



United States Department of the Interior



FISH AND WILDLIFE SERVICE
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March 18, 2003

Colonel James G. May
District Engineer
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Log No.: 4-1-02-F-2027
Application No.: 199905000(IP-TB)
Dated: August 23, 2002
Applicant: Omni Waste of Osceola County, LLC
County: Osceola

Dear Colonel May:

This document transmits the Fish and Wildlife Service's (Service) Biological Opinion for the proposed Omni Waste solid waste facility at Oak Hammock, located in Osceola County, Florida and its effects on the Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). Your November 5, 2002, request for formal consultation was received on November 5, 2002.

This biological opinion is based on information provided in the June 25, 2002, application for an environmental resources permit, the August 23, 2002, environmental summary of ecological conditions on the approximately 1,089-acre oak hammock conservation area, the August 23, 2002, Public Notice, telephone conversations, field investigations, meetings, and other sources of information. A complete administrative record of this consultation is on file in this office.

In an August 23, 2002, letter, the U.S. Army Corps of Engineers (Corps) provided a determination of "no effect" for the threatened sand skink (*Neoseps reynoldsi*), the threatened Florida scrub-jay (*Aphelocoma coerulescens*), and the threatened bald eagle (*Haliaeetus leucocephalus*). The August 23, 2002, letter also provided a determination of "may affect, not likely to adversely affect" for the threatened eastern indigo snake (*Drymarchon corais couperi*), the endangered wood stork (*Mycteria americana*), the threatened Audubon's crested caracara (*Polyborus plancus audubonii*), and the endangered red-cockaded woodpecker (*Picoides borealis*).

Sand skink

The project is outside of the extant range of the sand skink. Based on the lack of suitable habitat or soil types onsite, the Corps has provided a determination of “no effect” for the sand skink. The Service supports this determination.

Florida scrub-jay

Scrub-jays utilize a variety of scrub habitats in central and south Florida as foraging and nesting habitat. Scrub-jays prefer xeric oak scrub, scrubby pine flatwoods, scrubby coastal strand, and sand pine scrub, but will also utilize pastures, citrus groves, rangeland, pine habitats, and some disturbed habitats. In general, scrub-jays have well defined group territories, averaging 25 acres in size (Fitzpatrick *et al.*, 1991). Scrub areas onsite are small and will be preserved within the conservation area. No scrub-jays have been detected onsite. Based on the lack of habitat onsite, the Corps has provided a determination of “no effect” for the scrub-jay. The Service supports this determination.

Bald Eagle

Bald eagles occur in Osceola County year-round and utilize a variety of habitats including high pine, scrubby high pine, maritime hammock, temperate hammock, scrubby flatwoods, pine flatwoods, prairie, freshwater marsh, and swamp. There are no known bald eagle nests on or adjacent to the project site. Based on the lack of eagle nesting near the project site, the Corps has provided a determination of “no effect” for the bald eagle. The Service supports this determination.

Eastern indigo snake

Eastern indigo snakes occur year-round in Osceola County and utilize a variety of habitats including tropical hardwood hammock, pine, beach dune/coastal strand, xeric uplands, prairie, maritime hammock, freshwater marsh, and hydric pine flatwoods. Suitable habitat for the eastern indigo snake exists on the project site. The applicant has agreed to incorporate the *Standard Protection Measures for the Eastern Indigo Snake* into the project design, which minimizes potential adverse effects to this species. Based on the incorporation of the protection measures into the project design, the Corps has provided a determination of “may affect, not likely to adversely affect” for the eastern indigo snake. The Service concurs with this determination.

Wood stork

Wood storks utilize Florida’s wetlands for foraging habitat year-round. The Service has identified a core foraging area of 18.6 miles around all known wood stork rookeries. The Omni Waste project is within 18.6 miles of 5 known wood stork rookeries. Typical foraging sites for the wood stork include freshwater marshes, stock ponds, shallow and seasonally flooded roadside or agricultural ditches, narrow tidal creeks, shallow tidal pools, managed

impoundments, and depressions in cypress heads, swamps, and sloughs. Because of their specialized feeding behavior, wood storks forage most effectively in shallow water areas with highly concentrated prey. Construction of the Omni Waste project may impact wetlands important to wood stork foraging. The applicant is proposing to fill 1.35 acres of forested wetlands, 13.1 acres of herbaceous wetlands, and 0.85 acre of onsite ditches. As mitigation for wetland impacts, the applicant will enhance and preserve 1,089 acres onsite, including the hydrological enhancement of 113 acres of wetlands associated with Bull Creek. The historical excavation of Bull Creek increased drainage of the property and resulted in a reduced hydroperiod in the wetlands through which it flows. The applicant proposes to restore the historic hydrology in these wetlands by constructing a series of five weirs across the channelized sections of Bull Creek. Hydraulic modeling suggests the weirs will increase low flow water elevations of Bull Creek an average of 0.97 foot. The higher base flow water levels should increase the prey base for the wood stork and increase feeding efficiency in this area. These wetlands are within the core foraging area of the affected rookeries. Based on the applicant's mitigation, the Corps has provided a determination of "may affect, not likely to adversely affect" for the wood stork. The Service concurs with this determination.

