

NATIONAL WETLANDS INVENTORY

NOTES TO USERS

SOUTHEAST TEXAS

1:100,000 Scale Maps Covered

(PORT ARTHUR NW)

(HOUSTON NE)

(BEAUMONT NE)

(BEAUMONT SE)

# NATIONAL WETLANDS INVENTORY

## 1:100,000 MAP NARRATIVE

PORT ARTHUR NW

HOUSTON NE

BEAUMONT SE

BEAUMONT NE

### INTRODUCTION:

In 1974, the U.S. Fish and Wild Life Service directed its office of Biological Services to complete an inventory of the nations wetlands. As part of this our all objective, an effort began in November 1984 to delineate and classify wetlands by means of photo interpretation combined with field checking in the Southeastern Coastal Section of Texas. A total of six 1:100,000 scale maps are to be produced:

Port Arthur NW

Houston NE

Beaumont NE, SE, NW, SW

### PURPOSE:

The purpose of notes to Users is to provide general information regarding the production of NWI maps and wetlands found within a similar geographic area. Notes to users are not intended to include a complete description of all wetlands found in the area nor provide complete plant species information.

### BAILEY'S ECOREGIONS:

The study area of southeast Texas can be divided longitudinally by a transitional line which separates Port Arthur NW, Houston NE, Beaumont NE and Beaumont SE from Beaumont NW and Beaumont SW. The Port Arthur NW, Houston NE, Beaumont NE and Beaumont SW 1:100,000's are included in the Southeastern Mixed Forest Province. A small portion of Port Arthur NW is included in the Beech-Sweetgum-Magnolia-Oak Ecoregion which is one of the two sections of the Outer Coastal Plain Forest Province. The Beaumont NW and Beaumont SW 1:100,000's are included in the Oak Bluestem Parkland which is one of the two distinct sections of the Prairie Parkland province. The Southeastern Mixed

Forest Province is characterized by Bailey as a mixture of broad-leaved deciduous and needle leaved evergreen forests with at least 50 percent of the stands comprising short leaf pine (Pinus palustris), loblolly pine, (P. taeda), or southern yellow pine found in pure stands and mixed. Other common trees include sweetgum (Liquidambar styraciflua), blackgum (Nyssa sylvatica), oak (Quercus), hickory (Carya), red maple, (Acer rubrum), winged elm (Ulmus alata), dogwood (Cornus), hawthorn (Crataegus), and yaupon (Ilex vomitoria). The eastern portion of the mapped areas are transitional to the Oak-Bluestem Parkland of the Prarie parkland Province which consists of vegetation similar to that of the Southern Mixed Forest Province. A small portion of the Port Arthur NW mapped areas is adjacent to the Beech Sweetgum-Magnolia Oak Forest Province, one of the two distinct sections of the outer Coastal Plain Forest Province.

Topography of the Southern Mixed Forest Province consists of the irregular Gulf Coastal Plains and the Piedmont where 50 to 80 percent of the area slopes gently, and the flat Coastal Plains which have gentle slopes. The terrain of the study area is flat to moderately rolling. Elevations for the most part range from 100 to 300 feet. A very small portion of the study area reaches elevations of 500 feet.

Soil is an important element of wetlands and is one of the criteria used to define wetlands. Soil surveys produced by the Soil Conservation Service were consulted to aid in the interpretation of wetlands. Reference to the Harris County Soil Survey was made for the Southwestern tip of the Houston Northeast mapping area. The Chambers County Soil Survey was utilized to help interpret the southwest portion of the Houston NE 1:100,000 mapped areas and the western section of the eastern areas mapped for the Houston Northeast. The Jefferson County Soil Survey was consulted for all of the eastern half of the areas mapped for Houston Northeast, the Southeastern corner of Beaumont Southeast and the entire area of Port Arthur Northwest.

