

Wetlands in the Tar-Pamlico River Basin

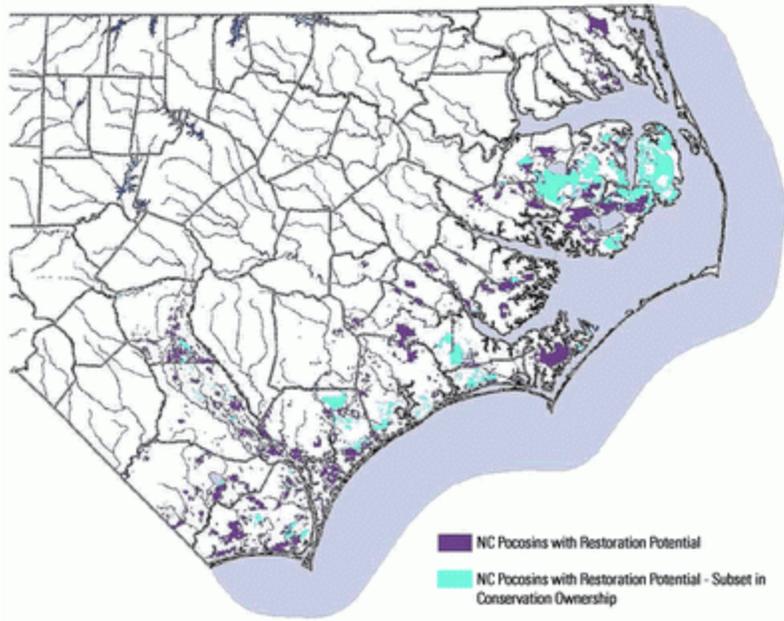
Wetlands are a key component of the state's water resources and are vital to the health of downstream ecosystems. There are various types of wetlands and they perform different natural functions, many of which are important to coastal North Carolina. The role of wetlands as wildlife habitat has long been acknowledged, but more recently the role of wetlands in protecting water quality, preventing floods and erosion, and maintaining fish populations have become obvious.

Wetlands include marshes, swamps, seeps, bogs, pocosins, and fens. Wetlands are land surfaces that are wet at least part of the year because their soils are either saturated or covered with a shallow layer of water. To be classified as a wetland, the area must meet all three criteria of wetland vegetation types (also known as hydrophytic vegetation), hydric soils and hydrologic features. North Carolina recognizes those areas that are considered jurisdictional wetlands by the United States Army Corps of Engineers (also known as 404 wetlands), as well as Isolated Wetlands which are only recognized by the State. Isolated Wetlands are identified by the United States Army Corps of Engineers because of a lack of hydrologic connection.

The name "pocosin" means "swamp on a hill" in the Algonquin Indian language. Seventy percent of the nation's pocosins are found in North Carolina, and they comprise approximately 50 percent of the state's freshwater wetlands. The majority of these pocosin wetlands are located within the Tar-Pamlico river basin. Found in the southeastern Atlantic coastal plain, pocosins are nutrient-poor, forested or shrub wetlands that evolved over the past 10,000 years due to blocked drainage and peat accumulation. The depth of the organic material ranges from 8 inches to more than 51 inches. The water table is near the surface from 6 to 12 months each year, and in winter sometimes rises above ground. Water moves slowly as sheetflow across the surface towards the estuary.

Pocosins serve the following functions:

- Serve as the last refuge for many upland and floodplain species requiring large blocks of habitat, especially area-sensitive, forest-interior birds and the black bear;
- Provide important habitat for four federally-listed endangered species and one federally-listed threatened species. Two other State-listed endangered species are also found there;
- Stabilize estuaries by controlling the rate of freshwater flow thereby regulating salinity. Much of the State's \$63 million commercial fishery depends on this estuarine regime;
- Contain 6 National Wildlife Refuges, 1 national and 2 State forests, 7 State parks, 5 State game lands, and 2 State natural areas. About 18 percent is owned by Federal and State forestry agencies.



Water-quality protection

During rain events, stormwater runoff moves into rivers and sounds. This runoff may contain toxins, bacteria, sediment or nutrients that can harm aquatic life and contaminate drinking water. Stormwater runoff is the number one non-point source pollutant in the state.

