

Chapter 35

An Interagency-Led Effort: Biodiversity Conservation in Pennsylvania: A Summary of the Status of Wildlife Habitat and Habitat Threats Statewide

by Laurie J. Goodrich, Margaret C. Brittingham,
Joseph A. Bishop, and Patricia Barber

1. Background

As in many states, responsibility for biodiversity conservation in Pennsylvania is divided among multiple agencies. During 2001 and 2002, the Pennsylvania state resource agencies with primary jurisdiction over issues related to biodiversity conservation, i.e., Pennsylvania Game Commission (PGC), Pennsylvania Fish and Boat Commission (PFBC), Pennsylvania Department of Conservation and Natural Resources (PDCNR), and the Governor's Sportsmen's Advisory Council, contracted with the authors of this chapter to compile a report on the status, trends, and major threats facing wildlife habitat across Pennsylvania. The 236-page report was completed by the authors during fall 2002 with assistance from the agency advisors and advisory groups, including representatives from the game and fish commissions and the PDCNR citizens' advisory council.¹ The report was commissioned by

1. Laurie J. Goodrich et al., *Wildlife Habitat in Pennsylvania: Past, Present, and Future, A Report to State Resource Agencies* (unpublished 2002). A full report with graphics, including those used in this chapter, is available on the Internet at <http://www.dcnr.state.pa.us>. All maps and land cover data included in the report, as well as in this chapter, were compiled by Joseph A. Bishop, Pennsylvania Gap Analysis Program (GAP) Habitat Project, Pennsylvania State University. Land cover typing is from 1992 to 1994 satellite images taken from WAYNE L. MYERS & JOSEPH A. BISHOP, PENNSYLVANIA GAP ANALYSIS

the agencies because of concerns about possible declines in wildlife populations and the lack of a comprehensive assessment of the quality of wildlife habitat and the current threats facing habitat within the commonwealth. One goal of the report was to pull together information on all habitat types and compile a ranking of the severity of threats facing wildlife and their habitats.

In this report, the authors focused primarily on evaluating the status of habitat across the commonwealth for the species that fell under jurisdiction of the state game and fish agencies: birds, mammals, fish, reptiles, amphibians, and mussels. The focus was on "habitat" and the quality and quantity of habitat remaining for wildlife species. The term "biodiversity" was not used because of the negative feedback the word could spark in some anglers and hunters.

To prepare the habitat report, the researchers gathered information from state and federal agency biologists, nonprofit organizations, and web- and literature-based searches to locate up-to-date information on the status and trends in wildlife and wildlife habitats. Habitat mapping for the report was conducted by the Pennsylvania Gap Analysis Program (GAP) office² and additional bird data was provided by the PGC Breeding Bird Atlas database.

Overall, the report evaluated habitat and wildlife trends by habitat type, current habitat quantity and distribution by ecoregion, the ongoing habitat conservation efforts and wildlife monitoring efforts within the commonwealth, and identified the top threats for each habitat type. Where possible, the report summarizes the quantity and quality of each habitat type by ecoregion or drainage within the commonwealth. State habitat quality estimates combining rankings for each habitat type within each of these ecoregions suggest that less than 10% of the commonwealth is represented by good quality habitat for wildlife. Wildlife status reports evaluated as a part of this report reflect the critical nature of wildlife habitat in Pennsylvania as they show that 20% of all of the commonwealth's wildlife species are listed on state species of special concern lists.

The main habitat types considered in the report include forest, grasslands, wetlands, and rivers and streams. Each of these types of wildlife habitat varies not only with respect to the degree of habitat loss it experiences, but also the degree of degradation. Despite these differences, the commonwealth must overcome challenges in the future to maintain and protect each of these

¹ PROGRAM, STRATIFIED LAND-USE/LAND-COVER FOR PENNSYLVANIA (Environmental Resources Research Institute & The Pennsylvania State University 1999). Bird distribution maps were based on atlas data collected during the mid- to late 1980s. See DANIEL BRAUNING, ATLAS OF BREEDING BIRDS OF PENNSYLVANIA (University of Pittsburgh Press 1992).

