3. Existing Vegetative Communities

The study area encompasses several different land use types, some of which are developed as urban, residential, agricultural (crops, groves, nurseries) and utility uses. The various land uses are described using the previously referenced FLUCFCS. All FLUCFCS codes and approximate boundaries of each land use, representing existing conditions, are shown on the project aerials in **Appendix B** of this report, as well as in the updated final *Wetland Evaluation Report* (CH2M HILL, June 2010).

Natural and altered vegetative communities that may provide wildlife habitat, including uplands, wetlands, and aquatic environments, are identified by code series 300, 400, 500, and 600. These types of land uses are described in this report and are summarized in **Table 3-1**. Any non-urbanized or non-industrial area has the potential to provide habitat for listed wildlife species. 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. Field surveys are required to assess the potential for any given area to support listed wildlife. That potential is discussed in Section 4.0 of this report.

TABLE 3-1
Land Use Category Descriptions in the Project Area
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)

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 east and west Lake County. However, the majority of the potential impact is in east Seminole County at Lake Sten, near the Wekiva Parkway interchange with I-4. Raccoon tracks (*Procyon lotor*) were the only evidence of wildlife usage at Lake Sten (641 marsh). Opportunities to reduce impacts to 641 marshes may be possible during final design of stormwater treatment ponds, particularly in west Lake County near US 441 and SR 46.

The wetland complex near 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. Wildlife observed during field investigations included northern cardinal (*Cardinalis cardinalis*), green treefrog (*Hyla cinerea*), American crow (*Corvus brachyrhynchos*), and sandhill crane. 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 small trees as 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. 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. Typically these shallow wet prairies are fringe areas on large wetlands, or create a wet-season surface-flow connection between deeper wetlands. 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.

However, when associated with other natural areas, shrub wetlands may have a higher value because of their connection to a natural area. Their ecological value increases with the opportunity to be utilized by a variety of wildlife species, such as wading birds, small mammals, and herpetofauna. This is evident in the shrub wetlands (outside the Preferred Alternative) at the Wekiva River, and on the Rock Springs Run State Reserve property, where wetland shrub occur as "islands" within areas of unimproved pasture (212) and freshwater marsh (641).

3.4.4 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 are 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. This western alignment maximizes the continuity of the Neighborhood Lakes habitat with the conservation lands of the Rock Springs Run State Reserve on the east property boundary.

In June 2005, protected wildlife species observed by CH2M HILL ecologists in the marsh area included white ibis (roosting and feeding) and sandhill cranes (flying over head). Wood storks are likely to feed in the marsh as well. A list of wildlife observations made by an adjacent property owner from 1998 to 2005 is provided in **Appendix C - Correspondence**. The Plymouth resident, Mr. Fred Antonio, is Director of Operations/General Curator of the Central Florida Zoo (June 9, 2005 email communication from Jennifer McMurtray). His list of species observed in his back yard which adjoins the Neighborhood Lakes property contains 64 species of birds, mammals, and herpetofauna, five of which are federal or state listed as a threatened species or as a species of special concern.

Freshwater Marshes (641) are relatively level, low-lying, seasonally or semi-permanently flooded basins and meadows, typically dominated by persistent

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. Wildlife observed at this small wetland on the south side of SR 46 included a red-shouldered hawk (*Buteo lineatus*), great horned owls (*Bubo virginianus*), coral snake (*Elaphe guttata*), and wood ducks (*Aix sponsa*). Fragmentation of the wildlife habitats in this rapidly changing urban landscape can lower the wildlife value of these small forested wetlands. On the other hand, they may serve as the only refuge for birds, small mammals, reptiles, and amphibians that can co-exist in the residential/urban environment.

3.4.3 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.

These wetland constituents tend to be invasive or pioneering species (namely Carolina willow, elderberry, primrose willow, and saltbush) and are common on the landward edge of disturbed wetland sites, and often form dense thickets along right-of-ways. 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.

