2. Wetland Identification and Assessment

A major purpose of this assessment was to identify significant and sensitive resources that occur within the study area. Several freshwater wetland habitats and surface water types were identified, classified, and characterized. These include marshes, shrub wetland, forested swamps, river, lakes, and ponds. Representative wetlands proposed to be impacted were assessed for function using the *Uniform Mitigation Assessment Method* (UMAM), per Chapter 62-345, F.A.C.

2.1 Identification Methods

Wetland mapping and habitat characterization were conducted by CH2M HILL on recent aerial photography during on-site field investigations conducted in 2002, 2005 and 2006. Using information gained from National Wetlands Inventory Mapping, SJRWMD GIS database of land use mapping, and soil surveys, project biologists characterized and delineated wetlands and surface water features located within and adjacent to the study area.

For the purposes of this report, the study area was defined as roughly an 800-foot wide corridor centered on the viable alternative alignments extending the project length including potential pond locations. The Preferred Alternative for Wekiva Parkway (SR 429) is, for the most part, a 300-foot wide corridor within the study area, and is shown along with the SR 46 Realignment and other project components in the previously referenced Exhibit 1-3.

Prior to field reviews, the following documents were reviewed for pertinent information:

- Aerial photography, color infrared format, flown in 1999 and 2004
- Natural Resources Conservation Service (NRCS) Soil Survey of Lake, Orange, and Seminole Counties, Florida (1971, 1989, 1990)
- FDOT's Florida Land Use, Cover and Forms Classification System (1999)
- USACE Wetlands Delineation Manual (1987)
- Florida's Wetland Delineation Manual (Gilbert et. al., 1995)
- *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et. al., 1979)
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory Maps

Wetlands are defined jointly by the U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE, 1987). Wetlands include swamps, marshes, bogs, and similar areas.

Wetlands in the study area were delineated (mapped) in accordance with the definitions and routine methods described in the federal and state manuals. The mapped wetland boundaries are based on ground-truthing selected areas and photo-interpretation. Parameters used in the field include the dominance of hydrophytic vegetation (wetland plants), the presence of hydric soils, and evidence of wetland hydrology.

The USACE currently utilizes the Corps of Engineers *Wetlands Delineation Manual* (1987 Manual) to establish USACE jurisdiction under Section 404 of the Clean Water Act. In addition, the USACE is field testing a *Draft Atlantic & Gulf Coastal Plain Regional Supplement to the 1987 Wetland Delineation Manual*. If adopted, this new delineation tool would be applicable to this project during the permitting phase. The wetland mapping estimate included in this report (**Appendix A**) is a conservative estimate and is not expected to deviate significantly should this new delineation tool be adopted. All wetlands delineation and land surveying conducted for permitting will follow rules, regulations and guidelines in place at that time. The State of Florida uses the *Florida Wetlands Delineation Manual* (FDEP, 1995) to determine wetland boundaries pursuant to Chapter 62-340, Florida Administrative Code, *Delineation of the Landward Extent of Wetlands and Surface Waters*.

Wetland plant status is determined by the US Fish and Wildlife Service (USFWS) *National List of Plant Species that Occur in Wetlands – Region 2* (1996) and the *Florida Vegetative Index* (FDEP, 1995). Field data were collected in accordance with the FDOT's *PD&E Manual, Part 2, Chapter 18* for establishing a baseline description of the project wetlands.

Each wetland was classified according to the FDOT's *Florida Land Use, Cover and Forms Classification System* (FLUCFCS) and cross referenced to the National Wetlands Inventory (NWI) description per the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al., 1979).

The regulatory agencies will distinguish vegetated wetlands from surface waters (ditches, ponds, open water) during the permitting phase of a project for the purpose of quantifying impacts to wetland resources. In general, the FLUCFCS developed by FDOT (1999) has land use codes in the 500-series for surface waters and in the 600-series for vegetated wetlands. **Table 2-1** presents the categories and corresponding descriptions of the land use types, both uplands and wetlands, found within the project study area.

The study area encompasses several different land use types, some of which are developed for urban, residential, agricultural (crops, groves, nurseries) and utility uses. The various land uses are described using the FLUCFCS codes in Table 2-1. The approximate acreage of each vegetative community, which falls within the Preferred Alternative, is provided in the land use descriptions that follow the table.

