

Wetland Wonders of the Musconetcong Watershed

Come explore the mysteries of nature hidden in these wetlands and discover the vast treasures they contain.

Wetland Basics

Covering more than 7,400 acres, the wetlands of the Musconetcong River Valley come in a variety of shapes and sizes. Some are permanently inundated with water, such as lakes, ponds and streams. Others, such as swamps, bogs and marshes, are temporarily saturated with water to the extent that they develop different soil characteristics and support plants and animals adapted to these unique water and soil features. Wetlands are identified by the presence of a specific combination of plant, water and soil attributes. (See Figure 1).

Characteristics of Wetlands

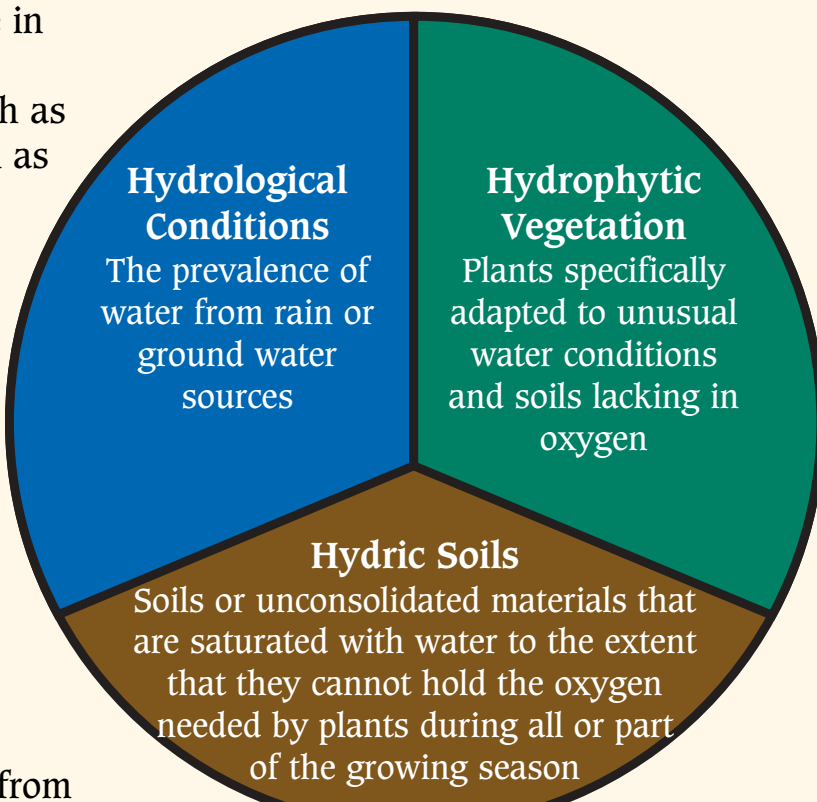


Figure 1 - Wetlands exhibit at least two of the three characteristics.

Two major categories of wetlands can be found in New Jersey. *Coastal* wetlands are found along the Atlantic Ocean where a beach area is protected from wave action by a barrier island, forming a salt marsh, or where a river meets the ocean, forming a tidal marsh. Wetlands along the ocean are flushed with seawater with the rise and fall of the tides. *Inland* wetlands found throughout New Jersey are replenished with fresh water from rain or ground water and are formed as the result of several factors:

Glacial **Deposits** of rocks and sediment that blocked the river valleys in Northern New Jersey, creating a number of the lakes along the upper Musconetcong.

Depressions scoured out by the movement of glaciers or shaped by large chunks of melting ice.

High water table conditions where groundwater is near or exposed to the surface.

Erosion in floodplain areas that causes sediment to shift as part of the cutting and flooding of rivers and streams.

Interference on the part of man or wildlife. Beavers build wetlands when they construct a dam that ponds upstream water. Farm ponds, quarries, canals and reservoirs are some of the wetlands shaped by man-made activities.

The wetlands within the Musconetcong River watershed are considered *inland* wetlands.



