

REGIONAL PROTECTION OF LISTED WILDLIFE SPECIES AND OTHER WILDLIFE RESOURCES IN THE GREATER CHARLOTTE HARBOR ECOSYSTEM

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ABSTRACT

The diversity of wildlife habitat in the Charlotte Harbor National Estuary Program Area ranges from xeric oak scrubs to subtidal soft-bottom, and supports both temperate and sub-tropical species. The habitats of the Charlotte Harbor National Estuary Program Area provide habitat for at least 39 mammal, 331 bird, 67 reptile, 27 amphibian and 452 fish (66 freshwater and 386 marine and estuarine) species.

The Charlotte Harbor National Estuary Program Area provides critical or essential habitat for at least 42 federal and state-listed species, including Florida black bear, West Indian manatee, bald eagle, wood stork, Florida scrub jay and American crocodile. Habitat conversion is a major contributing factor to the status of listed mammal species and many wide-ranging species. Conserving species diversity through large-scale habitat preservation and restoration is the best strategy for protection of wildlife resources in the Charlotte Harbor National Estuary Program Area.

Obstacles to state and regional wildlife conservation planning programs include funding deficiencies, poor public education, property rights issues, inconsistent land use planning, deficiencies in the wetland regulatory process, lack of upland habitat protection laws, water supply issues, and consumptive use and development pressure on public land. Positive trends in regional resource planning include significant land acquisition in the Charlotte Harbor project area, increased public support for land conservation, interagency coordination, private landowner initiatives, and regional and inter-local agreements. Strategies for habitat protection are included in state and regional wildlife habitat planning studies such as the Game and Fresh Water Fish Commission's "GAPS" plan and the U.S. Fish and Wildlife Service's ongoing "Multi-Species Recovery Plan" process for South Florida. Other programs that incorporate habitat conservation or restoration efforts include the National Estuary Program, the South Florida Ecosystem Restoration efforts, and regional and local comprehensive plans. Land acquisition to implement large-scale habitat preservation goals is accomplished through state and federal agency land acquisition and management programs, including the U.S. Department of the Interior's National Wildlife Refuge, National Park and Coastal Zone Management programs; the state of Florida's Conservation and Recreation Lands (CARL) Program; the South and Southwest Florida Water Management District Save-Our-Rivers (SOR) programs, and the Florida Communities Trust (FCT) program; as well as local government land acquisition programs, mitigation banks and private conservation group initiatives.

INTRODUCTION

The greater Charlotte Harbor ecosystem, as defined by the National Estuary Program (NEP) boundary, includes lands in eight counties (Lee, Charlotte, DeSoto, Sarasota, Hardee, Manatee, Highlands and Polk) in southwest Florida. The estuarine portion of this ecosystem features one large "harbor", three major river systems (Myakka, Peace and Caloosahatchee), and several smaller bays, rivers and creeks fronted by large

barrier islands (Estero, Sanibel, Captiva, North Captiva, Cayo Costa, Gasparilla and Don Pedro) in the southeastern Gulf of Mexico. Habitats within this ecosystem range from temperate to sub-tropical, and include xeric ridges, fresh and saltwater wetlands, impenetrable forests and treeless prairies. The region is one of the fastest growing areas in the United States and includes both intensive coastal development and extensive interior agricultural development. The effect of this

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rapid, yet relatively recent, growth and development is massive fragmentation of much of the area's landscape, particularly the coast.

LAND COVER IN THE CHARLOTTE HARBOR NEP

An analysis of land cover developed from Landsat satellite data collected from 1985-1993 by the Florida Game and Fresh Water Fish Commission (Cox et al. 1994) was utilized to assess the existing habitat and cover types in the Charlotte Harbor NEP boundary area. A total of 22 land cover types were identified in the Game and Fresh Water Fish Commission (GFC) state-wide study. These cover types include native upland communities (coastal strand, dry prairie, pineland, sand pine scrub, sandhill, xeric oak scrub, mixed hardwood-pine, upland hardwood forest and tropical hardwood hammock); native wetland communities (coastal salt marsh, freshwater marsh, cypress swamp, hardwood swamp, bay swamp, shrub swamp, mangrove swamp and bottomland hardwood forest); and disturbed land cover (barren and urban, grassland and agriculture, shrub and brush, and exotic plant). Landcover types that were identified within the Charlotte Harbor NEP area are illustrated on Map 1 (appendix).

Analysis of data within the Charlotte Harbor NEP boundary, which includes 12,586 square kilometers of area, indicates that a total of 53.2% of the land area is in some type of altered land cover (Figure 1). Of this total, approximately 35.6% is currently in agricultural use and 17.6% has been developed for urban, commercial, or other type of residential use. Approximately 24.5% of the land area is vegetated by some type of upland habitat, 11.5% (approximately 1,448 square kilometers) is considered to be open water and 10.7% of the area is vegetated by wetland habitat.

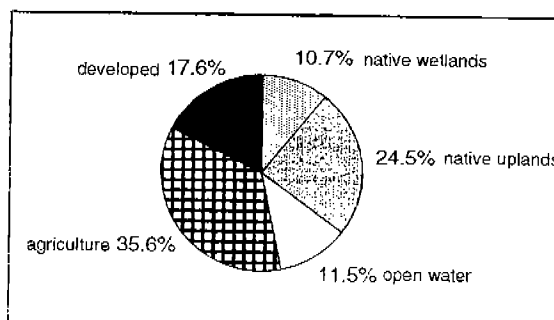


Figure 1. Distribution of land cover types.

