

FOREST + PEOPLE + NATURE
POSITIVE

DR. HEALY HAMILTON
CHIEF SCIENTIST
SUSTAINABLE FORESTRY INITIATIVE

May 15, 2024

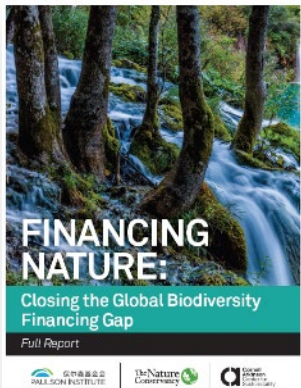
BIODIVERSITY IN
SUSTAINABLE FORESTRY:

**DATA, TOOLS, AND TRENDS FOR
RESPONSIBLE SOURCING**



SFI-0001

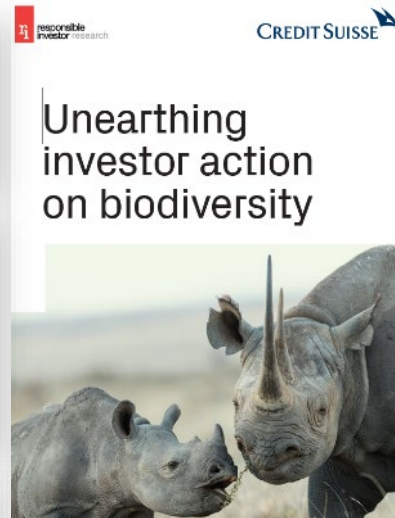
BUSINESS AND FINANCE SECTORS ARE INCREASINGLY SEEKING TO ACCOUNT FOR NATURE



Investors push 10,000 companies to disclose environmental data to CDP



A World Bank Group paper on private finance for biodiversity and ecosystem services



02.11.2021

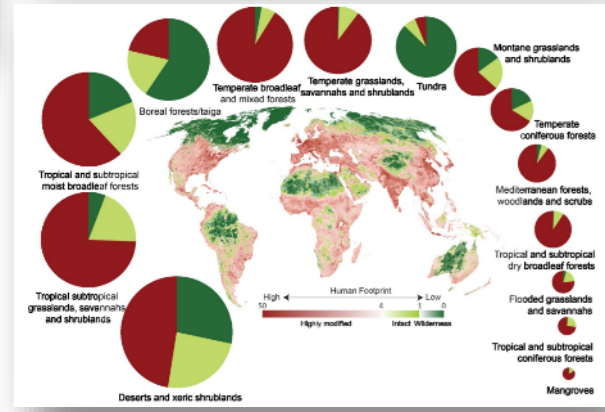
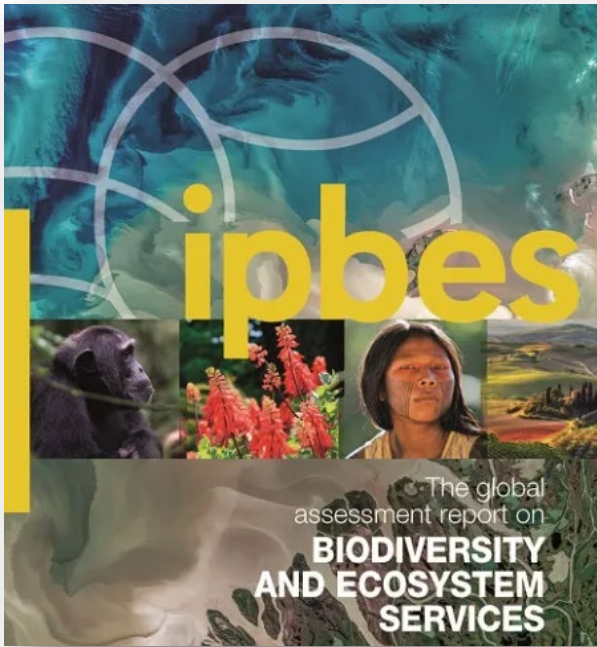
GLASGOW LEADERS' DECLARATION ON FORESTS AND LAND USE



COP26 Advances Ambitious Climate Action and Nature-based Solutions

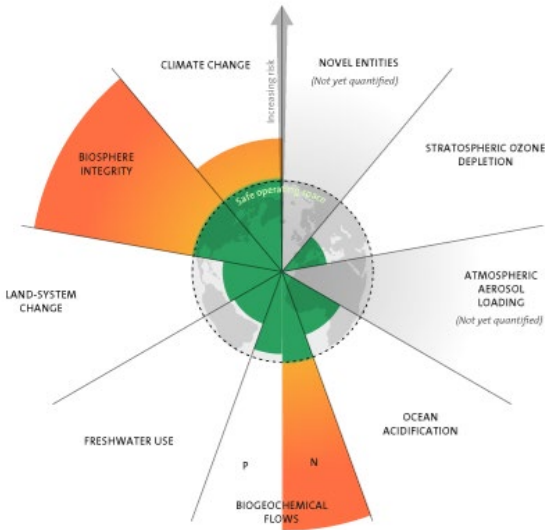
SUSTAINABLE DEVELOPMENT GOALS





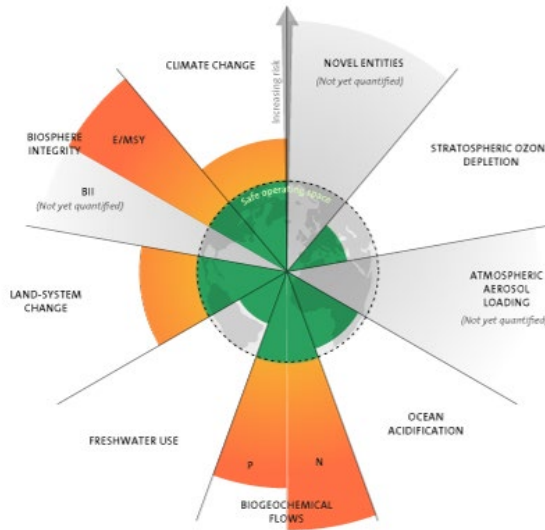
PLANETARY BOUNDARIES

2009



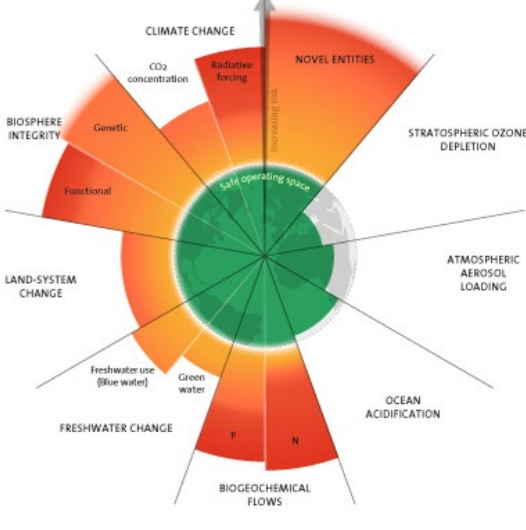
3 BOUNDARIES CROSSED

2015



4 BOUNDARIES CROSSED

2023



6 BOUNDARIES CROSSED

Richardson et al. 2023, Steffen et al. 2015, and Rockström et al. 2009



The impact of nature risk on credit ratings is a wake-up call for investors



150 financial institutions call on world leaders to adopt ambitious Global Biodiversity framework

Biodiversity liability and value chain risk report

Clyde & Co LLP

Perspectives

BRUNSWICK Business in the Ecosystem

INSIDER

BUSINESS | LIFE | NEWS | REVIEWS

Biodiversity concerns set to be the next frontier after climate change

ESG reporting has evolved amid rising stakeholder expectations, says Berry Global's VP of Sustainability



Finance *for*
Biodiversity
Pledge



Taskforce on Nature-related
Financial Disclosures



SCIENCE
BASED TARGETS
FOR NATURE.

Roadmaps to Nature Positive
→ *Foundations for
all businesses*



one planet
business for biodiversity



BUSINESS
FOR NATURE



Business @
Biodiversity



Recommendations
of the Taskforce on
Nature-related
Financial Disclosures

September 2023

“Nature risk, beyond climate change, is financial risk. Business as usual is no longer a viable option and nature must no longer be seen as a corporate social responsibility issue but a strategic risk management one.”

TNFD Metrics for reporting on drivers of nature change

- C1.0 total spatial footprint
- C1.1 ecosystem conversion/restoration
- C2.0 pollution
- C2.1-2.4 water, plastic, air pollution
- C3.0 water use
- C3.1 high-risk natural commodities sourced (ie, fiber sourcing)
- C4.0 invasive alien species
- C5.0 state of nature

TNFD Metrics for reporting on drivers of nature change

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- C5.0 state of nature





Annex 1;
Table 6,
pg. 87

Metric no.	Driver of nature change	Indicator	Metric	Connection to GBF targets
C5.0	State of nature	<p>Placeholder indicator: Ecosystem condition</p> <p>Placeholder indicator: Species extinction risk</p>	<p>For those organisations that choose to report on state of nature metrics, the TNFD encourages them to report the following indicators, and to refer to the TNFD additional guidance on measurement of the state of nature in Annex 2 of the LEAP approach:</p> <ul style="list-style-type: none"> • Level of ecosystem condition by type of ecosystem and business activity; and • Species extinction risk. <p>There are a number of different measurement options for these indicators. The TNFD does not currently specify one metric as there is no single metric that will capture all relevant dimensions of changes to the state of nature and a consensus is still developing.</p>	Target 1, Target 2, Target 3, Target 4, Target 11





iucnredlist.org

			
ANIMALIA - AVES GLOBAL Wandering Albatross <i>Diomedea exulans</i> ↓ Decreasing <VU>	ANIMALIA - AMPHIBIA GLOBAL São Tomé Giant Reed Frog <i>Hyperolius thomensis</i> ↓ Decreasing <EN>	ANIMALIA - MALACOSTRACA GLOBAL Lepidothelphusa cognetti Unknown <EN>	PLANTAE - MAGNOLIOPSIDA GLOBAL Pumpkin <i>Cucurbita pepo</i> Unknown <LC>

**SPECIES
THREAT
ABATEMENT &
RESTORATION
METRIC**

ibat-alliance.org

Integrated Biodiversity Assessment Tool

The world's most authoritative biodiversity data for your world-shaping decisions

[Create account](#)

STAR STAR is now available in IBAT!

Discover Protected Areas and OECMs



Search for a Region, Country or Area

- Terrestrial and Inland Waters Protected Areas
- Marine Protected Areas

Map Disclaimer

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

- Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.
- Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.



Discover Protected Areas and OECMs



Search for a Region, Country or Area

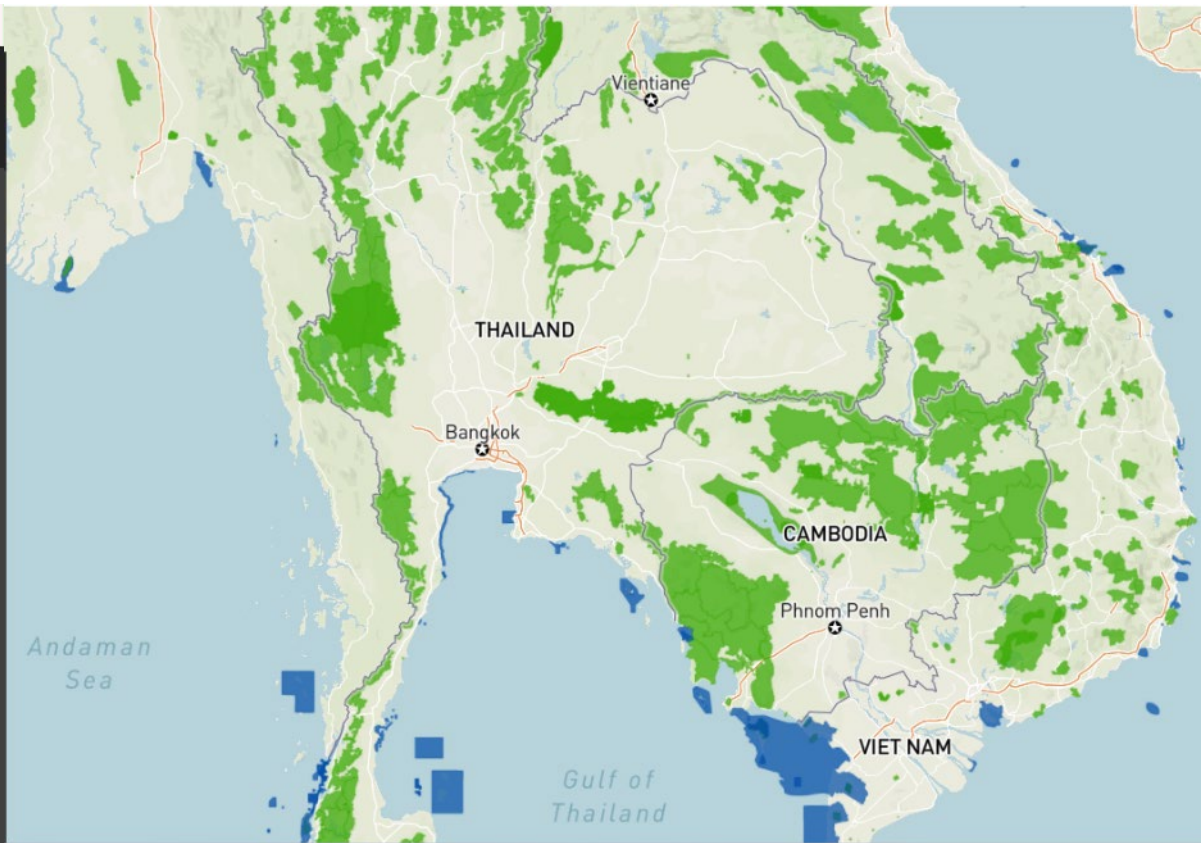
Terrestrial and Inland Waters Protected Areas

Marine Protected Areas

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- Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.



