# All Taxa Biodiversity Inventory

Great Smoky Mountains National Park · Tennessee and North Carolina

Coordinated by
**Discover Life in America**
nonprofit partner of the park · dlia.org

# 23,087

species documented in the park

**THE ATBI HAS MORE THAN DOUBLED WHAT WE KNOW**

**10,407** known before the ATBI began in 1998

**11,555** new to the park since 1998

**1,125** new to science

*An estimated 40,000–60,000 more species are still waiting to be discovered here.*

**DIVERSITY AT EVERY RANK**

| 7 | 58 | 138 | 485 | 1,866 | 8,608 |
|---|---|---|---|---|---|
| kingdoms | phyla | classes | orders | families | genera |




Straddling the Southern Appalachian Mountains of Tennessee and North Carolina, Great Smoky Mountains National Park encompasses 816 square miles of rugged, mountainous terrain and hosts an incredible diversity of flora and fauna. It's home to the All Taxa Biodiversity Inventory (ATBI), a massive effort to discover, understand, and conserve every species living in the park.

**ENDEMICS & EXOTICS**

**111** species occur only in the Smokies

**157** more occur only in the Smokies and nearby Southern Appalachians

**540** (est.) exotic species are present in the park (not native to the Smokies)

**ATBI-RELATED RESEARCH PERMITS**

**696** permits issued to 694 researchers from 187 institutions, 41 US states, and 27 countries (1998–2026)

## Smokies taxa tally

Microbes 4% · Plants & algae 15% · Fungi 22% · Arachnids 4% · Insects 47%

| | | Historic | New to park | New to science | Total |
|---|---|---|---|---|---|
| **MICROBES** 4% of park richness | | | | | **963** |
| Bacteria | | 0 | 267 | 272 | **539** |
| Archaea | | 0 | 0 | 44 | **44** |
| Viruses | | 1 | 18 | 5 | **24** |
| Protista | *slime molds, amoeba, microsporidia* | 143 | 195 | 18 | **356** |
| **PLANTS & ALGAE** 15% | | | | | **3,516** |
| Vascular | *flowering plants, conifers, ferns* | 1,598 | 219 | 1 | **1,818** |
| Non-vascular | *mosses, liverworts, hornworts* | 634 | 13 | 0 | **647** |
| Chromista | *water molds, sporozoans* | 9 | 39 | 1 | **49** |
| Algae | | 358 | 566 | 78 | **1,002** |
| **FUNGI** 22% | | | | | **4,994** |
| Non-lichenized | | 2,685 | 1,260 | 80 | **4,025** |
| Lichens | | 341 | 560 | 68 | **969** |
| **OTHER INVERTEBRATES** 2% | | | | | **570** |
| Cnidaria | *jellyfish, hydra* | 0 | 4 | 0 | **4** |
| Porifera | *freshwater sponges* | 0 | 2 | 0 | **2** |
| Platyhelminthes | *flatworms* | 6 | 43 | 4 | **53** |
| Bryozoa | *moss animals* | 0 | 1 | 0 | **1** |
| Gastrotricha | *hairy bellies* | 0 | 2 | 0 | **2** |
| Nematomorpha | *horsehair worms* | 2 | 3 | 0 | **5** |
| Nematoda | *roundworms* | 13 | 103 | 4 | **120** |
| Nemertea | *ribbon worms* | 0 | 1 | 0 | **1** |
| Mollusca | *snails, slugs, mussels, etc.* | 121 | 70 | 2 | **193** |
| Annelida | *aquatic worms, leeches, earthworms* | 23 | 68 | 7 | **98** |
| Tardigrada | *waterbears* | 2 | 57 | 26 | **85** |
| Rotifera | *wheel animals, spiny-headed worms* | 0 | 6 | 0 | **6** |

