

## USER NOTES FOR WETLAND CALLS OF NORTH CAROLINA

### INTRODUCTION

In 1974, the U.S. Fish and Wildlife Service directed its Office of Biological Services to conduct an inventory of the nation's wetlands. This National Wetlands Inventory (NWI) became operational in 1977.

Wetland delineations depicted on these maps were produced by stereoscopically interpreting high altitude aerial photography and then transferring this information with a zoom transfer scope to an overlay using U.S. Geological Survey 7.5' or 15' map series as base information.

Wetlands were identified on the photography by vegetation, visible hydrology, and geography, and subsequently classified in general accordance with Cowardin et al. (1979) Classification of Wetlands and Deep Water Habitats of the United States. Collateral information used in this mapping effort included U.S. Geological Survey topographic maps and Soil Conservation Service soil surveys. Where, for pragmatic reasons, strict adherence to this classification system was not possible, mapping conventions developed by NWI were used.

## NORTH CAROLINA USER NOTES

### MARINE SYSTEM

M1UBL - Ocean; boundaries extend from the outer edge of continental shelf shoreward to the landward limit of low tide along beaches and the seaward limit of the estuarine system in coastal inlets.

M1UB2L - Inlet shoals on the ocean side of an imaginary line connecting uplands of adjacent barrier islands, usually across the narrowest point of an inlet.

M2US2P - Unconsolidated shoreline (beach) as determined by land difference between low and high tide; M2US2N zone is included here.

#### Special cases

M2RS2P - Beach outcroppings of coquina limestone, found at Ft. Fisher, New Hanover Co.

M2RS2Pr - Rip-rap jetties that extend into the ocean and that were constructed to stabilize navigation channels through inlets.

### ESTUARINE SYSTEM

E1UBL - Open water of sounds and bays (i.e. Albemarle Sound) and unvegetated pools within saltmarshes; extends from leeward side of barrier islands to shore of mainland and to mouths of rivers and large tidal creeks, approximately to where ocean-derived salts are less than 0.5 ppt. For larger coastal rivers such as the Neuse or Pamlico, an arbitrary point, where the river narrows to less than a mile in width, was selected as the upstream limit of this wetland type.

E1UB2L - Inlet shoals on the embayment side of an imaginary line connecting uplands of adjacent barrier islands, usually across the narrowest point of an inlet.

E1UB3L - Open water of coastal rivers or streams extending from E1UBL to the palustrine system. Adjacent shoreline vegetation is usually saltmarsh.

E2US2M - Shoals occasionally exposed by wind tides along eroding headlands.

E2US2N - Sand flats usually derived from beach overwash and thus located leeward of barrier islands; exposed during low tide.

E2US2P - Sandy overwash islands, spits, and infrequent beaches that abut E1UBL.

E2US3M [E2US3N, E2US3P] - Large expanses of tidal mudflats within saltmarsh. Areas of unconfined dredged material are mapped as E2US3Ps.

E2EM1N - Saltmarsh community dominated by smooth cordgrass. The boundaries of this wetland type may include areas of open water, tidal mudflats and shellfish beds (E1UBL, E2US3N, and E2RF2N, respectively).

E2EM1P - Saltmarsh dominated by needle rush. In certain broad areas subject to inundation by freshwater, as around the eastern and southern shores of Dare and Hyde Cos., two distinct marshes are visible: the typical needle rush zone and a second marsh of sawgrass, giant cordgrass, cattails and switchgrass. For mapping purposes, the marshes are differentiated by water chemistry modifiers; needle rush is E2EM1P5 and mixed saltmarsh is E2EM1P6.

E2SS1P - Mixed shrub and saltmarsh flats that occur along the upper limits of E2EM1P on barrier islands, as a transitional zone around dredged material islands, along tidal creeks with substantial freshwater inflow, and on moist to somewhat dry saline soils. Due to the use of winter photography, the deciduous shrubs of this wetland type were masked by groundcover forbs, thus giving the appearance of marshlands.

E2SS3P - Southern waxmyrtle and/or yaupon dominated shrublands in interdune swales, on washover flats of barrier islands, and infrequently, as transitional areas between estuarine and palustrine wetlands.

E2SS7P - Any combination of Southern waxmyrtle, yaupon, red bay, loblolly bay, sweet bay with pine or cedar (less than 20 ft. tall) on barrier islands but more commonly as the transitional wetland between estuarine and palustrine areas. Southern red cedar shrublands occur on calcareous mud near Mann's Harbor, Dare Co.; along creeks and the upper shores on New River estuary, Onslow Co.; near the Shallotte River, Brunswick Co.; and possibly elsewhere. Similar vegetation on dredged material is mapped as E2SS7Ps.

#### Special cases

E1UB3Lx - Atlantic Intracoastal Waterway and other dredged navigation channels where the channel alignment obviously did not coincide with existing streams.

E1AB3L - Shoalweed beds found adjacent to Emerald Isle near the western end of Bogue Sound. Other areas of seagrass beds exist in New River estuary of Onslow Co. and in Currituck Sound.

E2RF2P - Shellfish beds visible when the aerial photograph used in wetland delineation was taken.