Names - common, scientific, regions etc...



Advanced ?

AMAZING SPECIES



ANIMALIA - AVES

GLOBAL

Wandering Albatross

Diomedea exulans

↓ Decreasing



PLANTAE - MAGNOLIOPSIDA

GLOBAL

Renala

Adansonia grandidieri

↓ Decreasing



ANIMALIA - MAMMALIA

GLOBAL

Patagonian Huemul

Hippocamelus bisulcus

↓ Decreasing



PLANTAE - MAGNOLIOPSIDA

GLOBAL

Siamese Rosewood

Dalbergia cochinchinensis

↓ Decreasing



[Amazing species](#)

More than 44,000 species
are threatened with extinction

That is still 28% of all assessed species.

AMPHIBIANS

41%



MAMMALS

26%



CONIFERS

34%



BIRDS

12%



SHARKS & RAYS

37%



REEF CORALS

36%



SELECTED CRUSTACEANS

28%



REPTILES

21%



CYCADS

70%





IBAT Briefing Note

Species Threat Abatement and Restoration (STAR)

A Global Metric Supporting Nature-Positive Action

STAR



White Rhino
Ceratotherium simum
Near Threatened

IBAT alliance partners



CONSERVATION INTERNATIONAL



UN@ WCMC
environment programme

Report prepared by



June 2021

Species Threat Abatement and Restoration (STAR) data layer

Business User Guidance

STAR



Sumatran Orangutan
Pongo abelii
Critically Endangered

IBAT alliance partners



CONSERVATION INTERNATIONAL



UN@ WCMC
environment programme

Report prepared by



1.4 Forest - Temperate

Layers

Map

Satellite

SCIENTIFIC DATA

www.nature.com/scientificdata

Check for updates

OPEN

A global map of terrestrial habitat types









DATA DESCRIPTOR

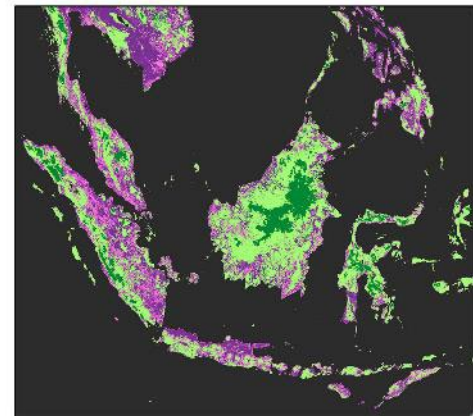
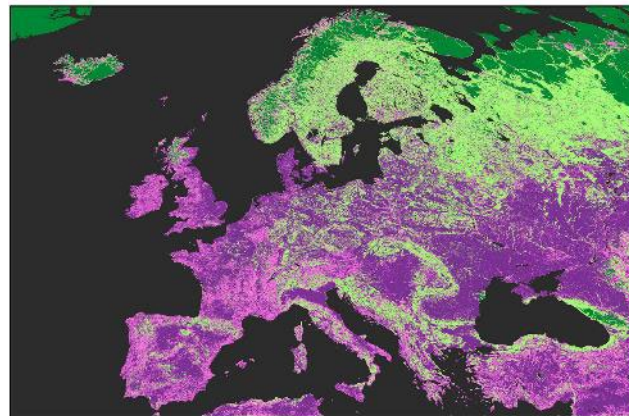
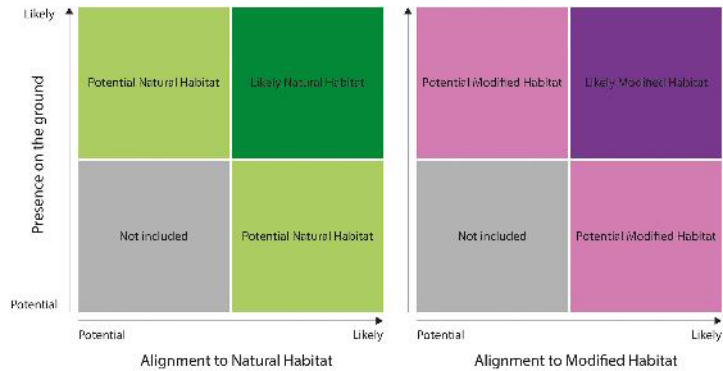
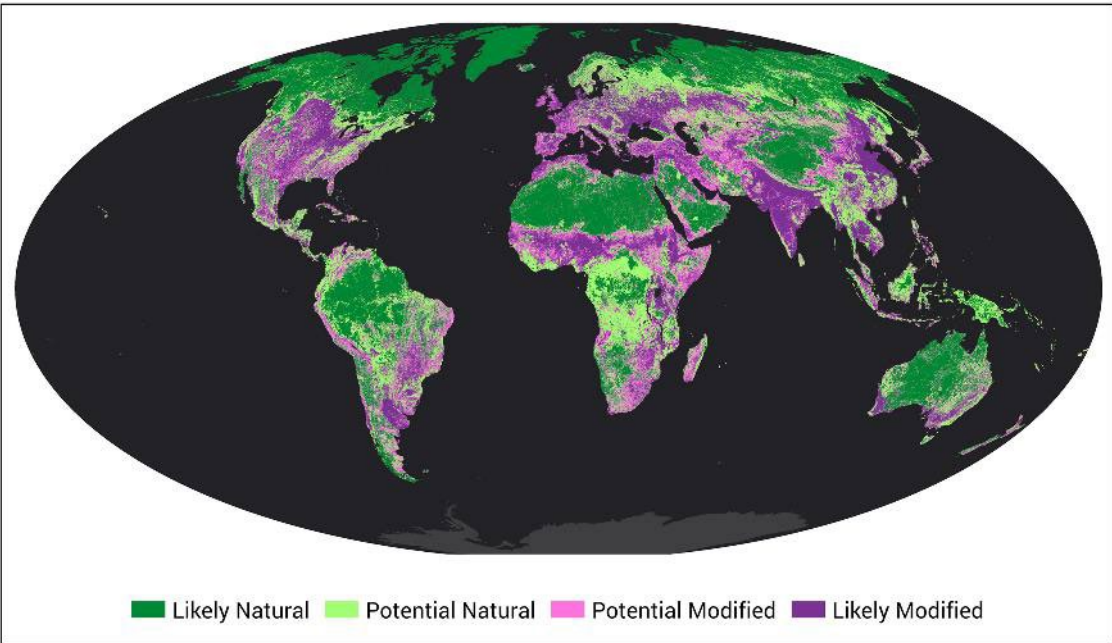
Martin Jung^{1,2}, Prabhat Raj Dahal², Stuart H. M. Butchart^{3,4}, Paul F. Donald⁵,
Xavier De Lamo⁶, Myroslava Lesiv⁶, Valerie Kapos⁶, Carlo Rondinini² & Piero Visconti¹

Keyboard shortcuts | Map data ©2024 Google, INEGI | 1000 km | Terms

Policy analysis

A global mapping template for natural and modified habitat across terrestrial Earth

Joe Gosling^a  , Matt I. Jones^a , Andy Arnell^a , James E.M. Watson^{b c d} , Oscar Venter^e , Andrea C. Baquero^a , Neil D. Burgess^{a f} 





16,428

Number of KBAs

21,007,810

KBA Area (sq. km)

43.58%

Avg. PA & OECM Coverage %

14,255

Trigger species

4,350

KBAs with identified threats

Key Biodiversity Areas: sites that contribute significantly to the global persistence of biodiversity

SFI ADVANCES SUSTAINABILITY THROUGH FOREST-FOCUSED COLLABORATION



**STANDARDS
AND SUPPLY
CHAINS**



**CONSERVATION
COLLABORATION**



**EDUCATION AND
CAREER
PATHWAYS**



**COMMUNITY AND
INDIGENOUS
RELATIONS**



NEW SFI 2022 FOREST MANAGEMENT STANDARD OBJECTIVES



OBJECTIVE 1. FOREST MANAGEMENT PLANNING



OBJECTIVE 2. FOREST HEALTH AND PRODUCTIVITY



OBJECTIVE 3. PROTECTION AND MAINTENANCE OF WATER RESOURCES



OBJECTIVE 4. CONSERVATION OF BIOLOGICAL DIVERSITY



OBJECTIVE 5. MANAGEMENT OF VISUAL QUALITY AND RECREATIONAL BENEFITS



OBJECTIVE 6. PROTECTION OF SPECIAL SITES



OBJECTIVE 7. EFFICIENT USE OF FIBER SOURCES



OBJECTIVE 8. RECOGNIZE AND RESPECT INDIGENOUS PEOPLES' RIGHTS



OBJECTIVE 9. CLIMATE SMART FORESTRY



OBJECTIVE 10. FIRE RESILIENCE AND AWARENESS



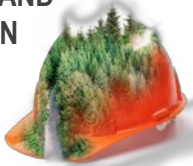
OBJECTIVE 11. LEGAL AND REGULATORY COMPLIANCE



OBJECTIVE 12. FORESTRY RESEARCH, SCIENCE AND TECHNOLOGY



OBJECTIVE 13. TRAINING AND EDUCATION



OBJECTIVE 14. COMMUNITY INVOLVEMENT AND LANDOWNER OUTREACH



OBJECTIVE 15. PUBLIC LAND MANAGEMENT RESPONSIBILITIES



OBJECTIVE 16. COMMUNICATIONS AND PUBLIC REPORTING



OBJECTIVE 17. MANAGEMENT REVIEW AND CONTINUAL IMPROVEMENT



SFI 2022 FIBER SOURCING STANDARD OBJECTIVES

**OBJECTIVE 1.
BIODIVERSITY IN
FIBER SOURCING**



**OBJECTIVE 2.
ADHERENCE TO
BEST MANAGEMENT
PRACTICES**



**OBJECTIVE 3. USE OF QUALIFIED
RESOURCE PROFESSIONALS, QUALIFIED
LOGGING PROFESSIONALS AND SFI-
CERTIFIED LOGGING COMPANIES**



