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Issues Related to

INDIANA'S STATE FORESTS

Conservation and A Public Voice

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INDIANA'S STATE FORESTS

Conservation and A Public Voice

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OVERVIEW

TIM MALONEY, SENIOR POLICY DIRECTOR, HOOSIER ENVIRONMENTAL COUNCIL

Management of Indiana's public forests is a topic of great public interest. It is also a subject of political and scientific controversy. Science must inform forest management practices, and yet the science of forest management and forest ecology is not conclusive in every respect. Research continues to provide greater knowledge of how Indiana temperate hardwood forests function, of their ecological services, and of the effects of various forest management strategies. Should we manage our public forests intensively to ensure that oak species remain a dominant component? Should we leave the forests alone and let natural processes determine their future? Or should we choose a balanced path that allows that some management may be positive, but also recognizes that some forests should be free of active timber management?

Besides the scientific considerations of forest management or preservation, social and economic factors must also be considered. Our public forests are owned by the people – the citizens of Indiana. These public forests in Indiana provide a variety of benefits including outdoor recreation opportunities and forest products. They also can provide ecological and recreational outcomes not available on private forestlands, such as the protection of large, contiguous mature forest areas that benefit certain forest-dependent wildlife species, and a backcountry recreation experience not available on private lands, nor most public lands in Indiana. How much public forestland is managed or preserved is not only a scientific question, but also a social one.

Responsible forestry professionals are trained to seek out and understand the goals of a forest owner¹ before they select a management strategy for their forestland. In the case of public forests, this means that the professionals charged with managing these forests have an obligation to seek out the views and desires of the public who own these forests and implement a management strategy responsive to the owners' goals. Where there are multiple owners with different views, and a degree of scientific uncertainty as noted above, the preferred approach should be a conservative management strategy.

This paper addresses the management of one component of Indiana's public forests – Indiana's state forests, whose 158,300 acres are managed by the Indiana Department of Natural Resources.

Prior to 2005, Indiana's thirteen state forests were managed conservatively. The timber harvest level averaged less than 3 million board feet a year. Old Forest areas totaling 5,741 acres were set aside for ecological reasons.² The three existing backcountry areas, in Morgan-Monroe and Yellowwood State Forests, Jackson-Washington State Forest, and Clark State Forest, were mostly free from active timber management.

In 2005, when a new governor took office, the management of Indiana state forests changed dramatically. With virtually no public input, the Indiana DNR adopted a 3-year forest plan³ that increased commercial logging nearly five-fold. For the ten years preceding 2005, the average annual timber harvest in the state forests was 2.6 million board feet.⁴ For the following ten-year period, the average annual harvest jumped to 12.2 million board feet, ranging from a low of 7.7 million board feet in 2006 to a high of 17.1 million board feet in 2014.⁵

It was not until 2008, three years after this abrupt change in direction, that the DNR's Division of Forestry completed an environmental assessment⁶ of the biological effects of this substantial increase in timber

production. The “Indiana State Forests: Environmental Assessment 2008-2027” served as an after the fact justification for the heavy logging emphasis of the new state forest management strategy. Yet the Division of Forestry conceded it actually did not understand all of the impacts of its forest management approach when it partnered with Purdue University to establish the Hardwood Ecosystem Experiment in 2006.⁷ HEE is a 100 year research project intended to develop forest management practices that maintain and restore oak-hickory forests, understand the impacts of these forest management practices on ecological communities and local human communities, and provide novel educational opportunities for the public.⁸ The result is that this intensive forest management strategy may well continue for 100 years before the ecological impacts are fully understood.

In the following pages, this paper will consider and challenge many of the justifications used by DNR and other parties for the state’s current intensive forest management approach. These justifications include:

- Need to maintain the oak-hickory communities in Indiana’s forests. DNR and many forestry professionals argue that without active management, the presence of oak trees in many of our forestlands will decline substantially, with harmful biological and timber production consequences.
- Need to establish a proper distribution of forest age classes on public forestlands. DNR argues that our public forests have an excess of stands in the 20 to 99-year age class, and not enough young forest (0 to 20 years) or old forest (greater than 100 years).

Also in the paper is a discussion of what many environmental groups see as the proper role of the state forests, a broader evaluation of the impacts of DNR’s management approach, an assessment of the values and benefits of protecting old forests, an overview of how other states manage their state-owned forests, and a review of the impacts of climate change on Indiana’s forests and implications for forest management, a topic largely neglected in DNR’s plans and research.

