

**NATIONAL WETLANDS INVENTORY**

**MAP REPORT FOR**

**WESTERN ARKANSAS**

**The 1:100,000 Map Units of**

**El Dorado NW, Little Rock SW, Little Rock NW  
Russellville SW, Russellville NW, Harrison SW**

**DRAFT**

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WESTERN ARKANSAS  
NATIONAL WETLANDS INVENTORY  
MAP REPORT

I. INTRODUCTION

The United States Fish and Wildlife Service's National Wetlands Inventory (NWI) is producing maps showing the location and classification of wetlands and deepwater habitats of the United States. The Classification of Wetlands and Deepwater Habitats of the United States by Cowardin et al. is the classification system used to define and classify wetlands. Photo interpretation conventions, hydric soils lists, and wetland plant lists are also available to enhance the use and application of the classification system.

The purpose of the report to users is threefold: (1) to provide localized information regarding the production of NWI maps, including field reconnaissance with a discussion of imagery and interpretation; (2) to provide a descriptive crosswalk from wetland codes on the map to common names and representative plant species; and (3) to explain local geography, climate, and wetland communities.

II. FIELD RECONNAISSANCE

Field reconnaissance of the work area is an integral part of the accurate interpretation of aerial photography. Photographic signatures are compared to the wetland's appearance in the field by observing vegetation, soil, and topography. This information is weighted for seasonality and conditions existing at the time of photography and at ground truthing.

The following 1:100,000 maps were reviewed:

El Dorado NW	Russellville SW
Little Rock SW	Russellville NW
Little Rock NW	Harrison SW

### Project Area

The project area is located in western Arkansas. El Dorado NW, Little Rock SW, and Little Rock NW are in the southern portion. Russellville SW, Russellville NW and Harrison SW are in the northern portion. See Map A and Map B for visual clarification.

### Field Personnel

Curtis Carley - U.S. Fish and Wildlife Service  
Region ~~IV~~ II  
Charlie Storrs - U.S. Fish and Wildlife Service  
Region ~~IV~~ IV  
Dennis Fowler - U.S. Fish and Wildlife Service  
National Quality Control  
Cynthia Bohn - Geonex, Inc.  
David Capaz - Geonex, Inc.  
John Swords - Geonex, Inc.

### Field Trip Dates

January 10 - 22, 1993

### Aerial Photography

Type: Color Infrared Transparencies  
Scale: 1:58,000 NHAP  
Dates: 2/25/83, 3/1/83, 3/6/83, 3/7/83, 3/11/83,  
3/11/84, 4/6/84, 2/28/85, 3/5/85, 3/18/85,  
3/25/85, 4/2/85  
Percent Coverage: All 192 USGS quadrangles were covered  
with the NHAP photography.

Collateral Data

United States Geological Survey Topographic Quadrangles:  
192 @ 1:24,000  
4 @ 1:250,000

Soil Surveys for the following counties:

Boone	Logan
Carroll	Madison
Clark	Newton
Franklin	Ouachita
Garland	Pope
Hempstead	Washington
Hot Springs	Yell
Johnson	

Bailey's Description of the Ecoregions of the United States.

Water Resources Data - Arkansas.

Hydric Soils of the State of Arkansas.

National List of Plant Species That Occur in Wetlands  
Arkansas.

Aquatic and Wetland Plants of Missouri.

Classification of Wetlands and Deepwater Habitats of the  
United States.

Common Marsh Plants of the United States and Canada.

A Key to Missouri Trees in Winter.

Underwater and Floating-Leaved Plants of the United States  
and Canada.

Manual of Vascular Plants of Northeastern United States and  
Adjacent Canada.

(See Literature Cited for complete bibliographies.)

### III. PHYSICAL DESCRIPTION OF PROJECT AREA

The area covered is between 93° to 94° W longitude and 38° 30' to 36° 30' N latitude. It extends from the Southeastern Mixed Forest Province in the south to the Oak-Hickory Forest Province in the north with the Arkansas River being the approximate boundary between these two provinces.