Audubon's crested caracara

Caracaras occur year-round in Osceola County and utilize a variety of habitats including mesic temperate hammock, mesic pine flatwoods, hydric pine flatwoods, prairie, and pasture. Caracaras primarily nest in cabbage palms, although nests have been recorded in other tree species. There are no cabbage palm trees within the development area of the Omni Waste project. Overall, there are few cabbage palm trees on the Omni Waste property. All cabbage palm trees onsite were surveyed, however no caracara nests were located onsite. Two caracaras were observed on two separate occasions flying over the site. No caracara has been observed foraging onsite. The majority of suitable habitat onsite will be preserved and managed in the conservation area. Based on the lack of nesting activity and the onsite habitat preservation, the Corps has provided a determination of "may affect, not likely to adversely affect" for the caracara. The Service concurs with this determination.

Red-cockaded woodpecker

Red-cockaded woodpeckers utilize southern slash pine (*Pinus elliottii* var. *densa*) flatwoods as nesting and foraging habitat in south Florida (Beever and Dryden 1992) and longleaf pine in central Florida (Delotelle *et al.* 1987). Colony sites are 5 to 10 acres in size. Homeranges average 350 to 400 acres in southern Florida, but can exceed 500 acres in southwest Florida. Suitable habitat for the red-cockaded woodpecker exists onsite. No red-cockaded woodpeckers were detected during species-specific surveys performed onsite. The project site is approximately 2.4 miles from the closest known active colony and is outside of the likely foraging range for this colony. Based on the lack of cavity trees, the Corps has provided a determination of "may affect, not likely to adversely affect" for the red-cockaded woodpecker. The Service concurs with this determination.

I. CONSULTATION HISTORY

On March 22, 2002, the applicant's consultant, Biological Research Associates (BRA), transmitted a letter to the Service outlining their proposed methodology for Florida grasshopper sparrow (Sparrow) surveys onsite.

On April 10, 2002, in a telephone conversation, the Service provided comments to BRA on the proposed survey methodology.

On May 17, 2002, BRA transmitted a letter to the Service describing Sparrow survey results for the years 2000 and 2002, and indicating that although one or more Sparrows were identified by song in early April, additional surveys later in the survey season were unable to identify any Sparrows.

On June 6, 2002, the applicant, BRA, and the Service met at the Service's Ecological Services Office in Vero Beach, Florida. BRA presented the project history and asked the Service's opinion on the identification of Sparrow(s) in 2000 and 2002 only early in the nesting (survey) season and never later in the survey season. The Service stated that Sparrow(s) have been identified onsite, therefore the Service considers the habitat occupied, and loss of the habitat onsite would require a biological opinion. The biological opinion process and mitigation options were discussed.

On June 25, 2002, BRA transmitted their application for an environmental resource permit, including the conceptual wildlife and habitat management plan for the Oak Hammock disposal site.

On August 23, 2002, the Corps issued a Public Notice for permit application 199905000(IP-TB). Omni Waste proposed to fill 14.33 acres of wetlands in order to develop a solid waste facility on a 2,179-acre parcel. The Corps determined that the proposed project would "not effect" the sand skink, Florida scrub-jay, or bald eagle. The Corps determined that the proposed project "may affect, but is not likely to adversely affect" the eastern indigo snake, wood stork, Audubon's crested caracara, and red-cockaded woodpecker.

On August 23, 2002, the Corps transmitted a letter to the Service providing an additional determination of "may affect" for the Sparrow.

On September 11, 2002, BRA transmitted an email to the Service stating no mitigation outside of the onsite conservation area is being proposed and their opinion that the correct determination for the Sparrow is "may affect, not likely to adversely affect."

On September 24, 2002, BRA transmitted an email to the Service containing additional information relating to wildlife surveys performed onsite, supporting Corps determinations.

On October 30, 2002, the applicant, the applicant's attorney, representatives from the City of St. Cloud and Osceola County, BRA, the Florida Fish and Wildlife Conservation Commission (FWC) and the Service met at the Service's Ecological Services Office in Vero Beach, Florida. BRA presented updated information regarding the conceptual wildlife and habitat management plan and the Service discussed what further information was needed in order to initiate formal consultation, particularly information on conservation measures proposed to minimize effects of the project to the Sparrow. The Service's June 4, 2002, *Florida Grasshopper Sparrow Conservation Guidelines* were distributed.

On November 1, 2002, BRA transmitted additional information via email related to the location of all scrub habitat inside the conservation area and presented draft language limiting cattle density to one cow-calf unit per 25 acres in the conservation area.

On November 1, 2002, BRA transmitted a CD containing a document entitled "Environmental Summary of Ecological Conditions on the +/- 1,089 Acre Oak Hammock Conservation Area."