As a conservative approach to estimating proposed impacts, the full extent of the proposed right-of-way was used. Approximate delineation of each land use area is shown on the project aerials in **Appendix A** of this report, as well as in the updated final *Endangered Species Biological Assessment* (CH2M HILL, June 2010).

TABLE 2-1

Natural Areas in the Project Area Identified by Land Use Category Descriptions Wekiva Parkway (SR 429)/SR 46 Realignment PD&E Study in Lake, Orange, and Seminole Counties

FLUCFCS	FLUCFCS Description	NWI Code	NWI Description				
Developed Land							
110	Residential, low density (<2 units/ac)		Upland (developed)				
119	Residential, low density under construction		Upland (developed)				
120	Residential, medium density (2-5 units/ac)		Upland (developed)				
129	Residential, medium density under construction		Upland (developed)				
130	Residential, high density (>6 units/ac)		Upland (developed)				
133	Multiple dwelling units, Low rise (2 stories or less)		Upland (developed)				
139	Residential, high density under construction		Upland (developed)				
140	Commercial and Services		Upland (developed)				
148	Cemeteries		Upland (managed)				
155	Other Light Industrial		Upland (developed)				
160	Extractive		Upland (developed)				
162	Sand and Gravel Pits		Upland (developed)				
167	Abandoned Mining Lands		Upland (developed)				
170	Institutional		Upland (developed)				
171	Educational Facilities		Upland (developed)				
172	Religious		Upland (developed)				
175	Governmental		Upland (developed)				
180	Recreational		Upland (managed)				
182	Golf Courses		Upland (developed/managed)				
190	Open Land		Upland				
191	Undeveloped Land in Urban Area		Upland				
Agricultura	al Land						
211	Improved Pasture*		Upland (managed)				
212	Unimproved Pasture		Upland				
213	Woodland Pasture*		Upland (managed)				
215	Field Crops*		Upland (managed)				
221	Citrus Groves*		Upland (managed)				
224	Abandoned Groves*		Upland (managed)				
231	Cattle Feeding Operations		Upland (developed)				

TABLE 2-1 (CONTINUED)

FLUCFCS	FLUCFCS Description	NWI Code	NWI Description				
240	Nurseries		Upland (developed)				
241	Tree Nurseries		Upland (developed)				
251	Horse Farms*		Upland (managed)				
Treeless U	plands	· · · · · ·					
310	Herbaceous (Dry Prairie)		Upland				
320	Shrub and Brushland		Upland				
330	Mixed Rangeland		Upland				
Forested Uplands							
411	Pine Flatwoods		Upland				
412	Longleaf Pine – Xeric Oak		Upland				
413	Sand Pine		Upland				
421	Xeric Oak		Upland				
434	Hardwood-Conifer Mixed		Upland				
441	Coniferous Plantations*		Upland (managed)				
443	Forest Regeneration Area*		Upland (managed)				
Surface Wa	aters						
510	River	R1UB2H	Riverine, Unconsolidated bottom, Sand, Permanently flooded				
523	Lakes, > 100 ac, < 500 ac	LUB2H	Lacustrine, Unconsolidated bottom, Sand, Permanently flooded				
524	Lakes <10 ac	LUB2H	Lacustrine, Unconsolidated bottom, Sand, Permanently flooded				
534	Reservoir / Pond, < 10 acres	PUB2Hx	Palustrine, Unconsolidated bottom, Sand, Permanently flooded, excavated .				
Forested Wetlands							
617	Mixed Wetland hardwoods	PFO1/3	Palustrine, Forested, Broad-leaved deciduous / Broad-leaved evergreen				
625	Wet Pine Flatwoods	PFO4	Palustrine, Forested, Needle-leaved, evergreen				
630	Wetland Forested Mixed	PFO6/7	Palustrine, Forested, Broad-leaved / needle-leaved, deciduous / evergreen				
Shrubby W	/etlands						
631	Wetland Shrub	PSS6/7	Palustrine, Shrub, Broad-leaved / needle- leaved, deciduous / evergreen				
Treeless W	/etlands						
641	Freshwater Marsh	PEM1	Palustrine, Emergent, Persistent				
643	Wet Prairie	PEM1	Palustrine, Emergent, Persistent				
644	Emergent Aquatic Vegetation	PEM1	Palustrine, Emergent, Persistent				
Improveme	ents and Utilities						
814	Roads and Highways		Upland (developed)				
8141	Interstate Highway		Upland (developed)				
8143	Two-lane State Highways		Upland (developed)				
833	Water Supply Plants		Upland (developed)				

TABLE 2-1 (CONTINUED)

FLUCFCS	FLUCFCS Description	NWI Code	NWI Description
830	Utilities		Upland (developed)
834	Sewage Treatment		Upland (developed)

FLUCFCS = Florida Land Use, Cover and Forms Classification System (FDOT, 1999) NWI = National Wetlands Inventory (Cowardin, et al., 1979)

*Managed uplands that often provide some wildlife habitat.

