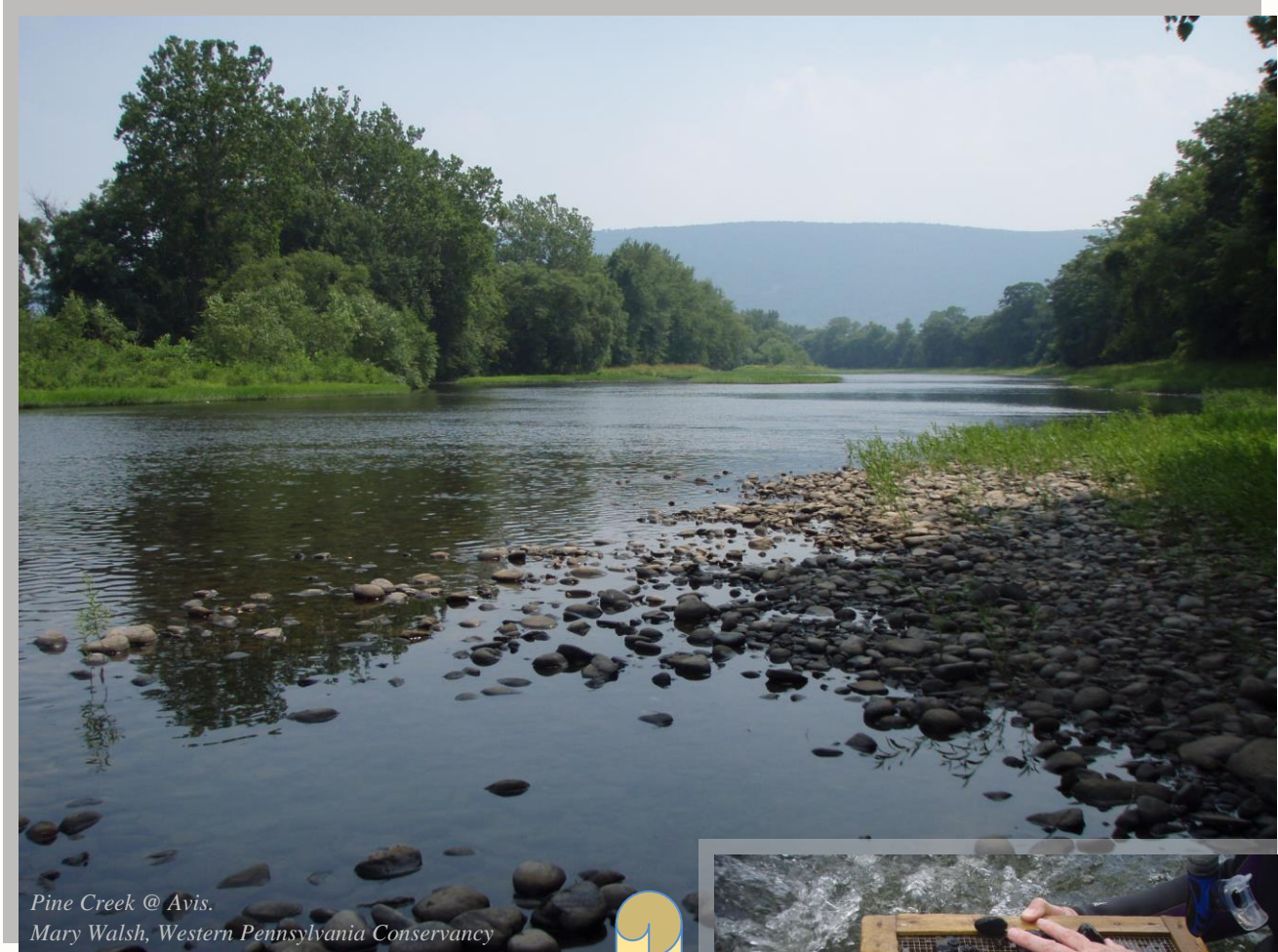


Pennsylvania Fish & Boat Commission 2014 Annual Summary

State Wildlife Grants



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February 2014

Aquatic Species & Habitats and the role of the Pennsylvania State Wildlife Action Plan

The State Wildlife Grants Program (SWG) represents an investment in the natural resources of Pennsylvania and provides practical, tangible benefits for the Commonwealth’s Species of Greatest Conservation Need (SGCN). These benefits include an increased understanding of the species thus contributing to enhanced protection & management of the species and their habitats. The data gathered from State Wildlife Grant projects are laying the foundation for current and future conservation actions and will be especially important for addressing impacts from factors such as climate change, urban sprawl and energy development. The Fish and Boat Commission has taken a 3-fold approach to addressing the aquatic resource needs.