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Waterloo Village, Allamuchy Township
Emergent Floodplain



Mahlon Dickerson Reservation, Jefferson
Township - Rock Hill, Vernal Pool



Mahlon Dickerson Reservation, Jefferson
Township - Saffin Pond, Emergent and
Shrub-Scrub Floodplain



Mahlon Dickerson Reservation, Jefferson
Township - Pine Swamp, Forested
Depression with Buttressed Trunk



Allamuchy Mountain State Park, Allamuchy Township
Emergent Depression



Asbury Riverfront, Franklin Township
Forested Floodplain



Eves Mountain Inlet Sanctuary, Hopatcong Borough
Aquatic Bed



Point Mountain, Lebanon Township
Forested Seep



Riverside Park, Byram Township
Forested Floodplain



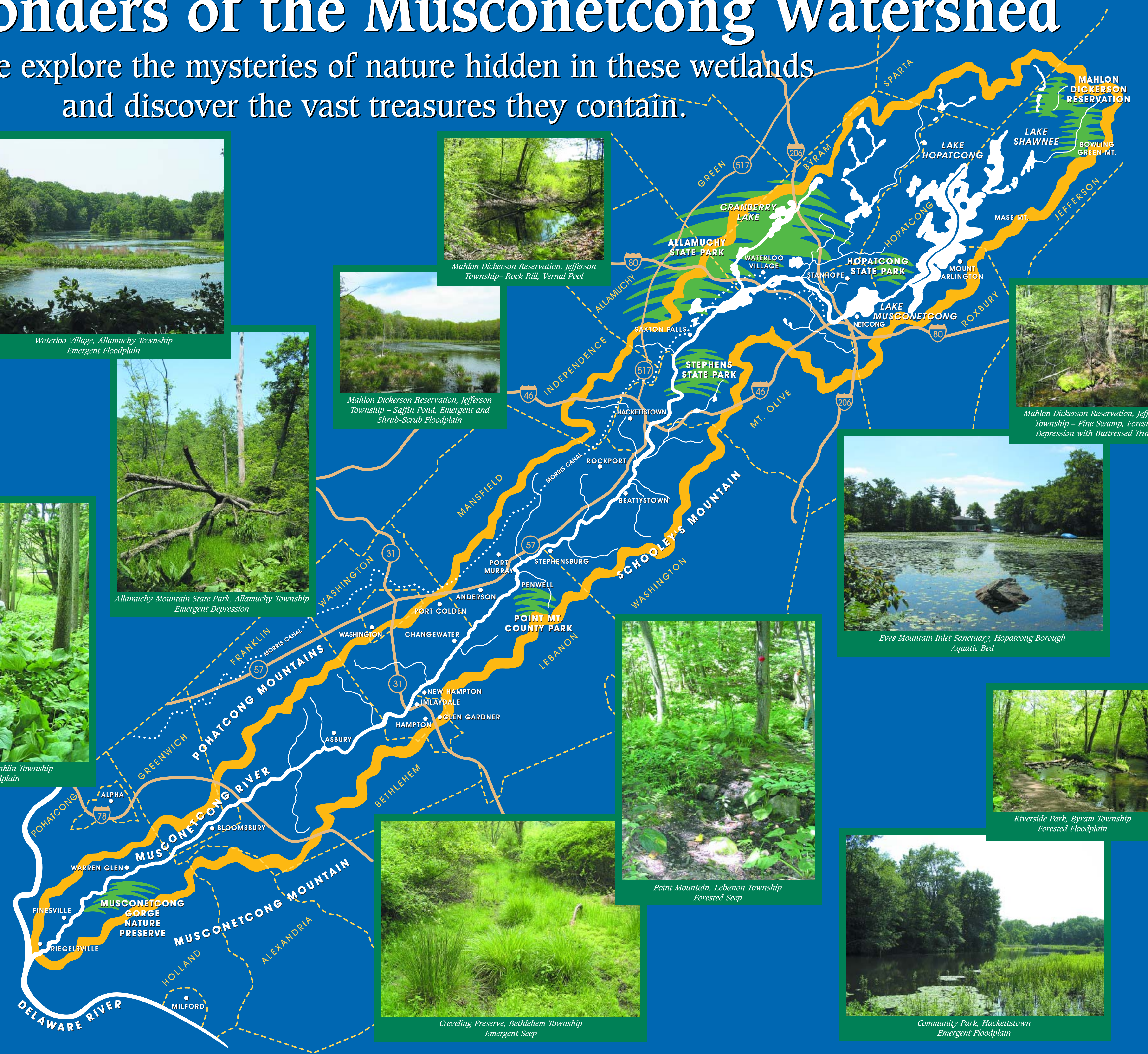
Creveling Preserve, Bethlehem Township
Emergent Seep