On November 5, 2002, the Corps requested initiation of formal consultation on the Sparrow.

On November 8, 2002, the Service visited the Omni Waste project site with the applicant. The Service discussed the habitat needs of the Sparrow and visited the conservation area and the neighboring property, a large ranch open to the public for wildlife tours entitled, Forever Florida. The applicant provided the Service with a map of land owners adjacent to Three Lakes Wildlife Management Area (WMA) and discussed voluntary compensation measures.

On November 13, 2002, the Service contacted Mike Adams concerning the Adams Ranch property east of Three Lakes Wildlife Management Area, south of Lake Marian. Mike Adams indicated that he would be amenable to discussing the placement of a conservation easement on his land and gave permission for Omni Waste to contact him concerning the Oak Hammock project.

On November 14, 2002, BRA transmitted to the Service, an aerial, via email, of the Adams Ranch property to the Service and asked the Service to indicate on the aerial where Sparrows had been identified on the property.

On November 14, 2002, the Service transmitted a revised aerial, depicting where 22 singing male Sparrows were identified during a 2000 Sparrow survey in the northwest corner of the Adams Ranch property, to BRA, the applicant, and the applicant's attorney.

On November 20, 2002, the applicant, in a telephone conversation with the Service, indicated he had set up a meeting with Mike Adams and hoped to arrange to have a conservation easement placed over occupied habitat as voluntary compensation.

On November 25, 2002, the applicant, in a telephone conversation with the Service, indicated that the meeting with the Adams family had gone well and Omni Waste expects to be able to arrange to place a conservation easement over part of the Adams Ranch property.

On December 16, 2002, the Service transmitted comments to the Corps, supporting the Corps' determinations on the sand skink, Florida scrub-jay, and bald eagle, and concurring with the Corps' determinations for the eastern indigo snake, wood stork, Audubon's crested caracara, red-cockaded woodpecker and the Sparrow. The Service initiated formal consultation and indicated that a final biological opinion would be provided to the Corps on or before March 20, 2003.

On December 19, 2002, the applicant transmitted an email to the Service indicating that Omni Waste had reached a tentative agreement with the owners of Adams Ranch to place 40 acres of occupied Sparrow habitat into an easement amenable to the Service, the applicant, and Adams Ranch.

On January 17, 2002, BRA transmitted an email to the Service indicating that Omni Waste would agree to restricting the timing of initial clearing or land disturbance of Borrow Pit A and Borrow Pit B, where surveys detected the presence of Sparrow(s), to outside of the nesting season as a Reasonable and Prudent Measure.

On January 17, 2002, the applicant's lawyer submitted a draft conservation easement stating that Omni Waste is prepared to record the conservation easement on 40 acres of the Adams Ranch.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

Proposed Action

The applicant proposes to construct a solid waste facility on an approximately 2,179-acre parcel. The site consists of 404 acres of improved pasture, 609 acres of palmetto prairie, 389 acres of pine flatwoods, 26 acres of xeric oak, 1 acre of reservoir, 9 acres of ditches, 138 acres of cypress dominated forested wetlands, 231 acres of mixed forested wetlands, 117 acres of freshwater marsh, and 255 acres of wet prairie (Figure 1). As shown on the project plans (Figure 2), less than half of the project site will be developed into the solid waste facility. Half, or 1,089 acres, of the project site will be preserved and managed under conservation easement. The solid waste facility will be built in an area which is currently improved pasture. Borrow pits will be constructed adjacent to the landfill footprint, in palmetto prairie. The placement of the landfill footprint and the adjacent borrow pits were designed to minimize wetland impacts and preserve the maximum amount of native habitat within the conservation area. The applicant proposes to fill 1.2 acres of cypress dominated forested wetlands, 0.15 acre of mixed forested wetland, 13.1 acres of herbaceous wetlands, 0.85 acre of ditch, and 0.2 acre of cattle pond. The project site is located 6.5 miles south of the intersection of US 192 and US 441, on the west side of US 441, in Sections 11, 13, and 14, Township 28 South, Range 32 East, and Sections 17 and 18, Township 28 South, Range 33 East, Osceola County, Florida (Figure 3).

As mitigation for wetland impacts, the applicant proposes to preserve and enhance a 1,089-acre parcel onsite consisting of 493.4 acres of wetlands and 595.6 acres of uplands. The applicant's

Conceptual Wildlife and Habitat Management Plan for the conservation area proposes upland enhancement through the implementation of a prescribed burn plan and hydrological enhancement and restoration of 113 acres of wetlands associated with Bull Creek (Figure 4). The applicant will install a series of five weirs across the channelized sections of Bull Creek. Excavation of Bull Creek increased drainage on the property and resulted in a reduced hydroperiod in adjacent wetlands. Hydraulic modeling predicts the series of weirs will increase low flow water elevations of Bull Creek an average of 0.97 foot. This hydrological enhancement should retard the current colonization of Bull Creek wetlands by upland plant species. The increased hydroperiod will benefit wetland dependant fish and wildlife species.

