

### **3 AFFECTED ENVIRONMENT**

The Affected Environment section succinctly describes the existing environmental resources of the areas that would be affected if any of the alternatives were implemented. This section describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those environmental resources that would affect or that would be affected by the alternatives if they were implemented. This section, in conjunction with the description of the "no-action" alternative forms the base line conditions for determining the environmental impacts of the proposed action.

#### **3.1 GENERAL ENVIRONMENTAL SETTING**

Lake Okeechobee is a subtropical lake in south Florida with a surface area of 730 square miles and an average depth of 9 feet. As a result of this shallow depth, wind is a major influence on the lake. The lake has an extensive littoral zone that occupies about 25 percent of the lake's surface. Littoral vegetation occurs along much of the lake's perimeter, but is most extensive along the southern and western border (USACE, 2000a). The vegetation and cover types within the Lake Okeechobee region have been greatly altered during the last century. Historically, the natural vegetation was a mix of freshwater marshes, hardwood swamps, cypress swamps, pond apple forests, and pine flatwoods. At present, the littoral zone vegetation consists of many native plant species but also consists of many less desirable and invasive exotic species. The invasion of exotic vegetation has impacted the health and productivity of the littoral zone plant community. Anthropogenic disturbances such as altered hydrology and pollution, along with nutrients, can directly and indirectly affect the health of Lake Okeechobee.

The Caloosahatchee Estuary is a large system where the Caloosahatchee River freshwater mixes with the Gulf of Mexico. A shallow bay supporting seagrass beds with mud and sand flats throughout characterizes the lower region closest to the Gulf of Mexico. Mangroves are a dominant species occurring on undeveloped shorelines.

There are two forks of the St. Lucie Estuary, the North Fork and the South Fork, that flow together and then eastward to the Indian River Lagoon and Atlantic Ocean at the St. Lucie Inlet. Both estuaries attract a variety of commercial, recreational and educational activities such as fishing, boating, ecotourism, and sightseeing.

## 3.2 VEGETATION

### Lake Okeechobee

The littoral zone of Lake Okeechobee occupies about 25 percent of the lake's surface (USACE, 2000a). The plant community consists of emergent, submerged and floating plants. Lake Okeechobee vegetation is important as it provides critical habitat for fish and wildlife and it helps improve near-shore water quality. Many invasive exotic plant species invade the littoral zone of Lake Okeechobee. These exotic species displace native vegetation, and in the process, reduce the natural habitat needed for fish and wildlife. Additionally, exotic plant species impede navigation and potentially create water quality problems.

### St. Lucie and Caloosahatchee Estuaries

Submerged Aquatic Vegetation (SAV) such as tape grass (*Vallisneria Americana*), shoal grass (*Halodule wrightii*), and turtlegrass (*Thalassia testudinum*) are prominent plant species in the Caloosahatchee used as performance indicators to determine the desirable range and frequency of water flow. *Vallisneria* is used extensively in the Caloosahatchee River Estuary as an indicator species as it has been proven to be an excellent ecological representative for a wide variety of other biota for this area (USACE, 2000a). The SFWMD staff monitors the Caloosahatchee River Estuary to quantify the performance of these plant species. The performance of these species provides a measure of the success of hydrologic performance measures and management strategies used to meet them.

Plants are not used as indicator species in the St. Lucie Estuary. The flow and salinity envelopes in the St. Lucie Estuary are based on the salinity requirements of the American oyster (*Crassostrea virginica*).

## 3.3 THREATENED AND ENDANGERED SPECIES

Endangered or threatened species known to occur within the project area include the wood stork, manatee, bald eagle, Everglades kite, and Okeechobee gourd.

## 3.4 FISH AND WILDLIFE RESOURCES

Lake Okeechobee provides a wide variety of habitat for fish and wildlife including wading and migratory birds, mammals, amphibians, reptiles, and a large number of fish species. Drought and extreme high water can both be detrimental to the fish and wildlife resources of Lake Okeechobee. High flow releases from the lake can have adverse consequences in the St. Lucie and Caloosahatchee Estuaries. These

effects were discussed in great detail in the Lake Okeechobee Regulation Study in 2000 (reference USACE, 2000a).

### 3.5 ESSENTIAL FISH HABITAT

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976 and the 1996 Sustainable Fisheries Act, an Essential Fish Habitat (EFH) Assessment is necessary for implementation of the Preferred Alternative. An EFH Assessment is a review of the proposed project and its potential impacts to EFH. The rules promulgated by the National Marine Fisheries Service (NMFS) in 1997 and 2002 further clarify EFH by definition as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.” *Waters* include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include areas historically used by fish where appropriate. *Substrate* includes sediment, hardbottom, structures underlying the waters, and any associated biological communities. *Necessary* means the habitat required to support a sustainable fishery and managed species’ contribution to a healthy ecosystem. *Spawning, breeding, feeding, or growth to maturity* covers all habitat types used by a species throughout its life cycle.

