

# *Snapshot* 2002

## BIODIVERSITY IN PENNSYLVANIA

### *Executive Summary*

The State of  
Biodiversity in  
Pennsylvania  
in 2002



PENNSYLVANIA  
BIODIVERSITY  
PARTNERSHIP



# Snapshot 2002

BIODIVERSITY IN PENNSYLVANIA:

## EXECUTIVE SUMMARY



### **Biodiversity**

Biodiversity is a scientific concept developed to embrace all living things, including humans, and how their existence – and survival – are interconnected. Biodiversity encompasses all living organisms, their genetic makeup, their ecological roles, and their interrelationships in the natural communities where they live. Preserving these biological communities is essential to maintaining our quality of life.

Pennsylvania's history is richly endowed with our use and enjoyment of its natural resources. Yet, the needs of more than 12 million Pennsylvanians for food, fuel, medicine, building products, farmland, and living space have had a major impact on the state's biological resources, with mixed results. Nevertheless, Penn's Woods still embodies a diverse wealth of natural resources that weave an interdependent biological web to form the complex tapestry needed to sustain human life.

Pennsylvania is home to more than 25,000 species of known organisms, and perhaps many thousands more yet to be identified in the state. These resources, if used wisely, can continue to support Pennsylvania's vibrant economy and provide a healthy, valued quality of life. However, many threats to our natural biological diversity are present, ranging from the proliferation of invasive plants to the degradation of ecosystems.

Animals, plants, and their unique habitats are being lost every year in Pennsylvania due to natural forces, human activities, neglect, and lack of coordination. Over 800 plant and animal species are considered to be rare, threatened, or endangered in the state. Recognizing the need for a better understanding of Pennsylvania's rich natural resources as well as the lack of a comprehensive strategy for biodiversity conservation, the Pennsylvania Biodiversity Partnership (PBP) was formed in 2000 in direct response to a recommendation by the Pennsylvania 21st Century Environment Commission.

*Biodiversity in Pennsylvania: Snapshot 2002* is a summary of a year-long effort by PBP to identify and consolidate information on the current state of Pennsylvania's biodiversity. *Snapshot 2002* represents the first phase of the development of a statewide plan for biodiversity conservation in Pennsylvania, a multi-year process under the leadership of the Pennsylvania Biodiversity Partnership.

*Snapshot 2002* summarizes the status of Pennsylvania's biodiversity as we presently know it, including wildlife and their habitats, laws, policies, funding, and educational resources relevant to biodiversity. It is designed to provide a baseline for future comparisons of how well we fulfill our roles as stewards of Pennsylvania's extraordinary natural wealth.

Phase Two will further pinpoint gaps in our knowledge; identify methods and initiate processes to fill those gaps; begin to formulate and consolidate recommendations; and provide a blueprint for how to achieve the final plan. These reports will serve as the focus for regional meetings in both Phase Two and Phase Three with expected completion of the *Pennsylvania Biodiversity Conservation Plan* in 2005.

### **REPORT SUMMARY**

Understanding the current status of biodiversity conservation in Pennsylvania is an essential first step in determining where we want to go. To achieve the ultimate goal of a statewide plan for improved biodiversity conservation, it is important to establish a sound baseline as well as a strategy for moving forward. *Snapshot 2002* assesses various aspects of the state of biodiversity in Pennsylvania, including the current knowledge and understanding of the state's biodiversity; known threats; how biodiversity is being managed; and the organizations, laws, policies, and funding in place to protect Pennsylvania's biodiversity.

## Current Knowledge and Understanding

Pennsylvania is home to more than 25,000 species of known organisms, and perhaps many thousands more yet to be identified in the state. Although no comprehensive inventory of Pennsylvania's biodiversity exists, we know that:

- Over 150 species of plants and animals have been lost from Pennsylvania and 130 species are considered to be globally endangered or threatened.
- Animals, plants, and their unique habitats are being lost every year in Pennsylvania due to natural forces, human activities, neglect, and lack of coordination.