| | | Historic | New to park | New to science | Total |
|---|---|---|---|---|---|
| **VERTEBRATES** 2% | | | | | **485** |
| Fish | | 70 | 5 | 0 | **75** |
| Amphibia | *frogs, salamanders* | 38 | 4 | 3 | **45** |
| Reptilia | *snakes, lizards, turtles* | 38 | 2 | 0 | **40** |
| Aves | *birds* | 233 | 22 | 0 | **255** |
| Mammalia | *bats, elk, rodents, bears, etc.* | 64 | 6 | 0 | **70** |
| **ARACHNIDS** 4% | | | | | **945** |
| Acari | *mites, ticks* | 43 | 252 | 48 | **343** |
| Opiliones | *harvestmen* | 1 | 22 | 2 | **25** |
| Araneae | *spiders* | 237 | 275 | 43 | **555** |
| Pseudoscorpions | *& scorpions* | 11 | 10 | 1 | **22** |
| **MYRIAPODS** 1% | | | | | **196** |
| Chilopoda | *centipedes* | 21 | 42 | 0 | **63** |
| Symphyla | *symphylans* | 0 | 1 | 2 | **3** |
| Pauropoda | *pauropods* | 7 | 25 | 17 | **49** |
| Diplopoda | *millipedes* | 39 | 33 | 9 | **81** |
| **OTHER ARTHROPODS** 2% | | | | | **456** |
| Crustacea | *crayfish, copepods, pillbugs* | 20 | 76 | 32 | **128** |
| Protura | *coneheads* | 7 | 9 | 10 | **26** |
| Collembola | *springtails* | 89 | 138 | 61 | **288** |
| Diplura | *two-pronged bristletails* | 4 | 5 | 5 | **14** |

| | | Historic | New to park | New to science | Total |
|---|---|---|---|---|---|
| **INSECTS** 47% | | | | | **10,962** |
| Archaeognatha | *jumping bristletails* | 1 | 2 | 1 | **4** |
| Zygentoma | *silverfish* | 1 | 1 | 0 | **2** |
| Odonata | *dragonflies, damselflies* | 58 | 45 | 0 | **103** |
| Ephemeroptera | *mayflies* | 81 | 54 | 8 | **143** |
| Zoraptera | *angel insects* | 0 | 0 | 0 | **0** |
| Dermaptera | *earwigs* | 2 | 0 | 0 | **2** |
| Plecoptera | *stoneflies* | 79 | 49 | 12 | **140** |
| Orthoptera | *grasshoppers, crickets, katydids* | 63 | 52 | 4 | **119** |
| Embioptera | *webspinners* | 0 | 1 | 0 | **1** |
| Phasmatodea | *walking sticks* | 2 | 2 | 0 | **4** |
| Mantodea | *mantids* | 2 | 0 | 0 | **2** |
| Blattodea | *cockroaches, termites* | 2 | 10 | 0 | **12** |
| Thysanoptera | *thrips* | 0 | 48 | 0 | **48** |
| Hemiptera | *true bugs, hoppers* | 354 | 601 | 5 | **960** |
| Psocodea | *barklice, booklice, parasitic lice* | 26 | 105 | 5 | **136** |
| Hymenoptera | *ants, bees, wasps* | 375 | 1,332 | 36 | **1,743** |
| Megaloptera | *alderflies, dobsonflies, fishflies* | 4 | 3 | 0 | **7** |
| Neuroptera | *lacewings, antlions, etc.* | 9 | 36 | 0 | **45** |
| Strepsiptera | *twisted-wing insects* | 0 | 2 | 0 | **2** |
| Coleoptera | *beetles* | 574 | 2,082 | 84 | **2,740** |
| Trichoptera | *caddisflies* | 173 | 67 | 4 | **244** |
| Lepidoptera | *butterflies, moths, skippers* | 728 | 1,219 | 39 | **1,986** |
| Mecoptera | *scorpionflies* | 15 | 2 | 1 | **18** |
| Siphonaptera | *fleas (parasitic Mecoptera)* | 17 | 9 | 1 | **27** |
| Diptera | *flies* | 983 | 1,409 | 82 | **2,474** |

**Historic**: documented in the park before the ATBI began in 1998
**New to park**: first recorded in the park since 1998
**New to science**: discovered and named from park material since 1998
**Full tally: dlia.org/smokies-species-tally**