Juniata River. Jeremy Deeds, Western PA Conservancy

The Ecological Setting

The Commonwealth is at a geographic crossroads in the Northeast and thus plays a pivotal role in conserving many species and their habitats. For this reason, the strategies and priorities identified in Pennsylvania’s State Wildlife Action Plan incorporate the needs of Pennsylvania’s “Responsibility Species” and their associated habitats. Examples of Pennsylvania’s ecosystems include:

- An estuary on the Delaware River,
- Woodlots and wide agricultural valleys in the southeast,
- Deciduous forests of the central ridges,
- Extensive mixed forests of the Allegheny high plateau,
- Glaciated woodlands and wetlands, and
- Lake Erie in the northwest.

1. Landscape-Scale Approach. A landscape-scale approach is being used in major ecological systems such as the Allegheny, Susquehanna, and Delaware River Basins to establish current, comprehensive baseline data on high-priority species and habitats.

2. Collecting Data on Priority Species: Data collection and management initiatives have been directed primarily towards indicator or keystone species, guilds or communities. These include freshwater mussels and fishes. SWG-funded projects are providing information on the status of many of these animals to allow a more *proactive* approach towards their protection and management.

3. Resource Planning: Resource planning includes development of resource management plans and other initiatives that will greatly assist resource managers with efficiently and effectively directing on-the-ground activities to secure species and their habitats.

Prior to the State Wildlife Grants funding, few resources were available for species of concern (referred to as Species of Greatest Conservation Need), primarily non-game species.

Pennsylvania’s Aquatic Habitats and Ecological Setting:

The Commonwealth lies within parts of six major river basins: Ohio, Lake Erie, Susquehanna, Potomac, Genesee, and Delaware River drainages, and contains numerous wetlands, nearly 4,000 lakes and more than 83,000 miles of waterways, ranging from high-gradient coldwater streams to large, warm-water rivers. These waters support a high diversity of fish, freshwater mussels, amphibians, reptiles, and other aquatic life, dependent upon Pennsylvania’s management and protection efforts.



Yellow Lampmussel: Mary Walsh, Western PA Conservancy

Freshwater Mussels in the Susquehanna River Basin: Findings from recent studies.



Sorting mussels: Mary Walsh, Western PA Conservancy

Summary: In 154 timed-search surveys conducted in the Susquehanna River Basin by PA Natural Heritage Program biologists found 7,000 mussels encompassing eleven species. The most common species in the watershed, Eastern *Elliptio*, dominated the catch.

Goal: Assess the distribution and habitat associations of the native mussel community through targeted sampling within the Susquehanna River system.

Status: Burrowing in the sand and rock bottoms of rivers and lakes, freshwater mussels often go unnoticed by boaters and fishermen. Although they receive little public recognition for their efforts, the shelled critters quietly spend their lives consuming particles from our waters, making them clearer and cleaner. Biologists in the Pennsylvania Natural Heritage Program (PNHP)

studied the bivalves’ distribution, habitat and population genetics in the lower Susquehanna River with funding from a State Wildlife Grant (SWG). The most recent SWG funding supplements recent mussel studies by PNHP in the other portions of the Susquehanna River watershed.

Surveys identified the mussel habitats in the diverse waterways in the Susquehanna River watershed. The bottoms of small, cool groundwater-fed waters, warm, meandering

creeks, and the wide Susquehanna River were searched for common and rare mussels. Biologists, donning protective wetsuits and snorkels, wade, float, and dive in search for the mussels nestled among the rocks. Standardized search techniques were used to estimate the numbers of mussels present.

