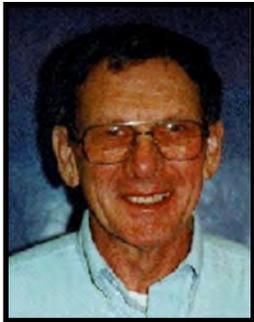


# Interior Forests in Indiana

by Marion T. Jackson and John O. Whitaker

Firetower at Harrison-Crawford State Forest, 2013. Source: Myke Luurtsema

**Editor's note** –We asked Professors Marion Jackson and John Whitaker, two of America's most notable and published scientists on the subjects of forest ecology and the flora and fauna of eastern hardwood forests, for their opinions on the merits of sparing large tracts of Indiana's state forests from logging. Below are their opinions on the subject, but first we provide their credentials.



Dr. Marion T. Jackson  
Source: Dept. of Biology  
photo archives, ISU

\*Marion T. Jackson has studied Indiana's forest ecosystem for his entire academic career. He earned his degree in Plant Ecology at Purdue University in 1964 under Dr. A. A. Lindsey, one of the world's leading forest ecologists. He joined the faculty of the Department of Life Sciences at Indiana State University that same year where he taught until his retirement in 2002. While there, he taught and worked with a number of undergraduate and graduate students and published a large number of papers, book chapters, and books, many in forest ecology. Some of his major contributions were as author and editor of *The Natural Heritage of Indiana*, published in association with the Indiana Department of Natural Resources and the Indiana Academy of Science. He also published *101 Trees of Indiana*, was associate editor of *Habitats and Ecological Communities of Indiana: Presettlement to Present*, and the Editor of the Proceedings of the Indiana Academy of Science for several years. While on sabbatical, Marion served for a year as program ecologist for the Indiana Natural Heritage Protection Program with the Division of Nature Preserves, in the Indiana Department of Natural Resources and as Acting Director of The Nature Conservancy of Indiana in 1978/79, during the sabbatical of TNC's first Indiana Director.



Dr. John O. Whitaker, Jr.  
Source: Angela  
Chamberlain

\*John O. Whitaker, Jr. obtained his PhD in Vertebrate Zoology/Wildlife Management from Cornell University in 1962. He worked under Dr. William J. Hamilton, Jr., one of the preeminent mammalogists in North America. Whitaker joined the Department of Biological Sciences at Indiana State University in 1962, where he taught and worked with a large number of undergraduate and graduate students. While there, he studied vertebrates, particularly mammals, and has published a large number of papers, book chapters, and books. Some of his more significant publications are *The Audubon Guide to the Mammals of North America*, *Mammals of the Eastern United States*, *Mammals of Indiana*, *Field Guide to Mammals of Indiana*, and *Bats of Indiana*. He was an author and the principal editor of *Habitats and Ecological Communities of Indiana: Presettlement to Present*, which included contributions by many of the outstanding biologists of our state. Dr. Whitaker still does research and maintains an office at ISU,

where he is also Director Emeritus of the Center for Bat Research, Outreach, and Conservation, which he founded.

We are very interested in the debate over commercial logging in our state forests. Although they comprise only three percent of our state's woodlands, many of the larger areas of contiguous forest in Indiana are found in these forests. Some of our views on the value of conserving large portions of our state forests in their natural state are presented below.

We need to conserve large tracts of natural forest on our public lands to provide a baseline to compare with managed forests and observe how these forests respond naturally to stresses, such as those increasingly brought on by pollution and climate change. For example, allowing large areas of forest to evolve into mature, all aged, old growth forest can provide forest managers with a wealth of information. Data relating to carbon uptake and storage, maintenance of moisture, and the growth and

other physiological responses of different trees at a variety of ages can be obtained. Information can be collected on how trees respond to disease, insects, and other factors, including increasing drought and changes in precipitation and precipitation events. Old growth forests also provide information on certain "hypogeous" or subterranean fungi, which are necessary for healthy forest regeneration.

The proliferation of non-native invasive plants throughout Indiana provides a good illustration of why larger areas of natural forests should be maintained on public lands. To date, the areas most resistant to this invasion have been found in larger mature forests undisturbed by logging, road-building, and other activities that disrupt the forest floor and increase sunlight in the forest.

Our state's hardwood forests are being characterized too simplistically by managers seeking to produce com-



**Animals living in Indiana's contiguous forests: (clockwise from top left) 1.) Pigmy Shrew, Source: Rob Simpson. 2.) Bobcat, Source: Tony Campbell. 3.) Eastern Pipestrelle Bat, Source: Adam Mann. 4.) Black-and-White Warbler, Source: Marty Jones. 5.) Northern Long-Eared Bat, Source: Adam Mann. 6.) Southern Flying Squirrel, Source: Jerry Gingerich**

mercial timber on public forestland. Indiana's mixed hardwood forests are part of what was once the largest and most diverse temperate hardwood forest on the planet. These forests are comprised of not just "oak and hickory" but a broad assemblage of tree species. A stunning variety of animals, insects and other arthropods, worms, plants (including mosses), fungi (including mushrooms), and microbes evolved from these vast mixed hardwood forests, which were unmanaged by human hands for thousands of years.

