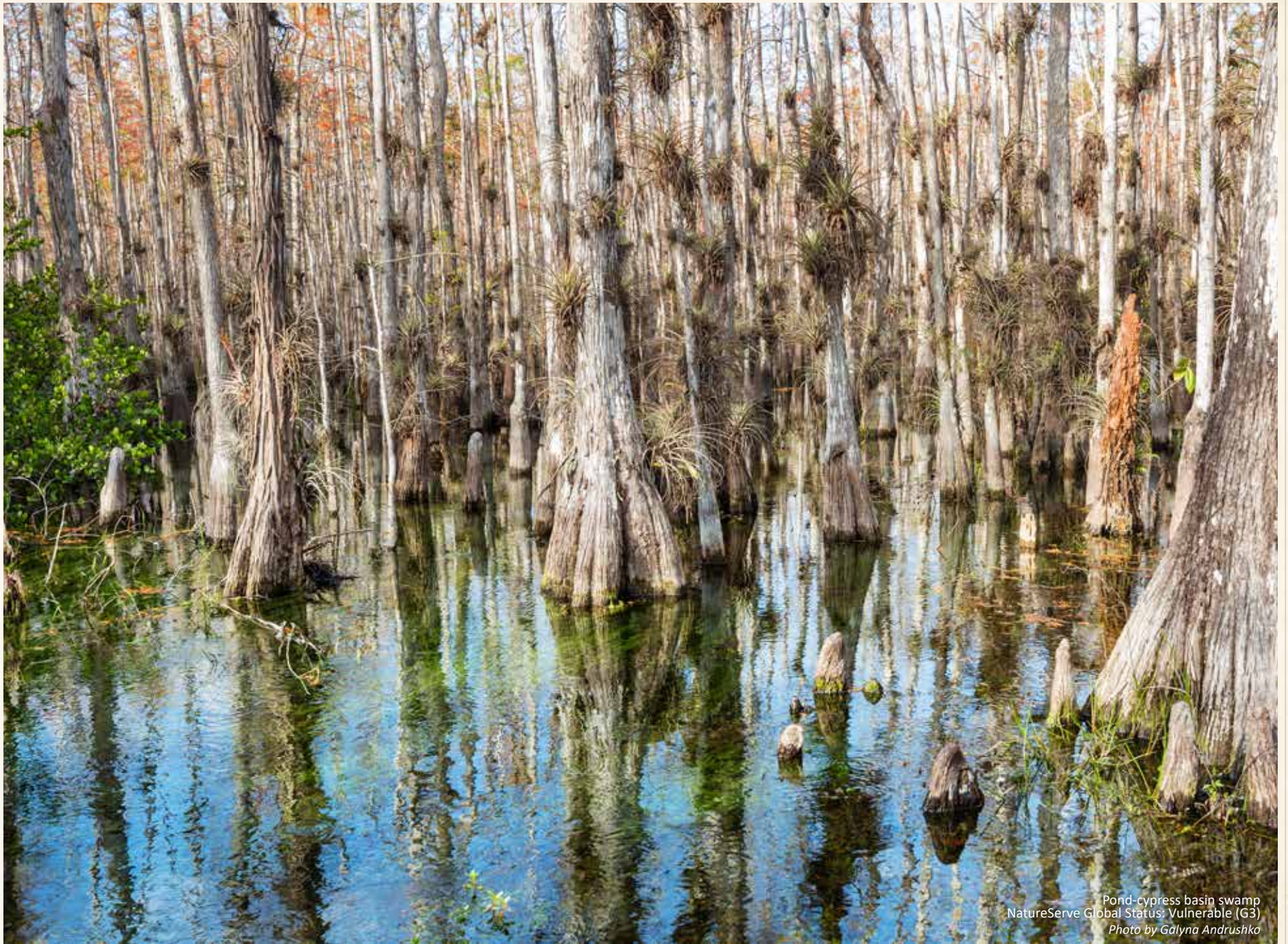


# Biodiversity in Focus: United States Edition





Pond-cypress basin swamp  
NatureServe Global Status: Vulnerable (G3)  
Photo by Galya Andrushko

## LETTER FROM THE PRESIDENT

# NatureServe supports biodiversity conservation today

At this moment, species are going extinct faster than any time in human history. Given limited resources available for land management, conservation, and research, we need to make the most effective decisions to ensure the survival of natural communities. Data should be driving these decisions. NatureServe's *Biodiversity in Focus: United States Edition* provides a sample of the best data available for decision-making for one of the most complex systems that exists: life on Earth.

To effectively protect biodiversity, we must understand it. This report considers and answers five essential questions about how to ensure biodiversity is adequately protected going forward:

1. How many species and ecosystems are at risk?
2. Are species and ecosystems adequately protected?
3. What are the major threats to biodiversity?
4. Where is imperiled biodiversity concentrated?
5. Where do we go from here?

The answers provide actionable insights that can inform high-level policies and forward-thinking initiatives.

The United States contains a vast array of species and ecosystems that are part of our shared cultural and natural heritage. This biological diversity on our state, tribal, and federal lands is intrinsically, ecologically, and economically important. I believe society has an obligation to protect all nature—both common and rare.

Throughout history, governments, organizations, and individuals have set aside large areas for environmental protection. However, many of those efforts have prioritized the conservation of inorganic features, such as scenic vistas, geologic formations, or glaciers, rather than the survival of imperiled species. As a result, many rare and endangered species remain unprotected and, often, so do the ecosystems of which they are a part. Given the scale of the current extinction crisis, now is the time to prioritize biodiversity conservation.

The United States is a global leader in science and was an early leader in conservation. If we are going to use our financial resources efficiently and effectively to maximize the value of policy initiatives such as America the Beautiful and Recovering America's Wildlife Act, decision-makers need the most accurate and up-to-date information to inform conservation decisions.

NatureServe's North American Network supports biodiversity conservation today through data and analyses that provide the insights needed to protect the well-being of our plants, animals, and natural communities for present and future generations.

Optimistically yours,



**Sean T. O'Brien, Ph.D.**  
President and CEO

P.S. Visit [www.natureserve.org/bif](http://www.natureserve.org/bif) to view an online version of this report, a detailed appendix, corresponding data, websites, and footnotes.

# Identifying at-risk biodiversity



*NatureServe's ranking system*

For nearly 50 years, NatureServe has developed data and methods to comprehensively assess the conservation status of North American plant and animal species. As the authoritative source for data on U.S. and Canadian biodiversity, NatureServe is uniquely suited to answer questions about species and ecosystems and the extent to which they are threatened. The NatureServe Network is comprised of more than 60 member programs which are predominantly natural heritage programs and conservation data centers within state and provincial agencies and universities. Together, we develop, curate, analyze, and share biodiversity information to support informed decisions about managing, protecting, restoring, and conserving our natural heritage.

NatureServe's conservation status ranks are widely used throughout the conservation community and are regarded as highly credible by scientists, government agencies, and private-sector organizations. We provide conservation status information at multiple geographic scales to support state, regional, or national level conservation decisions. These assessments are freely available on NatureServe Explorer, which contains information on tens of thousands of species and ecosystems.<sup>1</sup>

NatureServe assesses species and ecosystems as *imperiled* or *at risk* based on a consistent methodology.<sup>2</sup> We rank species and ecosystems—the unique vegetation types that provide habitats for species—into categories ranging from Possibly Extinct (H) to Critically Imperiled (1) to Secure (5). Each assigned conservation status rank is determined at three geographic scales: global, national, and subnational (e.g., state level)—G, N, S ranks respectively.<sup>3</sup>

<sup>1</sup> All conservation status ranks and supporting documentation for the species and ecosystems tracked by NatureServe are available at [explorer.natureserve.org](http://explorer.natureserve.org).

<sup>2</sup> The term *imperiled* is used throughout this report. In instances where imperiled refers to the conservation rank, it appears as Imperiled (G2).

<sup>3</sup> Additional ranks designate Presumed Extinct species (GX/NX/SX); Unrankable species (GU/NU/SU); species not yet ranked (GNR/NNR/SNR); and species for which ranks are not applicable because, for example, the species is a hybrid or vagrant to the area (GNA/NNNA/SNA). More information on NatureServe's ranking methodology can be found at [explorer.natureserve.org/AboutTheData/DataTypes/ConservationStatusCategories](http://explorer.natureserve.org/AboutTheData/DataTypes/ConservationStatusCategories).



Karner blue (*Plebejus samuelis*)  
NatureServe Global Status: Critically Imperiled (G1)  
ESA Listing Status: Endangered  
Photo by Larry Master ([masterimages.org](http://masterimages.org))

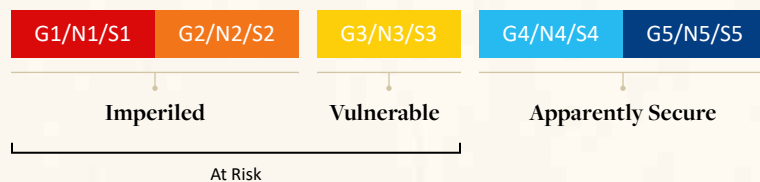
Greater sage-grouse (*Centrocercus urophasianus*)  
NatureServe Global Status: Vulnerable (G3)  
Photo by Dan Dzuris (Flickr)



*Imperiled species* are defined as those that are at high risk of extinction, which equates to NatureServe global conservation status ranks of Possibly Extinct (GH), Critically Imperiled (G1), or Imperiled (G2). We define *at-risk species* as all those that are imperiled (GH, G1, G2) as well as those that are Vulnerable (G3) and could become imperiled without intervention.