Sparrow surveys in 2000 detected a solitary singing male Sparrow in the palmetto prairie adjacent to the improved pasture habitat onsite (Figure 5). Additional surveys in 2002 detected one or more singing male Sparrows occupying the palmetto prairie in the same area as the individual Sparrow was detected in 2000 (Figure 6). The Service considers an average home range size for a breeding pair to be 7.8 acres, therefore, two occupied territories would occupy approximately 16 acres. The applicant proposes to convert all occupied habitat and adjacent improved pasture into a solid waste facility and associated borrow pits. Remaining prairie resources onsite in the conservation area are unlikely to support a population of Sparrows based on their small size and forested condition.

The applicant is proposing to place 40 acres of offsite habitat adjacent to Three Lakes WMA under conservation easement to benefit the species as a whole. Three Lakes WMA contains one of only six known populations of Sparrows in Florida, and is the closest known population of Sparrows to the project site. South of Lake Marian, and east of the Three Lakes WMA border, on the privately owned Adams Ranch Lake Marian property, 22 singing male Sparrows were identified by survey in 2000. The property is currently owned and managed by the Adams family. The Adams family is currently managing the occupied habitat to the benefit of the Sparrow, however under private ownership, the future of the property is uncertain. The applicant has reached an agreement with the Adams family to place 40 acres of occupied habitat adjacent to Three Lakes WMA under conservation easement, with continued management and use by the Adams family. The placement of occupied habitat on private property, adjacent to a protected and managed population of Sparrows, under conservation easement is consistent with the Service's June 4, 2002, *Draft Florida Grasshopper Sparrow Conservation Guidelines* and will provide benefit to the species as a whole.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The Service has determined that the action area for this project includes the project site, the offsite compensation area, and the adjacent population of Sparrows on Three Lakes WMA (Figure 7).

STATUS OF THE SPECIES AND CRITICAL HABITAT RANGEWIDE

The following discussion is summarized from the *South Florida Multi-Species Recovery Plan* (MSRP) (Service 1999). A complete Sparrow life history discussion can be found in the MSRP. Current research efforts are focused on determining the responses to habitat restoration and management actions, and on developing an effective translocation protocol. No critical habitat has been designated for the Sparrow, therefore none will be affected.

Species/Critical Habitat Description

General description

The Sparrow is a subspecies of grasshopper sparrow that is endemic to the dry prairie of central and southern Florida. This subspecies is extremely habitat specific and relies on fire every two to three years to maintain its habitat. Because of declines in the Sparrow's suitable habitat and population size, the National Audubon Society placed the Sparrow on its blue list in 1974. This species was listed as endangered by the State of Florida in 1977. The Service listed the Sparrow as endangered in 1986 because of habitat loss and degradation resulting from conversion of native vegetation to improved pasture and agriculture (51 FR 27495).

The Sparrow is a small, short-tailed, flat-headed sparrow averaging 13 cm in total length (Vickery 1996). The top of its head is mostly blackish with a light median stripe. The remainder of its dorsum is mainly black, edged with gray, and streaked with brown on the nape and upper back. The sparrows are whitish underneath, unstreaked, with buff throat and breast; juveniles have streaked breasts. The grasshopper sparrow's ventral color pattern resembles that of the Bachman's sparrow (*Aimophila aestivalis*). The retrices of the grasshopper sparrow are pointed, its lores are light gray to ochraceous, and the bend of the wing is yellow. Its bill is thick at the base, and its feet are flesh-colored.

This subspecies is marked with a longer bill and longer tarsi than the migrant northeastern subspecies (*A. s. pratensis*); it also has a darker dorsum. The plumage of the Sparrow is blacker in appearance than *A. s. pratensis*, and the sides and flanks are more grayish (Dean, personal communication 2002b). Adult Henslow's sparrows (*A. henslowii*) and Le Conte's sparrows (*A. lecontei*) are similar to grasshopper sparrows in appearance; however, unlike adult grasshopper sparrows, adults of these species have ventral streaking. Although the juveniles of these species would be difficult to distinguish visually, only the Sparrow breeds in Florida, so juveniles of these species do not overlap.

Behavior and identification

Sparrows are secretive by nature and have few behaviors or characteristics that allow them to be readily located or identified. They are almost exclusively terrestrial, spending nearly all of their time on the ground. The only times when they regularly perch or fly is when males are territorial, and when they are disturbed or flushed. During the breeding season, males perch,

sing, and perform short territorial display flights for a few hours each day. Females are only observed when carrying food to nestlings or when flushed. After the end of the breeding season, Sparrows become much more secretive, and do not vocalize or fly except in response to disturbance. In general, Sparrows prefer to avoid disturbances by walking rather than flying, and generally only fly if a potential predator approaches within 2-3 meters (6-10 ft).

