

# The Wonders of Wetlands: What Makes a Wetland a Wetland?

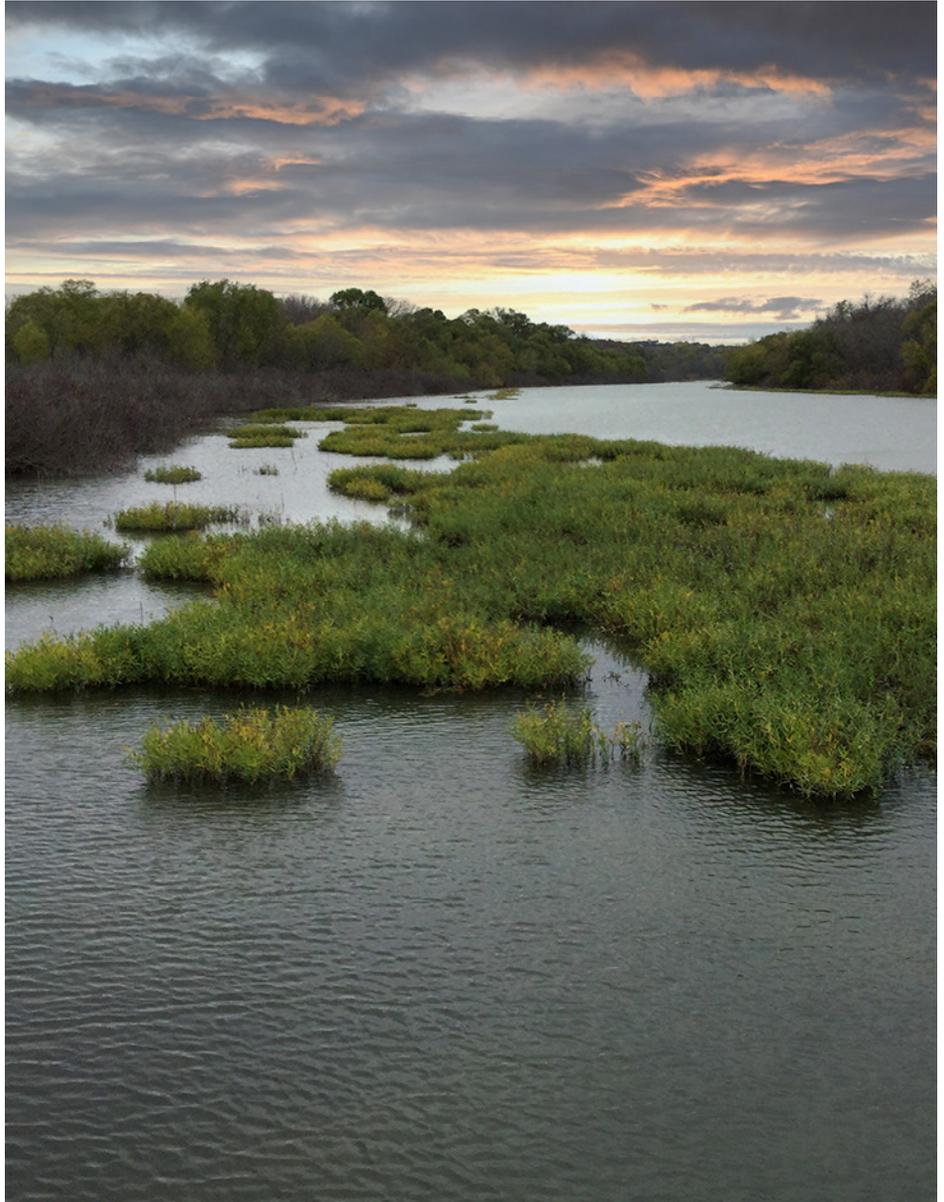
By Pete McKone, CWB, Wetland Scientist and Friends Board President

Wetlands have endured a checkered past in our collective history in the U.S. Up to the late 1800s, we viewed wetlands as wastelands to be removed and developed. These systems often occupied valuable land that could be converted into productive agricultural acreage. In the mid-1800s, we had laws that promoted the removal of these systems. Beginning in 1849 and updated through 1860, the Swamp Land Act authorized the construction of levees and drains to “reclaim the swamp and overflowed lands”<sup>1</sup>.

