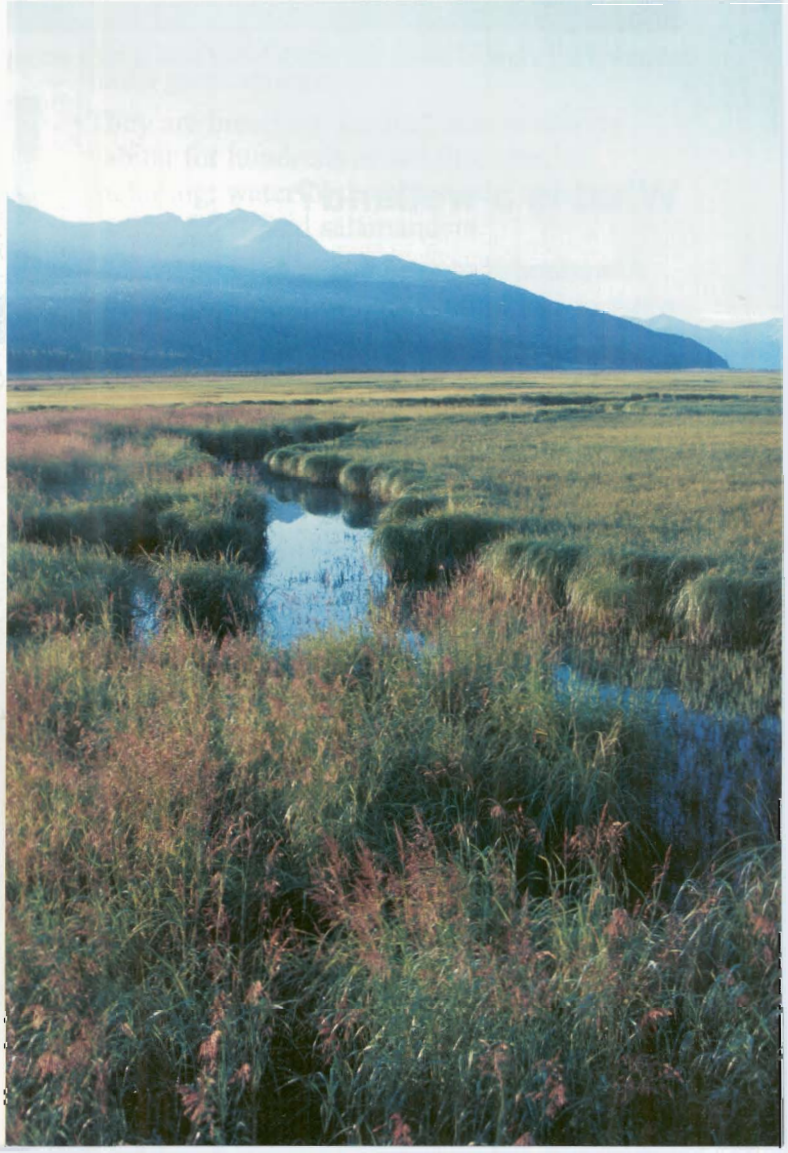
US Army Corps
of Engineers

Recognizing Wetlands

For additional information contact your local U.S. Army Corps of Engineers office.



Pitcher plant

Watershed view of wetlands associated with a lake ecosystem

What is a wetland?

A wetland is an area that is covered by shallow water or has waterlogged soils for long periods during the growing season in most years. Prolonged saturation with water leads to chemical changes in wetland soils, which in turn affect the kinds of plants that can grow in wetlands. Therefore, wetland vegetation often looks quite different from that of surrounding non-wetland areas.

Wetlands are known by many different names, some of which are specific to particular regions of the country. Wetlands that are dominated by trees and shrubs are commonly called *swamps*. Swamp forests associated with rivers and streams in the Southeast are locally known as bottomland hardwoods. Wetlands that consist of herbaceous vegetation, such as sedges, cattails, and bulrushes, are known as *marshes*. Marshes are highly variable and include fens, sloughs, potholes, and wet meadows. *Bogs* are generally dominated by sphagnum moss, which, when it dies, builds up in thick layers of peat. Extensive bogs in Canada and Alaska are called muskegs.

The information presented here will help you to determine whether you have a wetland on your property. If you intend to place fill material in a wetland or in an area that might be a wetland, contact the local District Office of the U.S. Army Corps of Engineers (Corps) for assistance in determining if a permit is required.

Why is it necessary to consider whether an area is a wetland?