The Harris county soils often found along the river flood plains were Gessner, Hatliff and Nahatche. Other wet soils of Harris county included Kaman and Ozan. West soils for Chambers county include Clodine, Harris Ijam, Kaufman clay and Vestan. The Jefferson county soils include Bibb soils which are found along river flood plains and alluvial land. Harris clay found in flat depressional areas, and in the marsh sections of the southern part of the county. Coastal wet soils are Coastal Land, Tidal Marsh and Made Land, the latter existing throughout the gulf marsh and coastal prairie parts of the county.

In general, soil types include Ultisals, vertisols formed from marls or soft limestone, and inceptisals found in association with flood plains of major streams.

The South eastern mixed Forest Province has a climate that is fairly uniform in which winters are mild, summers are hot and annual precipitation averages 40 to 60 inches. The humidity in the study area is influenced by air masses off the Gulf of Mexico.

#### Map Preparation

Wetland classification for the NWI maps is in accordance with "Classification of Wetland and Deepwater Habitats of the United States" by L.M. Cowardin, et al, 1979.

Wetland classification and delineations were produced by photo-interpretation of high level aerial photography. The photography used was color infrared at a scale of 1:58,000 taken in January and February of both 1982 and 1983 with the exception of Port Arthur Northwest photography which was taken on March 10, 1983.

Collateral data utilized in addition to ground truthing photosignature returns were USGS topographic maps (7.5 and 15 minute series), soil conservation surveys and input from local fish and wildlife personnel.

The quality of the photography varied from acceptable to marginal. Faded tones of some photographs made recognition of water regimes and impounded ponds difficult. In addition, consistency problems arose due to discrepancies in wetland signature returns due to localized recent rainfall. A comparison of overall photography taken in 1982 versus 1983 revealed that 1982 photography was considerably wetter than 1983 photography. [Furthermore verification of water regimes disclosed wetlands to be much wetter in the field than photosignature.] This may be due to the fact that the field trip was taken after heavy rainfall in the month of October. Many of the problems encountered with the photography were overcome by utilizing collateral data (quads, notes, soil surveys).

#### User Caution

Map users are cautioned that mapping with high altitude aerial photography has limitations. Wetlands are identified and classified through stereoscopic examination of photography or the basis of vegetation, visible hydrology and geography through photograph characteristics such as tone, texture, pattern, site and size as well as local ecology. The aerial photographs typically reflected conditions during the specific year and season when they

were taken. In addition, there is a margin of error inherent in the use of aerial photographs. Thus a detailed, on-the-ground and historical analysis of a single site may result in revision of wetland boundaries established through photographic interpretation. Some small wetlands and those obscured by dense forest cover may not be included on the map document. In addition, changes in the landscape and/or land use could have occurred since the time of photography, therefore some discrepancies between the map and current field conditions may exist.

Any discrepancies regarding wetland omissions, inclusions or errors should be brought to the attention of the Regional Wetland Coordinator, Region 2. The Project Officer for these wetland maps is Warren Hagenbuck, Regional Wetlands Coordinator, U.S. Fish and Wildlife Service, Region 2, P.O. Box 1306 Albuquerque, New Mexico 87103.

### Wetlands and Deepwater Habitats

Wetlands encompass a variety of habitats in which most share the single feature, that at least periodic saturation with or coverage by water determines the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Deep water habitats are areas which are permanently flooded (except during periods of extreme drought) and are characterized by open water on the aerial photography. Wetlands and deep water habitats within the subject area fall within all five systems, Marine, Estuarine, Riverine, Lacustrine and Palustrine.

### Marine System

This system includes the open ocean over lying the continental shelf and its associates high energy coastline. The salinities in this system must exceed 30 ppt. with little or no delution except outside the mouths of estuaries. The marine system on the NWI maps include the open water of the Gulf of Mexico (MIOW) and the narrow strip of coast line (M2US).