In addition to the scientific, technical and social concerns raised in this paper, we also address the lack of meaningful public participation in DNR’s forest management planning and decision-making. Among the deficiencies are the lack of a formal state forest planning process, specific to each state forest, that incorporates public participation early and throughout the process, a requirement that forest planning and management actions be responsive to public concerns, and a well-defined process for citizens to administratively challenge DNR forest management decisions when justified.

To paraphrase Gifford Pinchot, first Chief of the U.S. Forest Service, “... if [public] forests are going to accomplish anything worthwhile the people must know all about them and must take a very active part in their management.”⁹

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WHAT DO WE WANT FROM OUR STATE FORESTS?

**DAVE SEASTROM, BOARD OF DIRECTORS OF THE INDIANA FOREST ALLIANCE,
VICE CHAIR OF THE WILD TECUMSEH FRIENDS**

We want to see our state forests managed in a way that sustains them for the future, and protects them from decisions based on financial pressure. Since ninety-four percent of commercial logging takes place on private land, the timber industry is well served. The management of our thirteen, Indiana state forests should represent the interests of the public, and not just those of logging industry.

Public land offers an unparalleled opportunity to create and maintain a portion of our forests in a wilderness condition. Also, these mature forests serve as a repository for genetic diversity within the plant and animal species that are represented in this environment. They also provide a historic reference to what Indiana forests were like before settlement.

We want to see a management plan that would include large, undisturbed areas of passive management in combination with actively managed areas of single tree selection logging. The current focus on logging only management, combined with small, scattered preserved areas that comprise less than 3% of the total forest, eliminates the potential for wilderness in our state forests.

We want to see preservation of hiking trails that would include a buffer from logged areas to protect the integrity of the experience. This consideration is vital to create the intimate nature experience that so many seek when hiking. Nothing is more disturbing to a hiker than a hastily thrown together detour that skirts large areas of logged forest land. Our hiking trails are created and maintained by volunteers, and every step is engineered for proper drainage to avoid soil erosion. The vistas are carefully selected, and the switchbacks are designed for easy ascent and descent. When the trails are logged, the detours are poorly planned and executed, and the carefully crafted trails are obliterated.

Large tracts of undisturbed wilderness areas in state forests offer unique recreational opportunities that are not available in our state parks. For instance, in the Morgan-Monroe State Forest Back Country Area one can hike into the wilderness and camp anywhere on the property. In contrast, camping in state parks is limited to often over-crowded campgrounds that favor RV camping over primitive camping.

There are only a few wilderness hiking and camping areas in Indiana, and only three such areas within state forests (the Back Country Areas). Preserving these areas is not only beneficial to recreation and the environment. It also has the potential to provide an income stream from tourism that could pay for the operations in our state forests as an alternative to income generated from logging.

Maintaining and enhancing wilderness areas contribute to the quality of life in Indiana. When polled, young workers often site the quality of life as a strong influence on their decisions about where to locate. Undisturbed forest land offers a host of recreational activities. As development continues into the future, the value of preserved forest land will only increase because of its rarity.

In summation, here in Indiana we possess a rare opportunity to hold on to something we already have. The cost of preservation is miniscule, but once lost, the cost to the future is incalculable.

WHAT IS THE IMPACT OF LOGGING BY THE IDNR ON OUR STATE FORESTS?

RAE SCHNAPP, PH.D., CONSERVATION DIRECTOR, INDIANA FOREST ALLIANCE

Logging has adverse impacts on forest ecology. Even selective logging creates very significant disturbances in the ecosystem. Disturbance happens naturally as old trees die and fall and/or windstorms open up the forest canopy, but too much disturbance can be undesirable and detrimental. The Indiana Division of Forestry's plan to log 97-98% of our state forests every 20 years^{1,2,3,4} creates too much disturbance. This one-size-fits-all approach is at odds with the stated purposes that Indiana state forests are supposed to serve, and are counter-productive to forest health and resiliency. Indiana state forests are supposed to be managed for the benefit and enjoyment of future generations. Instead they are being harvested and sold at below market rates.

Artificial disturbances created by logging with heavy equipment do not mimic natural processes. Timber harvests, even selective harvests, have a much more extensive impact than natural disturbances. The heavy equipment used for logging destroys the fragile soils that form the foundation of forest ecosystems. Logging practices remove most of the downed woody debris that is tremendously important to the forest ecosystem, as many insects and small mammals use downed logs for food and/or habitat. Selective harvesting also removes dead and declining trees - that prevents additional downed woody debris from accumulating.

