

## **5.E.2 WETLANDS**

### **5.E.2.1 Regulations and Regulatory Involvement**

Executive Order (EO) 11990, Order DOT 5660.1A, Section 10 of the Rivers and Harbors Act of 1899; and Section 404 of the Clean Water Act, 1972, as amended in 1979, address activities in wetlands. EO 11990 requires Federal agencies to ensure their actions minimize the destruction, loss, or degradation of wetlands. It also assures the protection, preservation, and enhancement of the nation's wetlands to the fullest extent practicable during the planning, construction, funding, and operation of transportation facilities and projects. Order DOT 5660.1A sets forth DOT policy that transportation facilities should be planned, constructed, and operated to assure protection and enhancement of wetlands.

This section describes habitat within the Detailed Study Area that exhibit characteristics indicative of "wetlands" and "other surface waters" using the definitions under Title 33 CFR,<sup>49</sup> Chapters 373<sup>50</sup> and 403<sup>51</sup> Florida Statutes (FS), and Chapter 27 of the Broward County Code.<sup>52</sup>

Each jurisdictional wetland that could be affected by one or more of the proposed runway development alternatives was evaluated using the state's Uniform Mitigation Assessment Method (UMAM), as required by Chapter 62-345 FAC to discern their Functional Values (FVs) and determine appropriate compensatory mitigation. Presently, all of the state and local agencies are required by FS to use UMAM. These agencies include the Florida DEP, the SFWMD, and Broward County. More recently, the U.S. Army Corps of Engineers (USACE) has also adopted the use of UMAM in the State of Florida.<sup>53</sup>

#### **5.E.2.1.1 FEDERAL DEFINITION OF WETLANDS**

The USACE defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.<sup>54</sup> Normal circumstances are defined as conditions that would exist if any of the three criteria -- vegetation, hydrology, and soils -- were not altered or removed. The functional wetland definition identifies wetlands as transitional areas between well-drained uplands and permanently flooded (deepwater) aquatic habitats.

---

<sup>49</sup> Title 33 CFR 328.3(b). Definitions of Waters of the United States.

<sup>50</sup> 2006 Florida Statutes, Chapter 373 *Water Resources*.

<sup>51</sup> 2006 Florida Statutes, Chapter 403 *Environmental Control*.

<sup>52</sup> Chapter 27-332 Broward County Code (re: mangroves)

<sup>53</sup> U.S. Army Corps of Engineers (USACE), July 18, 2005, Public Notice, Uniform Mitigation Assessment Method.

<sup>54</sup> *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, January 1987, Final Report

### **5.E.2.1.2 STATE DEFINITIONS OF WETLANDS AND SURFACE WATERS**

The state of Florida defines "waters of the state" in Chapter 403.031<sup>55</sup> (13) FS as: "*Waters*" include, but are not limited to, rivers, lakes, streams, springs, impoundments, wetlands, and all other waters or bodies of water, including fresh, brackish, saline, tidal, surface, or underground waters... Chapter 373.019 (20) FS provides the following definition: "Water" or "waters in the state" means any and all water on or beneath the surface of the ground or in the atmosphere, including natural or artificial watercourses, lakes, ponds, or diffused surface water and water percolating, standing, or flowing beneath the surface of the ground, as well as all coastal waters within the jurisdiction of the state.

Surface Waters are defined in Chapter 373.019(19)<sup>56</sup> FS as: "Surface water" means water upon the surface of the earth, whether contained in bounds created naturally or artificially or diffused. Water from natural springs shall be classified as surface water when it exits from the spring onto the earth's surface.

### **5.E.2.2 Existing Conditions**

In general, wetlands and surface waters currently found within and adjacent to the Detailed Study Area have been altered by previous projects, exhibit the consequences of general urbanization, or were created as mitigation for unavoidable wetland impacts. Field observations indicate many of these habitats were encroached upon by exotic and nuisance vegetation to varying degrees, and displayed evidence of man-induced impacts such as ditching, clearing, or other forms of significant land disturbance.