Approximately 7 acres of shrub wetlands occur within the Preferred Alternative. Shrub wetlands are found along roadsides in wet areas that were previously altered, such as those adjacent to residential (110) land use. Another example is the wetland near SR 46 and US 441 in Lake County, where a disturbed portion of excavated marsh has been colonized by shrubby species. Small areas of shrub wetland also 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. These disturbed shrub areas often 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). Variations in hydrology or hydroperiod affect the utilization by herpetofauna and macroinvertebrates. No threatened or endangered wildlife species were observed in these areas during the field investigations for the PD&E study.

3.4.2 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 sixty-six percent (66 percent) dominance of the crown canopy composition. The USFWS National Wetland Inventory describes these systems as semi-permanently flooded systems. The mixed-forested wetland systems include 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, swamp 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, is 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, and primrose willow. Other constituents include American beautyberry 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, grape, greenbrier, Caesarweed, 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, little blue heron, tri-colored heron and limpkin (*Aramus guarauna*). The nearest wood stork colony to the project area is approximately 10 miles north of SR 46, and within the Wekiva River Aquatic Preserve boundary.

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, makes these wetlands ecologically valuable to many wildlife species.

Many of the Wetland Forested Mixed systems that will remain (post-construction) in the project area are directly connected to forested uplands and/or marsh wetland, which enhances their wildlife value (such as at the Wekiva River floodplain, the Wekiva River Mitigation bank property, and on Rock Springs Run State Reserve). A

3.4 Wetlands

Wetlands identified within the project area include forested, shrubby, and emergent systems. Details on the wetlands, functional assessment, and impacts are presented in the final *Wetland Evaluation Report* (CH2M HILL, March 2008). A brief description of the project wetlands, and their wildlife habitat value, is presented herein.

3.4.1 Mixed Wetland Hardwoods (617)

Mixed Wetland Hardwood systems are composed of varying mixtures of hardwood species such as red maple (*Acer rubrum*), sweetgum, 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 and buttonbush. Groundcover is sparse when canopy is dense, and includes Virginia chain fern, 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 proposed right-of-way. The majority of this area will be in two treatment pond locations near I-4. One proposed pond, on FDOT property located southeast of International Parkway and SR 46, is the only location that does not require a residential or commercial parcel impact. 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 is 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 peppervine (*Ampelopsis arborea*), climbing hempweed and grapevine. 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. No threatened or endangered wildlife species were observed in these areas during the field investigations for the PD&E study.

include the headwater spring in the Wekiva Springs State Park; and north to SR 44.

3.3.1.3 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; and (e)13 Rock Springs Run State Reserve; and (f)65 Wekiva River Buffers; and (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).