Many species known to be rare, threatened, or endangered are rare precisely because of the limited availability of interior forest habitat. The Division of Forestry reportedly checks a Natural Heritage database to determine if rare species have been reported in a particular tract, and claims that they will take steps to minimize the impacts to these species, but the public is not informed of the species present or the steps taken. Further, the Natural Heritage Database is very incomplete. The Indiana Forest Alliance has undertaken the first and only comprehensive taxonomic survey in our state forests and found more than 3000 species in one 900 acre tract, including many species that have not been reported in Indiana before.⁵

Logging equipment often carries seeds of invasive plant species from infested areas, introducing invasive species into forest interiors. The creation of openings in the forest canopy from logging also allows more sunlight to penetrate; changing the microclimate to more hot and dry conditions. These openings can foster the emergence of early succession habitat but this habitat also occurs through natural disturbance, timber harvests on private forest lands and/or when old fields are abandoned. Early succession habitat may result in an increase in the number of species present, but these are often common and adaptable species, such as deer or rabbits, or weedy invasive species, rather than interior forest specialist species.

Logging can also impact water quality. Any time the forest floor is exposed by removal of the canopy or disturbed by equipment, there is increased potential for soil erosion, especially on steep slopes. Openings that allow sunlight to penetrate and heat up the waterways also have a negative impact by decreasing oxygen content in streams.

Road building is another disruptive component of today's logging practices. Roads that are sufficiently wide to accommodate heavy equipment and logging trucks damage interior forest tracts by providing edges and pathways for non-native species to invade forest interiors. One example of this edge effect is the brown headed cowbird that is almost ubiquitous throughout Indiana, but prefers to parasitize nests

along forest edges. Logging trucks are exempt from normal weight limits for roadways, and there is the risk of damage to county roads as a result. While counties receive a share (15% of net logging revenues), these funds are not sufficient to cover road repairs, and earmarked for other purposes anyway.⁶

The economic impacts of logging are not always evident. By statute, Indiana state forests are supposed to be managed for the benefit and enjoyment of future generations. Instead they are being harvested and sold at below-market rates. Logging generates revenue for the Division of Forestry but state forest timber sales consistently receive low prices per board foot. And the accounting is further skewed because many costs are routinely excluded.⁷ State forest procedures dictate that costs associated with timber inventories, timber stand improvement, and invasive species control are specifically excluded from the balance sheet. While logging can supply Indiana's local wood products industry, logs from state forests are increasingly exported overseas, competing with private landowners and local businesses. Logging can also impact the property values of nearby real estate as the area is perceived as less forested and more industrial.

There are also opportunity costs. Recreation is big business. The Department of Tourism has identified outdoor recreation as part of Indiana's tourism niche. State forests are important for recreational uses such as geo-caching, wilderness camping, orienteering, wildlife watching, as well as hiking. State forests are the only public lands where off-trail hiking and camping are allowed. With logging activity, hiking trails are often closed and forests are less attractive for recreation and tourism.

The Knobstone Trail is now a 150 miles in length. It is Indiana's longest footpath, passing through nearly 40,000 acres of rugged, forested land beginning in Clark County and moving north into Scott and Washington counties in southern Indiana. The trail extends north into the Hoosier National Forest in Jackson County and then incorporates the Tecumseh footpath in Brown, Monroe and Morgan Counties. Volunteers help establish and maintain these trails, but logging can obliterate them so completely that GPS coordinates are needed to locate where the trail was. This is absolutely demoralizing for volunteers. Plus, few things deter hikers more than hiking through unsightly logged areas and/or the dense undergrowth that forms in early succession areas. These "openings" tend to invite invasive species as well.

There are viable alternatives to logging. Forest management can optimize recreational and wildlife uses, including areas managed for the establishment of secondary old growth forests. These would provide habitat for species adapted specifically to interior forest conditions and they would also support wilderness recreation and wildlife viewing with minimal investment.

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ECOLOGICAL IMPORTANCE OF OLD FOREST SET-ASIDES IN INDIANA STATE FORESTS

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1. To restore areas of old-growth forests

There are many definitions for old growth forests, but from the science of ecology old growth represents the late stage in forest succession. For our Indiana deciduous forests, this stage has trees over 150 years and has been relatively undisturbed.¹ An old growth forest has special structural features including large trees, snags or standing dead trees, large fallen trees, and large accumulations of forest biomass that enrich the soil. Because of these structural features, old forests are more efficient than younger forests in carbon storage, water filtration, and nitrogen cycling. The original old growth forests (also called virgin forests) were timbered heavily during the late 1800's in Indiana, and our current forests reflect a legacy of recovery with an opportunity for future secondary old growth forests.