Section 404 of the Clean Water Act requires that anyone interested in placing dredged or fill material into "waters of the United States, including wetlands" must first obtain a permit from the Corps. Activities in wetlands for which Section 404 permits may be required include, but are not limited to:

- Placement of fill and/or dredged material.
- Ditching activities when the excavated material is sidecast.

Wetland fill activity

- Levee and dike construction.
- Mechanized land clearing.
- Land leveling.
- Most road construction.
- Dam construction.

The final determination of whether an area is a wetland and whether the activity requires a permit must be made by the appropriate Corps District Office.

Wetlands help improve water quality

How do wetlands benefit people?

One of the goals of the Clean Water Act is to prevent the degradation of the Nation's waters, including needless destruction of wetlands. Wetlands benefit people in many ways that may not be obvious. Depending upon their location, wetlands provide one or more of the following benefits:

Wetlands help prevent flood damage

- They improve the quality of our water by filtering sediments and removing contaminants.
- They serve as spawning sites and nursery areas for fish and other aquatic life.
- They support downstream aquatic systems, including commercial and sport fisheries, by producing food and organic material that is flushed out of the wetlands and into streams during high flows.
- They reduce flood damage to crops and human settlements downstream by storing flood water and releasing it slowly, like a giant sponge.
- They are breeding, feeding, and wintering habitat for hundreds of wildlife species including: waterfowl, shorebirds, muskrats, turtles, frogs, and salamanders.
- They support many endangered species of animals and plants.
- They protect shorelines from erosion due to waves and currents.
- They provide recreational opportunities, such as hunting, fishing, boating, and wildlife watching.

Wetlands provide habitat for wildlife

How are wetlands recognized?

The term "wetland" encompasses a variety of conditions and degrees of wetness. Some wetlands are very easy to recognize because the water sits on the land's surface for much of the year. Other wetlands exist due to saturation of the soil by groundwater and can be difficult to identify. Wetlands do not need to be wet year-round. In fact, due to seasonal variations in rainfall and other environmental conditions, *most wetlands lack both surface water and waterlogged soils during at least part of the growing season each year.*

Mangrove wetland

One clue that a tract of land may contain wetlands is its topography or position in the landscape. Wetlands occur in areas where water naturally flows or accumulates, such as in the floodplains of streams and rivers, along smaller creeks and washes, in low spots or depressions in flat or rolling landscapes, around seeps and springs, along the fringes of ponds and lakes, and in coastal areas affected by tides.

Freshwater wetland

Even in fairly obvious wetland situations, it may be difficult to determine where the wetland ends and the upland begins. Therefore, identification of wetland boundaries (a procedure called *wetland delineation*) is a task best left to a qualified wetland consultant or Corps District personnel. Wetlands are delineated by carefully examining a site for the presence of wetland indicators. Three categories of wetland indicators — vegetation, soil, and hydrology — are explained briefly in the following sections.

Vegetation indicators

Skunk cabbage

Wetland delineators identify wetland vegetation – called *hydrophytic vegetation* – by making a list of the most abundant plant species in the area and looking up those species on the appropriate regional version of the *National List of Plant Species that Occur in Wetlands* published by the U.S. Fish and Wildlife Service (see the last page for information on obtaining a copy). Of the roughly 22,500 plant species in the United States, over 6,700 commonly grow in wetlands. However, you can often determine if wetland vegetation is present by knowing a relatively few plant species that commonly grow in wetlands in your area. For example, cattails, bulrushes, sedges,

rushes, cordgrass, sphagnum moss, baldcypress, tupelo gum, willows, buttonbush, mangroves, pickleweed, and arrowheads usually occur in wetlands.

Other evidence of wetland vegetation includes trees with shallow root systems, swollen trunks, and roots growing from the plant stem or trunk above the soil surface. Several Corps offices have published pictorial guides to representative wetland plant types, and other references to plant identification are available in bookstores. If you cannot determine whether the plant species in your area are those that commonly occur in wetlands, ask your Corps District Office or a local botanist for assistance.

Soil sampling

Soil indicators

Wetland soils – called *hydric soils* – are identified in the field by digging a shallow hole (roughly 1 to 1½ feet deep) and examining the soil for evidence of long-term saturation during the growing season. Soils that are waterlogged for long periods become depleted in oxygen. In turn, the lack of oxygen (1) retards normal breakdown of dead plant debris, causing partly decomposed organic matter to accumulate on the soil surface, and (2) produces chemical changes in the soil, which can affect its color and odor. For example, presence of any one of the following characteristics may indicate a hydric soil:

- Soil has a layer of partially decomposed plant material (peat or muck) on the surface.
- Soil color below the surface is predominantly grayish (compared with an upland soil sample from the same area), with or without spots or blotches of orange or brown.
- Soil has the sulfurous odor of rotten eggs.