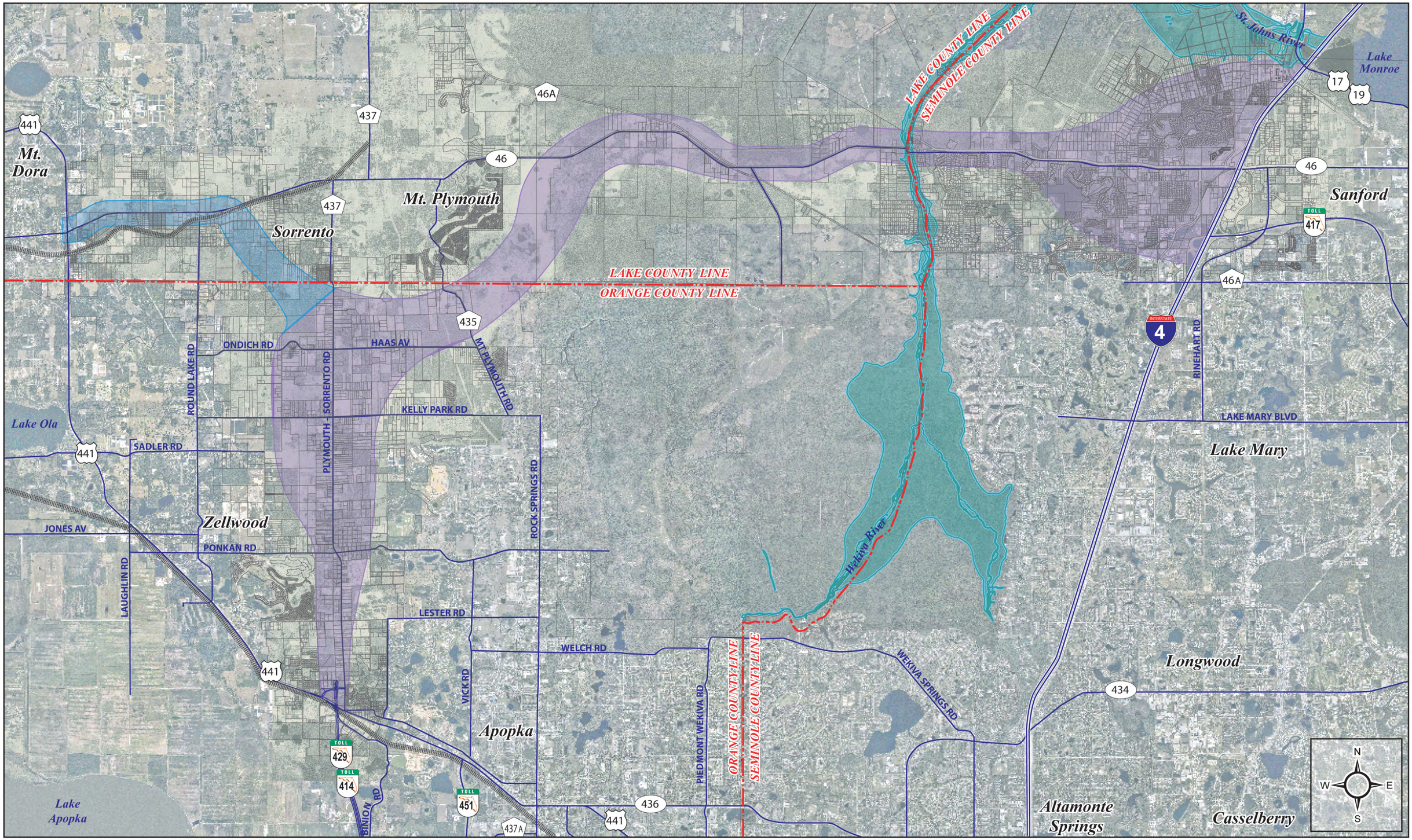
3.3.2 Lakes (523, 524)

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. No specific wildlife use of these water bodies was observed during the PD&E study.

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.

3.3.3 Reservoirs and Ponds (533, 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. A variety of wildlife potentially use open water areas, including water fowl, fish, and herptiles. No specific wildlife use of these man-made water bodies was observed during the PD&E study.



LEGEND

- Wekiva Parkway Study Corridor
- SR 46 Realignment Study Corridor
- Aquatic Preserve

Exhibit 3-1
Wekiva River Aquatic Preserve Boundary Map

WEKIVA PARKWAY
Project Development and Environment Study

must not adversely affect the abundance, food sources, or habitat (including its use 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 uplands that are 550 feet from the herbaceous wetland line, or uplands that are 50 feet from the forested 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.

3.3.1.2 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 3-1** (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.

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 right-of-way at a point 1,400 feet north of SR 434 (Sanlando Springs Road); southwest to

oak, southern magnolia (*Magnolia grandifolia*), sweetgum. The subcanopy includes winged sumac, gallberry, wax myrtle, cabbage palm, and saplings of the canopy species. Scattered patches of weedy grasses and forbs constitute the groundcover.