² Pennsylvania GAP project, *supra* note 1. The land cover classification is based on the LandsatTM Satellite Imagery, 1992-1994, available at <http://www.pasda.org>. For a discussion of the Pennsylvania GAP project, see *supra* Chapter 9.

ecoregions if there is to be any chance of conserving what biodiversity remains. This chapter summarizes the findings of the study regarding the status of wildlife habitat and threats to that habitat in Pennsylvania. Although the information is specific to Pennsylvania, other states are most likely experiencing similar threats to biological diversity. More importantly, this type of analysis is both a necessary first step and a necessary continuing element in any state biodiversity conservation program.

II. Habitat Summary

Pennsylvania, like much of the United States, has seen a dramatic change in wildlife habitat over time. Historically, Pennsylvania was mostly forested. However, large-scale timbering operations during the 1800s reduced overall forest cover to less than 35% of land cover. In the early to mid-1900s, grassland and early successional habitat reached a peak as a result of removal of forests while wetlands began to decline. Wetlands were drained or altered regularly as they were viewed as wasted land. Disease also took its toll on the forests of Pennsylvania as the chestnut blight, introduced in 1904, decimated the American chestnut. The chestnut, once a dominant tree in Pennsylvania forests and important wildlife food source, was unable to recover. As a result, various species of oak assumed a more dominant role in recovering forests.

III. Wildlife Habitat Status and Threats

Today, Pennsylvania stands at a critical cross-roads in wildlife conservation. Historically, wildlife habitats have endured dramatic changes. Forests were nearly completely cut over a century ago and streams filled with silt from the large-scale erosion that took place on the cleared land. Mining and industrialization scarred the landscape throughout the commonwealth and left a legacy of degraded streams. Grasslands were plowed under for agricultural crops, and even now, these altered grasslands are fast being lost to suburban sprawl in many regions.

Some habitats have recovered from some past abuses. Streams are slowly recovering across the commonwealth. Forests have regenerated over time, although old growth stands are lacking. Some reclaimed surface mines and new agricultural set-asides have provided much-needed refuge to some grassland species. Despite these new improvements, in many cases, habitats have not recovered. For example, American chestnut has not yet been re-stored and abandoned mines still impact both terrestrial and aquatic habitats.

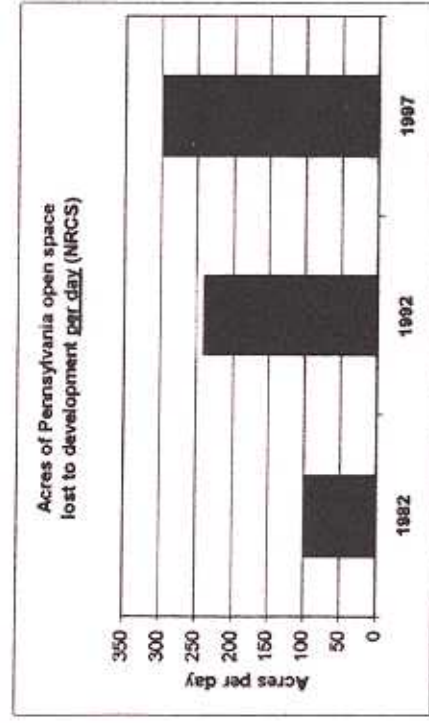
New threats to wildlife habitats loom large. In Pennsylvania, uncontrolled sprawl and the resulting habitat loss and fragmentation is now the number one threat to wildlife in the commonwealth. Three hundred acres or more of wildlife habitat are being lost every day, primarily to suburban sprawl (see Figure 1). Some counties have seen an increase in housing units exceeding

20% in the recent decade. Remaining wildlife habitats within the commonwealth are jeopardized further by a persistent lack of forest regeneration, an increase in the number of paved roads, a burgeoning of non-native invasive species, and the continued encroachment of development.

Although some species of wildlife have flourished with landscape changes in recent years, other species are declining at alarming rates as their habitat is degraded to critical levels or lost entirely. Species that inhabit mixed habitats or the suburban landscape such as the American robin or raccoon continue to prosper. But, species that rely on large blocks of habitat or wetland areas are showing signs of decline. Overall, 20% of Pennsylvania's wildlife species are declining.

