

# Wetlands: The Vital Link

by Walt Dietz

*This article is the third in a series on the Commission's theme, "Habitat." The author explains the differences among kinds of wetlands, why wetlands are important to us, and why fish, amphibians and reptiles need wetlands.*

*This large wetland is Wildwood Lake, just north of Harrisburg. It is part of the Wildwood Nature Preserve and is well-known for its flowering lotus (a wetland plant).*

**T**hey're wet, mushy, muddy and often thick with vegetation. Some people dislike them and others love them. Either way, you must admit that they have become a focal point of environmental awareness in recent years. Endangered species? Old-growth forests? Tropical jungles? No. I'm talking about wetlands. They have taken a top shelf when it comes to environmental issues. Punch the word "wetland" into an Internet browser and you'll come up with nearly 200,000 hits. Open a current-issues magazine and you will likely find an article or story about them. Turn on the television and you will probably find a wildlife program directly or indirectly related to wetlands.

Wetland issues are taught in schools. Today's generation is much more aware of wetlands and how they protect against flooding, trap sediment, clean water and provide food. Sportsmen's groups and environmental organizations appreciate wetlands' habitat and recreational value. Some groups build them to support and attract wildlife for hunting or watching. Wetland concerns even show up in political debates.

All this attention is for good reason. We have learned about the importance of wetlands and how to appreciate their inherent beauty, immeasurable value and function. We are concerned about their protection. We've come a long way from previous generations, who once thought of wetlands as a hindrance to human expansion, and that they should be drained for agriculture or development.

We are more informed today, but how much do we really know about wetlands? Maybe not as much as we think, because wetlands hold many secrets. Maybe it's a new species. What about a potential cure for a deadly disease? How about a new food or fuel source? To learn those secrets, we need to protect wetlands and learn much more about them.

### **What makes a wetland wet?**

We know wetlands best as shallow, mushy waterways with lots of thick vegetation. Of course, there is more to a wetland than muck and vegetation. Wetlands really are "wet lands." Most of them are transition zones between upland areas and larger waterways like rivers, lakes or the ocean. A transition zone might include a flood plain, riparian area, delta or estuary. Some wetlands are found in low-lying areas of

*Wetlands really are "wet lands." Most of them are transition zones between upland areas and larger waterways like rivers, lakes or the ocean.*



photos-Art Michaels

*This wetland is located in Pike County off of Route 507. Dense wetland vegetation provides important habitat for many animals. It also cleans the water by filtering out silt, nutrients and other suspended materials.*

woods or fields. An area's geology sometimes creates a wetland because water seeps to the surface, as it does in a small spring. Wetlands can even be temporary, like a vernal pond. These ponds fill with rainwater each spring or fall, but may become dry over the summer.

We often think of wetlands only as swamps. You would be amazed at how

many different kinds of wetlands there really are. And each type has unique features. Because there are so many, scientists categorize them in several groups and types. Coastal wetlands (marine or estuarine) include shrub wetlands, salt marshes, mangrove swamps, brackish marshes, Delmarva bays, deltas and lagoons. Inland wetlands (riverine, lacustrine or palustrine) include bottomlands, freshwater marshes, shrub and forest wetlands, ephemeral ponds, peatlands, springs, water seeps, bogs, mires, moors, muskegs, fens, potholes, sloughs, wet meadows and swamps. I bet you'll think twice before calling a wetland just a swamp!

Wherever wetlands are found or whatever they are called, all wetlands share some common characteristics. One is that they must support water-tolerant (hydrophytic) plants. These plants have special adaptations to survive in flooded areas and in environments with limited oxygen. Another characteristic of wetlands is the presence of saturated (hydric) soils. These soils do not drain well and are saturated long enough to create an anaerobic (low oxygen) condition. The final tipoff is the presence of a hydrological regime. In layman's terms, this means the presence of water at some point in the year. This hydrology is what causes the presence of the other two factors—hydric soils and hydrophytic vegetation. When you find these three characteristics together, then you have a wetland. Trying to figure out which type of wetland you have is another story for another day.

### Healthy habitat connection

Wetlands are vital to fish and wildlife. They clean the water and provide habitat for reproduction, feeding and resting. Wetlands are like natural tubs. Their location in areas of low drainage allows them to trap water and all the suspended materials that it carries. Dense hydrophytic vegetation acts as a filter. Wetland soils also act as natural sponges that absorb and store excess flood and surface waters. These attributes reduce soil erosion, trap sediment and clean the water. And there is nothing more important to fish and shellfish than clean water.



*Commission employees work with U.S. Fish and Wildlife Service employees in a cooperative effort to establish a wetland mitigation site at the Commission's Pleasant Gap Fish Culture Station, Centre County.*

Bottom-dwelling filter-feeders like freshwater mussels and clams can't survive if they are smothered with a layer of silt. Paddlefish can't strain food from water that looks like the chocolate pudding you had for lunch. Their gill rakers would become clogged with mud instead of the tasty zooplankton and aquatic insects they need. Clean, unsilted water is also impor-

tant for spawning fish. Silt covers eggs and deprives them of oxygen from the surrounding water. The eggs of bass, trout, minnows and other fish need clean gravel to hatch successfully.