For nearly 50 years, NatureServe conservation status ranks have been accepted by the U.S. government as a tool for identifying at-risk species and ecosystems and for informing both policy and on-the-ground management actions. While the federal Endangered Species Act (ESA) also focuses on species that are at risk, limits on staff and funding have precluded federal assessments of all the species considered at risk using NatureServe methodology. Our status ranks augment federal listings by offering a framework for evaluating the health of additional species and ecosystems on state, national, and global scales. Moreover, they provide status information for species that have not been listed or that are being evaluated for listing under the ESA. Conservation status ranks are calculated by using a replicable, openly available methodology that relies on published information and on data and analyses by experts at NatureServe and our member programs in each state.<sup>4</sup>

#### CONSERVATION STATUS RANKS FOR ECOSYSTEMS



While both terrestrial and aquatic species are evaluated using our system, at the ecosystem level, NatureServe focuses on terrestrial communities. To define ecosystem units, NatureServe uses the National Vegetation Classification (NVC), a system to categorize ecosystem types that was developed by NatureServe and the Network in collaboration with federal agencies. The NVC is coordinated with the Federal Geographic Data Committee and the Ecological Society of America and is a standard for reporting on vegetation types.<sup>5</sup>

#### CONSERVATION STATUS RANKS FOR SPECIES

GH/NH/SH	<b>Possibly Extinct</b> — known only from historical occurrences but still some hope of rediscovery
G1/N1/S1	<b>Critically Imperiled</b> — at very high risk of extinction due to factors such as a very restricted range, very few populations or occurrences, very steep declines, and/or very severe threats
G2/N2/S2	<b>Imperiled</b> — at high risk of extinction due to factors such as a restricted range, few populations or occurrences, steep declines, and/or severe threats
G3/N3/S3	<b>Vulnerable</b> — at moderate risk of extinction due to factors such as a fairly restricted range, relatively few populations or occurrences, and recent and widespread declines and/or threats
G4/N4/S4	<b>Apparently Secure</b> — at fairly low risk of extinction due to factors such as an extensive range and/or many populations or occurrences, but with possible cause for some concern because of recent local declines and/or threats
G5/N5/S5	<b>Secure</b> — at very low risk of extinction due to a very extensive range, abundant populations or occurrences, and little to no concern about declines or threats

Ecosystems are assessed based on their risk of range-wide collapse. Some ecosystems, such as freshwater lakes and streams, caves, or coastal marine ecosystems, are not addressed in this report.

The NVC is hierarchical, with finer-scale units (e.g., California coastal redwood forests) nested within broader-scale units (e.g., temperate forests, boreal forests, and woodlands). In this report, we use the word *ecosystem* to refer to any of the 398 terrestrial NVC *groups*, a mid-scale classification unit within the hierarchy. NatureServe has developed provisional conservation status ranks for about 90% of the NVC groups, and these are reported here. Similar to species, NVC ecosystems with a global conservation status rank of G1 or G2 are considered *imperiled*, and ecosystems ranked as G1, G2, or G3 are considered *at risk*.

<sup>4</sup> More information on NatureServe's conservation status assessments, including a link to the rank calculator, can be accessed at [www.natureserve.org/conservation-status-assessment](http://www.natureserve.org/conservation-status-assessment).

<sup>5</sup> See Franklin et al. "Building the United States National Vegetation Classification." *Annali di Botanica* 2 (2012): 1–9, [rosa.uniroma1.it/rosa04/annali\\_di\\_botanica/article/view/9261](http://rosa.uniroma1.it/rosa04/annali_di_botanica/article/view/9261).

1

# How many species and ecosystems are at risk?

*Using NatureServe's conservation status ranks, we calculate that 34% of plant species and 40% of animal species in the United States are at risk of extinction and that 41% of ecosystems are at risk of range-wide collapse.*



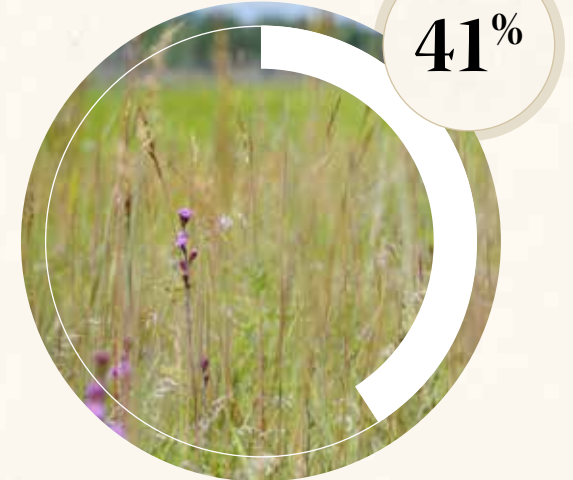
**34% of plant species** are at risk of extinction

Almost half of cactus species, about 200 tree species, and nearly one in five grass species are at risk



**40% of animal species** are at risk of extinction

Animals found in freshwater habitats, including amphibians, snails, mussels, crayfish, and many aquatic insects, are most at risk



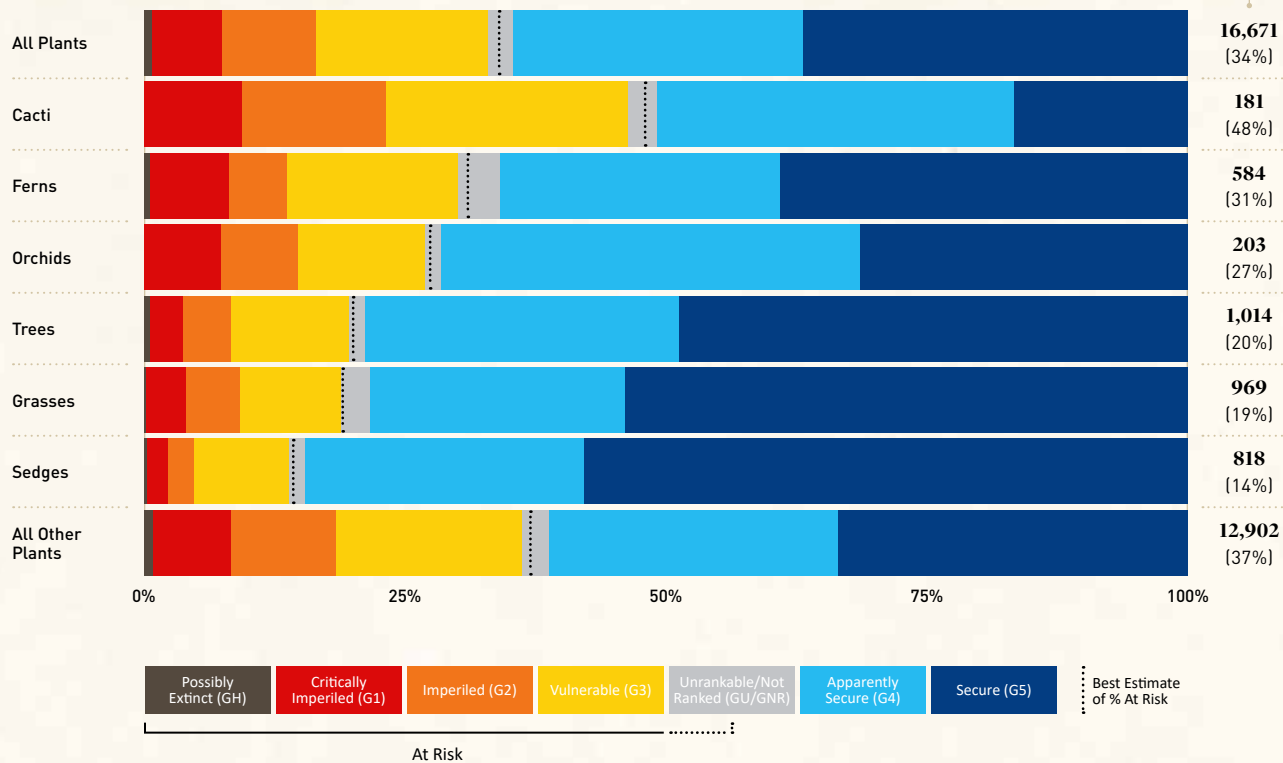
**41% of ecosystems** are at risk of range-wide collapse

Temperate grasslands are among the most threatened ecosystems, with over half of 78 grassland types known to be at risk



FIGURE 1

## CONSERVATION STATUS OF PLANTS IN THE UNITED STATES



### Number of Species

(Best Estimate of % At Risk)



American chaffseed (*Schwalbea americana*)  
 NatureServe Global Status: Imperiled (G2)  
 ESA Listing Status: Endangered  
 Photo by Doug McGrady, (Flickr)

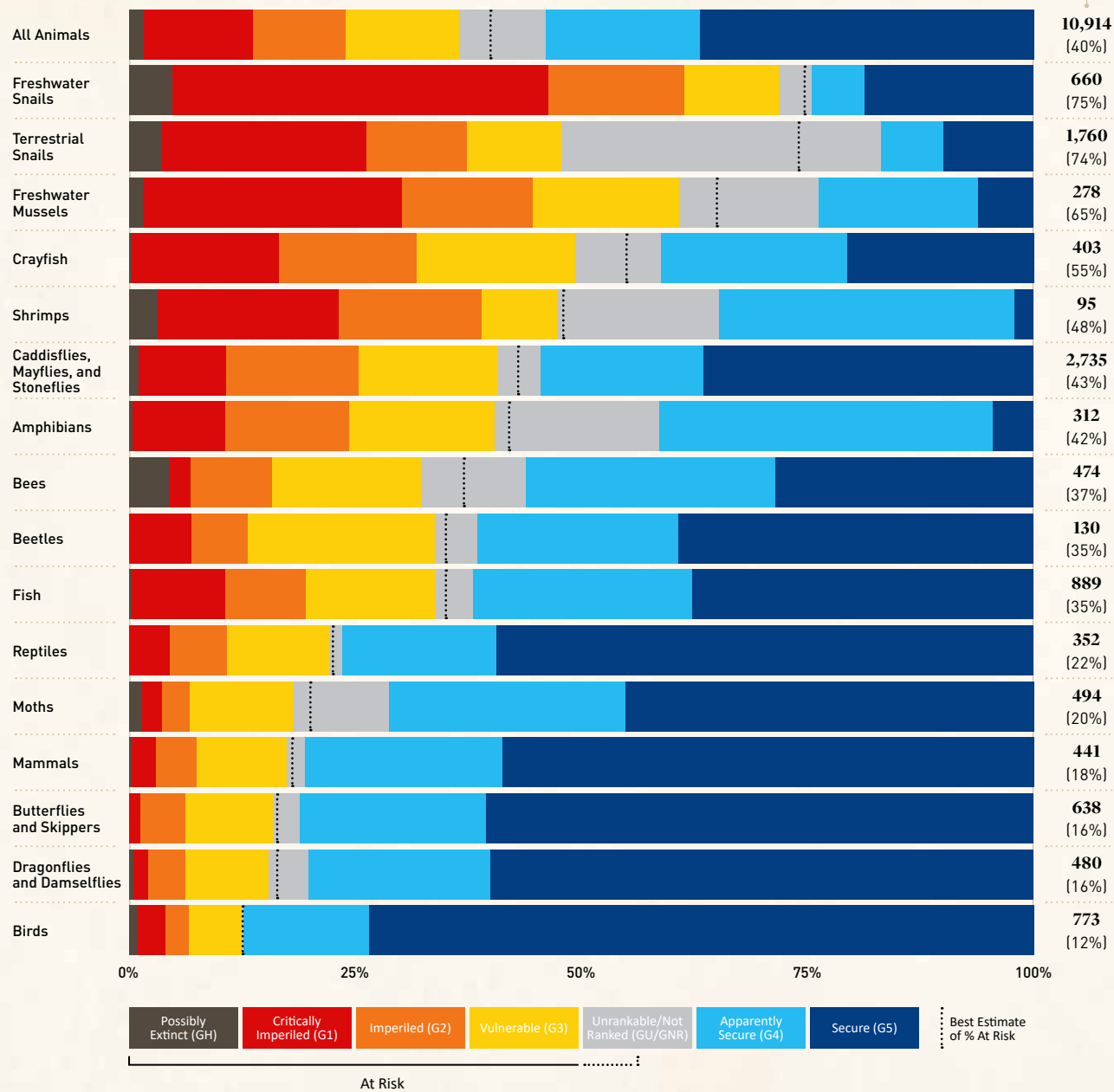
Diverse and healthy plant communities provide the foundation for abundant wildlife and resilient ecosystems. However, according to NatureServe data, 34% of all plant species in the United States are at risk of extinction.<sup>6</sup> This is an alarming general finding, but certain taxa face even greater threats. For example, 48% of cactus species are at risk of extinction, while around 200 tree species (about 20%) are at risk of extinction. Of the hundreds of grass species that form our nation's great prairies

