environmental assessment

may 1980

BIG CYPRESS

NATIONAL PRESERVE / FLORIDA

ENVIRONMENTAL ASSESSMENT

FOR

BIG CYPRESS NATIONAL PRESERVE
VISITOR USE AND GENERAL DEVELOPMENT PLAN

AND

EVERGLADES NATIONAL PARK
SHARK VALLEY/TAMIAMI
DEVELOPMENT CONCEPT PLAN

United States Department of the Interior, National Park Service

CONTENTS

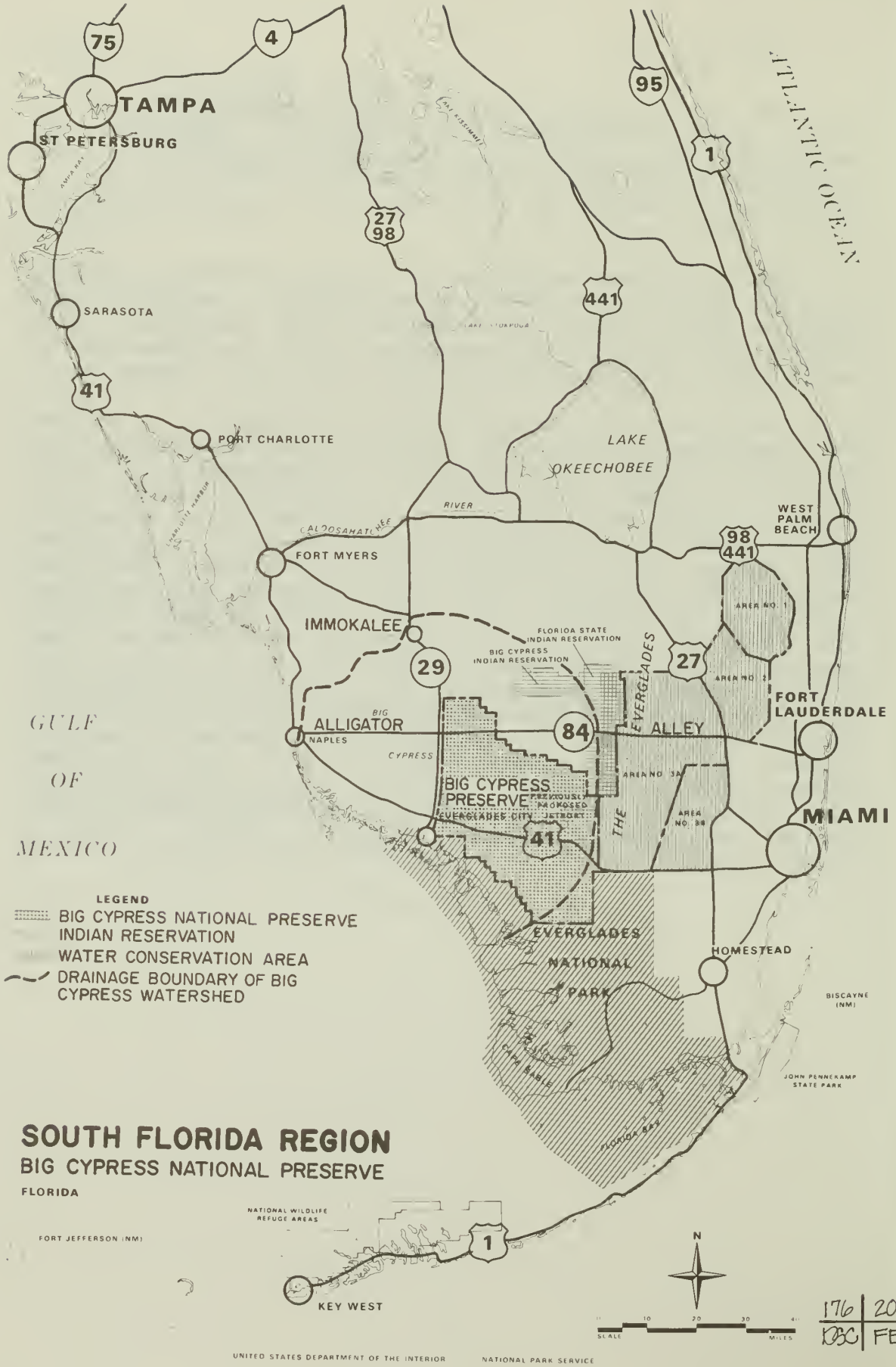
MAPS

I. INTRODUCTION

Big Cypress National Preserve was established in 1974 by Public Law 93-440 to ensure "the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof" (see appendix A).

The Big Cypress watershed is in southwest Florida in Collier, northern Monroe, and western Dade counties. The 570,000-acre preserve contains about three-eighths of this watershed, and it extends from the northern Everglades National Park boundary to seven miles north of Florida 84 (see South Florida Region map).

The purpose of this Environmental Assessment is to describe the alternatives formulated for visitor use and development within Big Cypress National Preserve and for development at the Shark Valley and Tamiami areas of northern Everglades National Park. The alternatives are evaluated in terms of anticipated impacts on natural, cultural, and socioeconomic environments. The National Park Service is also preparing a workbook for public distribution along with this document. After public and agency examination and comment on this document, the results will be carefully reviewed, and suggested revisions will be considered and implemented where possible. Based on the analysis of the alternatives suggested and public comment, the Park Service will select the final alternatives for the visitor use and general development plan for Big Cypress National Preserve and for the Shark Valley/Tamiami development concept plan for Everglades National Park. The alternatives selected may not be identical to any of the alternatives presented here because they may combine elements from several alternatives or include new elements suggested during the public and agency review period.



SOUTH FLORIDA REGION
BIG CYPRESS NATIONAL PRESERVE
FLORIDA

II. THE PROBLEM

The primary concern addressed in this Environmental Assessment is the location of development to serve visitors and of facilities to administrator Big Cypress National Preserve and the northern portion of Everglades National Park.

Development for visitors is needed because relatively intense visitor use within the preserve by south Florida recreationists has continued since the preserve was authorized in 1974. Hunters use over 1,000 off-road vehicles (ORVs) during the hunting season, and other recreationists hike portions of the Florida Trail within the preserve and fish in the canals paralleling the road system. In addition, thousands of tourists annually travel on U.S. 41 (Tamiami Trail) and Florida 84 (Alligator Alley) across the preserve.

Facilities must be provided for National Park Service personnel to administer the regulations that were called for in the authorizing legislation to govern the use of motorized vehicles, grazing, oil and gas exploration/extraction, agriculture, etc. (The regulations have been published in the Federal Register, vol. 44, no. 20, 1979.)

The level of development for the preserve, and also proposed functions and locations for particular development sites, were outlined in the Final Environmental Statement (FES 75-39) for the establishment of the preserve, completed in April 1975. However, during the four years that National Park Service personnel have been onsite at the preserve, they have been able to identify management needs, observe visitor use patterns, and evaluate cultural and natural resources, thus providing information that was unavailable at the time the preserve was authorized. This information indicates that the overall development level suggested in FES 75-39 is probably adequate, but the preserve can be better managed if the individual development sites and functions are relocated.

Several major resource concerns at the preserve--the locations of federally recognized endangered or threatened species populations, the locations of archeological sites, the environmental effects of ORV travel, and surface waterflow patterns--are not well documented at this time. A preliminary inventory of existing literature has been completed, but several additional years of site-specific studies will be required before a comprehensive resources management plan or detailed resources management action plans can be formulated. Therefore, this current planning effort is only designed to address the development issues, with resources management being necessarily delayed until an adequate data base is available.

Because Big Cypress National Preserve and Everglades National Park are adjacent areas of the National Park System that contain similar resources, management of the two areas has been, and will

remain, integrated to prevent the duplication of efforts and facilities. The 1979 Final Master Plan for Everglades National Park calls for additional development planning in the northern portion of Everglades National Park, in the vicinity of Shark Valley and the Tamiami ranger station. Because of the proximity of these areas to the preserve, both of them are being considered in this planning effort.

III. EXISTING CONDITIONS

A. Special Legislative Provisions for Big Cypress National Preserve

The establishment of Big Cypress and Big Thicket preserves on October 11, 1974, marked the inclusion of a new category of area into the National Park System. Senate Report No. 93-1128 (August 22, 1974) outlines the criteria necessary for establishment of a national preserve:

> National preserves will be areas of land and/or water which may vary in size, but which possess within their boundaries exceptional values or qualities illustrating the natural heritage of the Natior.. . . . The principal thrust of these areas should be the preservation of the natural values which they contain. They might differ, in some respects, from national parks and monuments insofar as administrative policies are concerned. Hunting, for example, subject to resonable regulation by the Secretary, could be permitted to the extent compatible with the purposes for which the area is established. Other activities, including the extraction of minerals, oil, and gas, could be permitted. . . . National preserves may accommodate significant recreational uses.

When Congress created the category of national preserves, it indicated that they should be administered somewhat differently from other existing National Park System areas. Although a different management strategy is proposed for preserves, the protection of the primary resources for which they are established will be the main consideration governing management actions. Within preserves, a wider variety of legislatively mandated recreational and nonrecreational uses may be permitted than in most National Park System areas. The establishing legislation for Big Cypress National Preserve sets forth a number of specific provisions, which are described below.

Sections 1 through 3 of the authorizing legislation set forth the guidelines for the largest land acquisition program ever undertaken by the National Park Service. In Big Cypress, approximately 45,000 individual landowners from around the world have been identified to date. The land acquisition program is expected to be substantially complete by the October 1980 congressional deadline, at a total cost of about $200 million.

Section 1 of the authorizing legislation provides that owners of improved property (property on which construction was begun before November 23, 1971) may continue to use their properties and that they will not be acquired by the federal government. Private residential and commercial improved properties that will remain include numerous private homes, seasonal hunting

camps, gas stations, a restaurant and motel, general stores, a campground, and a few tourist attractions. These owners are also guaranteed the right of reasonable access to their property. If an owner of improved property elects to sell it to the federal government, he may retain a right of use and occupancy either for a term not to exceed 25 years or for life. Section 1 also provides that no oil or gas rights be acquired by the government without consent of the owner, unless the secretary of interior determines them to be detrimental to the purposes of the preserve. Existing rights-of-way along Collier County 837, 841, 839, and 94, along Florida 84, and along U.S. 41 are also exempt from acquisition.

Section 4 of the authorizing legislation provides that the secretary of interior establish regulations to control the many ongoing activities that are legislatively permitted to continue. These uses include operation of motorized vehicles, exploration/extraction of oil and gas, grazing, operation of waterworks, agriculture, hunting, fishing, trapping, and new construction of any kind. Regulations governing oil and gas activities were promulgated in January 1979, and regulations governing the remainder of these activities went into effect in the summer of 1979.

Florida 84, which crosses the northern portion of the preserve, is scheduled for construction to become Interstate 75 by 1985. Section 4 of the establishing legislation provides that the secretary of interior consult and cooperate with the secretary of transportation to ensure that necessary transportation facilities are constructed within existing or reasonably expanded rights-of-way. Design studies for I-75 indicate that a 125-foot southward expansion of the existing right-of-way is required to provide an adequate water distribution system. Since the need for a wider right-of-way was recognized by Congress and since improved water distribution is in keeping with the purposes of the preserve, it is anticipated that the National Park Service will grant the expansion.

The preserve has natural resources that are a source of materials for housing, crafts, and other commercial, cultural, and religious uses on which the Seminole and Miccosukee Indians depend to a greater or lesser degree. This was recognized by Congress, and certain rights of use and occupancy by members of the Florida Miccosukee and Seminole tribes are recognized in sections 5 and 6 of the establishing legislation. The legislation authorizes their right to continue usual and customary uses (including hunting, fishing, and trapping on a subsistence basis, and also traditional tribal ceremonies), and occupancy of federally acquired lands and waters, subject to reasonable regulation by the secretary of interior. The Seminole and Miccosukee tribes shall be offered the right of first refusal to provide new revenue-producing visitor services within the preserve. However, the opportunity for establishing additional

visitor services cannot be evaluated at this time, since a number of owners of existing improved commercial properties that are exempt from acquisition may choose not to sell, thereby eliminating the need for additional visitor services.

B. Description of the Natural and Cultural Environment

Water is one of the most important components of the Big Cypress ecosystem. Abundant rainfall (about 57 inches annually) and flat topography (a seaward slope of about 2 inches per mile) allow water to collect during the wet season, covering 90 percent of the area and effectively extending the wet season several months beyond the actual rainfall period. During the dry season, water in ponds and sloughs covers only about 10 percent of the land.

Within the preserve, seasonal variation in rainfall is pronounced. During the normal rainy season from May to September, water levels rise first in the major natural drainages--the sloughs and strands. As these deeper areas overflow into adjacent marshes, the general pattern of overland sheet flow results. As the rainy season abates, the sheet flow ceases, leaving only the sloughs filled with water that evaporates throughout the dry season.

Data indicate that the preserve exists as a self-contained hydrological unit with a well-balanced water budget. However, the lack of information concerning the watershed prior to human disturbance makes it difficult to compare existing conditions with the original hydrological regime.

A great deal of surface water quality data has been collected from the Big Cypress watershed, primarily over the last 10 years, by the U.S. Geological Survey. Unfortunately most sample collection sites are concentrated in disturbed areas, and little information exists on water quality in undisturbed sites. The information compiled by Deuver, et al. (1979), indicates that waters in the preserve are relatively unpolluted, probably because of the lack of development.

Existing water losses due to human activities are probably negligible. Existing residential water consumption within the preserve represents an estimated 0.03 percent of the waterflow across U.S. 41 (Deuver 1979).

The Big Cypress watershed is a mix of plant communities and associated fauna, which in turn relates to the water level and its seasonal changes. It is called Big Cypress not because of the size of its trees, but because of its extent. About 43 percent of the preserve is covered by an open forest of small cypress trees and an undergrowth of herbaceous plants like sawgrass and beak rush.

As in Everglades National Park to the south, a difference of a few inches in elevation leads to the establishment of totally different plant communities. The preserve is speckled with low limestone ridges and outcrops, dotted with ponds or wet prairies, and cut with shallow sloughs or strands 1 to 2 feet deep. Pines grow on the higher limestone ridges, and tropical hardwood hammocks occur on rocky outcrops in the middle of marshes and prairies. The ponds of the wet prairies give rise to willow and cypress heads. The deepest water areas are the topographic depressions that form wide, shallow drainages called sloughs or strands. These sloughs have water on a more permanent basis and contain some of the largest cypress trees and most diverse and abundant fauna. Along the coastal fringe of the preserve, the wet prairies grade into coastal marshes and mangrove forests. (A vegetative map of Big Cypress, illustrating vegetative communities, was prepared by B. F. McPherson for the U.S. Geological Survey in 1973.)

Although the distribution of plant communities depends on topography, similar plant communities are found throughout the preserve, and no one area supports a unique type of vegetation. Species diversity within the various plant communities is similar to that found in Everglades National Park.

Most wildlife species native to south Florida occur within the watershed, and animal life is diverse and abundant. Species in the preserve are listed in the Final Environmental Statement for Big Cypress National Preserve. Ten of the species are on the federal list of endangered and threatened species (U.S. Department of the Interior, Fish and Wildlife Service, 1979). No critical habitat for any of the listed species has been established within the preserve. The National Park Service will fully comply with the 1973 Endangered Species Act and its 1978 amendments to protect any listed species. Federally listed endangered and threatened species include the following:

	Status
Florida panther (Felis concolor coryi)	Endangered
West Indian manatee (Trichechus manatus)	Endangered
American alligator (Alligator mississippiensis)	Threatened
Brown pelican (Penlicanus occidentalis)	Endangered
Florida Everglades kite (Rostrhamus sociabilis)	Endangered
Bald eagle (Haliaeetus leucocephalus)	Endangered
Cape Sable sparrow (Ammospiza maritima)	Endangered
Arctic peregrine falcon (Falco peregrinus tundrius)	Endangered
Red-cockaded woodpecker (Dendrocopos borealis)	Endangered
Eastern indigo snake (Drymarchon corais couperi)	Threatened

The state of Florida has also compiled a list of rare, threatened, or endangered species based on populations of those species within Florida. At least 30 species of plants and animals found in the preserve are on this list (Florida Committee on Rare and Endangered Plants and Animals, 1976).

Air quality within the preserve is generally very good. Although no air pollution monitoring stations exist within the preserve, stations to the west in Dade County, and stations to the north in Hendry, Glades, and Lee counties, all report particulate, sulfur dioxide, and nitrogen dioxide levels well below the national ambient air-quality standards. The standards are occasionally exceeded when certain meteorologic conditions occur simultaneously with smoke from fires in the preserve or Everglades National Park. However, these situations are short-lived and relatively unimportant.

The preserve is currently listed as a class II air quality area (as defined in Public Law 88-206), and limited increases over 1975 pollutant levels are permitted. However, the preserve has recently been proposed for redesignation as a class I area. Of special concern to this redesignation are sulfur dioxide from the Turkey Point power plant along Biscayne Bay and ozone from metropolitan Dade County. To date no effects from these sources have been documented, however, future increases in these pollutants could result in acid precipitation or the loss of the sensitive slash pine.

In compliance with Executive Order 11593, the National Park Service's Southeast Archeological Center has conducted three field seasons of a five-season archeological survey within the preserve. During 1977 and 1978 these surveys located 185 archeological sites. The sites were detected by four different methods--aerial photographic interpretation, information from informants, field investigations by the survey team, and the acquisition of site information from published maps. Sites identified to date include black earth middens, sand mounds, rock mounds, and transient camps dating back to the Glades I, about 3,000 years before present (U. S. Department of the Interior, National Park Service, 1978b). The initial surveys indicate that because of the quality and quantity of artifacts and other information available within the preserve, numerous questions about human behavior and its relation to the environment in south Florida may be answered. Six sites have been placed on the National Register of Historic Places and eight other sites are pending nomination. Many of the known sites have been partially disturbed by activities of vandals and amateur collectors.

Examination of the National Register of Historic Places shows no listed structures within the preserve. Preliminary

investigation indicates that there is probably only one structure within the preserve eligible for nomination to the national register. The structure is the Monroe station at the intersection of U.S. 41 and Collier 94 in Collier County. A survey of historical structures is expected to be completed in 1980.

C. Existing Use

There are five major types of land use within the preserve that are authorized to continue: residential, commercial, industrial, agricultural, and recreational.

1. Residential/Commercial Use

The Big Cypress Land Acquisition Office estimates that there were about 50 commercial properties within the preserve at the time of authorization, most of which are exempt from acquisition. Because U.S. 41 is a major transportation route between the heavily populated eastern and western coastal areas, most commercial operations in the preserve cater to traffic on this route. These operations include gas stations, a restaurant and motel, stores, a campground, and several tourist attractions. A few improved commercial properties are also along Collier 94, 839, and 841, all of which are unpaved roads.