### Estuarine System

The Estuarine System consists of deep water habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open partially obstructed, or sporadic access to the open ocean and in which ocean water is at least occasionally diluted by fresh water runoff by land. Salinities of the estuarine environment may not measure less than 0.5 ppt but may periodically increase above that of the open ocean by evaporation. Deep water habitats of the estuarine system for the areas studied were: open water pockets in

salt marshes inlets, the intercoastal water way and adjoining canals. Other estuarine classes observed were: persistent emergents (E2EMI) such as (Spartina spartinae), (S. patens), (S. Alterniflora), (Suaeda lineares), (Salicornia), (Borrchia frutescens), (Distichlis spicata), (Batis maritina), and (Limonium nashit), unconsolidated shore (E2US), and Scrub shrub (E2SS) such as (Iva frutescens) and (Tamarix gallica).

### Lacustrine

Natural or artificial basins greater than 20 acres in area are classified as lacustrine. There are two subsystems: the limnetic (lakes greater than two meters deep), and littoral (lakes less than two meters deep). The lacustrine system on NWI maps included the classes open water (L1OW, L2OW), aquatic bed (L2AB) and unconsolidated shore (L2US). The majority of lakes were reservoirs, impounded by man and classified in the limnetic subsystem. The major lakes included: Lake Livingston, Lake Charlotte and Lake Houston. Shallow lakes impounded by man and utilized for rice irrigation were classified in the littoral subsystem as permanently flooded (L2OWHh) or semi permanently flooded (L2OWFh). Aquatic species found in the Lacustrine system were Lemna minor and Eichornia crassipes which were classified in the littoral subsystem as permanently flooded (L2ABH), intermittently exposed (L2ABG) or semipermanently flooded (L2ABF). Unconsolidated shores of the lacustrine system were classified as L2US.

### Riverine

The riverine system includes wetlands and deep water habitats contained within a naturally or artificially created channel in which water flows periodically or continuously. Three subsystems were utilized to classify the riverine systems Tidal, Lower Perennial and Intermittent. The major rivers of the work area were the Trinity, Neches and Sabine. Tidal River areas were mapped where rivers flow into water bodies that were tidally influenced by the Gulf of Mexico and were labeled R1OWV. Most of the rivers were lower perennial and were labeled R2OWH. Aquatic beds observed in rivers were labeled R2ABH. Unconsolidated shores along rivers were classified as temporarily or seasonally flooded and were labeled R2USA or R2USC. Channelized canals were given the excavated special modifier and were labeled R2OWHx. Intermittent riverine systems were classified as temporarily flooded or seasonally flooded streambeds and were labeled R4SBA or R4SBC.

## Palustrine

The Palustrine system included both tidal and non tidal wetlands. Tidal wetlands were classified as palustrine if they occurred where salinity due to ocean derived salts is below 0.5 ppt. This system includes the classes, open water, aquaticbed, unconsolidated shore, all emergents, shrubs and trees. The most common open water bodies in the Palustrine system were excavated and impounded ponds (less than 20 acres in area), which were labeled POWHx, POWFx, POWHh or POWFh. Oxbows adjoining rivers at only one end were labeled POWH if they were less than 20 acres in area. Aquatic beds were found in both natural and man made Palustrine open water bodies and were labeled as either PABH or PABF with impounded (h) or excavated (x) modifiers used where appropriate. The most common aquatic species found were water hyacinth, (Eichornia crassipes), Duck weed (Lemna minor) and alligator fern (Ayolla carolirians).

Unconsolidated shores, were labeled as either temporarily flooded (PUSA) or seasonally flooded (PUSC). Reservoirs less than 20 acres in area were classified as seasonally flooded and were labeled PUSCh.