Approximately 85% of the wetland habitats remaining within the NEP boundary are freshwater wetlands (Map 2) and only 15% are saltwater wetlands (Map 3 and Figure 2). The three major types of freshwater wetlands in the NEP boundary are fairly evenly divided between freshwater marsh (24.8%), cypress swamp (27.5%) and hardwood swamp (28%). Smaller percentages of shrub swamp (3.6%) and bayhead (1.2%) make up the freshwater wetland balance. Approximately 12% of the remaining saltwater wetlands are mangrove wetlands. The remaining 3% of saltwater wetlands are salt marsh. The small percentages of salt marsh wetlands are partially explained by the dominance of mangrove species in a subtropical ecosystem (Figure 3).

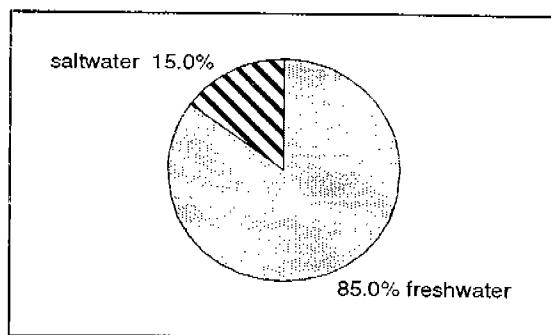


Figure 2. Distribution of general wetland types.

Of the total upland habitat that originally occurred in the NEP boundary area, 45.8% has been converted to some type of agricultural use and 22.6% has been developed for urban or residential use. Only

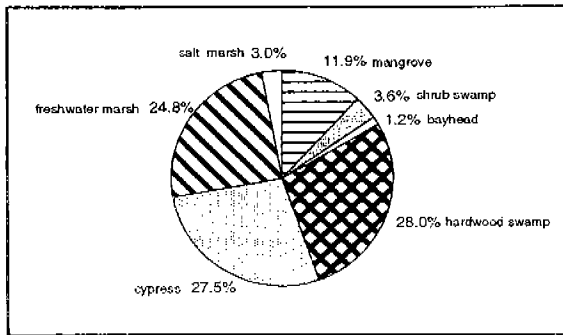


Figure 3. Distribution of native wetland habitats.

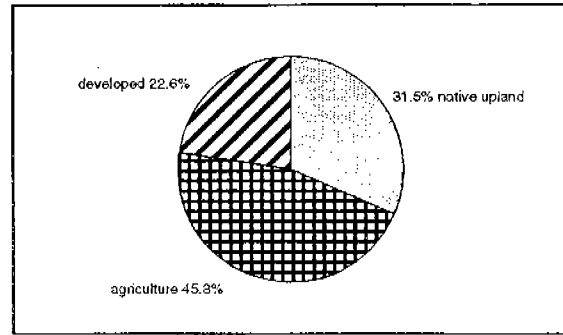


Figure 4. Distribution of general upland cover types.

31.5% of the total native upland habitat that originally existed in the NEP area remains in native upland land cover (Figure 4). Almost half, or 46.4% of this remaining upland habitat, is vegetated by dry or palmetto prairie. Only 31.9% is pinelands (Map 4). Fifteen percent of the remaining upland is hardwood hammock. There are only small amounts (less than 2.5%) of other upland types such as coastal strand, xeric oak, mixed hardwood, tropical hammock and sandhill, remaining in the project area (Figure 5). Upland habitat that is only present in small percentages can be characterized as rare and unique for the region.

LAND COVER ANALYSIS

An analysis of the remaining amount, location and type of land cover in the Charlotte Harbor NEP boundary is important to the characterization of wildlife habitat and its value in the project area. The loss of large areas of native land cover to disturbance results in a fragmented landscape that reduces habitat available for life functions and restricts wildlife dispersal through the landscape. In southwest Florida, much of the intensive urban or residential development is located in coastal or riparian habitat. These areas are particularly important to species dependent on wetlands for all or part of their life cycle (fish and wading birds), species that access coastal areas during a vulnerable period of their life cycle (migratory birds), and species that may utilize landscape features such as creeks and rivers for cover or

navigation through different habitat types (mammals and birds).

Many wildlife species that utilize the Charlotte Harbor NEP area are dependent on large, connected systems vegetated by native land cover (wide-ranging species), wetlands (wetland-dependent species), or rare and unique habitats (many listed species).

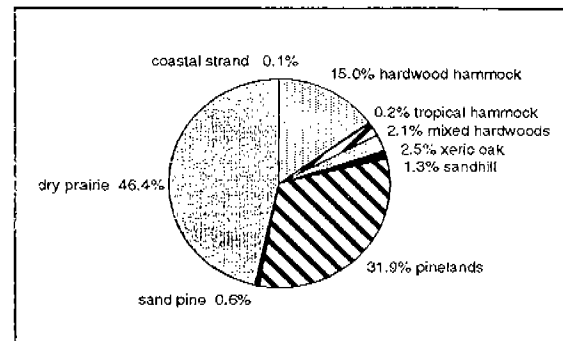


Figure 5. Distribution of native upland habitats.

