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## What Landowners Should Know About Biological Diversity in Indiana

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Biological diversity, or “biodiversity,” is defined as the variety and abundance of species and the ecosystems within which they occur. Biodiversity throughout the world is currently declining at rates not seen since the extinction of the dinosaurs, due mostly to pressures of human population growth. In the United States alone, over 900 species of plants and animals are listed as endangered under the Endangered Species Act, and another 266 are currently considered threatened.

(Drawing courtesy of [www.artbycheri.com](http://www.artbycheri.com))



There are many valid reasons for you to be concerned about biodiversity. A large number of species have economic value, and all species have roles in ecosystem processes. Recognition of these benefits, combined with additional values placed on species by society, have led to the passage of numerous laws encouraging, and even requiring conservation of species diversity. These laws, such as the Endangered Species Act, affect us all. This

brochure will provide recommendations on how all of us can contribute to maintain the biological diversity of our region.

The Central Hardwood Region, which contains Indiana, is naturally quite diverse, with a wide variety of ecological communities native to the region. All ecosystems in the region, however, have been subject to past disturbance and alteration. Private lands, which make up most of the region, are highly fragmented, meaning that the natural landscape has been chopped up into tiny, isolated patches. The resulting landscape is one dominated by agriculture and urban development, with the remaining wildlands embedded within it. The few large, unfragmented wildland ecosystems remaining in the region are generally in public ownership.

Human influences negatively affect species diversity in a variety of ways. Conversion of natural landscapes to urban, agricultural, or industrial uses has the greatest impact on diversity because the natural ecosystem is destroyed. Less severe impacts can occur as a result of activities which don't destroy the ecosystem, but result in changes to its natural characteristics. These impacts often result from fragmenting or breaking up of the ecosystem, such as occurs when housing subdivisions are built in natural forested areas. Additional impacts can occur from the introduction of chemicals into ecosystems. For example the use of fertilizers and pesticides in our yards, gardens, and farm fields can impact the environment.

The dominance of humans over most landscapes in the Central Hardwood Region in-

creates the importance of remaining natural areas to the maintenance of biodiversity. The most promising approach to managing for biodiversity concentrates on maintaining a wide variety of ecosystems in the region, thus providing habitat for a large number of species. The success of this approach, however, depends on all of us.

Landowners can manage their land to help maintain biodiversity. It is important to recognize that biodiversity is only one of many potential objectives for your property, and that while all lands can contribute to biodiversity, not all lands will be used to provide for the most critical elements of diversity. Private landowners who manage for biodiversity by providing these elements are therefore a valuable resource themselves.

Not all of the recommendations that follow will be appropriate in all instances. Some may only be relevant in the management of larger blocks of land. Others, while appropriate for management of smaller tracts of land, may not suit your objectives. Landowners and managers must be flexible in deciding how and when to apply specific approaches in the management of biodiversity.

Specific recommendations to landowners include:

- \* Recognize that your property does not exist in isolation. The biodiversity of your land, and how it contributes to regional biodiversity, is largely determined by the surrounding landscape. A 40-acre patch of forest bisected by a stream may be much more important for biodiversity if in the middle of an agricultural landscape than if surrounded by thousands of acres of forest.
- \* Be aware of how your land can contribute to regional biodiversity. Various governmental and non-governmental organizations can provide information of what sensitive species are likely to occur on your property, or what types of habitats are most valuable in your area. Involve a

professional wildlife biologist or forest manager in your planning. See FNR-87, or call your county Cooperative Extension Service Office to contact these resources. These people have specialized training in how to manage natural ecosystems. They can also guide you to additional sources of information on managing your property.