The U.S. Forest Service's Forest Inventory and Analysis (FIA) data demonstrate a scarcity of old growth forests in Indiana.² Not only are old growth forests rare and under-represented in Indiana (around 1,500 acres), they are also restricted to small, isolated patches of nature preserves scattered across the state.

By reserving 10-30% of our state forests from logging and intensive management, we would ensure future areas of old growth forests. Given that significant portions of our state forests are in the 80-120 age class, with set-asides and no further disturbance these forests could reach old growth status within our children's lifetimes.

Prior to 2005, the Indiana Division of Forestry designated 5,741 acres within 7 state forests as "Old Forest Areas" with the goal of allowing old growth characteristics to develop in the absence of timber harvest or management (with the exception of control of invasive plants, pests, and pathogens). Currently there are no such "Old Forest" designations, and within state forests the only areas protected from timber harvest are 2,000 acres as nature preserves with an additional 600 acres in research control plots. This is not enough. A policy requiring old forest set asides is essential to ensure a balance of successional ages in state forests. Timber harvest reduces stand age and species composition, since it is the oldest and most valuable trees that are typically harvested. With the current forestry management practices, we will not have old growth forests represented within our state forests in the future.

2. To maintain and enhance biodiversity

By maintaining state forests as a mosaic of age and size classes, species with varying ecological requirements can persist.³ Biodiversity in forests is linked to the overall habitat diversity: forests that include significant areas of undisturbed older forests enhance diversity because of the presence of specific structural features. Large snags and large fallen dead trees provide habitat for many mammals, birds, and insects. In addition, when old trees die and fall, they leave soil pits and tip-up mounds, which create unique habitats for many species. The gap that results when an old tree falls allows sunlight to reach the forest floor and creates conditions suitable for seeds to sprout and early-successional plants to thrive. All of these features increase structural complexity, which results in increased habitat diversity.

Over 120 species of mammals, birds, reptiles, and amphibians (and countless invertebrate species) require our forests for feeding and for successful reproduction. A few of the many examples of species that benefit from older forests are as follows:

- Salamanders require a thick layer of leaf litter on the forest floor, which provides cool, moist conditions under a dense upper canopy layer. Logging disrupts their habitat.⁴ (Five out of six salamander species on the Indiana Endangered or Special Concern list need undisturbed forests.)
- Eastern Box Turtles (on Indiana's Special Concern list) need undisturbed forest for winter hibernacula under deep layers of leaf litter. Logging roads disrupt summer movement within turtles' territories.⁵
- Timber Rattlesnakes (State Endangered) require undisturbed den areas in forests, which they use year after year.⁶
- Woodpeckers require standing dead trees for nest excavation.⁷ Woodpeckers eat wood-boring insects and can control outbreaks of pests.⁸ Other forest birds use the same cavities after the woodpeckers' nesting period.
- Ground beetles are more numerous and diverse in older forests compared to younger forests regenerating after logging.⁹ These insects benefit other aspects of biodiversity by providing food for spiders, rare forest shrews, snakes, salamanders, and birds.
- Small rare pygmy and smoky shrews rely on the presence of large rotting logs found in older undisturbed forests.¹⁰

The structural features of older forests are especially important to the diversity of fungi and lichens. Unique communities of fungi inhabit dead wood and soils associated with older forests and are different than fungi communities in younger forests. Also, different species of fungi associated with tree roots (mycorrhizae) vary with tree age and forest composition.¹¹ Different species of lichens can be found on soils, dead wood, rocks, and living trees. Because lichens are highly sensitive to changes in the environment, it is not surprising that forest management affects their diversity. Studies show that particular habitats within a forest, and even different successional stages, host distinctive lichen communities.¹¹ These studies also show that older forests have the highest diversity of lichen species compared to other successional stages.¹³ These studies emphasize the importance of old forests for biodiversity.