Even though Pennsylvania has a long history of documenting biodiversity with records of plants and animals dating back to at least the 1740s, biodiversity information is scattered across many agencies and organizations in various formats that are often incomplete, out-of-date, or inaccessible. Gaps in information at all levels make it difficult to form a comprehensive assessment of current biodiversity conditions and inhibit our ability to determine future needs for biodiversity conservation.

At the same time, public surveys reveal that people consistently place a high value on protecting plants, animals, and their habitats. Although Pennsylvanians strongly support biodiversity conservation, their perceived knowledge about biodiversity, especially the term itself, is not high. This is not surprising since both the concept and the term are relatively new, even to scientists.

This disconnection between the public's lack of understanding of biodiversity and their support for protecting the environment may be attributed, in part, to a lack of educational materials on biodiversity. Although concepts related to biodiversity were reported in many educational programs, the subject was often limited to individual species or habitats rather than interrelationships among species. Explanations of why species have become endangered or threatened, recovery plans, and critical habitat designations were rarely addressed. The inclusion of biodiversity in the recently adopted Pennsylvania Academic Standards for Environment and Ecology may help close this gap. However, it will not help address the lack of educational materials on biodiversity available to adult audiences.

## Threats to Biodiversity

Scientists agree that Pennsylvania's biodiversity is in peril for a variety of reasons, some obvious and some subtle. These threats are generally grouped into two major categories: (1) habitat loss and fragmentation and (2) pollution. Major sources of these threats include changing land use patterns, an over-abundance of white-tailed deer in many areas of the state, and invasive species. Aquatic organisms, such as freshwater mussels, have been especially impacted by pollution.

Although there is little doubt that human impacts have been largely responsible for a decline in biodiversity in the state, there is much that we don't know regarding how our actions affect species and ecosystems in Pennsylvania. While progress is being made in correcting some threats, such as point-source pollution, others, such as urban sprawl and invasive species, present increasing problems.

## Managing Biodiversity

### Best Management Practices

Given our dependence on biological resources for survival, mankind has greatly affected natural habitats. Best management practices (BMPs) have become widely recognized and accepted as one of the most effective approaches for managing natural resources on both public and private lands. While most best management practices do not specifically target biodiversity, many are applicable to biodiversity conservation. However, biodiversity conservation can be achieved only if the stewards of private lands have the education, tools, and will to make it happen.

### Land Protection

Land protection is one of the most important components of biodiversity conservation efforts. Land protection activities, including land acquisition, regulations, incentives, education, and, most important, good stewardship by private landowners are all components of biodiversity conservation. Cohesive land protection strategies and coordination among agencies are essential to achieving the ultimate goal of biodiversity conservation throughout the Commonwealth.

### Habitat Restoration and Species Reintroductions

When best management practices and land protection efforts have failed at conserving biodiversity, restoration and reintroduction projects have been somewhat successful in counteracting the loss of species and habitats in Pennsylvania. The serpentine aster, paddlefish, river otter, and elk are among the many species that have begun their resurgence in Pennsylvania as a result of restoration ecology. Restoration and reintroduction projects have taken many forms, ranging from wetland restoration and fire management to replanting native grasslands and translocating animals to their former ranges. Despite the success of some reintroduction efforts, most are costly and many fail.



Regal fritillary



River otter



Since the science of restoration ecology has emerged relatively recently, many questions remain regarding our ability to restore degraded habitats as well as the best methods for translocating species into their former locations. Loss of habitats and species will likely never be fully reversed, but restoration work and reintroduction of species into areas they formerly occupied can mitigate some of the damage. Nevertheless, these efforts will never be adequate substitutes for the conservation of biodiversity.

## Biodiversity Organizations, Laws, Policies, and Funding

### Organizations

State, federal, county, and local governmental organizations all have a role in managing the lands, waters, and biological resources of Pennsylvania and can have significant impact on biodiversity conservation. Although these multiple government units provide many tools, they have sometimes lacked coordination in matters of land use and biodiversity conservation. For instance, responsibility for monitoring plants, birds, mammals, fish, amphibians, reptiles, mussels, and aquatic insects is divided among state agencies. No state agency has oversight for terrestrial invertebrates – the largest group of organisms in the state.