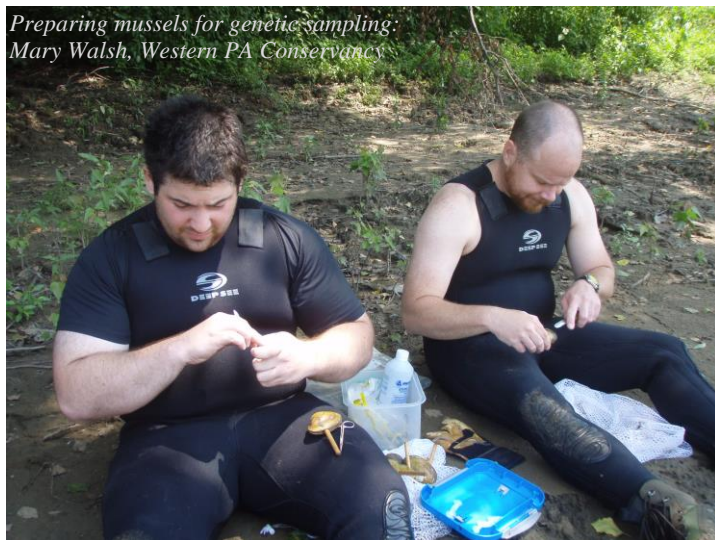
Outcome: While eighteen mussel species have been historically reported from the watershed, eleven species were found in surveys by Pennsylvania Natural Heritage Program biologists. Of the 7,000 mussels found in 154 timed-search surveys across the Susquehanna River basin, the most common species in the watershed, Eastern Elliptio, dominated the catch.

The Susquehanna River, however, does not support as many Eastern Elliptios as its counterpart to the east, the Delaware River. One of the rarest Susquehanna mussels, the Brook Floater, occurred in only three waterways in the PA portion of the Susquehanna River watershed. The relatively more common Yellow Lampmussel is found throughout the watershed, but its populations are declining throughout much of its range, which extends along the Atlantic Coast Rivers from Georgia to Nova Scotia.

In a genetic component of the study, project partner, Dr. Curt Elderkin from The College of New Jersey, found that Eastern Elliptio has high genetic diversity and genetically distinct populations in the Susquehanna River watershed; a population of interest that seems genetically isolated occurs in a Juniata River tributary. The Yellow Lampmussel populations do not appear to be distinct genetically and have low genetic

diversity. Small populations of Yellow Lampmussel have an increased risk of extinction because of low genetic diversity; for this reason large populations in different parts of the Susquehanna watershed should be conserved.

In another dimension of the project, models of watershed and landscape characteristics of mussel occurrences identified features associated with mussel species and rich communities. Information about the distribution, habitat characteristics, and population genetic characteristics can be used for management decisions. Future survey efforts can be compared to the information collected in this project and analyzed for changes in communities and populations.



Preparing mussels for genetic sampling: Mary Walsh, Western PA Conservancy

Project: T-2-05: *Mussel Community Assessment of the Lower Susquehanna River.* Western Pennsylvania Conservancy.

Project: T-51: *Yellow Lampmussel in the Susquehanna River Watershed.* Western Pennsylvania Conservancy.

Pennsylvania’s State Wildlife Action Plan: Addressing current needs while planning for the future.

Summary: The Pennsylvania State Wildlife Action Plan has guided efficient and effective use of federal and state funds to address conservation needs of at-risk and declining species and to keep common species from becoming imperiled. The plan is now undergoing the congressionally required 10-year comprehensive review and revision. In 2012, the Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission initiated this revision and will be

Goals of the Pennsylvania State Wildlife Action Plan

Goal 1: Improve the scientific basis for making conservation decisions for wildlife, with special emphasis on species of greatest conservation concern.

Goal 2: Plan, prioritize, and implement actions that will conserve the state’s diversity of wildlife and its habitat.

Goal 3: Develop a knowledgeable citizenry that supports and participates in wildlife conservation.

Goal 4: Ensure that the necessary resources are available to conserve Pennsylvania’s wildlife.

Goal 5: Expand and improve coordination of the public agencies and other partners in wildlife conservation planning and implementation.

