

## II. What is a Wetland?

Before going any further, it is necessary to be more precise about what is meant by a "wetland." There is not a single definition of wetland that all agencies, scientists, policymakers, or landowners use for all purposes. Although there is a single definition that has evolved in Federal agencies regulating wetlands, the process of delineating wetlands on the ground and deciding what wetlands are subject to what policies is a matter of continuing controversy. By examining the different definitions used for different purposes, we find that three characteristics play a part in all definitions of wetlands: hydrology, soils, and vegetation.

Differences between *scientific* definitions of wetlands and *jurisdictional* definitions (those used in administering wetland programs) are discussed next, as well as differences between *defining* wetlands in general, and *delineating* wetlands on the ground.

### Wetland Science and Wetland Jurisdiction

Federal agencies currently use several different definitions of "wetland." Wetland has been used as a term only since the beginning of the century (Wright, 1907), and only widely used by scientists, who prefer more specific terms such as mire, bog, fen, or swamp, since the 1950's (Mitsch and Gosselink, 1993). Despite recent controversies, concepts of wetland definition have been nearly constant since at least 1977, and slightly different definitions for scientific and jurisdictional purposes have evolved. Agency wetland definition attempts included efforts by the Fish and Wildlife Service in 1956, 1974, 1976, and 1979, the U.S. Army Corps of Engineers in 1975 and 1977, the Clean Water Act in 1977, and the Food Security Act in 1985 (NRC, 1995). The scientific definition developed by Lewis M. Cowardin in 1979 for the Fish and Wildlife Service has been approved by the Federal Geographic Data Committee as a standard for nonregulatory wetland classification and is used by the Fish and Wildlife Service for scientific classification of wetlands in the National Wetlands Inventory and by USDA in the National Resources Inventory (Cowardin, and others, 1979). For jurisdictional purposes, the Army Corps of Engineers uses their 1977 definition in the Section 404 permit program, and USDA uses the 1987 National Food Security Act Manual definition in administering the Swampbuster provision. All of these definitions include one or more of four essential factors: integration of physical,

chemical, and biophysical aspects in the environment as an ecosystem; the central role of water as a defining feature; the presence of substrate or soils formed under saturated conditions (hydric soils); and the presence of vegetation adapted for saturated conditions (hydrophytic vegetation).

A National Research Council committee charged with investigating wetland definitions provided a reference definition (National Research Council, 1995 p. 55):

A wetland is an ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical, and biological features reflective of the recurrent, sustained inundation or saturation. Common diagnostic features of wetlands are hydric soils and hydrophytic vegetation. These features will be present except where specific physicochemical, biotic, or anthropogenic factors have removed them or prevented their development.

A number of modifiers are used with "wetland" to describe various alterations or changes to wetlands that have policy relevance (see box: "Wetland Terminology"). Unfortunately, there is often disagreement or misunderstanding about what these terms and modifiers mean, which can create confusion in discussing the state of wetland resources and changes in wetland policy (Smith, 1997).

In this report, *wetlands* or *farmed wetlands* are generally considered to be in their natural state, or to have had the naturally occurring vegetation removed, but still have the soil and hydrologic conditions defining wetlands. *Prior converted* or *converted wetlands* have been cleared, drained, or filled so that wetland hydrology is no longer present. *Uplands* is the term usually applied to land that has never been wetland, while *created wetlands* or *artificial wetlands* are upland that has had wetland hydrology and vegetation artificially created or planted, usually to replace wetlands that are allowed to be converted. *Wetland restoration* is the process by which a former wetland that has been converted is made a wetland once again by restoring the wetland vegetation and hydrology necessary to meet the definition. Wetlands can be

## Wetland Terminology

These definitions are based on the terms defined to implement wetland conservation (Swampbuster) provisions of the 1985 Food Security Act, as set forth in 7 C.F.R. Part 12, Section 12.2.

**Creation** (of a wetland)—The development of the hydrologic, geochemical, and biological components necessary to support and maintain a wetland where a wetland did not previously exist. Any wetland established on a nonhydric soil is considered a created wetland.

**Degradation** (of a wetland)—The alteration of an existing wetland to decrease its specific functions and values. Degradation can occur because of activities in the wetland itself, such as drainage or clearing, or because of activities around the wetland, such as soil erosion or hydrologic modifications.