The Land Acquisition Office also estimates that there were 600 to 650 residences within the preserve at the time of authorization, of which about 30 percent were "improved properties" and are exempt from acquisition. The greatest concentration of improved residential properties is in the Ochopee vicinity, where an estimated 30 to 35 improved properties will remain at the conclusion of the land acquisition process. Most of these exempt properties are connected to the Ochopee water system, which was acquired as part of a condemnation action to prevent further development. The National Park Service will continue to operate this water system indefinitely, and funds for limited rehabilitation have been allocated.

As of November 20, 1979, owners of 116 residences and 9 commercial properties within the preserve had elected to remain exempt from acquisition (see Existing Conditions map). However, not all owners of improved property have been contacted, and the number of exempt properties is expected to increase as acquisition proceeds. At present, the owners of about 80 percent of the improved properties are either selling their properties or setting up term or life estates. At this time, the number of exempt commercial properties and residences that will remain at the close of the land acquisition effort is unknown.

In 1968, construction began on a jetport just inside the eastern boundary of the preserve to serve all of south Florida and to replace Miami International Airport. Full development of this

facility (known as the Dade-Collier Transition and Training Jetport) was blocked by conservation and environmental groups. In 1970, it was agreed that existing facilities at the jetport would revert to the federal government once a more environmentally compatible site had been selected. A final environmental statement on a proposed site west of Fort Lauderdale is expected to be completed in 1980. Following construction of the new facility, the existing jetport will be dismantled: fences will be removed, buildings taken apart, the entrance road partially obliterated, and runways broken up. All possible materials will be salvaged. Revegetation by natural species will be encouraged, and exotic plants will be controlled.

2. Industrial Use

By the mid-1950s, virtually all of the pine and cypress stands within the preserve had been commercially logged. The only remaining signs of these logging activities are scattered stumps, logging roads, and elevated tramways used for access into the stands. Some of these historic access routes, such as those at Sawmill Road and into Roberts Lake Strand, now provide access into portions of the preserve.

Limestone quarrying has been a significant land use in the past but is expected to be phased out.

Oil and gas extraction is the only expanding industrial use in the preserve. As of August 1977, at least 72 test wells had been drilled within the preserve, 8 of which are currently "producers." Most of the producing wells are in the northwest portion of the preserve, in the Bear Island and Baxter Island areas (see Existing Conditions map). However, recent exploratory operations possibly have located high potential reserves in the Raccoon Point area, north of the jetport. More exploration will probably occur between these points if supported by geophysical data.

Oil and gas operations within the preserve occur in a two-step process--exploration and extraction. Seismic surveys, using large ORVs equipped with a coring device and recording equipment, are first conducted to determine the most likely locations for oil and gas reserves. Once potential reserves have been located, a test hole is drilled to determine the production potential of a well. Development of the test hole requires a road to the well site and about 3 acres for construction of the drill pad. The road and drill pad must be elevated several feet (in wetter areas) to prevent year-round flooding. If the well is a producer, then the pad size is reduced to about 1 acre, and depending on quantity, the oil is either trucked out or a pipeline is constructed. State law prescribes a minimum spacing of one well per 160 acres for wells deeper than 6,000 feet. Following abandonment of the oil and gas operation, the road and pad must be removed and the site

rehabilitated in accordance with operational plans approved by the National Park Service.

Exxon Corporation is the largest oil producer within the preserve, with an estimated 300,000 acres of gas and oil leases in force. Other leases are probably in force with other companies, and as much as 75 percent of the preserve may currently be under lease.

The Big Cypress Swamp Advisory Committee was established in 1971 by the state of Florida to evaluate potential oil and gas exploration and extraction operations within the Big Cypress watershed. This committee includes representatives of the oil industry, state government, and conservation groups, as well as a hydrologist and botanist. The committee has recently approved eight additional sites for drilling.

Oil and gas operations within the preserve are also subject to the new National Park Service oil and gas regulations. Onsite evaluation by the Big Cypress Advisory Committee in conjunction with National Park Service regulations is intended to guide operations during the predevelopment phase to prevent substantial environmental impact. Frequent monitoring of ongoing operations by the oil companies and the National Park Service reduces the threat of oil spills and other environmental hazards.

Studies on the impacts of oil and gas operations within the Big Cypress watershed are limited. To date, no detrimental long-term effects have been identified. Analysis by Frank D. Masch and Associates indicates that if adequate culverting is utilized, oil and gas operations will have minimal effects on surface water flow (1971).

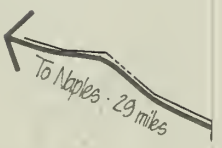
Natural vegetation is precluded during the life of the well; however, native vegetation at abandoned well sites begins to recover within several months of abandonment and pad removal. After three years, species diversity increases and understory species of the original community start to appear. After visiting several abandoned well sites within the preserve, Deuver (1979) concluded that oil well pads and roads, when removed, do not represent a long-term obstacle to the recovery of native vegetation, providing that exotics and heavy ORV use are controlled.

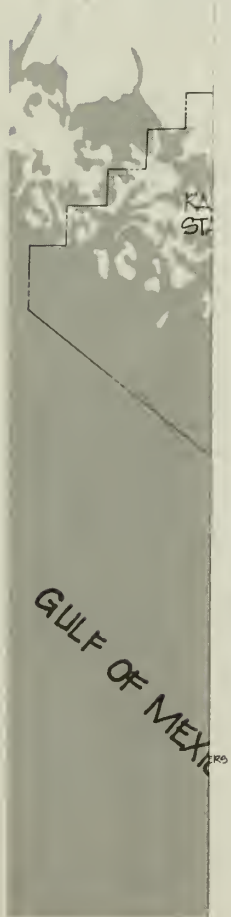
3. Agricultural Use

Grazing is the only significant agricultural use within the preserve. About 1,400 head of cattle are grazing on 60,720 acres, mostly in the Bear Island area. Cattle operations currently are limited to calf production only. Low soil fertility and the harsh environment (insects, lack of water holes, etc.) make cattle raising only marginally successful. Although the cattle range

LEGEND

- EXEMPT RESIDENTIAL PROPERTY (AS OF NOVEMBER 20, 1979)
- EXEMPT COMMERCIAL OPERATION (AS OF NOVEMBER 20, 1979)
- BORROW PIT
- MAJOR ROADSIDE PARK
- INDIAN VILLAGE
- INDIAN CEREMONIAL SITE
- NPS OPERATION
- 138-KV OVERHEAD ELECTRIC TRANSMISSION LINE
- 3-PHASE OVERHEAD ELECTRIC DISTRIBUTION LINE
- 3-PHASE UNDERGROUND ELECTRIC DISTRIBUTION LINE
- SINGLE-PHASE OVERHEAD ELECTRIC DISTRIBUTION LINE
- —W—W— 6" OCHOPEE WATERLINE & SYSTEM
- OIL EXPLORATION & PRODUCTION
- PERMITTED WELLS (AS OF NOVEMBER 20, 1979)
- MAJOR ORV ACCESS
- NPS HOUSING
- NPS HOUSING OCCUPIED BY FLORIDA GAME AND FRESHWATER FISH COMMISSION PERSONNEL





EXISTING CONDITIONS

BIG CYPRESS NATIONAL PRESERVE florida

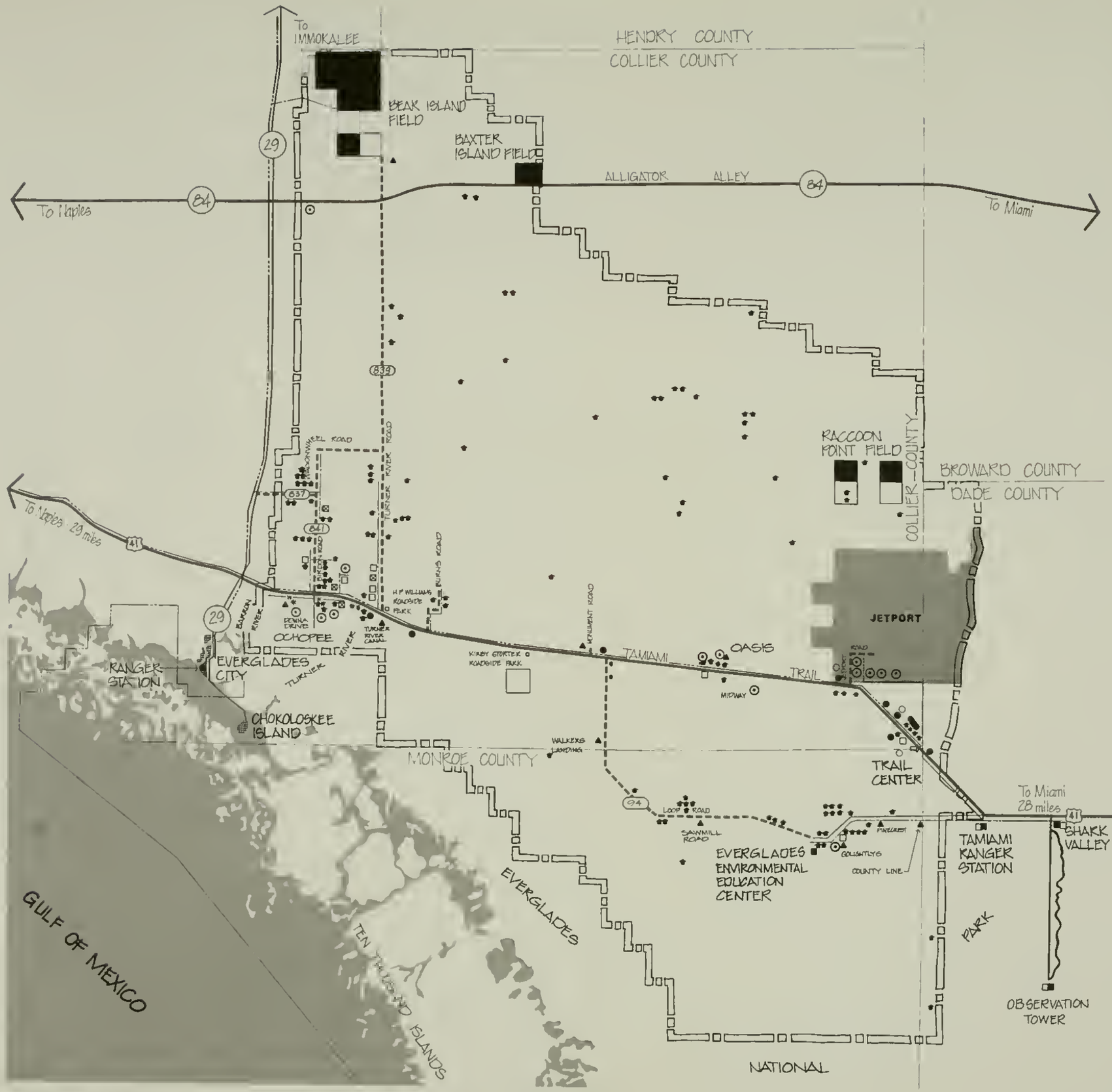
0 3 6 9 12 15

0 5 10 15 20

NORTH

United States Department of the Interior · National Park Service

176	20006A
DSC	FEB 80



LEGEND

- EXEMPT RESIDENTIAL PROPERTY (AS OF NOVEMBER 20, 1979)
- EXEMPT COMMERCIAL OPERATION (AS OF NOVEMBER 20, 1979)
- BORROW PIT
- MAJOR ROADSIDE PARK
- INDIAN VILLAGE
- INDIAN CEREMONIAL SITE
- NPS OPERATION
- 138 KV OVERHEAD ELECTRIC TRANSMISSION LINE
- 3 PHASE OVERHEAD ELECTRIC DISTRIBUTION LINE
- 3 PHASE UNDERGROUND ELECTRIC DISTRIBUTION LINE
- SINGLE-PHASE OVERHEAD ELECTRIC DISTRIBUTION LINE
- 6" OCHOPEE WATERLINE & SYSTEM
- OIL EXPLORATION & PRODUCTION
- PERMITTED WELLS (AS OF NOVEMBER 20, 1979)
- MAJOR ORV ACCESS
- NPS HOUSING
- NPS HOUSING OCCUPIED BY FLORIDA GAME AND FRESHWATER FISH COMMISSION PERSONNEL

EXISTING CONDITIONS

BIG CYPRESS NATIONAL PRESERVE florida

MILES 0 3 6 9 12 15
KILOMETERS 0 5 10 15 20
NORTH

United States Department of the Interior National Park Service

176 | 20006A
DSC | FEB 80

is fenced, range management is limited to relatively frequent burning and infrequent rotational grazing. Grazing will be phased out as the original permits expire.

4. Recreational Use

Recreation has traditionally been the major land use in the preserve, and it can be expected to be even more dominant in the future because of projected increases in tourism and residential population. Recreational use data specific to the preserve are limited; however, some assumptions can be made, based on information compiled by Deuver (1979) and findings of the Florida State Comprehensive Outdoor Recreation Plan (SCORP) for Collier County (state planning region IX) and Monroe, Dade, and Broward counties (state planning region X).

a. Hunting

Hunters, who use ORVs and established backcountry camps, are by far the dominant group using the preserve. Deer and turkey are the primary game sought during the November-to-March hunting season. Most ORV use (swamp buggies, airboats, all-terrain cycles, and track vehicles) is for access and mobility. Major use periods include the opening week of deer-hunting season and weekends during spring, winter, and fall. A dramatic increase in ORV trails in the last 20 years attests to a corresponding increase in hunting pressure. Based on aerial photography taken in 1973, Deuver completed a map illustrating some of the major ORV trails in the preserve (see Trails map).

An estimated 800 to 1,000 swamp buggies, 100 to 200 airboats, and 50 to 100 track vehicles are active in the preserve during the peak hunting season (Deuver, 1979). Most of these ORVs are transported to the preserve by means of trailers, and during hunting season, numerous tow vehicles and trailers are parked along preserve roads. This situation leads to congestion and associated safety problems, particularly along the narrow Loop Road (Collier 94).

Most hunting activities center around permanent backcountry camps (500 to 600 camps are estimated). Camps vary from lean-tos to mobile homes to elaborate two-story houses with plumbing and electricity. Although most camps are on land to which the camp owner does not have title, some backcountry camps qualify as "improved property" and thus are exempt from acquisition. Camps not qualifying as exempt properties are being issued five-year special use permits, and they must be removed when the permits expire.

Most hunters come from southeast Florida and spend an average of 28 days per year hunting in the preserve (Deuver 1979). A smaller number of hunters use "front country"

camping areas, camp along roadsides, or hike into hunting areas. Demand for roadside camping may increase as backcountry camps are phased out.

There is little information on the number of hunters using the preserve, but broad estimates indicate 40,000 hunter-days per year in the Big Cypress region, with as many as 2,500-4,000 hunters present in the preserve on peak weekends (Deuver 1979). Many hunters have used the preserve for as long as 25 to 30 years. Although most hunters are responsible users of the preserve, some poaching and general resource abuse does occur.

b. Camping

There is one privately operated campground within the preserve on the west side along U.S. 41 (Trail Lakes Campground). On the west side of the preserve, camping opportunities are available at Everglades City, Chokoloskee, and Collier-Seminole State Park and also along Alligator Alley--all within 15 miles of the preserve boundary. Camping opportunities are also available in the Naples vicinity, about 30 miles west of the preserve. On the east side of the preserve, camping opportunities are limited; the nearest camping opportunities are in the Homestead vicinity, about 50 miles away.

Some backcountry camping is done in association with hunting or hiking, especially along the Florida Trail where there are two primitive campsites. The number of campers is unknown, but most use is restricted to upland pine and hammock habitats.

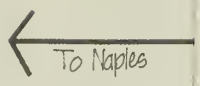
c. Hiking

The only established hiking trail in the preserve is a 22-mile section of the Florida Trail, which leads from Florida 84 south to the Oasis ranger station on U.S. 41. Based on trail register data, an estimated 1,000 hikers use the trail annually.

Hikers primarily come during the dry season when the low water level permits easier access to the interior. Potential for increasing hiking opportunities in the preserve is restricted by the seasonal lack of dry upland areas.

d. Fishing

Fishing in the preserve is limited by the lack of open water areas. State game wardens report that on busy weekends about 20 to 40 persons fish in canals along U.S. 41, Collier 94 and 839, and Florida 84. A few fishermen fish in gator holes south of Collier 94, but these ponds are rare and fairly inaccessible. Fishing is also generally light at existing rock pits because they are inaccessible by public road; as these rock pits are

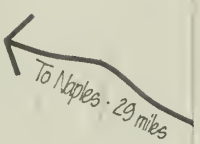


BUGGY TRAILS

AIRBOAT TRAILS

FLORIDA TRAIL

ELEVEN-MILE ROAD



TRAILS

NOTE: BASED ON MICHAEL J. DEUVER AND DANIEL P. SPANGLER, "RESOURCE INVENTORY AND ANALYSIS OF THE BIG CYPRESS NATIONAL PRESERVE" (GAINSVILLE: CENTER FOR WETLANDS, UNIVERSITY OF FLORIDA, AND ECOSYSTEM RESEARCH UNIT, NATIONAL AUDUBON SOCIETY, 1979)

BIG CYPRESS NATIONAL PRESERVE
florida

0 3 6 9 12 15

0 5 10 15 20

NORTH

United States Department of the Interior · National Park Service

176 | 20009A
DSC | FEB 80

TRAILS

BIG CYPRESS NATIONAL PRESERVE florida

BUGGY TRAILS
AIRBOAT TRAILS
FLORIDA TRAIL
ELEVEN-MILE ROAD

NOTE: BASED ON MICHAEL J. DEBVER AND DANIEL P. SPANGLER, "RESOURCE INVENTORY AND ANALYSIS OF THE BIG CYPRESS NATIONAL PRESERVE" (GAINSVILLE: CENTER FOR WETLANDS, UNIVERSITY OF FLORIDA, AND ECOSYSTEM RESEARCH UNIT, NATIONAL AUDUBON SOCIETY, 1979)

MILES 0 3 6 9 12 15
KILOMETERS 0 5 10 15 20

NORTH

United States Department of the Interior · National Park Service

176 | 20004A
DSC | FEB80

acquired by the federal government, opportunities for fishing in the preserve will increase.