Vernal pool plant community

Sampling core

Gray color indicates wetland soil

- Soil is very sandy and has a black surface layer.
- Soil is very sandy and appears blotchy or has dark streaks of organic matter below the surface.

Another way to determine whether a particular area *might* contain hydric soils is to check the Soil Survey Report for your county published by the USDA Natural Resources Conservation Service (NRCS). Map sheets given in the Soil Survey Report will tell you the name(s) of the soils on your property. You then look up these soils on a list of hydric soils in the county. Ask your county NRCS office for help in using Soil Survey Reports and hydric soil lists to determine whether you might have areas of hydric soil on your property.

Hydrology indicators

Wetland hydrology refers to the presence of surface water or waterlogged soils for a sufficient period of time in most years to influence the kinds of plants and soils that occur in an area. The most reliable evidence of wetland hydrology is provided by gaging stations or groundwater wells, but such information is limited in most areas and, when available, requires analysis by trained individuals.

Wetland delineators more often use hydrologic indicators that can be observed during a field inspection. For example, the following indicators provide evidence of periodic flooding or soil saturation:

Watermark in seasonally-flooded wetland

Drift line in tidal marsh

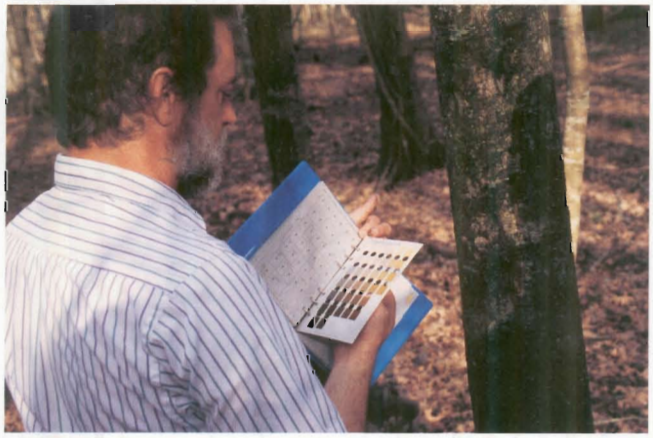
- Standing or flowing water is observed on the area during the growing season.
- Soil is observed to be waterlogged during the growing season.
- Watermarks are present on trees and other erect objects. These indicate the approximate depth of standing or flowing water.
- Drift lines or small piles of debris deposited by flowing water are present. These often occur along contours and indicate the approximate extent of flooding in an area.
- Thin layers of sediment coat leaves or other objects on the ground, caused when suspended particles settle out of flood waters over a period of time.
- Plant roots have rust-colored coatings or zones of soil around them. Under water-logged conditions, these are caused by leakage of oxygen out of plant roots, resulting in oxidation of iron compounds in the soil around the root.

Wetland determinations

Corps policy requires that at least one indicator from each category – vegetation, soil, and hydrology – must be present for an area to be identified as a wetland under Section 404 of the Clean Water Act. However, if you observe *any* of the indicators described in this brochure, you should seek assistance from either your local Corps District Office or someone who is an expert at delineating wetlands. This brochure provides general information only; *it is not intended to be used to make a final wetland delineation!*

What to do if your property has wetlands that you propose to alter

Contact the Corps District Office that has responsibility for the Section 404 permitting process in your area. This office will assist you in defining the boundary of any wetlands on your property, and will provide instructions for applying for a Section 404 permit, if necessary.



Wetland Delineator uses soil color chart to make a wetland determination

Sedimentation trap — a wetland function

Sources of information for making wetland delineations

The Corps of Engineers *Wetlands Delineation Manual* is available on the Internet in ".pdf" format at http://www.wes.army.mil/el/wetlands/wlpubs.html or can be purchased from:

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
To place an order: (703) 487-4650
For help in identifying a title for sale:
(703) 487-4780

The U.S. Fish and Wildlife Service *National List of Plant Species that Occur in Wetlands* is available on the Internet at http://www.nwi.fws.gov/ecology.html or can be purchased from NTIS above.

County Soil Survey Reports and hydric soil lists are available from county Natural Resources Conservation Service offices.

Information on wetland laws and regulations is available from the U.S. Army Corps of Engineers (http://www.usace.army.mil/inet/functions/cw/cecwo/reg/).

Front Cover Photo: Salt marsh