During the breeding season, the male and female grasshopper sparrows can be distinguished in the hand by the presence of a cloacal protuberance in the male or brood patch in the female. Gender may also be determined during the breeding season by wing chord length and body weight, the wing dimension is smaller in female grasshopper sparrows relative to their body weight (Delany *et al.* 1994, cited in Service 1999).

The Sparrow is most easily located and identified by its song. The song of the Sparrow is among the weakest of any North American bird (Stevenson 1978). Nicholson (1936) described it as being indistinct and as having a definite insect-like quality, which gave rise to the bird's common name (Sprunt 1954). The song starts as three low pitched notes followed by a longer, higher pitched "buzz" (Delany 1996a). Grasshopper sparrows sing while perched upon dead palmetto leaves, dead oak twigs, staggerbush (*Lyonia* spp.), and tarflower (*Befaria racemosa*), generally between 15 and 90 cm in height (Nicholson 1936, Delany *et al.* 1995), although they may also sing from the ground (Dean, personal communication 2002b).

Habitat

As stated previously, the Sparrow is endemic to the dry prairie of central and southern Florida. These dry prairies are relatively flat and are moderately to poorly drained. The soils typically consist of 0.3 to 1.0 m of acidic, nutrient-poor quartz sands overlying a high clay subsoil or organic hardpan (spodic horizon) (FNAI and FDNR 1990, Abrahamson and Hartnett 1990). Both the heavy subsoil and hardpan reduce the movement of water below and above their surfaces (FNAI and FDNR 1990). Thus, dry prairies may become flooded for short periods during the rainy season, but remain dry for the remainder of the year. The water table in these prairies is normally found between several centimeters and a meter below the soil surface.

Sparrows prefer large (greater than 50 hectare [ha]), treeless tracts of dry prairie, dominated by saw palmetto (*Serenoa repens*) and dwarf oaks (*Quercus minima*) ranging from 30 to 70 cm in height. Bluestem grasses (*Andropogon* spp.), St. John's wort (*Hypericum* spp.), and wiregrasses (*Aristida* spp.) are also common components of grasshopper sparrow habitat (Delany *et al.* 1985, Service 1988). Grasshopper sparrows prefer tree densities well below one tree per acre. When compared with habitat of other grasshopper sparrows, habitat used by *A. s. floridanus* and *A. s. pratensis* is characterized by a larger percentage of shrub and bare ground, a smaller percentage of tall vegetation, and less litter (Delany *et al.* 1985). Because grasshopper sparrows are ground-dwelling birds, they usually require at least 20 percent bare ground for unrestricted movement and foraging, but need enough vegetation to provide nesting cover (Whitmore 1979, Vickery 1996). Large areas of prairie habitat, possibly greater than 4,000 ha, are needed to maintain self-sustaining populations of Sparrows (Perkins 1999).

Sparrows are also documented to be reproductively successful in pastures that are overgrown or ungrazed (Mulholland and Small 2001). However, as pastures become heavily grazed, Sparrow populations have been documented to decrease or disappear (Delany and Linda 1994). Little is known about what characteristics of non-native vegetation make an area suitable. Field observations have revealed use of non-native habitats including bahia pastures with nearly 100 percent ground cover (Dean, personal communication 2002a). Additionally, radio-telemetry has located birds within tall graminoids, such as *Andropogon* spp., and other native grasses with dense inflorescences in excess of 6 feet tall. Sparrows appear to prefer pasture sites containing some structural diversity, such as bunchgrasses (*Andropogon* spp., *Aristida* spp., *Schizachyrium* spp.), small shrubs (*Asimina* spp., *Myrica cerifera*, *Serenoa repens*, and others), and forbs (*Eupatorium* spp., *Solidago* spp., and others) (Dean, personal communication 2002a). Appropriate management of bahia pastures to maintain Sparrow habitat remains largely unknown.

Extant range

Using an aerial assessment, Shriver and Vickery (1999) calculated that by 1995, 81 percent of the dry prairie that had been documented in 1967 had been converted to habitat unsuitable for sustaining Sparrows, primarily “improved” pastures consisting of exotic sod-forming grasses, row-crops, citrus, and pine plantations. Additional prairie habitat may have been severely degraded or eliminated due to infrequent burning. The current known range of the species is limited to Highlands, Okeechobee, Osceola, and Polk Counties. The birds identified on the Omni Waste Oak Hammock site are most likely a subpopulation of the Sparrows occurring on Three Lakes WMA, one of six known remaining populations of Sparrows, five of which occur on protected habitat (Figure 8). Although adult Sparrows are sedentary, the high level of genetic homogeneity between five existing populations of sparrows suggests that gene flow is occurring between the populations (Delaney *et al.* 2000).