Community Park, Hackettstown
Emergent Floodplain



Musconetcong River Fishing Access, Franklin Township
Forested Floodplain





Blueberry
(*Vaccinium*)

Skunk Cabbage
(*Symplocarpus foetidus*)

Blue Flag Iris
(*Iris versicolor*)

Soft Stemmed Bulrush
Larry Allain. USDA-NRCS Plants Database

Red Maple
(*Acer rubrum*)

Buttonbush
(*Cephalanthus occidentalis*)

Sensitive Fern (*Oncoclea sensibilis*) and
Duckweed (*Spirodela polyrrhiza*)

Jewelweed
(*Impatiens capensis*)

Tussock Sedge
(*Carex stricta*)

Smooth Alder
(*Alnus serrulata*)

Plant Communities

Inland wetlands can support different kinds of plant communities. (See Figure 2)

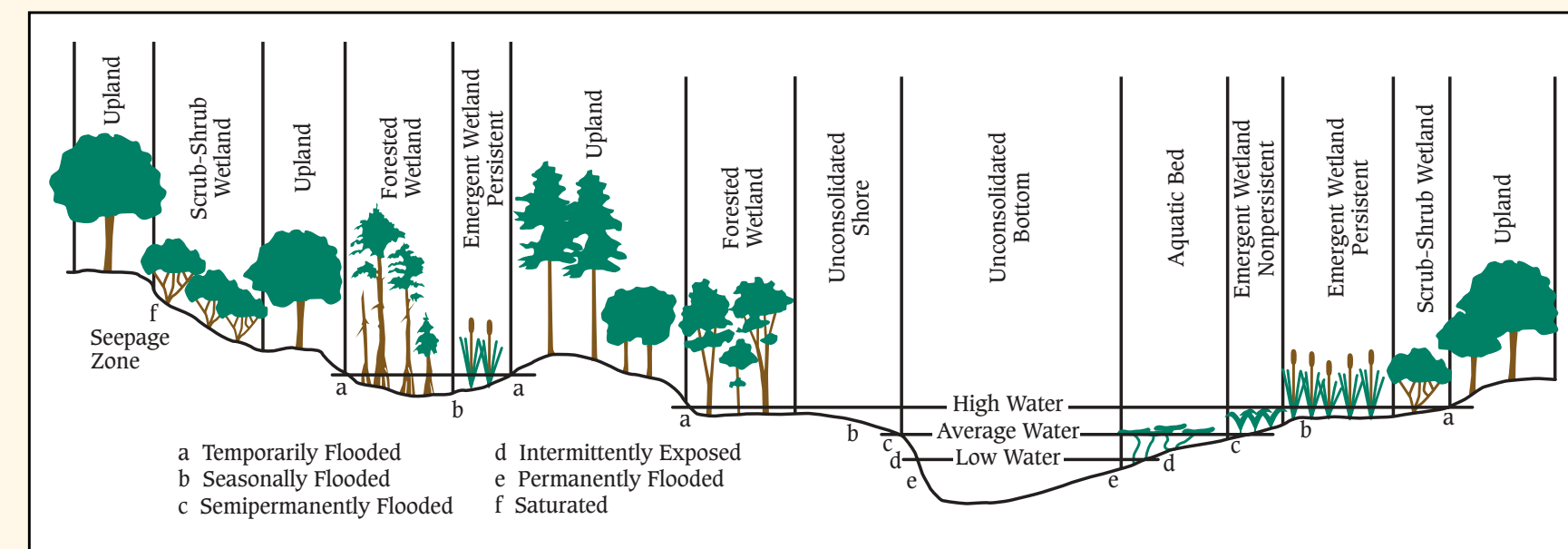


Figure 2 - Examples of Plant Communities

Forested

Most of New Jersey's *inland* wetlands consist of wooded areas with mature trees. The forested wetlands along the Musconetcong River consist predominantly of red maples in association with other deciduous trees including black willow, pin oak, silver maple, sycamore and white ash. The forest floor is covered with shrubs, such as winterberry, high-bush blueberry, silky dogwood and swamp azalea, along with a variety of herbaceous plants like skunk cabbage and jack-in-the-pulpit. To adapt to the wet environment, some woody plants develop what are known as *adventitious roots, buttressed trunks or "knees"* that help the plant get the oxygen needed for growth. Waterfowl breed in forested wetlands located along floodplains. In upland areas, forested wetlands provide a habitat for black bear in addition to a variety of birds, amphibians and reptiles. Shallow depressions, usually filled with water for a short time, are known as vernal pools and are important breeding grounds for woodland frogs and salamanders.

Shrub-Scrub

Areas thick with shrubs and trees less than 20 feet tall are called shrub-scrub wetlands. In addition to young red maple trees, a number of shrub species can be found here including alders, arrowwood, blackberry, buttonbush, meadowsweet, poison sumac, red-osier dogwood, swamp rose, sweet pepperbush and willow. Sphagnum moss thrives in some shrub-scrub environments. Herbaceous plants, consisting of cattails, sedges, marsh fern and reed canary grass, complement the shrub growth. Game birds like pheasants, ruffed grouse and ducks prefer the shrub-scrub vegetation along with a variety of songbirds, including warblers.

Emergent

