

# NatureServe SPECIES AT RISK

## Featured Species



**Pyne's Ground-Plum**  
*Astragalus bibulatus*  
G1, S1 (Tennessee)  
Photo by David Pineros, Tennessee Division of Natural Areas  
Pyne's ground-plum (*Astragalus bibulatus*) is a long-lived perennial in the pea family that is restricted to limestone cedar glades in the Central Basin of Tennessee. Once considered possibly extinct, Pyne's ground-plum was rediscovered in 1979 by recently retired NatureServe ecologist Milo Pyne. The Tennessee Division of Natural Areas, in collaboration with the Missouri Botanical Garden and U.S. Fish and Wildlife Service, has instituted a long-term, science-based recovery program to improve restoration and management outcomes for this rare species, which is listed as endangered under the U.S. Endangered Species Act. The reintroduction program has made measurable progress toward changing the status of the species to threatened.



**Venus Flytrap**  
*Dionaea muscipula*  
G2, S2 (North Carolina)  
Photo by Miguel Vieira  
Perhaps the world's most iconic carnivorous plant, the Venus flytrap (*Dionaea muscipula*) occurs naturally only on the coastal plain of North Carolina and South Carolina. Described by Charles Darwin as one of the most wonderful plants in the world, the Venus flytrap ensnares insects like beetles, ants, and flies in its leaves when bristles detect their presence, causing the trap to spring shut in less than a second. The North Carolina Natural Heritage Program closely monitors populations of the Venus flytrap, including a 2019 census on public lands and a survey on private lands planned for 2020. While there are over 100 populations made up of thousands of individual plants, the species continues to experience declines due to multiple threats including collection from wild populations, habitat conversion, and fire suppression.



**Macfarlane's Four-O'clock**  
*Mirabilis macfarlanei*  
G1, S1 (Idaho)  
Photo by Michael Baird  
Macfarlane's four-o'clock (*Mirabilis macfarlanei*) is known from only nine locations in Idaho and four in adjacent Oregon, where it grows on rockslides, canyon walls, and sandy to gravelly talus slopes. The Idaho Natural Heritage Program has been monitoring and promoting recovery of the species for many years, risking life and limb along the Snake and Salmon rivers to manage this endemic perennial herb. Macfarlane's four-o'clock is one of the few plant species in Idaho that has been transplanted to another field site in an effort to increase its numbers. Major threats include livestock grazing and the invasion of exotic plants. Originally listed as endangered under the U.S. Endangered Species Act, the species was downlisted to threatened in 1996 after successful recovery efforts and newly discovered populations.



**Klaza Draba**  
*Draba bruce-bennettii*  
G1, S1 (Yukon)  
Photo by Bruce Bennett, Yukon Conservation Data Centre  
A member of the mustard (Brassicaceae) family's largest and most complex genus, the Klaza draba (*Draba bruce-bennettii*) was discovered in 2012 by Yukon Conservation Data Centre Coordinator Bruce Bennett in an alpine region so remote it is most easily reached by helicopter. Known only from Langham and Tritop mountains in Canada's Dawson Range, Klaza draba grows on volcanic bedrock at the very summit of these isolated mountains, giving the species little room to move upslope as its habitat is altered by climate change. Additional fieldwork in the best explored regions of North America is needed to help improve our limited understanding of the complex *Draba* genus.

## About the Map

Plants are the foundation of life on Earth, creating energy from sunlight, regulating the atmosphere, and forming the base of the food chain on which we all depend. North America is home to an incredible diversity of native plants that form unique ecological communities across the continent's varied terrains—from the tundra of the Arctic to the coastal plains of the Southeast, from the arid deserts of the Southwest to the lush Acadian forests of the Northeast, and everywhere in between. Like the animal species that depend on them, many plants are threatened by habitat conversion, degradation, and fragmentation caused by human activities—and the growing effects of climate change further increase their risk of extinction.