Existing wetland/surface water conditions within the Detailed Study Area vary in terms of habitat value; wetland quality; level of intrusion by exotic, invasive, and nuisance species; and degree of geographical isolation. Based on field observations, there appear to be no natural, undisturbed wetlands remaining within the Detailed Study Area. Existing wetland and surface water features are comprised of mangrove systems, isolated freshwater marshes, and vegetated drainage ditches and swales dominated by exotic and nuisance plants.

The wetland systems described below are graphically depicted within the Detailed Study Area. Impacts to these systems and their corresponding functions and values are discussed and evaluated in further detail in Chapter Six, *Environmental Consequences*. Wetlands and surface waters identified within the Detailed Study Area are graphically depicted on **Exhibit 5.E.2-1, Existing Wetlands and Surface Waters Within FLL Detailed Study Area**. **Table 5.E.2-1** provides the size and type of wetlands within the Detailed Study Area.

---

<sup>55</sup> Florida Statutes Title XXVIII Natural Resources; Conservation, Reclamation, and use Part I State Resource Plan Chapter 373 Water Resources.

<sup>56</sup> Title XXIX Public Health Chapter 403 Environmental Part I Pollution Control, Control 403.031 Definitions.

**Table 5.E.2-1  
WETLAND AREAS AND SIZES WITHIN THE DETAILED STUDY AREA  
Fort Lauderdale-Hollywood International Airport<sup>57</sup>**

WETLAND IDENTIFICATION CODE	WETLAND SIZE (Acres)*	WETLAND IDENTIFICATION CODE	WETLAND SIZE (Acres)*
W-2	0.74	W-8	2.67
W-N2a	1.04	W-17a	0.61
W-N2b	0.82	W-17c	2.67
W-3	0.47	W-17b	2.81
W-3	0.46	W-23	0.13
W-N3a	2.95	W-23	0.06
W-N3b	5.65	W-23	0.14
W-4	2.62	W-22	3.69
W-N4	13.45	W-25a	8.92
W-5	1.42	W-25b	22.80
W-5	0.22	W-26	0.04
W-N5	0.14	W-33	8.59
W-6	5.27		

Notes:

W = identification code used in earlier studies  
W-N = code used to identify wetlands newly identified in this study  
Please reference Exhibit 5.E.2-1 for wetland locations

\* The wetland size described in this table reflects the area of each wetland within the boundary of the Detailed Study Area. Some of the wetlands extend beyond the boundary of the Detailed Study Area.

Source: Sandra Walters Consultants, Inc. (SWC), 2006

**5.E.2.2.1 MARINE/ESTUARINE WETLANDS**

FLL is situated in the extreme southeast section of Broward County, near the Port Everglades Inlet, the Intra-Coastal Waterway, and the Dania Cut-Off Canal. Wetlands and contiguous low-lying areas that are subject to tidal inundation may be colonized by mangroves and other estuarine plants that have historically occurred in the area. As described by the Florida Natural Area Inventory (FNAI), mangroves typically occur "...along relatively flat, intertidal<sup>58</sup> and supratidal<sup>59</sup> shorelines of low wave energy." Other native halophytic plants<sup>60</sup> that may be associated include cordgrass (*Spartina spp.*), black needlerush (*Juncus roemerianus*), glasswort (*Salicornia sp.*), sea purslane (*Sesuvium portulacastrum*), saltwort (*Batis maritima*), and sea oxeye (*Borrichia spp.*).

<sup>57</sup> Wetland 7 (W-7), previously identified as 0.44 acres in the Draft EIS no longer exists, but has been permitted under ERP #06-00339-S and mitigated through enhancement to wetland 6 (W-6). See Appendix M, *Biological Resources*, for more details on Wetlands 1-7.

<sup>58</sup> Intertidal is defined as the area that is exposed as water recedes from high-water to low-water tide levels.

<sup>59</sup> Supratidal is defined as above the level of the high tide.

<sup>60</sup> Halophytic plants are defined as plants adapted to living in saline environments.