and marshes, about 19% are at risk of vanishing forever. Preventing plant extinction is essential to maintaining ecosystem function and the services that wildlife and people rely upon.

<sup>6</sup> This analysis is based on information extracted from NatureServe's database of biodiversity in 2022. The highlighted groups of species do not represent all kinds of plants but include examples of native plant groups that are likely to be familiar to people throughout the United States. The reported percentage of species at risk is a best estimate that assumes that the same percentage of unassessed species (GU/GNR) are at risk as species whose conservation status has been assessed (G1-G5 species); see online appendix for more information. [www.natureserve.org/bif](http://www.natureserve.org/bif)

Number of Species  
(Best Estimate of % At Risk)

**FIGURE 2**  
**CONSERVATION STATUS OF ANIMALS IN THE UNITED STATES**



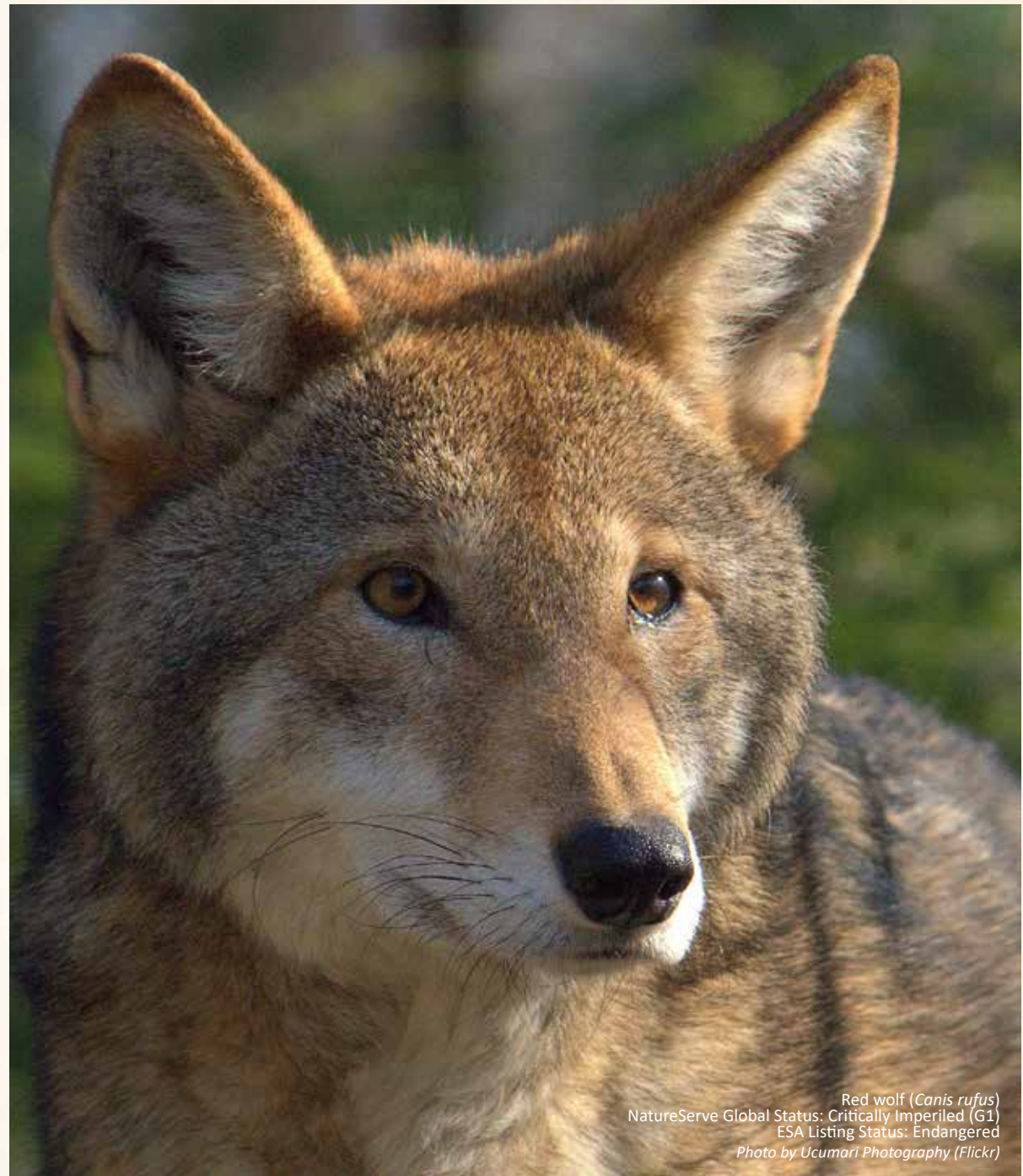
Rusty-patched bumble bee (*Bombus affinis*)  
NatureServe Global Status: Imperiled (G2)  
ESA Listing Status: Endangered  
Photo by Jessica Petersen

An alarming percent of animal species are at risk of extinction in the United States—40%, according to our estimate.<sup>7</sup> As a group, species associated with fresh water, including amphibians, snails, mussels, crayfish, and many aquatic insects, have the highest percentage of at-risk species, highlighting the importance of conservation strategies to protect freshwater ecosystems. Among pollinators, bees are particularly threatened, with 37% of assessed species at risk. The conservation needs of these, and other invertebrate species, are often overlooked, yet many invertebrates are integral to maintaining the ecological functions of freshwater and terrestrial ecosystems.

7 This analysis is based on information extracted from NatureServe's database of biodiversity in 2022. It includes animals in comprehensively assessed taxonomic groups native to all 50 states. The reported percentage of species at risk is a best estimate that assumes that the same percentage of unassessed species (GU/GNR) are at risk as species whose conservation status has been assessed (G1-G5 species); see online appendix for more information. [www.natureserve.org/bif](http://www.natureserve.org/bif)



Northern goshawk (*Accipiter gentilis*)  
NatureServe Global Status: Secure (G5)  
Photo by Larry Master ([masterimages.org](http://masterimages.org))



Red wolf (*Canis rufus*)  
NatureServe Global Status: Critically Imperiled (G1)  
ESA Listing Status: Endangered  
Photo by Ucumar1 Photography (Flickr)

Californian vernal pool  
NatureServe Global Status: Imperiled (G2)  
Photo by Kathy and Don Faber-Langendoen



Overall, 41% of the ecosystems in the United States are known to be at risk of range-wide collapse due to extensive threats such as land-cover conversion.<sup>8,9</sup> Tropical ecosystems in the U.S. are all under substantial risk, but account for relatively small proportions in number and area. Temperate grasslands, boreal grasslands, and shrublands stand out among highly threatened ecosystems that extend over vast areas of the country, with 51% of the 78 grassland types known to be at risk of range-wide collapse. Temperate forests, boreal forests, and woodlands have also experienced multiple pressures, leading to an at-risk status for 40% of the 107 types of native U.S. forests.