e. Boating

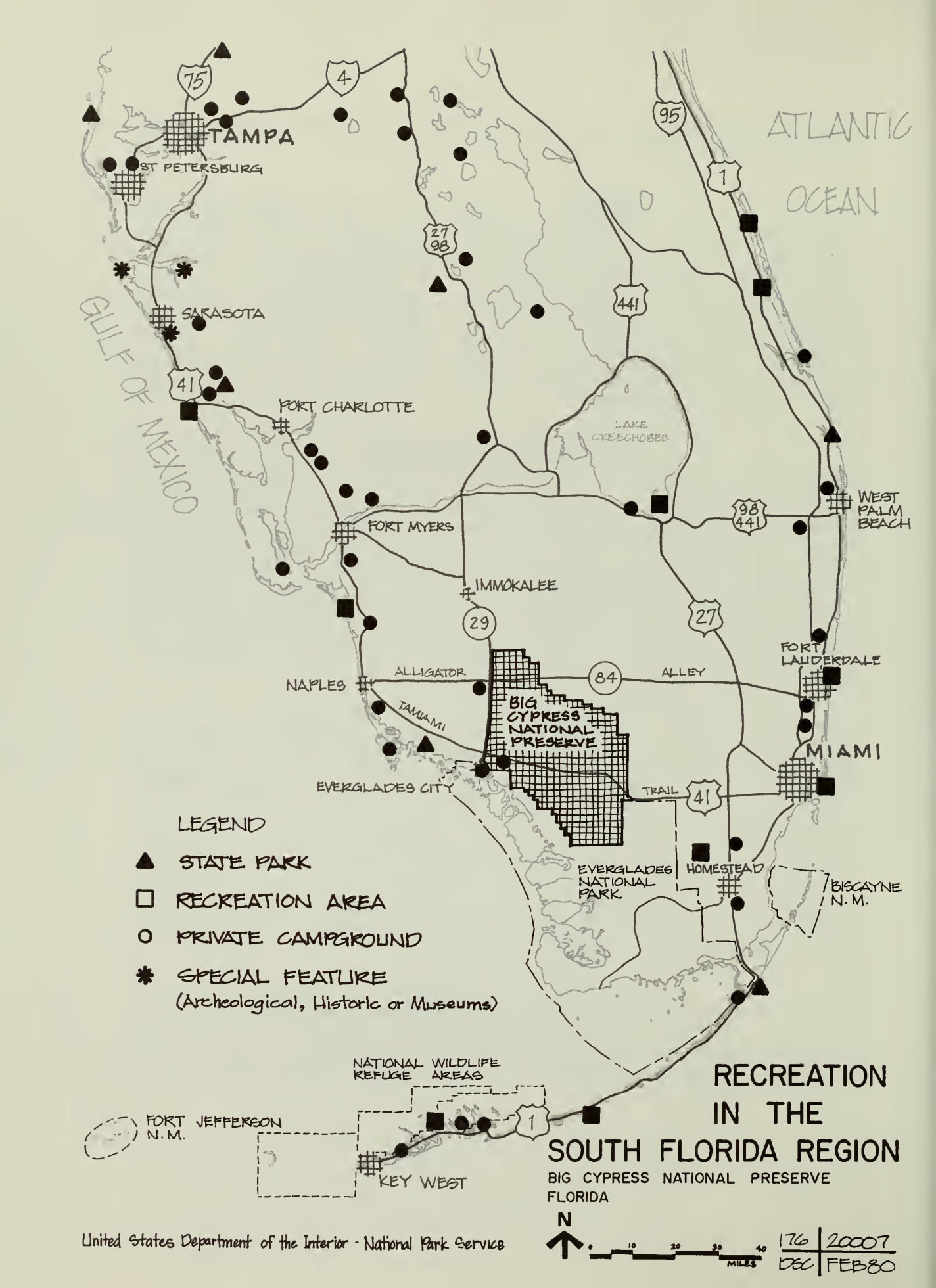
Boating is limited by dense vegetation and narrow waterways. The Turner River and its associated canal are used, but data on specific numbers of boaters are not available. The Turner River canal is utilized primarily by airboaters, whereas Turner River is used by canoeists. The attractiveness of Turner River for canoeing is expected to increase once water diversion projects restore historical flow levels to the river. An undetermined number of boaters also use the waterways between Ochopee and Chokoloskee Bay, and the canal (L-28) along the eastern preserve boundary.

f. Interpretation/Nature Study

Many visitors to Everglades National Park also visit Big Cypress--to experience the unique cypress swamp environment, especially while en route to Everglades City or Shark Valley. Because the preserve is relatively close to Shark Valley, many of the Shark Valley visitors are potential preserve visitors. The number of visitors to Shark Valley has substantially increased since the opening of passenger tram service in 1972. Although visitation dipped in 1974 because of the gas shortage, visitation in 1977 was 100 percent greater than in 1972. Passenger trams are currently running at near capacity and can accommodate approximately 80,000 persons per year.

Everglades visitors who do visit the preserve take short walks or engage in passive recreation such as sightseeing and bird-watching. Some of these visitors may also take side trips to the Audubon Society's Corkscrew Swamp Sanctuary, the Fakahatchee Strand State Preserve, or Collier-Seminole State Park to seek nature study/interpretation opportunities. Interpretive boardwalks lead into cypress stands at both the Fakahatchee Strand State Preserve and Corkscrew Swamp. Another cypress dome boardwalk is proposed in the Everglades National Park Final Master Plan. At Kirby Storter Roadside Park, within the preserve, there is a short boardwalk into a cypress dome, but the dome is not interpreted.

No regular interpretive programs are now offered in the preserve, and interpretation for the general public is currently limited to occasional guided programs offered by Everglades National Park staff. The newly established environmental education center near Pinecrest provides facilities and programs for area school groups.


TAMPA
ST PETERSBURG
SARASOTA
PORT CHARLOTTE
FORT MYERS
IMMOKALEE
NAPLES
ALLIGATOR
ALLEY
TAMIAMI
BIG CYPRESS NATIONAL PRESERVE
EVERGLADES CITY
TRAIL
LAKE OKEECHOBEE
WEST PALM BEACH
FORT LAUDERDALE
MIAMI
EVERGLADES NATIONAL PARK
HOMESTEAD
BISCAYNE N.M.
ATLANTIC OCEAN
GULF OF MEXICO
75
4
95
1
27
98
441
41
29
84
LEGEND
STATE PARK
RECREATION AREA
PRIVATE CAMPGROUND
SPECIAL FEATURE
(Archeological, Historic or Museums)
NATIONAL WILDLIFE REFUGE AREAS
FORT JEFFERSON N.M.
KEY WEST
RECREATION IN THE SOUTH FLORIDA REGION
BIG CYPRESS NATIONAL PRESERVE
FLORIDA
N
0 10 20 30 40
MILES
United States Department of the Interior - National Park Service
176 | 20007
DSC | FEB80

g. Picnicking

There are two small picnic areas in the preserve--Kirby Storter and H.P. Williams roadside parks, each with less than 10 tables. Since these areas are located along the right-of-way of heavily traveled U.S. 41, they are used primarily as rest areas by travelers rather than as destination picnic areas.

h. Highway Travelers

With two major travel routes crossing the preserve (U.S. 41 and Florida 84), a large number of people simply drive through the preserve on their way to other destinations. Estimated average traffic flow during the winter months is 3,000 vehicles per day on U.S. 41, and 5,000 vehicles per day on Florida 84. On both routes, summer traffic is significantly less. For the most part, travelers are from south Florida population centers, but out-of-state tourists are also highly represented. Use of the preserve by these travelers is now limited to stopping at roadside facilities (such as restaurants, picnic areas, and gas stations) sightseeing, photography, and other kinds of passive recreation.

i. Florida SCORP Recreational Opportunity Analysis

The Florida SCORP assesses the demand for recreation facilities and activities in planning region IX, which includes Collier County, and planning region X, which includes Monroe, Dade, and Broward counties. Because the preserve is largely within Collier County, and partly within Monroe and Dade counties, and because it receives much use from residents of these counties and nearby Broward County, data for planning regions IX and X indicate trends that are relevant to recreation planning for the preserve. However, because the SCORP is based largely on an analysis of the highly populated urban areas along the coasts, its relevance to recreational use within the preserve is uncertain. The preserve is relatively far (50 to 60 miles) from the highly populated coastlines, and recreation within the preserve will probably be increasingly influenced by the needs of national visitors. A brief summary of the demand for recreational activities that could be provided within the preserve are listed as follows:

Canoeing -- There has been a remarkable upswing in demand in recent years; additional designated trails are needed in both regions IX and X by 1990

Picnicking -- Additional facilities are needed in both regions by 1990; the need in region X is greatest for the state

Nature Study -- Among all state planning regions, nature study is most popular in region IX, where there is also the greatest need for additional opportunities; there is less need in region X

Hiking -- Some additional trails are needed in region X, but a surplus is indicated in region IX

Camping -- Camping opportunities are indicated to be in surplus in both regions IX and X

D. Existing National Park Service Development and Management

1. Big Cypress National Preserve

The headquarters occupies leased space in downtown Naples, about 35 miles west of the preserve. The park manager, administrative officer, resources management specialist, and secretary work out of the Naples headquarters.

The field office is in the preserve at the Oasis ranger station, about 55 miles east of Naples. The ranger and maintenance activities are centered at this facility, which consists of a two-story, cement-block building with 2,800 square feet on each floor and an attached 5,500-square-foot hangar. The building houses offices, storage, and partially completed seasonal quarters. The hangar is utilized for vehicle storage and maintenance. The hangar building is structurally sound, but requires rehabilitation to improve working conditions. Behind the hangar building are a small storage shed for flammable materials, a trailer that serves as a fire cache, and a landing strip. Fueling facilities for automobiles and aircraft are also available.

Preserve field personnel are currently living in ten housing units scattered throughout the preserve. Everglades research personnel, interpreters, and rangers, and also Florida Game and Freshwater Fish Commission personnel, live in 12 units within the preserve (see Existing Conditions map). Housing for the research personnel is only temporary, and it is currently maintained by preserve personnel. The four housing units occupied by Florida Game and Freshwater Fish Commission personnel are under a long-term special use permit, and maintenance of those units will remain the responsibility of the state of Florida.

All of the residences and other National Park Service facilities operate on individual water and septic systems. There are no wastewater treatment facilities within the vicinity of the preserve, and the only water systems are at Ochopee and in the Miccosukee special use area west of Shark Valley within Everglades National Park. Electrical power and telephone service are provided to all areas by overhead power lines.

Specialized vehicles--swamp buggies and airboats--are used by rangers operating from the Oasis ranger station for fire control, exotic plant control, and backcountry patrol. The vehicles are stored at Oasis and transported by trailer to access points. Aircraft support is also centered at Oasis.

In 1977-1978 and again in 1978-1979, the preserve had numerous wildfires. During the latter season, more than 130 fires that burned over 23,000 acres were recorded. Research for a fire management plan is in the initial stages, but it will be several years before an approved fire management plan can be adopted. Response time by ORV to backcountry fires is often several hours, so aircraft support is mandatory for fire control. Fires along roadways occasionally threaten exempt properties and must be controlled.

The primary focus of ranger activities within the preserve will continue to be in the 570,000-acre backcountry. Backcountry ORV use within the preserve, especially during hunting season, is extensive, and backcountry patrol for search and rescue, emergency operations, and enforcement of National Park Service and Florida Game and Freshwater Fish Commission regulations is necessary. Because orientation within the preserve is difficult, and because most backcountry users are very familiar with the terrain, long-term employees (technicians and permanents) are required to carry out effective patrol. Because of the size of the preserve and the slow speeds of the specialized backcountry vehicles, patrols will continue to rely heavily on aircraft support. Current aircraft operations within the preserve include substantial use of a small helicopter. While more expensive to operate than fixed-wing aircraft, the helicopter is more versatile and better able to perform management activities within the preserve. The National Park Service has no jurisdiction on preserve roadways, therefore the need for of rangers to respond to problems on designated roads will remain secondary.

In south Florida, several exotic plant species have multiplied so fast that they threaten to disrupt the native plant communities and are a major management concern. Extensive man-caused disturbance in the preserve--such as drainages, residential/commercial developments, and agriculture--has altered habitats and has made them more susceptible to exotic species invasion. Although about 250 plant species have naturalized in south Florida, only two--melaleuca (Melaleuca quinquenervia) and Brazilian pepper (Schinus terebinthifolius)--have become major problem species in the preserve because they are extremely difficult to control. Currently, most large stands of these exotics are concentrated along roadsides, with only an occasional plant in the backcountry. To prevent their increase in the preserve, an active management program, including removal and frequent retreating, is required. Researchers in Everglades National Park are attempting to find new control techniques. However, if current management techniques are used, exotic plant control requires a large work force to eliminate and prevent reestablishment of these exotics.

2. Everglades National Park

Shark Valley is a major interpretive focus for Everglades National Park. A one-way loop road leads 7 miles from the parking area to a 35-foot observation tower. The road is closed to private vehicles, but interpreters provide hourly shuttle bus tours to the tower from September through June. Other interpretive activities in this area include bike trips, swamp hikes, and canoe trips. This area is very popular with visitors because of the spectacular wildlife-viewing opportunities. Since 1975, approximately 75,000 to 85,000 persons have visited the area annually. Minimum staff levels necessary to provide a high quality interpretive experience are 1 permanent employee and 12 seasonals.

National Park Service facilities at Shark Valley are very limited. Two house trailers provide living quarters for park personnel assigned to this site. A converted 10- by 50-foot house trailer provides office space, and metal storage buildings are used for storage of National Park Service bicycles and materials. A gravel and paved parking lot (accommodating approximately 75 cars and 15 recreation vehicles), an entrance station, two open-air shelters ("chickees"), and lock-vault restroom facilities are the only Park Service visitor facilities at the entrance to the Shark Valley loop road. One efficiency apartment for seasonals and a public restroom are located at the base of the observation tower.

The Everglades Environmental Education Center is on the Loop Road (Collier 94), just west of Pinecrest within the preserve. Environmental education activities are provided for school groups from Dade, Collier, Monroe, Lee, and Broward counties on a day and overnight basis. Approximately 40 study groups of 25-30 students and teachers are accommodated each school year. Facilities at the center are currently limited to several "chickees," a small office, and several informal trails. Staffing levels now required for this program are one permanent and six seasonal employees.

The Tamiami ranger station is southeast of the junction of U.S. 41 and Collier 94. Three permanent rangers operate from this facility. Their major duties include boundary patrol and resource management activities in northern Everglades National Park and visitor protection activities at Shark Valley. Three permanent maintenance personnel operate from this facility to provide support for rangers and for the Shark Valley operation. Facilities at the Tamiami ranger station are limited to two residential trailers, one trailer that has been converted to an office, four detached maintenance buildings, an airboat launch area, and underground fuel tanks.

All Everglades National Park facilities operate on individual water and septic systems. Electrical power and telephone service are provided to all areas except the Shark Valley tower, where power is provided by a diesel generator.

IV. PLANNING CONSIDERATIONS

The development of alternatives presented in this Environmental Assessment has been guided by the authorizing legislation, applicable laws and executive orders, informal public comment through the superintendent, and information gathered and analyzed by the planning team. A brief analysis of how these factors have affected the alternatives is included here.

A. Use of Previously Disturbed Sites

Substantial development has taken place in the preserve, particularly along existing road corridors. Invariably, this development has caused the removal of natural vegetation and the placement of several feet of fill to elevate developments above the surface water level experienced during the wet season. All development sights, regardless of the alternative that is selected, will make maximum use of these elevated sites, thereby minimizing environmental impacts and development costs and ensuring feasible sites for construction.

B. Wetland Development

Because a substantial portion of the preserve is a wetland area, as defined by the Water Resources Council, development must comply with the provisions of Executive Order 11990 ("Protection of Wetlands") and its implementing regulations. Wetland filling in the preserve as discussed in this Assessment will be limited to three sites where wetland development must be undertaken to provide the necessary visitor facilities. These sites are the Sawmill Road and Pinecrest ORV access points, and also Gannet Slough. Heavy visitor use at Sawmill Road and Pinecrest is expected to continue. Development to alleviate traffic congestion and visitor safety problems, and to facilitate backcountry management at these ORV access points, will require some filling. Similarly, development for access into Gannet Slough (or at any other cypress dome identified for interpretation) will require some filling in the vicinity of the slough.

Several alternatives consider wetland filling at Shark Valley, but there are alternatives to filling, which are fully evaluated in this document. The National Park Service will consult with the Corps of Engineers about any necessary permits for filling wetlands, as required under section 404, Public Law 92-500 (Water Pollution Control Act, as amended). In all areas requiring filling, properly located culverting will be installed to protect sheet water flow.

C. Floodplain Management

Executive Order 11988 ("Floodplain Management") stipulates that federal agencies will avoid development within the 100-year or 500-year floodplain (depending upon the type of development proposed) when practicable alternative development

sites exist. Such floods have either a 1 percent or 0.2 percent chance of occurring in a given year. According to national flood insurance program maps, the 100-year flood level at potential development sites within the preserve ranges from 5 or 6 feet above mean sea level at Ochopee to approximately 8 or 9 feet at Oasis ranger station and Trail Center (based on extrapolations).

Developments considered in this Assessment, which must be excluded from areas inundated by a 100-year flood, make maximum use of sites already elevated with earth fill above the estimated 100-year flood level. In instances where the National Park Service proposes development in unfilled areas (see "Wetland Development," section V. B.), adequate fill will be used to ensure that the developments are above the 100-year flood level.

D. Use of Existing Structures

Although many existing structures have been acquired within the preserve, opportunities for utilizing them are limited. Most such structures are either substandard or inappropriate for government use. The present ranger/maintenance area at the centrally located Oasis building is proposed to continue at this site under several alternatives. The only concentrated area of suitable housing in the preserve is in Ochopee, where about 11 cement-block and wooden-frame structures are located. These houses are all connected to the Ochopee water system.

E. Wastewater Disposal

Hookups to municipal sewer systems are not feasible in any alternative because the nearest service is at least 25 miles from the preserve boundary. The use of water-conserving fixtures in new facilities will be employed to reduce water consumption. Two different methods for sewage disposal--septic system and lock vault--are proposed in the alternatives. Where necessary to protect groundwater, septic systems would be self-contained (no soil infiltration) and effluent disposal would be by evapotranspiration. No detrimental effects on water quality in the preserve caused by sewage disposal from numerous private residences have been recorded to date. Since National Park Service development alternatives provide for an overall reduction in sewage effluent and for the careful design of new treatment facilities, anticipated impacts on water quality are minimal. Sewage collection, treatment, and effluent disposal systems will conform to appropriate county health department standards, Environmental Protection Agency guidelines, and regulations of other agencies with jurisdiction as required under Executive Order 11507 ("Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities").

F. Housing

Housing for National Park Service personnel is considered in several alternatives. These proposals for housing in the preserve meet the requirements under criteria set forth in Office of

Management and Budget (OMB) Circular A-18 and the Department of Interior's Quarters Handbook, 400 DM.

G. Campgrounds

Several alternatives consider the construction of a 125-site developed campground. The two potential major user groups are vacationists in the winter and hunters in the fall. Casual travelers along the Tamiami Trail may also potentially utilize these campgrounds.

Observation of winter vacationist camping patterns indicates that a campground with utility hookups where visitors could stay a minimum of several weeks is generally preferred. However, according to policy, the National Park Service does not attempt to provide the full range of amenities and utility hookups associated with some private campgrounds.