**OBJECTIVE 4.
LEGAL AND
REGULATORY
COMPLIANCE**



**OBJECTIVE 5. FORESTRY
RESEARCH, SCIENCE AND
TECHNOLOGY**



**OBJECTIVE 6.
TRAINING AND
EDUCATION**



**OBJECTIVE 7. COMMUNITY
INVOLVEMENT AND
LANDOWNER
OUTREACH**



**OBJECTIVE 8. PUBLIC LAND
MANAGEMENT
RESPONSIBILITIES**



**OBJECTIVE 9.
COMMUNICATIONS AND
PUBLIC REPORTING**



**OBJECTIVE 10.
MANAGEMENT REVIEW
AND CONTINUAL
IMPROVEMENT**



**OBJECTIVE 11. AVOID
CONTROVERSIAL
SOURCES**

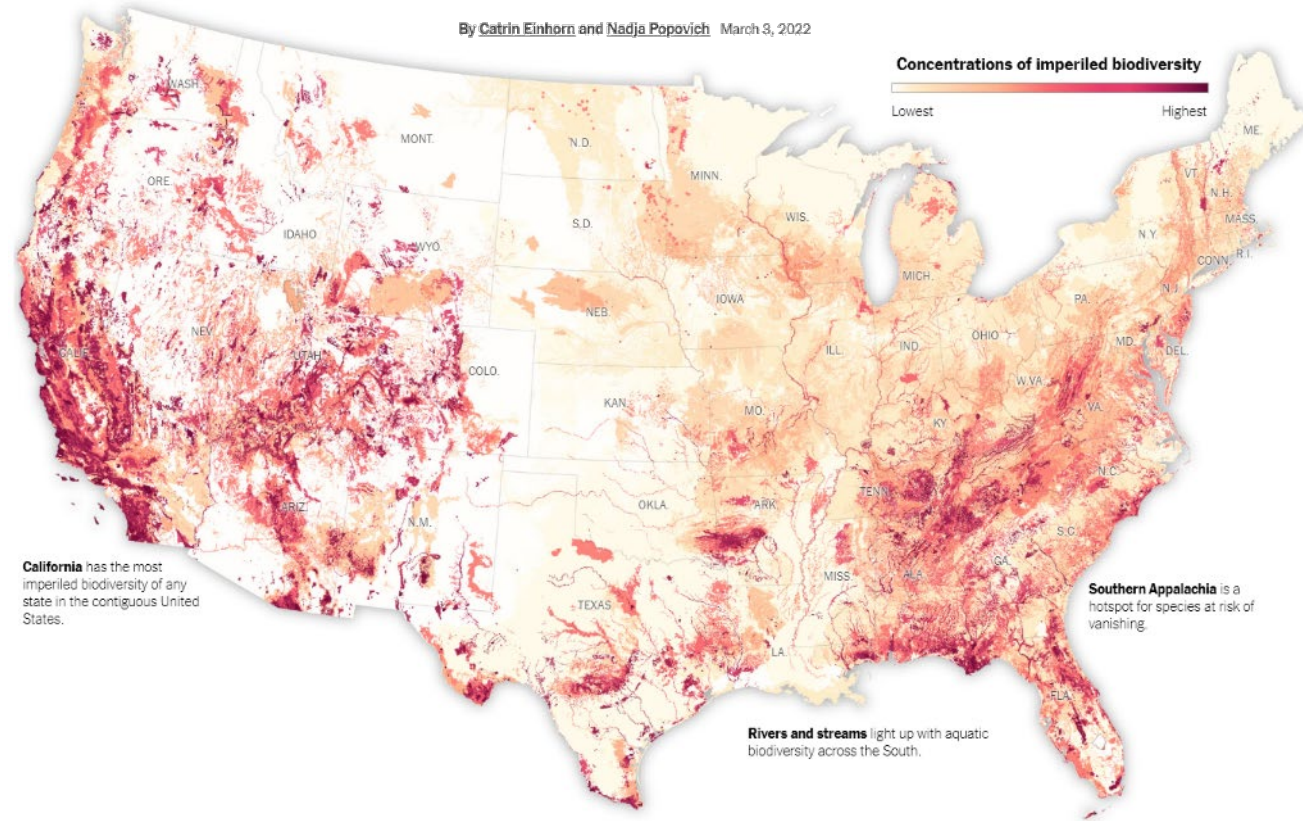


The New York Times

This Map Shows Where Biodiversity Is Most at Risk in America

By [Catrin Einhorn](#) and [Nadja Popovich](#) March 3, 2022

Concentrations of imperiled biodiversity



**SPECIES METRICS -
IMPERILED SPECIES
RICHNESS**

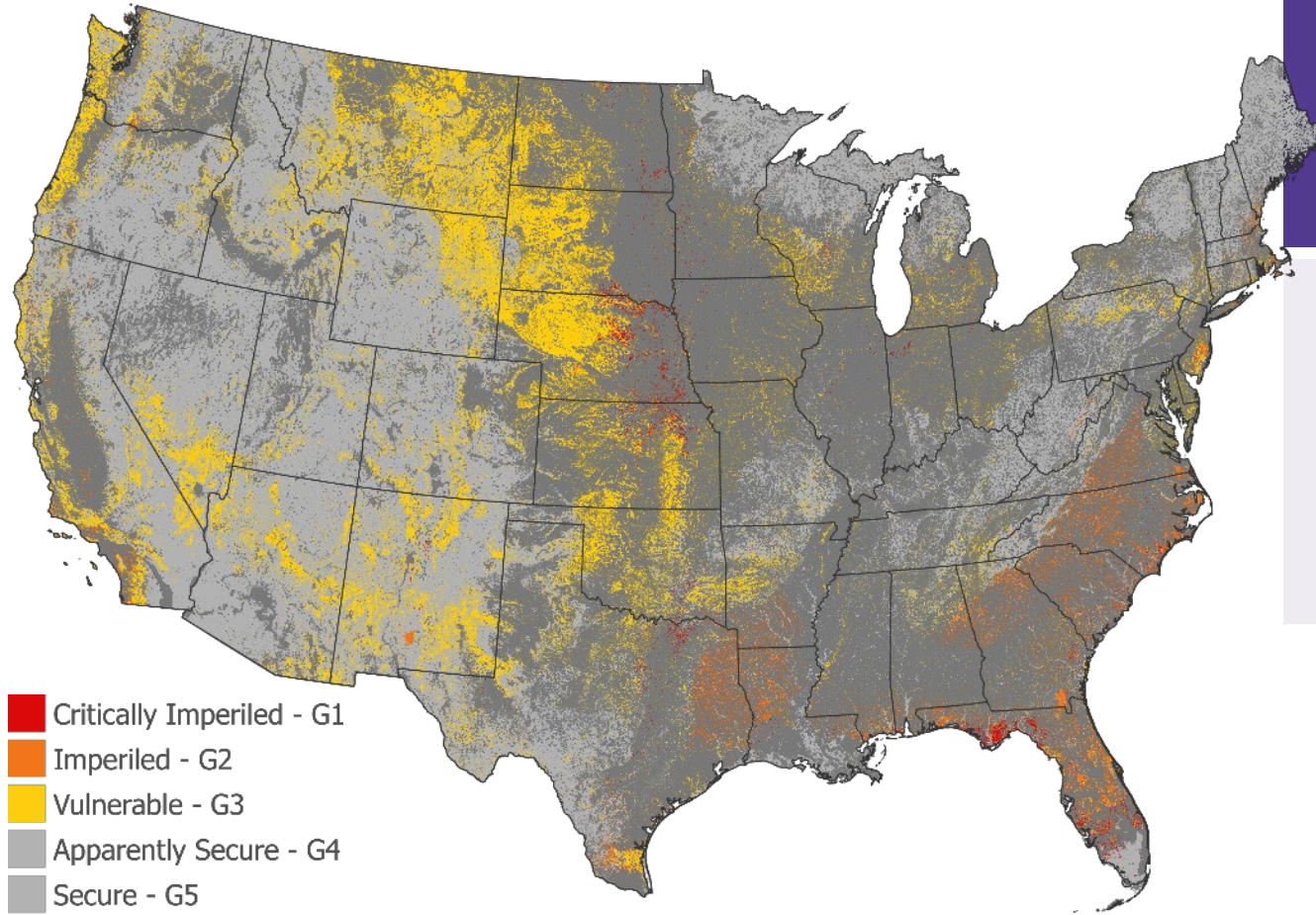
**MODELED
DISTRIBUTIONS FOR
>2200 GLOBALLY
IMPERILED SPECIES**







(Hamilton *et al.*, *Ecol. Appl.* 2022)

ECOSYSTEM METRICS: CONDITION AND EXTENT

CONSERVATION STATUS OF U.S. ECOSYSTEMS

(Comer et al. 2022)









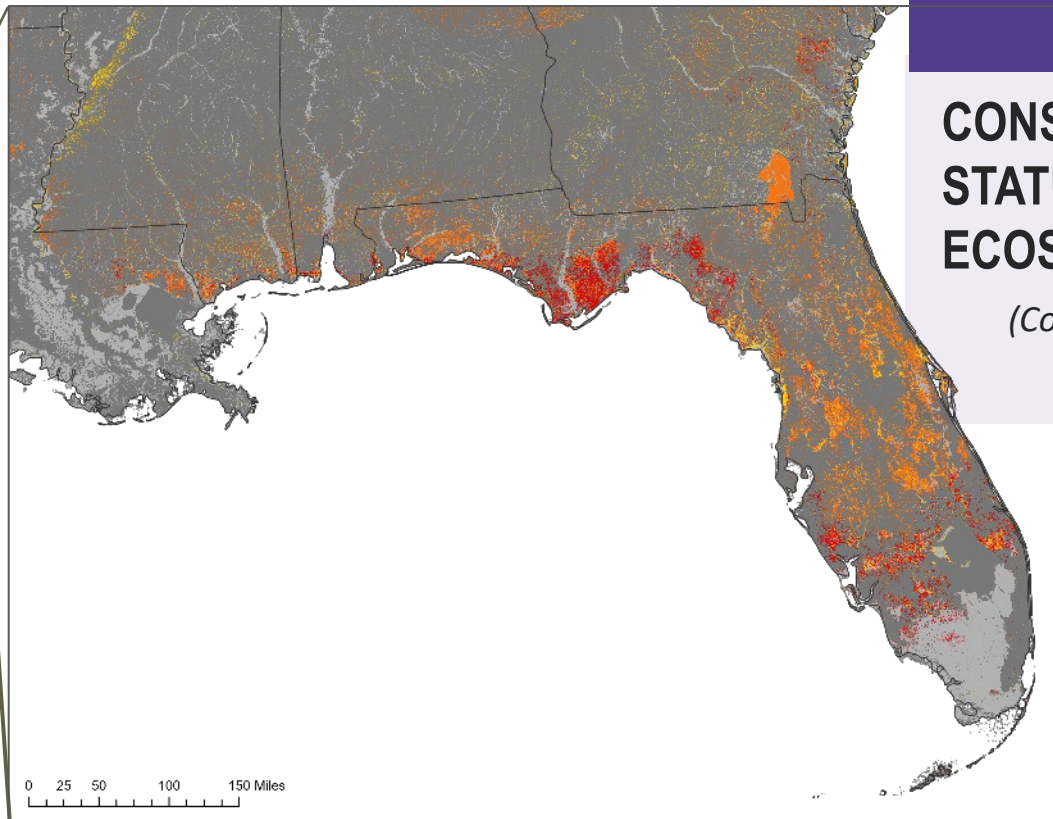
-  Critically Imperiled - G1
-  Imperiled - G2
-  Vulnerable - G3
-  Apparently Secure - G4
-  Secure - G5
-  Developed Land or Cultural Vegetation