This is the most common land use type along the project corridor and is found in all three counties, although some of it has been converted to other land use such as residential whereby the understory and/or groundcover has been cleared leaving only the canopy. It is often found between wetlands and developed areas, which makes these areas available to several types of wildlife. Hardwood-conifer mixed communities within the Preferred Alternative, and in stormwater pond locations, total 202 acres. These communities provide habitat to a variety of organisms including passerine bird species, large, medium and small mammals, and herpetofauna. Protected species that potentially could inhabit the Hardwood-conifer mixed communities include the Sherman's fox squirrel, Florida mouse, and eastern indigo snake. No threatened or endangered wildlife species were observed in these areas during the field investigations for the PD&E study.

3.3 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.

3.3.1 Wekiva River (510), RHPZ, AP, OFW, and WSR

The open water portion of the Wekiva River is given a land use code of 510 and is describes as a surface water. It covers approximately 1 acre within the Preferred Alternative. 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, as well as receiving run off 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.

3.3.1.1 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 (RHPZ).* This is a specific area of protection to buffer the river from surrounding land uses. The RHPZ is designated per 40C-41 Surface Water Management Basin Criteria whereby specific standards and criteria are established for the protection of the riparian functions (forested uplands along a riverine system) of the Wekiva River Hydrologic Basin per subsection (3)(e)1. F.A.C. (SJRWMD 2005). Construction or alteration of a system

when present, vary in height from roughly 5 to 30 feet. Several of the sand pine tops have been broken off, presumably in the 2004 and 2005 hurricane seasons. This poorer quality habitat is located to the north and northeast of the scrub parcels along Ondich Road (previously described); namely, on the eastern portion of the Forman parcel and the former Silvestri parcel.

Elsewhere along the Preferred Alternative (within the Systems Interchange in north Orange County) approximately 15 acres of sand pine mixed with residential land use occurs. Also sand pine is found on Seminole State Forest land west of the Wekiva River (eastern Lake County) abutting the existing SR 46 right-of-way. The southern edge of this habitat along SR 46 right-of-way totals approximately 8 acres within the Preferred Alternative. No threatened or endangered wildlife species were observed in these areas during the field investigations for the PD&E study.

3.2.7 Xeric Oak (421)

The Xeric (dry) Oak community is a naturally occurring stand of trees characterized by a canopy dominated by oaks adapted to drier soils. Common canopy species include Live oak (*Quercus virginiana*), sand live oak, myrtle oak, and laurel oak (*Quercus hemisphaerica*). Minor and infrequent canopy constituents include cabbage palm, sweetgum (*Liquidambar styraciflua*), slash pine, camphortree, black cherry *(Prunus serotina*), and Spanish moss (*Tillandsia usneoides*). Saw palmetto often dominates the shrub layer.

The groundcover can vary with soil moisture and shade from a dense canopy. It is sometimes comprised of variable witchgrass (*Dichanthelium commutatum*), Spanish moss, ball moss (*Tillandsia recurvata*), Caesarweed, and common dayflower (*Commelina diffusa*), along with several vines, muscadine grape, climbing hempvine (*Mikania scandens*), poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), and greenbrier (*Smilax* sp.).

Approximately 41 acres within the Preferred Alternative is characterized as xeric oak/residential mix, which occurs in scattered locations through Orange, Lake, and Seminole Counties. The result of residential development in the xeric oak community is that the understory and/or groundcover is often cleared leaving only the canopy. Natural xeric oak community can provide habitat to a variety of organisms including passerine bird species, large, medium and small mammals, and herpetofauna. No threatened or endangered wildlife species were observed in these areas of xeric oak/residential mix during the field investigations for the PD&E study.

3.2.8 Hardwood-Conifer Mixed (434)

Hardwood-conifer mixed communities is used to describe upland forests that have a nearly equal mix of oaks, bays and pines. Common species are varied and can include a mix of longleaf pine, slash pine, sand pine, black cherry, live oak, laurel

Approximately 49 acres of Pine Flatwoods occur in the Preferred Alternative in scattered locations. Approximately half of this acreage (26 acres) is found at the Orange County abandoned borrow pits/landfills between Yothers and Ponkan Roads. Pine flatwoods provide habitat to a variety of organisms including passerine bird species, large, medium and small mammals, and herpetofauna, including the Sherman's fox squirrel and the eastern indigo snake. No threatened or endangered wildlife species were observed; in particular, no evidence of Red-cockaded Woodpeckers (*Picoides borealis*) was found, or reported to be, in the study area.