GUIDING PRINCIPLES

- **Conserve Species At-Risk.** Allowing species to become threatened or endangered results in long-term and costly recovery efforts with uncertain outcomes.
- **Keep Common Species Common.** Native wildlife species must be retained in healthy numbers throughout their natural ranges to maintain their role in ecological processes.
- **Recognize the Unique Role of Pennsylvania.** Pennsylvania straddles the border of many ecological systems and exhibits a diversity of physiographic provinces and thus plays an important role in conserving many species and habitats.
- **Voluntary Partnerships for Species, Habitats and People.** The power of conservation lies in the synergy that builds when diverse, committed partners work together toward a common goal.
- **A Comprehensive Strategy.** The State Wildlife Action Plan strategies and priorities are presented so that stakeholders can find meaningful recommendations regardless of their scale and scope of interest.

submitting Pennsylvania’s revised plan by September 30, 2015.

Background:

Designed and guided by Congress in the late 1990’s, the proactive State Wildlife Action Plans have provided a vital foundation for states to address the needs of declining species and habitats. Implementing actions to protect, conserve and enhance species *before* they become federally threatened and endangered is both ecologically and economically beneficial. Early on, Congress recognized that costs for recovering species on the brink of extinction are far greater than taking an early interventional approach when the species are more abundant.

Submitted jointly in September, 2005 by the Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission on behalf of Pennsylvania, this plan has been a

foundational document for addressing vital resource conservation needs within the Commonwealth. In the intervening years since its approval, both agencies have used the plan to guide application of the State Wildlife Grant Funds to address high-priority needs identified in the Plan. The plan also serves as a blueprint for conservation partners as they look to determine how they can implement actions to protect and enhance Species of Greatest Conservation Need and their habitats. For the Fish and Boat Commission, the State Wildlife Action Plan has also been adapted into the agency Strategic Plan.

Foundations of Pennsylvania’s Plan:

The natural resources of Pennsylvania have played an important part in the history of the Commonwealth influencing the culture, economy, recreation and overall well-being of its citizens. The diverse habitats including cold headwater streams, large rivers, wetlands, expansive and abundant forests, as well as rare habitats (e.g., vernal pools) support a wide array of species. Therefore, the purpose of the current State Wildlife Action Plan has been *To conserve Pennsylvania’s diverse wildlife to maintain its role in ecological processes, and to protect and enhance species of conservation concern.* The overall vision of the plan is *Pennsylvanians working together to attain sustainable wildlife populations, communities and ecosystems and to prevent and reverse the declines of species.* The Vision and Purpose statements encompass five guiding principles of Pennsylvania’s State Wildlife Action Plan (see Page 5).

Implementing Pennsylvania’s Plan:

Many of Pennsylvania’s *Species of Greatest Conservation Need* identified in the State Wildlife Action Plan may be cryptic in coloration, low in abundance, or sparsely distributed. Additionally, some habitats are difficult to sample (e.g., deep, large-river systems) and the inability to sample

these habitats has contributed to incomplete information about some species. Further, the lack of population and range information for some species has limited full development of conservation measures for the species. Thus, for the Fish and Boat Commission, an overarching emphasis has been to gather information on these rare, and little-known, species.

New Sampling techniques, more intensive sampling efforts, enlisting assistance from volunteers and other initiatives have greatly expanded the knowledge about many species. Because of this enhanced information, ten state-threatened and endangered species have been delisted as they were found to be more abundant than previous data had indicated (see 2013 Summary). Of course, this enhanced surveying has also found some species to be less abundant than previously known and has contributed to the state-listing of several species. Consequently, these species are likely to become a higher priority for conservation actions.

Comprehensive Review and Revision of State Wildlife Action Plans (SWAP):

As required by Congress, and specified in Required Element #6, each state and territory is required to conduct a comprehensive review and revision of their State Wildlife Action Plan no less than every 10 years. In 2012, Pennsylvania began this review and

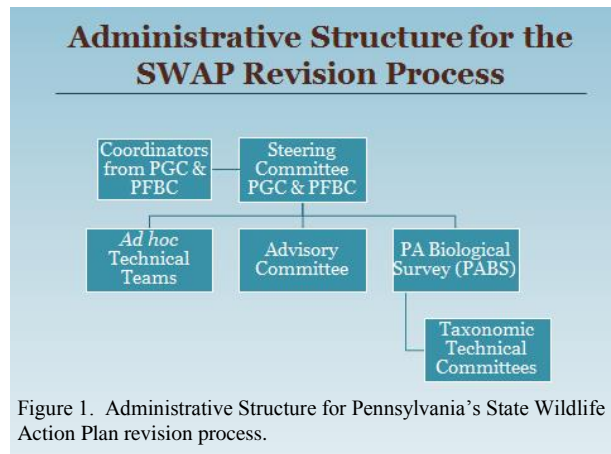


Figure 1. Administrative Structure for Pennsylvania’s State Wildlife Action Plan revision process.