Emergent wetlands consist primarily of herbaceous vegetation. Woody materials such as trees and shrubs are absent. Emergent wetlands are popular resting and feeding areas for migrating birds in addition to providing breeding grounds. Common species include geese, red-winged blackbirds and wading birds, like the heron. An abundance of mammals, reptiles and amphibians can also be found here such as beavers, muskrats, snakes, frogs and turtles. Water willow, pickerelweed, soft rush, woolgrass, smartweed, rice cutgrass, bur-reeds, sweet flag and common reed are just a few of the many herbaceous plants found in emergent wetlands. Some emergent plants are considered to be persistent in that they can still be seen, even if part of the plant dies back until the next growing season. Bulrushes and cattails are examples of persistent emergent plants. Other emergents are non-persistent, breaking down to the extent that the above-ground portions of the plant are carried away by flowing water. In certain instances, the main body of the plant may lie dormant beneath the water's surface, invisible to the naked eye. Arrow arum is an example of a non-persistent emergent. Many emergent plants have developed unique methods for transporting oxygen in a watery environment. For example, cattails have tube-like tissue with large air spaces called *aerenchyma* that provide oxygen to the root system.

Aquatic Bed

Aquatic bed environments host plants that float freely in the water or have leaves that float on the surface to get the oxygen they need to grow. Free-floating plants include duckweeds and algae. Water shield, spatterdock and white water lily are examples of floating-leaved species. Wild celery, naiads, coontail, and waterweeds are more commonly found in lakes and ponds and are typically submerged beneath the water's surface. Fresh-water fishes, such as chain pickerel, bullheads, carp, and trout, rely on aquatic bed wetlands because they feed on wetland plants and spawn in wetlands areas. The aquatic environment also supports a variety of insect life, including waterstriders and dragonflies.

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Yellow Warbler
Steve Maslowski/USFWS



Raccoon Tracks



Black Bear Cub
R. L. Bridges/USFWS

Swamp Azalea
(*Rhododendron viscosum*)

White Water Lily
(*Nymphaea odorata*)

Arrow Arum
(*Peltandra virginica*)

Forget-Me-Not
(*Myosotis scorpioides*)

Soft Rush
(*Juncus effusus*)

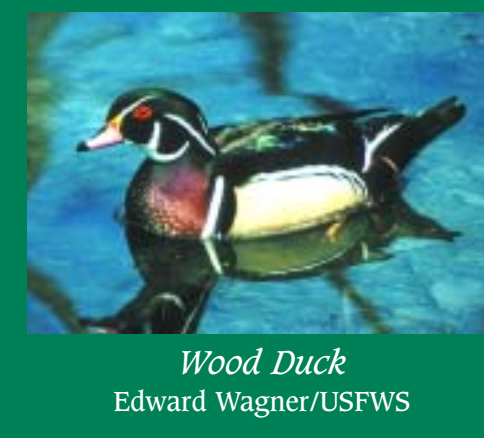
Narrow-Leaved Meadowsweet
(*Spiraea alba*)