2.2 Surface Water Features

Surface water features are characterized by open water and/or features that convey open water. Surface water features in the project area include naturally occurring creeks, rivers, lakes, and man-made ditches, ponds, and canals. If any of these open water/conveyance features have associated floodplains, they are described below in the applicable palustrine (vegetated) wetlands subsection.

2.2.1 Wekiva River (510) an OFW, WSR, AP, and RHPZ

The open water portion of the Wekiva River is given a land use code of 510 and is described as surface water. It covers approximately 1 acre within the 300- foot Preferred Alternative limited access right-of-way. The wetland areas directly connected to the open water stream are described in the wetlands section below. The Wekiva River is spring fed from the aquifer and receives runoff from its 130-square mile watershed. Its headwaters begin at the confluence of Wekiwa Springs Run and Rock Springs Run on state park land, from which it flows north under SR 46 before joining the St. Johns River.

The Wekiva River has special designations that afford it extra protection to maintain its water quality and habitat quality: Outstanding Florida Water (OFW), Wekiva River Protection Area, Wild and Scenic River (WSR), State Canoe Trail, Aquatic Preserve (AP), and Riparian Habitat Protection Zone (RHPZ).

2.2.1.1 Outstanding Florida Water (OFW) and Wild and Scenic River (WSR)

The Wekiva River is designated as a State and Federal Wild and Scenic River, a State Canoe Trail per Chapter 62-302.700 (9)j(3) F.A.C. (FDEP 2008); and an Outstanding Florida Water pursuant to Chapter 62-302 *Surface Water Quality Standards*, under *Special Protection, Outstanding Florida Waters, Outstanding National Resource Waters* (9) Outstanding Florida Waters: (c)76 Wekiwa Springs State Park, (e)13 Rock Springs Run State Reserve, (f)65 Wekiva River Buffers, (h)41 & 42 Wekiva River Aquatic Preserve, excluding that portion of the St. Johns River between Interstate Highway 4 and the Wekiva River confluence; and (i)39 Wekiva River System (FDEP, 2008).

2.2.1.2 Aquatic Preserve (AP)

The Wekiva River Aquatic Preserve occurs within the project study area (FDEP, 2006). In places the river is bordered by an extensive floodplain of hardwood forest; however, in the project area the river and floodplain are relatively narrow. The Preferred Alternative will cross the Wekiva River Aquatic Preserve at its narrowest point at the existing SR 46 crossing. A map of the Aquatic Preserve boundary is provided in **Exhibit 2-1** (FDEP, 2006).

Aquatic Preserves are the vested interest of the State of Florida, Board of Trustees through the Florida Aquatic Preserve Act of 1975 (Sections 258.35 through 258.46, Florida Statutes). Aquatic Preserves are submerged lands that are to be preserved in their natural or existing condition based on their aesthetic, biological, and scientific value to the public and future generations. *The Wekiva Parkway and Protection Act* recognizes the importance of the Wekiva Parkway and provides protection to the Wekiva River system.

A detailed description of the Wekiva River Aquatic Preserve boundary is provided in Florida Statues, Chapter 258.39(30) *Boundaries of Preserves*, Wekiva River Aquatic Preserve. In brief, the aquatic preserve is generally described as "All the state-owned sovereignty lands lying waterward of the ordinary high-water mark of the Wekiva River and the Little Wekiva River and their tributaries lying and being in Lake, Seminole, and Orange counties", (FDEP, 2006).

Based on a review of the F.A.C., Chapter 62-302.700, the Wekiva River Aquatic Preserve is given a special provision that has been established for the protection of the adjoining lands and tributaries to the Wekiva River System. As set forth in Section 369.301 F.A.C., *Conservation Part II: Wekiva River Protection*, the Wekiva River System as defined in Section 369.303(10) F.A.C, includes the Wekiva River, the Little Wekiva River, Black Water Creek, Rock Springs Run, and Seminole Creek. The Wekiva River Aquatic Preserve's protection boundary (as defined in Section 369.303(9) F.A.C., *"Wekiva River Protection Area"*) extends from Markham Woods Road at its eastern boundary, which comes within 200 feet of the western I-4 rightof-way at a point 1,400 feet north of SR 434 (Sanlando Springs Road), southwest to include the headwater spring in the Wekiva Springs State Park, and north to SR 44.