ECOSYSTEM CONDITION AND EXTENT

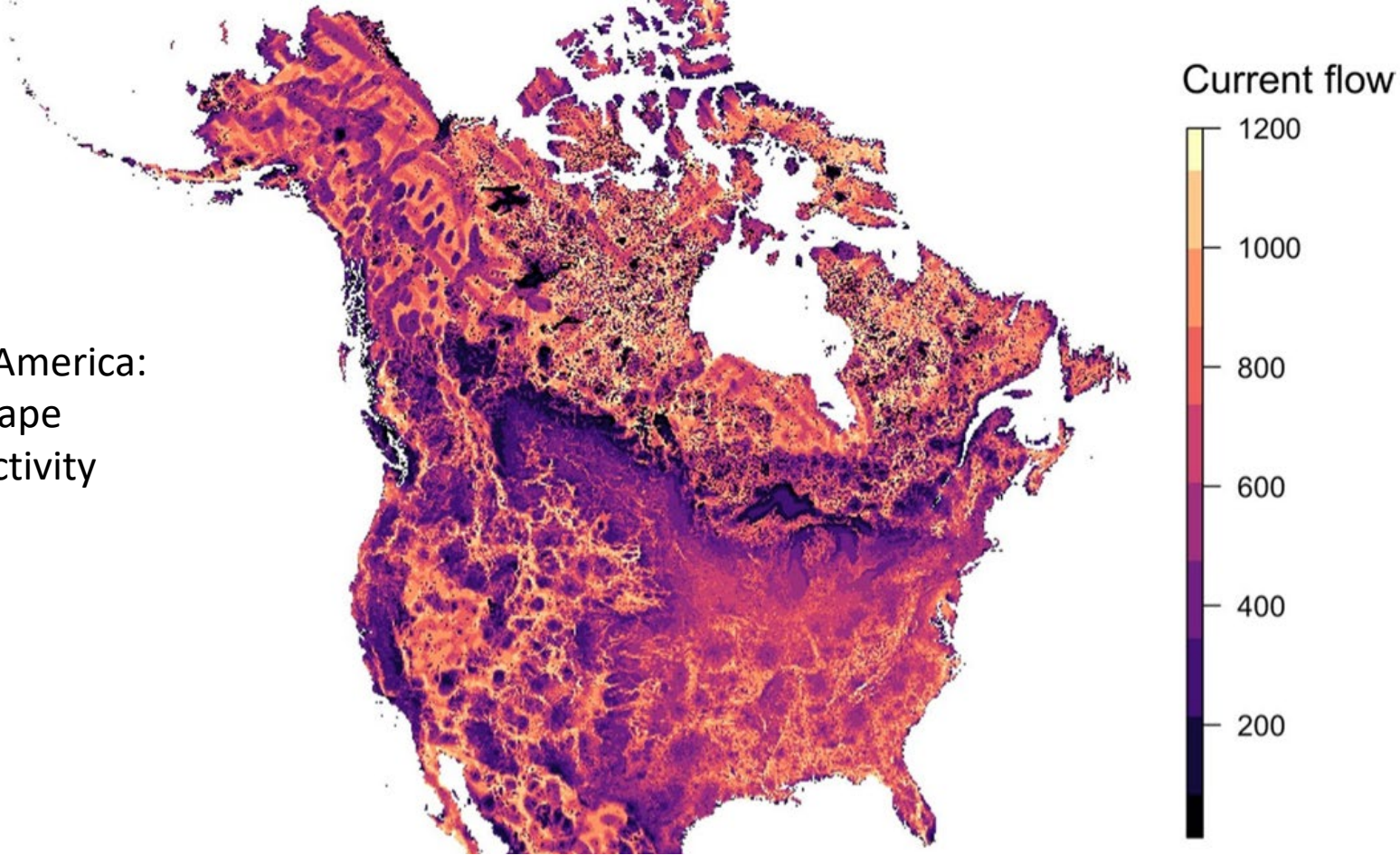
CONSERVATION STATUS OF U.S. ECOSYSTEMS

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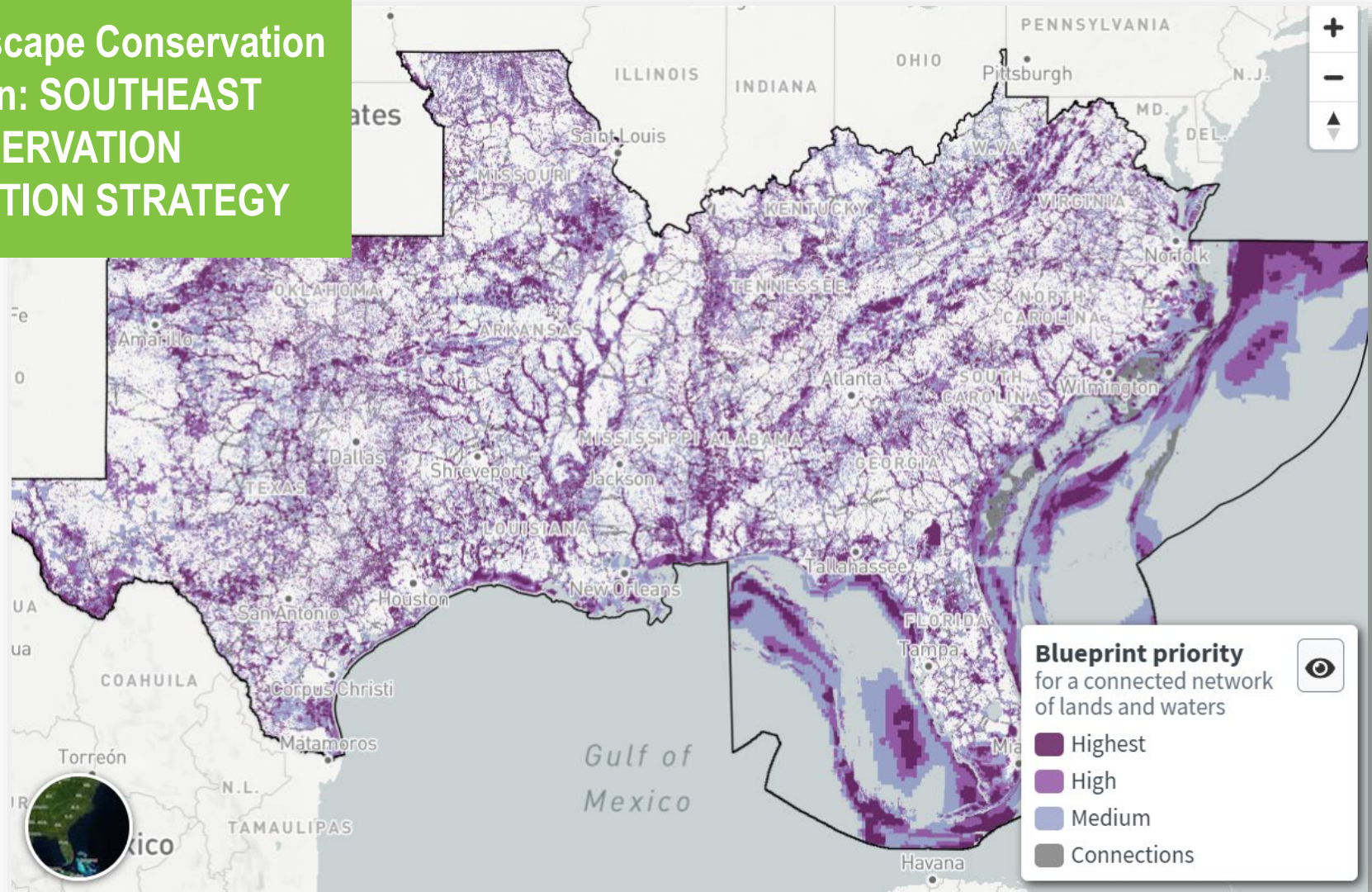


North America:
Landscape
Connectivity



Belote et al (2022) Landscape Ecology 37:2977–2990
doi.org/10.1007/s10980-022-01530-9

Landscape Conservation Design: SOUTHEAST CONSERVATION ADAPTION STRATEGY



THERE ARE MANY BIODIVERSITY VALUES

**SPECIES RICHNESS
& IMPERILED
SPECIES RICHNESS**

**ECOSYSTEM
DIVERSITY &
CONSERVATION
STATUS**

**ECOLOGICAL
INTEGRITY**

CONNECTIVITY

**CLIMATE
REFUGIA**

**CONTRIBUTION
TO LANDSCAPE
CONSERVATION
DESIGN**

**RESTORATION
POTENTIAL**





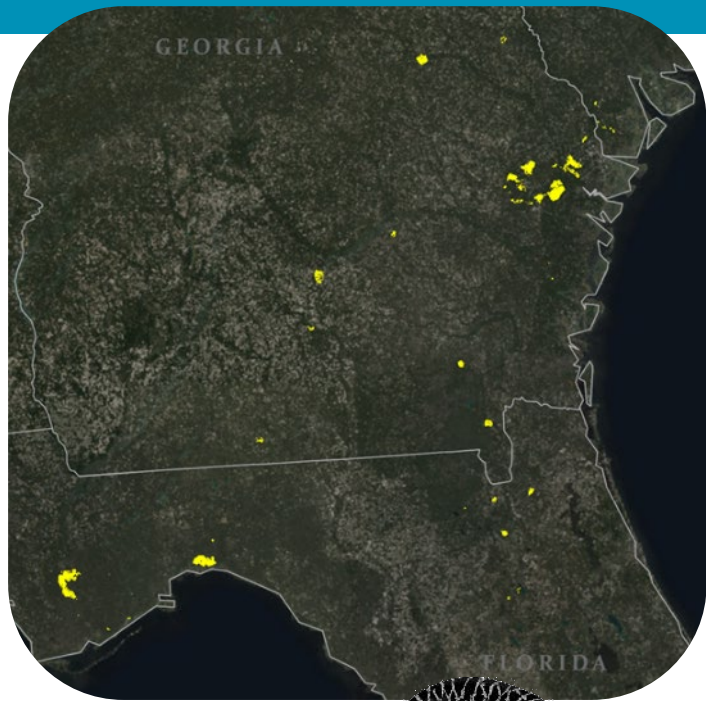
Georgia-Pacific

Progress with Purpose

2022 Stewardship Report

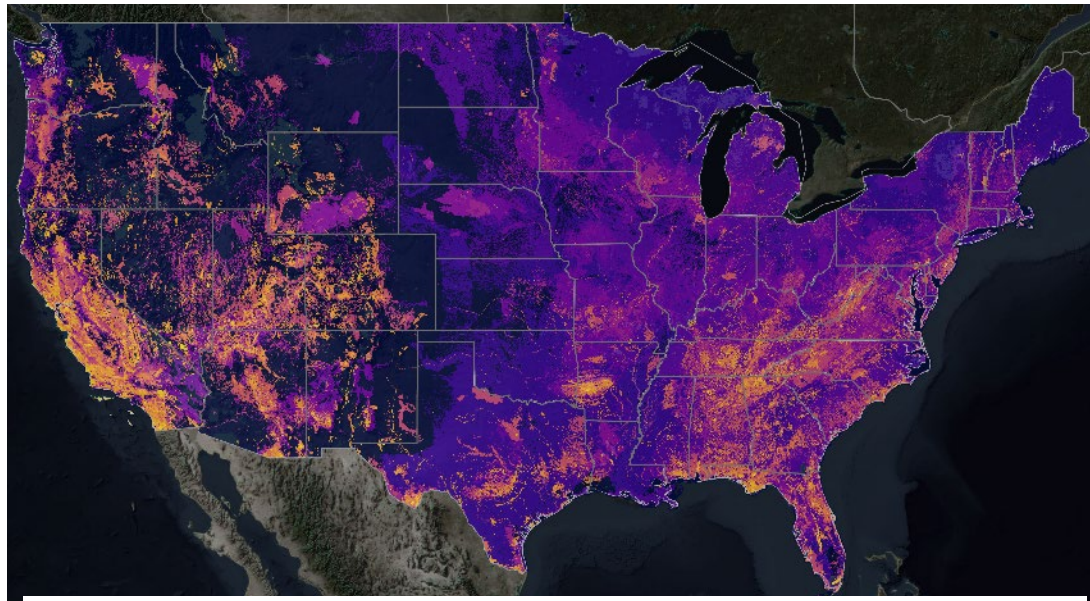


HABITAT MODEL FOR THE FROSTED FLATWOODS SALAMANDER



Ambystoma cingulatum
G2 - Imperiled

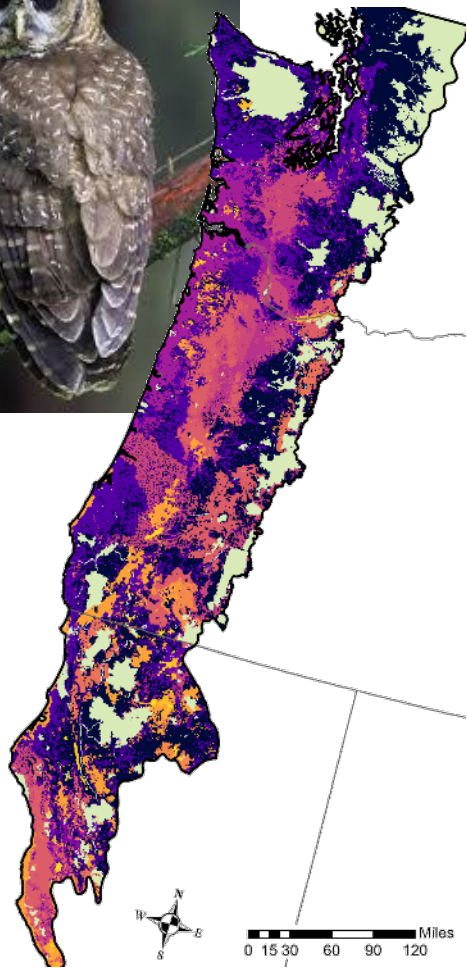
RICHNESS 'HOTSPOTS' FOR 2216 GLOBALLY IMPERILED SPECIES