The tide began to turn indirectly for wetlands in 1899 with passage of the Rivers and Harbors Act. This Act regulated activities in navigable waters throughout the U.S. and is still in place today. Sixty years later, the environmental movement began in earnest and resulted in a number of landmark environmental laws. The primary law protecting waters of the U.S., which include wetlands, is called the Clean Water Act. This law centers on the prevention, reduction, and elimination of pollution in our nation’s waters in order to restore and maintain their chemical, physical, and biological integrity<sup>2</sup>.

Over the years, we have impacted wetlands and other waters through land development practices, pollution runoff, agricultural activities, dam building, filling, encroachment, etc. As a result, life within our waters (i.e., fish, wildlife, and invertebrates) has been significantly impacted. Our rivers have caught fire. Flood impacts have increased. Eating fish from a large number of our waterbodies has been banned. However, with the new laws and regulations passed by the federal government as well as some state and local laws/ordinances, our waterbodies have shown a marked elevation in quality in recent years. We have a long way to go, but we are making progress.

More than a decade after the Clean Water Act was passed, we finally received our first official definition of what constitutes a regulated wetland. It was recognized that a wetland should have three primary factors: wetland plants (hydrophytic vegetation), wetland soils (hydric soils), and wetland hydrology. Due to the hydrologic regime in wetlands, hydrophytic vegetation has developed unique adaptations to survive—and thrive—in wetland communities. In addition, hydric soils have undergone unique changes as a result of the anaerobic environment brought on by the hydrologic regime.



*Wetlands are sometimes referred to as the kidneys of the world; they capture and filter harmful pollutants and support many fish and wildlife species. In addition, they moderate floods, support groundwater recharge, and provide other critical functions. Pete McKone Photo.*

Not all species of plants can survive in a wetland environment. Through the years, scientists have developed a list of plants in the U.S. and categorized them by their affinity to wetland and upland environments. Bald cypress (*Taxodium distichum*) develops its famous knees, or, if you want to sound scientific, “pneumatophores.” Other species have buttressed trunks (i.e. flared at the bottom)



*Cypress knees get their name from the woody projections the tree sends above the normal waterline. Pete McKone Photo.*

and adventitious roots. Still others have aerenchyma (plant tissue with air spaces), and others have shallow root systems. Some try to get as much of an advantage as they can and use two or three adaptations to help them.

Hydric soils are soils that have developed under anaerobic conditions. As a result, these soils can undergo a number of changes, accumulating or losing iron, manganese, sulfur, or carbon compounds as a result of extended saturation and anaerobic conditions<sup>3</sup>. Some develop a hydrogen sulfide odor (think rotten eggs). Others accumulate organic carbon since the soil microbes can't use carbon in these wet conditions. As a result, these soils develop mucky and peat layers. Other mechanisms that might occur are the chemical reduction, translocation, and accumulation of iron and manganese.

Wetlands are also dynamic systems and are usually in a constant state of change. There are many types of wetlands (i.e., playa lakes, prairie potholes, bogs, fens, marshes, swamps, etc.), and each has unique features. A large number of these wetland systems undergo a wet/dry cycle. So, sometimes you might not find water present during dry periods, but you can still find evidence of a wet environment. Things such as water marks on trees, crawfish

chimneys, flattened vegetation, debris lines, drainage patterns, and other indicators will tell a story of what's happening on the site. You might also dig down within the root layer and find a high-water table.

On Saturday, March 27, 2021, the Friends hosted its first event in The Wonders of Wetlands series. Each quarter over the next two years, we will host a new event in the series and explore the wonders of wetlands and how to identify them in the great outdoors. Each event will cover an in-depth topic and investigate the mysteries of wetlands and what makes them so special and valuable. Ancient societies recognized the value of wetlands, and we'll probe how these systems function, what services they provide, the fish and wildlife that rely on them, their history, and other interesting facts. Watch for future announcements as we schedule these events. Most will be held in-person at the Nature Center as pandemic restrictions allow.

<sup>1</sup> Library of Congress. Statutes at Large. <https://www.loc.gov/law/help/statutes-at-large/30th-congress/session-2/c30s2ch87.pdf> Accessed March 29, 2021.

<sup>2</sup> U.S. Environmental Protection Agency. The Clean Water Act and Federal Facilities. <https://www.epa.gov/enforcement/clean-water-act-cwa-and-federal-facilities>, Accessed March 29, 2021.

<sup>3</sup> United States Department of Agriculture, Natural Resources Conservation Service. 2018. Field Indicators of Hydric Soils in the United States, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.



*It takes a special type of plant to be able to survive in the wet conditions usually found in a wetland. These trees have adapted by growing shallow buttressed roots that are flared to provide stability and aid in gathering more nutrients. Pete McKone Photo.*