2.2.1.3 Riparian Habitat Protection Zone (RHPZ)

Overlain on wetlands and forested uplands adjacent to the open water portion of the Wekiva River is the Riparian Habitat Protection Zone. This is a specific area of protection to buffer the river from surrounding land uses. The RHPZ is designated per 40C-41 <u>Surface Water Management Basin Criteria</u> whereby specific standards and criteria are established for the protection of the riparian functions (forested uplands along a riverine system) of the <u>Wekiva River Hydrologic Basin</u> per subsection (3)(e)1., F.A.C., (SJRWMD, 2005). Construction or alteration of a system must not adversely affect the abundance, food sources, or habitat (including its use



------ Wekiva Parkway Study Corridor

Exhibit 2-1 Wekiva River Aquatic Preserve Boundary Map



to satisfy nesting, breeding and resting needs) of aquatic or wetland dependent species provided by the designated RHPZ (SJRWMD, 2005). For the Wekiva River and Rock Springs Run, the RHPZ is the most landward limit of: the undeveloped uplands that are 550 feet from the water's edge of the river/creek, or the uplands that are 550 feet from the herbaceous wetland line, or the uplands that are 50 feet from the herbaceous wetland line, or the uplands that are 50 feet from the herbaceous wetland line.

Within the Preferred Alternative, which is generally centered on the existing SR 46 bridge over the Wekiva River, the upland habitat/land use types that fall within the RHPZ are: low density Residential (110), medium density residential (120), and Hardwood-Conifer Mixed (434). The RHPZ within the Preferred Alternative totals 1.0 acre.

2.2.2 Lakes (523 and 524)

Lakes are typically classified as *Lacustrine* under the NWI system, but can have a *Palustrine* component in vegetated areas, such as along the littoral fringe. FLUCFCS distinguishes between natural inland lakes based on size. Classification code 523 is used for lakes larger than 10 acres but less than 100 acres, and code 524 is used for lakes under 10 acres in surface area. Approximately 2 acres of natural lakes occur within the Preferred Alternative. These potential impact areas are found in Lake County on the Neighborhood Lakes parcel and along proposed CR 46A realignment. A variety of wildlife use open water areas, including water fowl, fish, and herptiles.

Three large (523) natural lakes are near the Preferred Alternative, but will not be impacted: Yankee Lake and Sylvan Lake (Seminole County), and Bear Pond (Lake County). Two smaller (524) lakes found in Orange County (Lake Smith and Lake Lucie) are also outside the Preferred Alternative.

2.2.3 Reservoirs and Ponds (533 and 534)

Ponds can be classified as either *Palustrine* if vegetated, or *Lacustrine* if mainly open water. FLUCFCS distinguishes between these excavated (man-made) water bodies based on size. Classification code 533 is used for reservoirs larger than 10 acres but less than 100 acres, and code 534 is used for ponds under 10 acres. Several man-made ponds and a few reservoirs occur in the area. Most are small ponds, presumably permitted for stormwater treatment, scattered along the project corridor amid the developments. Approximately 20 acres of excavated surface water ponds occur within the Preferred Alternative.

2.3 Wetlands

Wetlands identified within the project area include forested, shrubby, and emergent systems. Details on the wetlands, functional assessment, and impacts are presented

in this final *Wetland Evaluation Report*. A brief description of the project wetlands, and their wildlife habitat value, is also presented herein.

2.3.1 Mixed Wetland Hardwoods (617)

Mixed Wetland Hardwood systems are composed of varying mixtures of hardwood species such as red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), black gum (*Nyssa sylvatica*), red bay (*Persea borbonia*), swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), water oak (*Quercus nigra*), dahoon holly (*Ilex cassine*), and American elm (*Ulmus americanus*). The shrub layer is typically dominated by wax myrtle (*Myrica cerifera*) and buttonbush (*Cephalanthus occidentalis*). Groundcover is sparse when canopy is dense and includes Virginia chain fern (*Woodwardia virginica*) and swamp fern (*Blechnum serrulatum*).