The Southeastern Mixed Forest Province is the predominant ecoregion in the project area. Located in this province is El Dorado NW, Little Rock SW, Little Rock NW and Russellville SW.

The Oak-Hickory Forest Province is in the northern part of the project area. Located in this province is Russellville NW and Harrison SW.

See Location Map A and Location Map B for more detail.

#### Geography

Southeastern Mixed Forest Province - This region contained within this province extends from the bottomland area of the Little and Red Rivers in the south, to the Ouachita Mountains and Arkansas River Valley in the north.

Oak-Hickory Mixed Forest - The region contained within this province consists of the Arkansas River Valley in the south, to the Boston Mountains and Ozark Highlands in the north. Elevations range from approximately 250 feet to over 2000 feet in the highlands and mountainous areas.

#### Climate

Southern Mixed Forest Province - The climate is strongly influenced by its proximity to the Gulf of Mexico in the growing season. It is hot in the summer and moderately cool in the winter. Precipitation is well distributed throughout the year with an average of 50 inches. Average annual temperature range is from 60°F to 70°F. The growing season extends from mid-March to mid-September.

Oak-Hickory Forest Province - The climate is influenced by a drier continental climate regime wind flow with occasional intervals of moist air from the Gulf of Mexico. The summers are hot and winters are moderately cool. Average annual precipitation is 45 inches and is well distributed throughout the year. Temperature ranges average between 59°F and 65°F. The growing season extends from April to September.

## Vegetation

Southeastern Mixed Forest Province - The climate vegetation is slash and loblolly pine intermixed with oak, hickory, sweetgum and elm. Cypress and tupelo was found in former oxbows. Smartweed and rice cutgrass were common wetland herbaceous species in this area.

Oak-Hickory Forest Province - Dominated by broadleaf deciduous trees intermixed with slash and loblolly pine. Oak, hickory, elm and willow were common trees found. River birch is found along the banks of streams.

## Soils

Southeastern Mixed Forest Province - The soils in the southern part of this region in the project area are silty loam and are poorly drained along the floodplains to well drained in the upland areas. In the northern part the soils are gravelly and loamy.

Oak-Hickory Forest Province - Limestones are dominant in this area. The soils are chalky to very chalky and stony on ridges and mountainsides.

## IV. DESCRIPTION OF WETLAND HABITATS IN STUDY AREA

### A. RIVERINE

The following subsystem and classes were represented in the study area.

Lower Perennial  
- Unconsolidated bottom  
- Unconsolidated shore

Upper Perennial  
- Unconsolidated bottom  
- Unconsolidated shore

Intermittent  
- Streambed

The major rivers in the project area are the Arkansas, Red, Petit Jean, Fourche la Pave, Little Missouri, Ouachita, Buffalo and Caddo. The study area shows a wide variation in topography from the south to the north. In the El Dorado NW 1:100,000, the Little Missouri, Red River and Ouachita River contain wide floodplains. Both rivers were lower perennial with a permanently flooded (H) water regime. Oxbows and small pockets are common.

The Arkansas River is also considered lower perennial riverine when not dammed by locks. The dammed areas are classified within the lacustrine system. It exhibits a wide floodplain along its track.

In the northern half of the study area, the topography exhibited the characteristics more indicative of upper perennial systems such as a poorly developed floodplain and high oxygenation. A good example of an upper perennial river is the Buffalo River in the Russellville NW/Harrison SW 1:100,000.

Much of this region is transitional between the lower and upper perennial types. The determination for upper and lower perennial breaks were difficult to correlate with in-field observation. Therefore, classification is determined by the gradient observed on the USGS topo. A 100 foot drop in a mile of river is used as a general guide.