Only species managed under a federal fishery management plan (FMP) are covered (50 C.F.R. 600). The act requires federal agencies to consult on activities that may adversely influence EFH designated in the FMPs. The activities may have direct (e.g., physical disruption) or indirect (e.g., loss of prey species) effects on EFH and may be site-specific or habitat-wide. The adverse result(s) must be evaluated individually and cumulatively.

South Atlantic Fishery Management Council (SAFMC) has designated seagrass areas within the study area as EFH (**Table 2**). Impacts to EFH result in the loss of substrate used by managed species for spawning, nursery, foraging, and migratory/temporary habitats. Estuaries are areas of particular concern for shrimps, red drum, and grouper. These species prefer estuarine inshore habitats such as seagrass beds for portions of their life history requirements.

**Table 2 Essential Fish Habitat Areas in the Study Area**

Estuarine Areas (Caloosahatchee River Estuary and St. Lucie Estuary)	Estuarine Emergent Vegetation
	Estuarine shrub/scrub (mangrove)
	Seagrass
	Intertidal flats
	Estuarine Water Column
	Algae

*Source: South Atlantic Fisheries Management Council, 1998*

In conformance with the 1996 amendment to the MSFCMA, the information provided in this EA will comprise the required EFH assessment. This EA will be coordinated with the NMFS Habitat Conservation Division and initiate consultation under the MSFCMA.

### **3.6 WATER QUALITY**

Waters of Lake Okeechobee have been designated by the State of Florida as Class I Waters, suitable for potable water supplies, and Class III, recreation, propagation and maintenance of a health, well-balanced population of fish and wildlife

### **3.7 WATER SUPPLY**

Lake Okeechobee supplies water for agricultural irrigation, municipalities, industry, Everglades National Park, regional groundwater control and for salinity control. The Caloosahatchee River (C-43) serves as a water supply for Lee County and the city of Ft. Myers.

### **3.8 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE**

A preliminary assessment indicated no evidence of hazardous, toxic or radioactive waste (HTRW) affecting this action.

### **3.9 AIR QUALITY**

No significant sources of air quality pollutants are located in the Lake Okeechobee and Waterway vicinity.

### **3.10 NOISE**

Ambient noise levels are low to moderate in the Lake Okeechobee region. The major noise producing sources are vehicular and boat traffic.

### **3.11 AESTHETIC RESOURCES**

Lake Okeechobee, Caloosahatchee River Basin and the St. Lucie Estuary have several landscape features that are aesthetically appealing to tourists and local communities.

### **3.12 RECREATION RESOURCES**

Lake Okeechobee and the St. Lucie and Caloosahatchee Estuaries are considered popular recreational resources in South Florida. Fishing, recreational boating, sightseeing, wildlife watching, camping and swimming are just a few of the recreational activities residents and visitors participate in. Lake Okeechobee is host to over 500 permitted bass fishing tournaments annually and ranks as the top bass fishing lake in the USA (Havens, et al., 2004a).

### **3.13 NAVIGATION**

The Okeechobee Waterway connects Stuart on the Atlantic Ocean with Ft. Myers on the Gulf of Mexico. The waterway consists of 154 miles of navigation channel, including the lake itself. Commercial and recreational navigation via the Okeechobee Waterway take advantage of this shortcut across the Florida peninsula

### **3.14 WATER CONSERVATION AREAS (WCA)**

The WCAs cover approximately 1,372 square miles and are located south of Lake Okeechobee and Everglades Agricultural Area. The WCAs are divided into three areas known as WCA 1 (also known as the Arthur R. Marshall Loxahatchee National Wildlife Refuge), WCA 2 (the smallest of the WCAs) and WCA 3, the largest of the WCAs covering approximately 915 square miles (USACE, 2000a).

The Water Control Plan for Lake Okeechobee (USACE, 200b) outlines the pulse release criteria for the WSE regulation schedule. The level of pulse release selected at a particular juncture of the WSE Operational Guidelines Decision Tree (Figures 3 & 4) takes into consideration a number of factors including water levels in the WCAs. Higher than desirable water levels in the WCAs should allow pulse releases to be made to tidewater at lower lake levels, while lower than desired water levels in the WCAs may preclude or lessen regulatory discharges being made to tidewater (USACE, 2000a). This is particularly true while in Zone D of the WSE regulation schedule.

### **3.15 HISTORIC PROPERTIES**

This action was coordinated in accordance with Section 106 of the *National Historic Preservation Act* of 1966, as amended, and 36 C.F.R., Part 800: *Protection of Historic Properties*. The State Historic Preservation Officer advises and assist the Corps in identifying historic properties (archaeological, architectural, and historical) listed, or eligible for listing, in the *National Register of Historic Places*, assessing the project's effects, and considering alternatives to avoid or minimize effects.