Wetlands are natural buffers between uplands and waterways. By trapping sediment, removing nutrients and detoxifying chemicals, wetlands act as efficient and cost-effective filtration systems. When runoff enters a wetland, many of the harmful components are removed before the water enters a stream.

In the lower Tar-Pamlico River Basin, nitrogen from nonpoint sources may be attributable to observed eutrophication, hypoxia, and other ecological degradation. However, denitrification via a vis depressional (non-riparian Carolina bays and pocosins) wetlands can be a significant landscape sink for nitrogen. (Ator, S.W. and others)

Wooded wetland corridors along headwater creeks are the most important filters of agricultural runoff in the coastal area. Bottomland hardwoods and swamp forests along rivers remove sediments, nutrients and toxic chemicals from the river when floodwaters run through them. Wetlands are vital for protecting the quality of coastal sounds because they remove upstream pollutants from the water.

Flood protection

Wetlands mitigate the effects of damaging floods by storing and preventing rapid runoff of water. Large pocosin wetlands can store enormous amounts of water and slow runoff of freshwater into brackish estuaries, which is especially important during hurricane events. Bottomland hardwood wetlands along streams provide holding basins for floodwaters and slow the water to reduce flood damage.

Wetlands store water after rains and release it gradually into groundwater or through surface outflow. This function of wetlands helps maintain more constant water levels in streams.

Shoreline-erosion protection

Wetland vegetation is frequently very dense, both the aboveground portion and the root system. This plant cover can absorb energy from floods and wave action, including hurricanes. This mechanical absorption binds soils and encourages sediment deposition, thereby stabilizing shorelines along coastal streams, lakes and sounds.

Fish and wildlife habitat

Wetlands provide essential habitat for many species of fish, wildlife and plants. In North Carolina, more than 70 percent of the species listed as endangered, threatened or of special concern, depend on wetlands for survival. Additionally, many common species of waterfowl, fish, birds, mammals and amphibians live in wetlands during crucial stages of their lives.

Coastal marshes provide nursery areas for finfish and shellfish. These marshes are among the most productive natural systems in the world, and this productivity makes the adjoining sounds some of America's richest fisheries.

Large pocosins serve as refuge areas for wilderness animals, such as black bear and bobcat. Carolina bays are critical habitat for many uncommon amphibians and reptiles. Pine savannas are host to numerous rare plants, such as insectivorous species, and to the endangered red-cockaded woodpecker.

Without its wetlands, coastal North Carolina would have much less biological diversity and would be a far less interesting place to live, visit or recreate in.

Economic importance of wetlands

Numerous economically important products and activities depend on wetlands. Fish and shellfish vital to our commercial and sports fisheries use coastal saltmarshes for habitat and food. Inland freshwater wetlands also affect estuarine water quality and productivity; thus they too influence fisheries.

An important use of freshwater wetlands in coastal North Carolina is timber production. Many wetland areas, if managed properly, can produce forest products without substantially detracting from their other wetland functions.

Other traditional wetland uses of economic importance include hunting, fishing and trapping. The water-filtration and flood-protection roles of wetlands are also of economic value, since they save money that would otherwise be spent on runoff control, water treatment and property preservation.

In addition to hunting and fishing, many wetlands offer opportunities for birdwatching, canoeing and photography. Almost all of the public recreation areas in the coastal area include significant wetlands. Visits to wetland wildlife refuges are an important part of the tourist economy in some coastal counties.

Development in wetlands

Development in wetlands in North Carolina requires a permit from the U.S. Army Corps of Engineers and usually the NC Division of Water Resources (401 Wetlands Certification). Wetland permits are processed and issued by the U.S. Army Corps of Engineers and the NC Division of Water Resources and the N.C. Division of Coastal Management (CAMA wetlands), or solely the NC Division of Water Resources (Isolated Wetlands). Wetland permits are meant to protect the valuable wetland functions described previously. Before disturbing wetlands, consult with one of these agencies.