Subsystem classification breaks are based on the perennial (R2, R3) versus the intermittent (R4) designated as portrayed by USGS on the topo sheet. Intermittent systems are generally classified as seasonally flooded (R4SBC) or temporarily flooded (R4SBA) unless the canopy covers the streambed by at least 30%. In this case, they are placed in the palustrine vegetated system.

B. LACUSTRINE

This system is represented by the following subsystems and classes.

Limnetic

- Unconsolidated bottom
- Aquatic bed

Littoral

- Unconsolidated shore

In the study area, there is extensive manipulation of the waterways by damming forming large reservoirs. These reservoirs and impoundments greater than 20 acres are classified as limnetic, unconsolidated bottom, permanently flooded (L1UBHh). Any exposed shoreline large enough to be enclosed by a polygon will be classified as littoral, unconsolidated shore, seasonally or temporarily flooded with an impoundment modifier (L2USC/Ah). Any vegetated wetlands within the system will be classified under the palustrine system.

Many of the backwaters of the reservoirs contain standing trees and shrubs due to the exceptionally wet winter conditions. Most of the wetland vegetation will be classified as only temporarily flooded (A) since, during the year, water fluctuates greatly in these man-made lakes and these backwaters tend to dry out quickly in early spring. The majority of the breaks between lacustrine impounded and riverine will be taken from the normal pool elevation if given on the topographic map.

The major reservoirs and the rivers impounded to create these man-made lakes are listed below starting with the southern part of the area and working in a northward direction.

In El Dorado NW the Little River is impounded creating Millwood Lake. The Little River then flows into the Red River, not more than ten miles downstream from the lake. White Oak Creek is impounded forming White Oak Lake. The creek eventually flows into the Ouachita River.

In Little Rock SW, Narrows Dam impounds the Little Missouri River creating Lake Greason. Carpenter Dam forms Lake Hamilton impounding the Ouachita River. Five miles upstream in Little Rock NW this river is again impounded by Blakely Mountain Dam forming Lake Ouachita, the largest lake contained entirely in the study area. The section of the "river" between the two dams is classified by Cowardin in the lacustrine system (L1UBHh) since it no longer maintains its flow. Further north, the Fourche la Pave River with a well-developed floodplain is impounded by Nimrod Dam creating Nimrod Lake.

In Russellville SW the Petit Jean is impounded creating Blue Mountain Lake. In Harrison SW the White River is impounded by Beaver Dam forming Beaver Lake and further downstream on the White River, Bull Shoals Lake is formed by a similar dam.

C. PALUSTRINE

This system is represented by the following classes.

- Unconsolidated bottom
- Unconsolidated shore
- Aquatic bed
- Emergents
- Forested
- Scrub-shrub

Palustrine wetlands are the dominant wetland type observed in the project area. Within this system, impounded farm ponds (PUBHh) are the most common palustrine classification. Emergents (PEM) and aquatic beds (PAB) are also found in these ponds and classified based on photo signature. Sand and gravel pits, sewage treatment ponds and closed unvegetated oxbows are palustrine unconsolidated bottom.

Palustrine unconsolidated shore (PUS) wetlands are primarily restricted to small shallow impoundments or depressions that portrayed an exposed substrate. Aquatic bed vegetation (PAB) is found associated with any shallow water body such as impoundments, beaver ponds and sloughs when growing conditions permit.

Most wetland forested and scrub habitat is classified as broadleaf deciduous, notable exceptions being the cypress stands which are needleleaf deciduous (PFO2, PSS2). Temporarily flooded communities (PSS1A, PFO1A) are the most commonly found in the upper reaches of reservoirs, rivers and some impounded ponds. They are also portrayed as linears substituting for a riverine classification (R2, R3, R4) when the vegetation forms a greater than 30% canopy over the water body. Seasonally flooded (C) and semipermanently flooded (F) communities are more commonly associated with large bottomland riverine swamps particularly in the southern part of the work area and show more predominance of cypress and tupelo with mixed broadleaf deciduous species. These classifications are also associated with beaver activity or springs which are observed throughout the project area. Saturated (B) forests and scrub-shrub habitat is restricted to slopes with slight gradients that contain ponding soils (such as the Bibb series.)