One of the main causes of biodiversity loss worldwide is the effect of invasive species on natural populations. It has been well documented that logging activity in mature forests results in a high density of invasive plants.¹⁴ This is due to a combination of factors. Tree removal opens the canopy so that sunlight reaches the forest floor, making the perfect conditions for invasive seeds to sprout and proliferate. In addition, the tires on the heavy equipment used in logging operations bring seeds into the site disturbed from the activity. Invasive species, like Japanese stiltgrass, can then grow rapidly and outcompete the native herbaceous species. Studies show that there are fewer invasive plants in older forest interiors that have been protected from timber management. As a result, there is higher diversity of wildflowers and other herbs in protected older forests.¹⁵

3. To provide opportunity for scientific study

Reserves of older forest are essential in any management plan that uses science as guidance. Any scientific experiment requires controls, and timber management is an experiment, especially now as we face the uncertain future for forests due to climate change. Older forest set-asides can function as control plots to assess the consequences of the active management that occurs in larger areas of the forest.¹⁶ In addition, these reserves can serve as ecological reference plots to study the natural processes of an aging forest, including natural disturbances, biogeochemical cycles, soil development, and specific species relationships.¹⁷

4. To provide resilience in a time of uncertainty

Ecological resilience is the capacity of an ecosystem to absorb disturbance and undergo change while maintaining its essential functions, structures, identity, and feedbacks. Multi-aged forests that include set-asides of older forest have greater resilience and supply more pathways to recovery from unpredictable disturbances such as drought, flooding, increased storm events, invasive insect pests, and pathogens.¹⁸

The best defense against invasive insects and diseases is to have maximum diversity of forest types. In recent years, we have seen both the ecological and economic effect of invasive pests and pathogens causing the loss of chestnut, tulip poplar, hemlock, and balsam fir, among others. We don't know what new pests are coming down the pike, so we need the diversity of age classes and tree sizes to ensure that there are some unaffected trees remaining in the forest.¹⁹ In addition, research is showing that genetic diversity within populations is critical for forest resilience against pests. For example, ongoing work on the Emerald Ash Borer is demonstrating that despite the devastating effect of the insect pest on ash populations, some individual trees are resilient in that they survive despite infestation.²⁰ Thus, it is critical that these trees are left standing in order to produce resilient offspring. Older forest set-asides ensure that diversity within populations can persist.

Summary

Areas of unmanaged older forest set-asides in our state forests are important for a variety of ecological reasons, some of which are listed above. These set-asides can proceed through natural successional stages to provide structural components important to biodiversity and species composition important to forest resilience. Older forest set-asides would also serve as reference and control plots for scientific investigation. Changes in current policy through our legislature are the only way to ensure that set-asides will be part of our state forest management plan.

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WHAT CAN HOOSIERS LEARN FROM HOW OTHER STATES MANAGE THEIR PUBLIC FORESTS?

RAE SCHNAPP, PH.D., CONSERVATION DIRECTOR, INDIANA FOREST ALLIANCE

Most states manage their state forests for multiple purposes, but states have developed very different approaches for achieving similar goals. According to the Indiana's enabling statute, state forests are to be managed for purposes that include conservation for the enjoyment of future generations:

IC 14-23-4 Chapter 4. State Forest Management IC 14-23-4-1 Legislative intent Sec. 1. (a) It is the public policy of Indiana to protect and conserve the timber, water resources, wildlife, and topsoil in the forests owned and operated by the division of forestry for the equal enjoyment and guaranteed use of future generations. However, by the employment of good husbandry, timber that has a substantial commercial value may be removed in a manner that benefits the growth of saplings and other trees by thinnings, improvement cuttings, and harvest processes and at the same time provides a source of revenue to the state and counties and provides local markets with a further source of building material.¹

While this statute allows timber harvesting, it does not appear to be a mandate. The statutory intent seems to contemplate a forest management system that balances timber harvesting with other objectives such as wildlife habitat and ecological services. Indiana's Strategic Plan² and sustainability certification documents¹³ claim that our state forests are being managed for 10% early succession and 10% late succession, **but this is not what is happening on the ground**. In practice, Indiana state forests are managed with a primary emphasis on timber harvest. In fact, the Division of Forestry Strategic Plan indicates that 97-98% of state forest lands are to be included in a 20 year harvest rotation. The only exclusions are designated nature preserves, known bat hibernacula, and the control plots in the hardwood ecosystem experiment. This aggressive management of almost all of our state forest lands does not provide for the multiple benefits envisioned in the authorizing statute.

Other states have a more balanced approach to management for multiple purposes. In particular, other states provide that designated portions of their state forests be managed minimally, without timber harvests, so that these areas can serve as scientific reference and/or ecological/wilderness, and so that these can continue to grow and become older forests without logging.

Wisconsin: Wisconsin's enabling legislation is similar to Indiana's in that it describes a broad mandate for forest management, but in Wisconsin each state forest has different land use classifications with differing priorities for management.