Bird Blind

Big-Leafed Arrowhead
(*Sagittaria latifolia*)

Swamp Rose
(*Rose palustris*)

Pin Oak
(*Quercus palustris*)



Wood Duck
Edward Wagner/USFWS



Shrub-Scrub Wetland



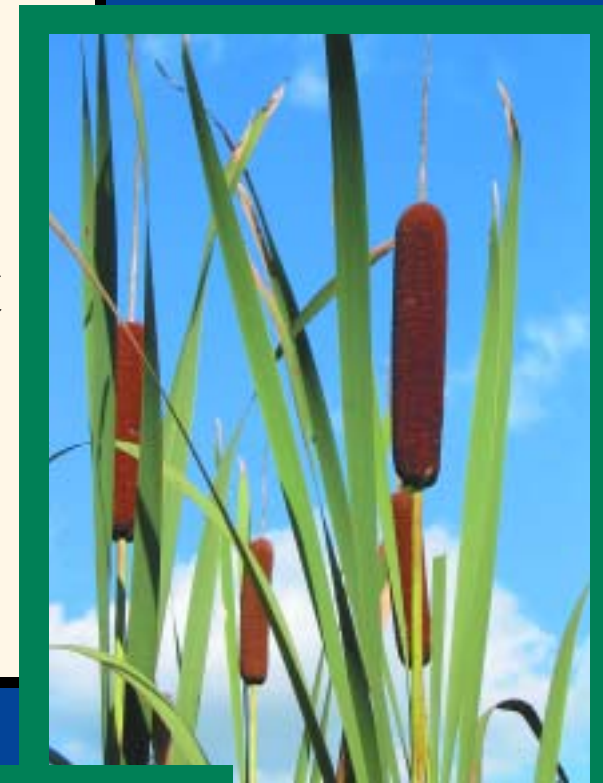
Green Frog



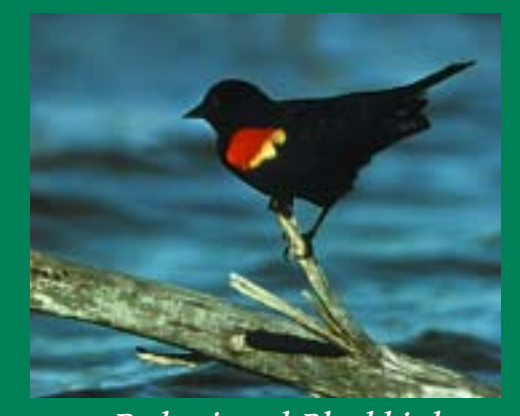
Painted Turtle
W. L. Franch/USFWS



Turtle Nest



Cattails



Red-winged Blackbird
Kent Olsen/USFWS



Muskrat
R. Town/USFWS



Root System of Common Bladderwort
(*Utricularia macrorhiza*)



Dragonfly
LaVonda Walton/USFWS

Regulatory Protections for Wetlands

Over a 20-year period from the mid-1950's to the mid-1970's, more than 11 million acres of wetlands were lost nationwide, equal to an area twice the size of New Jersey. The 1999 Sustainable State Report conservatively estimates that New Jersey has lost more than 300,000 acres of wetlands. The Clean Water Act enacted by the U.S. Government, in combination with the New Jersey Wetlands Act of 1970 and Freshwater Wetlands Protection Act of 1987 (as amended), prevents wetlands from being dredged, drained, filled or damaged without a permit and requires a surrounding zone to act as a protective buffer. In the case of vernal pools, no disturbance is allowed under any circumstances. Although New Jersey has one of the strongest wetland protection laws in the nation, approximately 100 acres of wetlands continue to be lost per year across the state.