Several types of mangrove swamps are recognized in literature: overwash swamps, narrow fringe swamps, riverine swamps, basin swamps, hammock swamps, and scrub swamps. Most of those within the Detailed Study Area have been previously impacted and are dependent upon man-made water conveyances. They are considered narrow fringe swamps and basin swamps. Associated soils are generally saturated with brackish water<sup>61</sup> at all times and are usually inundated at high tide. Field observations revealed mangrove forests with large, dense canopy, but lacking significant understory. Their extensive root systems can provide sanctuary and nursery habitat to a number of fish, crustaceans, and other marine species.

A large mangrove wetland (W-25) is located immediately east of NW 7<sup>th</sup> Avenue. It is the largest contiguous wetland within the Detailed Study Area. It is composed mainly of red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and to a lesser degree, buttonwood (*Conocarpus erectus*). W-25 is interspersed with areas of Brazilian pepper tree (*Schinus terebinthifolius*), Australian pine (*Casuarina equisetifolia*), and other non-native species, particularly within its northwestern reaches and at its periphery. This is primarily due to significant and long-term impacts from the past construction of drainage ditches and soil disruption due to farming practices. Currently, W-25 is tidally connected to the Dania Cut-Off Canal through culverts, ditches, and flushing cuts, allowing for the mixture of the surface waters. These constructed hydrologic connections have greatly improved tidal flushing, which has resulted in functional enhancement of this mangrove ecosystem.

There are numerous smaller mangrove wetlands dispersed around the periphery of FLL associated with the Dania Cut-Off Canal and the lesser man-made drainage systems within the Detailed Study Area. These wetlands exhibit some of the structure, but little of the function of a typical mangrove wetland.

The Dania Cut-Off Canal, a man-made drainage canal, provides a deep-water estuarine habitat that flanks FLL along its southern and southwestern boundary. The canal was originally constructed to connect to the Miami Canal to the west as part of a regional drainage system. The canal system facilitated the landward migration of saltwater altering the freshwater character of the immediate region. This hydrologic connection and the subsequent alteration of the landscape through farming led to the establishment of mangroves and estuarine wetland areas located east of NE 7<sup>th</sup> Avenue. The Dania Cut-Off Canal, while steep sided, provides a limited littoral shelf<sup>62</sup> that has become settled with halophytic vegetation, primarily various species of mangroves and mahoe (*Thespesia populnea*).

No submerged aquatic vegetation (SAV)<sup>63</sup> was observed within the Dania Cut-Off Canal during field investigations conducted in November 2004. SAV (e.g., *R. maritima*) was noted in adjacent areas and may inhabit the canal bottom as

---

<sup>61</sup> Brackish water is defined as water in which salinity values range from 0.5 to 17.0 parts per thousand.

<sup>62</sup> Littoral shelf is defined as shallows dominated by rooted vascular plants and their attached flora and fauna.

<sup>63</sup> Submerged aquatic vegetation is defined as rooted vegetation that grows under water in shallow zones where light penetrates, such as attached macroalgae and seagrasses.

conditions allow. Johnson's seagrass (*Halophila johnsonii*), a Federally-listed, threatened species, is known to occur in the Intra-Coastal Waterway (e.g., Whiskey Creek, NOVA University marine lab shoreline), about two miles to the east.

At the request of the National Marine Fisheries Service (NMFS) and following methodology finalized in a September 8, 2006 email,<sup>64</sup> a limited survey of SAVs was conducted in a selected area near the Dania Cut-Off Canal. This survey found no SAVs and a habitat that is poorly suited for supporting SAVs.<sup>65</sup>

The open water portion of the Dania Cut-Off Canal provides habitat to a variety of saltwater, brackish, and freshwater aquatic and semi-aquatic animal species. The presence of many of these animal species within the canal waters shifts with the seasonal freshwater/saltwater interface. Due to diurnal tidal changes and seasonal freshwater releases upstream of the Detailed Study Area, the Dania Cut-Off Canal has a significant effect on the water regime in most of the surface water conveyance systems within the central and southern portion of FLL. Many of the ditches that make up the surface water conveyance system have been colonized with mangrove species along their banks due to the long-term tidal transport of seeds/prospagules. Various estuarine fishes inhabit these mangrove communities.