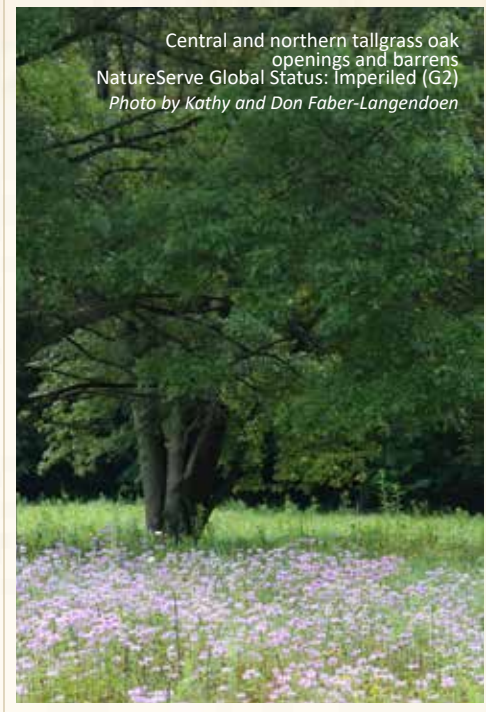
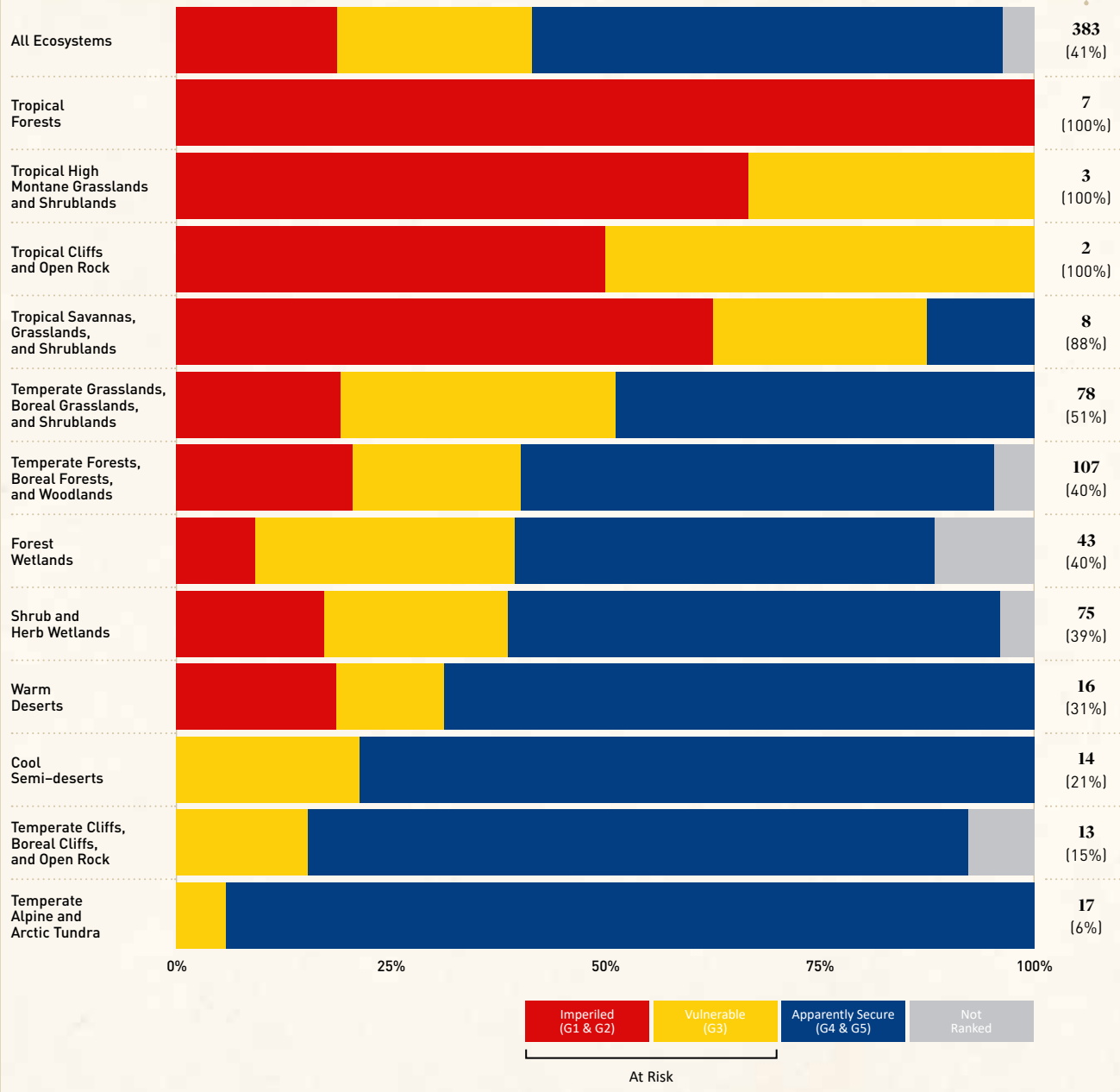
Documenting the conservation status for ecosystems supports efforts to prioritize conservation actions that can restore imperiled and at-risk ecosystems. Land management decisions made at the ecosystem level benefit both ecosystems and the species they support.

<sup>8</sup> Collapse involves a transformation of identity, loss of defining features, and/or replacement by a novel ecosystem. It occurs when all ecosystem occurrences lose defining biotic or abiotic features and when characteristic native biota are no longer sustained.

<sup>9</sup> This analysis is based on the provisional global conservation rank of NVC groups occurring in all 50 U.S. states, as extracted from NatureServe's database of biodiversity in 2022.

**FIGURE 3**  
**CONSERVATION STATUS OF ECOSYSTEMS IN THE UNITED STATES**

**Number of Ecosystems**  
 (% At Risk)



Central and northern tallgrass oak openings and barrens  
 NatureServe Global Status: Imperiled (G2)  
 Photo by Kathy and Don Faber-Langendoen



Chihuahuan sandy plains semi-desert grassland  
 NatureServe Global Status: Imperiled (G2)  
 Photo by Curtis Monger, New Mexico State University

# Are species and ecosystems adequately protected?

*Most at-risk species and ecosystems are found outside of areas managed for biodiversity conservation and are insufficiently protected to prevent further decline.*



Dudley's swordfern (*Polystichum dudleyi*)  
NatureServe Global Status: Imperiled (G2)  
Photo by Eloncira (Flickr)

According to the United States Geological Survey's (USGS) Protected Areas Database of the United States (PAD-US), in 2018, only 12% of the country was protected as a wildlife refuge, wilderness area, national park, or other conservation management area.<sup>10</sup>

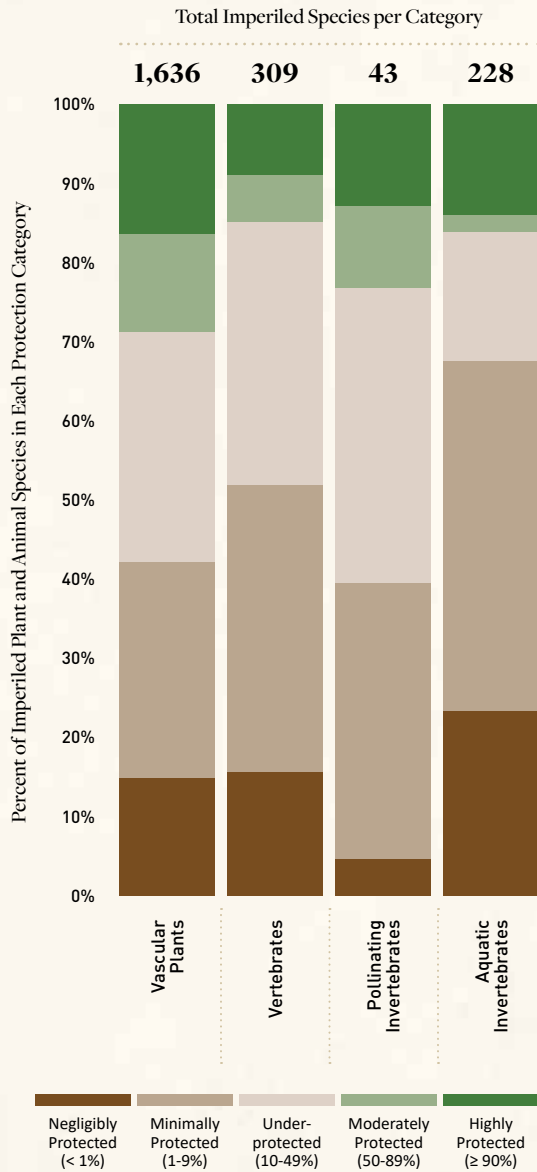
As with species, most at-risk ecosystems in the contiguous United States primarily occur outside of areas managed for biodiversity conservation.<sup>11</sup> Ecosystems that are Apparently Secure (G4/G5) are also largely unprotected.<sup>12</sup> The most effective conservation strategies should help preserve all natural ecosystems, including those that are imperiled and those that are secure.<sup>13</sup>

Proactively protecting the full diversity of natural ecosystems helps ensure that the habitat needs of species not yet at risk are met. Furthermore, such action can minimize the need for costly, reactive, species-specific conservation efforts in the future.

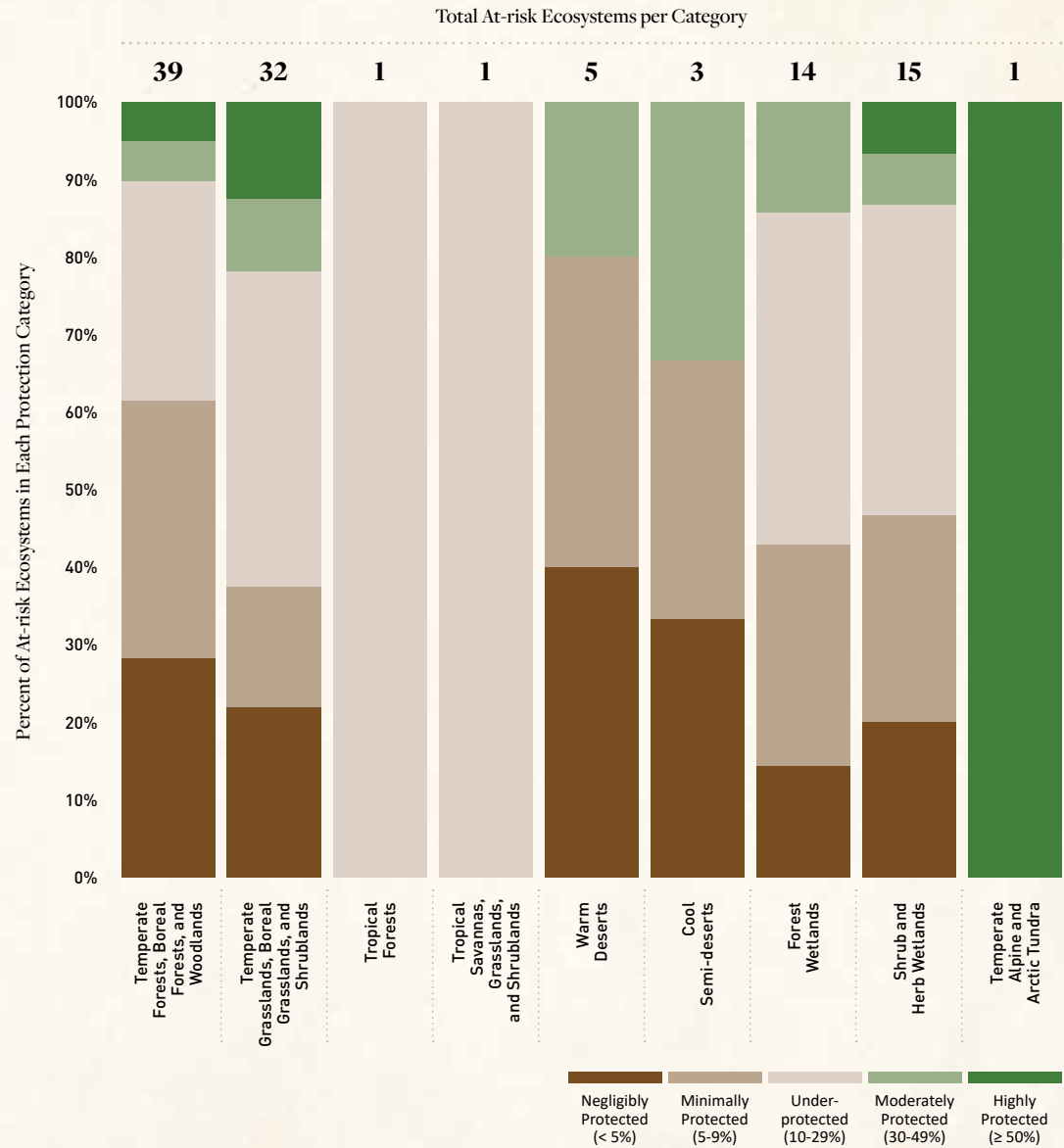
Protected areas also help maintain healthy populations of numerous species, but most imperiled plant and animal species occur largely outside of protected areas.<sup>14</sup> To protect these species, land and water protection could be expanded to encompass their habitats. In many cases, land under government management could be re-designated for conservation to provide increased protection for imperiled species as well as for ecosystems.