### Unconsolidated Bottom

- PUBH - Permanently flooded. Used predominantly with an impoundment modifier (h) and is most commonly used to classify impounded farm ponds. The excavated modifier (x) is used if there is no visible evidence of drainage into or out of the water body and/or is formed because of strip mining. Fish hatcheries also use the (x) modifier.
- PUBK - Artificially flooded. Restricted to sewage treatment ponds.
- PUBF - Semipermanently flooded. Restricted to closed oxbows and water bodies impounded by beaver. In the latter case the (b) modifier will be used.

### Unconsolidated Shore

- PUSA - Temporarily flooded. Impoundments or excavations with no standing water present.
- PUSC - Seasonally flooded. Impoundments or excavations with some standing water present.

### Aquatic Bed

- PAB3F  
PAB4F - Semipermanently flooded. Aquatic beds (floating and rooted vascular) in impoundments with water almost always present.
- PAB3H  
PAB4H - Permanently flooded. Aquatic bed (floating or rooted vascular) in impoundments with permanent water.

### Emergents

- PEM1A - Temporarily flooded. Emergents predominantly found alongside impounded farm ponds and reservoirs.
- PEM1C - Seasonally flooded. Emergents predominantly found in impoundments and excavations and shallow depressions.
- PEM1F - Semipermanently flooded. Emergents in closed oxbows and large depressions.

### Scrub-shrub

- PSS1A - Temporarily flooded. Shrubs in swollen reservoirs and rivers.
- PSS1C - Seasonally flooded. Shrub vegetation found inside impoundments and associated with beaver ponds.
- PSS1F - Semipermanently flooded. Shrubs inside closed oxbows and directly adjacent to beaver impoundments.
- PSS1B - Saturated. Shrubs associated with seepage areas on slopes, sometimes correlates with ponded soil types such as Guyton series.

### Forested

- PFO1A - Temporarily flooded. Bottomland hardwoods deciduous species in shallows on swollen rivers and reservoirs and linears on small creeks and drains.
- PFO1C - Seasonally flooded. Small pockets of deciduous hardwoods confined to depressions or channels in floodplains or lower elevations in reservoirs.
- PFO2C - Seasonally flooded. Primarily limited to the identification of cypress in its drier habitat.
- PFO1F - Semipermanently flooded. Bottomland deciduous species particularly water tupelo isolated to deepest water sloughs.
- PFO2F - Semipermanently flooded. Cypress stands in deeper water areas, particularly sloughs and oxbows.
- PFO1B - Saturated. Deciduous species associated with seepage areas on slopes, sometimes correlates with ponded soil types such as Guyton series.