Large areas of Mixed Wetland Hardwood remain near I-4 and SR 46. Approximately 13 acres of Mixed Wetland Hardwoods occur within the Preferred Alternative. Two areas of impact to wetland hardwoods will be for treatment ponds near I-4. One proposed pond site, on FDOT property located southeast of International Parkway and SR 46, is the only location that does not require residential or commercial relocation (existing or planned) in that area. The parcel is 8.5 acres, but the pond has been resized from 8 acres (viable alternatives) to 5 acres (Preferred Alternative) based on updated drainage calculations. Further pond size reduction is possible during detailed design if innovative design features are used. The wetland currently receives untreated runoff from SR 46, International Parkway, and Wayside Drive. The water quality of the remaining wetland will be enhanced by this treating of project related runoff.

These forested wetlands are fragmented by roads and are surrounded by commercial and low, medium, and high density residential land uses. Dense stands of opportunistic and nuisance vegetation are found along the outer edge of the forested wetland, as is typical when development meets the wetland edge. Species include elderberry (*Sambucus canadensis*), primrose willow (*Ludwigia peruviana*), saltbush (*Baccharis* sp.), and a variety of vines including pepper vine (*Ampelopsis arborea*), climbing hempweed (*Mikania scandens*) and grapevine (*Vitis rotundifolia*). These systems experience seasonal flooding; however, their historical hydrologic regimes have been slightly altered by adjacent development. Wildlife use includes avian species, medium and small mammals, herpetofauna, and macroinvertebrates when water levels are sufficient.

2.3.2 Wetland Forested Mixed (630)

Approximately 11 acres of Wetland Forested Mixed systems occur within the Preferred Alternative. Included in this total acreage estimate is the bridged area over the Wekiva River forested floodplain, which will cross 6.4 acres of 630 floodplain. The Wetland Forested Mixed (630) systems are dominated by a variety of hardwood and conifer tree species where neither achieves more than a 66 percent dominance of the crown canopy composition. The USFWS National Wetland Inventory describes these as semi-permanently flooded systems. The mixed-forested wetland systems have both broad-leaved and needle-leaved deciduous and evergreen tree species, including American elm, cabbage palm, loblolly bay (*Gordonia lasianthus*), red maple, slash pine, hackberry (*Celtis laevigata*), water oak, laurel oak, water hickory (*Carya aquatica*), black gum, sweetgum, sweet bay, American hornbeam (*Carpinus caroliniana*), tuliptree (*Liriodendron tulipifera*), and dogwood (*Cornus* sp.).

Subcanopy species, although sometimes sparse, are typically comprised of younger sapling specimens of the above mentioned tree species. Other species may include wax myrtle, Carolina willow (*Salix caroliniana*), buttonbush, fetterbush (*Lyonia lucida*), elderberry, persimmon, saltbush, camphortree (*Cinnamomum camphora*), and primrose willow. Other constituents include American beautyberry (*Callicarpa americana*) and saw palmetto.

Groundcover can include swamp fern, cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), netted chain fern (*Woodwardia areolata*), Virginia chain fern, poison ivy (*Toxicodendron radicans*), grapevine, greenbrier (*Smilax* sp.), Caesarweed (*Urena lobata*), lizard's-tail (*Saururus cernuus*), sawgrass (*Cladium jamaicensis*), redroot (*Lachnanthes caroliniana*), and beggar's tick (*Bidens alba*).

Listed wildlife species that have been reported (FDEP, 2006) as nesting and foraging along the 630 floodplain of the Wekiva River Aquatic Preserve include the wood stork (*Mycteria americana*), little blue heron (*Egretta caerulea*), tri-colored heron (*Egretta tricolor*) and limpkin (*Aramus guarauna*). Threatened plant species have also been found (FDEP, 2006), such as water orchid (*Spiranthes odorata*), needle palm (*Rhapidophyllum hystrix*), butterfly orchid (*Encyclia tampensis*), and southern shield fern (*Thelypteris kunthii*).

Organisms of all trophic levels including avian species, large, medium and small mammals, herpetofauna, and macro invertebrates are likely to be found in or near these areas. Connectivity with other wetland systems, and a diversity of native flora and fauna, make these wetlands ecologically valuable to many wildlife species. Many of the Wetland Forested Mixed systems in the study corridor are directly connected to forested uplands and/or marsh wetland, which enhances their wildlife value; these include the Wekiva River floodplain, the Wekiva River Mitigation Bank property, and the Rock Springs Run State Reserve.