- 10 Further information about the Protected Areas Database of the United States is available at [www.usgs.gov/programs/gap-analysis-project/science/protected-areas](http://www.usgs.gov/programs/gap-analysis-project/science/protected-areas).
- 11 This analysis is based on the mapped distribution of NVC groups in the contiguous United States. Note that mapped distribution data are not available for all NVC groups; those groups were excluded from the analysis.
- 12 Thresholds for defining protection status for species and ecosystems vary based on differences in protection needs. For example, a 29% threshold for "under-protected" ecosystems is appropriate based on typical ecosystem extent, whereas a Critically Imperiled (G1) species that occurs in just a handful of locations would be considered under-protected at 49%. See the online appendix for more details on this methodology at [www.natureserve.org/bif](http://www.natureserve.org/bif).
- 13 Hunter Jr., Malcom L. "A Mesofilter Conservation Strategy to Complement Fine and Coarse Filters." *Conservation Biology* 19, no. 4 (2005): 1025-1029. doi.org/10.1111/j.1523-1739.2005.00172.x.
- 14 This analysis is based on the modeled distribution of habitats for select imperiled species in the contiguous United States. Vulnerable (G3) species and certain invertebrate taxonomic groups are not included because of a lack of comprehensive habitat maps for these taxa. See Hamilton et al. "Increasing Taxonomic Diversity and Spatial Resolution Clarifies Opportunities for Protecting US Imperiled Species," *Ecological Applications* 32 no. 3 (April 2022): e2534. [esajournals.onlinelibrary.wiley.com/doi/full/10.1002/eap.2534](https://doi.org/10.1002/eap.2534).

**FIGURE 4**  
**PROTECTION STATUS OF**  
**IMPERILED PLANTS AND ANIMALS<sup>14</sup>**



**FIGURE 5**  
**PROTECTION STATUS OF**  
**AT-RISK TERRESTRIAL ECOSYSTEMS**



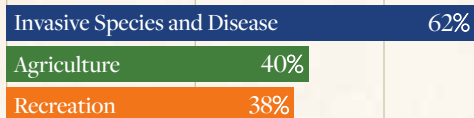
# What are the major threats to biodiversity?

*Habitat destruction and degradation, invasive species, dams, and climate change are among the primary threats to our nation's biodiversity.*

FIGURE 6

## THREATS TO IMPERILED SPECIES

### Plants



### Terrestrial Animals



### Freshwater Animals



0% 50% 100%  
Percent of Species Impacted

One outcome of conducting species conservation status assessments is that a list of threats that groups of species face can be analyzed.<sup>15</sup> Understanding the specific threats affecting imperiled species or groups of species is essential to tailoring conservation strategies to promote their recovery or prevent further decline.

Threats differ between plants and animals and between freshwater and terrestrial species, but common patterns exist. For example, land conversion and degradation of natural habitats—whether through the damming and polluting of rivers, historical loss of natural habitat to agriculture, or off-road vehicle use in fragile ecosystems—are major drivers of extinction risk among imperiled species. Another widespread threat is the proliferation of invasive species that prey on or outcompete native species and that parasitize or alter their habitats. Direct and indirect effects of climate change, including extreme weather events and rising global temperatures, exacerbate other threats to species and ecosystems.

Land conversion has resulted in a significant loss of ecosystems across the United States. This loss is a major contributor to the alarming numbers of species and ecosystems at risk. The extent of habitat conversion differs by ecosystem type, with grassland and wetland ecosystems being the most affected.<sup>16</sup> For example, among grassland ecosystems, the northern tallgrass prairie (G2), which stretches from the eastern Dakotas south to Iowa, has lost more than 95% of its historic extent.

Use of ecosystem data in conservation decision-making enables coarse-filter conservation strategies that focus on maintaining or restoring natural ecosystems. They are an important complement to fine-filter strategies, which involve species-specific conservation efforts. Coarse-filter strategies can ensure that common species stay common, that at-risk species can recover, and that important ecosystem services like carbon storage and flood control are maintained.

<sup>15</sup> Threats data were analyzed based on NatureServe's database of biodiversity in 2022.

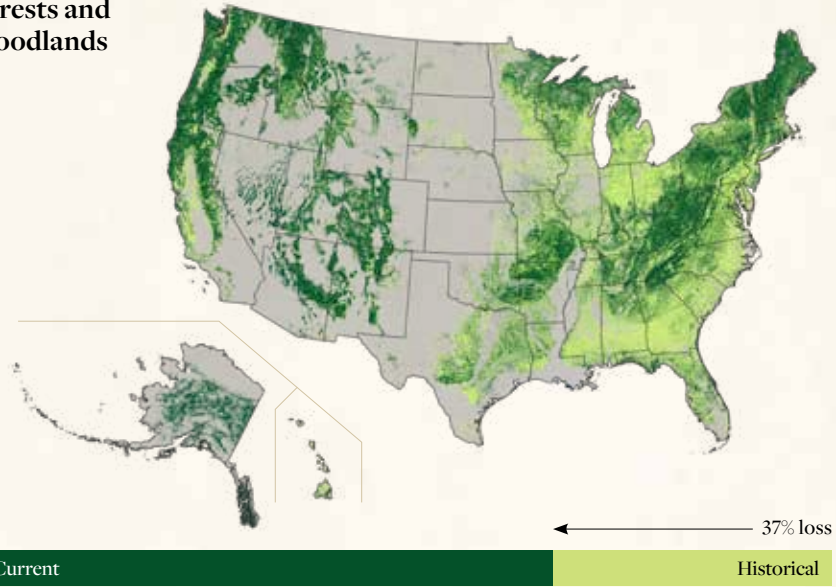
<sup>16</sup> Habitat loss is presented for NVC subclasses. See Comer et al. "Long-Term Loss in Extent and Current Protection of Terrestrial Ecosystem Diversity in the Temperate and Tropical Americas." *PLoS One* 15, no. 6 (June 2020): e0234960, [journals.plos.org/plosone/article?id=10.1371/journal.pone.0234960](https://doi.org/10.1371/journal.pone.0234960).