**OBSERVED WETLAND VEGETATION**  
 (grouped by wetland class)  
 Table 1

		<u>Indicator Category</u>	
A. <u>SCRUB-SHRUB</u>	alder	<u>Alnus serrulata</u>	F1 CW+
	black willow	<u>Salix nigra</u>	OBL
	saltbush	<u>Baccharis halimifolia</u>	F1 C
	buttonbush	<u>Cephalanthus occidentalis</u>	OBL
B. <u>FORESTED</u>	willow oak	<u>Quercus phellos</u>	F1 CW
	overcup oak	<u>Quercus lyrata</u>	OBL
	water oak	<u>Quercus nigra</u>	F1 C
	hackberry	<u>Celtis occidentalis</u>	F1 CU
	sweetgum	<u>Liquidambar styraciflua</u>	F1 C+
	hickory	<u>Carya sp.</u>	
	elm	<u>Ulmus sp.</u>	
	river birch	<u>Betula nigra</u>	F1 CW
	sycamore	<u>Plantas occidentalis</u>	F1 CW-
	willow	<u>Salix nigra</u>	OBL
	sweet bay	<u>Magnolia virginiana</u>	F1 CW+
	Eastern hornbeam	<u>Ostrya virginiana</u>	F1 CU-
	water locust	<u>Gledista aquatica</u>	OBL
	cypress	<u>Taxodium distichum</u>	OBL
	tupelo	<u>Nyssa aquatica</u>	OBL
	C. <u>EMERGENT</u>	woolgrass	<u>Scirpus cyperinus</u>
bulrush		<u>Scirpus sp.</u>	OBL
rice cutgrass		<u>Leersia oryzoides</u>	OBL
rush		<u>Juncus sp.</u>	F1 CW
smartweed		<u>Polygonum sp.</u>	OBL
sedge		<u>Carix sp.</u>	F1 CW
D. <u>AQUATIC BED</u>	duckweed	<u>Lemna minor</u>	OBL
E. <u>UPLAND</u>	slash pine	<u>Pinus palustris</u>	
	loblolly pine	<u>Pinus taeda</u>	F1 C
	Eastern red cedar	<u>Juniperus virginia</u>	F1 CU-
	green briar	<u>Smilax sp.</u>	F1 C

WETLAND CLASSIFICATION CODES AND WATER REGIME DESCRIPTIONS

Table 2 - Cowardin Classification Codes and Descriptions

WATER REGIME	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION
R2UB (F,H)	Riverine, lower perennial, unconsolidated bottom	Rivers	Unvegetated mud, sand or gravel bottom
R2US (A,C)	Riverine, unconsolidated shore	River flats	Unvegetated sand, or gravel shore
R3UB (F,H)	Riverine, upper perennial, unconsolidated bottom	Rivers	Unvegetated sand, gravel or rubble bottom
R3US (A,C)	Riverine, upper perennial, unconsolidated shore	River flats	Unvegetated sand, gravel or rubble shore
R4SB (A,C)	Riverine, intermittent stream bed	Streams, creeks	Unvegetated mud, sand, gravel or rubble streambed
E1UB (H)	Lacustrine, limnetic, unconsolidated bottom	Lakes, locks and dams, strip mines	Unvegetated mud, sand, gravel or bedrock bottom
E2US (A,C)	Lacustrine, littoral, unconsolidated shore	Lake flats	Unvegetated sand, gravel or shore
PUB (H,K)	Palustrine, unconsolidated bottom	Ponds, sand and gravel pits, impoundments, sewage treatment ponds	Unvegetated mud, sand, gravel or artificial bottom
PAB (F,H)	Palustrine, aquatic bed	Ponds or deep marshes	<u>Myriophyllum laxum</u> <u>Nymphaea odorata</u>
PEM (A,B,C,F,H)	Palustrine, emergent	Meadows, marshes, depressions, or drainage areas -	<u>Carix</u> sp. <u>Juncus effusus</u> <u>Leersia oryzoides</u> <u>Polygonum</u> sp. <u>Scirpus cyperinus</u>

WETLAND CLASSIFICATION CODES AND WATER REGIME DESCRIPTIONS

Table 2 - Cowardin Classification Codes and Descriptions

NWI CODE WATER REGIME	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION
PSS (A,B,C,F)	Palustrine, scrub-shrub	Shrub swamps, river banks, springs, thickets, bogs	<u>Alnus serrulata</u> <u>Baccharis sp.</u> <u>Cephalanthus occidentalis</u> <u>Salix nigra</u>
PFO (A,B,C,F,H)	Palustrine, forested floodplains or	Forested depressions, swamps, bottomland hardwoods, bogs	<u>Liquidambar styraciflua</u> <u>Taxodium distichum</u> <u>Quercus nigra</u> <u>Nyssa sylvatica</u> <u>Betula nigra</u> <u>Carya sp.</u> <u>Celtis occidentalis</u> <u>Gledista aquatica</u> <u>Magnolia virginiana</u> <u>Ostrya virginiana</u> <u>Plantas occidentalis</u> <u>Quercus phellos</u> <u>Quercus lyrata</u> <u>Salix sp.</u> <u>Ulmus sp.</u>