Wide-Ranging Wildlife Species

Wide-ranging wildlife species that utilize forested upland and wetland systems in the Charlotte Harbor NEP ecosystem include the state and federally-endangered Florida panther and the state-threatened Florida black bear. Southwest Florida has the only viable population of panthers remaining in the eastern United States (Cox et al. 1994). Within the study area, habitat within southeastern and northeastern Lee County, Charlotte County east of Charlotte Harbor, and western DeSoto County (Cox et al. 1994, USFWS 1993) is important to the Florida panther. Important Florida black bear

habitat remains in northwest and south-eastern Lee County, eastern Charlotte, Sarasota, and Manatee Counties, the Peace River corridor in Hardee and De Soto counties, and portions of "the ridge" in Highlands County (Cox et al. 1994, Maehr pers. comm.).

Wetland-Dependent Species

Wildlife species that require wetlands for nesting and foraging habitat in the Charlotte Harbor NEP area include many state-listed wading birds (reddish egret, little blue heron, snowy egret, tri-colored heron, white ibis and limpkin), as well as the state and federally-endangered wood stork. An analysis (Cox et al. 1994) of wetlands within 15 km of wading bird colonies and 30 km of wood stork colonies (approximate distances that individual wading birds will travel from rookeries to forage) indicates that the Charlotte Harbor NEP program area contains wetlands critical to the success of wading bird rookeries. These fresh and saltwater wetlands are located around the perimeter of Charlotte Harbor and Estero Bay, near Corkscrew Swamp in southeastern Lee County, adjacent to the Peace and Myakka Rivers, and in south central Polk County and eastern Manatee County. A second wetland-dependent species that utilizes wetlands for nesting and foraging, but also heavily utilizes open uplands for foraging is the state-threatened sandhill crane. Habitat important to the Florida sandhill crane include significant portions of the Charlotte Harbor NEP program area: central and eastern Charlotte County, eastern Sarasota and Manatee Counties, eastern DeSoto County and northwestern Hardee County (Cox et al. 1994).

Listed Species

The habitats of the Charlotte Harbor NEP area provide habitat for at least 39 mammal, 331 bird, 67 reptile, 27 amphibian and 452 fish (66 freshwater and 386 marine and

estuarine) species. The loss and fragmentation of large areas of habitat, particularly uplands and many rare and unique habitats, in combination with the urbanization of coastal/riparian areas, has endangered many wildlife species in the Charlotte Harbor NEP study area. The Florida Game and Fresh Water Fish Commission and the U.S. Fish and Wildlife Service have designated special protection status (listing) for 42 wildlife species in the Charlotte Harbor NEP boundary (Tables 1 and 2). Two species that are particularly threatened by habitat conversion are the Florida scrub jay and the red-cockaded woodpecker.

The threatened Florida scrub jay is restricted to the rare oak and sand pine scrub habitat in the NEP area. Significant geographic populations of the scrub jay are associated with the upper Caloosahatchee River scrubs in Lee county, coastal Sarasota and Charlotte Counties, central Charlotte County, eastern Manatee County, northwestern Highlands County (the ridge) and southeastern Polk County (Cox et al. 1994, USFWS unpub. inform.).

The red-cockaded woodpecker is endemic to mature pinelands in the NEP study area. Almost all of the pinelands in the study area have been previously logged and mature pine forests of sufficient size to support red-cockaded woodpeckers are rare in the program area (K. Dryden pers. obs.). GFC has projected that the only viable population of the red-cockaded woodpecker in the study area is located in central Charlotte county and northwestern Lee county.

REGIONAL HABITAT PROTECTION Factors Contributing to Wildlife Habitat Loss

Causes associated with the continuing loss of significant wildlife habitat in the program area include poor land use planning, urban sprawl, property rights issues, roadway grid, intensive

Table 1. State-listed wildlife species in the Charlotte Harbor NEP study area.

SCIENTIFIC NAME	COMMON NAME	STATUS
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	SSC
<i>Ajaia ajaja</i>	roseate spoonbill	SSC
<i>Alligator mississippiensis</i>	American alligator	SSC
<i>Ammodramus savannarum floridanus</i>	Florida grasshopper sparrow	E
<i>Aphelocoma coerulescens coerulescens</i>	Florida scrub jay	T
<i>Aramus guarauna</i>	limpkin	SSC
<i>Athene cunicularia</i>	burrowing owl	SSC
<i>Blarina carolinensis shermani</i>	Sherman's short-tailed shrew	SSC
<i>Caretta caretta caretta</i>	Atlantic loggerhead turtle	T
<i>Centropomus undecimalis</i>	common snook	SSC
<i>Charadrius melodus</i>	piping plover	T
<i>Charadrius alexandrinus tenuirostris</i>	southeastern snowy plover	T
<i>Chelonia mydas mydas</i>	Atlantic green turtle	E
<i>Crocodylus acutus</i>	American crocodile	E
<i>Dermochelys coriacea</i>	leatherback turtle	E
<i>Drymarchon corais couperi</i>	eastern indigo snake	T
<i>Egretta caerulea</i>	little blue heron	SSC
<i>Egretta rufescens</i>	reddish egret	SSC
<i>Egretta thula</i>	snowy egret	SSC
<i>Egretta tricolor</i>	tricolored heron	SSC
<i>Eudocimus albus</i>	white ibis	SSC
<i>Falco peregrinus</i>	Arctic peregrine falcon	E
<i>Falco sparverius paulus</i>	southeastern American kestrel	SSC
<i>Felis concolor coryi</i>	Florida panther	E
<i>Gopherus polyphemus</i>	gopher tortoise	SSC
<i>Grus canadensis pratensis</i>	Florida sandhill crane	T
<i>Hoematopus palliatus</i>	American oystercatcher	SSC
<i>Haliaeetus leucocephalus</i>	bald eagle	T
<i>Lepidochelys kempii</i>	Atlantic ridley turtle	E
<i>Mustela vison evergladensis</i>	Everglades mink	E
<i>Mycteria americana</i>	wood stork	E
<i>Neoseps reynoldsi</i>	sand skink	T
<i>Pelicanus occidentalis</i>	brown pelican	SSC
<i>Picoides borealis</i>	red-cockaded woodpecker	T
<i>Podomys floridanus</i>	Florida mouse	SSC
<i>Polyborus plancus adubonii</i>	Audubon's crested caracara	T
<i>Rana areolata</i>	gopher frog	SSC
<i>Rhynchops niger</i>	black skimmer	SSC
<i>Sciurus niger avicennia</i>	mangrove fox squirrel	T
<i>Sciurus niger shermani</i>	Sherman's fox squirrel	SSC
<i>Sterna antillarum</i>	least tern	T
<i>Trichechus manatus</i>	West Indian manatee	E
<i>Ursus americanus floridanus</i>	Florida black bear	T