Emergent Palustrine species were found under four water regime conditions: temporarily flooded (A), Saturated (B), Seasonally flooded (C) and Semipermanent (F). Most Palustrine wetland emergents occurred along riparian drainage ways, impounded lakes, and ponds, or in small depressions. Some coastal marsh areas were classified as Palustrine because salt water intrusion was prevented by dikes and levees. Emergents which occurred along tidally influenced flood plains were classified as either seasonally tidal (PEMR), temporarily tidal (PEMS) or semipermanently tidal (PFMT). Common emergents in these fresh water marshes were the common reed (Phragmites australis) and salt meadow cordgrass (spartina patens). The dominant species of saturated areas were sphagnum and sedges. Most other emergent species were either temporarily (A), seasonally (C), or semipermanently (F) flooded areas containing: Blackrush (Juncus roemerians). Common cat-tail (Typha latifolia), Southern wild rice (Zizaniopsis miliacea), switchgrass (Panicum virgatum), and sedges carex.

Scrub shrub species of the Palustrine system were classified as broad leaf deciduous, needle leaf deciduous or needle leaf evergreen and were labelled PSS1, PSS2 or PSS4. The broad leaf deciduous scrub shrub species were most commonly Rattlebush (sesbania drummondii), Buttonbush Cephalanthus occidentalis), Baccharis, and small trees (less than six meters tall) such as tallow (Sapium sebiterum) and Black willow (Salix nigra). The broad leaf deciduous species of scrub shrubs were found in temporary, seasonal or semi permanent flood conditions and were

labeled PSSIA, PSSIC, Or PSSIF. Needle leaf deciduous species of shrubs were small (less than six meters tall). Bald Cypress (Taxodium distichum) trees found in semi permanent and permanent conditions and labeled PSS2F and PSS2H. Needle leaf evergreen species of shrubs consisted of predominately loblolly pine (Pinus taeda) and were classified as either seasonally flooded or temporarily flooded and labeled as either PSS4C or PSS4A.

A variety of Palustrine forested species were in the work areas. Broad leaf deciduous species were sweetgum, (Liquidambar styraciflua), sugarberry (Celtis laevigata), winged Elm (Ulmus alata), water oak (Q. nigra) River birch (Betula nigra), Black willow (Salix nigra) Red Maple (Acer rubrum) and water tupelo (Nyasa aquatica), american sycamore (platanus occidentalis) and green ash (Fraxinus pennsylvanica). These species were found in temporarily and seasonally flooded conditions and were labeled PFOIA and PFOIC. Black willow (Salix nigra) was found also in semipermanent conditions and was labeled PFO1F. Needle leaf deciduous forests consisting of Taxodium distichum were found in semipermanent conditions and were labeled PFO2F. In semipermanent areas where it could not be determined if the dominating species of trees were broad leaf deciduous or needle leaf deciduous, the subclass deciduous (PFO6F) was utilized. The needle leaf evergreen subclass comprised primarily loblolly pines (Pinus taeda) which were labeled PFO4A or PFO4C. Dead trees observed on the photography were labeled PFO5 with the appropriate water regime.

### Water Regimes

Hydrologic characteristics are an important aspect of wetlands. The following water regimes describe in general terms the duration and timing of surface inundation, as well as ground-water fluctuations.

Temporarily Flooded (A) - Surface water present for brief period's during the growing season, but water table usually lies well below the surface.

Saturated Flooded (B) - Surface water is seldom present, but substrate is saturated to the surface for extended periods during the growing season.

Seasonally Flooded (C) - Surface water is present for extended periods, especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is very variable, range in from a saturated condition to one in which the water table is well below the ground's surface.

Semipermanently Flooded (F) - Surface water persists throughout the growing season in most years. Land surface is normally saturated when water level drops below soil surface.

Intermittently Exposed (G) - Surface water is present throughout the year except in years of extreme drought.

Permanently Flooded (H) - Water covers land surface throughout the year in all years.

Special modifiers included on these NWI maps, where applicable, are:

Partly Drained (d): The water level has been artificially lowered, but the area is still classified as wetland because soil moisture is sufficient to support hydrophytes. Drained areas are not considered wetland if they can no longer support hydrophytes.

Diked/Impounded (h): Created or modified by a barrier, dike, or dam which obstructs the inflow or outflow of water.

Excavated (x): Lies within a basin or channel excavated by man.