#### **5.E.2.2.2 FRESHWATER WETLANDS**

No undisturbed freshwater wetlands were found within the Detailed Study Area. Nearly all of the freshwater wetlands observed were in association with man-made lakes, ditches, and stormwater detention areas associated with FLL and the contiguous highway and railroad facilities. Most of these freshwater wetlands are dominated by herbaceous wetland plants which are the result of the periodic flooding of associated low-lying areas. Many of these areas are regularly maintained through mowing and/or the application of herbicides to maintain the conveyance of stormwater. These areas are vegetated with disturbance-adapted wetland, landscape, and common nuisance plant species. They provide relatively low wetland habitat value due to their intended function and routine maintenance, the low quality of runoff received, their relative location related to man-made features, and a relatively low plant species diversity/mix.

Some of these freshwater wetlands comprise a part of the FLL stormwater treatment facilities and are connected and drain to off-site waterbodies. To the north, the FLL stormwater system ultimately conveys water to the northwest through Outfall 4 to Osceola Creek. Due to its location on the property, the northern system remains fresh water and is not subject to the introduction of saltwater due to daily tidal fluctuations.

---

<sup>64</sup> Email exchange with National Marine Fisheries Service culminating on September 8, 2006 in Dania Cut-Off Canal field survey methodology.

<sup>65</sup> September 30, 2006 memo to project file regarding September 19, 2006 field survey with triangular dredged lake associated with Dania Cut-Off Canal immediately west of Fort Lauderdale-Hollywood International Airport.

The stormwater system to the south of FLL flows through four outfalls that ultimately connect with the Dania Cut-Off Canal. Many of these canal systems are subject to daily tidal fluctuations. A variety of halophytic flora<sup>66</sup> and estuarine fauna<sup>67</sup> populate these systems. With the exception of extreme storm or flood events that may raise the water level in the Dania Cut-Off Canal and cause flooding to the north, these areas maintain a freshwater character. Daily shifts in tidal flow can be noted even at interior locations at FLL. It is probable that freshwater or water with low salinity remains at the surface of the canal allowing less salt-tolerant plant and animal species to survive in the canal.

Several manmade lakes are situated to the east and west of FLL within the Detailed Study Area (See Exhibit 5.E.2-1). East of the approach to Runway 27R, there is a large open water facility that receives stormwater from runways as well as highways. As noted in previous project documents (2002 Supplemental Draft Environmental Impact Statement (DEIS)),<sup>68</sup> this system conveys water via a culvert to the east. This open water stormwater facility is ringed by a variety of freshwater emergent species, including common reed (*Phragmites australis*), cattail (*Typha spp.*), camphorweed (*Pluchea rosea*), willow (*Salix spp.*), purple sedge (*Cyperus ligularis*), water hyssop (*Bacopa monnieri*), and torpedo grass (*Panicum repens*). Two manmade lakes to the west of the approach to Runway 9L appear to be artifacts of past excavations. These deep, open waterbodies are fringed with a variety of emergent and woody wetland vegetation. The associated open water areas are deep and vegetated with a variety of submerged vegetation (e.g., *Pontamogeton diversifolia*).

One freshwater wetland (designated as W-22 in Exhibit 5.E.2-1, *Existing Wetlands and Surface Waters within FLL Detailed Study Area*) that functions as part of the stormwater treatment system to the east of FLL has also been identified as a wetland mitigation site for a previously completed Florida DOT project.

---

<sup>66</sup> A halophyte is a plant that naturally grows where it is affected by salinity in the root area or by salt spray.

<sup>67</sup> Those animals that naturally occur in estuaries: a mixing place for seawater and freshwater where salinities may vary from near fresh to that of seawater.

<sup>68</sup> 2001 Supplemental Draft Environmental Impact Statement, March 2002.