Deep water species of the Gulf of Mexico, occasional to Charlotte Harbor:

<i>Balaena glacialis</i>	right whale	E
<i>Balaenoptera physalus</i>	fin whale	E
<i>Megaptera novaeangliae</i>	humpback whale	E
<i>Physeter catodon</i>	sperm whale	E

Regionally extinct, historically found in the Charlotte Harbor NEP region:

<i>Canis rufus floridanus</i>	Florida red wolf
<i>Monachus tropicalis</i>	West Indian monk seal
<i>Peromyscus gossypinus restrictus</i>	Chadwick beach mouse

Table 2. Listed wildlife species in the Charlotte Harbor NEP study area by taxon and level of endangerment.

	FGFWFC	USFWS
BIRDS		
Wood Stork	E	E
Snail Kite	E	E
Arctic Peregrine Falcon	E	
Florida Grasshopper Sparrow	E	E
Florida Scrub Jay	T	T
Red-Cockaded Woodpecker	T	E
Least Tern	T	T
Audubon's Crested Caracara	T	T
Bald Eagle	T	T
Piping Plover	T	T
Southeastern American Kestrel	T	
Florida Sandhill Crane	T	
Southeastern Snowy Plover	T	
Black Skimmer	SSC	
White Ibis	SSC	
Tri-Colored Heron	SSC	
Little Blue Heron	SSC	
Snowy Egret	SSC	
Limpkin	SSC	
Roseate Spoonbill	SSC	
Burrowing Owl	SSC	
Brown Pelican	SSC	
American Oystercatcher	SSC	
Reddish Egret	SSC	
MAMMALS		
West Indian manatee	E	E
Florida panther	E	E
Florida mastiff bat	E	
Big Cypress fox squirrel	T	
Everglades mink	T	
Florida black bear	T	
Sherman's fox squirrel	SSC	
Sherman's short-tailed shrew	SSC	
Florida mouse	SSC	
Sanibel Island rice rat	SSC	
AMPHIBIANS		
Florida Gopher Frog	SSC	
REPTILES		
American Crocodile	E	E
Atlantic Green Sea Turtle	E	E
Atlantic Leatherback Sea Turtle	E	E
Atlantic Ridley Sea Turtle	E	E
Eastern Indigo Snake	T	T
Atlantic Loggerhead Sea Turtle	T	T
Gopher Tortoise	SSC	
Sand Skink	SSC	
American Alligator	SSC	T-SA
FISH		
Gulf sturgeon	SSC	T
Common snook	SSC	

Key to Listed Species Designated Status For Tables 1 and 2

E—Endangered; T—Threatened; T-SA—Threatened Due to Similarity of Appearance; SSC—Species of Special Concern; FGFWFC—Florida Game and Fresh Water Fish Commission; USFWS—United States Fish and Wildlife Service

coastal development, agricultural development in sensitive areas, large-scale landscape disturbances such as mines and utilities, and development adjacent to existing preserve or conservation areas. In addition to direct habitat loss, cumulative and secondary impacts that degrade habitat quality also contribute to the loss of wildlife habitat. These impacts include the cumulative amount of a particular habitat lost over time, habitat fragmentation, lack of habitat management, exotic plant invasion, and disturbances associated with human presence (noise, lights, pets) and pollution.

State and federal habitat protection laws employed in the Charlotte Harbor NEP area do not address upland habitat or listed species habitat protection. Protection of a mosaic of habitats that include uplands and wetlands is necessary for species that utilize different habitat types for different portions of their life cycle, many wide-ranging species, and biodiversity in general.

Even where acquisition of public lands for wildlife conservation has occurred, a multitude of pressures on those land values continues. Over-recreation of public lands resulting from poor planning, management, or simply over-population, threatens habitat quality. A recent emphasis on income-generating activities on public lands, such as timbering and saw palmetto berry harvest also requires additional scrutiny.