Another serious threat to state wildlife arises from the lack of knowledge or adequate monitoring. As a result, the status or distribution of most of the commonwealth's wildlife species is not known. Extensive monitoring programs exist only for birds and selected other species. Even for birds, the most widely monitored wildlife group, over one-half of the species are not a focus of any statewide survey. Newly integrated and comprehensive inventory and monitoring initiatives are gravely needed.

Figure 1



A. Forests

Although nearly completely decimated 100 years ago, Pennsylvania's forests have been able to successfully regenerate and now cover approximately 62% of the commonwealth. Today, the biggest threat to the wildlife dependent on these forest habitats is the increasing fragmentation of these remaining habitats. Although the commonwealth is mostly forested, less than

one-half of Pennsylvania's forests remain in "core or interior" forest-type cover (7 million acres of core forest out of 17 million total acres of forest). Core forest is any forest over 300 feet from an opening or paved road. Currently, over 10 million acres of Pennsylvania forests are considered edge forest (see Figure 2). As a result, wildlife that depend upon these core or interior forest types have declined within the commonwealth.

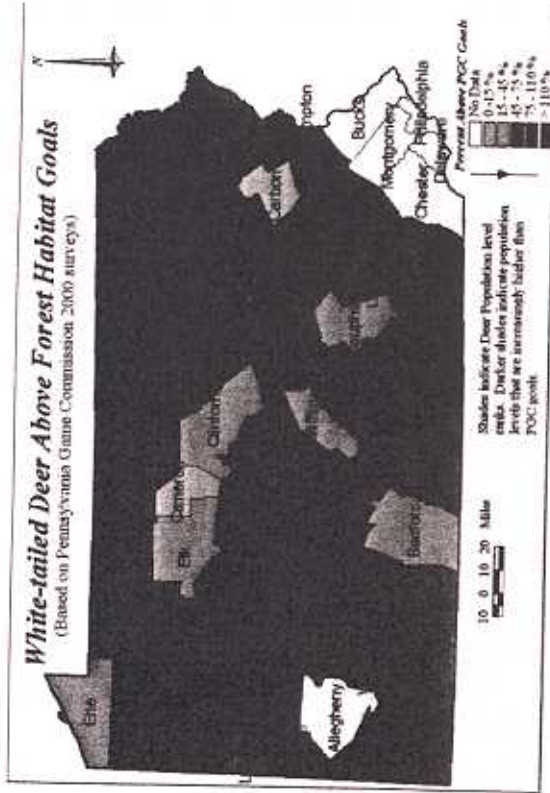
Figure 2



Pennsylvania's forests are also threatened by the lack of regeneration caused primarily by an overabundance of white-tailed deer (see Figure 3). Without young trees being produced to replace older trees, overall forest structure and function is in jeopardy. As a result of this lost ability to regenerate, wildlife that inhabit understory or groundcover layers of a forest are showing declines in some regions. White-tailed deer thrive in fragmented, forest-edge habitats. Thus, the fragmentation of forests invites an increase in deer that may lead to greater pressures on the remaining forest habitats.

Other threats, such as forest pests, pollutants (including acidic deposition), and non-native invasive plants, provide additional challenges to the remaining forest. In addition, more coniferous forest stands, which only account for 8% of the current forest land but were much more common historically, as well as an increasingly diverse age class of forests, e.g., old growth and early successional, should be encouraged and conserved to benefit a wider array of forest species.

Figure 3



B. Wetlands, Riparian, and Stream Habitats

In Pennsylvania, as in other states, one of the most serious wildlife habitat threats today is the loss and fragmentation of wetland habitats. Although wetlands cover 700,000 acres of the commonwealth today, over one-half of Pennsylvania's wetlands have already been lost. The majority of wetland loss occurred in the southern counties where 90% of the region's total wetlands have already disappeared. Much of what does remain is severely degraded. Despite protection, wetlands continue to be degraded and altered. Overall, the loss and degradation of wetlands is a major byproduct of sprawl, with acidic deposition and runoff from roads and agriculture also posing serious threats.