## V. WATER REGIME DESCRIPTION

### Non-Tidal

- (A) Temporarily Flooded -- Surface water present for brief periods during growing season, but water table usually lies well below soil surface. Plants that grow both in uplands and wetlands are characteristic of this water regime.
- (B) Saturated -- The substance is saturated to surface for extended periods during the growing season, but surface water is seldom present.
- (C) Seasonally Flooded -- 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 extremely variable, extending from saturated to a water table well below the ground surface.
- (F) Semipermanently Flooded -- Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land's surface.
- (H) Permanently Flooded -- Water covers land surface throughout the year in all years.
- (K) Artificially Flooded -- Amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams.

## VI. IMAGERY

Imagery for this mapping area is of good quality and resolution. However, because the numerous dates of photography and field reconnaissance reflecting non-growing season flooding, delineation of the wetlands to represent the growing season conditions proved challenging.

Field conditions were similar to the photography with both characterizing the normally wet non-growing season with the leaf-off conditions (except in the late March and early April photographs.) There is an excess of winter water, predominantly in agricultural fields and partially submerged trees are a common sight along the shorelines at many reservoirs. In the growing season (April-September) field conditions are drier, therefore, the wetland water regimes modifiers were scaled back to represent true annual wetland conditions.

## VII. MAP PREPARATION

The wetland classification that appears on the National Wetlands Inventory (NWI) base map is in accordance with Cowardin et al. (1977). The delineations were produced through stereoscopic interpretation of 1:58,000 scale color infrared photography. The majority of the photography was taken during the late winter and early spring months of 1983-1985.

Field checks of areas found within the Western Arkansas project were made prior to the actual delineation of wetlands. Field check sites were selected to clarify varying signatures found on the photography. These photographic signatures were then identified in the field using vegetation types and soil types, as well as additional input from field personnel.

Collateral data included USGS topographic maps, SCS soil surveys, climate, vegetation, and ecoregional information.

The user of the map is cautioned that, due to the limitation of mapping primarily through aerial photointerpretation, a small percentage of wetlands may have gone unidentified or simplified for graphic portrayal. Since the photography was taken during a particular time and season, there may be discrepancies between the map and current field conditions. Changes in landscape which occurred after the photography was taken would result in such discrepancies.

Aerial photointerpretation and drafting were completed by Geonex Corporation, St. Petersburg Operations.

## VIII. SPECIAL MAPPING PROBLEMS

Field conditions were wet and generally coincided with the photography which was also wet. Comparison of photo overlap and correlation between differing dates of photography was performed when possible to gain insight into "normal" hydrology.

Standing water found in agricultural fields was not delineated as wetland. Wet areas showing evidence of plowing will also be labeled upland. However, deeper oxbows and depressions in agricultural areas are considered wetland and labeled accordingly if vegetation is contained within or on the edges of those areas.

The identification of wetlands within floodplains that are characterized by a complex of braided channels and upland banks is difficult at this mapping scale. Therefore, simplification of those areas was necessary and may contain a certain percentage (usually less than 30%) of uplands or different wetland types.

IX. MAP ACQUISITION

To discuss any questions concerning these maps or to place a map order, please contact:

John Hefner  
Regional Wetland Coordinator  
U.S. Fish and Wildlife Service - Region IV  
R.B. Russell Federal Building  
75 Spring Street S.W.  
Atlanta, GA 30303

To order maps only, contact:

National Cartographic Information Center  
U.S. Geological Survey  
National Center  
Reston, VA 22092

Maps are identified by the name of the corresponding USGS 1:24,000 scale topographic quadrangle name. Topographic map indices are available from the U.S. Geological Survey.

X. LITERATURE CITED

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LOCATOR MAP  
WESTERN ARKANSAS PROJECT AREA

(MAP A)