A continual lack of adequate funding for land purchase and land management, and the projected demise of the Preservation 2000 ((P-2000) land acquisition program in the State of Florida threatens the progress made and the completion of regional wildlife protection strategies.

**Strategies to Increase
Regional Wildlife Habitat Protection**
An organized approach to regional wildlife

habitat conservation is essential because of the continuing rapid growth of the Charlotte Harbor NEP program area. In 1994, the Florida Game and Fresh Water Fish Commission used a Geographic Information System (GIS) to manipulate geographic data sets for selected species of wildlife to identify habitat areas not currently protected on existing conservation lands (Cox et al. 1994). The results of this study were used to depict lands in the state of Florida recommended for additional protection, referred to as Strategic Habitat Conservation Areas (SHCAs). The SHCAs identified for the Charlotte Harbor NEP area are depicted on Map 5. These areas include coastal Lee, Charlotte and Sarasota Counties (bald eagle, snowy plover, West Indian manatee, least tern, Florida scrub jay, loggerhead sea turtle, Florida pine snake, gopher tortoise, piping plover, Sanibel island rice rat, eastern indigo snake, migratory birds, wading bird rookeries and shorebird aggregation areas), southeastern Lee County (Florida panther, Florida black bear, wood stork and swallow-tailed kite), northwestern Lee county and southwestern Charlotte County (red-cockaded woodpecker), northeastern Lee county and eastern Charlotte County (Florida black bear, wood stork, various wading birds, bald eagle, red-cockaded woodpecker, burrowing owl, Florida sandhill crane, Florida scrub jay, eastern indigo snake, Audubon's crested caracara), southeastern Sarasota County (Florida sandhill crane), east central Manatee County (Florida sandhill crane), Myakka River drainage in Manatee County (Sherman's fox squirrel, burrowing owl, Florida scrub jay, Audubon's crested caracara, southeastern American kestrel, red-cockaded woodpecker, limpkin, and wading bird rookeries), western DeSoto County (Audubon's crested caracara, Florida sandhill crane, Florida grasshopper sparrow), Peace River in Polk and DeSoto Counties (wading bird rookeries), southeastern DeSoto and southwestern Highlands County (Audubon's

crested caracara, Florida sandhill crane).

Acquisition and conservation of large landholdings is key to the success of a regional wildlife protection strategy. This strategy includes the completion of public land acquisition programs already initiated by various entities, the additional public acquisition of lands to enhance regional wildlife resource biodiversity, and working with private landholders to establish initiatives and/or incentives for management of conservation lands. Land acquisition programs active in the program area include the federal National Wildlife Refuge and Coastal Zone Management programs, the state's Conservation and Recreational Lands (CARL), Save-Our-Rivers (SOR) and FCT (Florida Communities Trust) programs, and local government programs such as the Lee county 20/20 land acquisition effort, private conservation group programs such as Trust for Public Lands or the Nature Conservancy.

Within the Charlotte Harbor NEP boundary, the Corkscrew Regional Ecosystem Restoration Watershed (CREW), the Charlotte Harbor Flatwoods, Charlotte Harbor Buffer, Cayo Costa Island, Estero and Lemon Bay Buffer CARL projects; and the Myakka and Peace River SOR projects should be completed to secure the public investment in regional resource conservation.

In addition to land acquisition projects that have been ongoing, newly proposed acquisition projects within the Charlotte Harbor NEP boundary include the Cape Haze CARL project, the Myakka Conservancy Connectivity Plan, and the Integrated Habitat Conservation Plan for the Phosphate District including the Tenoroc Restoration. Additional purchase of lands in eastern Sarasota, DeSoto, Hardee and Manatee counties should be completed to increase public resource conservation lands in counties with low percentages of public lands,

and to provide habitat for listed species. Since many of these landholdings are currently in private ownership in agricultural use, some type of economic incentive, including lease or purchase of development rights, income or estate tax credit, or some other type of cash or non-cash payment may assist in securing long-term regional habitat conservation on private lands (Florida Stewardship Foundation, May 1997).

Restoration and management of natural resources in the region is another key feature in the protection of regional wildlife resources. The U.S. Fish and Wildlife Service is currently preparing a comprehensive, ecosystem-wide recovery strategy to restore and maintain the biodiversity of the South Florida ecosystem, recover listed species, coordinate development plans and permits, manage hydrological conditions in undeveloped and restorable lands to maximize natural processes, and restore a healthy ecosystem in the coastal waters of south Florida (USFWS, 1996). As part of this effort, the U.S. Fish and Wildlife Service, in coordination with other federal, state and local governments, as well as the academic community, conservation organizations and private entities, is preparing a Multi-Species Recovery Strategy to address the recovery needs of federally-listed threatened and endangered species in the south Florida region. The largest federal effort to restore regional ecosystems, of benefit to the southern portion of the Charlotte Harbor NEP area, is the South Florida Ecosystem Restoration program. The goal of this program is to restore the landscapes, biodiversity and wildlife abundance characteristic of pre-drainage South Florida, while allowing for sustainable use (Science Subgroup, 1996).