E2FO4P - Loblolly pines with needle rush understory, usually located within the broader expanses of E2EM1P as near the mouth of Pungo River, in eastern Pamlico Co. and along the lower Pamlico and Neuse Rivers. Possible inconsistency in interpretation; may be mapped elsewhere as PFO4A, PFO4B.

## RIVERINE SYSTEM

- R1UB3V - Broad, sluggish, freshwater stretches of coastal plain rivers such as the Scuppernong, Perquimans, Northeast Cape Fear, etc. where the level of water in the channel is affected by wind or lunar tides.
- R2UB3H - Stream channels in the coastal plain upstream from tidal effects; velocity is slow, turbidity high, and stream bottoms covered by sandy silt or mud.
- R2UBH [R3UBH] - Piedmont and mountain streams where bottom conditions are unknown.
- R2UB3H - Typical muddy bottom stream channel in the piedmont; may become R3UB3H in the western piedmont or where shoals (R3RB1G) are prominent.
- R3UB1H - Common stream type in mountains; occasionally becoming R3URB1H in areas of shoals; hornleaf riverweed is commonly associated with larger cobbles and boulders; aquatic mosses sometimes abundant.

### Special cases

- R1AB3V - Aquatic beds comprised of water lilies and spadderdock are common along large blackwater tributaries and coastal rivers such as the Northeast Cape Fear and Black River.

## LACUSTRINE SYSTEM

- L1UBH - Carolina bay lakes larger than 20 acres and other large natural lakes such as Great Lake in Croatan National Forest and Sawyer Lake in Alligator River National Wildlife Refuge.
- L2AB3H - Thickly vegetated shallow bottom of Lake Mattamuskeet and Phelps Lake, perhaps others. Mapped as L2AB3/UB2H and L2AB2/UBH at Lake Mattamuskeet and L2OWH and L2AB6H at Phelps Lake.
- L2US3Gh - Exposed drawdown zone in certain large impoundments in the piedmont and mountains as along the Yadkin River in High Rock Lake and the Little Tennessee River in Lake Hiwassee.

### Special cases

- L1UB1Hx - Flooded pits larger than 20 acres where limestone, phosphate, or other materials have been removed.
- L1UB3Hh - Hydroelectric and water supply impoundments found mostly in the piedmont and mountains.
- L2UB3Kx - Phosphate mine slime pond.
- L2AB3K3h - Wildlife impoundments with submerged aquatic plants as in Pea Island National Wildlife Refuge.

L2US3Khs - Unvegetated, diked disposal areas for dredged material.

L2EM2K3h - Wildlife impoundments containing spikerush and other nonpersistent emergent plants as along the south shore of Lake Mattamuskeet and in eastern Pamlico Co.

#### PALUSTRINE SYSTEM

PUB3H - Natural ponds, smaller than 20 acres, occurring as interdune swales, as karst features (Sunny Point and Boiling Springs Lakes), as small Carolina bays, and as other flooded depressions of undetermined origin.

PAB3H - Shallow ponds colonized by water lilies, spatterdock, water shield, various species of pondweeds, or other aquatic plants.

PEM1A [PEM1C, PEM1F] - Freshwater marshes with varying degrees of wetness; occasionally applied to powerline rights-of-way and undrained field depressions. PEM1A is frequently applied to areas recently cleared for agriculture or silviculture. Dominant plants may include bullrushes, spikerushes, rushes, beakerushes, sedges, panic grasses, cattails and arrowheads.

PEM1B - Marshes or boggy areas in peatlands, Carolina bay depressions, or rarely, mountain bogs.

PSS1A [PSS1C] - Cutover timberlands, abandoned bottomland fields, and infrequently, site-prepared silvicultural lands.

PSS4A [PSS4C] - Pine scrublands of loblolly and/or pond pine, abandoned lowland fields where pines have invaded, and occasional wet pine plantations.

PSS7A [PSS7B, PSS7C] - Mixed shrub assemblages of broadleaf evergreens and pines, sometimes mixed with cedars, or in the mountains, red spruce.

PSS1B - Non-alluvial scrub-shrub swamps dominated by titi or red maple as in Gull Rock Game Lands, Hyde Co.

PSS3B - Gallberry or mixed bay shrub areas in peatlands; shrublands regenerating after forest fires. Also very rare montane bogs, covered mostly by species of rhododendron.

PSS4B - Scrub pinelands often over peat, and when mixed with or dominated by Atlantic white cedar, mapped as PSS4Bg.

PSS3C - Broad-leaved evergreen scrub-shrub swamps. Dominant shrubs include waxmyrtles, sweet bay, red bay and greenbriars; Japanese privet is common in some parts on the inner coastal plain.

PSS6C [PSS6F] - Mixed baldcypress-hardwood shrub, willow, or buttonbush swamps.

PSS2F - Scrub pond cypress or baldcypress, often found as a pond fringe.