**Enhancement** (of a wetland)—The alteration of an existing wetland to increase its specific functions and values. Enhancement actions include new capabilities, management options, structures, or other actions to influence one or several functions and values.

**Hydric soils**—Soils that, in an undrained condition, are saturated, flooded, or ponded long enough during a growing season to develop an anaerobic condition that supports the growth and regeneration of hydrophytic vegetation.

**Hydrophytic vegetation**—Plants growing in water or in a substrate that is at least periodically deficient in oxygen during a growing season as a result of excessive water content.

**Restoration** (of a wetland)—The re-establishment of wetland conditions, including hydrologic condition or native hydrophytic vegetation, to an area where a wetland had previously existed.

**Wetland**—Land that (1) has a predominance of hydric soils; (2) is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and (3) under normal circumstances does support a prevalence of such vegetation, except that this term does not include lands in Alaska identified as having a high potential for agricultural development and a predominance of permafrost soils.

**Wetland determination**—A decision regarding whether or not an area is a wetland, including identification of wetland type and size. A wetland determination may include identification of an area as one of the following types of wetland:

(1) Artificial wetland—An area that was formerly nonwetland, but now meets wetland criteria due to human activities, such as creation of an artificial lake or pond; temporary or incidental creation of a wetland as a result of adjacent development activity.

(2) Commenced-conversion wetland—A wetland, farmed wetland, farmed-wetland pasture, or converted wetland on which conversion began, but was not completed, prior to December 23, 1985.

(3) Converted wetland—A wetland that has been drained, dredged, filled, leveled, or otherwise manipulated (including the removal of woody vegetation or any activity that results in impairing or reducing the flow and circulation of water), making possible the production of an agricultural commodity.

(4) Farmed wetland—A wetland that prior to December 23, 1985, was manipulated and used to produce an agricultural commodity, and on December 23, 1985, did not support woody vegetation and met the wetland hydrologic criteria.

(5) Farmed-wetland pasture—Wetland that was manipulated and managed for pasture or hayland prior to December 23, 1985, and on December 23, 1985, met wetland hydrologic criteria.

(6) Prior-converted cropland—A converted wetland where the conversion occurred prior to December 23, 1985, an agricultural commodity had been produced at least once before December 23, 1985, and as of December 23, 1985, the converted wetland did not support woody vegetation and met wetland hydrologic criteria.

**Wetland delineation**—Outlining the boundaries of a wetland determination on aerial photography, digital imagery, other graphic representation of the area, or on the land.

*degraded*, but not converted or destroyed, by loss of wetland vegetation, impairment of wetland hydrology, or contamination by pollutants or sediments that reduce wetland functional characteristics, while still meeting the definition of a wetland. *Wetland enhancement* is the process of improving the vegetation or hydrology of a degraded wetland to fully functional status. While some controversy remains over our ability to reverse wetland conversion or degradation (Steinhart, 1987; Kusler and Kentula, 1990; NRC, 1992, p. 316; Kentula, 1996; Hunt, 1996), it is generally agreed that restoring or creating wetlands adds to total wetland resources. Wetland enhancement improves wetland function, but does not increase the total acreage of wetlands.

### Delineating Wetlands

Although there has been considerable agreement on how to *define* jurisdictional wetlands, great controversy has surrounded the application of criteria and indicators of the essential factors in the reference definition (such as depth and duration of saturation or inundation) (NRC, 1995; EDF/WWF, 1992). Wetlands can be broadly *defined*, but administering wetland programs requires *delineating* a wetland's boundaries on the ground by applying specific criteria at a particular site.

Federal agencies responsible for wetland programs did not explicitly develop rules or manuals for wetland delineation until 1987. Since then, attempts have bogged down because of disagreements over requirements for direct evidence of wetland characteristics that resulted in including or excluding specific wetlands. Instead of agreeing on a standard manual, debate was conducted through a series of opposing manuals. An attempt to develop a common interagency manual was first attempted in 1989, but controversy erupted over exact delineation criteria. Another attempt in 1991 also failed to achieve consensus, lead-

ing to a National Research Council study of wetland delineation and a retreat to earlier manuals. (See box: "Wetland Delineation.")