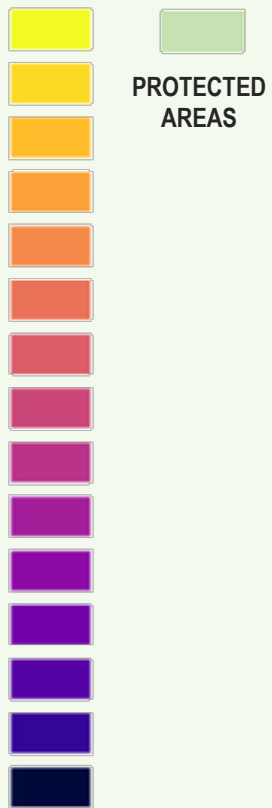
www.natureserve.org/map-biodiversity-importance



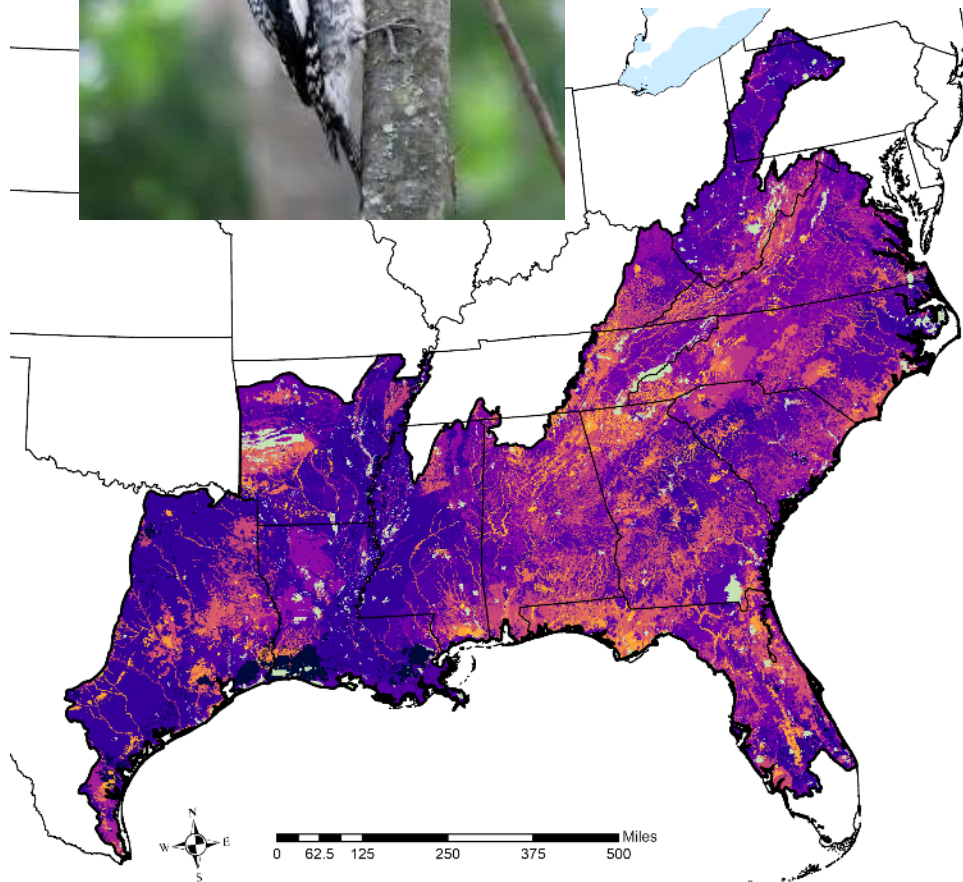
Hamilton *et al.*, 2022,
Ecological Applications



**IMPERILED NARROW
ENDEMIC
0% PROTECTED**



**IMPERILED, 100%
PROTECTED**





Ozark-Ouachita Dry-Mesic Oak Forest



Southern Appalachian Oak Forest



North Pacific Maritime Mesic-Wet Douglas-fir-Western Hemlock Forest (Vulnerable)



Mississippi River Low Floodplain (Bottomland) Forest



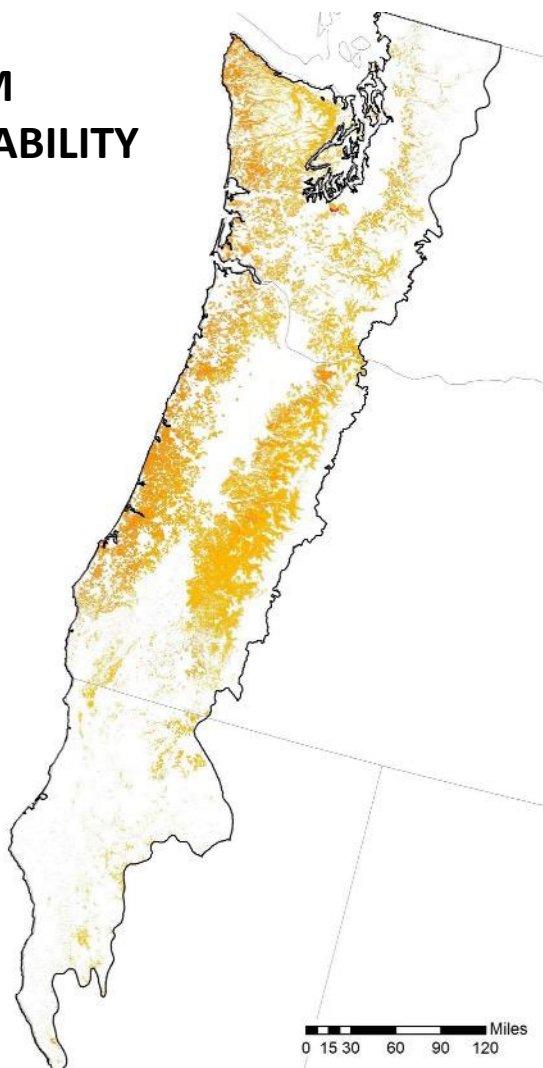
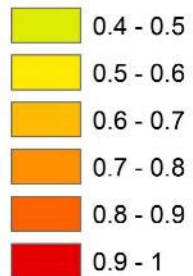
Central Florida Pine Flatwoods



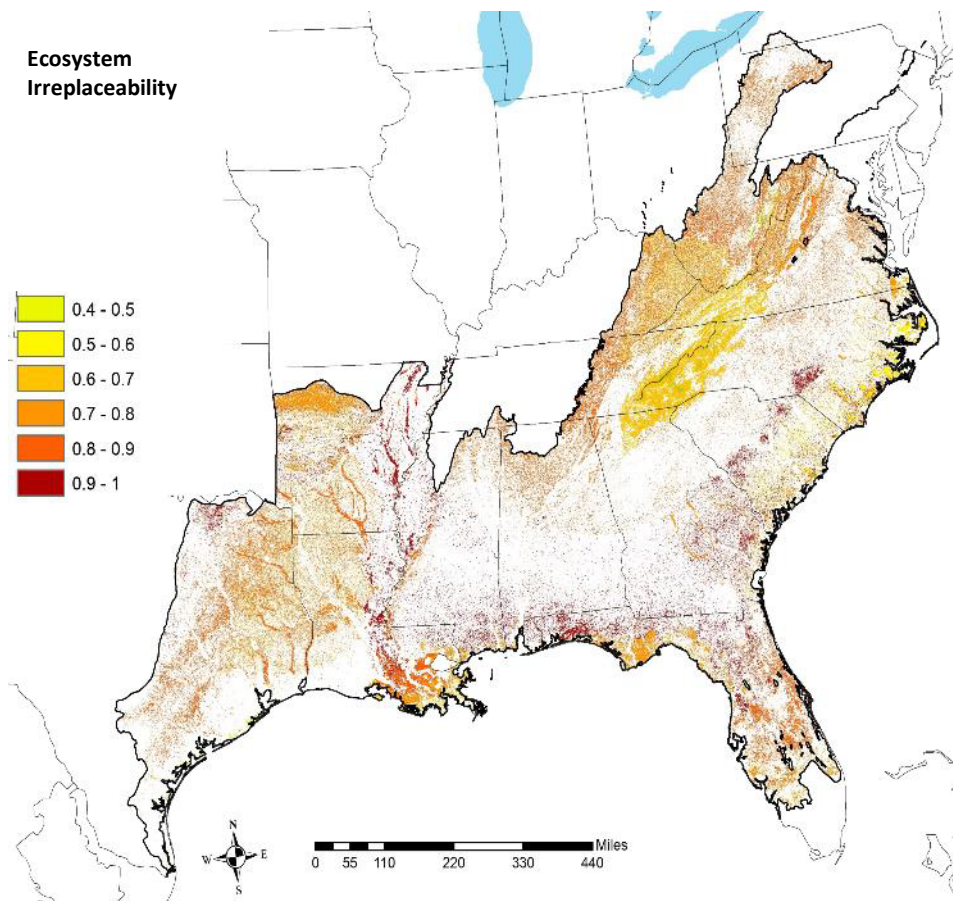
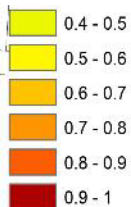
North Pacific Oak Woodland (Vulnerable)

ECOSYSTEM IRREPLACEABILITY

Metric of
ecosystem
condition



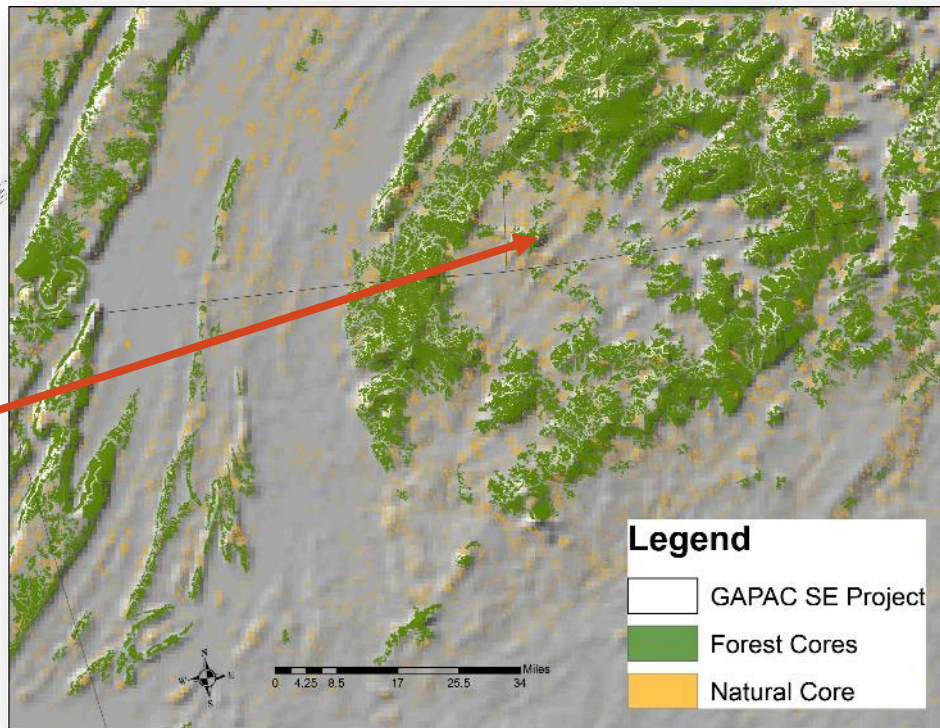
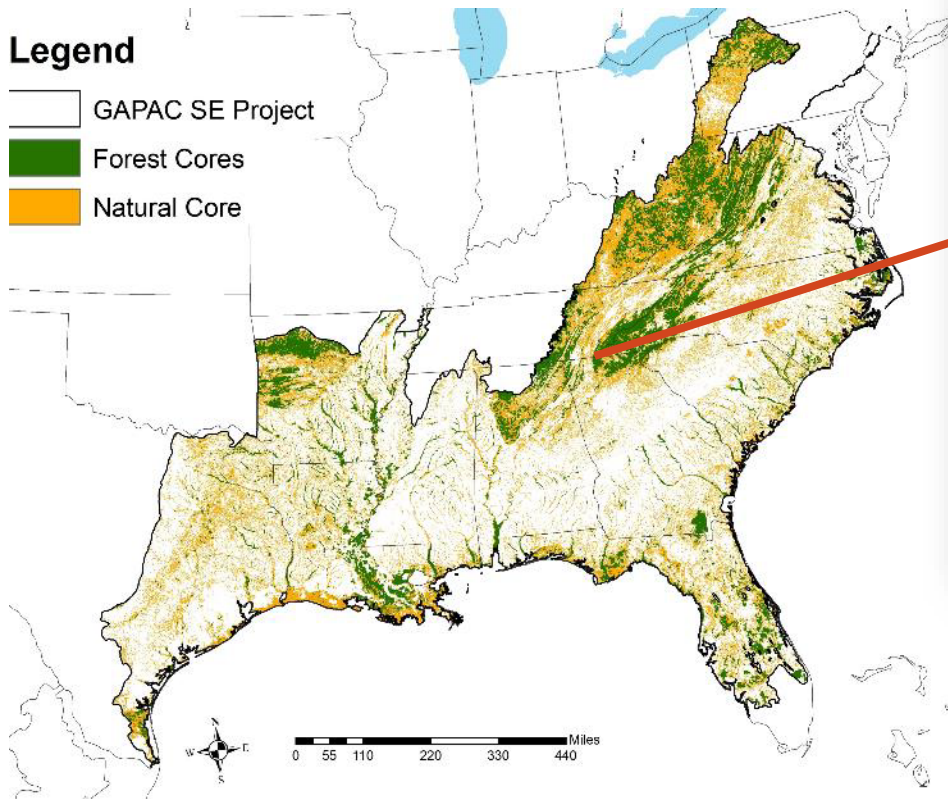
Ecosystem Irreplaceability