3.2.5 Longleaf Pine – Xeric Oak (412)

Longleaf Pine – Xeric Oak is a natural upland forest community characterized by a dominance of longleaf pine (*Pinus palustris*) and various dry-site oaks (*Quercus* spp.). Common vegetative species include an open canopy of myrtle oak (*Quercus myrtifolia*), turkey oak (*Quercus laevis*), longleaf pine, sand pine, rosemary (*Ceratiola ericoides*), Chapman oak (*Quercus chapmanii*), sand live oak (*Quercus geminata*), rusty lyonia (*Lyonia ferruginea*), prickly pear, and narrowleaf silkgrass (*Pityopsis graminifolia*).

Three relatively large areas of Longleaf Pine – Xeric Oak occur in or near the study area: near CR 46A on the Seminole Woods parcel; at the entrance to Rock Springs Run State Reserve off of SR 46; and east of the Wekiva River floodplain northeast of the SR 46 bridge. Approximately 5 acres of Longleaf Pine - Xeric Oak occur in the Preferred Alternative.

Protected species that could inhabit this xeric area include Sherman's fox squirrel, gopher tortoise, eastern indigo snake, short-tailed snake (*Stilosoma extenuatum*) and Florida pine snake (*Pituophis melanoleucus mugitus*), as well as more common species of passerine birds, large, medium and small mammals, and herpetofauna. Sherman's fox squirrel, wild turkey, and blue-gray gnatcatcher (*Polioptila caerulea*) were observed during the field investigations in the 412 community occurred on the Lower Wekiva River State Park, east of the river.

3.2.6 Sand Pine (413)

Sand Pine is an upland forested community characterized by a dominance of sand pine and various dry-site oaks. In the project area, this community type designation is given to the "scrub areas" along Ondich Road in Orange County where a small group of three (3) scrub jays were observed in the few areas were the canopy is still somewhat low and open. The Preferred Alternative will avoid the area of Sand Pine where the scrub jays were found, as described in Section 4.3.13 *Florida Scrub Jay*. By shifting the Preferred Alternative to the east, approximately 39 acres of poorer quality habitat of sand pine will be impacted. In this area of the project, a nearly impenetrable stand of sand pine has over shadowed and out-competed the xeric oak community. The dense canopy (90 to 100% closure) is comprised of sand pine reaching a height of 50 to 60 feet. Very few open sandy patches remain. Oak species,

3.2.2 Shrub and Brushland (320)

Shrub and Brushland is generally dominated with saw palmetto (*Serenoa repens*). Other woody shrubs, such as winged sumac (*Rhus copallinum*) and gallberry (*Ilex glabra*), and a variety of grasses and herbaceous plants are intermixed with the palmetto. As with the Herbaceous Dry Prairie, wildlife value of the Shrub and Brushland varies depending on the surrounding habitats and land uses. However, the shrub stratum provides an additional layer of refuge for small mammals and herpetofauna species. Protected wildlife species utilization could include gopher tortoise and indigo snake, as well as a variety of common birds, mammals, and herpetofauna. No threatened or endangered wildlife species were observed. A small amount of 320 Shrub and Brushland occurs as a fringe along the edge of freshwater marsh on northwest side of Rock Springs Run State Reserve; and approximately 1 acre is found within the Preferred Alternative.

3.2.3 Mixed Rangeland (330)

Mixed Rangeland is a tree-less community (or nearly tree-less) with a mixed cover of grasslands and shrubs, where neither type is dominant. Mixed Rangeland occurring in the Preferred Alternative totals approximately 2 acres. Included in the mixed cover of grasses, sedges, and shrubs is wiregrass, bahiagrass, bushy bluestem, dog fennel, saw palmetto, gallberry, persimmon, wax myrtle (*Myrica cerifera*), rabbit's tobacco (*Gnaphalium obtusifolium*), big carpetgrass, and prickly pear.