PF01A - Bottomland forests in the mountains and piedmont where the streamflow is moderate and alluvium is fairly well-drained; dominant trees are river birch, sweetgum, red maple, yellow poplar, sycamore, American elm, sugarberry, bitternut hickory, swamp chestnut oak and box elder. Shingle oak is sometimes common in the mountains. Toward the eastern piedmont and on the driest bottomlands of the coastal plain, loblolly pine can be a frequent component. This forest type also occurs outside of bottomlands in certain parts of the coastal plain as in Pamlico, Bertie, and western Hyde Cos. On these sites, the soil has high base saturation and is usually silty or clayey.

PF04A [PF04C] - Loblolly pine forests, occasionally mixed with longleaf pine and/or pond pine on the coastal plain; shortleaf pine in the piedmont; white pine and hemlock in the mountains.

PF05A [PF05B] - Burned-over forest; possible to have salt kill in outer coastal plain.

PF01B - Infrequently occurring non-alluvial hardwood swamps, dominated by sweet gum or red maple and swamp black gum.

PF04B - Pond pine and sometimes loblolly pine forests on peat soils or saturated mineral soils in the coastal plain; red spruce or pitch pine in the mountains. Atlantic white cedar forests are mapped PF04Bg.

PF06B - Non-alluvial swamps of baldcypress and/or swamp black gum; occasionally red maple is present.

PF07B - Mixed forests of evergreens, usually one or more species of pine and loblolly bay, red bay, or sweet bay; associated with peatlands; coastal plain only.

PF01C - A forest type of limited occurrence in the western piedmont but common east of the Uwharries, especially in the Triassic Basin and on the western coastal plain. Species are much the same as in PF01A with increased dominance of swamp chestnut oak, overcup oak, swamp black gum, Southern red oak, Shumard oak, laurel oak, and water hickory.

PF06C - A common inner coastal plain forest type with baldcypress invariably present; otherwise, similar to PF01C.

PF02F - Pond cypress or baldcypress swamps; alphanumeric originally reserved for baldcypress-tupelo swamps.

PF06F - Predominantly baldcypress and swamp black gum, or tupelo and Carolina ash in the wettest sites; frequent along coastal plain rivers and large creeks. Blackwater river swamps in SE NC may also have water elm.

PF05G - Forests killed from excessive flooding as in the upper reaches of impoundments (human-made or beaver).

PFO6G - Forested ponds or fringes of ponds were some combination or single species of the following occur: pond cypress, baldcypress, tupelo gum, swamp black gum, willow and red maple.

Special cases

PRB1Gx - Quarry pool in an area with active mining.

PRB1Hx - Abandoned quarries that remain permanently flooded.

PUB1Gx or Hx - Gravel pit containing water, usually located in a floodplain.

PUB2Gx or Hx - Sand pit containing water, usually located in a floodplain or in riverine sand ridges.

PUB3Gx - Large, shallow roadside borrow pits, often seen along newer highways such as interstate highways; sites are mostly former uplands.

PUB3Hh - Farm or golf course ponds that are irregular in outline, located near the headwaters of small drainages where the flow of water has been obstructed by human-made dams. The lower case "h" modifier is applied to other wetlands that occur upstream from the ponds and that have hydrologies affected by impoundment.

PUB3Hx - Excavated irrigation ponds, usually rectangular in outline.

PUB3Kr - Regular-shaped wastewater lagoons, sometimes constructed in uplands adjacent to wetlands; with concrete, gravel, or cobble substrates, and flooded with wastewater. Lagoons associated with farming operations may also be mapped as farm ponds or irrigation ponds.

PEM1Khs - Diked dredged material disposal areas, often colonized by common reed or cattails.

PEM1N - Freshwater or very mildly brackish water marshes formerly used for wild rice cultivation with little or no evidence of prior impoundment; Cape Fear region.

PEM1Sh - Partly impounded marshes formerly used for wild rice cultivation; generally restricted to lower Cape Fear region.

PEM2Kh - Small wildlife impoundments with nonpersistent grasses and sedges.

PSS1Gb - Mixed shrub and marsh (PAB3Gb, PEM1Gb) areas in beaver ponds.

In mapping eastern North Carolina, exceptions always arise and many different combinations of alphanumeric codes have been tried. The earlier maps contain mixed classes and mixed subclasses. Unfortunately, this practice has all but eliminated any reasonable chance at data processing, in that the number of permutations is staggering.

Although certain mixed categories more accurately depict the actual field conditions, for example, PFO4/SS3B for pocosin wetlands with a pond pine overstory and a gallberry and bay understory, we are refraining from excessive use of mixed groups. Current NWI convention guidelines allow only these combinations or their reciprocals: for SS, 1/3 and 1/4, for FO, 1/2, 1/3, 1/4, 2/4, and 6/7. In North Carolina, an SS1/3 is almost impossible to find without pines (4), and the FO2/4 doesn't exist here. Therefore, the likely combinations in North Carolina are SS1/4, SS4/1, FO1/2, FO2/1 (must be verified by field truthing), FO1/3, FO3/1 (rare or nonexistent), FO1/4, FO4/1, FO6/7, and FO7/6.

Early maps also show frequent use of combinations such as EM/SS, FO/SS, etc. We have tried to eliminate all of these mixed classes.