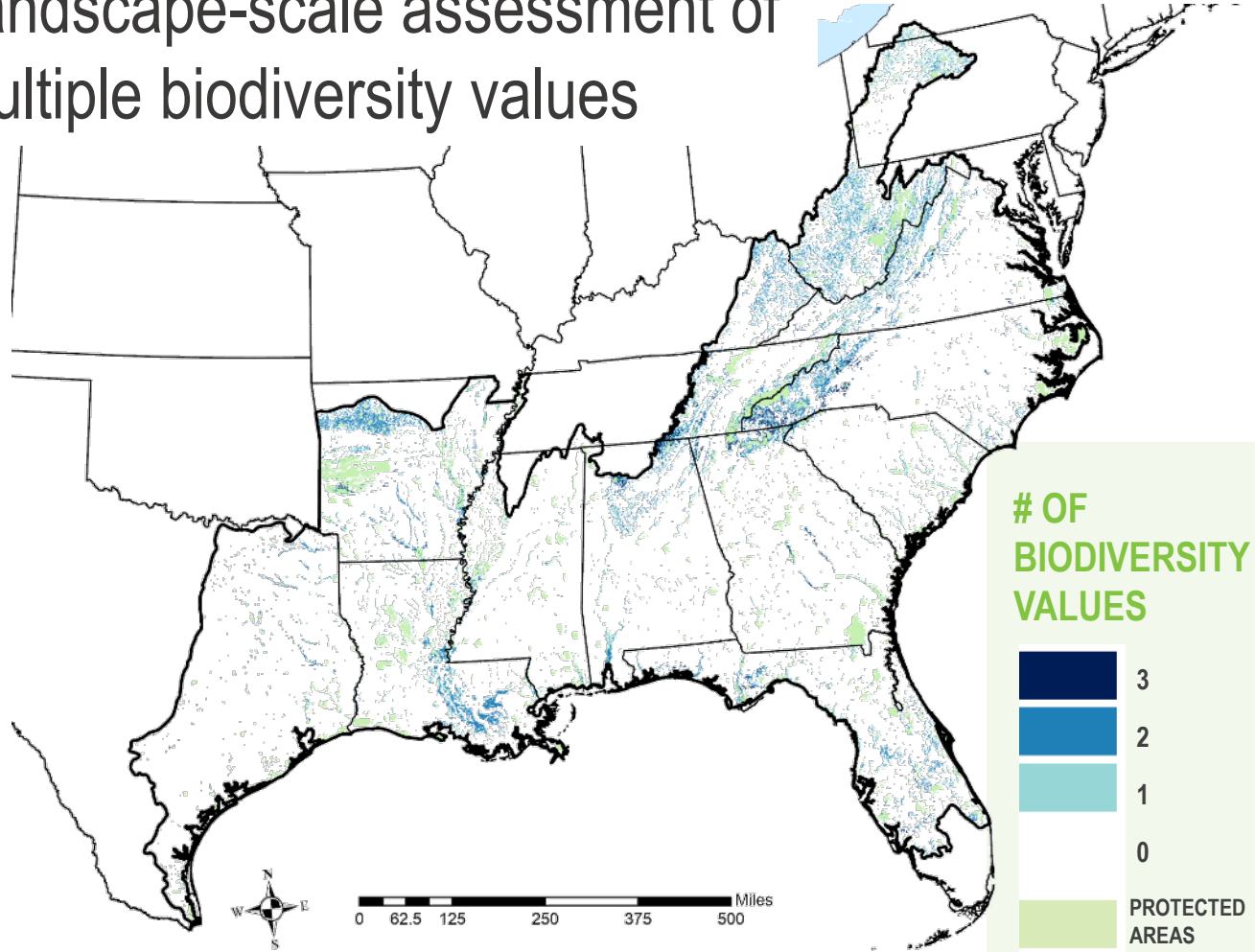
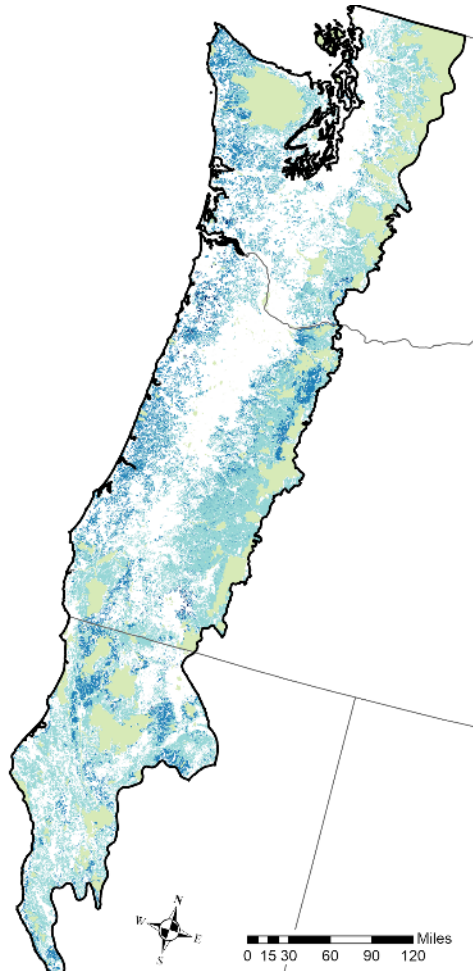
MAPPING FOREST CORES

Legend

- GAPAC SE Project
- Forest Cores
- Natural Core



Landscape-scale assessment of multiple biodiversity values





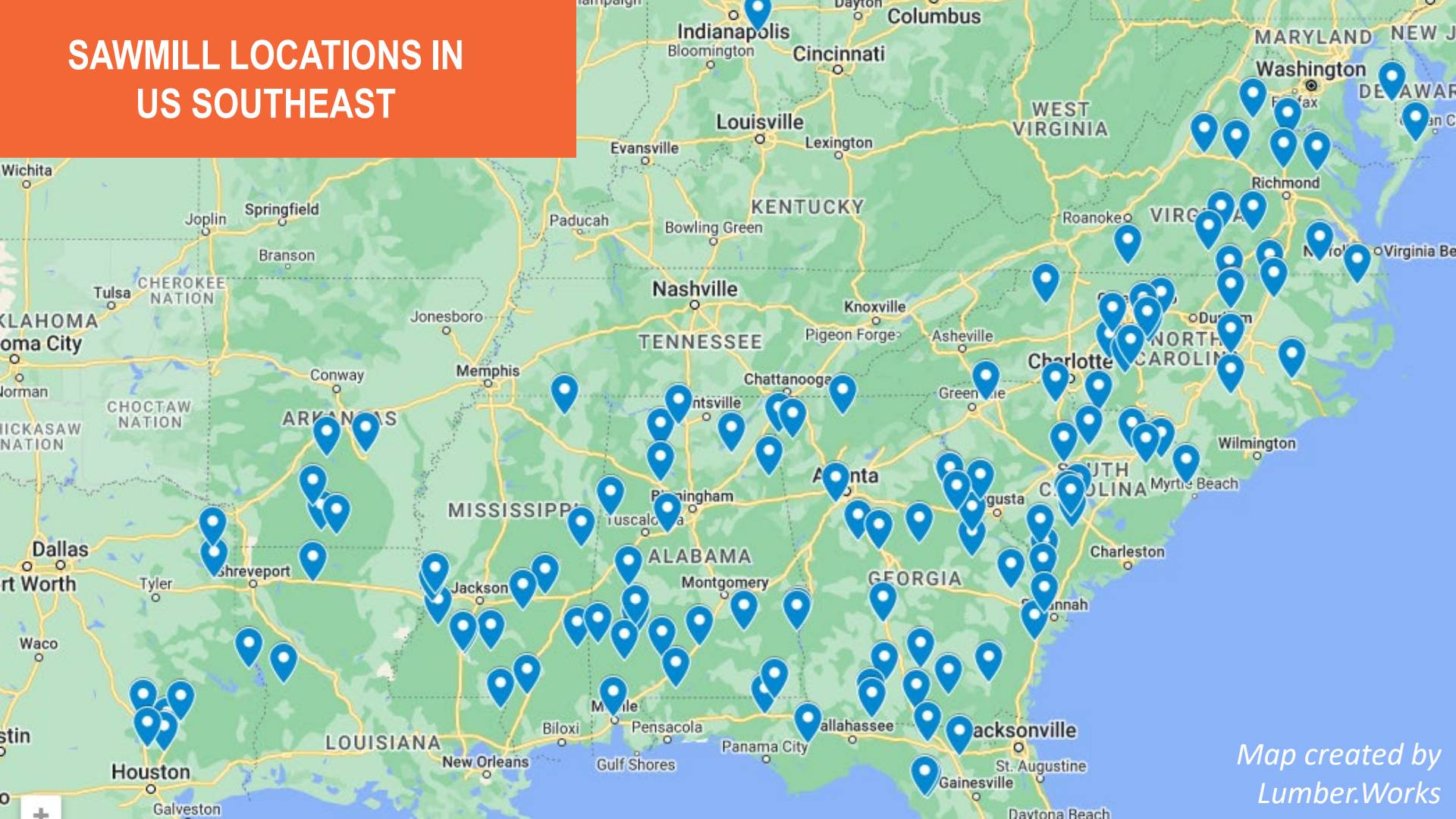
Weyerhaeuser



SUSTAINABILITY

Responsible
actions. Future
focused.

SAWMILL LOCATIONS IN US SOUTHEAST



Map created by
Lumber.Works



Search for a Species

Explore an Area

See What Species are on the Map:

DRAW ON MAP

SELECT FROM LAYERS

Map Layers

+ ADD LAYER

NatureServe Species Data

Element Occurrences MARCH2023 - NCASI

NatureServe Documented Species

NatureServe Explorer Species Data Gaps



Scale: 1 : 73,957,190
Latitude: 49.72315, Longitude: -92.83791

Search for a Species

Explore an Area

Draw Area on Map

Click on the map to place your point.

