

December 10, 2017

Governor Eric J. Holcomb
402 West Washington Street
Room W160A
Indianapolis, Indiana 46204

Dear Governor Holcomb:

We recently reviewed a letter that you received from several PhDs concerning the Division of Forestry's management of Indiana state forest lands. We have over 30 years of experience doing research on Indiana's forests, including old growth and response of forest biota to timber harvest. The content of their letter provides a distorted view of forest management, and it is disturbing that so many Indiana scientists signed it without thoroughly reviewing the science. Much of what they state is not supported by sound research or is contrary to published research. Let us provide some evidence to support our objections to their letter.

First, we provide a brief history of forest disturbance over the past 200+ years. In 1800 there were about 20 million acres of forest in Indiana. By 1902, of the 3.8 million acres of forest remaining, only 250,080 acres were considered first grade timber. These were forests that probably were being grazed by domestic livestock and burned annually to maintain open under-stories for pasture, but retained a good stand of trees. The remaining second and third grade timber lands were in various stages of recovery from agricultural disturbance. For example, Brown County had 897 acres of first grade timber land out of 48,233 acres of forest remaining in 1902. See the Indiana Department of Statistics, 1901-1902 for county-by-county data.

By 2000, over 5 million acres were in forest across the state, mostly the result of farmland abandonment and transfer to Federal and State agencies for management. Brown County had 179,459 acres of non-farm land, mostly in recovering forest ecosystems. These forests are currently rich in biota and in much better condition than they were in the early 1900s.

This brief history is a testament to the resiliency of eastern hardwood forests after severe disturbance. The recovery of these forests and the reduced fragmentation of the landscape has allowed recovery of many species, such as the white-tailed deer, bobcat, river otter and many others.

Now, let us discuss the points made in their letter. We agree that Indiana forests are composed of a rich mixture of species that provide services to the people of

Indiana. Forests are dynamic, responding to a variety of disturbances, but the conditions described due to disease, insects, wind and fire are also present across the forest lands managed with the silvicultural prescriptions currently used by the Division of Forestry. Single tree selection and group selection create openings for increased sunlight to the forest floor while allowing for standing dead trees and fallen logs. On a reentry interval of 20+ years into managed stands, many trees that die are never harvested. Forests managed for trees 100 to 200 years of age have the same biota as forests not managed.

We agree that the current acres of old-growth are small, because of the extensive forest clearing in the 1800s, but even these stands are not free from past disturbance from livestock and fire. An examination of old-growth forest acreage on public lands, under current management practices, indicates old forests will increase dramatically over the next 50 years. Most of these acres are located within the south-central region of the state where land in state parks, state forests, and the Hoosier National Forest occurs, providing a mixture of different management systems, including areas with no timber harvest. The management programs within the state forests and the Hoosier National Forest are sustainable without devoting more acres to old-growth condition, since biota found in old-growth forests are also present in older managed forests.

Ephemeral openings resulting from timber harvest are not important in forest fragmentation, but are important in providing habitat conditions that allow a broader array of biota to survive across a forested landscape. Long term survival of Indiana's biota would be better insured by placing more emphasis on maintaining or increasing landscapes with large areas of connected forest.

Many plant species require periodic disturbance to maintain populations across forested landscapes. Plant species present in forest openings respond to the variety of microsites created by the disturbance and include a mix of species from those needing full sunlight to those found in closed canopies. Full sunlight species gradually decline as new tree seedlings and sprouts regrow creating a closed canopy within 5 to 10 years. The closed canopy species present before the harvest remain.

There are two features on the relationships of vertebrates to forests that particularly concern us in their statement. First, several terms are used interchangeably to describe forests – old growth, mature, interior – that are quite different relative to their relationships to species and disturbance factors and lead to inappropriate generalizations. Secondly, practically all of the species comments are flawed and are based on species/habitat relationships from science of 30 years ago. Unlike the “mature forests without disturbance is required for bird species survival” mantra of the 1980's, research since that time has refined relationships

and suggests that a matrix of forest stands of various ages best serves the overall bird community.

In considering forest age in the lower Midwest, it is useless to posit the values of old-growth. Essentially none exists in Indiana or surrounding states, and it all disappeared before any scientific evaluation occurred. Any species dependent on old-growth are no longer extant in the state. Similarly, “interior” is also a term that can be applied to forests of any age and almost any size. Thus, “mature forests” is a state to which we ought to direct our attention/concern. Their vertebrate examples reflect either an ignorance of relationships or a purposeful misrepresentation. We will not offer case-by-case evaluations, but examples include woodpeckers, which do well in highly fragmented landscapes, salamanders that have highly restricted distributions because of specialized habitat requirements, gray foxes, which use variously aged woodlands but feed mainly on cottontails (a brushland species), and Indiana bats, which have been shown to forage around openings and heavily use forest-edges for maternity colonies, likely because of increased thermal options.

The concerns expressed regarding limiting anthropogenic disturbance (logging of any type) are based on a premise that existence of species requiring mature woods is threatened by these disturbances. Early concerns about fragmentation of mature forests revolved around these mature-woods species and subsequent management of public lands featured minimizing fragmentation of mature forests. The resulting minimization of harvesting on federal lands (and to some degree state lands) has had unintended consequences – mature woods related bird species have for the most part done well, but bird species adapted to early successional woodlands (brushlands) have been seriously negatively impacted in much of the eastern U.S., including Indiana. We have two major data sets that give us a picture of bird population changes in Indiana over time – the Breeding Bird Survey (BBS; counts of territorial birds made under the auspices of USFWS) and the Indiana Atlas Program (1/6 of the state was surveyed for breeding species twice, from 1985-1990 and 2005-2011). Therefore, changes in species abundance over time can be assessed and tested for statistical significance. Atlas data show that for mature woodland species, 1 species (9.1%) significantly declined between the 2 periods, while 5 (55.6%) increased; BBS demonstrated similar trends. For early successional woodland species, 10 (41.7%) declined significantly and 3 (12.5%) increased; again BBS showed similar trends. These Indiana results reflect the pattern in the whole eastern U.S. – the mature woods species are doing well (with a few exceptions – e.g., cerulean warbler), while early successional woodland species are declining substantially. This pattern is almost surely the result of reduced disturbance on forested landscapes.

One further bird example begs to be considered. Numerous studies have demonstrated that species that nest in a mature woods invariably move their fledglings to disturbed areas (usually clearcuts) immediately post-fledging, where they presumably benefit from increased predator protection from dense vegetation, while foraging on the large insect biomass produced by that vegetation. This was first demonstrated for wood thrushes about 20 years ago (as radio transmitters became small enough for these birds to carry). Current research on the HEE (Hardwood Ecosystem Experiment) Project in southern Indiana has documented this phenomenon for several mature-forest nesting species, with the influx of some species reaching the phenomenal category – over 400 worm-eating warblers captured in clearcuts in 1 year.

In summary, we believe great progress has been made in the recovery of Indiana's forests and current public management programs will insure this recovery continues. The current programs to maintain and increase forest lands that improve connectivity of forested landscapes are very important for the longterm survival of Indiana's biological diversity.

Sincerely,

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