Field tests of the 1989 and 1991 delineation manuals by Federal, joint Federal and State, and State field teams under a variety of conditions indicated that 30 to 80 percent of land delineated as wetlands in the 1989 manual were excluded by the 1991 manual (EDF/WWF, 1992). Areas that would have been excluded by the latter include cottonwood and willow wetlands in riparian areas of the Rocky Mountains and Southwest, most bogs in the Northeast and Midwest, and many prairie potholes in the Dakotas. Also excluded would be high coastal marsh along the Pacific coast, some of the Florida Everglades in the National Park and remaining on private land, and as much as 80 percent of the Great Dismal Swamp in Virginia and North Carolina. Similar results were obtained in comparisons of the 1987 Army Corps of Engineers manual and changes proposed to the Clean Water Act in 1995 (*National Wetlands Newsletter*, 1995).

Wetland definitions and delineation criteria used to administer programs differ from definitions and criteria used by scientists and for scientific inventories (NRC, 1995; Cowardin, and others, 1979). Estimates of national and regional wetland acreage and wetland losses and gains are based on scientific definitions (Frayer, and others, 1983; Dahl and Johnson, 1991). Programmatic or jurisdictional wetlands are not comprehensively inventoried but are delineated by the Army Corps of Engineers, USDA, or contractor technicians if and when permit or other regulatory action is pending. Although general writing treats "wetlands" as a homogeneous class of lands, the reality is a diverse set of landscapes with different hydrology, vegetation, and soil substrates that provide a widely varying set of natural functions (NRC, 1995; Cowardin, and others, 1979; Tiner, 1996).

## Wetland Delineation

**1987 U.S. Army Corps of Engineers Wetlands Delineation Manual (USACE, 1987)**—Developed between 1978 and 1986 by the Environmental Laboratory at the Army Corps of Engineers Waterways Experiment Station, this manual used the three-parameter (hydrology, soils, and vegetation) definition. Congress directed the Army Corps of Engineers to resume use of the 1987 manual after a consensus failed to develop around interagency manuals proposed in 1989 and 1991.

**1988 Environmental Protection Agency Wetland Identification and Delineation Manual (EPA, 1988)**—Developed between 1980 and 1987, this manual also used the three-parameter definition, but distinguished between a "simple" approach for routine delineations and a more complex "detailed" approach for large or controversial situations. The Environmental Protection Agency acceded to the Army Corps of Engineers 1987 manual after interagency approaches failed.

**1987 National Food Security Act Manual (NRCS, 1994)**—Developed in 1987 to implement the 1985 Food Security Act conservation provisions, including the Swampbuster provision, this manual has been revised three times. The manual stressed cooperation and consultation with other wetland agencies, but differed from other manuals on delineation details.

**1989 Interagency Wetland Delineation Manual (Interagency Manual, 1989)**—Differences between the Army Corps of Engineers 1987 manual (USACE, 1987) and the National Food Security Act Manual led to this interagency attempt to develop a common manual.

**1991 Interagency Wetland Delineation Manual**—Critics argued that the 1989 interagency manual expanded the scope of wetland regulation and countered with this manual (56 Fed. Reg. 40,446, 1991).

**1995 National Research Council Study (NRC, 1995)**—By January 1992, the 1991 delineation manual received more than 80,000 formal comments. Attempts to revise the manual to account for the diverging views bogged down. A National Research Council committee was funded to study the delineation question, delaying any decision for 18 months. In the interim, the Army Corps of Engineers and the Environmental Protection Agency returned to using the 1987 delineation manual. The Administration's August 1993 wetland policy statement affirmed using the 1987 delineation manual pending completion of the National Research Council study. No further action on developing an interagency delineation manual has occurred since the National Research Council report was published in 1995. The National Research Council confirmed that wetlands are defined by hydrology, soils, and vegetation, and recommended that a new manual be developed based on 35 recommendations. Although administrative attempts to clarify delineation issues have not confirmed either the more expansive 1989 manual or the more restrictive 1991 manual, there is general agreement that the agencies have achieved greater uniformity in applying delineation criteria and indicators already present in earlier manuals. However, legislation to specify wetland delineation procedures to reduce the scope of wetlands regulatory jurisdiction was passed in the House version of the Clean Water Act reauthorization (104th Congress H.R. 961 and S. 851) and was discussed as a change to Swampbuster provisions in the 1996 farm bill debate. None of these provisions was enacted into law.