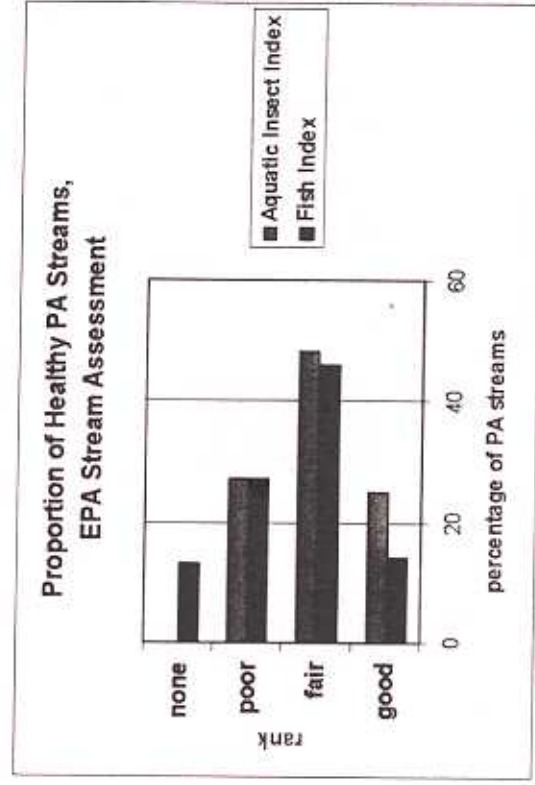
Wetlands and riparian areas are a particularly important habitat type for biodiversity conservation for several reasons. They support both aquatic and terrestrial species, thereby creating more varied conditions and additional niches. In addition, the availability of water provides wildlife with an essential element of their habitat needs. Wetland species dominate the state list of species of special concern, with 28% of all fishes listed as endangered or threatened. Because the home range of some wetland-associated wildlife is restricted to the southeastern counties, e.g., turtles, their survival is particularly tenuous.

Rivers or streams extend over 83,000 miles in Pennsylvania, with riparian habitat occurring over an estimated 172,067 acres. Although some rivers and streams have recovered past abuses, many continue to endure problems. Thirty percent of Pennsylvania's streams have been ranked as having poor

biotic integrity based on sampling for invertebrate and fish populations, and good quality fish habitat was found in only 14% of Pennsylvania streams (see Figure 4). Stream quality is threatened by pollutants, sedimentation, acidic mine drainage, and a lack of adequate riparian buffers. In areas enduring increasing sprawl, road runoff is a growing challenge.

Concern regarding aquatic habitat arises not just from threats to the quality of Pennsylvania's streams, but also from threats to the water quantity. Water quantity may be an increasingly important issue for wetland and stream conservation. There are many species that rely on cool, fast-flowing streams as habitat. In Pennsylvania, the base flow of most streams is fed by groundwater. As water withdrawals increase and water table depletion becomes more common, these fast-flowing streams and other habitat types, such as intermittent pools and wetlands, may be jeopardized. Restoration of wetlands and protection of remaining wetlands and stream flow are especially critical given the severe decline this habitat type has endured. As this habitat continues to decline, restoration and protection of the remaining wetlands and maintenance of stream flow are especially critical. Larger wetland complexes should be given high priority for protection and restoration as some wildlife species depend on larger wetlands.