Life History

Reproductive strategy

Courtship

Little information is available on the courtship activities of this secretive bird. Nicholson wrote that “the male Sparrow has a fluttering mating flight similar to that of the seaside sparrow (*Ammodramus maritimus*) except that it is low, 3 to 5 feet above the ground for 50 to 100 feet; upon alighting on a twig or saw palmetto it bursts into song.” Female grasshopper sparrows “may answer the song with a trill of her own. Then the male responds by singing the sustained song or by flying to her. Even at times, the male pursues the female and sings the sustained song as he gives chase” (Smith 1968).

Sparrows form breeding aggregations within suitable habitat (Delany 1996b). Males set up individual territories within the breeding aggregations, but the territories are rarely tightly-packed within a prairie area. Instead, territories may be widely and irregularly spaced. Territory

density has been shown to be related to habitat quality, as expressed as time since fire. Shriver (1996) and Delany *et al.* (1998) report significant declines in territory density as time since fire increases.

Mean territory size for Sparrows on Avon Park Air Force Range (AFR) is 1.8 ha (4.4 acres) with a maximum home range size of 4.82 ha (11.9 acres) (Delany *et al.* 1995). The territory size of unmated and mated males is not significantly different. As the interval between fire events increase, Sparrow home ranges become larger (Delany *et al.* 1992). Males vigorously defend the boundaries of their territories from the time territories are established through incubation (Delany *et al.* 1995). After the young hatch, the territory defense is less rigorous (Smith 1968). Adult Sparrows exhibit strong site-fidelity to nesting territories, although individuals have been observed traveling as far as 4 km from the nesting territories during winter months. The great majority of males (86 percent - Delany *et al.* 1995, >90 percent - Vickery and Perkins, personal communication 2001) remain on the same territory in consecutive years.

Onset of breeding

Males begin singing mid- to late March, and their singing usually diminishes by late June, though they continue to sing through August (Dean, personal communication 2002b). After late summer burns (June and early July) males may sing more frequently than in unburned areas (Vickery 1996). Males will sing throughout the day, however, they sing more frequently from sunrise to 9:00 a.m. and 15 minutes before sunset (Delany 1996a). When they are establishing breeding territories, they only sing the short primary song (Smith 1959). Some evidence suggests that in small populations of Sparrows (1-2 males), singing may only occur early in the nesting season, once nesting activities are initiated singing may cease (Perkins, personal communication 2003)

Sparrows begin nest-building activities approximately 4 weeks after the onset of territorial singing (Vickery 1996). Dome-shaped nests are located on the ground in shallow (<3.2 cm) excavations in the sand substrate (Delany and Linda 1998a, 1998b). The nests are constructed of narrow-leaved grasses and grass-like monocots, such as wiregrass (*Aristida beyrichiana*), bluestems (*Andropogon* sp.), and yellow-eyed grass (*Xyris* spp.). Nests are typically shielded by dwarf shrubs, (*i.e.* saw palmetto, *Serenoa repens*) and dwarf live oak (*Quercus minima*), rather than grass clumps as reported for other subspecies (Delany and Linda 1998a).

Nesting behavior

Egg-laying is reported to begin as early as March (McNair 1986) and breeding activities may extend into September (Vickery and Shriver 1995, Perkins 1999). Most nests contain three to five eggs with a mean of 3.71 (Delany 1996a, McNair 1986, Smith 1968). Perkins *et al.* (1998) found mean clutch sizes of 3.29 (n=7) at Avon Park AFR and 3.00 (n=2) at Three Lakes WMA. The eggs are white, smooth, slightly glossy, and lightly speckled and spotted with reddish-brown markings, and measure 1.8 to 1.4 cm (Sprunt 1954). These markings are generally sharp and well-defined, either scattered over the entire egg or concentrated toward the large end.

Females incubate their eggs for 11 to 12 days (Nicholson 1936). Perkins *et al.* (1998) reported it takes an average of 13.5 days between the fledging of a successful nest and the first egg of a new attempt. Dean (personal communication 1997) found that if a nest is destroyed, the female may make a new one within 10 to 12 days. Multiple clutches are common (Vickery 1996), and 3-4 successful clutches are possible within a single breeding season (Vickery 1996, Perkins 1999). Nesting activity late in the season regularly occurs, and Perkins (1999) reports a nest with eggs in late August that would not have fledged until mid-September. Breeding activity has been reported to increase following summer fires (Shriver 1996, Shriver *et al.* 1996, Shriver *et al.* 1999, Shriver and Vickery 2001).

The chicks are altricial and are brooded by the female for 6 to 8 days (Delany 1996a), up to 9 days (Vickery 1996, Perkins *et al.* 1998). When young hatch, both male and female become more defensive to human and other intrusions (Smith 1963). Nonparental attendants have been reported for *A. s. pratensis* (Kaspari and O'Leary 1988), but complete information on their function or the extent of cooperative breeding is not available.

After fledging from the nest, both parents continue to provide parental care, and the duration of parental care before the young become independent is poorly documented (Vickery 1996). In Florida, fledglings are known to aggregate in loose flocks with no parental care 3 to 4 weeks post-fledging (Vickery 1996). After juveniles leave the natal territory, little is known about their behavior, but the few recaptures of independent juveniles that were originally banded as nestlings suggest that juveniles may travel widely across the landscape (Dean and Perkins, unpublished data cited in Dean personal communication 2002b).