- \* Consider providing additional areas of natural habitat on your property for native plants and animals. Habitat can be increased and fragmentation can be reduced by planting trees or other natural vegetation on marginal farmland, in streamside forests, and in windbreaks. Construction of wetlands on your property can be an extremely valuable way to enhance biodiversity. Visit [www.nrcs.usda.gov](http://www.nrcs.usda.gov), for more information about backyard habitat.
- \* Explore opportunities for providing habitats for native wildlife while managing for specialty products which can be used in the home or marketed for supplemental income. These products can include fruits, vegetables, firewood, fence posts, flowers, or mushrooms. Contact your county Cooperative Extension Office for more information.
- \* Maintain naturally occurring conditions. On your specific property, this may include preserving the natural diversity of tree species, keeping standing dead trees (termed snags), and keeping large fallen logs. All of these features together provide habitat structure, and are important to a variety of wildlife.
- \* Maintain or mimic natural processes on your property. Naturally occurring processes, such as disturbance from wind, fire, flooding, or disease, have been important forces in creating a variety of habitats and thus increasing species diversity, and they should be provided for to the extent possible. Natural disturbance processes

can be difficult to manage for on smaller properties; however, prescribed fire or managed flooding can be relatively easy to do. Timber harvesting ranging from removal of individual trees to creation of large regeneration openings of one to two acres can be used to simulate disturbances such as tornadoes, windthrow, or death due to insects or disease.

- \* Protect genetic diversity. Genetic variation within plant and animal populations provide species with greater flexibility to adapt to changing environmental conditions, thus increasing the probability of survival. One way to protect genetic diversity is to protect isolated populations, which are often genetically distinct. This can be done by protecting important habitats, establishing corridors of native vegetation between separated patches of habitat, or by creating additional habitat.
- \* Minimize habitat fragmentation. Large patches of natural habitat are important to conserving biodiversity. Further breaking up of these habitats in the already highly fragmented region reduces the availability of habitat conditions that are rarest in the region. Travel corridors such as riparian zones and fencerows can reduce the effects of fragmentation.
- \* Learn to recognize unique or otherwise important characteristics of your property. Rare and sensitive species are often found in unique sites such as wetlands, seeps, cliffs, rock outcrops, and streamside forests. If you know your property contains rare or ecologically important species, efforts can be made to offer protection.
- \* Match your proposed activities to the specific conditions of the site. Some areas are appropriate locations for intensive activity and management, while others are more sensitive. For example, land clearing activities and chemical inputs should be limited within a riparian zone.

- \* Attempt to maintain native plant and animal species. Avoid introducing non-native plants and animals that have the potential to spread and displace native species, modify or disrupt natural communities, or reduce ecological or economic values. In Indiana, there is no compiled list of all non-native species. Indiana has, however, declared the following species noxious weeds and made it illegal to import them: Canada thistle, purple loosestrife, multiflora rose, burcucumber, shattercane, and Johnsongrass. Further questions about non-native species should be directed to the Indiana Department of Natural Resources at (317) 232-4020, or visit <http://tncweeds.ucdavis.edu/>. A listing of recommended native plants can be obtained at [www.inpaws.org](http://www.inpaws.org).

- \* Monitor for impacts of your management on the biodiversity of your property. You'll probably want to focus on a few important elements of diversity, such as bird species or reptiles and amphibians. For example, count the number of bird species you currently observe on your property prior to management. Repeat this count periodically as your management is being implemented. This will give you an idea of the impacts of your management, and will add to your awareness and enjoyment of your property. A professional wildlife biologist can help you with ideas on how you can do this.

Biological diversity is becoming an increasingly important consideration in how we manage the natural resources of our country. All landowners should be aware that their activities could potentially affect biodiversity by altering the habitat values that their lands provide.

Landowners interested in learning more about how their actions might potentially affect

biodiversity, or how they can manage to enhance diversity should contact a professional wildlife biologist or forest manager. District wildlife biologists and foresters working for the Indiana Department of Natural Resources provide free advice and counseling to private landowners in the state. The Purdue University Department of Forestry and Natural Resources or your county Cooperative Extension Office can also answer questions regarding the management for biological diversity in Indiana.



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