Most of the Mixed Rangeland is in the Neighborhood Lakes property in Orange County (discussed under abandoned groves 224). A large area of long-time abandoned grove, transitioning to mixed rangeland, supports numerous gopher tortoises. Protected wildlife species utilization could also include indigo snake, sandhill crane (foraging), burrowing owl, and southeastern American kestrel, as well as a variety of common birds, mammals, and herpetofauna.

3.2.4 Pine Flatwoods (411)

Pine Flatwoods is a once common community type found on sandy non-hydric soils across Florida. Within the study corridor, only a few areas of pine flatwoods remain. Expansive Pine Flatwoods occur adjacent to the study corridor on Rock Springs Run State Reserve and on Seminole State Forest. Canopy density varies considerably throughout this community type. Canopy is dominated by slash pine with saw palmetto and wiregrass understory. Minor species include swamp laurel oak (*Quercus laurifolia*), gallberry, wax myrtle, winged sumac, cabbage palm (*Sabal palmetto*), camphor tree (*Camphora cinnamomea*), and water oak (*Quercus nigra*). The shrub layer contains saw palmetto, American beautyberry (*Callicarpa americana*), gallberry, and shiny blueberry (*Vaccinium myrsinites*). The herbaceous layer is sparse, and includes bracken fern (*Pteridium aquilinum*), Virginia chain fern (*Woodwardia virginica*), muscadine grape (*Vitis rotundifolia*), and Caesarweed (*Urena lobata*).

Pine plantations provide significant commercial value for forest products such as lumber, pulp wood for paper, and pine straw. Unless hunting is allowed, these areas would not generally provide food source or recreational public use.

3.1.4 Forest Regeneration (443)

The Forest Regeneration designation is used when previously managed lands of natural and planted slash pine have been left to regenerate. The SR 46 Realignment will cross through an area of Forest Regeneration in Lake County West, north of the Orange County line and west of Plymouth Sorrento Road. The dominant canopy constituent is sand pine. Approximately 26 acres of this habitat will be impacted by the Preferred Alternative and stormwater ponds. A few ground dwelling passerine birds, small mammals, and herpetofauna may take refuge under the dense canopy. No wildlife was directly observed in this area during field investigations conducted for the PD&E study.

3.2 Undeveloped Uplands

3.2.1 Herbaceous Dry Prairie (310)

Herbaceous Dry Prairie is characterized as a tree-less upland densely covered with a variety of herbs, sedges, rushes, and grasses, such as wiregrass (*Aristida* sp.), bushy bluestem, dog fennel, and may include some saw palmetto (*Serenoa repens*). Soils are non-hydric, but the community may be inundated for short periods of time. Herbaceous Dry Prairie occurring in the Preferred Alternative covers approximately 48 acres. The majority of this area (37 acres) occurs along the southern boundary of the Seminole State Forest. This area will be impacted by the Wekiva Parkway and the proposed stormwater ponds located between the remnant portion of SR 46 to the south and Wekiva Parkway to the north. A large area of Herbaceous Dry Prairie will remain on the Seminole State Forest north of SR 46 in Lake County. This area is vegetated with a broad cover of prickly pear (*Opuntia humifusa*) and persimmon (*Diospyros virginiana*). Two active gopher tortoise burrows were found near the southern edge of this dry prairie. A few areas of Herbaceous Dry Prairie also occur in Seminole County near the proposed Wekiva Parkway (SR 429) interchange with I-4.