Wetlands Benefits

Wetlands benefit society in a number of ways:

- **Improve Water Quality and Availability**
As a natural water filtration mechanism, wetlands keep our drinking water supplies plentiful and clean. They are so effective at improving water quality that some communities are constructing wetlands as part of their wastewater treatment system to remove chemicals and sediment.
- **Maintain Biodiversity**
Across the U.S., wetlands sustain nearly 200 amphibian species, approximately 5,000 plant species and at least 30% of all native birds, including 1/3 of our rare or endangered wildlife. The fruit, nuts, insects and small prey found in wetlands are important components of the food chain needed to maintain biodiversity.
- **Contribute to the Economy**
Wetlands are the most productive type of ecosystem and support a number of commercial industries. The natural resources found in wetlands are used as forage for livestock, timber, fish, fur, peat and food, particularly blueberries and cranberries.
- **Provide Recreational Opportunities and Aesthetics**
The natural beauty of wetlands makes an ideal setting for recreational activities, including bird watching, hiking, biking, boating, swimming, fishing and hunting. Wetlands also make great outdoor classrooms for environmental education programs focusing on ecological principles.

Wetland Functions

Wetlands serve several important environmental functions:

- **Wetlands Provide Protection from Floods**
Wetlands provide a temporary storage area for precipitation, stormwater runoff and floodwaters during a storm, reducing peak flows downstream. After the storm is over, wetlands gradually release floodwater back into the lake or stream.
- **Wetlands Stabilize Shorelines and Prevent Erosion**
Vegetated wetlands help to stabilize the shorelines of lakes and banks of rivers by anchoring soils with dense root growth. Wetland plants also help to dampen the wave energy from wind and recreational activity along shorelines.
- **Wetlands Purify Water**
The leaves, stems and branches of plants slow the flow of runoff entering a wetland, filtering out and trapping sediments. Nutrients in the sediment such as phosphorus, that would otherwise pollute lakes and streams, are stored or used by wetland plants for growth. Wetlands also transform nutrients in runoff, such as nitrogen through complicated biochemical processes, reducing the total nitrogen entering our waterways.
- **Wetlands Provide Habitat**
Wetlands are home for a variety of animals. Fish and invertebrates depend upon wetlands for oxygenated water, plant food and spawning grounds while birds rely on wetlands for seeds, permanent nesting spots and migratory resting areas. Amphibians require wetlands for breeding purposes. Reptiles and mammals find shelter in the diverse vegetative cover. 60 rare species in New Jersey depend upon a wetland environment for their survival.

Prospects for Wetlands of the Musconetcong Watershed

Although the current federal and state regulations have stemmed the loss of wetland habitats from human acts of destruction, wetlands still need our protection. Scientific research continues to uncover new threats. Recent findings show that invasive plants, like purple loosestrife, are overtaking wetland areas, jeopardizing biodiversity. Wetlands are also affected by changes in temperature, sediment loading and the chemical composition of stormwater runoff collected from surrounding areas, so the manner in which we develop land for residential, commercial, institutional and industrial purposes will impact wetlands accordingly. Since wetlands act as an interface with groundwater resources, the demands placed on wetlands should not exceed their capacity to perform a wide range of environmental functions, in order to maintain fresh water supplies. Connections between wetlands and nearby open space areas are also needed to provide corridors for the movement of wildlife to maintain biodiversity.

The future of these wetlands depends on us.

Municipalities concerned about protecting wetlands can utilize a number of preservation, planning, and enforcement tools to safeguard these natural resources including:

- Land acquisition
- Erosion and sedimentation control requirements
- Stream corridor protection
- Zoning regulations
- Stormwater management plan

Residents and businesses can also participate in efforts to directly and indirectly protect wetlands by:

- Landscaping with native plants
- Recycling waste
- Conserving water
- Properly disposing of hazardous materials.

Adopt-a-wetland programs, watershed association activities and environmental education programs are great ways for communities to get involved.

Stewardship begins with knowledge. Enjoy visiting the wetlands along the Musconetcong...to look, listen and learn...

References

To learn more about our wetland resources:

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Wetlands Education: http://www.epa.gov/region5/water/wshednps/topic_wetlands_education.htm

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Bald Eagle Chicks
Dave Menke/USFWS



Beaver
US Fish and Wildlife Service