Since most hunters have traditionally utilized backcountry camps, it is difficult to generalize about their future camping preferences. They may prefer to camp along roadsides where no fee is charged, or they may not camp in the frontcountry at all because of the long travel time to backcountry hunting areas. Under these circumstances, demand for developed camping would remain relatively low, particularly on the western side of the preserve where camping opportunities are available in the private sector. As previously mentioned, the Florida SCORP indicates that adequate developed camping opportunities exist in planning regions IX and X.

Camping areas around lakes might be used frequently by picnickers and fishermen during the day. Moreover, demand for a relatively primitive type of camping by highway travelers and local persons could be high. Primitive campgrounds would provide a type of experience generally unavailable within the region, keeping with National Park Service policy to provide the minimum level of overnight facilities.

An array of camping opportunities are considered in this document to solicit public comment on their appropriateness within the preserve.

H. Design Criteria

All adapted or newly constructed structures will be appropriate for the area's climate. The architectural design and the materials used will be compatible with the natural landscape.

In accordance with applicable laws and regulations, all facilities will be designed and constructed to allow for access by special populations (physically and mentally handicapped, elderly, etc.). Moreover, in providing for general development and visitor

use, energy efficiency will be stressed in locating, designing, and constructing all facilities and access systems.

Future design studies will be utilized to minimize impacts of various construction activities. For example, during the design of trail and utility corridors, ways to avoid tree-cutting and also impacts on identified cultural resources will be incorporated into the plans.

I. Cultural Resources

All work on this project will adhere to the requirements of section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's regulations, 36 CFR 800.

When advisable, a professional archeologist will be onsite during any construction to prevent damage to known cultural resources and to assist in the recognition of new resources that may be discovered. The contracting officer and/or the archeologist will have the responsibility and authority to halt any construction activities should historical, archeological, or paleontological resources be exposed. Construction activities endangering newly discovered resources will remain halted pending the investigation and evaluation of the remains and the completion of the procedures required by the Advisory Council on Historic Preservation. The contractor will be briefed specifically on these provisions by the contracting officer before construction starts. All contracts will reflect these provisions.

Vandalism and looting of the various cultural resources will be controlled by appropriate interpretive messages, signs, and security measures.

J. Threatened or Endangered Species

Informal contact with the U.S. Fish and Wildlife Service will be maintained to ensure the protection of listed threatened or endangered species or their critical habitat. The National Park Service will actively enforce all provisions of the Endangered Species Act. A separate biological assessment detailing the effects of this project on such species will be prepared for submission to the U.S. Fish and Wildlife Service.

V. ALTERNATIVE ACTIONS AND THEIR IMPACTS ON THE ENVIRONMENT

A. Actions Common to All Alternatives

1. Administration

The preserve will remain under the administration of Everglades National Park, and cooperation will continue between National Park Service personnel from Big Cypress National Preserve and Everglades National Park in the areas of resource protection, visitor safety, interpretation, law enforcement, and maintenance.

2. Interstate 75 and Collier 839 Intersection; Florida Trail

In all alternatives, the proposed Interstate 75 will be grade-separated from Collier 839, which provides access to the northern part of the preserve.

In all alternatives, the Florida Trail within Big Cypress National Preserve will be rerouted to take maximum advantage of federal lands. It will cross I-75 at a wildlife underpass just inside the eastern preserve boundary and will have its southern terminus within the preserve at Oasis. The National Park Service will work with the Florida Trail Association to expand the trail system within the preserve, with construction and maintenance being done by volunteers of the association.

3. Resources Management

The underlying concept for resources management within the preserve will be the preservation of the dynamic preserve ecosystem. Unnecessary alteration of the natural scene or interference with natural processes will be avoided. The effects of human activities on natural resources will be monitored to ensure that appropriate actions are taken to perpetuate the resources. Actions may be needed in areas where ecological processes have been altered by past human activity; such actions would help to maintain the closest approximation of the natural scene where a truly natural system is no longer attainable.

A basic resource inventory of the preserve ecosystem will be undertaken to identify sensitive elements. By means of monitoring, this baseline data will be compared with later conditions, especially where change might be anticipated because of physical development or visitor use. Where use patterns are detrimental to the resource, they will be limited or modified to prevent resource deterioration.

B. Alternative Packages and Impact Analysis

1. Alternative 1 - No Action/Status Quo

a. Description

The existing facilities for staffing, housing, rangers, maintenance, and visitor use would remain within the preserve, and at Shark Valley, Tamiami ranger station, and the

Everglades Environmental Education Center. Only minimal modifications would be made to provide adequate working and safety conditions for staff and visitors.

Big Cypress Development for Operations--The existing Oasis building would be partitioned to provide separate maintenance shops/fire cache, covered vehicular storage and hangar, ranger station/offices, and dormitory for six seasonals.

Big Cypress Information/Interpretation--Visitor orientation/information would be provided at Fakahatchee Strand State Preserve through a cooperative agreement and at Shark Valley.

Shark Valley/Tamiami/Environmental Education Center--Development at Shark Valley would be limited to the provision of turning lanes off the Tamiami Trail and the removal of the existing visitor entrance station. Ticket sales and information would be conducted from an existing structure in the Shark Valley parking area.

b. Impacts

(1) Natural/Cultural Environment

Under alternative 1, approximately 1/4 acre of roadside annual and perennial vegetation would be removed for development of turning lanes off the Tamiami Trail at Shark Valley.

Development would be at least 2½ miles from the nearest known archeological site. Since backcountry travel is difficult because of the terrain, and since this alternative makes no provision for increased access, there would probably be no effect on any cultural resources.

(2) Socioeconomic Environment

The impact of this alternative would be related principally to its influence on tourism. No major industries would be altered. The effect on the lifestyle of the regional population, including Native American residents, would be minor.

Economic benefits to the construction industry would be short term, depending on the extent of development. Any construction would probably be handled by local and area contractors, which would contribute to the regional economy.

Since the regional economy is largely based on tourism, its orientation would not be altered. The economic impacts from increased visitation would result in the financial strengthening of existing tourist facilities along the Tamiami Trail.

general development plan alternative 1

To Naples

OASIS
- EXISTING RANGER / MAINTENANCE FACILITY

FAKAHATCHEE STRAND STATE PRESERVE
- VISITOR ORIENTATION FACILITY

SHARK VALLEY
- VISITOR ORIENTATION FACILITY

NAPLES
- EXISTING HEADQUARTERS

EVERGLADES ENVIRONMENTAL EDUCATION CENTER
- EXISTING FACILITIES

LEGEND

- MAJOR NPS FACILITY
- MINOR NPS FACILITY
- FOOT TRAIL
- PAVED ROAD
- GRAVEL ROAD

To Naples · 29 miles

BIG CYPRESS NATIONAL PRESERVE florida

0 3 6 9 12 15
METERS
0 5 10 15 20

NORTH

United States Department of the Interior · National Park Service

176 | 20008
DEC | FEB 80

general development plan alternative 1

HENDRY COUNTY
COLLIER COUNTY

To IMMOKALEE

29

ALLIGATOR ALLEY

84

To Naples

To Miami

GRADE SEPARATION

PROPOSED REST AREA ON I-75 WITH ACCESS TO THE FLORIDA TRAIL AND THE WILDLIFE UNDERPASS

FLORIDA TRAIL

839

WAGONWHEEL ROAD

TURNER RIVER ROAD

FAKAHATCHEE STRAND STATE PRESERVE

837

To Naples 29 miles

41

841

BARRON RIVER

BURNS ROAD

MONUMENT ROAD

COLLIER-COUNTY

BROWARD COUNTY
DADE COUNTY

TAMIAMI TRAIL

OASIS

JETPORT ROAD

EVERGLADES CITY

TURNER RIVER

CHOKOLOSKEE ISLAND

MONROE COUNTY

94

LOOP ROAD

To Miami 28 miles

41

SHARK VALLEY

EVERGLADES ENVIRONMENTAL EDUCATION CENTER

EVERGLADES NATIONAL PARK

GULF OF MEXICO

TEN THOUSAND ISLANDS

OASIS
- EXISTING RANGER / MAINTENANCE FACILITY

FAKAHATCHEE STRAND STATE PRESERVE
- VISITOR ORIENTATION FACILITY

SHARK VALLEY
- VISITOR ORIENTATION FACILITY

NAPLES
- EXISTING HEADQUARTERS

EVERGLADES ENVIRONMENTAL EDUCATION CENTER
- EXISTING FACILITIES

LEGEND

- MAJOR NPS FACILITY
- MINOR NPS FACILITY
- FOOT TRAIL
- PAVED ROAD
- GRAVEL ROAD

BIG CYPRESS NATIONAL PRESERVE
florida

MILES 0 3 6 9 12 15
KILOMETERS 0 5 10 15 20

NORTH

United States Department of the Interior · National Park Service

176 | 20008
DSC | FEB 80

Local workers who were employed by the National Park Service in the preserve would benefit.

(3) Visitors

The inadequacy of existing facilities to accommodate various recreational uses would affect visitors. The minimal provision of orientation/information would continue to limit the ability of visitors to understand the significance of the area and to know what recreational opportunities and facilities were available. Unmarked trailheads, lack of designated parking, and minimal facilities would restrict recreational use potential in the preserve.

ORV users would continue to park their tow vehicles and trailers along the roadsides, causing unsafe roadway congestion, particularly on the Loop Road during heavy-use winter months. Moreover, as developed backcountry camps were phased out, an unmet demand for frontcountry camping areas might increase.

(4) Management

Minimal changes in staffing and facilities would mean that resource and visitor management within the preserve would remain approximately as they are now.

The spread of exotic plants would remain largely uncontrolled, and fire management capabilities, including the protection of inholdings, would continue to be limited. Due to the complex nature of the backcountry terrain, continued dependence on short-term seasonals for backcountry patrol would lead to ineffective patrols. Ranger patrols would still be the only means for National Park Service personnel to contact visitors in the preserve.

The maintenance staff would have to spend substantial time in the upkeep of acquired housing and associated septic and water systems, which are scattered throughout the preserve. Continued operation of the Ochopee water system might not be possible with available manpower. Although Oasis would be a suitable location for vehicular maintenance of Shark Valley/Tamiami and Everglades City vehicles, adequate manpower and facilities for this maintenance would be unavailable.

Random roadside parking of ORVs would continue causing unsafe and congested parking at ORV access points along the Loop Road and associated problems of littering and vandalism/theft from vehicles. Preserve staff would have to respond to these problems, consequently decreasing staff availability for nonenforcement types of visitor contacts.

Keeping the headquarters office in Naples would allow for more efficient and convenient procurement for headquarters staff, would alleviate the need for some government housing, and would provide good accessibility to local community leaders and county government. A disadvantage would be the possibility that the preserve manager could lose daily contact with immediate issues and concerns of visitors to the preserve.

Alternative 1 would propose formal routine administrative cooperation between staffs of the national preserve and Fakahatchee Strand State Preserve for the operation of the Big Cypress Bend contact station. Although this facility is about 7 miles west of the preserve boundary, it is along the most important traffic route through the preserve and is a strategic place to provide information. This relationship would be expected to result in closer cooperation between the two agencies and in better public understanding of the two areas.

2. Alternative 2

a. Description

Big Cypress Development for Operations--No housing for National Park Service personnel would be provided in the preserve.

Three buildings would be constructed in the Ochopee area for operations:

A 5,400-square-foot building would accommodate maintenance shop space (including two vehicular maintenance bays), ranger activities, ranger/maintenance offices, storage, and a 25-man fire cache with 1,500 square feet of attached covered vehicular storage.

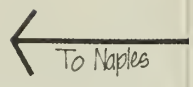
A separate 240-square-foot building would be built for storage of flammable materials.

A 2,000-square-foot interpretive center/headquarters building with an adjacent 50-car parking lot would also be provided. Approximately 4,500 square feet of uncovered parking space would be provided for 18 other pieces of equipment.

Development at Ochopee would be tied to the existing water system and electrical transmission lines. Sewage disposal would be by septic system.

Aircraft operations now at Oasis would be transferred to Everglades City.

general development plan alternative 2



OCHOPEE
- RANGER / MAINTENANCE / HEADQUARTERS / VISITOR CONTACT

OASIS
- 125-SITE DEVELOPED CAMPGROUND

ORV ACCESS POINTS (developed parking)
- TURNER RIVER CANAL
- GOLIGHTLYS
- MONUMENT LAKE

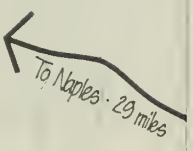
TAMIAMI RANGER STATION
- RANGER STATION

SHARK VALLEY
- VISITOR CONTACT / HOUSING / MAINTENANCE / ADMINISTRATION

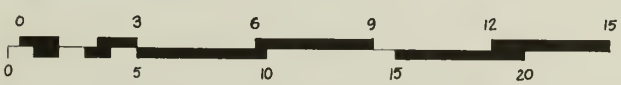
EVERGLADES ENVIRONMENTAL EDUCATION CENTER
- BOARDWALK TRAIL

LEGEND

- MAJOR NPS FACILITY
- MINOR NPS FACILITY
- FOOT TRAIL
- PAVED ROAD
- GRAVEL ROAD



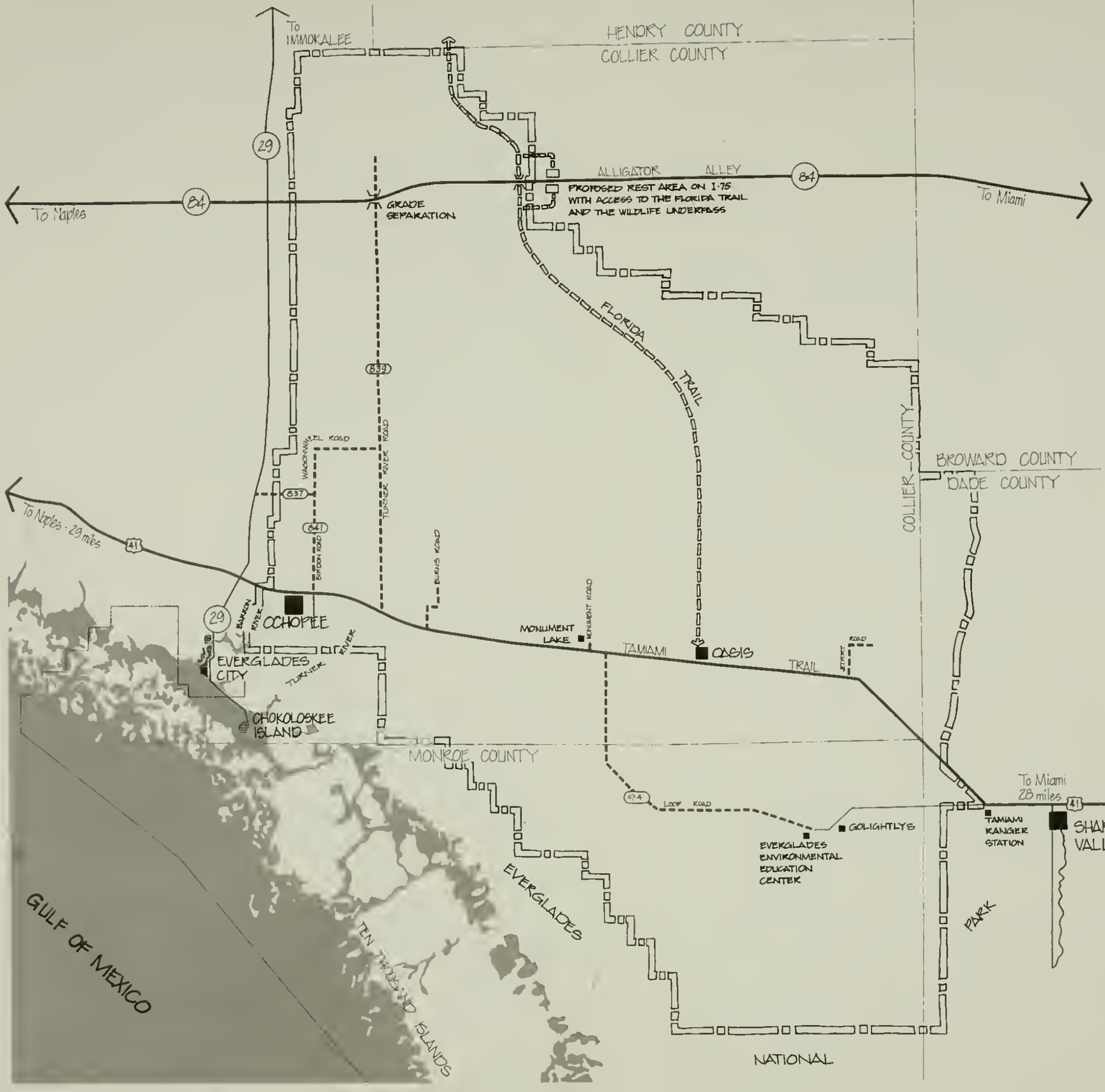
BIG CYPRESS NATIONAL PRESERVE florida



United States Department of the Interior · National Park Service

176 | 20009
DSC | FEB 80

general development plan alternative 2



OCHOPEE
- RANGER / MAINTENANCE / HEADQUARTERS / VISITOR CONTACT

OASIS
- 125 - SITE DEVELOPED CAMPGROUND

ORV ACCESS POINTS (developed parking)
- TURNER RIVER CANAL
- GOLIGHTLYS
- MONUMENT LAKE

TAMIAMI RANGER STATION
- RANGER STATION

SHARK VALLEY
- VISITOR CONTACT / HOUSING / MAINTENANCE / ADMINISTRATION

EVERGLADES ENVIRONMENTAL EDUCATION CENTER
- BOARDWALK TRAIL

LEGEND
- MAJOR NPS FACILITY
- MINOR NPS FACILITY
- FOOT TRAIL
- PAVED ROAD
- GRAVEL ROAD

BIG CYPRESS NATIONAL PRESERVE florida

MILES 0 3 6 9 12 15
KILOMETERS 0 5 10 15 20

NORTH

United States Department of the Interior · National Park Service

176 | 20009
DSC | FEB 80

Big Cypress Development for Recreation--A 125-site developed campground with picnic tables, drinking water supplied from wells, fire pits, toilet facilities (septic system), and trash collection points would be developed at Oasis.

Parking areas would be developed for ORV access at Turner River Canal, Golightlys near Pinecrest, and Monument Lake. Site improvements at each area would provide parking for 20 vehicles and trailers. Appropriate signing, vault toilets, and trash collection points would also be provided at each area.

Designated, undeveloped parking for canoe access would be provided at canals in the Everglades Shores area (in Ochopee) and off the Tamiami Trail (at the Turner River). Designated, undeveloped parking would also be allowed at trailheads at Roberts Lake Strand and Sawmill Road. The footbridge on the north side of the Tamiami Trail at Turner River would be removed.