Wildlife value varies depending on the surrounding habitats and land uses. For example, prairie that is contiguous to natural forested habitats would be utilized by more wildlife species than would prairie surrounded by residential development. Protected wildlife species utilization could include gopher tortoise, southeastern American kestrel (*Falco sparverius paulus*), burrowing owl, as well as a variety of common birds, mammals, and herpetofauna. No threatened or endangered wildlife species were observed, other than the previously mentioned two gopher tortoise burrows found on Seminole State Forest.

surveys will be conducted within this land use type, per the FWC protocol, during the permitting phase of the project.

Another large area of long-time abandoned grove is transitioning to Mixed Rangeland (330) on the Neighborhood Lakes parcel, also in Orange County. This area supports numerous gopher tortoises, and approximately 44 acres will be impacted by the Preferred Alternative. Another 8 acres of this abandoned grove/mixed rangeland may be graded for a floodplain compensation pond; however, this loss of rangeland habitat may be unnecessary if the regulatory agencies agree to allow the floodplain volume to be absorbed into the expansive rangeland. This would result in a very small increase in ground water level, which is expected to have no effect on gopher tortoise, indigo snakes, or burrowing owls.

An abandoned grove in Seminole County, north of SR 46 near Yankee Lake, has been converted to a forested spray field (833) for the Seminole County NW Water Reclamation Facility. Approximately 18 acres will be impacted by the Preferred Alternative and stormwater ponds for the Wekiva Parkway. A stormwater pond will also be constructed in a 10-acre area of abandoned grove that is transitioning to xeric oak (224/421), located farther east at Glade View Drive. Feral hogs and wild turkey (*Meleagris gallopavo*) were observed in the forest.

3.1.3 Coniferous Plantations (441)

Managed lands of natural and planted slash pine (*Pinus elliottii*) are found throughout the area. In the general project vicinity, areas of dry planted pines are small in acreage and are intermixed among residential and agricultural land uses. This planted pine community, totaling 39 acres in the Preferred Alternative, is a low-intensity managed land where human activity is very infrequent. Tree harvesting may occur on a 20 – 30 year rotation; occasional clearing of the understory or controlled burn, may or may not occur.

The managed areas are in various growth stages as the harvesting and replanting rotation progresses from stand to stand. When the area is cleared of trees, the groundcover becomes the dominant vegetative descriptor. Wildlife habitat value of the pine plantations is limited compared to a natural pine forest with more vegetative diversity. Pine plantations have poor species diversity in the canopy as well as in other strata: subcanopy, shrub and herbaceous layers. However, they do provide refuge and forage for a number of wildlife species. A few gopher tortoises were found along the edge of the pine plantation, in the area known as Pine Plantation, located west of the Neighborhood Lakes parcels in Orange County. The Preferred Alternative will avoid the known burrows. The area will be surveyed again for gopher tortoise, per FWC protocol, during the permitting phase of the project.

3.1.1 Pastures (211, 212, 213, 215, 251)

Improved Pasture (211), Unimproved Pasture (212), Woodland Pasture (213), Field Crops (215), and Horse Farm Pasture (251) occur in the project study area mainly in Lake and Orange Counties. Acreage covered by these land use types within the Preferred Alternative are approximately: 158 acres of Improved Pasture, 120 acres of Unimproved Pasture, 14 acres of Woodland Pasture, 69 acres of Field Crops, and 66 acres of Horse Farm Pasture. Most of these land use types are small parcels associated with residential land uses. The largest area of unimproved pastures is within the Neighborhood Lakes parcel. The field crops land use occurs on the Rock Springs Run State Reserve along existing SR 46.

The dominant characteristic of pastureland is the groundcover. Most often it is dominated by bahiagrass (*Paspalum notatum)*, with associate species that can include dogfennel (*Eupatorium capillifolium*), bushy bluestem (*Andropogon glomeratus)*, big carpetgrass (*Axonopus furcatus)*, capeweed (*Phyla nodiflora*), and thistle (*Cirsium* sp.). With the exception of the woodland pasture, most trees have been removed. Woodland pastures typically feature xeric oaks set amid the pasture grasses, with little to no understory or shrub layer. The extent to which these pastures will be used by wildlife is dependent on the availability of adjacent habitat and the intensity of human activity in the area. Burrowing owls, sandhill cranes, and gopher tortoises were found on the 212 Unimproved Pasture of the Neighborhood Lakes parcel located west of the Rock Springs Run State Reserve and south of SR 46. This large parcel will be set aside for conservation, except for that needed for the right-of-way. Feral hog (*Sus scrofa*) and white-tailed deer (*Odocoileus virginianus*) were observed in the cleared field (215) on Rock Springs Run State Reserve south of SR 46.