A few smaller and fragmented areas of Wetland Forested Mixed systems remain along the corridor and are bordered by residential, commercial, agricultural, and roadway land uses. In some areas along existing roadway, fragmented portions of forested wetlands are connected by culverts under the road. For example, in Seminole County near Yankee Lake, two 4-foot diameter culverts under SR 46 connect a small remnant of Wetland Forested Mixed to the larger swamp on the north side of SR 46. In this rapidly changing urban landscape, fragmentation of the wildlife habitats and adjacent high intensity land uses can lower the wildlife value of these small forested wetlands. On the other hand, they may serve as a refuge for birds, small mammals, reptiles, and amphibians that can co-exist in the residential/urban environment.

2.3.3 Other Wetland Shrub (631)

Shrub wetlands are characterized by a dominance of subcanopy-height woody species, with Carolina willow being the most dominant species. Common subcanopy species with the willow include elderberry, primrose willow, wax myrtle, and cabbage palm. Less common species found with willow include buttonbush, fetterbush, red maple, saltbush, sweetgum, loblolly bay, and black gum.

Because these wetland constituents tend to be invasive or pioneering species, they are common on the landward edge of disturbed wetland sites and often form dense thickets along rights-of-way. Eventually, the dense thickets limit light and space for other species to co-exist within these wetlands. They can also be found within the depressions of upland communities or other wetland communities.

Within the Preferred Alternative, shrub wetlands associated with previously altered areas along roadsides are found along SR 46 east of US 441 in Lake County where an area of shrub has colonized a disturbed portion of excavated marsh adjacent to residential land use (110). Small areas of shrub wetland occur along the southern portion of the study corridor in Orange County. These are found at the edge of ponds in horse pastures (251) and in the abandoned borrow/mining lands (167). Often these areas are on the edge of wetlands disturbed by mowing and/or fences. Approximately 7 acres of shrub wetlands occur within the Preferred Alternative. These areas do not provide recreational opportunities or a commercial source of food or fiber and do not typically provide valuable habitat, except to a few common avian species (particularly song birds), wading birds, small mammals, and herpetofauna. Variations in hydrology or hydroperiod affect the utilization by herpteofauna and macroinvertebrates.

When associated with other natural areas, shrub wetlands have the opportunity to be utilized by a variety of wildlife species, such as the shrub wetlands in Lake County at the Wekiva River and on the state reserve property where wetland shrub areas occur as "islands" within areas of unimproved pasture (212) and freshwater marsh (641).

2.3.4 Freshwater Marshes (641), Wet Prairie (643), and Emergent Aquatic Vegetation (644)

These three habitat types, Freshwater Marshes (641), Wet Prairie (643), and Emergent Aquatic Vegetation (644), are discussed together in this section of the report because they have similar characteristics and because their location in the landscape is often intertwined. Organisms of most trophic levels including avian species, medium, and small mammals, herpetofauna, and macroinvertebrates are likely to be found in or near marsh/lake areas. A few marsh wetlands are adjacent to commercial, institutional, residential, and interstate land uses. Wetlands amid developed lands typically provide some water quality treatment functions and can provide refuge for wildlife.

A large marsh complex is found on the Neighborhood Lakes property on the Orange/Lake County line. With high habitat diversity, it is characterized as a 643 wet prairie interspersed with irregular shaped areas of freshwater marsh (641), deeper marsh (644), palmetto/shrub prairie (330), mixed upland forest (434), and wet pine flatwoods (625). This mosaic of habitats in a relatively large, contiguous piece of land adds wildlife habitat value to the property. Although the new roadway will cross the marsh complex, the Preferred Alternative was located as far to the west as possible at the request of FDEP. This western alignment maximizes the continuity of the Neighborhood Lakes habitat with the contiguous conservation lands of the Rock Springs Run State Reserve.

In June 2005, protected wildlife species observed by CH2M HILL ecologists in the marsh area included white ibis (*Eudocimus albus*) (roosting and feeding) and sandhill cranes (*Grus canadensis pratensis*) (flying over head). Wood storks are likely to feed in the marsh as well.