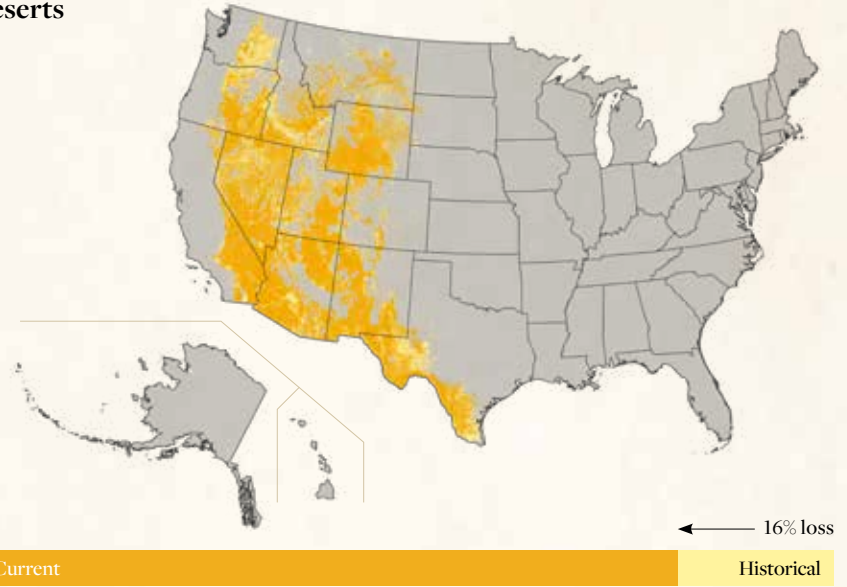
FIGURE 7

IMPACT OF LAND CONVERSION ON U.S. ECOSYSTEMS

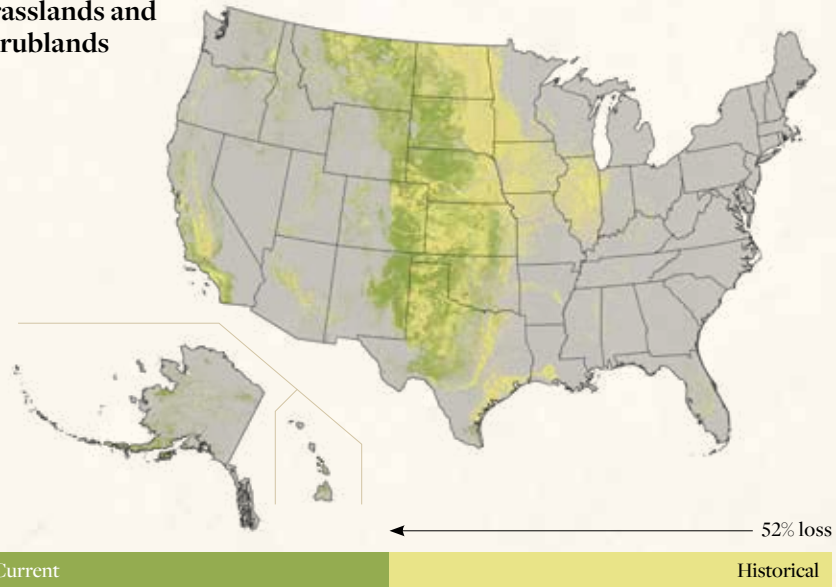
Forests and Woodlands



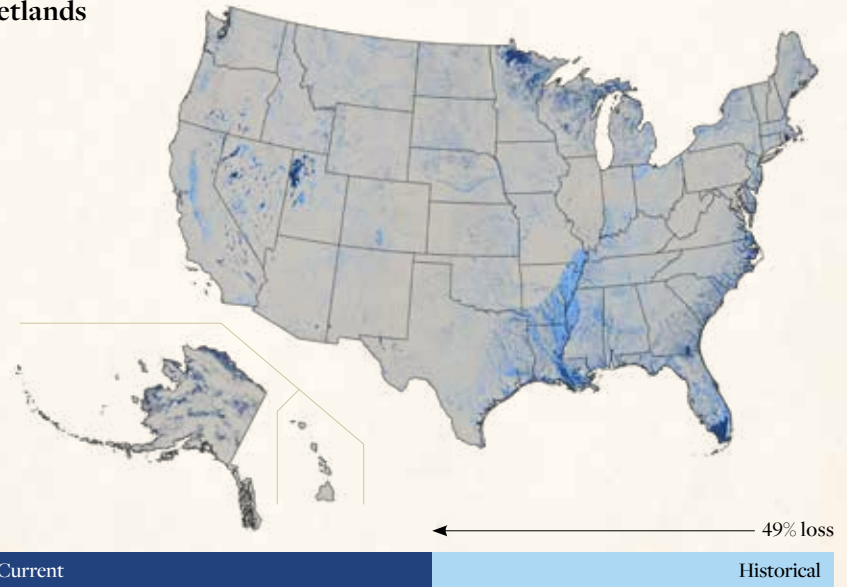
Deserts



Grasslands and Shrublands



Wetlands



# Where is imperiled biodiversity concentrated?

*Geographical patterns of biodiversity generally follow patterns of ecosystem diversity. At-risk species are concentrated where threats are greatest.*

Plant and animal species richness (i.e., total number of species in an area) is influenced by biophysical factors, such as soil type and climate, and the size of the area being evaluated. The number of species tends to decrease as latitude increases. However, patterns can differ by taxonomic group. For example, geographical patterns of species richness for orchids (especially diverse in the Southeast) and bees (especially diverse in the Southwest) differ from the generalized patterns of plants and animals.

The geographical patterns in richness of at-risk species reflect both underlying species richness and the geographical distribution of threats. For instance, Florida has the highest number of orchid species, but Texas has a greater percentage of orchids that are at risk of extinction. Similarly, although bee diversity is greater in the West, high percentages of at-risk species are also found in the Midwest and in the South in Georgia and Florida.<sup>17</sup>

<sup>17</sup> Note that the genera of yellow-faced bees, the only native bees in Hawai'i, have not been comprehensively assessed and are not included in this analysis. For more information on included and excluded species, see online appendix. [www.natureserve.org/bif](http://www.natureserve.org/bif)



Ram's-head lady's-slipper (*Cypripedium arietinum*)  
NatureServe Global Status: Vulnerable (G3)  
Photo by Larry Master (masterimages.org)



American bumble bee (*Bombus pensylvanicus*)  
NatureServe Global Status: Vulnerable (G3)  
ESA Listing Status: Under Review  
Photo by Larry Master (masterimages.org)

FIGURE 8

GEOGRAPHY OF SPECIES DIVERSITY AND IMPERILMENT

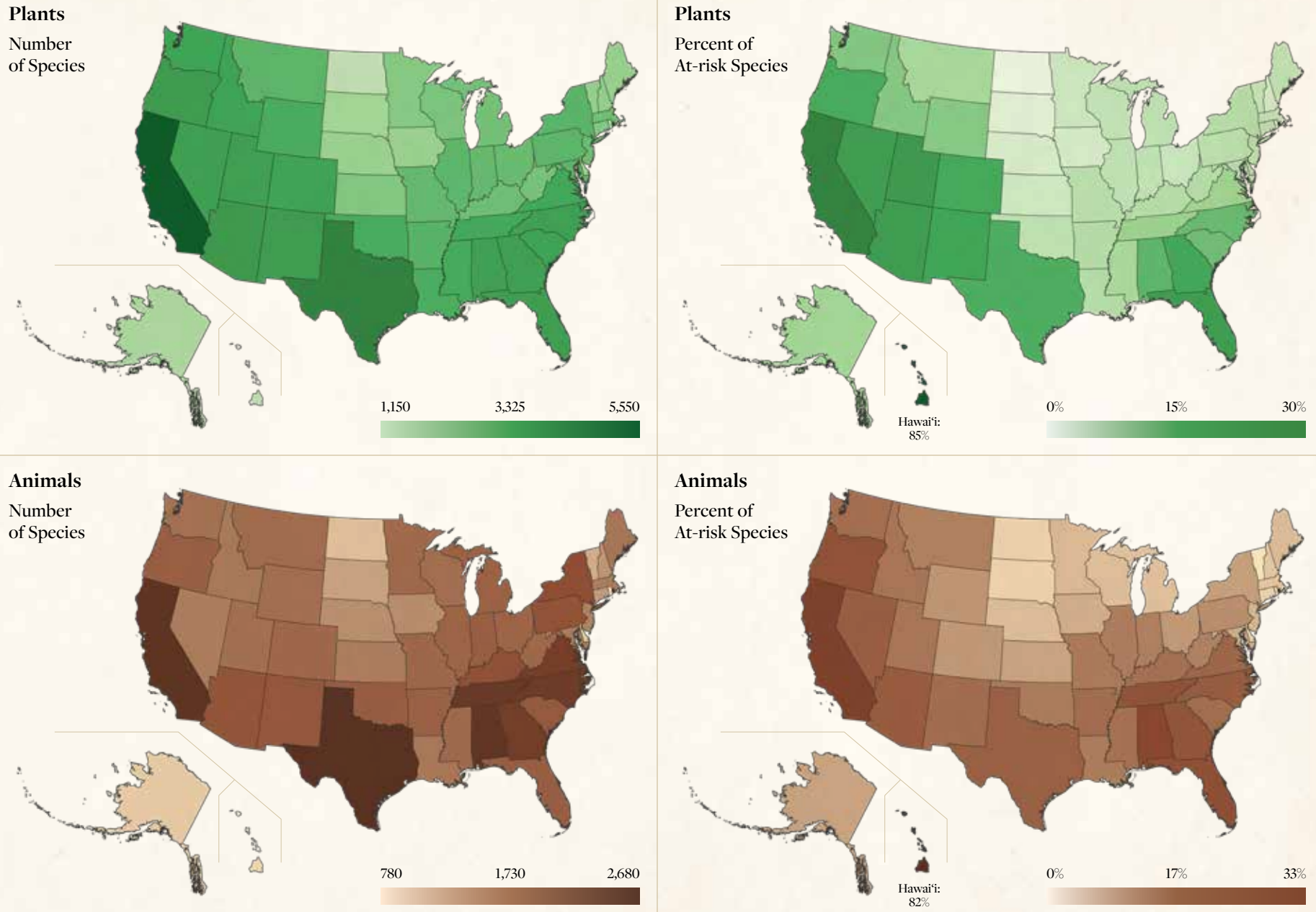
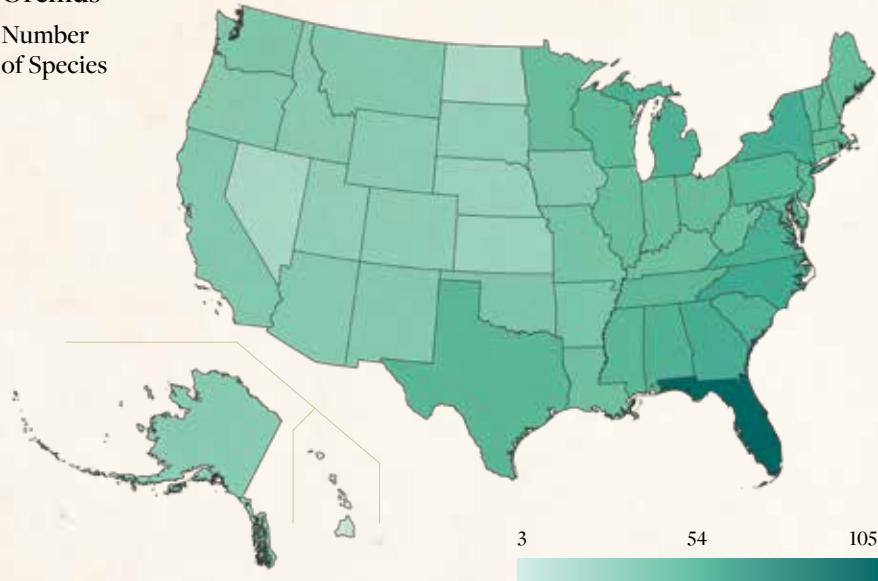