Big Cypress Information/Interpretation--The focal point for visitor information/interpretation within the preserve would be at the Ochopee contact station. In addition, a visitor orientation wayside would be developed at the Tamiami ranger station. However, most of the interpretation within the preserve would be handled by Everglades personnel.

Shark Valley/Tamiami/Environmental Education Center--Turning lanes would be developed at Shark Valley for access from the Tamiami Trail. The existing entrance station would be removed. Tram ticket sales and information would be available at a 1,000-square-foot screened shelter constructed on stilts adjacent to the parking area. An additional 23 parking spaces would be constructed on fill to raise the total parking capacity to 100 cars and 16 buses. Existing employee housing at the Tamiami ranger station would be relocated to Shark Valley. Housing for 26 employees would be constructed on fill adjacent to the existing residences. Water would continue to be supplied from wells, and sewage disposal would be by septic system. A 1,200-square-foot building, which would include an attached, covered, one-bay vehicle maintenance area, would accommodate interpreter offices, maintenance, and a five-man fire cache.

The present Tamiami ranger station would remain, and the responsibility for patrolling the eastern half of the Stairsteps unit of the preserve would be transferred to the Tamiami ranger staff. Approximately 2,000 square feet of covered parking for ten vehicles would be built at the ranger station.

At the Everglades Environmental Education Center, a new comfort station and a 500-foot-long boardwalk/nature trail would be constructed on the north side of the Loop Road across from the center.

b. Impacts

(1) Natural/Cultural Environment

Under alternative 2, no additional effects on natural or cultural resources would result from proposed development at Oasis, Ochopee, Turner River Canal, Monument Lake, or Golightlys because these areas have already undergone considerable modification (denuded, grubbed, and filled). Vehicular parking off the Tamiami Trail at Turner River for canoeists could damage and possibly destroy the vegetation of a 1/2-acre open area of annual and perennial vegetation bordered by a tree/shrub association of red maple, redbay, sweetbay, and exotic Brazilian pepper. The parking of vehicles at Roberts Lake Strand trailhead could also damage or destroy 1/4 acre of vegetation (annual and perennial grasses) along the roadside. At Shark Valley, approximately 1½ acres of sawgrass marsh and associated wildlife habitat would be removed (grubbed and filled) to accommodate proposed development, representing a very small percentage of the estimated 340,000 acres of sawgrass marsh habitat within Everglades National Park. The effects of the proposed turning lanes off the Tamiami Trail at Shark Valley would be the same as those under alternative 1.

Impacts on air and water quality would be limited to short-term construction impacts at major development sites.

The provision of an undeveloped parking area for canoe access at Turner River would be near an important archeological site consisting of several middens, but impacts, if any, would probably be minimal. This site has been nominated to the National Register of Historic Places, but it is on the north side of U.S. 41, and the canoe access point would be on the south side of the highway. Canoe travel would be southward toward Chokoloskee Bay; travel northward on the river towards the archeological site would probably be minimal. Access to this archeological area would also be limited by removal of the footbridge on the north side of the road. More use along Turner River could result in increased vandalism or looting at a midden conspicuously located along the river south of U.S. 41. The extent of impact would depend on actual visitation levels, the effectiveness of interpretive messages, and the availability of staff for patrol.

No impacts are expected at two archeological middens adjacent to the old tram grade, which would be the route of the trail through Roberts Lake Strand. These

middens are about 5-3/4 miles from the trailhead, and use levels in the vicinity are expected to remain very low due to the difficulty of the terrain. Access into the area is restricted to foot travel only. All other development sites are at least 1 mile from the nearest known archeological sites.

(2) Socioeconomic Environment

Impacts on the socioeconomic environment would be identical with those listed under alternative 1.

(3) Visitors

Proposed recreation developments, such as designated parking and trailheads, and picnic and camping facilities, would expand and upgrade recreational opportunities at the preserve. ORV parking areas would alleviate much of the unsafe roadside congestion.

Opportunities for personal contact would be increased with contact stations near both the east (Shark Valley) and west (Ochopee) boundaries of the preserve. More orientation/information and interpretation would enhance visitors' experiences by allowing them a variety of activities and facilities. With increased awareness of recreational opportunities in the preserve, an increase could be expected in activities other than hunting and ORV use.

More information and interpretation would also have positive impacts on visitor safety and would encourage responsible and appropriate use of preserve resources and facilities. Increased exposure to interpretation of the resources, purposes, and management policies of the preserve would enhance visitor understanding and appreciation of the area.

(4) Management

Although housing maintenance costs would be financed through rental receipts, removal of all National Park Service housing would lessen overall needs for manpower and facilities. However, maintenance personnel would still be required to operate the water system in Ochopee. The removal of National Park Service housing and the unavailability of affordable housing in the private sector outside the preserve would make the recruitment of personnel, particularly seasonals, very difficult. Response time for emergency situations during off-hours would be increased--it would be at least one hour for park personnel living in Naples.

The location of aircraft operations in Everglades City would be inconvenient for routine patrol. Fueling of aircraft would have to be done in Naples or on Marco Island, since no facilities are available in Everglades City.

The location of vehicular maintenance facilities in Ochopee would make them more accessible for Everglades City personnel, but they would be so far for Shark Valley/Tamiami personnel that major vehicular maintenance would have to continue to be done 55 miles away at Pine Island in Everglades National Park. Utilizing Ochopee for the ranger activities center would increase time and facilities needed to provide adequate patrols on the east side of the preserve.

The construction of a 125-site developed campground would require approximately two additional man-years on the staff to provide adequate visitor services, including fee collection, enforcement of regulations, trash collection, and restroom cleaning.

Expanded interpretive efforts under alternative 2, which would include a manned interpretive center at Ochopee, would enable personnel to distribute information to visitors personally.

Grouped parking at ORV access points would simplify the physical and logistical difficulties of providing security and litter collection. Management of backcountry use would be improved with the designation of access points where visitors could be contacted.

3. Alternative 3

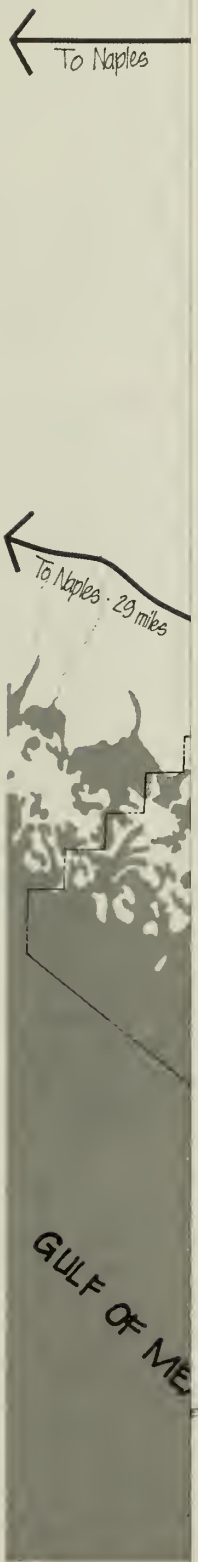
a. Description

Big Cypress Development for Operations--Under this alternative, housing for four permanent employees and six seasonals would be constructed at Oasis. Permanent employees would be those essential for fire control, maintenance, and search and rescue (i.e., chief ranger, maintenance mechanic, resource technician, and helicopter pilot).

The existing 5,500-square-foot hangar at Oasis would be modified to accommodate maintenance shops (including two bays for vehicular maintenance), ranger activities, a 25-man fire cache, and storage. The attached 5,600-square-foot cement-block building would be modified to accommodate a dormitory for six seasonals upstairs, and ranger/maintenance offices and a 1,000-square-foot contact/interpretive station downstairs. If renovation of this building was not practicable, it would be torn down and the necessary facilities would be constructed at the Oasis site--the maintenance/ranger facility would be at the north end of the site, and a 1,500-square-foot contact station would be built along the Tamiami Trail.

Under either option, approximately 1,500 square feet of covered storage at Oasis would be provided for vehicles and

general development plan alternative 3



OASIS
- RANGER / MAINTENANCE / VISITOR CONTACT

NAPLES
- EXISTING HEADQUARTERS

ORV ACCESS POINTS (developed parking)
- SAWMILL ROAD
- GOLIGHTLYS
- PINECREST
- MONUMENT LAKE

PRIMATIVE CAMPGROUNDS (25 SITES)
- BURNS LAKE
- MONUMENT LAKE
- TRAIL CENTER

ORIENTATION WAYSIDE
- TRAIL CENTER
- H.P. WILLIAMS ROADSIDE PARK

GANNET SLOUGH
- BOARDWALK TRAIL

SHARK VALLEY
- VISITOR CONTACT / HOUSING / MAINTENANCE / ADMINISTRATION

EVERGLADES ENVIRONMENTAL EDUCATION CENTER
- HOUSING / OFFICE

LEGEND

- MAJOR NPS FACILITY
- MINOR NPS FACILITY
- FOOT TRAIL
- PAVED ROAD
- GRAVEL ROAD

BIG CYPRESS NATIONAL PRESERVE florida

0 3 6 9 12 15
0 5 10 15 20
METERS

NORTH

United States Department of the Interior · National Park Service

176 | 20010
DEC | FEB 80

general development plan alternative 3

OASIS
- RANGER / MAINTENANCE / VISITOR CONTACT

NAPLES
- EXISTING HEADQUARTERS

ORV ACCESS POINTS (developed parking)
- SAWMILL ROAD
- GOLIGHTLYS
- PINECREST
- MONUMENT LAKE

PRIMATIVE CAMPGROUNDS (25 SITES)
- BURNS LAKE
- MONUMENT LAKE
- TRAIL CENTER

ORIENTATION WAYSIDE
- TRAIL CENTER
- H P WILLIAMS ROADSIDE PARK

GANNET SLOUGH
- BOARDWALK TRAIL

SHARK VALLEY
- VISITOR CONTACT / HOUSING / MAINTENANCE / ADMINISTRATION

EVERGLADES ENVIRONMENTAL EDUCATION CENTER
- HOUSING / OFFICE

LEGEND
- MAJOR NPS FACILITY
- MINOR NPS FACILITY
- FOOT TRAIL
- PAVED ROAD
- GRAVEL ROAD

BIG CYPRESS NATIONAL PRESERVE florida

MILES 0 3 6 9 12 15
KILOMETERS 0 5 10 15 20

NORTH

United States Department of the Interior · National Park Service

176 | 20010
DEC | FEB 80

equipment, and also approximately 4,500 square feet of uncovered parking for 18 other vehicles and equipment. A 240-square-foot flammable-material storage building would also be constructed at Oasis. Water for the Oasis development would be from existing wells, and sewage disposal would be by septic system; electricity would come from existing lines.

Aircraft operations would remain at Oasis, and headquarters would remain in Naples.

Big Cypress Development for Recreation--Primitive 25-site campgrounds would be developed at Burns Lake, Monument Lake, and Trail Center. Development at these campgrounds would include necessary surface improvements for access and site designation, fire pits, picnic tables, vault toilets, and trash collection points.

Parking areas would be developed for ORV access at Sawmill Road, Golightlys, Monument Lake, and Pinecrest. Site improvements at each area, including some filling at Sawmill Road and Pinecrest, would provide parking for 20 vehicles and trailers. Appropriate signing, vault toilets, and trash collection points would also be provided at each area.

Undeveloped, designated parking for canoe access would be provided at the Everglades Shores area (in Ochopee) and off the Tamiami Trail (at Turner River). The footbridge on the north side of the Tamiami Trail at Turner River would be removed. Undeveloped, designated parking would also be allowed at the trailhead into Roberts Lake Strand.

Big Cypress Information/Interpretation--In addition to the visitor contact station at Oasis, orientation waysides would be developed at Trail Center and at H.P. Williams Roadside Park.

The visitor contact station at Shark Valley would provide information about the preserve, but interpretation would be handled at the visitor contact station and waysides within the preserve. Everglades and Big Cypress interpreters would cooperate in presenting personal services programs within the preserve.

A 16-car/4-bus parking lot (requiring some site filling and a bridge across the Tamiami Canal) would be developed north of the Tamiami Trail at Gannet Slough. A 2,500-foot long boardwalk would lead from the parking lot into Gannet Slough.

Shark Valley/Tamiami/Environmental Education Center--Turning lanes would be developed at Shark Valley to facilitate access from the Tamiami Trail. The existing entrance station would be removed. Tram ticket sales and information would be available at a 1,000-square-foot screened shelter constructed

on stilts adjacent to the parking area. An additional 23 parking spaces would be constructed on fill, raising the total parking capacity to 100 cars and 16 buses. Housing at the Tamiami ranger station would be relocated to Shark Valley, where housing for 20 persons would be constructed on stilts. Water would continue to be supplied from wells, and sewage disposal would be by septic system. A 1,200-square-foot building with an attached and covered one-bay vehicle maintenance area would accommodate ranger/interpreter offices, maintenance, and a five-man fire cache. About 2,000 square feet of covered parking for ten vehicles would also be provided.

The Tamiami ranger station function would be relocated to Shark Valley, but airboat launch and fueling capabilities would remain at that location.

Development at the environmental education center would include a new comfort station, a new 750-square-foot office/storage building, and housing for six seasonals.

b. Impacts

(1) Natural/Cultural Environment

Under alternative 3, the development proposed for Oasis, Burns Lake, Monument Lake, Trail Center, and Golightlys would not result in any major new disruption of the environment, since these areas have already been subject to extensive modification (grubbing and filling). The effect of vehicular parking for canoeists off the Tamiami Trail at Turner River and for hikers at the Roberts Lake trailhead would be the same as under alternative 2. To accommodate vehicular parking for the Gannet Slough boardwalk, approximately 6,000 square feet of dwarf cypress, beak rushes, and associated wildlife habitat would be removed (grubbed and filled). A total of approximately 8,000 square feet of dwarf cypress, sawgrass, and beak rushes would be removed (grubbed and filled) for ORV parking at both Sawmill and Pinecrest. At Shark Valley, approximately 7,500 square feet of sawgrass marsh and associated wildlife habitat would be removed (grubbed and filled) to allow for proposed development. The effects of the proposed turning lanes off the Tamiami Trail at Shark Valley would be the same as those under alternative 1.

Impacts on archeological sites from the undeveloped parking areas at Roberts Lake Strand trailhead and Turner River canoe access would be the same as those under alternative 2.

An ORV access point at Pinecrest along Collier 94 would be about ½ mile from an archeological site. But the site is north of the road and in an area closed to ORV travel, so no impact from increased use due to improved access is anticipated.

A 25-site primitive campground at Trail Center would be about 1-3/4 miles from approximately 11 known archeological sites, the nearest one about 1 mile away. However, due to the difficulty of the terrain and the fact that access within the area is restricted to foot travel, minimal trespass to these sites is expected. All other development sites are at least 1½ miles from the nearest known archeological sites.

(2) Socioeconomic Environment

The impacts on the socioeconomic environment under alternative 3 would be the same as those under alternative 1.

(3) Visitors

Impacts on visitors would be the same as those under alternative 2, except that visitors electing to drive the Loop Road would have to backtrack to receive information at the Oasis contact center or at the Trail Center wayside (for west-bound visitors).

(4) Management

The expanded facilities at the centrally located Oasis would serve as the focal point for ranger and maintenance operations in alternative 3. Vehicular maintenance at Oasis would conveniently serve Everglades National Park vehicles from Shark Valley/Tamiami and also from Everglades City. Ranger patrols to all portions of the preserve would be facilitated by concentrating ranger facilities and equipment at Oasis.

Management and maintenance operations at the 25-site campgrounds would require about four man-hours daily.

The management implications of keeping the manager's office, expanded interpretive efforts, and designated ORV parking at Naples are described under alternatives 1 and 2.

4. Alternative 4

a. Description

Big Cypress Development for Operations--Under this alternative, housing for National Park Service personnel from Big Cypress National Preserve and Everglades National Park would be concentrated at Ochopee (11 existing units for 14 employees) and Monroe Station (a new quadraplex for 8 employees). Housing and maintenance at Ochopee would utilize existing structures acquired by the Park Service, and also the existing water system and septic systems. Electricity would come from existing lines.

Two buildings, besides the housing quadraplex, would be constructed in the Monroe Station area for operations:

A 5,500-square-foot building would accommodate maintenance shop space (including two vehicular maintenance bays), ranger activities, ranger/maintenance offices, storage, and a 25-man fire cache.

A separate 240-square-foot building would be built for storage of flammable materials.

The existing Monroe Station building would be renovated to be utilized as a visitor contact station.

Approximately 1,500 square feet of covered parking would be provided for vehicles and equipment, and approximately 4,500 square feet of uncovered parking for 18 other vehicles and pieces of equipment.

Because of site limitations, helicopter operations would be relocated to Monroe Station, but fixed-wing aircraft operations would be located at Oasis. A 4,500-square-foot hangar for the preserve aircraft would be constructed at the north end of the existing runway, and existing fuel tanks would be moved there.

Water at the Monroe Station development would be supplied from existing wells, and sewage disposal would be by septic system. Electricity would come from existing lines.

Headquarters would remain in Naples.

Big Cypress Development for Recreation--A 125-site developed campground with picnic tables, drinking water supplied from wells, fire pits, trash collection, and toilet facilities (septic system) would be developed at Monument Lake. A primitive 25-site campground would be developed at Midway Station. Development at this campground would include necessary surface improvements for access and site designation, fire pits, picnic tables, vault toilets, and trash collection points.

Parking would be developed for ORV access at Donna Drive (in Ochopee), Turner River Canal, Golightlys, and Monument Lake. Necessary site improvements at each area would provide parking for 20 vehicles and trailers.

Appropriate signing, vault toilets, and trash collection points would also be provided at each area.