WISCONSIN PURPOSES AND BENEFITS OF STATE FORESTS (WI Statutes 28.04)

- (a) The department shall manage the state forests to benefit the present and future generations of residents of this state, recognizing that the state forests contribute to local and statewide economies and to a healthy natural environment. The department shall assure the practice of sustainable forestry and use it to assure that state forests can provide a full range of benefits for present and future generations. The department shall also assure that the management of state forests is consistent with the ecological capability of the state forest land and with the long-term maintenance of sustainable forest communities and ecosystems. These benefits include soil protection,

public hunting, protection of water quality, production of recurring forest products, outdoor recreation, native biological diversity, aquatic and terrestrial wildlife, and aesthetics. The range of benefits provided by the department in each state forest shall reflect its unique character and position in the regional landscape. <https://docs.legis.wisconsin.gov/statutes/statutes/28>

The statute is implemented through rules and guidance documents that provide distinct management goals and transparent practices for each of the following land use classifications.

- Forest production area. sustainable production of timber and other forest products. The specific objective ... may vary depending on site capability, timber types, markets, societal needs, desired associated benefits, the desired future forest conditions, adjacent land uses and local economic conditions. In addition, under limited, special circumstances, which shall be specified in the master plan, the following may be forest management objectives:
 1. In areas of high recreational use and where site conditions allow, manage to produce timber on extended rotations in a manner that promotes long-term visual appeal.
 2. While managing for timber products, promote the production and maintenance of certain ecological attributes that are characteristic of older forests.
- Habitat management area - provide or enhance habitat, whether upland, wetland or aquatic, to support specific species of plants or animals. Habitats and communities in areas with this designation may be managed for a wide variety of purposes, including focused species production and protection. Areas that initially do not have desired habitat conditions but have a high potential to be restored to those conditions may be included under this classification.
- Native community management area - to represent, restore and perpetuate native plant and animal communities, whether upland, wetland or aquatic, and other aspects of native biological diversity. Areas that initially do not have the desired community conditions but have a reasonable potential to be restored to those conditions may be included.
- Special management area - for special uses not included under other land management classifications described in this section. Note: Examples of special management areas include administrative or service facility areas, cultural resource protection areas, propagation and nursery areas and demonstration or experimental management areas where the primary use is for research and testing of new resource management methods and techniques.
- Recreation management area - provide and maintain areas and facilities for outdoor public recreation or education.
- Scenic resources management area - where managing for aesthetics is a primary concern due to significant or special public use of the area.
- Wild resources management area - where natural ecological processes predominate and evidence of human cultural impact is low; little or no visible resource management activity and facility development is limited to primitive recreational uses.

Wisconsin's approach to forest management conforms with its Public Lands Master Plans and emphasizes multiple values and extensive stakeholder consultation with plans for each state property. Forest management goals and activities reflect regional and landscape assessments across ownerships.

Pennsylvania: The Pennsylvania Legislature authorized the creation of Natural Areas and Wild Areas and prescribed their management objective in 17 PA Code § 27 in 1996. The Pennsylvania Bureau of Forestry has designated 231,516 acres—just over 10% of its 2.2 million acres state forest acreage—as either “Natural Areas” or “Wild Areas.” Natural have been “set aside to provide locations for scientific observation of natural systems, to protect examples of typical unique plant and animal communities, and to protect outstanding examples of natural interest and beauty.” Meanwhile, “management of wild areas

will be aimed at preserving the wild or undeveloped character of the area” for the public to “see, use and enjoy for such activities as hiking, hunting, and fishing.” An additional 22% of state forest acreage is in designated “Limited Resource” zones, where commercial logging is prohibited due to severe topography and other factors. Further, the Pennsylvania State Forest Resource Management Plan sets the goal to “maintain a minimum of 20% of state forestlands as potential or existing old-growth areas.”⁴

Maryland: In 1971, the Maryland Wildlands Act established a state system of legislatively designated areas “to be preserved in their natural condition for present and future generations.” To date, 29 State Wildlands have been established on state-owned land, totaling nearly 44,000 acres. The Maryland Department of Natural Resources has recently proposed to expand the Wildlands system by 22,000 additional acres by expanding 14 existing Wildlands and establishing nine new areas. An additional 9,106 acres of state forests have been proposed for protection, which would increase the total acreage Wildlands to 31,000 acres, or 15.5% of all of Maryland’s state forestland.⁵