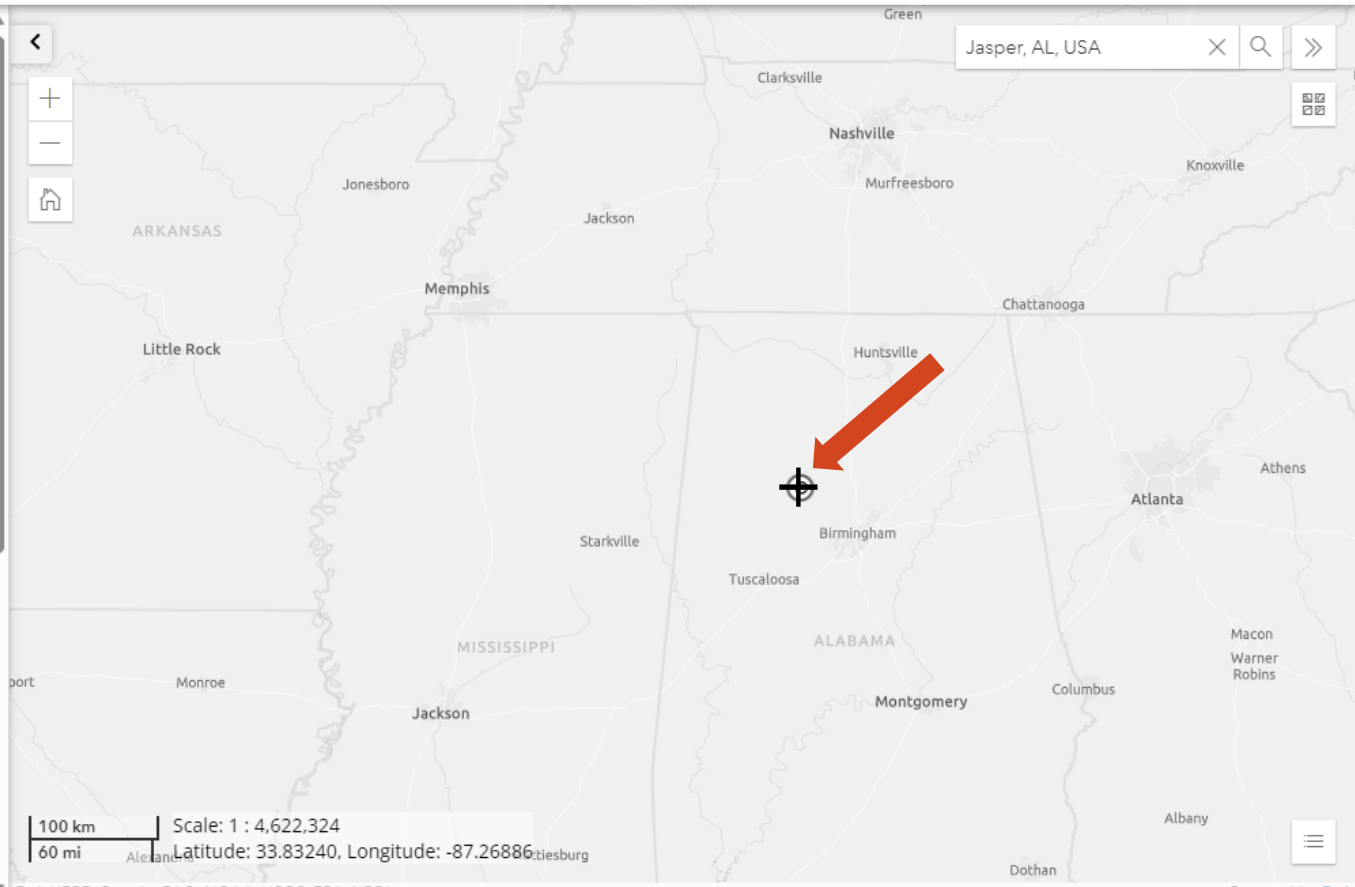


Buffer 100 mi

Area: 0 sq km Perimeter: 0 mi

Map Layers

+ ADD LAYER





Search for a Species

Explore an Area

Draw Area on Map

Click on the geometry to edit, or select a drawing tool below to draw a new shape:



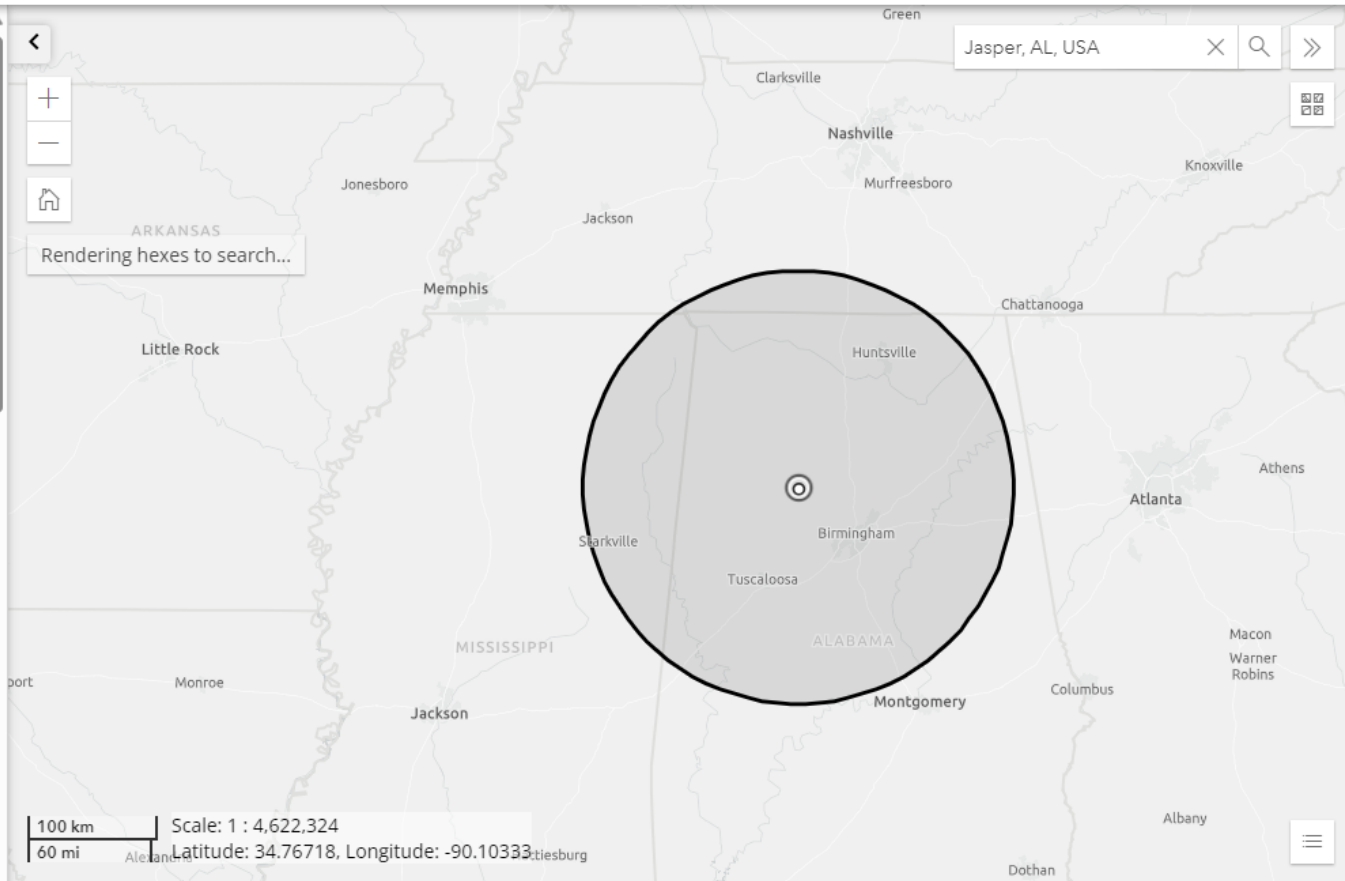
Buffer

100 mi

Area: 81,297.94 [sq km](#)

Perimeter: 628.127 [mi](#)

- Refine results to:
- At-Risk species
 - Species with COSEWIC status
 - Species with SARA status



100 km Scale: 1 : 4,622,324

60 mi Latitude: 34.76718, Longitude: -90.10333



Click on the geometry to edit, or select a drawing tool below to draw a new shape:




Buffer

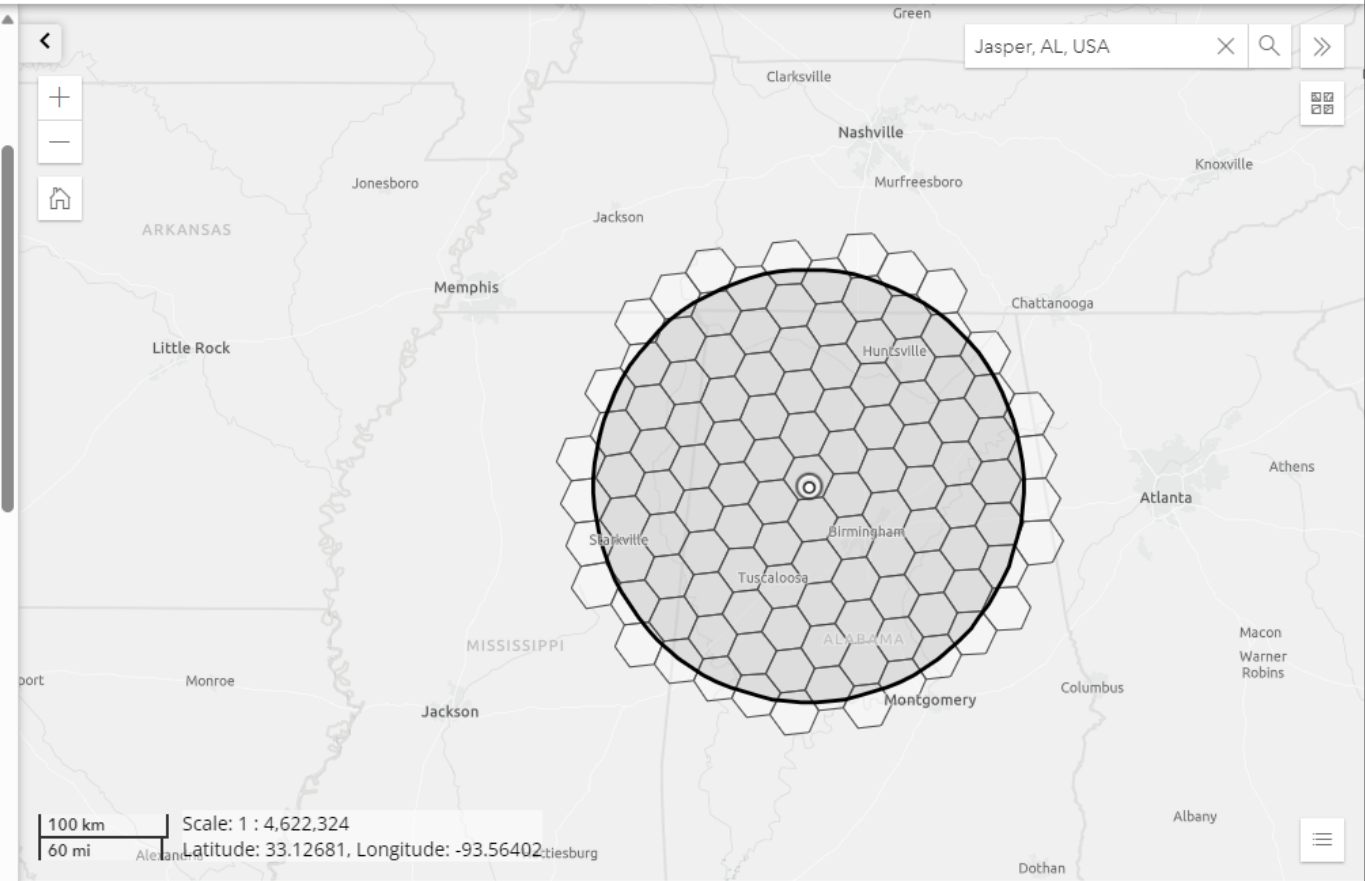
100 [mi](#)

Area: 81,297.94 [sq km](#)
 Perimeter: 628.127 [mi](#)

Refine results to:

- At-Risk species
- Species with COSEWIC status
- Species with SARA status
- Species with U.S. Endangered Species status

RUN BIODIVERSITY REPORT 



Preview of Biodiversity Report

Over 100 species were found. Displaying 100 species below. View full biodiversity report for all records.