Freshwater Marshes (641) are relatively level, low-lying, seasonally or semipermanently flooded basins and meadows, typically dominated by persistent herbaceous, non-woody vegetation. Approximately 24 acres of Freshwater Marsh occur within the Preferred Alternative. Many small locations of marsh will be filled along SR 46 in the Lake County East and West areas. However, the majority of the potential impact is in Seminole County near the Wekiva Parkway (SR 429) interchange with I-4. Opportunities to reduce impacts to 641 marshes may be possible during final design of stormwater treatment ponds, particularly in Lake County West near US 441 and SR 46.

The wetland complex east of US 441, a large Freshwater Marsh (641) that is bisected by SR 46, contains islands of scrub wetland, forested wetland, emergent marsh, and excavated open water ponds. Surrounding land uses include newly constructed residential, high density residential, retention ponds, sand mining pits, forested uplands, and improved pastures. In April 2005, a sandhill crane sitting on a nest was observed on a portion of the marsh on the north side of SR 46. In August 2006, the marsh was almost completely dry. Two stormwater ponds will be constructed in uplands adjacent to the marsh where the nest was observed. Considering the rapid growth in residential development at this location of US 441 and SR 46, these ponds will offer some buffering effect for future sandhill crane nesting activity.

Occasionally marshes include shrubs or young trees as a small part (less than 10 percent) of the species mix. Most are dominated by a variety of herbaceous plant

species including maidencane (*Panicum hemitomon*), duck potato (*Sagittaria* spp.), pickerelweed (*Pontederia cordata*), soft rush (*Juncus effusus*), cattail (*Typha* spp.), water lilies (*Nymphaea ordorata*), spatterdock (*Nuphar advena*), sand cordgrass (*Spartina* bakeri), burr marigold (*Bidens laevis*), floating marsh pennywort (*Hydrocotyle ranunculoides*), and sedges (*Carex, Rhynchospora* spp.). When present, woody species included Carolina willow, wax myrtle, buttonbush, primrose willow, and pine (*Pinus* spp.). Indications of wildlife utilization include wading birds, small and medium mammals, herpetofauna, fish, and benthic macroinvertebrates, depending on the size of the marsh, water quality, and the diversity of available adjacent habitats.

Wet Prairies (643) are shallower marshes characterized by grassy and herbaceous species on hydric soils. These areas can be distinguished from marshes by shorter vegetation and a shorter hydroperiod. Approximately 18 acres of Wet Prairie occur within the Preferred Alternative. The majority of this potential impact is on the Neighborhood Lakes parcel. However, approximately 5 acres of this total impact will be shading by the Wekiva Parkway bridge, and will not be a loss of habitat.

The prairies have a variety of groundcover species commonly associated with this tree-less habitat, such as wire grass (*Aristida* sp.), rushes (*Eleocharis spp*.), sand cordgrass, sedges, witchgrases (*Dichanthelium* spp.), cinnamon fern , sphagnum moss (*Sphagnum* sp.), redroot, and panic grasses (*Panicum* spp.). The ephemeral (seasonally dry up) condition of isolated areas of wet prairie (not connected to a permanently wet system) makes them especially important to several species of amphibians including the listed gopher frog and striped newt (Owen 2005).

Emergent Aquatic Vegetation (644) is a deeper marsh characterized by herbaceous vegetation that floats on the water surface. Vegetation of this type must be able to survive in permanently inundated soils. Typical species found within this community are spatterdock, water lilies, sawgrass, duck potato, and water hyacinth (*Eichhornia crassipes*). Indications of wildlife utilization include water fowl, herpetofauna, fish, and benthic macroinvertebrates, depending on the size and water quality of the marsh, and the diversity of available adjacent habitats. Approximately 1 acre of Emergent Aquatic Vegetation occurs within the Preferred Alternative.

2.4 Essential Fish Habitat

No Essential Fish Habitat (EFH) occurs in the project area. The immediate project area is not considered to be a breeding or nursery area for marine fish species, nor are the project wetlands and ditches directly connected to tidal-influenced waters. However, at certain times of the year, some marine species such as blue crab, (*Callinectes* sp.), Atlantic Stingray (*Dasyatis sabina*), and Atlantic needlefish

(*Strongylura marina*) (FDEP, 2006) can be found downstream of the project area at the confluence of the Wekiva River with the St. Johns River.

The project will be designed to meet Outstanding Florida Waters (OFW) water quality treatment criteria, and no changes to floodplain storage or the downstream hydrologic regime will occur; therefore, the project will not have any direct or indirect negative impacts on EFH.