Developed parking areas for eight cars and two buses would be provided at canoe put-in points on the Turner River and at the Everglades Shores area (in Ochopee) and at the Roberts Lake Strand trailhead. The footbridge on the north side of the Tamiami Trail at Turner River would be removed.

general development plan alternative 4

To Naples

OCHOPEE
EXISTING HOUSING

MONROE STATION
RANGER / MAINTENANCE / VISITOR CONTACT / HOUSING

OASIS
RUNWAY / HANGAR

NAPLES
EXISTING HEADQUARTERS

ORV ACCESS POINTS
(developed parking)
MONUMENT LAKE
TURNER RIVER CANAL
GOLIGHTLYS
DONNA DRIVE

CAMPGROUND
MIDWAY STATION (25 PRIMITIVE SITES)
MONUMENT LAKE (125 DEVELOPED SITES)

CANOE ACCESS
(developed parking)
TURNER RIVER
OCHOPEE

TRAILHEAD
ROBERTS LAKE STRAND

GANNET SLOUGH
BOARDWALK TRAIL

SHARK VALLEY
VISITOR CONTACT / MAINTENANCE / ADMINISTRATION

TRAIL CENTER
ORIENTATION WAYSIDE / HOUSING / MAINTENANCE

EVERGLADES ENVIRONMENTAL EDUCATION CENTER
OFFICE

To Naples - 29 miles

LEGEND

- MAJOR NPS FACILITY
- MINOR NPS FACILITY
- FOOT TRAIL
- PAVED ROAD
- GRAVEL ROAD

GULF OF ME

BIG CYPRESS NATIONAL PRESERVE florida

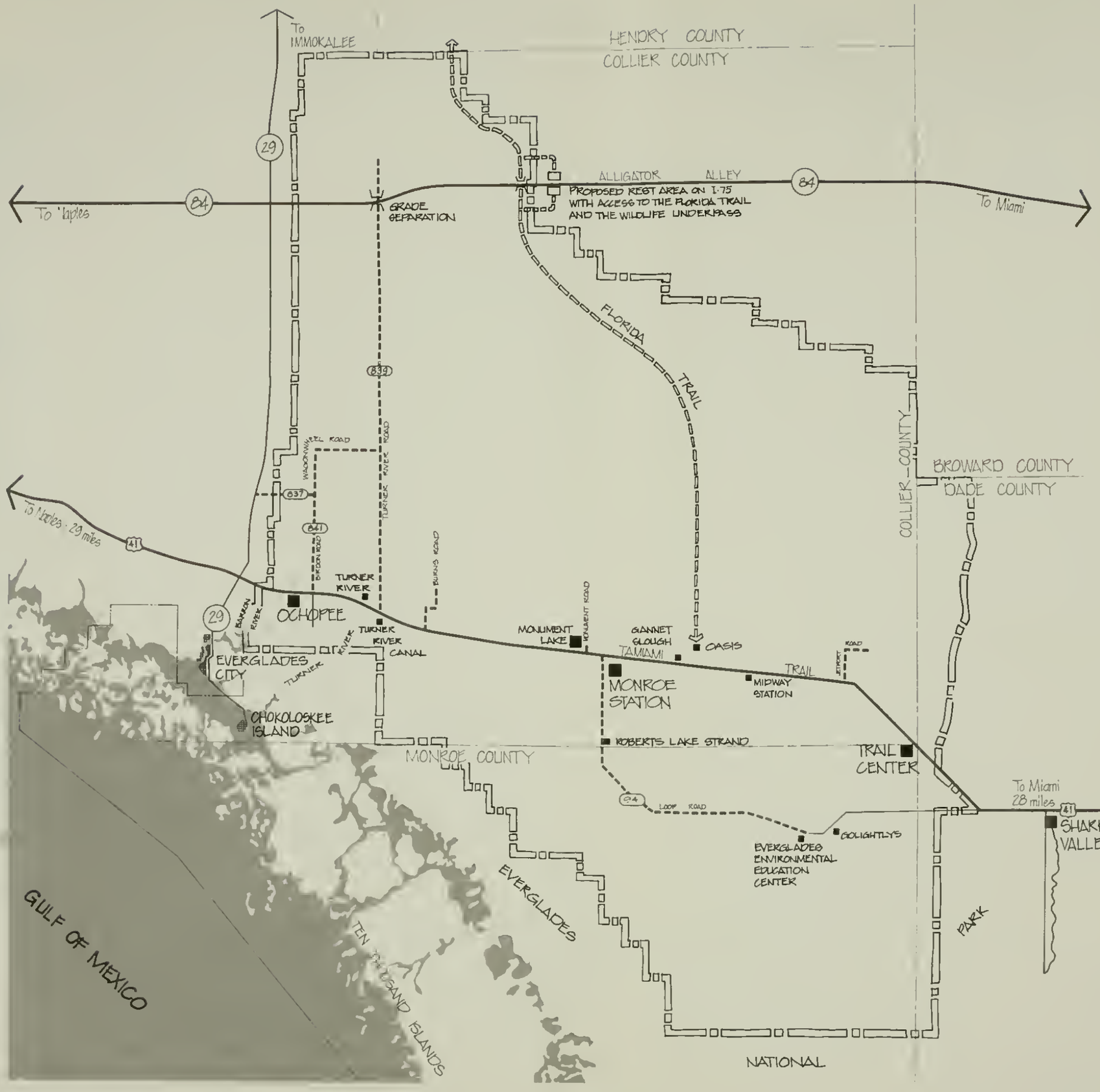
0 3 6 9 12 15
0 5 10 15 20
METERS

NORTH

United States Department of the Interior · National Park Service

176 | 20011
DEC | FEB 80

general development plan alternative 4



OCHOPEE
EXISTING HOUSING

MONROE STATION
RANGER / MAINTENANCE / VISITOR CONTACT / HOUSING

OASIS
RUNWAY / HANGAR

NAPLES
EXISTING HEADQUARTERS

ORV ACCESS POINTS
(developed parking)
MONUMENT LAKE
TURNER RIVER CANAL
GOLIGHTLYS
DONNA DRIVE

CAMPGROUND
MIDWAY STATION (25 PRIMITIVE SITES)
MONUMENT LAKE (128 DEVELOPED SITES)

CANOE ACCESS
(developed parking)
TURNER RIVER
OCHOPEE

TRAILHEAD
ROBERTS LAKE STRAND

GANNET SLOUGH
BOARDWALK TRAIL

SHARK VALLEY
VISITOR CONTACT / MAINTENANCE / ADMINISTRATION

TRAIL CENTER
ORIENTATION WAYSIDE / HOUSING / MAINTENANCE

EVERGLADES ENVIRONMENTAL EDUCATION CENTER
OFFICE

LEGEND
- MAJOR NPS FACILITY
- MINOR NPS FACILITY
- FOOT TRAIL
- PAVED ROAD
- GRAVEL ROAD

BIG CYPRESS NATIONAL PRESERVE florida

MILES 0 3 6 9 12 15
KILOMETERS 0 5 10 15 20
NORTH

United States Department of the Interior · National Park Service

176 | 20011
DEC | FEB 80

Big Cypress Information/Interpretation--In addition to the contact center at Monroe Station, an orientation wayside for the preserve would be developed at Trail Center (vault toilet and three picnic tables). A system of short-range AM transmitters would be utilized to provide visitor information along the Tamiami Trail and on the Loop Road.

A 16-car/4-bus parking lot (requiring some filling and a bridge across the Tamiami Canal) would be developed off the Tamiami Trail at Gannet Slough. A 2,500-foot-long boardwalk would lead from the parking lot into Gannet Slough.

The visitor contact station at Shark Valley would provide information about Big Cypress National Preserve, but interpretation of the preserve would be handled at the visitor contact station within the preserve. Everglades and Big Cypress interpreters would cooperate in presenting personal service programs within the preserve.

Shark Valley/Tamiami/Environmental Education Center--Turning lanes would be developed at Shark Valley to facilitate access from the Tamiami Trail. The existing entrance station would be removed. Tram ticket sales and information would be available at a 1,000-square-foot screened shelter, constructed on stilts and adjacent to the parking area. An additional 23 parking spaces would be constructed on fill to raise the total parking capacity to 100 cars and 16 buses. A 1,200-square-foot building with an attached, covered one bay vehicle maintenance area would accommodate interpreter offices and minor vehicular maintenance.

Housing for Everglades personnel from Shark Valley, Tamiami, and the environmental education center would be constructed within the preserve at Trail Center. Housing for 26 employees would be provided. The existing Tamiami ranger station would be relocated to Trail Center, where a 500-square-foot buidling for maintenance, storage, and a five-man fire cache would be developed, along with a 2,000-square-foot covered building for storage of ten vehicles. Water would continue to be supplied from existing wells, and sewage disposal would be by septic system.

At the environmental education center, a new comfort station and a new 750-square-foot office/storage building would be constructed.

b. Impacts

(1) Natural/Cultural Environment

The development proposed at Donna Drive, Turner River Canal, Oasis, Monroe Station, Ochopee, Trail Center,

Monument Lake, Midway Station, and Golightlys under alternative 4 would not result in major additional effects on natural or cultural resources, since these areas have already undergone considerable disruption (denuded, grubbed, and filled). Approximately 3,000 square feet of vegetation (annual and perennial grasses) would be removed during construction of a developed parking area for canoeists off the Tamiami Trail at Turner River; the site is an open area bordered by red maple, red bay, sweetbay, and exotic Brazilian pepper. Another 3,000 square feet of roadside vegetation (annual and perennial grasses) would be removed to accommodate parking at Roberts Lake Strand trailhead. The vehicular parking area at Gannet Slough would require removal (grubbing and filling) of approximately 6,000 square feet of dwarf cypress, sawgrass, and beak rushes and associated wildlife habitat. At Shark Valley, approximately 5,000 square feet of sawgrass marsh/wet prairie and associated wildlife habitat would be removed (grubbed and filled) to accommodate development. The effects of constructing the turning lanes off the Tamiami Trail at Shark Valley would be the same as those discussed under alternative 1.

Impacts on archeological resources from the development of parking areas at the Roberts Lake Strand trailhead and the Turner River canoe access area would be similar to those discussed under alternatives 2 and 3. The provision of developed parking might cause increased use levels. These developed parking areas would also provide for interpretive activities that could improve opportunities for interpretation of nearby archeological resources. All other development sites are at least 1½ miles from the nearest known archeological sites.

(2) Socioeconomic Environment

These impacts would be the same as those discussed under alternative 1.

(3) Visitors

Impacts on visitors would be the same as those described under alternative 2, except that visitors who drive the Loop Road could elect to stop at the Monroe Station contact center. Under this alternative, west-bound visitors could also stop at the wayside at Trail Center to receive information on whether to drive U.S. 41 or the Loop Road. If they elected to drive the Loop Road, they would have to backtrack about 4 miles. All visitors could receive necessary information by means of the AM radio transmission system for cars.

More developed parking at trailheads and canoe put-in points would encourage the use of those areas by organized groups and for guided interpretive programs.

Use of historic Monroe Station as a visitor contact station could foster visitor interest in the history of the preserve.

(4) Management

Housing all field personnel within the preserve would alleviate the management problem of recruiting personnel without having adequate housing. It would also probably shorten response time for emergencies during off-hours. Concentrating housing at Ochopee would take maximum advantage of existing, new (post-1973), and relatively energy-efficient housing, and also of the water system, which would be operated by the National Park Service.

Construction of the ranger/maintenance facility at Monroe Station would have the same logistical advantages as utilizing the centrally located Oasis site (alternative 3). The Monroe Station location would also be strategic for management of ORV use off the Loop Road. Although this site is large enough for the construction of necessary buildings, adequate fill is not available for fixed-wing aircraft facilities. Retaining fixed-wing operations at Oasis (about 5 miles away) would lead to certain in-efficiencies for routine patrol. Construction of a hangar at Oasis would probably be required to provide adequate protection for the aircraft.

Utilization of short-range AM transmitters along the Tamiami Trail would permit the National Park Service to maximize the opportunities to contact highway travelers. Use of these transmitters would require periodic maintenance.

The management implications of keeping the park manager's office at Naples, developing a 125-site campground and a 25-site primitive campground, expanding interpretive programs, and designating ORV parking are discussed under alternatives 1, 2, and 3.

C. Comparisons of Use and Development Alternatives and Their Impacts

The following tables summarize and compare the alternatives and their consequences.

SUMMARY OF ALTERNATIVE PROPOSALS

Action	Alternative 1	2	3	4
Housing	Existing--dispersed	.None for preserve personnel .Shark Valley--construct housing for 26 persons (Everglades)	.Oasis--construct housing for 4 permanents; 6 seasonals in existing dorm .Shark Valley--construct housing for 20 persons (Everglades) .EEC--construct housing for 6 persons (Everglades)	.Ochopee--house 14 Big Cypress personnel in existing structures. .Trail Center--construct housing for 26 persons (Everglades) .Monroe Station--construct quadraplex
Staffing (for preserve)	Existing--13 permanents, 5 seasonal man-years	18 permanents, 5 seasonal man-years	20 permanents, 6 seasonal man-years	15 permanents, 6 seasonal man-years
Maintenance/ Ranger/Aircraft Operation (for preserve)	Oasis--minor rehabilitation of existing building	Ochopee--construct new facility; relocate aircraft to Everglades City	Oasis--rehabilitate existing building or construct new facilities at Oasis site	Monroe Station--construct new facility; Oasis--retain fixed-wing aircraft
Manager/ Administration (for preserve)	Naples--Big Cypress manager continue administration under Everglades	Ochopee--Big Cypress manager; continue administration under Everglades	Naples--Big Cypress manager; continue administration under Everglades	Naples--Big Cypress manager; continue administration under Everglades
Camping	None	Oasis--125 developed sites	Burns Lake--25 primitive sites; Monument Lake--25 primitive sites; Trail Center--25 primitive sites	Monument Lake--125 developed sites; Midway Station--25 primitive sites
ORV Parking (20 vehicles at each area)	None	Turner River Canal, Golightlys, Monument Lake	Sawmill Road, Pinecrest, Monument Lake, Golightlys	Turner River Canal, Donna Drive, Monument Lake, Golightlys
Trailhead Parking	None	Roberts Lake Strand and Sawmill Road--undesignated/undeveloped	Roberts Lake Strand--undesignated/undeveloped	Roberts Lake Strand--costruct 8-car/2-bus parking lot
Canoe Access Parking	None	Turner River and Everglades Shores (Ochopee)--undesignated/undeveloped	Turner River and Everglades Shores (Ochopee)--undesignated/undeveloped	Turner River and Everglades Shores (Ochopee)--construct 8-car/2-bus parking lot
Interpretive Boardwalk	None	Environmental Education Center--500 feet long	Gannet Slough--2,500 feet long	Gannet Slough--2,500 feet long
Picnic Area	Existing--Kirby Storter Roadside Park, H.P. Williams Roadside Park	Oasis campground, Kirby Storter Roadside Park, H.P. Williams Roadside Park	Burns Lake campground, Monument Lake campground, Trail Center campground, H.P. Williams Roadside Park, Kirby Storter Roadside Park	Monument Lake campground, Midway Station campground, Trail Center picnic area, H.P. Williams Roadside Park, Kirby Storter Roadside Park

Action	Alternative 1	2	3	4
Information/ Orientation	Fakahatchee Strand State Preserve (west) and Shark Valley (east)--wayside exhibits	Tamiami Trail ranger station--wayside exhibit	Trail Center (east) and H.P. Williams Roadside Park (west)--wayside exhibits	.Trail Center (east)--wayside exhibit .AM transmitters
Vistor Contact Station	None	.Ochopee--construct joint headquarters/visitor contact station .Shark Valley--construct and expand parking	.Oasis--rehabilitate existing structure or construct new facilities .Shark Valley--construct and expand parking	.Monroe Station--use existing structure .Shark Valley--construct and expand parking
Tamiami Ranger Station	Continue in existing location	Continue ranger station in present location, but relocate housing to Shark Valley	Retain airboat launch, but relocate everything else to Shark Valley	Relocate to Trail Center
I-75/839 Intersection	Grade separation	Grade separation	Grade separation	Grade separation
Estimated Big Cypress Development Cost	$112,000	$1,370,000	$1,401,000	$1,792,000
Estimated Everglades Development Cost	$ 41,000	$1,246,000	$1,136,000	$1,129,000

SUMMARY OF IMPACTS

Impact on	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Vegetation	Shark Valley--disturb 1/4 acre annual/perennial vegetation	.Shark Valley--fill 1½ acres sawgrass marsh; disturb 1/4 acre annual/perennial vegetation .Turner River--disturb 1/2 acre annual/perennial vegetation .Roberts Lake Strand--disturb 1/4 acre annual/perennial vegetation	.Gannett Slough--fill 6,000 square feet sawgrass marsh/cypress .Pinecrest--fill 8,000 square feet sawgrass marsh/cypress .Shark Valley--fill 7,500 square feet sawgrass marsh; disturb 1/4 acre annual/perennial vegetation .Turner River--disturb 1/2 acre annual/perennial vegetation .Roberts Lake Strand--disturb 1/4 acre annual/perennial vegetation	.Gannet Slough--fill 6,000 square feet sawgrass marsh/cypress .Shark Valley--fill 5,000 square feet sawgrass marsh; disturb 1/4 acre annual/perennial vegetation .Turner River--remove 3,000 square feet annual/perennial vegetation .Roberts Lake Strand--remove 3,000 square feet annual/perennial vegetation
Wildlife	Wildlife associated with disturbed communities (see "Vegetation" above) would be lost	Wildlife associated with disturbed communities (see "Vegetation" above) would be lost	Wildlife associated with disturbed communities (see "Vegetation" above) would be lost	Wildlife associated with disturbed communties (see "Vegetation" above) would be lost
Surface Water Resources	Insignificant	Insignificant	Insignificant	Insignificant
Noise	Insignificant	Insignificant	Insignificant	Insignificant
Air Quality	Insignificant	Insignificant	Insignificant	Insignificant
Soils	Insignificant	Insignificant	Insignificant	Insignificant
Socioeconomic Environment	.Short-term economic benefits to local/regional construction industry .Economic benefits to tourist industry along U.S. 41 .Limited employment opportunities for private sector with NPS	.Short-term economic benefits to local/regional construction industry .Economic benefits to tourist industry along U.S. 41 .Limited employment opportunities for private sector with NPS	.Short-term economic benefits to local/regional construction industry .Economic benefits to tourist industry along U.S. 41 .Limited employment opportunities for private sector with NPS	.Short-term economic benefits to local/regional construction industry .Economic benefits to tourist industry along U.S. 41 .Limited employment opportunities for private sector with NPS

Impact on	Alternative 1	2	3	4
Cultural Resources	None	Minimal	Minimal	Minimal
Visitor Experience	.Recreational opportunities limited due to lack of information/facilities .Continued unsafe and congested roadside parking associated with ORV use	.Increased visitor safety .Increased recreational opportunities .Fewer congestion problems associated with roadside ORV parking .Increased interpretive opportunities .Increased staff response time during off-hours because of offsite housing	.Increased visitor safety .Increased recreational opportunities .Fewer congestion problems associated with roadside ORV parking .Increased interpretive opportunities .Backtracking necessary for contact station visitors wanting to drive Loop Road	.Increased visitor safety .Increased recreational opportunities .Fewer congestion problems associated with roadside ORV parking .Increased interpretive opportunities .Visitor information available through AM radio transmitters .Easier access because of developed parking at trailheads/canoe put-ins
Management for Preserve	.Resource and visitor management restricted by low staffing level .Ineffective backcountry patrol .Maintenance manpower preoccupied by upkeep of housing .Unable to operate Ochopee water system .Convenient procurement in Naples .Potential contact lost between manager and staff .Inadequate staff to handle vehicular maintenance for Shark Valley/Tamiami	.Aircraft operation in Everglades City inconvenient .Continued vehicular maintenance for Shark Valley/Tamiami in Everglades National Park .Substantial maintenance efforts for 125-site campground .Increased visitor awareness through expanded interpretation, thus facilitating management .Easier management by grouping ORV parking	.Central Oasis facility for vehicular maintenance of Shark Valley/Everglades City vehicles .Convenient procurement in Naples .Potential contact lost between manager and staff .Increased visitor awareness through expanded interpretation, thus facilitating management .Easier management by grouping ORV parking	.More efficient management and better emergency response time because of onsite housing for all personnel .Substantial maintenance efforts for 125-site campground .Vehicular maintenance of Shark Valley/Everglades City vehicles at Monroe Station .Convenient procurement in Naples .Potential contact lost between manager and staff .Increased visitor awareness through expanded interpretation, thus facilitating management .Easier management by grouping ORV parking .Inconvenience for management because aircraft operation separated from ranger/maintenance facility

VI. CONSULTATION AND COORDINATION

Copies of the Assessment will be sent to the following for review:

Federal Agencies

- Advisory Council on Historic Preservation
- Department of Agriculture
  - Soil Conservation Service
- Department of Commerce
- Department of Defense
  - Department of the Army, Corps of Engineers
- Department of the Interior
  - Bureau of Indian Affairs
  - Bureau of Land Management
  - Fish and Wildlife Service
  - Geological Survey
  - Heritage Conservation and Recreation Service
- Department of Transportation
  - Federal Highway Administration
- Environmental Protection Agency

State Agencies

- Florida Department of Natural Resources
- Florida State Clearinghouse
- Florida State Historic Preservation Officer
- Governor of Florida

Other Agencies

- Chambers of Commerce
  - Everglades City
  - Homestead
  - Naples
- Miccosukee Indian Tribal Council
- Southwest Florida Regional Planning Council

APPENDIXES

Public Law 93-440
93rd Congress, H. R. 10088
October 11, 1974

An Act

88 STAT. 1258

To establish the Big Cypress National Preserve in the State of Florida, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) in order to assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof, the Big Cypress National Preserve is hereby established. Big Cypress National Preserve, Fla. Establishment. 16 USC 698f.