FIGURE 8 CONTINUED

GEOGRAPHY OF SPECIES DIVERSITY AND IMPERILMENT

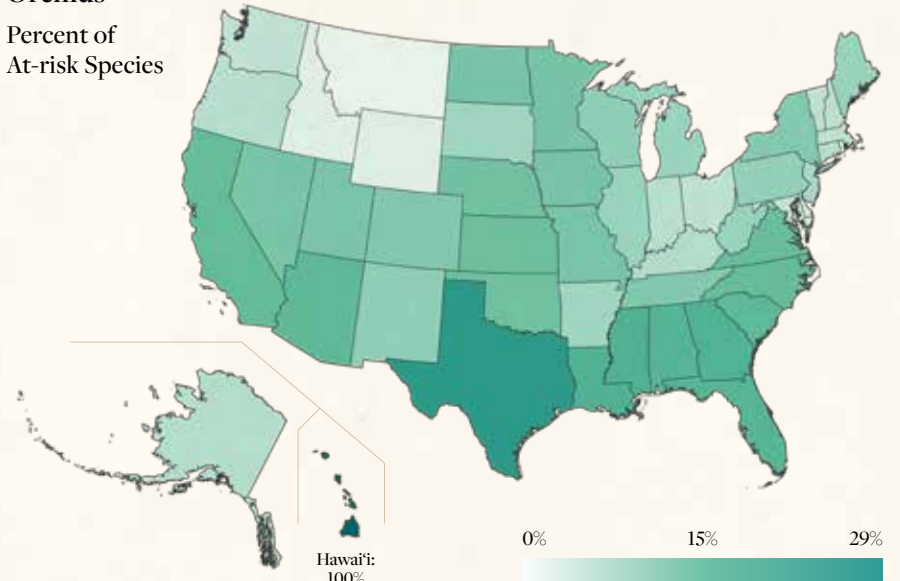
**Orchids**

Number of Species



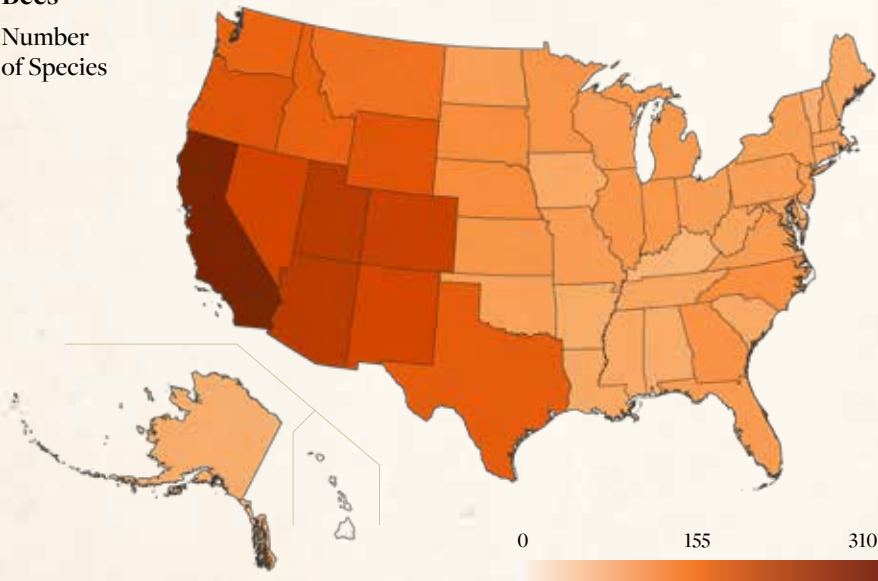
**Orchids**

Percent of At-risk Species



**Bees**

Number of Species



**Bees**

Percent of At-risk Species

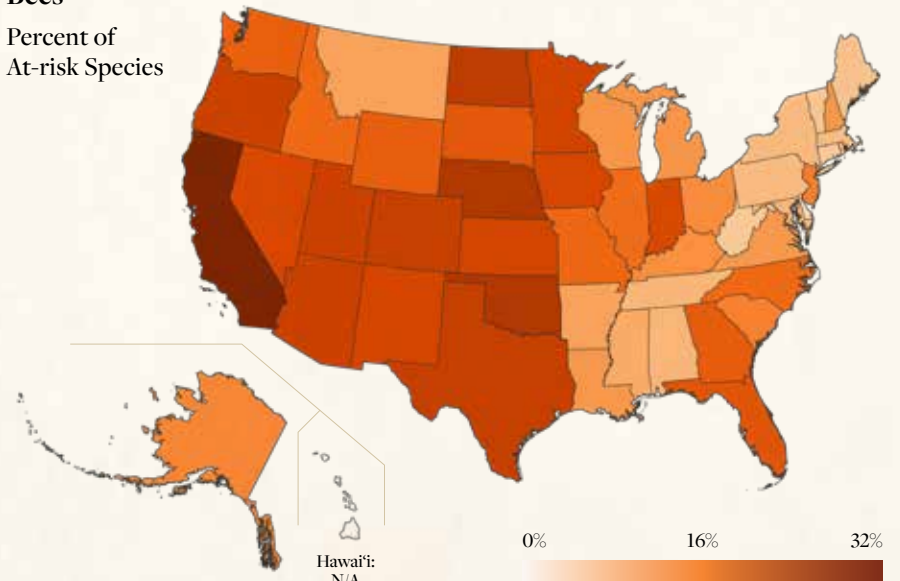
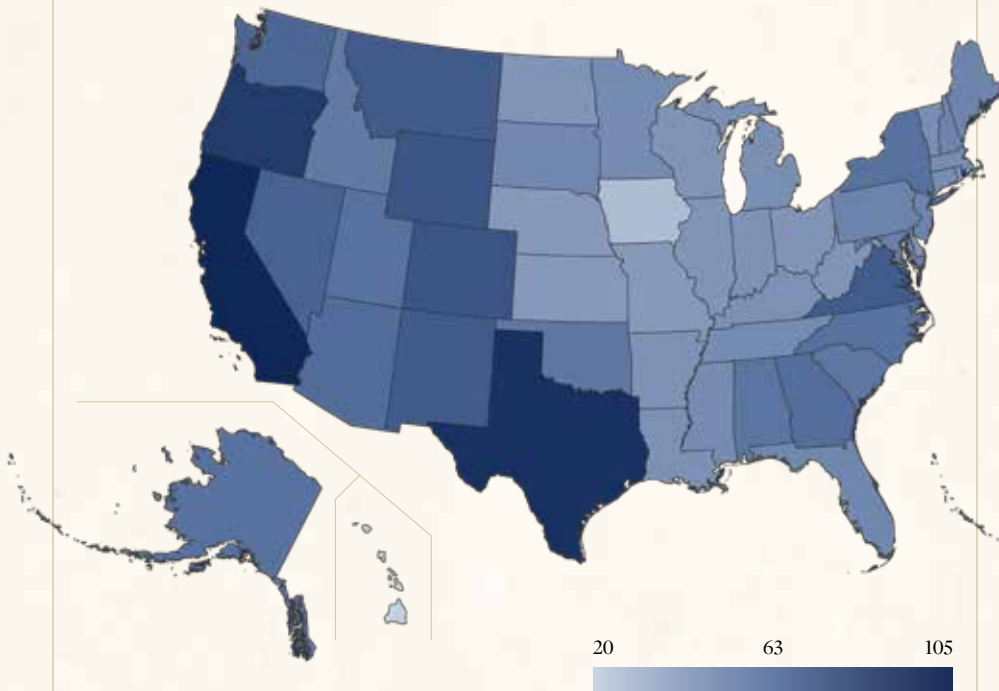


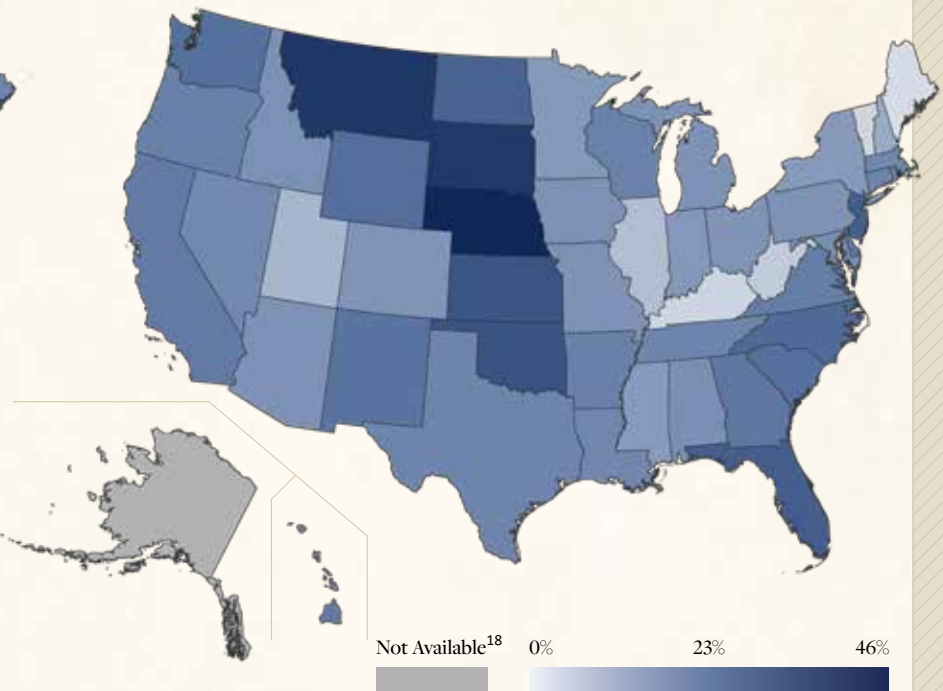
FIGURE 9

## THE GEOGRAPHY OF ECOSYSTEM DIVERSITY AND IMPERILMENT

Number of Ecosystems



Percent of State Area with At-risk Ecosystems



As with patterns in species diversity, patterns in ecosystem diversity vary based on geography. Our data show that more U.S. ecosystems are found in topographically diverse regions (e.g., mountains, coastal areas) or in large and biogeographically diverse states such as Texas and California.<sup>19</sup>

Geographical patterns for at-risk ecosystems reflect the legacy of human land use. The prevalence of at-risk ecosystems is high in the South, especially in Florida. In the western Great Plains, many states have relatively low ecosystem diversity, but contain large areas of at-risk grasslands. For example, Montana, South Dakota,

and Nebraska score high for percentage of state area with at-risk ecosystems. In mountainous western states, there is a high diversity of ecosystems but those that are at risk are largely limited to low elevations where the human footprint is greatest; thus, those states score relatively low for percentage of state area with at-risk ecosystems.

<sup>18</sup> Distribution and conservation status for NVC groups is not yet available for Alaska. See online appendix for more information on Alaska ecosystems of conservation concern.

<sup>19</sup> Ecosystem counts are based on state distribution data for NVC groups extracted from NatureServe's database of biodiversity in 2022. The percentage of state area with at-risk ecosystems is calculated based on the mapped distribution of at-risk NVC groups. Mapped information on the extent of at-risk ecosystems in Alaska was not available at the time of reporting.

# Where do we go from here?

*Addressing our nation's biodiversity crisis is possible only when decision-makers have the information needed to ensure that investments are well-targeted.*

The United States has an incredible diversity of living natural resources. From California's redwood forests to Maine's bogs, and from the Alaskan tundra to the Florida Everglades, biodiversity is a source of national pride.

But too much of our biodiversity is at risk: 34% of plant species and 40% of animal species are threatened with extinction, and 41% of ecosystems are at risk of collapse. A significant portion of land area—42% in the contiguous United States—has already been converted to nonnative landscapes through development and other land conversion.<sup>20</sup> There are countless opportunities for ecological restoration that can provide significant benefits to native species and habitats. However, restoration efforts are often costly, difficult, and not always successful. Therefore, it is critically important to conserve the biodiversity that remains before it is lost.