3.1.2 Groves (221, 224)

Citrus Groves (221) are characterized by managed rows of citrus trees (orange, grapefruit, lemon, tangerine, etc); whereas, Abandoned Groves (224) no longer are actively managed for citrus, but the rows of trees are still evident. Actively managed groves might include an irrigation system, weed and pest control, pruning, and harvesting. Wildlife uses are common on the edge of grove, such as gopher tortoise, lizards, snakes, and birds. Citrus Groves occurring in the Preferred Alternative total 10 acres. Most of the groves in the project study area are in Lake and Orange Counties, and often are associated with residential land uses.

Abandoned groves transition into other land use types as the citrus stumps are taken over by xeric oak or pine species growing in rows. Abandoned groves will be utilized by a wide variety of wildlife as the oaks reestablish. In Orange County north of Haas Road and west of Plymouth Sorrento Road, one area of long-time abandoned grove is being over grown with sand pine (*Pinus clausa*) (413). Approximately 14 acres of this area is within the Preferred Alternative. Ten active gopher tortoise burrows were observed in the area in 2005. Gopher tortoise burrow

TABLE 3-1 (CONTINUED)

FLUCFCS	FLUCFCS Description	NWI Code	NWI Description
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 Wetlands			
631	Wetland Shrub	PSS6/7	Palustrine, Shrub, Broad-leaved / needle-leaved, deciduous / evergreen
Treeless Wetlands			
641	Freshwater Marsh	PEM1	Palustrine, Emergent, Persistent
643	Wet Prairie	PEM1	Palustrine, Emergent, Persistent
644	Emergent Aquatic Vegetation	PEM1	Palustrine, Emergent, Persistent
Improvements 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)
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.

3.1 Low-Intensity Managed Agriculture Lands

Some of the agriculture and silviculture land use types require lower intensity management activities than do others; as such, they may provide some habitat for wildlife. Land use types that typically have less frequent human presence and a lower intensity management schedule include improved pastures (211), unimproved pasture (212), woodland pastures (213), field crops (215), citrus groves (221), abandoned groves (224), horse farm pastures (251), coniferous plantations (441), and forest regeneration areas (443).

Species such as the burrowing owl, pine snake (*Pituophis melanoleucus mugitus*), and gopher tortoise along with the many species that share its burrow (like the indigo snake, Florida mouse (*Podomys floridanus*), and gopher frog (*Rana capito*) may use these areas when human and/or cattle disturbances are at a minimum. Field investigations were conducted to identify if any of these privately managed lands also provide habitat for listed wildlife.

TABLE 3-1 (CONTINUED)

FLUCFCS	FLUCFCS Description	NWI Code	NWI Description
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
Agricultural 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)
240	Nurseries	--	Upland (developed)
241	Tree Nurseries	--	Upland (developed)
251	Horse Farms*	--	Upland (managed)
Treeless Uplands			
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 Waters			
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**.

The prairies have a variety of groundcover species commonly associated with this tree-less habitat, such as wiregrass, rushes (*Eleocharis spp.*), sand cordgrass, sedges, witchgrass, cinnamon fern, sphagnum moss (*Sphagnum* sp.), Carolina redroot, and panic grasses (*Panicum* spp.).

Indications of wildlife utilization include use by wading birds, small and medium mammals (white-tailed deer), and breeding areas for herpetofauna. The ephemeral (seasonally dry) 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.

3.5 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 (e.g., 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.