Recruitment

Little is known about the timing, extent, or frequency of dispersal by juveniles, though most agree that juveniles are the most likely group to disperse (Perkins and Vickery 2001). To date, no movements among the disjunct populations of Sparrows have been documented. Genetics studies indicate little genetic differentiation among the populations, suggesting either relatively regular movement of individuals among the disjunct populations, or recent isolation of the populations (Delany *et al.* 2000).

Seasonal distribution patterns

During the non-breeding season, Sparrows appear to expand their scope of movements. The average non-breeding season home range, as determined through radio telemetry, was 29.0 ha, and individual home ranges varied from 1.0 to 173.6 ha (Dean 2001). In addition, nearly 40 percent of individuals used > 1 home range during the course of the non-breeding season. These home ranges were not mutually-exclusive, however, and many Sparrows' home ranges overlapped (Dean 2001). The longest movements recorded were approximately 4 km, indicating that sparrows are capable of traveling long distances across the landscape (Dean 2001). Near the beginning of the breeding season, all of the adult sparrows that had known breeding territories during the previous breeding season returned to their breeding territories, again indicating strong breeding-season site fidelity (Dean 2001).

Barriers to movement include forested edges and even sparsely-stocked pine flatwoods. One radio-marked Sparrow crossed a forested slough that was at least 100 m wide, indicating that these features may not represent complete barriers to movement. However, Sparrows regularly encountered these features, and only one individual ever ventured to cross one (Dean 2001). The width and density of the forested habitats certainly affects the likelihood of Sparrows moving across them.

Food habits

Sparrows forage on the ground or just above it. An examination of the contents of 10 stomachs of Sparrows from the Kissimmee Prairie found 69 percent "animal matter" (insects) and 31 percent vegetation (Howell 1932). Insects identified included grasshoppers, crickets, spiders, beetles, weevils, moths and their larvae, with a few flies and bugs. Sedge seeds, as well as some star grass (*Hypoxis* spp.) seeds composed most of the vegetation found in the diet (Service 1988). Grasshopper sparrows switch to a seed-dominated diet during the non-nesting season, but still consume some animal matter (Vickery and Dean 1997).

Population Dynamics

Sparrow surveys have been conducted regularly since 1991 on Three Lakes WMA, and since 1993 on Avon Park AFR. In 1998, the Kissimmee Prairie State Preserve was acquired, and the first surveys were conducted there in 1999. Studies and monitoring were initiated in 1994 on National Audubon Society's Ordway-Whittell Kissimmee Prairie State Preserve. This site was added to the adjacent Kissimmee Prairie State Preserve in 2001.

Population size

Monitoring efforts from 1999-2001, at the three primary sites, suggest that the documented population size is approximately 600-690 individuals on these properties. The 2001 survey total for these three sites was 684 individuals (Mulholland and Small 2001, Delany *et al.* 2001). Comprehensive point-count surveys at Three Lakes WMA and Avon Park AFR cover all of the potential Sparrow habitat on the property. However, at Kissimmee Prairie State Preserve, the expanse of the prairie makes comprehensive surveys impractical. Instead, point-count grids are placed throughout the property in representative prairie patches. Sparrows do not occur evenly throughout the property, and have not been recorded on some plots (Mulholland and Small 2001). This fact makes extrapolation of the sampled population difficult, and the survey total for the three sites may underestimate the total population. Private ranches adjacent to these sites support Sparrows, but the extent of the population on these areas is largely unknown. Recently, a population of Sparrows was discovered on private property approximately 7 miles south of Kissimmee Prairie State Preserve in Okeechobee County. Surveys performed during the 2001 nesting season employed a methodology designed to sample a population, not to determine an exact count, and estimated the population at 24-40 individuals. However, the future of this unprotected population is uncertain; the privately owned land appears to be managed solely for cattle.

Population variability and stability

Population variability is affected by several characteristics of a species' life history including unstable reproductive rates and age distributions, population density, dispersal rates, genetic viability, and variable predation rates. Sparrows are capable of breeding during the first spring after hatching, and are assumed to breed every year. Several studies (Shriver 1996, Perkins 1999) have suggested that not all singing males are paired; as many as 15-23 percent of males were identified as unpaired (Vickery and Perkins 2001). While it is certainly reasonable to suggest that not all males are paired, there is no known mechanism to assess sex ratio. The difficulty of observing females makes accurate determination of pairing (or the lack thereof) difficult.

