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STUDY TITLE: Southwest Florida Shelf Coastal Ecological Characterization

REPORT TITLE: An Ecological Characterization of the Caloosahatchee River/Big Cypress Watershed

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PROJECT MANAGER: J. Adams

AFFILIATION: U.S. Fish and Wildlife Service

ADDRESS: 1010 Gause Boulevard, Slidell, Louisiana 70458

PRINCIPAL INVESTIGATORS*: R. Drew, N. Schomer

KEY WORDS: Straits of Florida; Eastern Gulf; Southwest Florida Shelf; Florida; baseline; biology; characterization; Caloosahatchee River; Big Cypress; watershed; estuarine; geology; sediment; terrestrial; marine; freshwater; habitat; literature review; synthesis

BACKGROUND: This ecological characterization of the Caloosahatchee River/Big Cypress watershed is one of a series that provides ecological descriptions of Florida's Gulf coast. The major goal of the series is maintenance of watershed natural resources and productivity through enlightened resource management. This report will be used by the U.S. Fish and Wildlife Service and the Minerals Management Service to plan for development of oil and gas reserves offshore of southwestern Florida.

OBJECTIVES: (1) To review and synthesize available literature on the ecology of and environmental alterations in the Caloosahatchee River/Big Cypress watershed.

DESCRIPTION: The study region consists of the watersheds and estuaries of the Caloosahatchee River, the Big Cypress Swamp, Estero Bay, and Corkscrew Swamp. This is a review and synthesis of available literature on the study region focusing

particularly on how the watershed functions as an integrated ecological system. The report is divided into two parts: physical/chemical background conditions, and biological resources. The first part describes the geology, physiography, climate, and characteristics of the ground and surface waters of the region. The concept of watershed energetics for the Caloosahatchee River/Big Cypress watershed are discussed, attempting to describe the meshing of man's socioeconomic structure with the area's natural setting. The second part describes plant succession and communities, and fish and wildlife habits and habitat preferences.

SIGNIFICANT CONCLUSIONS: Southwestern Florida contains a variety of natural resources that have contributed to the development of the area into an important industrial, shipping, agricultural, sport and commercial fishing, recreational, and retirement center. As growth continues, finite resources of the area will diminish in both quality and quantity. Future management of remaining resources requires careful consideration to preserve a productive balance between man and nature.

STUDY RESULTS: The upper watershed is dominated by the canalized Caloosahatchee River running from Lake Okeechobee to the Franklin Locks, a salinity control structure. A series of three locks on the river control flow and stage in the river. Many tributaries to the river have been canalized for drainage and irrigation purposes and are supplied with pumps and weirs for control. The river flows into the Gulf of Mexico via San Carlos Bay in the lee of Sanibel and Pine Islands, part of the Charlotte Harbor estuarine system. Estero Bay watershed encompasses the bay and small drainage streams. Corkscrew Swamp is ill-defined beginning near Lake Trafford and running southwesterly toward the coast. The Big Cypress Swamp includes the cypress sloughs and strands, flows southwest to Tamiami Canal, and eventually discharges into the Gulf of Mexico through the Ten Thousand Islands region.

The study area is located in the South Florida Basin on the Floridan Plateau. Of particular significance in this area is a continuation of anticlinal folds and faults along the lower southwestern coast from the South Florida Shelf. These features may be significant to oil accumulation. The dominant physiographic feature of the Caloosahatchee River watershed is the Caloosahatchee River Valley. To the north lies the flat Desoto Plain; to the south, the Immokalee Rise. The Big Cypress watershed consists of all or part of four major physiographic features: (1) the Immokalee Rise; (2) the Big Cypress Spur; (3) the Southern Slope; and (4) Coastal Swamps and Lagoons.

Recent sediments of the watershed area are generally described as surficial sediments. Soil types fall into five major substrate-sediment groups: (1) limestone rock; (2) calcareous muds (marls); (3) sands (marine terraces); (4) organic material (peats and mucks); and (5) mixed solids.

The watershed is located within the Everglades and Southwest Coast climatic division. Climatic variables of temperature and rainfall are generally consistent when averaged over extended record periods. The climatic pattern can best be described as tropical savannah climate with a long dry season and a wet season.

Watershed surface water drainage consists of diffused waterways (strands), a few stream channels, and extensive man-made canals. Identifiable drainage basins include: (1) Caloosahatchee Valley and River watershed; (2) Estero Bay and Imperial River watershed; (3) Gold Gate Canal/Gordon River/Cocohatchee River Canal drainage to Cocohatchee Bay, Rookery Bay, Naples Bay, and the Ten Thousand Islands; and (4) Turner and Barron River Canals and the Big Cypress National Reserve to Chokoloskee Bay and south.

Fresh groundwater is typically drawn from the Tamiami, Hawthorne, and Floridan Aquifers in the watershed area. Surface water quality is controlled by the low relief, semitropical climate, discharge from Lake Okeechobee, and land use.

The watershed energies are modeled for the four major systems: terrestrial, freshwater, estuarine, and marine. Watershed energy flow is affected by physical/chemical background conditions and forces and biological forces. Each system consists of a set of habitats maintained by unique environmental conditions. Man's role in watershed energetics is examined and found to be represented by three consumer management functions: (1) urban/industrial system, both coastal and inland on the shore of the Caloosahatchee River; (2) agriculture in the upper Caloosahatchee River watershed; and (3) control and redistribution of water by the South Florida Water Management District.

Terrestrial and freshwater habitats in the watershed include pinelands, hardwood hammocks, cypress and mixed swamp forests, prairies, marshes, sloughs, ponds, and riverine communities. Estuarine and saltwater wetland habitats include salt prairies, marshes, mangrove forests, and open waters containing varying benthic and pelagic habitats and communities. Any of these plant communities may be disturbed by man's land use practices. Disturbed communities include urbanized lands, agricultural operations, industrial sites, canalized waterways, and exotic plant communities. Knowledge of faunal species in a particular habitat is fundamental to understanding and managing fish and wildlife resources in the watershed. Watershed animals are described according to species-habitat association. The invertebrates, fishes, amphibians, reptiles, birds, and mammals, including endangered species, are listed and described.

STUDY PRODUCT: Drew, R. D. and N. S. Schomer. 1984. An Ecological Characterization of the Caloosahatchee River/Big Cypress Watershed. A final report by the U.S. Fish and Wildlife Service for the U.S. Department of the Interior, Minerals Management Service Gulf of Mexico OCS Region, Metairie, LA. NTIS No. PB85-245405. FWS/OBS-82/58.2. Contract No. 14-12-0001-30036. 243 pp.

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