(b) The Big Cypress National Preserve (hereafter referred to as the "preserve") shall comprise the area generally depicted on the map entitled "Big Cypress National Preserve", dated November 1971 and numbered BC-91,001, which shall be on file and available for public inspection in the Offices of the National Park Service, Department of the Interior, Washington, District of Columbia, and shall be filed with appropriate offices of Collier, Monroe, and Dade Counties in the State of Florida. The Secretary of the Interior (hereafter referred to as the "Secretary") shall, as soon as practicable, publish a detailed description of the boundaries of the preserve in the Federal Register which shall include not more than five hundred and seventy thousand acres of land and water. Map and description, filing. Publication in Federal Register.

(c) The Secretary is authorized to acquire by donation, purchase with donated or appropriated funds, transfer from any other Federal agency, or exchange, any lands, waters, or interests therein which are located within the boundaries of the preserve: *Provided*, That any lands owned or acquired by the State of Florida, or any of its subdivisions, may be acquired by donation only: *Provided further*, That no Federal funds shall be appropriated until the Governor of Florida executes an agreement on behalf of the State which (i) provides for the transfer to the United States of all lands within the preserve previously owned or acquired by the State and (ii) provides for the donation to the United States of all lands acquired by the State within the preserve pursuant to the provision of "the Big Cypress Conservation Act of 1973" (Chapter 73-131 of the Florida Statutes) or provides for the donation to the United States of any remaining moneys appropriated pursuant to such Act for the purchase of lands within the preserve. No improved property, as defined by this Act, nor oil and gas rights, shall be acquired without the consent of the owner unless the Secretary, in his judgment, determines that such property is subject to, or threatened with, uses which are, or would be, detrimental to the purposes of the preserve. The Secretary may, if he determines that the acquisition of any other subsurface estate is not needed for the purposes of the preserve, exclude such interest in acquiring any lands within the preserve. Notwithstanding the provisions of section 301 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (84 Stat. 1894, 1904) the Secretary (i) may evaluate any offer to sell land within the preserve by any landowner and may, in his discretion, accept any offer not in excess of $10,000 without an appraisal and (ii) may direct an appraisal to be made of any unimproved property within the preserve without notice to the owner or owners thereof. Notwithstanding any other provision of law, any federally owned lands within the preserve shall, with the concurrence of the head of the administering agency, be transferred to the administrative jurisdiction of the Secretary for the purposes of this Act, without transfer of funds. Lands, waters, acquisition. 42 USC 4651.

16 USC 698g.

SEC. 2. (a) In recognition of the efforts of the State of Florida in the preservation of the area, through the enactment of chapter 73–131 of the Florida statutes, "The Big Cypress Conservation Act of 1973", the Secretary is directed to proceed as expeditiously as possible to acquire the lands and interests in lands necessary to achieve the purposes of this Act.

Land acquisition plan, committal to congressional committees.

(b) Within one year after the date of the enactment of this Act, the Secretary shall submit, in writing, to the Committee on Interior and Insular Affairs and to the Committees on Appropriations of the United States Congress a detailed plan which shall indicate:

(i) the lands and areas which he deems essential to the protection and public enjoyment of this preserve,

(ii) the lands which he has previously acquired by purchase, donation, exchange or transfer for administration for the purpose of this preserve, and

(iii) the annual acquisition program (including the level of funding) which he recommends for the ensuing five fiscal years.

Completion date.

(c) It is the express intent of the Congress that the Secretary should substantially complete the land acquisition program contemplated by this Act within six years after the date of its enactment.

Property owners, retention rights. 16 USC 698h.

SEC. 3. (a) The owner of an improved property on the date of its acquisition by the Secretary may, as a condition of such acquisition, retain for himself and his heirs and assigns a right of use and occupancy of the improved property for a definite term of not more than twenty-five years or, in lieu thereof, for a term ending at the death of the owner or the death of his spouse, whichever is later. The owner shall elect the term to be reserved. Unless this property is wholly or partially donated to the United States, the Secretary shall pay the owner the fair market value of the property on the date of acquisition less the fair market value, on that date, of the right retained by the owner. A right retained pursuant to this section shall be subject to termination by the Secretary upon his determination that it is being exercised in a manner inconsistent with the purposes of this Act, which shall include the exercise of such right in violation of any applicable State or local laws and ordinances, and it shall terminate by operation of law upon the Secretary's notifying the holder of the right of such determination and tendering to him an amount equal to the fair market value of that portion of the right which remains unexpired.

"Improved property."

(b) As used in this Act, the term "improved property" means:

(i) a detached, one family dwelling, construction of which was begun before November 23, 1971, which is used for noncommercial residential purposes, together with not to exceed three acres of land on which the dwelling is situated and such additional lands as the Secretary deems reasonably necessary for access thereto, such land being in the same ownership as the dwelling, and together with any structures accessory to the dwelling which are situated on such lands and

(ii) any other building, construction of which was begun before November 23, 1971, which was constructed and is used in accordance with all applicable State and local laws and ordinances, together with as much of the land on which the building is situated, such land being in the same ownership as the building, as the Secretary shall designate to be reasonably necessary for the continued enjoyment and use of the building in the same manner and to the same extent as existed in November 23, 1971, together with any structures accessory to the building which are situated on the lands so designated. In making such designation

the Secretary shall take into account the manner of use in which the building, accessory structures, and lands were customarily enjoyed prior to November 23, 1971.

(c) Whenever an owner of property elects to retain a right of use and occupancy as provided in this section, such owner shall be deemed to have waived any benefits or rights accruing under sections 203, 204, 205, and 206 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (84 Stat. 1894), and for the purposes of such sections such owner shall not be considered a displaced person as defined in section 101(6) of such Act. Waiver. 42 USC 4623-4626. 42 USC 4601.

SEC. 4. (a) The area within the boundaries depicted on the map referred to in section 1 shall be known as the Big Cypress National Preserve. Such lands shall be administered by the Secretary as a unit of the National Park System in a manner which will assure their natural and ecological integrity in perpetuity in accordance with the provisions of this Act and with the provisions of the Act of August 25, 1916 (39 Stat. 535; 16 U.S.C. 1-4), as amended and supplemented. Administration. 16 USC 698i.

(b) In administering the preserve, the Secretary shall develop and publish in the Federal Register such rules and regulations as he deems necessary and appropriate to limit or control the use of Federal lands and waters with respect to: Rules and regulations; publication in Federal Register.

(1) motorized vehicles,

(2) exploration for and extraction of oil, gas, and other minerals,

(3) grazing,

(4) draining or constructing of works or structures which alter the natural water courses,

(5) agriculture,

(6) hunting, fishing, and trapping,

(7) new construction of any kind, and

(8) such other uses as the Secretary determines must be limited or controlled in order to carry out the purposes of this Act: *Provided*, That the Secretary shall consult and cooperate with the Secretary of Transportation to assure that necessary transportation facilities shall be located within existing or reasonably expanded rights-of-way and constructed within the reserve in a manner consistent with the purposes of this Act. Transportation facilities.

SEC. 5. The Secretary shall permit hunting, fishing, and trapping on lands and waters under his jurisdiction within the preserve in accordance with the applicable laws of the United States and the State of Florida, except that he may designate zones where and periods when no hunting, fishing, trapping, or entry may be permitted for reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment. Except in emergencies, any regulations prescribing such restrictions relating to hunting, fishing, or trapping shall be put into effect only after consultation with the appropriate State agency having jurisdiction over hunting, fishing, and trapping activities. Notwithstanding this section or any other provision of this Act, members of the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida shall be permitted, subject to reasonable regulations established by the Secretary, to continue their usual and customary use and occupancy of Federal or federally acquired lands and waters within the preserve, including hunting, fishing, and trapping on a subsistence basis and traditional tribal ceremonials. Hunting and fishing. 16 USC 698j. Miccosukee and Seminole Indian Tribes, land use, retention rights.

SEC. 6. Notwithstanding any other provision of law, before entering into any contract for the provision of revenue producing visitor services, Visitor services, contracts. 16 USC 698k.

(i) the Secretary shall offer those members of the Miccosukee and Seminole Indian Tribes who, on January 1, 1972, were engaged in the provision of similar services, a right of first refusal to continue providing such services within the preserve subject to such terms and conditions as he may deem appropriate, and

(ii) before entering into any contract or agreement to provide new revenue-producing visitor services within the preserve, the Secretary shall offer to the Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida the right of first refusal to provide such services, the right to be open for a period of ninety days. Should both Tribes respond with proposals that satisfy the terms and conditions established by the Secretary, the Secretary may allow the Tribes an additional period of ninety days in which to enter into an inter-Tribal cooperative agreement to provide such visitor services, but if neither tribe responds with proposals that satisfy the terms and conditions established by the Secretary, then the Secretary shall provide such visitor services in accordance with the Act of October 9, 1965 (79 Stat. 969, 16 U.S.C. 20). No such agreement may be assigned or otherwise transferred without the consent of the Secretary.

Preserve review, report to President. 16 USC 698l.

SEC. 7. Within five years from the date of the enactment of this Act, the Secretary shall review the area within the preserve and shall report to the President, in accordance with section 3 (c) and (d) of the Wilderness Act (78 Stat. 891; 16 U.S.C. 1132 (c) and (d)), his recommendations as to the suitability or nonsuitability of any area within the preserve for preservation as wilderness, and any designation of any such areas as a wilderness shall be accomplished in accordance with said subsections of the Wilderness Act.

16 USC 1131 note.

Appropriation. 16 USC 698m.

SEC. 8. There are authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act, but not to exceed $116,000,000 for the acquisition of lands and interests in lands and not to exceed $900,000 for development. Any funds donated to the United States by the State of Florida pursuant to chapter 73-131 of the Florida statutes shall be used solely for the acquisition of lands and interests in land within the preserve.

Funds donated to U.S. by State of Florida, use.

Approved October 11, 1974.

B: MANAGEMENT OBJECTIVES--BIG CYPRESS NATIONAL PRESERVE (Revised December 1978)

Secure an accurate basic resource data base, and develop management plans and programs that stress the quality and quantity of water resources and the reduction and elimination of adverse impacts from visitor use.

Obtain sufficient staff, facilities, equipment, and funds so that the natural resources and physical facilities can be adequately managed and protected and so that visitor services and protection are available year-round.

Ensure that all facilities and uses lawfully retained and permitted to private individuals and concerns within the preserve have as little adverse effect upon water flow and quality and the other natural resources as possible.

Maintain good public relations with permanent residents within the preserve and foster public appreciation and understanding of the significance of the Big Cypress watershed and its plant and animal communities within the south Florida ecosystem.

Improve resource protection, park management efficiency, and public safety through the securing of concurrent jurisdiction with the state of Florida over all preserve lands.

Survey and dispose of all unneeded improved properties acquired by the land acquisition office, and restore all impacted sites to as natural a condition as possible.

Control exotic plant and animal species when necessary to prevent disruption of native floral and faunal communities.

Manage oil and gas exploration, extraction, transportation, and reclamation programs in a manner that will minimize damage and promote recovery of areas affected by this activity.

Manage the preserve as an undeveloped natural area except in the vicinity of major road corridors where minimal but adequate facilities may be established for management needs and for the health and safety of preserve visitors.

Encourage the Miccosukee and Seminole Indians to provide new visitor services were required and urge them to identify, exercise, and protect their customary rights and uses of the preserve in such a way that enhances and ensures the perpetuation of their traditional tribal culture and the ecological well-being of the preserve.

Permit access to backcountry areas for hunting, camping, hiking, and other recreational activities through use of existing trails where possible and practicable, and manage the use of suitable off-road vehicles to those areas and time periods as will ensure minimal adverse effects on preserve resources.

Identify, evaluate, protect, and preserve cultural resources consistent with all policies and legislative and executive mandates; and interpret and interrelate these cultural values with those outstanding natural values found in the preserve.

Utilize fire as a management tool, ensuring that the influence of fire on the Big Cypress ecosystem maintains and perpetuates the dynamics of this system.

C: SUMMARY OF ALTERNATIVE COSTS AND STAFFING

ALTERNATIVE I

Development Class "C" Cost Estimates

Big Cypress

Rehabilitate maintenance area--5,500 sq. ft.	$110,000
Wayside signing--1	2,000
TOTAL	$112,000

Everglades

Improve intersection (turn lanes)--600 ft.	$ 40,000
Remove structure--50 sq. ft.	1,000
TOTAL	$ 41,000

Annual Big Cypress Operations and Maintenance Cost $360,000

Staffing - Big Cypress

Preserve manager	GS-12
Secretary	GS-4/5
Administrative technician	GS-7
Resource management specialist	GS-9/11
Chief ranger	GS-11
Park ranger	GS-5/6
Park technician (3 man-years)	GS-4/5
Maintenance supervisor	WG-9
Laborer (2 man-years)	WG-3
Helicopter pilot	GS-11
Seasonals (5 man-years)	GS-4/5
Mechanic	WG-8
Maintenance worker	WG-7

ALTERNATIVE 2

Development Class "C" Cost Estimates

Big Cypress	
Maintenance/ranger building--5,400 sq. ft.	$ 324,000
Vehicular storage--1,500 sq. ft.	15,000
Visitor contact/offices--2,000 sq. ft.	200,000
Parking lot--50 cars	55,000
Storage building (flammable materials)--240 sq. ft.	16,000
Septic system	50,000
Wayside pulloff--1	20,000
Developed campground--125 sites	450,000
Septic system	200,000
Vault-toilet facilities--3	30,000
Landscaping	10,000
TOTAL	$1,370,000
Everglades	
Environmental Education Center	
Toilet facility--1	10,000
Boardwalk--500 ft.	75,000
Shark Valley/Tamiami	
Improve intersection (turn lanes)--600 ft.	40,000
Remove structure--50 sq. ft.	1,000
Relocate trailers--2	10,000
Visitor contact (on stilts)--1,000 sq. ft.	50,000
Maintenance/offices--1,200 sq. ft.	100,000
Covered parking--2,000 sq. ft.	20,000
Housing: eight 2-bedroom units	240,000
four 1-bedroom units	120,000
two 6-person dorms	200,000
Toilet facilities--1	25,000
Landscaping	20,000
Septic system	150,000
Utilities	80,000
Landfill--8,000 cubic yards	80,000
Parking--23 spaces	25,000
TOTAL	$1,246,000

Annual Big Cypress Operations and Maintenance Cost		$ 400,000

Staffing - Big Cypress

Preserve manager	GS-12
Secretary	GS-4/5
Administrative technician	GS-7
Chief ranger	GS-11
Park ranger (2 man-years)	GS-9
Park technician (3 man-years)	GS-5/6
Resource management specialist	GS-9/11
Interpretive technician	GS-6/7
Helicopter pilot	GS-11
Maintenance supervisor	WG-8
Maintenance mechanic	WG-9
Maintenance worker (2 man-years)	WG-7
Water treatment operator	WG-9
Seasonals (5 man-years)	GS-4/5
Mechanic	WG-9

ALTERNATIVE 3

Development Class "C" Cost Estimates

Big Cypress	
Rehabilitate existing maintenance building--5,500 sq. ft., or construct new facility of similar size	$ 400,000
Visitor contact station--1,500 sq. ft.	150,000
Covered vehicular parking--1,500 sq. ft.	15,000
Storage building (flammable materials)--240 sq. ft.	16,000
Landscaping	10,000
Housing--four 2-bedroom units	120,000
Septic system	75,000
Wayside pulloff--1	15,000
Primitive campgrounds--three 25-site areas	75,000
Parking/landfill--16-auto/4-bus area	15,000
Bridge--20 ft.	45,000
Boardwalk--2,500 sq. ft.	450,000
ORV Parking/landfill	30,000
Vault-toilet facilities--5	50,000
TOTAL	$1,401,000
Everglades	
Environmental Education Center	
Toilet facility--1	$ 10,000
Office space--750 sq. ft.	30,000
Housing--one 6-unit dorm	100,000
Septic system	40,000

Shark Valley/Tamiami	
Relocate trailers--3	$ 15,000
Visitor contact (on stilts)--1,000 sq. ft.	50,000
Housing (on stilts): eight 2-bedroom units	240,000
four 1-bedroom units	120,000
one 6-person dorm	100,000
Septic system	110,000
Maintenance/offices--1,200 sq. ft.	100,000
Covered parking--2,000 sq. ft.	20,000
Toilet facility--1	25,000
Landscaping	20,000
Utilities	80,000
Landfill--1,000 cubic yards	10,000
Parking--23 spaces	25,000
Improve intersection (turn lanes)--600 ft.	40,000
Remove structure--50 sq. ft.	1,000
TOTAL	$1,136,000

Annual Big Cypress Operations and Maintenance Cost $ 400,000

Staffing--Big Cypress

Preserve manager	GS-12
Secretary	GS-4/5
Administrative technician	GS-7
Chief ranger	GS-11
Park ranger (2 man-years)	GS-9
Park technician (6 man-years)	GS-5/6
Resource management specialist	GS-9/11
Maintenance supervisor	WG-8
Maintenance mechanic	WG-9
Maintenance worker (2 man-years)	WG-7
Mechanic	WG-9
Helicopter pilot	GS-11
Seasonals (6 man-years)	GS-4/5
Water treatment operator	WG-9