Other state efforts include the Florida Department of Environmental Protections Ecosystem Management program, which

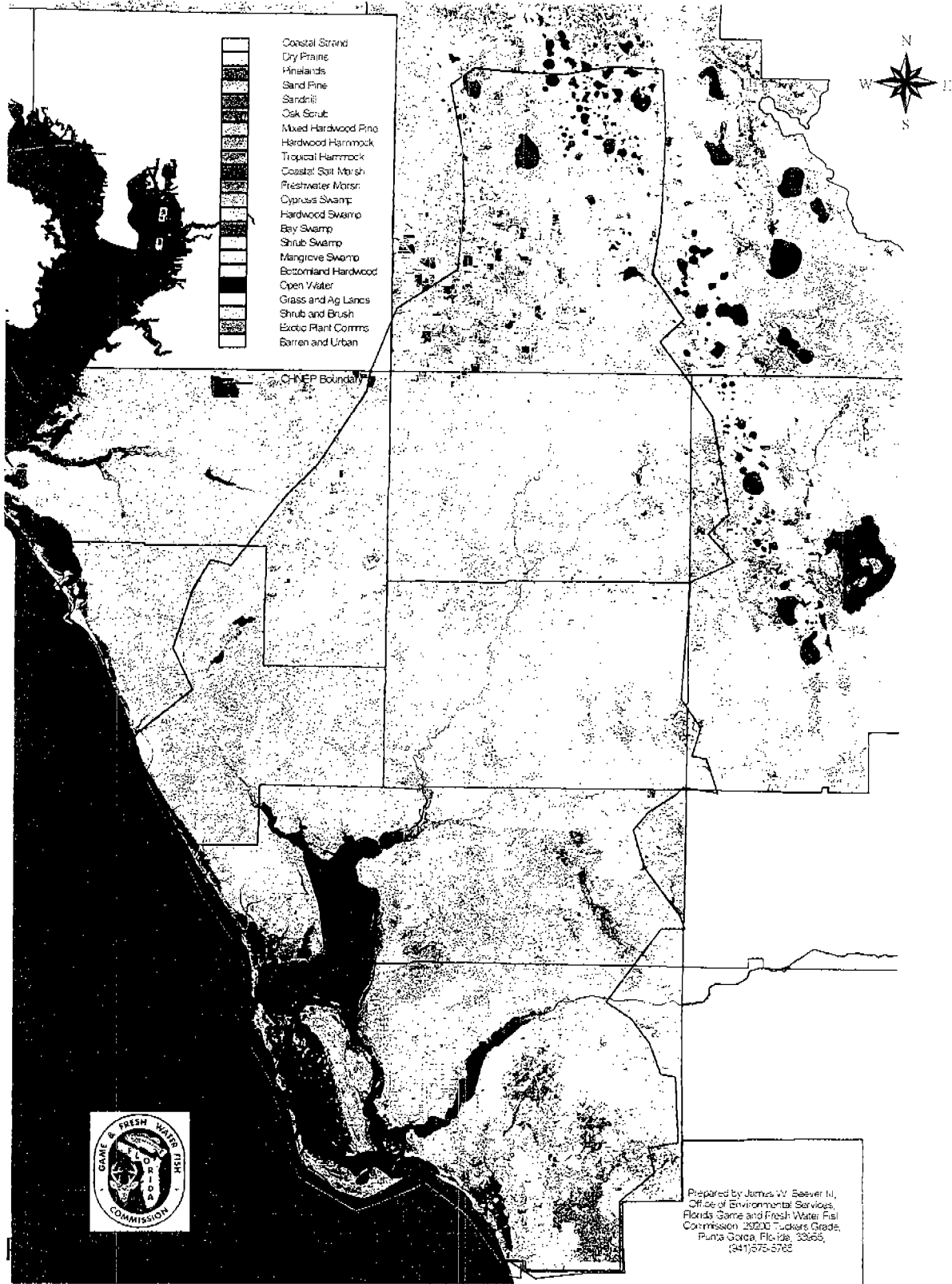
emphasizes place-based management, common-sense regulation, cultural change to improve protection for environmental resources, protect human health, encourage a conservation ethic and sustainable lifestyle by the people of Florida, and help stimulate a healthy economy (FDEP, September 1995).