Wetland Acreage In North Carolina: North Carolina is estimated to have had 11.1 million acres of wetlands of which 2.5 million acres were natural pocosins. By early 1993, only about 5.0 million acres of wetlands remained in North Carolina. Of the original 2.5 million acres of pocosins, 695,000 acres (31 percent) remained in their natural state. A third of the original pocosin acreage had been totally converted, and 36 percent had been partially altered or was scheduled for development by the owners. Some pocosins that were threatened with development in the recent past have been purchased by or donated to the U.S. Fish & Wildlife Service to become part of the Alligator River National Wildlife Refuge and Pocosin Lakes National Wildlife Refuge. In addition to the pocosins in these two refuges, approximately 363,000 acres of pocosins currently receive some level of protection as natural areas, although some of these have been partially altered. Current estimates of total wetland acreage in North Carolina are 4.0 4.5 million acres.

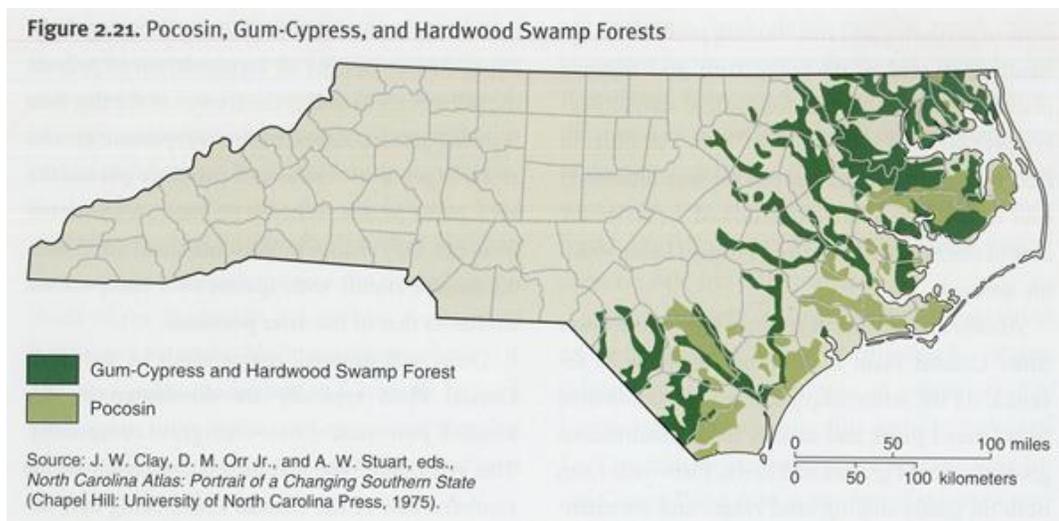
Trends: Since the 1950s, forestry and drainage of wetlands for agriculture have caused a steady decline in North Carolina's wetlands. Between 1973 and 1983, North Carolina lost 1.2 million acres of wetlands, which was the highest net loss of wetlands within the southeastern states. Nearly all of these losses were forested and shrub wetlands

To date conversions for forestry and agriculture have had the greatest impact on the area's wetlands. However, currently, the opportunities for profitable wetland conversion and development of these wetlands for silviculture or agriculture are limited. Mining the Pocosins for peat, however, represents a legitimate concern.

Development has also had an impact on wetlands. These environmental effects include the fragmentation of wildlife species which results in less species diversity and in fewer numbers. During rain events in unaltered conditions, runoff rises slowly after storms, often peaking several days after the rain event while drainage systems interrupt the sheetflow that moves slowly across the wetland surface. This process attenuates the flow of water and mitigates the salinity of receiving waters. Nutrients, pollutants, and silt from agricultural runoff are filtered, as well. Once drainage is installed, peak and annual flows increase, and pulses of freshwater containing increased loads of chemicals and sediments are discharged into streams, marshes, and shallow estuarine nursery areas.

Over 90 percent of North Carolina's commercial fish harvest depends on the estuaries. Studies have shown that unaltered areas maintained stable salinity, while areas which received drainage from ditched pocosins and non-alluvial swamp forests had salinity which varied by 100 percent over short periods of time. The altered areas produce fewer shrimp, finfish, and oysters. Other studies have linked agricultural drainage to excessive algal blooms and food chain disruptions.

Environmental protection for the Pocosins was strengthened with passage in 1986 of fairly restrictive peat mining regulations by the State. These regulations require that any peat mining project must include controls that produce runoff which closely approximates that which would have occurred had the site developed naturally to vegetative maturity. While these regulations are forceful in their treatment of discharges and in reducing adverse impacts to water quality, they fail to address mitigation for wetland losses or degradation due to peat mining.



Literature Cited

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