**Sources:** Becky Nichols & Paul Super, Great Smoky Mountains National Park; Discover Life in America. Tally updated October 2026. **Silhouettes:** Pascal Abel, Dave Angelini, Timothy Bartley, Sasha Bliznina, César Camilo Julián Caballero, Fernando Carezzano, Matthew Crook, Maxime Dahirel, Guillaume Dera, Fernando Domenico, Olivier Glaizot, Caleb M. Gordon, Cristina Guijarro, Scott Hartman, Tracy Heath, Kamil S. Jaron, Faith Jones, T. Michael Keesey, Emma Kärrnäs, lucy_the_bob_man, david maas, Gemma Martínez-Redondo, Sean McCann, Mattia Menchetti, Tatiana Miroliubova, Gareth Monger, Graham Montgomery, Nico Muñoz, Darren J. Parker, Blair Perry, Carlo De Rito, Ferran Sayol, Noah Schlottman, Arcadia Science, seung9park, Ian Shin, Michelle Site, Martin R Smith, Steven Traver, Jennifer Trimble, Kelsey Wood via PhyloPic.org

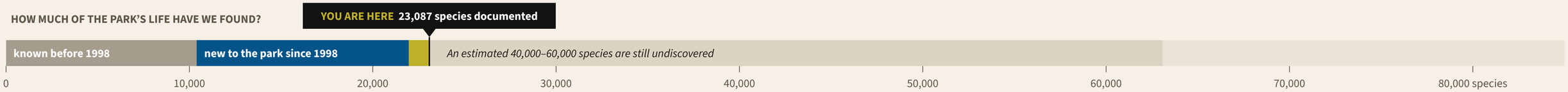
CALLING ALL ENTOMOLOGISTS

# Join the discovery in the Great Smoky Mountains

Five ways to help Discover Life in America find every species in the park

Links & resources
**dlia.org/entomology-2026**

HOW MUCH OF THE PARK'S LIFE HAVE WE FOUND?




## 1 Identify iNaturalist observations

Visitors have logged 320,000 iNaturalist observations in the Smokies, adding 410 new species records for the park. Many arthropods still need an expert eye: add IDs (even above species), flag ones you disagree with, and annotate life stage, sex, and interactions.

**Smokies arthropods needing ID**
Taxon-specific links at dlia.org/entomology-2026

## 2 Identify material from our backlog

Over 25+ years, we've accumulated roughly 500,000 arthropods from Malaise, pitfall, and Lindgren funnel traps. Most are in alcohol and sorted to order. We can send material to you, and we may be able to pay you for your time and effort.

**Our priority taxa**
Questions? will@dlia.org

## 3 Survey your taxon in the Smokies

Despite 28 years of research, there's so much more to learn about life in this ancient, biologically fascinating ecosystem. We can help you get a research permit and get started, and funding may be available through our mini-grants.

**Information for scientists**
Questions? will@dlia.org

## 4 Apply for our summer internship

Undergraduates spend 9 weeks (June–July) in the park near Gatlinburg, Tennessee, doing biodiversity field research, DNA barcoding, and more. Stipend and housing provided. Applications open January 2027.

**Summer internships**
Please share with your students!
Questions? julie@dlia.org

## 5 Donate to conserve biodiversity

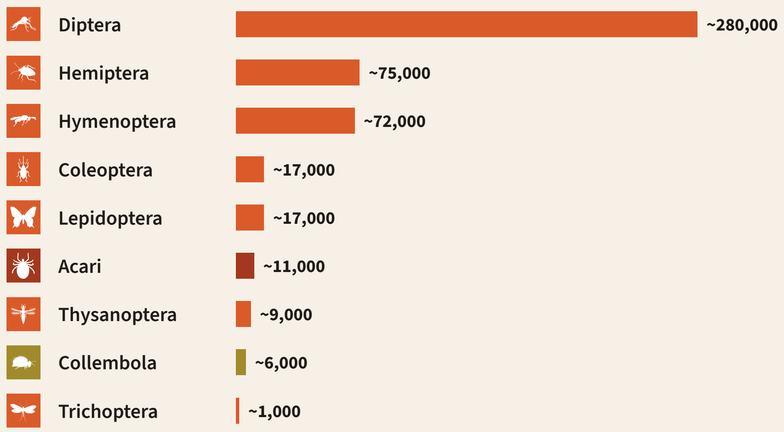
Discover Life in America is a 501(c)(3) nonprofit partner of Great Smoky Mountains National Park. Your gift helps us run the ATBI, train the next generation of scientists through internships, and share discoveries with the public.