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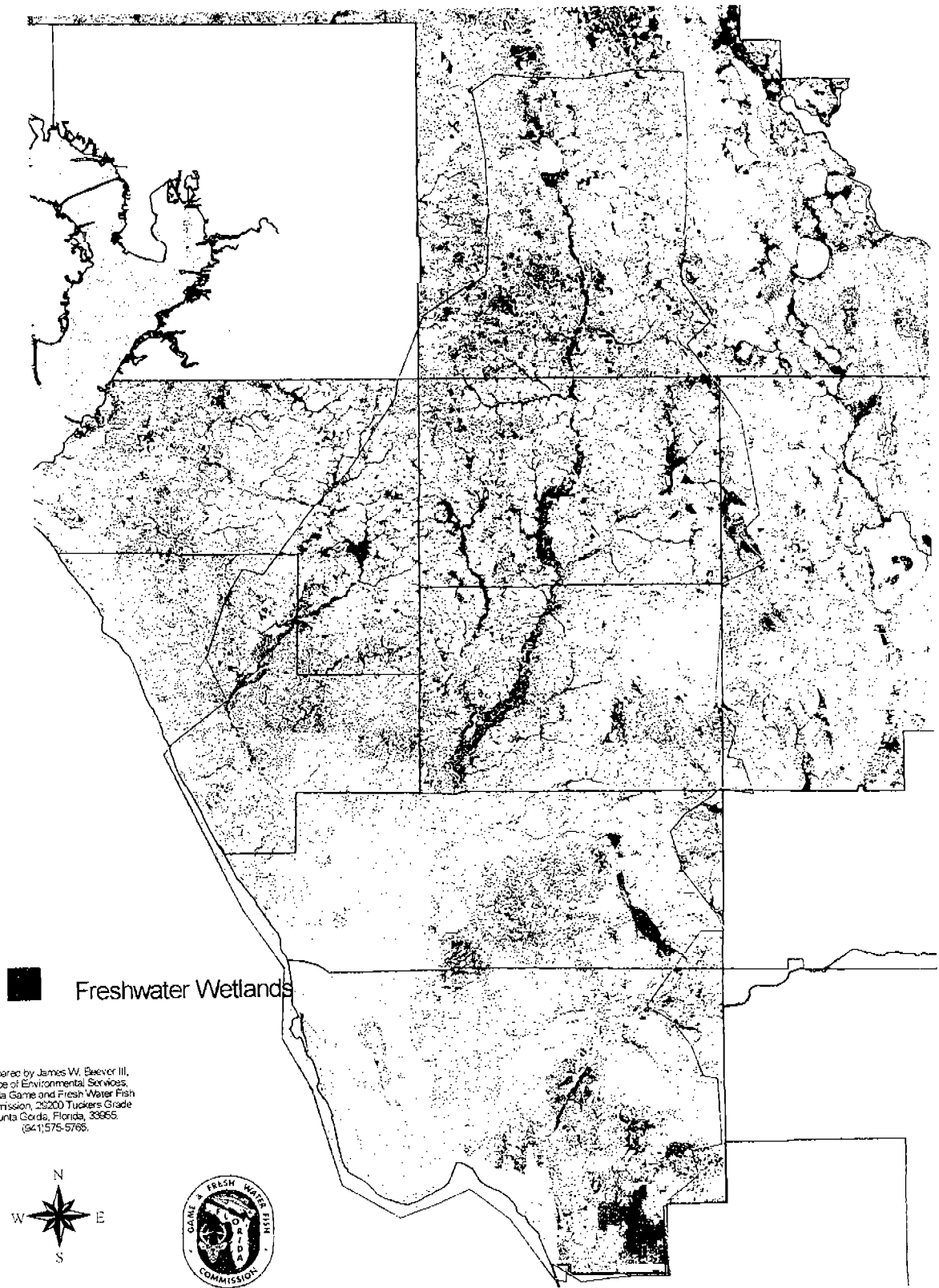
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MAPS 1-5 FOLLOW

