ACCESS NUMBER: 29085

STUDY TITLE: Ecological Characterization of the Mississippi Delta Plain Region

REPORT TITLE: Mississippi Deltaic Plain Region Ecological Characterization: A Habitat Mapping Study, Map Series and A User's Guide to the Habitat Maps

CONTRACT NUMBERS: BLM: MU8-28; MMS: 14-12-0001-29085

SPONSORING OCS REGION: Gulf of Mexico

APPLICABLE PLANNING AREAS: Central Gulf of Mexico

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PROJECT MANAGER: J. Johnston

AFFILIATION: U.S. Fish and Wildlife Service

ADDRESS: 1010 Gause Boulevard, Slidell, Louisiana 70458

PRINCIPAL INVESTIGATOR*: K. Wicker

KEY WORDS: Central Gulf; Mississippi River; Louisiana; Mississippi; baseline; characterization; habitat; maps; wetlands; barrier islands; aerial photography; estuarine; marine; riverine; freshwater; floral zones; literature review; diversity

BACKGROUND: The purpose of the Mississippi Deltaic Plain Region Ecological Characterization Study was to compile existing information from the biological, physical, and social sciences for the study region. Habitat maps and a companion user's guide constituted a part of this characterization study. Funding was provided by the Bureau of Land Management and the work effort was completed through a Memorandum of Understanding with the U.S. Fish and Wildlife Service (USFWS).

OBJECTIVES: (1) To measure habitats in the study area and illustrate change over a given period of time; and (2) to produce two sets of habitat maps which could be used in planning for Outer Continental Shelf oil and gas development.

DESCRIPTION: The study area was located in the coastal region of southeastern Louisiana and southern Mississippi. In Mississippi, the study area encompassed all of the coastal zone between the Alabama and Louisiana borders. In Louisiana, the western extent of the study area was terminated near the western shores of Vermilion Bay. The offshore boundary for both states was the 3-mi State-Federal demarcation line. Two time periods (mid-1950s and late 1970s) were selected for study, which constituted periods for which there were complete, high quality aerial photography of the

study area. Habitat maps were constructed at a scale of 1:24,000 for two reasons. First, this was a convenient scale for mapping habitats and generating information useful in coastal habitat and land use evaluation, planning, and management. Second, the land area within the entire study area had already been mapped by the U.S. Geological Survey at this scale in the form of topographic maps, or orthophotoquads, which were available as base maps. Most of the photographs were large scale (1:24,000), but about one-third of the frames taken in the 1950's covering eastern Mississippi and the barrier islands were at a scale of 1:20,000.

The method for identifying and labeling habitats within the study area was adapted from the USFWS Classification of Wetlands and Deep-Water Habitats of the United States (Cowardin et al., 1979). One advantage of this system of classification was that it permitted labeling of a habitat in varying degrees of detail according to the data base available for the major systems within the study area.

Classification of water bodies fell under one of five systems, depending primarily upon salinity and secondarily upon size and shape. These systems included marine, estuarine, palustrine, lacustrine, and riverine. Information on tidal influence was necessary in determining the break between tidal and lower perennial systems within channelized bodies of water.

Unlike aquatic habitats and unvegetated environments with and without structures, vegetated habitats were recognized because of their fine to coarse texture and their light to dark and/or mottled tones. Categories of vegetated habitats included shrubs, trees, marsh, agriculture/pasture, cleared right-of-ways, floating aquatics, and submerged aquatics. Distinctions among marsh grasses, trees, and shrubs were made on the basis of monoscopic interpretation of the aerial photograph, with reference to topographic and topical maps. The classification of vegetated habitats required a knowledge of the following vegetation association characteristics: species morphology (e.g., tree, shrub, grass, etc.); species composition (e.g., broad-leafed deciduous, broad-leaved evergreen, etc.); elevation of vegetation substrate with regard to water levels and hydroperiod (e.g., backswamp, marsh, intertidal flat, etc.); and soil and water salinity (i.e., fresh, intermediate, brackish, saline). Identification and classification of vegetated habitats could only be done accurately from aerial photography when collateral information, such as field checking or existing vegetation maps and reports, was utilized. Within the Mississippi Deltaic Plain Region, there was a close correlation between vegetation associations that could be seen on aerial photographs in terms of class and subclass, and topographic features (physiographic regions and units) that could be viewed in terms of system and subsystem.

Aerial photographs were used as the basis for habitat interpretation on the maps. Topical maps, topographic maps, published reports, and field reconnaissance were also essential for detailed habitat identification.

SIGNIFICANT CONCLUSIONS: There were 22 water-related habitats identified in the study area. Fifty vegetated habitats were discerned; some were natural and other influenced by actions of man. Areal extent of the vegetation habitats changed between

the 1950s and 1978, in some cases due to major storms. Species composition within the habitat types did not change significantly.

STUDY RESULTS: The final product consists of two sets of habitat areal measurements: one for the 1950s habitat map series and the other for the 1978 series. Each set consists of 272 final tally sheets depicting 232 (7.5 minute) named habitat map units and 40 (7.5 minute) open water units contained within the study area. Color infrared photography was used for 1978 and black and white photography was used for the 1950s.

The study area consists of older, elevated Pleistocene deposits on the Pleistocene Terrace, Recent alluvial deposits within the Deltaic Plain, and marine and Pleistocene outwash materials along the Mississippi coast. Virtually all habitats within the Pleistocene Terrace fell within the upland system. Recent sediments within the Deltaic Plain of Louisiana could be divided into five major physiographic units: natural levees; backswamp; marsh; beaches and barrier islands; and abandoned beach ridges. The portion of the study area included within the Pleistocene or Upland Terrace east of the Mississippi River was divided into two major tree regions, loblolly-shortleaf pine, and longleaf-slash pine, which provided the basis for class and subclass identification. The entire forested portion of the Alluvial Valley was classified variously as Bottomwood Hardwoods and Cypress Region or an Oak-Gum-Cypress forest type. Extensive, low-lying swamps in the study area occurred in the freshwater interdistributary backswamp basins in the Alluvial Valley and Deltaic Plain. Marsh distribution in Mississippi showed no change from photographic comparisons as saltwater intrusion was not as extensive as in Louisiana. Submerged aquatic plants in the study area were generally confined to water depths of less than 6 ft and were not usually visible on aerial photographs. The distribution of all submerged and floating aquatics throughout the entire study area was not mapped.

STUDY PRODUCTS: Wicker, K. M. 1980. Mississippi Deltaic Plain Region Ecological Characterization: A Habitat Mapping Study. Map Series. A map series by the U.S. Fish and Wildlife Service for the U.S. Department of the Interior, Bureau of Land Management Gulf of Mexico OCS Office, New Orleans, LA. FWS/OBS-79/07. Contract No. 14-12-0001-29085. 464 maps.

Wicker, K. M. 1980. Mississippi Deltaic Plain Region Ecological Characterization: A Habitat Mapping Study. A User's Guide to the Habitat Maps. A final report by the U.S. Fish and Wildlife Service for the U.S. Department of the Interior, Bureau of Land Management Gulf of Mexico OCS Office, New Orleans, LA. FWS/OBS-79/07. Contract No. 14-12-0001-29085. 76 pp.

*P.I.'s affiliation may be different than that listed for Project Managers.