revision process and will be providing a revised plan by the required date of September 30, 2015. Staff in the Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission are leading this process and an administrative structure (See page 6, Figure 1) has been developed to help ensure that that review and revision are complete and accurate. Conservation partners (e.g., federal and state natural resource agencies, non-governmental organizations) comprise an Advisory Committee that serves a crucial role by ensuring that the direction and content of the revised plan will address the broad conservation needs of the Commonwealth. Technical Committees provide support for species

assessments and other special topics (e.g., climate change).

Although early in the revision process, it is clear that in the years since the current plan was approved, substantive changes have occurred in Pennsylvania. These include new threats to resources, advances in knowledge of species and their habitats, and a greater understanding of Pennsylvania’s regional role. This new information and other changes will be discussed in the revised Pennsylvania Wildlife Action Plan. *Cathy Haffner-PA Game Commission, Diana Day-PA Fish and Boat Commission.*

Pennsylvania’s crayfish fauna: spread of exotics and loss of native species threaten the state’s aquatic resources.

Summary: Recent surveys in combination with historical records documented the presence of 16 crayfish species in Pennsylvania. Four of those species are not native to the state (including the invasive Rusty Crayfish, Virile Crayfish, and Red Swamp Crayfish) and were introduced to the state’s waters in recent decades. The ranges of three native species have also expanded in recent decades as a result of introductions. Human activities including intentional stocking efforts and the release or escape of fishing bait, aquarium and pond pets, and classroom, laboratory and aquaculture animals are likely responsible for most crayfish introductions in Pennsylvania.



Spinycheek Crayfish a native to eastern Pennsylvania. D.H. Funk.

Goal: Through a State Wildlife Grant funded project (T-02-07-R-1), we are evaluating the status of the state’s crayfish fauna (including several SGCN species) and assessing the ecological impacts of invasive crayfishes.

Status: Crayfish introductions in Pennsylvania have been associated with declines in several native crayfishes. For example, the range of the Spinycheek Crayfish, which is native to eastern

Pennsylvania, has declined (retreated eastward) by approximately 225 km and the species has nearly been eliminated from the Susquehanna and Potomac drainages of Pennsylvania. Resampling efforts at or near historical sites in those drainages yielded hundreds of introduced crayfish but no Spinycheek Crayfish. The prevalence of introduced crayfish in areas of Pennsylvania that have lost populations of Spinycheek Crayfish suggests that crayfish introductions likely played a major role in those losses.

The replacement of native crayfish by introduced crayfish represents a significant threat to aquatic communities because densities of introduced crayfish can exceed 10 individuals/ft² and are frequently an order of magnitude higher than their native counterparts. At such high densities, introduced crayfish often eliminate or greatly reduce aquatic macrophytes and suppress benthic invertebrate communities. In addition, introduced crayfish tend to be less vulnerable to fish predation than native crayfish because many introduced crayfish quickly grow to a size that reduces their susceptibility to predation, possess large claws, and are aggressive. Introduced crayfish also readily consume fish eggs and can have strong negative effects on fish reproduction. The end result for effected fish populations is often less food, decreased recruitment, and ultimately reduced abundance and biomass. Introduced crayfish have also been shown to have strong negative effects on a variety of amphibian species and can readily consume freshwater mussels (especially juveniles).

Outcome: This information has contributed to the protection of crayfish, fish, and mussel resources in Pennsylvania (including a number of SGCN species) by providing a foundation for our efforts to slow the spread of invasive crayfishes in the state. These efforts include potential new regulations that restrict the sale, possession, introduction, transportation, and importation of live crayfishes in the Commonwealth. If approved, these regulations would go a long way towards protecting the state’s aquatic resources from invasive crayfishes.



Invasive rusty crayfish.
K. Kelly (above); D. A. Lieb, & P. Mooney (upper right)

Project: T-02-07-R-1: *Freshwater Aquatic Invertebrate Conservation, Protection, and Restoration.* Dr. David A. Lieb, Pennsylvania Fish & Boat Commission & Western Pennsylvania Conservancy.

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