MAP 1 Distribution of Landcover in the CHNEP Study Area

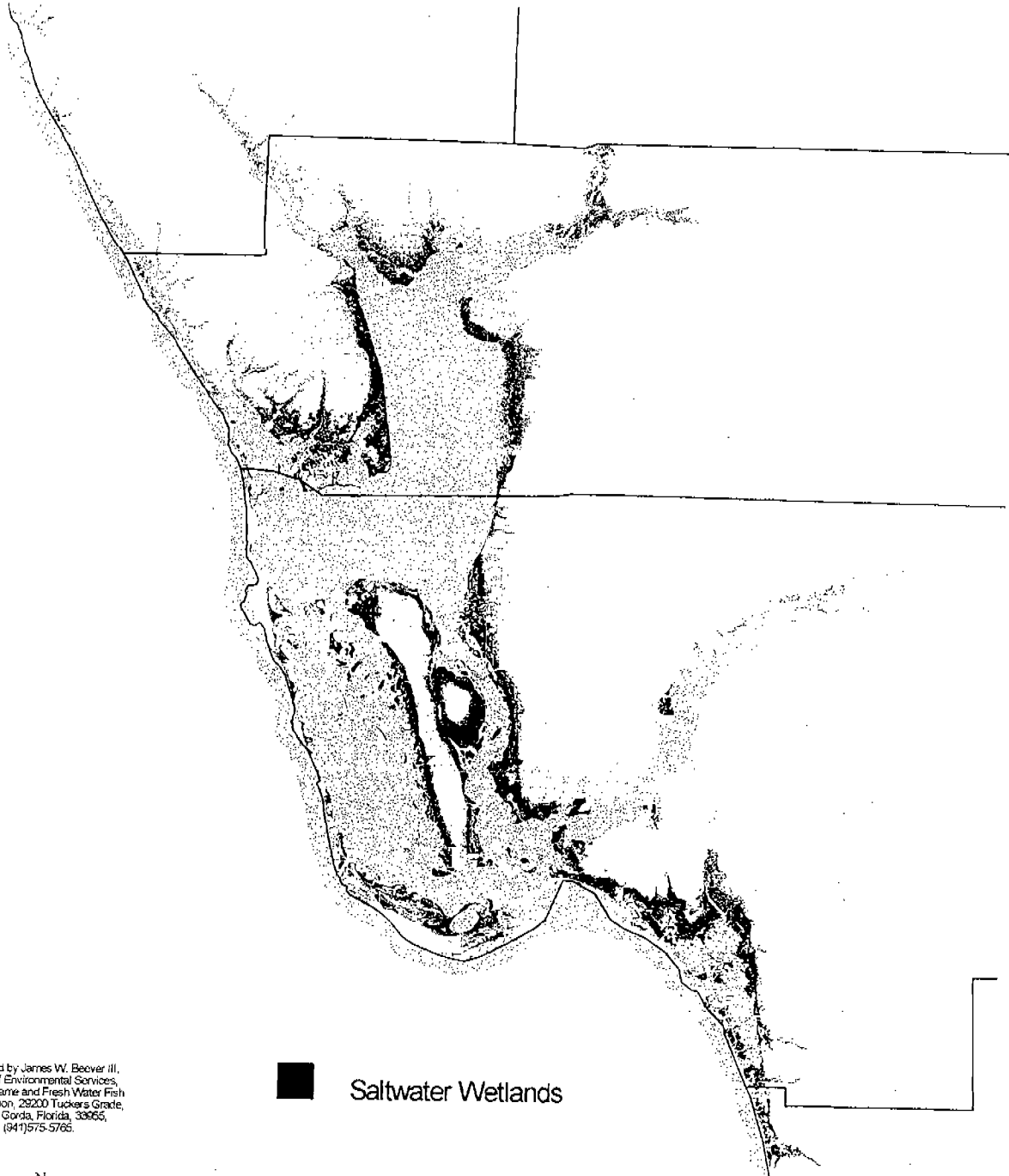


MAP 2
Distribution of Freshwater Wetlands in the CHNEP Study Area



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MAP 3
Distribution of Mangrove and Saltmarsh Wetlands in the CHNEP Study Area

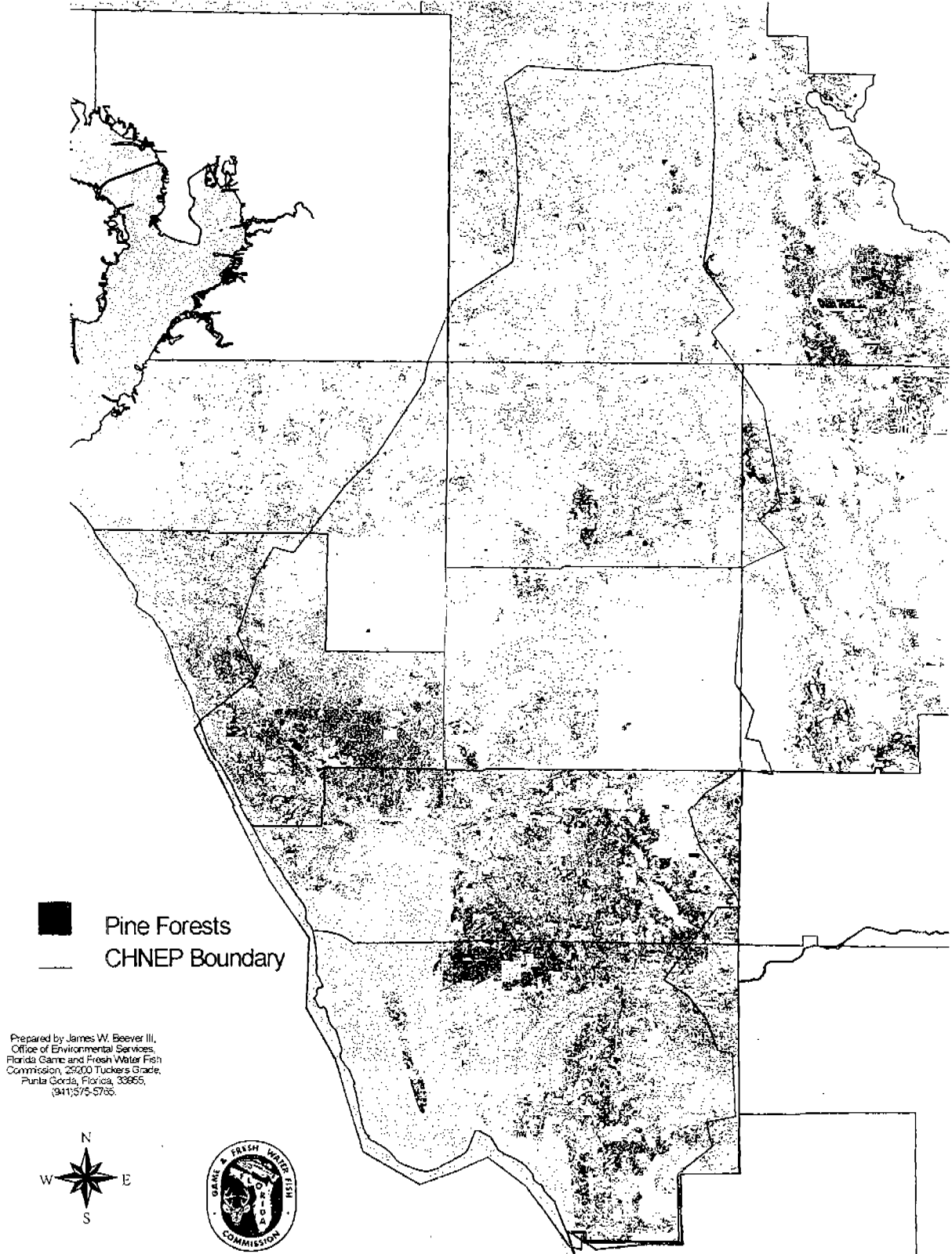


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■ Saltwater Wetlands



MAP 4
Distribution of Pine Forests in the CHNEP Study Area



MAP 5
Distribution of Strategic Habitat Conservation Areas in the CHNEP Study Area