Documented Species	Informal Taxonomy	Rounded NatureServe Global Status	Legal Status
Carychium riparium [ⓘ] Floodplain Thorn Snail	Terrestrial Snails	G2: Imperiled	
Callophrys irus [ⓘ] Frosted Elfin	Butterflies and Skippers	G2: Imperiled	COSEWIC: 'XT' SARA: 'Extirpated/Disparue du pays'
Utterbackiana heardi [ⓘ] Apalachicola Floater	Freshwater Mussels	G2: Imperiled	
Elimia christyi [ⓘ] Christy's Elimia	Freshwater Snails	G2: Imperiled	
Xyris longisepala [ⓘ] Kral's Yellow-eyed-grass	Monocots	G2: Imperiled	USESAs: 'UR'

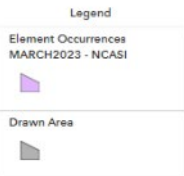
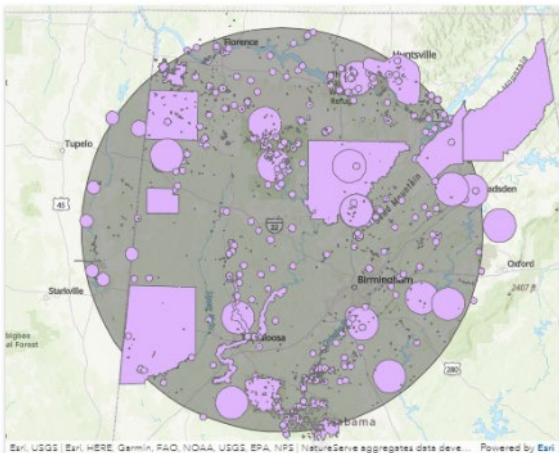
CANCEL SEE FULL REPORT



Biodiversity Report for Selected Area

NCASI LICENSED DATA PUBLIC DATA

Report Results for NCASI Data License



Counts of licensed data within the searched area:

Species: 280
 Observations: Counts not available
 Element occurrences: 2044

[EXPORT DATA](#) [PRINT REPORT](#) [RETURN TO MAP](#)

Species Filters:

- Including at-Risk species
- Including species with U.S. Endangered Species status

Please refer to [NatureServe Explorer map details](#) for important metadata about how the precision level of distribution data can affect search results.

This report does not satisfy or replace regulatory review requirements. More information may be available from these NatureServe Network programs:

- Alabama Natural Heritage Program
- Mississippi Natural Heritage Program
- Tennessee Division of Natural Areas

Counts of licensed data within the searched area:

Species: 280

Counts of licensed data within the searched area:

Species: 280
 Observations: Counts not available
 Element occurrences: 2044

Documented Species	Informal Taxonomy	Rounded NatureServe Global Status	Legal Status	Element Occurrence Count
<i>Carex brysonii</i> Bryson's Sedge	Monocots	G1: Critically Imperiled		4
<i>Lesquerella lyrata</i> Lyrate Bladderpod	Dicots	G1: Critically Imperiled	USESAs: 'T'	11
<i>Arabis georgiana</i> Georgia Rockcross	Dicots	G1: Critically Imperiled	USESAs: 'T'	14
<i>Sagittaria secundifolia</i> Little River Arrowhead	Monocots	G1: Critically Imperiled	USESAs: 'T'	2
<i>Phlox pulchra</i> Wherry's Phlox	Dicots	G1: Critically Imperiled		7
<i>Quercus boyntonii</i> Boynton's Sand Post Oak	Dicots	G1: Critically Imperiled		13
<i>Clematis socialis</i> Alabama Leatherflower	Dicots	G1: Critically Imperiled	USESAs: 'E'	3
<i>Leptogramma burksiorum</i> Streak-sorus Fern	Leptosporangiate Ferns	G1: Critically Imperiled	USESAs: 'T'	2
<i>Xyris spathifolia</i>	Monocots	G1: Critically Imperiled		1
<i>Litocampa henroti</i> a hexapod	Diplurans, Springtails, and Proturans	G1: Critically Imperiled		3
<i>Liatris oligocephala</i> Cahaba Torch	Dicots	G1: Critically Imperiled		7
<i>Hydroptila coweetensis</i> a purse casemaker caddisfly	Caddisflies	G1: Critically Imperiled		1
<i>Appaleptoneta jonesi</i> a cave spider	Spiders and other Chelicerates	G1: Critically Imperiled		1
<i>Leptoxis compacta</i> Oblong Rocksnail	Freshwater Snails	G1: Critically Imperiled	USESAs: 'UR'	1
<i>Speoplatyrhinus poulsoni</i>	Fishes - Freshwater and Anadromous Bony,	G1: Critically Imperiled	USESAs: 'E'	1



Working Forests for Birds

SFI Conservation Impact Project: Biodiversity

Emily Jo Williams

American Bird Conservancy, Southeast Region VP



Managed Forests for Birds Partnership

Sustainable Forestry Initiative

Resource Management Service

Hancock Natural Resource Group

Timberland Investment Resources

Forest Investment Associates

Molpus Woodlands Group

The Westervelt Company

American Bird Conservancy

Weyerhaeuser Company

Campbell Global LLC

International Paper

Georgia-Pacific

Rayonier, Inc.

PotlatchDeltic

Technical Partners: National Council for Air & Stream Improvement, Inc.

Avian Research Conservation Institute

Klamath Bird Observatory



Northern Bobwhite



Swallow-tailed Kite



Red-cockaded Woodpecker



Brown-headed Nuthatch



Wood Thrush



Bachman's Sparrow



Kentucky Warbler



Prairie Warbler



Prothonotary Warbler



Swainson's Warbler

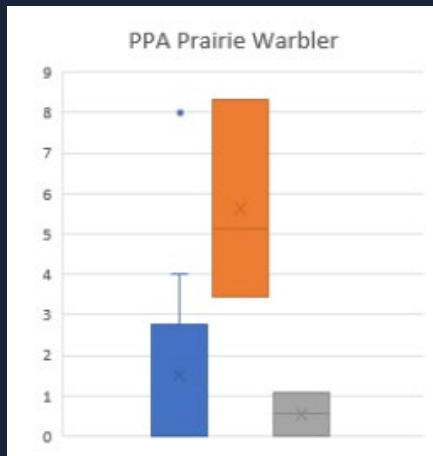
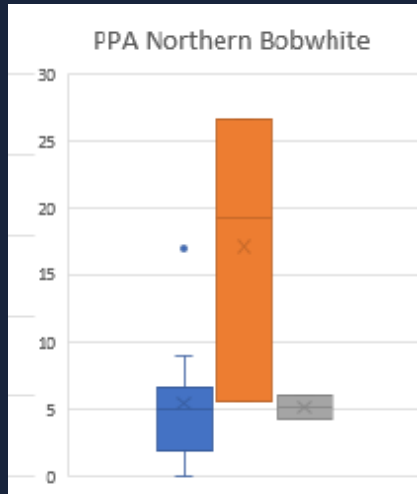
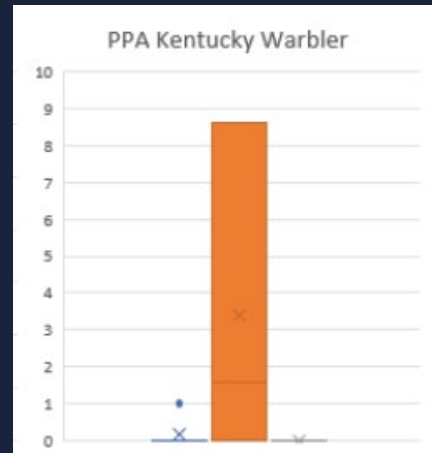
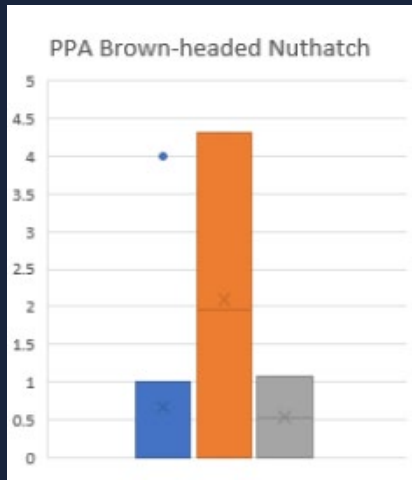
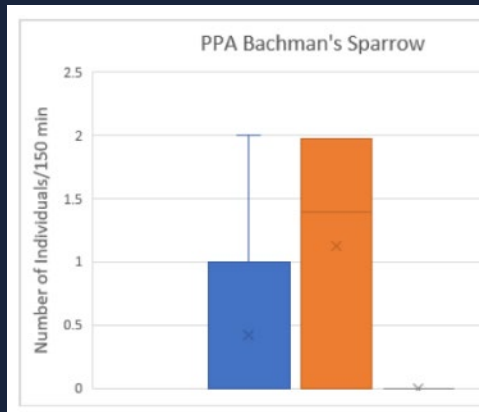


Worm-eating Warbler



Southeastern U.S. Focal Geography and Project Areas





Diversity and Abundance of Birds Use and Depend on Managed Forests

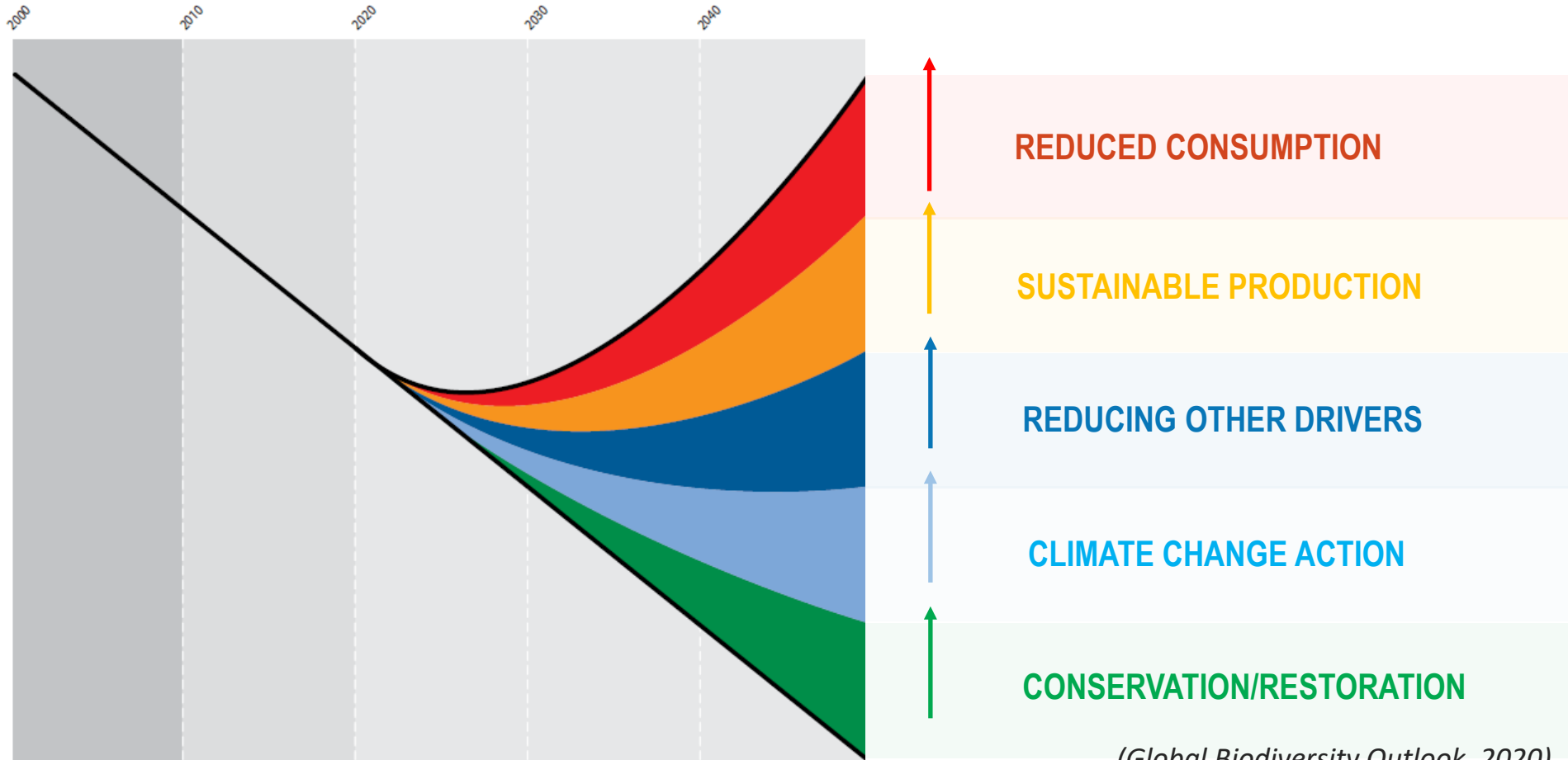
Bird of Conservation Concern



107 Total Species



A PORTFOLIO OF ACTIONS TO REDUCE LOSS AND RESTORE BIODIVERSITY



Healy.Hamilton@forests.org



BIODIVERSITY IN SUSTAINABLE FORESTRY:

DATA, TOOLS, AND TRENDS FOR RESPONSIBLE SOURCING

DR. HEALY HAMILTON
CHIEF SCIENTIST
SUSTAINABLE FORESTRY INITIATIVE

SEPTEMBER 27, 2023



SFI-0001