NatureServe continues to support the Recovering America's Wildlife Act (RAWA) in the 118th Congress. If passed, RAWA would represent the largest, most transformational investment in wildlife and habitat conservation in a generation and would fund state, territory, and tribal-led work to identify and protect species and areas of greatest conservation need.

<sup>20</sup> LANDFIRE 2016 Remap. LANDFIRE (LF), Landscape Fire and Resource Management Planning Tools, is a shared program between the wildland fire management programs of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior, providing landscape scale geo-spatial products to support cross-boundary planning, management, and operations. As illustrated by 2016 LANDFIRE data, a significant portion of the land area of the United States—42%—has already been converted to developed areas, ruderal vegetation, or agriculture. [www.landfire.gov](http://www.landfire.gov)



Georgia dwarf trillium (*Trillium georgianum*)  
NatureServe Global Status: Critically Imperiled (G1)  
Photo by Jim Fowler

FIGURE 10

## LAND CONVERSION IN THE UNITED STATES



These investments, guided by State Wildlife Action Plans, will need the most comprehensive and scientifically sound data available. This report provides a high-level look at the challenges faced by biodiversity in the United States and some of the data available to help make the most effective decisions.

Moreover, America the Beautiful and the 30x30 global initiative call for conservation of 30% of the planet's land and water by 2030. Meeting this goal requires investments in land acquisition and management to maximize value for biodiversity conservation. Strategies

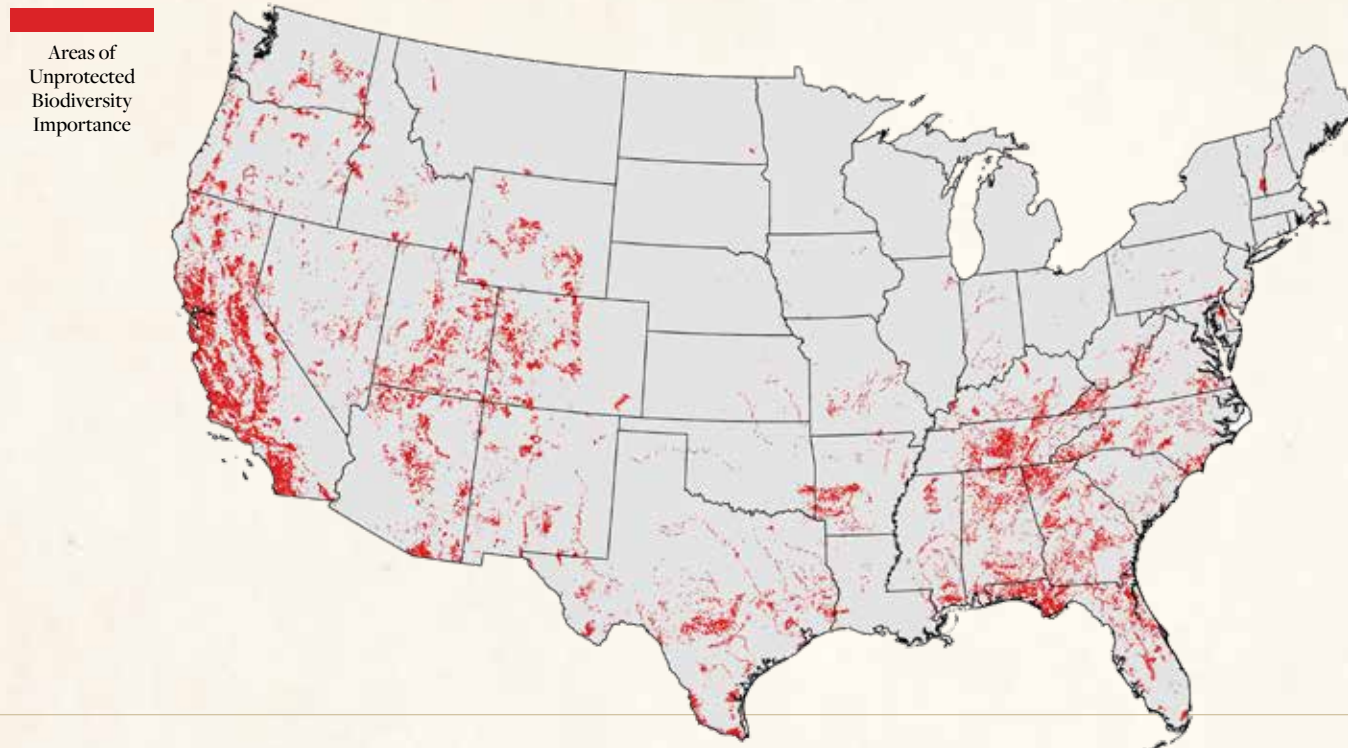
that protect the persistence of the full diversity of natural ecosystems (coarse-filter conservation) should be complemented by strategies that address the needs of individual species at risk of extinction (fine-filter conservation). NatureServe data make this possible.

Recognizing which species and ecosystems are at risk, and whether at-risk biodiversity is sufficiently protected, is foundational information. Documenting current threats and where they occur is critical for identifying the likely location of future threats and for determining conservation strategies. Data can inform



FIGURE 11

## PRIORITY AREAS FOR CONSERVING UNPROTECTED, IMPERILED SPECIES



decisions about how to expand existing protected areas and better manage working lands. NatureServe and NatureServe Network data are already used by federal and state governments, and the private sector to make conservation decisions. NatureServe's data on the location of at-risk species and ecosystems can also be analyzed with other information, such as spatial data on land management and protection, to identify regions of conservation importance.<sup>21</sup>

To make the best decisions possible, we need an understanding of our natural heritage. We need to know what biological resources exist, where they occur, and which ones are most at risk. As global change rapidly alters the environment, we need continued investment to ensure that we have the most comprehensive and current information. Accessible and accurate data about the status and trends of our nation's biodiversity empowers all stakeholders to make decisions that positively impact species and ecosystems throughout the United States. This knowledge will ensure that our nation's biodiversity is protected for generations to come.

<sup>21</sup> Areas of unprotected biodiversity importance have been identified by NatureServe and partners based on the presence of unprotected, range-limited imperiled species. By combining our data on the location of imperiled species with a map of protected areas, NatureServe has identified currently unprotected areas where conservation actions will most benefit biodiversity. These areas, marked in red on the map, indicate where on-the-ground conservation actions can most effectively prevent the extinction of the nation's most imperiled species. See Hamilton et al. 2022.



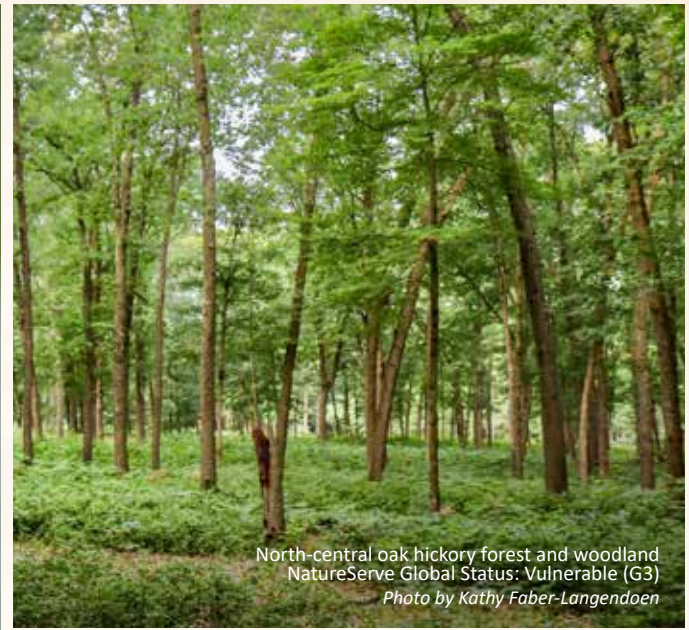




Monterey cypress (*Cupressus macrocarpa*)  
NatureServe Global Status: Critically Imperiled (G1)  
Photo by Rachel Stringham (iNaturalist)



Red-cockaded woodpecker  
(*Dryobates borealis*)  
NatureServe Global Status:  
Vulnerable (G3)  
ESA Listing Status: Endangered  
Photo by the U.S. Fish and Wildlife Service



North-central oak hickory forest and woodland  
NatureServe Global Status: Vulnerable (G3)  
Photo by Kathy Faber-Langendoen



Utah prairie dog (*Cynomys parvidens*)  
NatureServe Global Status: Imperiled (G2)  
ESA Listing Status: Threatened  
Photo by James Marvin Phelps



Mesic longleaf pine flatwoods - spodosol woodland  
NatureServe Global Status: Imperiled (G2)  
Photo by Michael Lee, NatureServe



Dusky gopher frog (*Lithobates sevosus*)  
NatureServe Global Status: Critically Imperiled (G1)  
ESA Listing Status: Endangered  
Photo by Evan Grimes (iNaturalist)



Bachman's sparrow (*Peucaea aestivalis*)  
NatureServe Global Status: Vulnerable (G3)  
Photo by Larry Master ([masterimages.org](http://masterimages.org))

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**Front Cover Photo:**

Mojave mid-elevation mixed desert scrub  
NatureServe Global Status: Vulnerable (G3)

Photo by Sundry Photography

**Back Cover Photo:**

Minnesota trout-lily (*Erythronium propullans*)  
NatureServe Global Status: Critically Imperiled (G1)

ESA Listing Status: Endangered

Photo by Brian (Flickr)

**Page 8 photos, left to right:**

Desert valley fishhook cactus  
(*Sclerocactus spinosior*)

NatureServe Global Status: Imperiled (G2)

Photo by Janel Johnson ([iNaturalist](http://iNaturalist))

A burrowing crayfish (*Cambarus fetzneri*)  
NatureServe Global Status: Vulnerable (G3)

Photo by Chris Lukhaup

Northern tallgrass prairie

NatureServe Global Status: Imperiled (G2)

Photo by Marilena

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Graphic Design by

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Great Lakes dune  
NatureServe Global Status: Vulnerable (G3)  
*Photo by Kathy and Don Faber-Langendoen*



## Biodiversity in Focus: United States Edition

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The data that support the findings of this report are available. To access those data, a detailed appendix, and an online version of *NatureServe's Biodiversity in Focus: United States Edition*, please visit [www.natureserve.org/bif](http://www.natureserve.org/bif).

Contact [info@natureserve.org](mailto:info@natureserve.org) for high-resolution figures included in this report.

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