ALTERNATIVE 4

Development Class "C" Cost Estimates

Big Cypress	
Maintenance/ranger building--5,500 sq. ft.	$ 324,000
Rehabilitate Monroe Station	150,000
Housing--four 2-bedroom units	120,000
Landscaping	10,000
Storage building (flammable materials)--240 sq. ft.	16,000
Hangar--1,200 sq. ft.	27,000

Covered vehicular parking--1,500 sq. ft.		15,000
Wayside pulloff--1		15,000
Developed campground--125 sites		450,000
Septic system		200,000
Primitive campground--25 sites		25,000
Boardwalk--2,500 ft.		325,000
Bridge--20 ft.		45,000
Parking/landfill--16-auto/4-bus area		15,000
Parking--8-auto/2-bus		5,000
Vault-toilet facilities--5		50,000
TOTAL		$1,792,000

Everglades		
Environmental Education Center		
Office/storage--750 sq. ft.		$ 30,000
Alternative energy system (solar or wind)		40,000
Toilet facility--1		10,000
Shark Valley/Tamiami		
Housing		
Trail Center:	eight 2-bedroom units	240,000
	four 1-bedroom units	120,000
	two 6-person dorms	200,000
Septic system		150,000
Housing maintenance--500 sq. ft.		13,000
Covered vehicular parking--2,000 sq. ft.		20,000
Maintenance/offices--1,200 sq. ft.		100,000
Relocate trailers--3		15,000
Visitor contact (on stilts)--1,000 sq. ft.		50,000
Remove structure--50 sq. ft.		1,000
Improve intersection (turn lanes)--600 ft.		40,000
Toilet facilities--1		25,000
Landscaping		20,000
Utilities		30,000
Parking--23 sites		25,000
TOTAL		$1,129,000

Annual Big Cypress Operations and Maintenance Cost $ 435,000

Staffing--Big Cypress

Preserve manager	GS-12
Secretary	GS-4/5
Administrative technician	GS-7
Resource management specialist	GS-9/11
Chief ranger	GS-11
Park ranger (2 man-years)	GS-9
Park technician (3 man-years)	GS-5/6
Resource management specialist	GS-6/7
Maintenance supervisor	WG-8
Maintenance mechanic	WG-9
Maintenance worker (2 man-years)	WG-7
Water treatment operator	WG-9
Mechanic	WG-9
Helicopter pilot	GS-11
Seasonals (6 man-years)	GS-4/5

D: COST-EFFECTIVENESS OF THE ALTERNATIVES

Several recent National Park Service directives and guidelines have required a cost-effectiveness analysis: NPS-2 (appendix B), Special Directive 76-17, and Executive Circular A-94. This analysis evaluates the effectiveness of each alternative in meeting the planning objectives related to the projected development cost.

To complete the analysis, it was first necessary to establish and rank the planning objectives of this assessment. The planning team and preserve manager agreed that the objectives of this planning effort were based on the enabling legislation for the preserve (appendix A), the management objectives contained in the the Statement for Management (appendix B), and general National Park Service policies. Based on these guidelines, 15 planning objectives were developed (table D-1). The planning objectives were then divided into three categories: natural resources, management and development, and visitor use.

As stated in the "Introduction," the purpose of this Environmental Assessment is to analyze various strategies for providing development that is necessary for resource protection and visitor use. Consequently, the categories of management and development objectives and of visitor use objectives were considered the most important and were assigned relative weights of 45 and 35 percent, respectively. Natural resource values were ranked comparatively low (20 percent) because the team felt the potential impacts on natural resources under any alternative were relatively minor. The planning objectives within each category were then assigned relative weights within their respective category and the relative importance of each planning objective in the assessment was determined (table D-1).

The planning team agreed on a ranking to rate how well each alternative would fulfill each of the 15 planning objectives. The ranking varied from one to four, with higher values being assigned to actions that were thought to better meet the stated objectives (for example, if two alternatives had minimal impacts on wetlands, they could both be ranked as fours). These rankings were next multiplied by their relative importance to get a weighted ranking. The weighted ranking for each objective was then summed for each alternative to produce the total weighted factor (table D-2).

Since the units of measure are meaningless without some reference, alternative 1 (no action) was established as the reference alternative. Dividing the total weighted factor for each alternative by the total weighted factor for alternative 1 (no action) gave the effectiveness of each alternative in meeting the planning objectives, relative to alternative 1. For example, alternative 2 is 51 percent more effective in meeting the planning objectives than alternative 1 (table D-2). This is the reference factor.

Development and operation/maintenance costs were then incorporated into the analysis to determine how well each alternative met the planning objectives relative to cost (cost-effectiveness). The fixed development costs were averaged over 10 and 15 years (the expected life of the plan) to get annual average costs. The annual operations and maintenance costs are shown in appendix C. Alternative 1 was again used as the base for establishing reference costs (table D-3).

The reference factor for each alternative was then divided by the corresponding reference cost (table D-4) to get the cost-effectiveness ratio for each alternative. Given a project life of 10 years, alternative 2 is the most cost-effective.

This methodology enables the decision maker to look at the trade-offs between alternatives in a quantitative summarized format. However, several shortcomings of this system limit its usefulness. The cost-effectiveness ratio is only useful in a comparison with other ratios. With a cost benefit analysis, a ratio greater than one indicates that a project is cost-effective. The cost-effectiveness analysis only indicates which of a number of options is most cost-effective. However, none or all of the options may actually be cost-effective. Thus, this procedure cannot be used to determine whether a project should be undertaken, only which alternative is most cost-effective. Another drawback of this analysis is that it evaluates the cost-effectiveness of whole alternatives and not the individual elements within each alternative. If a new alternative is created, the cost effectiveness analysis must be repeated. Also, this method does not analyze the nonplanning aspects of the decision, such as public opinion, availability of development funding, and political concerns. The cost-effectiveness analysis is not designed to replace the decision maker, but rather as one of many elements for the decision maker to consider in formulating a decision.

Table D-1: Relative Importance of Planning Objectives

	Relative Weight of Major Categories in Assessment (a)	Relative Weight of Objectives Within Major Categories (b)	Relative Importance of Planning Objectives in Assessment (a x b)
Natural Resource Objectives	20%		
1. Avoid impacting wetlands		50%	10%
2. Avoid impacting wildlife		10%	2%
3. Avoid disturbing native flora		10%	2%
4. Avoid impacting scenic values		30%	6%
Management and Development Objectives	45%		
5. Provide adequate staffing and development for visitor safety		15%	7%
6. Provide adequate staffing for resource protection		25%	11%
7. Provide minimum facilities necessary to carry out management objectives, legislation, and NPS policies		25%	11%
8. Maximize integration with Everglades of administration, maintenance, interpretation, and ranger activities		15%	7%
9. Strategically locate facilities to minimize response time and energy consumption		15%	7%
10. Provide adequate, energy-efficient housing		5%	2%
Visitor Use Objectives	35%		
11. Provide for orientation of preserve use		35%	12%
12. Provide for interpretation of preserve resources		10%	4%
13. Avoid duplication of Everglades interpretive facilities and services		15%	5%
14. Provide for recreational activities in short supply regionally		25%	9%
15. Provide for a variety of compatible recreational activities		15%	5%
			100%

Table D-2: Reference Factors: How Well Alternatives Meet Planning Objectives

		Alt. 1		Alt. 2		Alt. 3		Alt. 4	
		Rank	Weighted Ranking	Rank	Weighted Ranking	Rank	Weighted Ranking	Rank	Weighted Ranking
Natural Resource Values	Relative Importance (from table D-1)								
1. Wetlands	10%	3	.30	4	.40	1	.10	2	.20
2. Wildlife	2%	4	.08	2	.04	1	.02	1	.02
3. Native Flora	2%	4	.08	2	.04	1	.02	1	.02
4. Scenic Values	6%	1	.06	3	.18	2	.12	2	.12
Subtotal			.52		.66		.26		.36
Management and Development Values									
5. Visitor Safety	7%	1	.07	3	.21	3	.21	4	.28
6. Resource Protection	11%	1	.11	3	.33	3	.33	4	.44
7. Minimum Facilities	11%	2	.22	3	.33	2	.22	1	.11
8. Maximize Integration	7%	3	.21	3	.21	3	.21	4	.28
9. Facilities Location	7%	3	.21	2	.14	3	.21	4	.28
10. Housing	2%	2	.04	1	.02	3	.06	4	.08
Subtotal			.86		1.24		1.24		1.47
Visitor Use									
11. Orientation	12%	1	.12	3	.36	3	.36	4	.48
12. Interpretation	4%	1	.04	2	.08	3	.12	4	.16
13. Interpretive Duplication	5%	3	.15	3	.15	2	.10	1	.05
14. Activities in Short Supply	9%	1	.09	2	.18	3	.27	3	.27
15. Variety of Activities	5%	1	.05	2	.10	2	.10	3	.15
Subtotal			.45		.87		.95		1.11
Total Weighted Factor			1.83		2.77		2.45		2.94
Reference Factor			1.00		1.51		1.34		1.60

Table D-3: Reference Costs

	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Development Cost				
Annual Average (10 Years)	$ 11,200	$137,000	$140,100	$179,200
Annual Average (15 Years)	7,467	91,333	93,400	119,500
Annual Operations and Maintenance Cost				
Annual Average	360,000	400,000	400,000	435,000
Total Cost				
Annual Average (10 Years)	$371,200	$537,000	$540,100	$614,200
Annual Average (15 Years)	$367,467	$491,333	$493,400	$554,500
Reference Cost (10 Years)	1.00	1.45	1.46	1.65
Reference Cost (15 Years)	1.00	1.34	1.34	1.51

Table D-4: Cost-Effectiveness

Cost-Effectiveness (10 Years)	
Alternative 1	1.00/1.00 = 1.00
Alternative 2	1.51/1.45 = 1.04
Alternative 3	1.34/1.46 = .92
Alternative 4	1.60/1.65 = .97
Cost-Effectiveness (15 Years)	
Alternative 1	1.00/1.00 = 1.00
Alternative 2	1.51/1.34 = 1.13
Alternative 3	1.34/1.34 = 1.00
Alternative 4	1.60/1.51 = 1.06

REFERENCES

ALEXANDER, T.R., and HOFSTETTER, R.H.
1975 "Some Current Ecological Aspects of Melaleuca quinquenervia (Cav.) Blake in Southern Florida." Paper presented at the 39th meeting of the Florida Academy of Sciences, Lakeland, Fla.

ARMBRUSTER, J.T.
1972 Land Use in the Big Cypress Area, Southern Florida. Florida Bureau of Geology Map Series 50.

ASHTON, R.E., JR.
1978 Identification Manual to the Amphibians and Reptiles of Florida. Interpretation Series I. Gainesville: Florida State Museum Association.

AUSTIN, D.F.
1978 "Exotic Plants and Their Effects in Southeastern Florida." Environmental Conservation, 5:25-34.

AYENSU, E.S., and DEFILIPPS, R.A.
1978 Endangered and Threatened Plants of the United States. Washington: Smithsonian Institution and the World Wildlife Fund, Inc.

BLACK, CROW AND EIDSNESS, INC.
1970 "Future Water Supply Studies for the City of Naples, Florida." Florida Engineering Report 305-69-51. Gainesville.

DEUVER, MICHAEL J., and SPANGLER, DANIEL P.
1979 "Resource Inventory and Analysis of the Big Cypress National Preserve." Report for National Park Service. Gainesville: Center for Wetlands, University of Florida and Ecosystem Research Unit, National Audubon Society.

FLORIDA COMMITTEE ON RARE AND ENDANGERED PLANTS AND ANIMALS
1976 Rare and Endangered Plants and Animals of Florida. Maitland, Fla.

FLORIDA DEPARTMENT OF NATURAL RESOURCES
1976 Outdoor Recreation in Florida: A Comprehensive Program for Meeting Florida's Outdoor Recreation Needs. Tallahassee.

FLORIDA DEPARTMENT OF TRANSPORTATION
1976 "Design Approval Report, Interstate Route 75." Tallahassee.

FLORIDA DIVISION OF PLANNING
1975 The Florida General Soils Atlas With Interpretation for Regional Planning, Districts IX and X, by E. Van Atta. Tallahassee.

GEORGE, JEAN CRAIGHEAD
1972 Everglades Wildguide. Natural History Series, National Park Service. Washington: Government Printing Office.

GLEASON, P.J., ed.
1974 Environments of South Florida: Present and Past. Miami Geological Society Memoir 2. Miami.

LUGO, A.E.; SNEDAKER, S.C.; BAYLEY, S.; ODUM, H.T.
1971 Models for Planning and Research for the South Florida Environmental Study. Gainesville: Center for Aquatic Sciences, University of Florida.

MASCH, FRANK D., AND ASSOCIATES
1971 Influence of Well Fields and Connecting Roadways on Hydrologic and Hydraulic Features of Big Cypress Swamp, Florida. New Orleans: Humble Oil and Refining Co.

MYERS, R.L.
1975 "The Relationship of Site Conditions to the Invading Capability of Melaleuca quinquenervia in Southwest Florida." Master's thesis, University of Florida, Gainesville.

ODUM, H.T., and BROWN, M.T., eds.
1975 "Carrying Capacity for Man and Nature in South Florida." Report to National Park Service and Florida State Division of Planning. Gainesville: Center for Wetlands, University of Florida.

ODUM, H.T.; EWEL, W.J.; MITSCH, W.J.; and ORDWAY, J.W.
1975 "Recycling Treated Sewage Through Cypress Wetlands in Florida." Occasional Publication No. 1. Gainesville: Center for Wetlands, University of Florida.

SCHEMNITA, S.D., and SCHORTEMEYER, J.L.
1973 "The Impact of Half Tracks and Airboats on the Florida Everglades Environment." Proceedings of 1973 Snowmobile and Off-the-Road-Vehicle Research Symposium, pp. 86-117. Lansing: Michigan State University.

SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL
1977 The Southwest Florida Economy: A Survey of the Region. Regional Comprehensive Plan Series. Fort Myers, Fla.

1978 Land Use Policy Plan. Regional Comprehensive Plan Series. Fort Myers, Fla.

TABB, D.C.; HEALD, E.J.; ALEXANDER, T.R.; ROESSLER, M.A.; and BEARDSLEY, G.L.
1976 An Ecological and Hydrological Assessment of the Golden Gate Estates Drainage Basin, With Recommendations for Future Land Use and Water Management Strategies. Miami: Tropical Bioindustries Development Co.

U.S. CONGRESS, HOUSE
1975 Report on Endangered and Threatened Plant Species of the United States, by Smithsonian Institution Secretary. H. Doc. 94-51, Serial 94-A, 94th Cong., 1st sess.

U.S. CONGRESS, HOUSE, COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
1972 Big Cypress Preserve, Florida, Hearings Before the Subcommittee on National Parks and Recreation. 92d Cong., 2d sess.

U.S. CONGRESS, SENATE, COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
1974 Big Cypress National Preserve, (Part 2) Hearing on S. 334, S. 783, S. 920, H.R. 10008 Before the Subcommittee on Parks and Recreation. 93d Cong., 2d sess.

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE
1962 General Soil Map of Florida, by J.R. Beckenbach. Gainesville: Florida Agricultural Experiment Station.

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF OUTDOOR RECREATION
1973 An Analysis of Outdoor Recreation Resources, Impacts, and Potentials in South Florida. Report PB-231-760. Washington.

U.S. DEPARTMENT OF THE INTERIOR, FEDERAL WATER QUALITY ADMINISTRATION
1970 A Synoptic Survey of Limnological Characteristics of the Big Cypress Swamp, Florida, by John A. Little, Robert F. Schneider, and Bobby J. Corro. Washington.

U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

1979 "Endangered and Threatened Wildlife." Federal Register, vol. 44, no. 12, pt. II.

U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY

1973 Environmental Monitoring of Training and Transition Airport, South Florida, by H.J. Freiberger and B.F. McPherson. Water Resource Program report. Reston, Va.

1973 "Vegetation in Relation to Water Depth in Conservation Area 3, Florida," by Benjamin F. McPherson. Open file report 73-025. Tallahassee.

1973 Vegetation Map of Southern Parts of Subareas A and C, Big Cypress Swamp, Florida, by B.J. McPherson. Atlas HA-402. Tallahassee.

1974 "Quality of Surface Water in the Vicinity of Oil Exploration Sites, Big Cypress Area, South Florida," by E.T. Wimberly. Open file report 74-012. Tallahassee.

1975 "Summary of Hydrologic Conditions in Collier County, Florida," by H.J. McCoy. Open file report 75-007. Tallahassee.

1975 Water and the South Florida Environment, by Howard Klein, et al. Water Resources Investigations 24-75. Reston, Va.

1976 The Environment of South Florida, A Summary Report, by B.F. McPherson, et al. Professional Paper 1011. Tallahassee.

U.S. DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE

1977 "Big Cypress National Preserve, Statement for Management," by J. Mortenson. Naples, Fla.: Big Cypress National Preserve.

1978a "Preliminary Investigation of the Florida Panther in Big Cypress Swamp," by K.A. Reeves. Homestead, Fla., Everglades National Park.

1978b "The Archeological Survey of Big Cypress National Preserve: Phase I," by J. Ehrenhard, R.S. Carr, and R.C. Taylor. Tallahassee: Southeast Archeological Center.

1979a Everglades National Park, Final Master Plan. Atlanta: Southeast Regional Office.

1979b "Special Regulations for Big Cypress National Preserve," Federal Register, vol. 44, no. 20.

U.S. ENVIRONMENTAL PROTECTION AGENCY

1973 Ecosystems Analysis of the Big Cypress Swamp and Estuaries, by M.R. Carter, L.A. Burns, T.R. Cavinder, K.R. Dugger, P.L. Fore, D.B. Hicks, H.L. Revells, and T.W. Schmidt. Report DI-SFEP-74-51. Washington.

PREPARERS

Steve Hodapp - Team Captain/Natural Resource Planner/Wildlife Biologist, Denver Service Center

Bill Springer - Outdoor Recreation Planner/Hydrologist, Denver Service Center

Paul McNutt - Natural Resource Economist/Sociologist, Denver Service Center

Marilyn Hof - Interpretive Planner, Denver Service Center

Larry Walling - Landscape Architect, Denver Service Center

Irv Mortenson - Area Manager, Big Cypress National Preserve

Publication services were provided by the graphics and editorial staffs of the Denver Service Center. NPS 1574

As the nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, and parks and recreation areas, and to ensure the wise use of all these resources. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

☆ U.S. GOVERNMENT PRINTING OFFICE. 1980—677-120/ 7