Michigan: The Michigan Department of Natural Resources has designated 116,397 acres of state forests as Ecological Reference Areas (ERAs) to “serve as models of ecological reference within the state,” as well as “recreation, research, and education.”⁶ An additional 6,503 acres have been legally designated as Natural Areas, which offer “unique opportunities for solitude or primitive and unconfined types of recreation,” thus providing “economic opportunities for local communities.”⁷

Ohio: In 1972, the Ohio Legislature designated nearly 8,000 contiguous acres of the Shawnee State Forest as a Wilderness Area. This area has been set aside by statute “to allow natural forest succession and natural forest disturbances to occur without human influence” and “to provide an area that has outstanding opportunities for solitude and primitive recreation,” among other goals.⁸

Connecticut: 11,168 acres (of 167,572 acres of State Forest) are classified as Old Forest Management Sites. ‘Old forest growth’ is an important ecological component of Connecticut’s State Forests, selected to grow and evolve naturally to reach advanced stages of vegetative succession and develop with minimal or no human intervention. The goal is to establish or promote areas of advanced successional stages of forest growth comprising approximately ten (10) percent of the State Forest System.

See Table “Comparing Other State’s Non-Production Areas to Indiana”.

In summary, other states are much more serious about managing their state forests for multiple uses, including some areas set aside from logging to support wilderness recreation and secondary old growth habitat. Other states also provide more transparency and opportunities for public input than Indiana. Wisconsin has a strategic plan with different land use priorities for each state forest. This approach would give the public insight into the management of each SF and helps ensure a more balanced approach.

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Comparing Other State's Non-Production Areas to Indiana				
States	Total Acres	Non-Production Acres	% of Total	References
Wisconsin	454,000	61,400	14	https://docs.legis.wisconsin.gov/statutes/statutes/28 State Lands – Passive Management Report 2010. March 31, 2010. p. 4
Pennsylvania	2,200,000	232,000	11	Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry. (2007, January 23). State Forest Resource Management Plan – Ecological Considerations. Retrieved February 23, 2015 from Pennsylvania DCNR – Bureau of Forestry
Maryland	214,000	31,000	14	http://dnr.maryland.gov/forests/Pages/mdforests.aspx
Michigan	4,000,000	123,000	3.1	Michigan Department of Natural Resources – Forest Resources and Wildlife Divisions. Michigan State Forest Management Plan. December 17, 2014. p. 9.
Ohio	193,000	31,100	16	http://forestry.ohiodnr.gov/Portals/forestry/PDFs/plans/5yearplan15-20.pdf
Connecticut	170,000	11,200	6.8	Personal communication with M.L. Kramer, Office of the Commissioner, Connecticut Department of Energy and Environmental Protection, Hartford, CT
Kentucky	47,700	18,800	39	http://www2.ca.uky.edu/KYWoodlandsmagazine/VOL_2_NO_1/Page18-19parks.pdf
Indiana	158,000	4,600	2.9	IFA - Concealed Costs and Hidden Values

MATURE FORESTS PROTECT AGAINST CLIMATE CHANGE

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In October the Intergovernmental Panel on Climate Change issued an alarming report saying that limiting global warming to 1.5 degrees Celsius to ensure a sustainable and equitable future will require “rapid, far-reaching and unprecedented changes in all aspects of society.”¹

“Every extra bit of warming matters, especially since warming of 1.5 degree C or higher increases the risk associated with long-lasting or irreversible changes, such as the loss of some ecosystems,” said Hans-Otto Portner, co-chair of I.P.C.C. Working Group II.¹

To confront this dire threat, we must all do everything we can to halt the build-up of carbon in our atmosphere. IDNR should incorporate into its management plans consideration of how logging practices impact climate change. A balanced approach would allow for some logging to occur alongside large areas of unmanaged forests.

“Standing forests are the only proven system that can remove and restore vast amounts of carbon dioxide from the atmosphere at the scale necessary to keep global temperature rise below 1.5 degrees Celsius this century,” says a report issued by the Dogwood Alliance, a forest advocacy organization in the southeastern United States.²

Protecting and expanding our forests globally could reduce carbon emissions by 75 percent over the next 50 years.^{2,3} “Forests are one of the best ways we have to keep carbon out of the atmosphere, especially older trees, because each year they absorb carbon and store it in their roots, leaves, and wood.” (Seeing the Forest, p. 2.)

