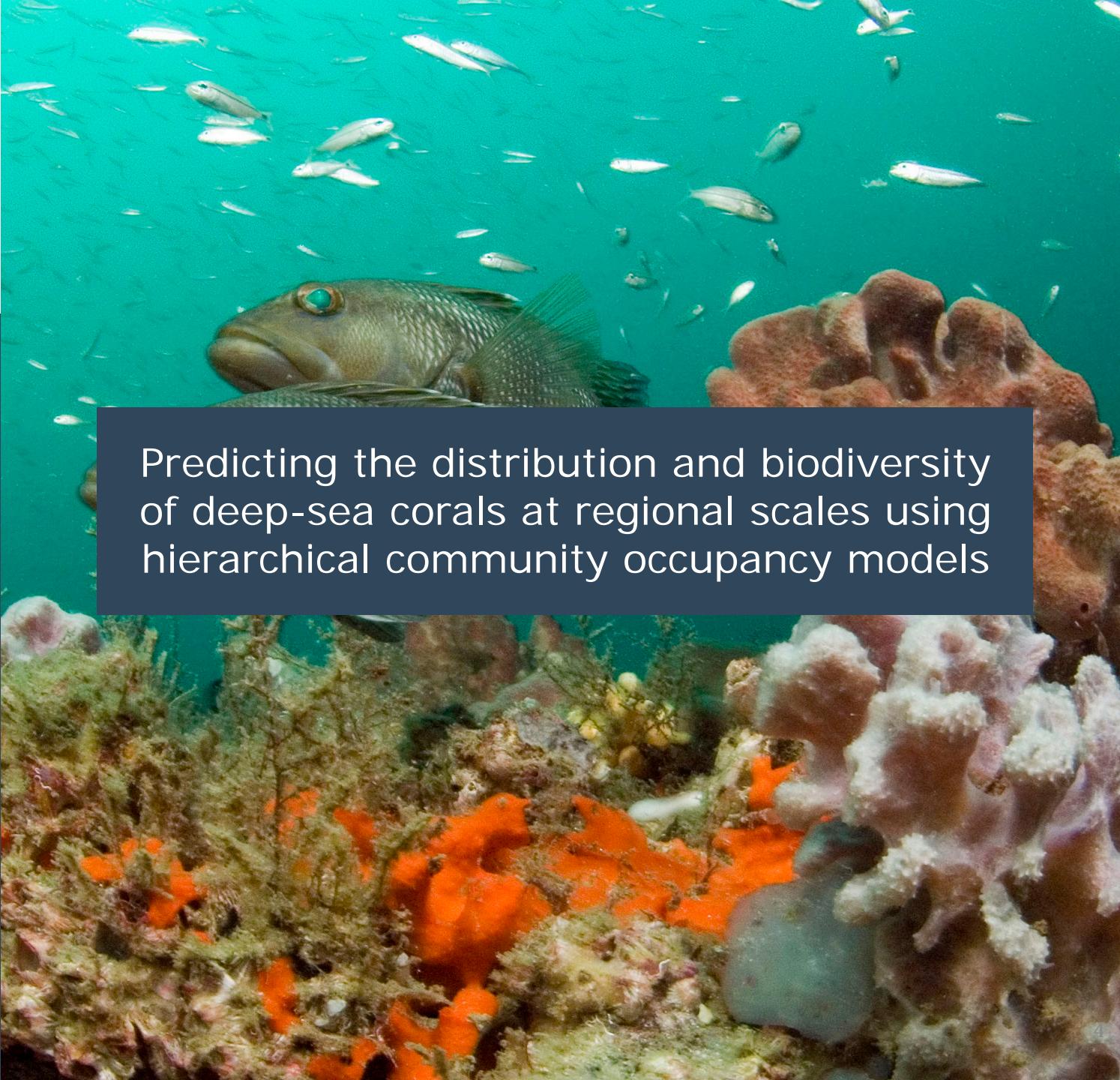
Next Third Thursday
Web Forum

3-21-2024

10:00 am ET

Matthew Poti, NOAA
National Centers for
Coastal Ocean Science

Predicting the distribution and biodiversity
of deep-sea corals at regional scales using
hierarchical community occupancy models





Staff updates

- Indicator review teams gearing up

Indicator review teams gearing up

- We're assembling expert review teams for the following indicators:
 - Grasslands: <https://secassoutheast.org/2024/01/16/Calling-all-grassland-lovers-and-experts.html>
 - Gulf coral & hardbottom
 - Landscape condition
 - Forest birds
- Look for sign-up instructions in the newsletter!

How to get involved in SECAS

- Sign up for the SECAS newsletter

secassoutheast.org

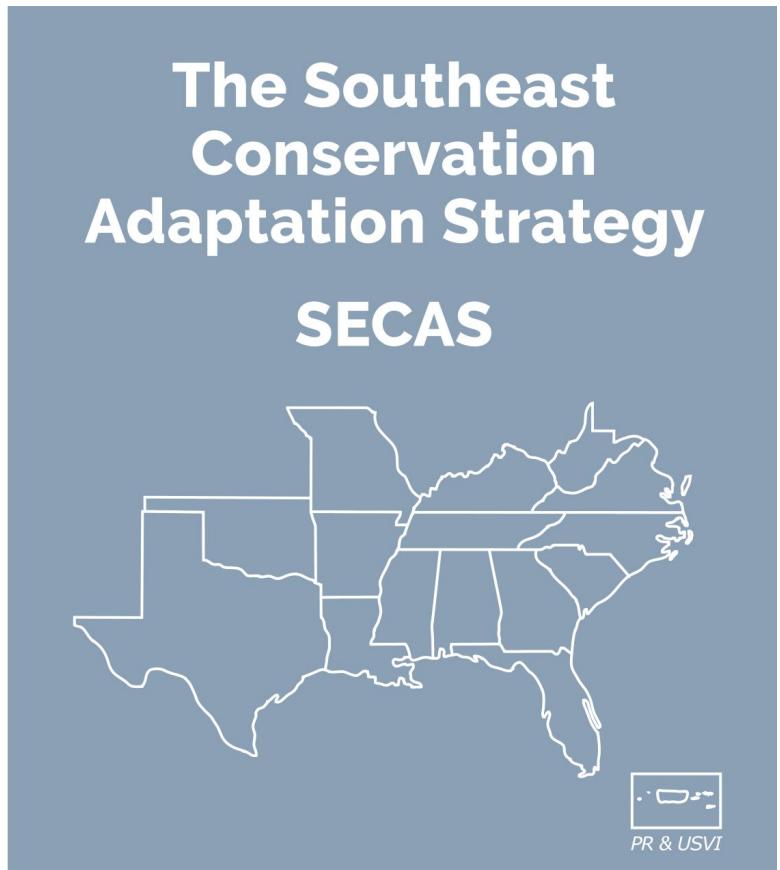
- Connect with SECAS staff or partners

secassoutheast.org/staff

secassoutheast.org/partners

- Explore the Southeast Conservation Blueprint

secassoutheast.org/blueprint





Questions?