### Laws and Policies

Although some laws protecting the environment existed prior to the 1960s, there was no concerted effort to protect the use of public natural resources in the state. With passage of the Environmental Rights Clause to the Pennsylvania Constitution in 1971, the government's attitude changed to one of trustee for public natural resources. This amendment also declared that the citizens of Pennsylvania have a right to a healthy environment and guarantees public rights in preservation of natural values in the environment.

Today, Pennsylvania has numerous laws and policies that relate to biodiversity conservation. These include laws that govern public and private actions affecting lands and waters as well as ones specifically addressing conservation and restoration objectives. Other laws and policies address what biological information is collected, how it is organized, how it is made available to public and private decision-makers, and what requirements or incentives exist to ensure its use. Significant opportunities exist under current laws and policies for government agencies, business, and citizens to develop and implement strategies for conserving biodiversity.



White-tailed deer

### Funding for Research and Conservation

Although there are several funding sources for biodiversity research and conservation in Pennsylvania, the amount of money available does not come close to meeting the projected needs. In particular, funding to gather information on basic questions such as what plants and animals live in the state, where they live, and their ability to reproduce and thrive is limited. Lack of such fundamental knowledge about biodiversity in the state hampers efforts at conservation.

## Conclusions and Next Steps

*Biodiversity in Pennsylvania: Snapshot 2002* reveals that despite extensive knowledge about natural resource conservation in Pennsylvania and many activities focused on conserving wildlife and habitats, there is much we don't know about biodiversity in the state. Many gaps need to be filled.

In the face of this imperfect knowledge, one point is clear – sustainable use of our natural resources is critical for maintaining Pennsylvania's economic health, as well as the quality of life of all Pennsylvanians. Even with extensive technological advances and modern conveniences, our survival still depends on natural resources.

Despite the importance of biodiversity and the continuing threats to biological communities, Pennsylvania lacks a statewide strategy for biodiversity conservation. Critical habitats, plants, and animals are being lost every year in the Commonwealth due to development, neglect, and lack of coordination among interested parties.

American shad



*Sustainable use of our natural resources is critical for maintaining Pennsylvania's economic health as well as the quality of life of all residents.*

## PENNSYLVANIA BIODIVERSITY CONSERVATION PLAN

Even though Pennsylvania Biodiversity Partnership members represent a wide range of backgrounds and opinions, a consensus quickly emerged on the priority of developing a comprehensive statewide plan for conserving Pennsylvania's biodiversity. *Biodiversity in Pennsylvania: Snapshot 2002* summarizes the present state of biodiversity in Pennsylvania. It is the first step in a multi-year process to formulate the *Pennsylvania Biodiversity Conservation Plan*.

### Benefits of a Statewide Biodiversity Conservation Plan

- Facilitate interactions among groups concerned with biodiversity.
- Increase cooperation and coordination among government agencies, organizations, business, and individuals involved in biodiversity issues.
- Minimize duplication of efforts among organizations.
- Establish informed priorities for inventory, monitoring, and conservation at a statewide level.
- Develop educational and training materials for managing and enhancing Pennsylvania's biodiversity.
- Increase voluntary stewardship of biodiversity and thus avoid the need for additional regulations.
- Increase educational opportunities regarding the impact and importance of biodiversity to our lives and to the ecological and economic health of Pennsylvania.