According to the latter report, scientists have determined that logging accounts for 85 percent of carbon emissions from U.S. forests, more than five times the emissions from forest conversion, fire, wind, insects, and tree mortality combined. Additionally, logging diminishes the potential forest carbon sink by at least 35 percent. Carbon emissions from logging from 2006 to 2010 were greater than fossil fuel emissions from the residential and commercial sectors combined (p. 4).

Mature trees are especially valuable in the fight against climate change because they have sequestered carbon their whole lives. The report says that a single mature tree can store up to 48 pounds of carbon annually (p. 5). Currently we are emitting into the atmosphere four billion more metric tons of carbon than our land and oceans can absorb (p. 6). Reducing emissions from power plants, while necessary, won't get us to where we need to be quickly enough to avoid catastrophic impacts. Stopping deforestation and restoring and expanding our forests can help us achieve the emission reductions we need to meet the challenge identified by the I.P.C.C.

What could rapid global warming mean for Indiana? The Purdue Climate Change Research Center is releasing a series of reports assessing potential impacts on various aspects on life in our state (e.g., health, agriculture, water, tourism and recreation, aquatic and forest ecosystems,⁴). Potential adverse impacts include reduced water and air quality, decreased productivity of corn and soybean crops, loss of species,

increased rainfall and flooding, record-breaking heat waves, more exposure to disease-carrying ticks, and an extended allergy season.⁵

The key takeaway is that we must do everything in our power to minimize global warming. Preserving and expanding the maturity of our state forests is a vital part of this effort.

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- 3 Seeing the Forest: Nature's Solution to Climate Change, p. 2; <https://stand4forests.org/wp-content/uploads/2018/09/The-Climate-Plan.pdf>.
- 4 <https://ag.purdue.edu/indianaclimate/>.
- 5 <https://ag.purdue.edu/climate/indiana-impact/>

CONCLUSIONS

Our state forests should be so much more than just a resource to be extracted. The interests of the broader public are inadequately served by Indiana DNR's Division of Forestry (DoF).

Prior to 2005, there was more of a balance in state forest management. What has changed? The DoF now needs to raise funds for half of its budget by selling timber contracts. This economic pressure resulted in a strategic plan that relies on increased logging.

The current DoF policies neglect many essential forest attributes in order to promote timber extraction.

They discount the public's enjoyment of woodland expanses that is not offered by crowded state parks or small state nature preserves. Our state forests are one of the few Indiana woodland resources available to the public for wilderness recreation.

They discount that fact that Indiana's public forests have few old growth areas. Timber management, as currently practiced by DoF, will never allow these forests to attain old growth character. Prior governors from both political parties recognized this and set aside vast areas (Back Country Areas) in order that Hoosiers could enjoy the character of older forests. These undisturbed areas also provide large forest tracts for comparative science and research.

They discount the fact that many people who appreciate nature buy homes near state forests, and that job seekers and their families are attracted to locations where nature can be appreciated in undisturbed woodlands.

They discount the fact that tourism is negatively affected by logging activities in some Indiana counties. Most states already recognize the primacy of tourism economics. This should be a top priority for long range planning.

They discount calls for protection and preservation of hiking trails such as the Tecumseh and the Knobstone. These trails are where many outdoors enthusiasts interact with nature and seek large tracts of undisturbed woodlands for wilderness experiences.

They discount the impact of road building on the ecology of the forest. DoF timber management is practiced on an industrial scale requiring roads to move heavy equipment. These roads impact fragile ecosystems by compacting the soil and increasing the prevalence of invasive plant species.

They discount that Indiana's management of our public forests requires public input. Several states like Wisconsin have a detailed plan for each forest tract. Public input is seriously sought and incorporated well before any timber management activities are proposed. Indiana needs to move to this level of planning, engagement, and balance in order to build a trust with the public who owns these forests.

Climate change introduces more uncertainty into the future of our forests. This uncertainty argues for a conservative strategy in managing this precious resource. The current DoF forest management plan does

not include planning for climate change. We need to balance our portfolio of approaches in planning for an unpredictable future. We should also question those who claim to have all the answers on how to best manage our public woodlands.

The administration and our lawmakers should understand that DoF is taking large unnecessary risks with our forests. Other midwestern and eastern states with hardwood forests have a more balanced approach by setting aside significant portions (10-30%) of their state forests from timber management activities, in contrast to Indiana's 2.9%.

This paper is not an anti-logging treatise. The hardwood industry in Indiana is important and one of the missions of the DoF is to support that industry. However, Hoosiers need and deserve policies that balance the interests of many other stakeholders as well.

Yes, trees are important, but there is so much more to our state forests.