**Donate online**
EIN 62-1770910

## Our taxonomic priorities

*Our biggest needs right now. There are always species to find, even in the best-studied groups.*

BACKLOG: SPECIMENS AWAITING ID




Plus hundreds of Annelida, Neuroptera, Plecoptera, and Mecoptera, and dozens of Ephemeroptera, Siphonaptera, isopods, and mollusks.

UNDERSTUDIED GROUPS

**Microbes & small invertebrates**
Bacteria, archaea & protozoa · Nematoda · Nemertea · Rotifera

**Arachnids & myriapods**
Acari (especially soil, water & plant mites) · Pseudoscorpiones · Diplopoda · Symphyla

**Smaller insect orders**
Zoraptera (none recorded yet!) · Embioptera (webs first found in 2025) · Strepsiptera · Dermaptera

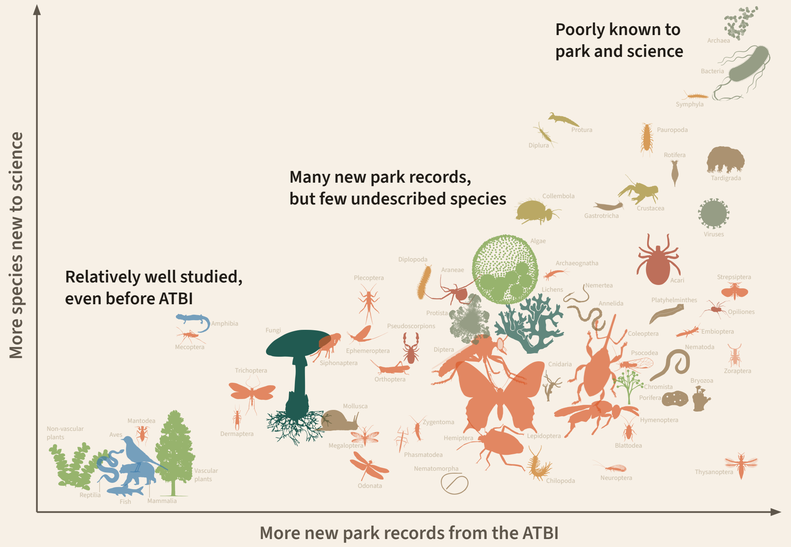
**Hemiptera**
Anthocoridae · Coccoidea · Fulgoroidea · Miridae · Nabidae · Psyllidae · Tingidae

**Hymenoptera**
Chalcidoidea · Cynipoidea · Ichneumonoidea · Platygastroidea

**Diptera**
"Acalyptratae" · Asiloidea · Muscoidea · Oestroidea

**Leafminers & gallformers**
Ideal for iNaturalist when the host plant is recorded

HOW WELL DO WE KNOW THESE GROUPS IN THE SMOKIES?
*Silhouette size roughly tracks number of species documented.*




**Silhouettes:** Pascal Abel, Dave Angelini, Timothy Bartley, Sasha Bliznina, César Camilo Julián Caballero, Fernando Carezzano, Matthew Crook, Maxime Dahirel, Guillaume Dera, Fernando Domenico, Olivier Glaizot, Caleb M. Gordon, Cristina Guijarro, Scott Hartman, Tracy Heath, Kamil S. Jaron, Faith Jones, T. Michael Keesey, Emma Kärrnäs, lucy_the_bob_man, david maas, Gemma Martínez-Redondo, Sean McCann, Mattia Menchetti, Tatiana Miroliubova, Gareth Monger, Graham Montgomery, Nico Muñoz, Darren J. Parker, Blair Perry, Carlo De Rito, Ferran Sayol, Noah Schlottman, Arcadia Science, seung9park, Ian Shin, Michelle Site, Martin R Smith, Steven Traver, Jennifer Trimble, Kelsey Wood via PhyloPic.org

## Discover Life in America

Connecting communities and scientists in discovering, understanding, and conserving the natural world.
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