Figure 4



C. Grasslands, Barrens, and Farmland Habitats

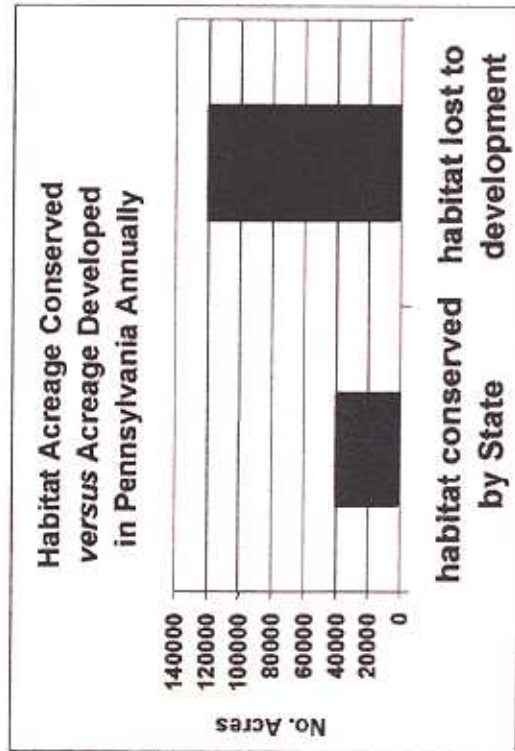
Although grassland habitat constitutes 26% of Pennsylvania, this habitat type has been drastically reduced in the last half century. The decline in this

habitat has led to a parallel decline in grassland species. Today, even species traditionally associated with the artificial grassland created by agriculture, such as pheasant and bobwhite, are suffering from a reduction in habitat due to changes in farm crops and farm management. Other species that rely on more extensive grassy meadows are relegated to reclaimed surface mines. To counteract the impact of lost grassland habitat, government set-aside programs for farmers, and restoration of currently unrestored surface mines could benefit this wildlife group by helping to restore grasslands.

IV. Habitat Conservation

Despite the serious threats facing wildlife habitats, Pennsylvania has a jump on the conservation of wildlife habitat with an estimated 13.5% of Pennsylvania lands, many of which are in the northern central region, in conservation status. Public agencies manage approximately 4.6 million acres and spend an estimated \$119 million dollars for habitat management or acquisition (see Figure 5). Private land trusts are estimated to conserve between 10,000 and 20,000 additional acres each year, over and above land donated to public agencies. Moreover, public support and interest in wildlife and wildlife pursuits is widespread. Surveys by federal fish and wildlife agencies suggest that 90% of U.S. citizens value open space, and nationwide, nearly 40% of people participate in hunting, fishing, and other wildlife oriented recreation.

Figure 5



Although habitat is conserved annually under state and privately funded programs and Pennsylvania's population is rather stable, Pennsylvania is

still recording a net loss of 35,000 to 50,000 acres of wildlife habitat annually. This total does not include the additional acres of habitat that is degraded by an increase in sprawl and the resulting habitat fragmentation. Without any change in how development is managed or controlled, further wildlife loss is certain, leading to lost opportunities for hunting, fishing, and wildlife watching, and creating further declines in Pennsylvania's wildlife and wild places.

V. Changing the Course of Habitat Loss

During the late 1800s, Pennsylvania wildlife was severely threatened by widespread habitat alteration and overharvesting. In response, three new resource agencies—the PGC, the PFBC, and the Pennsylvania Bureau of Forestry—were established along with broad-reaching policies and programs to conserve wildlife habitat and wildlife for the future. A century later, new threats have emerged and a similar bold change of course is essential.

To reverse the current net habitat loss, it is necessary to more than double the annual amount of wildlife habitat conserved within existing programs. Private citizens, public agencies, municipal authorities, nonprofits, and industries need to join together to conserve open space and wildlife habitat and begin recovery of degraded lands. Private and public efforts are needed. Forest fragmentation and farmland and wetland loss must be prevented. Water quality and riparian corridors need restoration. Overabundant deer populations must be reduced to allow regeneration of forests.

New multi-taxa monitoring programs and a new emphasis on coordinated inventory and monitoring statewide for all wildlife, from mammals to muskshells, are critically needed to increase the information available regarding Pennsylvania's wildlife resources. The cost of species' conservation is lowest when the species are still relatively common. Without adequate monitoring programs in place, Pennsylvanians are losing the opportunity of detecting population declines in time to address them easily and economically. Cooperative monitoring efforts among states and regions similar to federal programs conducted for migratory birds could be cost effective and beneficial for conserving other taxa.

123
12

Biodiversity Conservation Handbook

State, Local, and Private Protection of
Biological Diversity

editors:

Robert B. McKinstry, Jr.

Coreen Ripp

Emily Lisy

2006

ENVIRONMENTAL LAW INSTITUTE
Washington, D.C.