Numerous species of birds and mammals depend on our contiguous forest. Thirty species of mammals currently present in Indiana forests can be referred to as woodland forms, meaning they live primarily in or often in forests. Also, seven species of mammals have become extirpated since European settlement. The gray fox has been declining in Indiana over past decades and needs our help to survive. The eastern woodrat has decreased and now exists in just a few forested areas along the Ohio River in Indiana. Most shrews live in forests and two rare species, the pygmy and smoky shrews, live in the forests of south central Indiana. Both were discovered in the state in 1982 and are dependent on the deep soils of  
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*"Sadly, a brief glance at our state's list of endangered species reveals that many native wildlife species are struggling to maintain viable populations in Indiana today in significant part due to the scarcity of large mature hardwood forests, unfragmented by human activities."*

the interior forest. Flying squirrels are not often seen by most residents of Indiana, but primarily live in woodpecker holes in dead and dying trees (snags) in Indiana forests. These snags also provide habitat and roosts for squirrels, bats, and some larger mammals such as bobcats, opossums, and raccoons. Bats are under heavy duress now for several reasons, including loss of habitat, White Nose Syndrome (a malady which has been killing many thousands of hibernating bats) and wind farms (which are killing huge numbers of migratory bats). Several species of bats utilize woodlands for their roosts, with some species such as the evening bat, Indiana Bat and northern bat using snags while others such as the red bat, hoary bat and Eastern pipistrelle roost mostly in the foliage of trees. Woodpecker holes were mentioned above, but many woodpeckers themselves (pileated, red bellied, downy, hairy, and to some extent red-headed), live in interior forest. Also, many smaller birds are dependent on interior forest, particularly many warblers, flycatchers, vireos, thrushes, and the ovenbird and scarlet tanager. Cowbirds are "nest parasites", which means that they lay their eggs in the nests of other smaller birds, often eliminating the eggs of the host birds. Opening the forest allows entrance to cowbirds.



*Yellowwood State Forest, 2014, Source: Myke Luurtsema*

Many amphibians and reptiles live in interior forests. Many herbaceous plants such as ferns and many wildflowers live in forests, and opening the forest can be very detrimental to these, and also to the hypogenous fungi mentioned above which are necessary for forest regeneration.

Rather than a static, shaded condition, old growth forest is ever evolving and contains a continuum of successional habitats, including early vegetation in canopy openings and disruptions caused by forest diseases and insects, storm blow downs, fires and other disturbances within deep forest interiors spread over vast areas. The inherent nature of this natural diversity is found in larger blocks of unmanaged forest. Conserving such diversity in the highly fragmented private woods that comprise four fifths of our state's forestland is not a practical option. Furthermore, our forest ecosystem cannot survive in a healthy condition if only separated fragments of old growth forest are allowed to exist in the third of one percent of Indiana in nature preserves and state parks. In Indiana, the state forests and the Hoosier National Forest offer virtually the only publicly owned forest acreages large enough to conserve this natural diversity on a viable scale.

Sadly, a brief glance at our state's list of endangered species reveals that many native wildlife species are struggling to maintain viable populations in Indiana today in significant part due to the scarcity of large mature hardwood forests, unfragmented by human activities. All but one of Indiana's 12 bat species are federally or state endangered, threatened, or a "species of special concern." A large number of native, neotropical, migrant songbirds are not successfully reproducing in Indiana's smaller woodlots and managed forests due to increased nest predation and parasitization from human-induced edge. Many sal-

amanders require moist environments in predominantly closed canopy forests that are eliminated by active forest management activity. Many Indiana fish and mollusks need clean, clear water in streams with temperatures regulated by large, mature forests.

Our state forests occupy a good portion of the only tracts of forestland large enough for these species to maintain viable populations. Accordingly, managing our state forests for the community of more rare, forest-dependent fauna is crucially important to successfully addressing what forest biologists recognize as a major extinction event in the history of life sweeping the earth at an unprecedented rate. While some species that are disappearing, such as the ruffed grouse, may benefit from creating more edge, the explosion of other species, such as the white-tailed deer, which prefer edge habitats, suggest that the ruffed grouse's decline in Indiana may not be due to the absence of edge and browse created by logging Indiana's limited public forests.

Hoosiers will also benefit from leaving large areas of public forest alone to evolve naturally. It is known that a large majority of Hoosiers prefer that the large tracts of wild forest that they collectively own be conserved for their biological and recreational values, rather than degraded to produce commercial timber that is in more than ample supply on private woodlands.

To conserve our wild heritage and ensure the viability of Indiana's native forest ecosystem and our future quality of life, we need to let more of our state forests return to old growth conditions and to allow nature to function in these public lands.

*Respectfully yours,*

*Marion T. Jackson and John O. Whitaker, Jr. Professors Emeriti, Indiana State University, Terre Haute, Indiana. ♦*



*Indiana's forests harbor several species of salamanders, including the spotted salamander (pictured here), which depend upon continuous forest canopy to maintain their body moisture*

*Photo Source: Alan Resetar.*