### Pennsylvania Biodiversity Conservation Plan Timetable

Phase	Activities
Phase One <b>Biodiversity in Pennsylvania – Snapshot 2002</b> 2001-2002	<ul style="list-style-type: none"> <li>• Baseline report on present state of biodiversity as we know it.</li> <li>• Research current conditions and information.</li> </ul>
Phase Two <b>Blueprint for the Pennsylvania Biodiversity Conservation Plan</b> 2002-2003	<ul style="list-style-type: none"> <li>• Conduct regional meetings of organizations and individuals interested in biodiversity issues.</li> <li>• Pinpoint gaps in our knowledge.</li> <li>• Identify ways to fill gaps and begin the process to achieve this goal.</li> <li>• Continue information gathering.</li> <li>• Consolidate existing recommendations.</li> <li>• Provide a blueprint for achieving the Pennsylvania Biodiversity Conservation Plan.</li> </ul>
Phase Three <b>Draft Pennsylvania Biodiversity Conservation Plan</b> 2003-2004	<ul style="list-style-type: none"> <li>• Continue regional public meetings.</li> <li>• Solicit additional recommendations and comments.</li> <li>• Prioritize recommendations.</li> <li>• Continue information gathering.</li> </ul>
Phase Four <b>Pennsylvania Biodiversity Conservation Plan</b> 2005	<ul style="list-style-type: none"> <li>• Finalize and publish document.</li> <li>• Partners begin implementation.</li> </ul>

Gypsy moth females and eggs

Eastern bluebird

Mountain laurel

Mating green darners

### What You Can Do

- Get involved in efforts to conserve Pennsylvania's biodiversity.
- Contact the Pennsylvania Biodiversity Partnership (412-481-4100; pbpinfo@pabiodiversity.org) or visit PBP's website at [www.pabiodiversity.org](http://www.pabiodiversity.org).
- Attend regional meetings to assist in development of the *Pennsylvania Biodiversity Conservation Plan*.
- Participate in community dialogues on conservation issues.
- Adopt best management practices for conserving biodiversity on your own lands.

The full reports, on which *Biodiversity in Pennsylvania: Snapshot 2002* is based, are available on the *Pennsylvania Biodiversity Partnership* website at [www.pabiodiversity.org](http://www.pabiodiversity.org).

## **Pennsylvania Biodiversity Partnership**

The Pennsylvania Biodiversity Partnership is a broad-based, public-private partnership to promote the conservation of native species and their habitats. PBP is unique in bringing together – as equal partners – organizations and individuals with diverse interests and backgrounds. PBP members represent conservation and environmental organizations, government agencies, business and industry, scientists and academic institutions, sportsmen, and private landowners. For the first time in Pennsylvania, under the leadership of the Pennsylvania Biodiversity Partnership, there is a comprehensive and collaborative effort to address the lack of a statewide biodiversity conservation plan.

### **Board Members**

P. Randolph Gray, The Nature Conservancy of Pennsylvania, PBP Chairman  
William Adams, Pennsylvania Farm Bureau  
James Brett, Governor's Sportsmen's Advisor  
Thomas S. Buzby, Hardwood Lumber Manufacturers Association of Pennsylvania  
Michelle Cohen, The Pennsylvania Chapter of The Wildlife Society  
Peter Colangelo, Pennsylvania Fish & Boat Commission  
Cindy Adams Dunn, Pennsylvania Audubon  
Laurie Goodrich, Hawk Mountain Sanctuary  
David Hess, Pennsylvania Department of Environmental Protection  
Paulette Johnson, Ph.D., PA Center for Environmental Education, Slippery Rock University  
Clifford Jones, Mechanicsburg, PA  
Kenneth Kane, Keith Horn Forestry, Inc.  
Thomas J. Kerr, Wildlands Conservancy  
Ke Chung Kim, Ph.D., Center for BioDiversity Research, Pennsylvania State University  
Douglas Kuntz, Pennsylvania General Energy Corporation  
Andrew McElwaine, Pennsylvania Environmental Council  
John Oliver, Pennsylvania Department of Conservation & Natural Resources  
Tom Pauley, Ph.D., Allegheny Institute of Natural History, University of Pittsburgh, Bradford  
Peter Pinchot, Milford Experimental Forest  
Blaine Puller, Kane Hardwood, a Collins Company  
John E. Rawlins, Ph.D., Carnegie Museum of Natural History  
Ann F. Rhoads, Ph.D., Morris Arboretum of the University of Pennsylvania  
Vernon Ross, Pennsylvania Game Commission  
Larry J. Schweiger, Western Pennsylvania Conservancy  
Richard Whiteford, Downingtown, PA

Sue A. Thompson, Ph.D., President

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