



Classification of wetlands and deepwater habitats of the United States

(Cowardin *et al.* 1979)

- Designed for use in a national inventory of wetlands (NWI)
- Intended to be:
 - ✓ ecologically based
 - ✓ furnish the mapping units needed for the inventory
 - ✓ provide national consistency in terminology and definition
- The Cowardin system has been adopted as the National Vegetation Classification Standard for wetlands.
- Used by most states in this region

Wetlands:

“lands transitional between terrestrial & aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water”

- **Must have *one or more* of the following:**
 - hydrophytic vegetation
 - undrained hydric soil
 - nonsoil and saturated or covered by shallow water

A dried plant specimen, possibly a stem with two leaves, is positioned vertically on the left side of the page. The stem is dark brown and extends from the bottom left towards the middle. Two leaves are attached: one at the top left, pointing upwards and to the right, and another at the bottom right, pointing downwards and to the right. The leaves are a muted, brownish-green color. The background is a light, textured surface, possibly paper or parchment, with some faint, irregular brown stains or watermarks.

Deepwater habitats:

“permanently flooded lands
lying below the deepwater
boundary of wetlands”

Definitions and Descriptions for the Cowardin Classification System

SYSTEMS

LACUSTRINE: Deepwater habitats with all the following:

1. Situated in a topographic depression or dammed river channel.
2. Lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with $> 30\%$ areal coverage.
3. Total area exceeds 20 acres. Areas < 20 acres may be included in the lacustrine system if an active wave formed or bedrock shoreline makes up all or part of the boundary, or if water is > 2 meters in the deepest part of the basin at low water.

PALUSTRINE : Area dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. Areas lacking such vegetation are also included if they have all of the following:

1. Area < 20 acres (8 hectares).
2. No active wave formed or bedrock shoreline.
3. Water depth in deepest part of basin < 2 meters at low water. May be situated at the edge of a lake or river or in river floodplain.

Definitions and Descriptions for the Cowardin Classification System

CLASSES

Aquatic Bed: This includes wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years.

Emergent: Vegetation includes erect, rooted herbaceous hydrophytes representing more than 30% of the areal cover.

Forested: Woody vegetation that is 6 meters tall or taller covering 30% or more of the area.

Open Water: Non-vegetated areas less than 20 acres that are covered by water less than 2 meters deep. This includes ponds, borrow pits, small reservoirs, and open water areas within a marsh or swamp.

Unconsolidated Bottom: Wetlands in which the substrate is at least 25% particles smaller than stones, vegetative cover < 30 %, and permanently flooded.

Problems

(Cowardin & Golet 1995)

- **Lack of basic ecological data**
- **Wetland definition**
- **Limitations of remote sensing**

**“many of these issues have been
or are being resolved”**

How useful is this system?

“One of the most comprehensive and widely applauded wetland classification systems is that developed for the USA by Cowardin *et al.* (1979).” Finlayson & van der Valk 1995

“...for ecological studies and inventories the 1979 USFWS definition has been and should continue to be applied to wetlands in the US.” Mitsch & Gosselink 1993

“Despite undisputed problems, we believe that the classification has met its stated objectives.” Cowardin & Golet 1995

Defining wetlands and nutrient benchmark values

- Minimum size (10 acres?)
- Mapping and classification (Cowardin *et. al.* 1979?)
- When is a wetland a lake and a lake a wetland?
- Benchmarks for different wetland classes?
- Wetlands with permanent or near permanent surface water only?
- Sampling issues (where, when and how many samples ?)
- Response indicator group (macrophytes, algae, bugs, all, other ?)