You might wonder how much difference a wetland makes in removing silt. Are they a potential solution to our siltation problems? Decide for yourself. Studies have shown that some wetlands remove 95 percent of the sediments in the water column by simply slowing the water velocity.

Wetlands clean the water in other ways, too. Wetland plants and microbes remove excess nutrients from our waters, which helps prevent eutrophication (over-fertilization of aquatic ecosystems). Eutrophication is one of the biggest problems threatening our region's most precious resource—Chesapeake Bay. Years of land development, road construction, agriculture, forest removal and wetland filling have left our river's shores open to erosion. Silt and excess nutrients eventually wash downriver to the Chesapeake. We might not be able to stop the land use trends; after all, we need places to live and food to eat. But if we were smart, we'd leave the wetlands alone to do their cleanup job.

Wetlands also provide food, vegetative cover and water. Many commercial or recreational fish breed and grow in wetlands that surround open waters. They include perch, pickerel, bass, sunfish, muskellunge, catfish and walleyes. Aquatic insects, amphibians and reptiles also live and breed in wetlands. Unfortunately, some of these species are endangered or threatened because they have lost wetland habitat.

The bog turtle is one such species. It's a "habitat specialist" that likes to keep its "feet wet and back dry." It prefers marshy sedge meadows and wet pastures. Its range is right in the middle of our state's most populated and fastest growing areas.

Fortunately, the "endangered" label also means that certain wetlands are afforded special protection. It's ironic that the critter became endangered because it lost habitat, and now the habitat is protected because that animal is found there.

Even animals that live nowhere near a wetland depend on wetlands. This might not seem to make sense at first. Nevertheless, some animals live in other habitats but must return to a wetland to breed. The Jefferson salamander is a perfect example. As an adult, it lives in damp forestlands. During the spring, it returns to the same vernal (ephemeral) pond to breed. Vernal ponds fill with water in late winter or early spring. Visit them in the summer and you may never notice them because they often dry up. These pond filling and breeding cycles have continued for thousands of years in some areas. It's interesting to think how an animal hatched in a small wetland can live out the rest of its life on dry land.

### Wetland threats

You might think that all these wonderful fish and wildlife benefits and values would convince us to protect wetlands better. Historically, this was not the case. Before the arrival of Europeans, there were some 221 million acres of wetlands in what became the United States. Today, there is less than half that number. Wetlands were drained, dredged, filled, leveled and flooded for other land uses. The rate of wetland loss has slowed to about 290,000 acres per year. We are getting better at protecting them, but we are far from our potential.

There are also other threats to wetlands. One of those threats is the introduction of non-native invasive plant species, including purple loosestrife. It was brought to the East Coast from Europe and Asia in cargo ships during the 1800s. It has since spread across the country to the Northwest Coast.

This aggressive and prolific plant outcompetes with native wetland plants. It forms dense monotypic stands that are difficult to control. It is less beneficial than native plants for food, shelter and wildlife nesting sites. Purple loosestrife can be seen growing along many Pennsylvania waterways, like the shores and islands of the lower Susquehanna River.



*The endangered bog turtle is a "habitat specialist." This means that the bog turtle prefers marshy sedge meadows and wet pastures. Loss of habitat has caused its demise. Its unique wetland habitat is now given special protection.*

### Protecting the vital link

Fortunately, wetlands are protected under the Dam Safety and Encroachments Act and the federal Clean Water Act. The protection process is confusing for most of us. The easiest way to think of wetlands protection is with three simple words: Avoid, minimize and compensate.

There is nothing to worry about if you have wetland property that you don't plan to develop. It's a different story if you decide to build, fill or "encroach on" a wetland. A delineation must be completed

to mark boundaries so that the wetland can be "avoided." This is the key ingredient in the protection recipe; otherwise, if a project encroaches on a wetland, a project is thrown into the permitting process. This is where the agencies come in. The U.S. Army Corp of Engineers, Department of Environmental Protection, conservation districts, Fish & Boat Commission and other agencies all play a role. These agencies recommend methods to "minimize" the effects on a wetland. The last option is to "compensate," if a wetland must be affected. This means that the project owner has to create a wetland or make a monetary contribution to a Wetland Replacement Fund.

The Commission also helps protect and enhance wetlands in other ways. It sets rules and regulations to protect fish, amphibians and reptiles that live in wetlands. Any wetland that harbors endangered or threatened animals always receives top priority. The Commission also enforces regulations to protect those species and their wetland habitats. The Commission even enhances wetland habitats through restoration and stream-bank fencing projects. One example is a cooperative effort between the Commission and the U.S. Fish and Wildlife Service to establish a wetland replacement site at Pleasant Gap Fish Culture Station. This wetland will eventually become a home for fish and other wildlife.

All this attention and protection may seem extreme, but it's well worth the effort when you ponder the important role that wetlands play in our lives. You

just never know when a wetland might give up another secret like a new amphibian species, a fuel source, a food item or a cure for a deadly disease. Wetlands are truly a vital link that connects everything we need to survive. □



*The Jefferson salamander cannot reproduce without wetlands. It lives on the forest floor, but must return to temporary vernal ponds to breed each spring.*