TABLE 1. SUMMARY OF WETLANDS AND DEEPWATER HABITATS

NWI CODE	NWI DESCRIPTION	COMMON DESCRIPTION	VEGETATION SUBSTRATE
M1OW	Marine openwater	Gulf of Mexico	Open water
M2US	Marine intertidal unconsolidated shore	Gulf Shore	Exposed coastline
E1OW	Estuarine open water	Brackish water	Open water
EZEM	Estuarine emergent	Salt marsh	Spartina spp. Suaeda lineares Borrchia frutescens Distichlis spicata Batis maritina Limonium nashii
E2US	Estuarine intertidal unconsolidated shore	Shore	Exposed shore
E2SS2	Estuarine Intertidal Scrub Shrub	Shrubs	<u>Iva frutescens</u> <u>Tamarix gallica</u>
L1OW	Lacustrine open water	Lake	Open water
L2US	Lacustrine littoral unconsolidated shore	Lake flat	Unvegetated mud, sand, gravel
L2AB	Lacustrine aquatic bed	Pond weeds, water weeds	<u>Nymphaea</u> (water lily) <u>Lemna</u> (duckweed) <u>Hydrocotyle</u> (pennywort) <u>Myriophyllum</u> (milfoil)
R2OW	Riverine lower perennial open water	River, stream	Open water, year round
R4SB	Riverine intermittent streambed	Intermittent stream	Unvegetated river bottom
R4US	Riverine unconsolidated	River bar, river flat	Unvegetated mud, sand, gravel

TABLE 1. SUMMARY OF WETLANDS AND DEEPWATER HABITATS

NWI CODE	NWI DESCRIPTION	COMMON DESCRIPTION	VEGETATION SUBSTRATE
POW	Palustrine open water	Pond	Open water
PAB3	Palustrine aquatic bed	Pond weeds	<u>Hydrocotyle</u> (pennywort)
PAB4	Palustrine aquatic bed	Pond weeds	<u>Lemna</u> (duckweed)
PUS	Palustrine unconsolidated shore	Pond shore	Exposed pond shore
PEM1	Palustrine emergent, persistent.	Marsh, wet meadow	<u>Scirpus</u> (bulrush) <u>Typha</u> (cattail) <u>Juncus</u> (rush) <u>Eleocharis</u> (spike sedge) <u>Carex</u> spp. (sedge) <u>Polygonum</u> (smartweed)
PSS1	Palustrine scrub/shrub broad-leaved deciduous	Shrub swamp	<u>Salix</u> spp. (willow) <u>Cephalanthus occidentalis</u> (buttonbush)
PSS2	Palustrine scrub/shrub	Shrub swamp	<u>Taxodium distichum</u> (bald cypress)
PSS4	Palustrine scrub/shrub	Scrub	<u>Pinus taeda</u> (loblolly pine)
PF01	Palustrine forested broad-leaved deciduous	Forested wetland	<u>Salix nigra</u> (black willow) <u>Celtis</u> spp. (hackberry) <u>Quercus</u> spp. (oaks) <u>Ulmus americana</u> (American elm) <u>Liquidambar styraciflua</u> (sweetgum) <u>Betula</u> (River Birch) <u>Nyssa</u> (tupelo)
PF02	Palustrine forested needle leaved evergreen	Forested wetland	<u>Taxodium distichum</u> (bald cypress)
PF04	Palustrine forested needle leaved evergreen	Forested	<u>Pinus taeda</u> (loblolly pine)

LITERATURE CITED

Bailey, Robert G. 1980, Description of Ecoregions of the United States, U.S.P.A. Forest Service, Intermountain Region Ogden, Utah.

Brockman, C.F. 1968, Trees of North America, Golden Press, New York.

Cowardin, Lewis M. 1979, Classification of Wetlands and Deepwater Habitats of the United States. USDI, Fish and Wildlife Service FWS/PBS 79/81.

U.S.D.A. Soil Conservation Service Soil Surveys

Chambers County	May 1976
Harris County	August 1976
Jefferson County	February 1975