Compared to animals, at-risk plants are less likely to receive legal protection, and fewer resources are directed toward their conservation and recovery. This makes the decades-long efforts of the NatureServe Network to identify, monitor, and conserve native plant species even more important. Both the Canadian and United States governments look to NatureServe data to inform them about what plants are most at risk, what threats they face, and how to protect them.

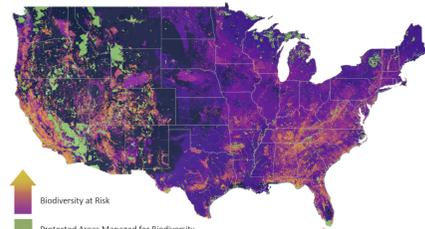
The map on the right illustrates vascular plants chosen by botanical experts from each network program. Each plant is both globally at risk of extinction and particularly vulnerable to disappearing from the state or province where it appears on the map. Although they represent just a sliver of the many thousands of at-risk plants across the continent, these species highlight the taxonomic and visual diversity of the plant kingdom, as well as the comprehensive knowledge of the NatureServe Network about native biodiversity. Through on-the-ground inventory efforts, our Network's dedicated botanists work diligently to understand species' needs, describe the threats they face, and develop strategies for their recovery.

## Mapping the Places That Matter Most

Preventing extinctions requires precise information on where imperiled species occur. For nearly 50 years, scientists in the NatureServe Network have developed detailed information on species of conservation concern, producing the authoritative dataset on imperiled plants and animals. Now, by applying 21st-century technology including machine learning methods, NatureServe has transformed those data into a comprehensive picture of the most critical areas for the conservation of the most endangered species in the contiguous United States. Completed in collaboration with our Network and with support from Esri, The Nature Conservancy, and Microsoft's AI for Earth Program, the Map of Biodiversity Importance project synthesized decades of natural heritage data and expertise to build habitat suitability models for 2,216 of the United States' most imperiled species—including vertebrates, pollinators, plants, mussels, and crayfish. The Map of Biodiversity Importance collection consists of fifteen map products which depict three different measures of conservation value for imperiled species as a whole, as well as for specific taxonomic subgroups (e.g., plants or pollinators). These map products, and the methods used to generate them, will improve the efficiency and effectiveness of conservation practitioners—from federal resource managers to local governments, and from land trusts to farmers, foresters, and private citizens.

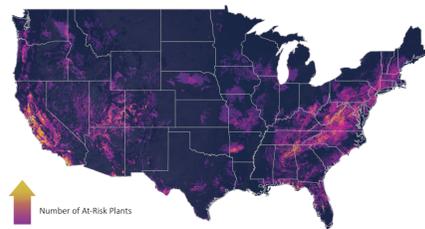
"The Map of Biodiversity Importance allows us to see what we've never seen before. With unprecedented resolution, we can now identify the places that matter most for sustaining biodiversity."

—Dr. Healy Hamilton, NatureServe's Chief Scientist



### The Map of Biodiversity Importance

The Map of Biodiversity Importance identifies areas of highest conservation need to prevent species extinctions. By analyzing species habitat models, we calculated a metric called protection-weighted range-size rarity, which takes into account the total predicted range size of each species and the degree to which its habitat is already protected. Brighter colors indicate places where multiple underprotected species are likely to occur, showing us which areas are most important for preventing the extinction of imperiled biodiversity.



### Richness of Vascular Plants at Risk

The map of Biodiversity Importance is unique in that it represents a taxonomically and ecologically diverse set of species never before comprehensively mapped at fine spatial resolution, including 1,636 plants. The map above depicts species richness of imperiled plants—brighter colors show areas where multiple imperiled plants are predicted to be concentrated together. Nearly a third of native vascular plant species in the United States are at risk of extinction. Despite representing over half of all taxa listed under the Endangered Species Act, plants receive less than 5% of federal expenditures spent on protection. This map will help direct conservation investment toward the places most important for sustaining the extraordinary diversity of plant life in the United States.