Clutch sizes vary, but reported averages range from 3.14 (Perkins 1999) to 3.71 (McNair 1986). Considering the number of potential nesting attempts and the productivity per nest, the maximum productivity per pair could reasonably be expected to exceed 13 young per year, though this level of productivity is certainly uncommon. Nest success (defined as fledging at least one young) rates are generally low, and annual nest success rates range from 11-38 percent. Accounting for the number of nesting attempts and the observed nest success, Vickery and Perkins (2001) report average annual productivity per pair between 2.8 and 3.5 per year. Nest predation is the most common cause of nest failures, with snakes and mammals accounting for the majority of observed depredations (Perkins 1999). The large reproductive potential and the variability in depredation and nest failure rates probably leads to widely varying reproductive success among years.

Estimates of annual adult male survival rates range between 0.23 and 0.66 for different populations and different years (Delany *et al.* 1993; Perkins 1999). Perkins and Vickery (2001) estimated juvenile survival rate to be 0.35. Results of a 3-year banding study indicate a mean life expectancy of 1.95 years for male birds equal to or greater than 1 year old ($n=48$) (Delany *et al.* 1993). The longevity record for Sparrows is 7 years (Dean *et al.* 1998). There is no information on the survival and life expectancy of females, and we must assume that female survival rates approximate those of males.

The primary cause of adult mortality appears to be predation, primarily by wintering raptors (Dean and Perkins, unpublished data cited in Dean personal communication 2002b). Since Sparrows spend the majority of their time on the ground, adults and young birds are, most likely, captured on the ground (Vickery 1996). Studies on Avon Park AFR and Three Lakes WMA have recorded several predation events for radio-instrumented adult Sparrows. Although not identified to species level, the predators have been identified as mammals, snakes, and birds (Perkins *et al.* 1998, Dean 2001). The majority of adult mortality probably occurs during the winter, when migrant raptors occur in large numbers in Central Florida; red-shouldered hawks are the only common raptor that occurs in dry prairies during the breeding season, and they do not regularly prey on birds (Meyer personal communication 1999). Loggerhead shrikes (*Lanius ludovicianus*) are known to predate on adult Sparrows year round. Other predators are known to take eggs or nestlings, including the striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale*

putorius), raccoon (*Procyon lotor*), longtailed weasel (*Mustela frenata*), foxes, cats (*Felis* spp.), feral hogs (*Sus scrofa*), snakes, and possibly armadillos (*Dasyurus novemcinctus*) (Vickery 1996). As with many other federally listed endangered species in Florida, the relationship between the Sparrow and man has been significant. Changes in land use will continue to be a significant factor in the survival and recovery of this species. Conversion of native prairies to row crops and citrus, removal of the subshrub components of the communities, replacement of native bunch grasses with exotic sod-forming grasses, and suppression of a natural fire regime have made much of the historically available habitat unsuitable for Sparrows.

Status and Distribution

Reasons for listing

Early records on Sparrow abundance and distribution are scarce; however, it is believed that the Sparrow was more numerous and widespread than it is today (Delany 1996b). Howell's (1932) observations of Sparrows suggest that population numbers were greater during the early 1930s. Colony size at that time appears to have ranged between 3 to 19 pairs, although precise survey data for the early 20th century are not available (Howell 1932, Smith 1968, McNair 1986). Apparently, Sparrow numbers were never constant or predictable. Nicholson (1936) noted that "grasshopper sparrows do not occupy all apparently suitable habitats, and the species fluctuates considerably in abundance from year to year."

Between 1927 and 1945, many sightings of grasshopper sparrows were recorded for Kenansville in Osceola County, Basinger and a location south of Fort Drum in Okeechobee County, and a site south of Lake Hicpochee and an area southeast of Immokalee in Hendry County. There appears to be a gap in Sparrow records between 1945 and the early 1960s. Records for the 1960s include a site north of Lake Okeechobee in Okeechobee County, and a site south of Brighton in Glades County. In the early 1970s, records note a site west of Lake Okeechobee with no county specified and a site southwest of Kenansville (Service 1988).

Before the FWC (formerly the Florida Game and Freshwater Fish Commission) began conducting surveys for the Sparrow in the 1980s, the historic sightings identified above gave little insight to the degree of abundance of the species (Delany and Cox 1985). The FWC surveys of the early and mid-1980s focused on historically occupied as well as potential breeding sites. These surveys located 182 individual Sparrows on nine sites in Glades, Highlands, Okeechobee, Osceola, and Polk Counties (Delany *et al.* 1985, Delany and Cox 1985). Cattle grazing on improved pastures (one animal per eight ha) occurred on almost all grasshopper sparrow sites (Delany and Cox 1985). Abandonment of some pasture sites is probably a response to changes in land management toward improved pastures (Delany and Linda 1994).

The results of FWC's surveys led to the Federal listing of the sparrow as endangered on July 31, 1986. The reason for listing was identified as population decline resulting from habitat degradation and loss from pasture improvement (51 FR 27495).

Rangewide trends

Singing male surveys performed between 1989 and 1993 resulted in a minimum population estimate of 424 adults at seven breeding sites (Delany 1996b). Sparrows were found at three former locations, but were not located at six locations from the previous survey (Delany and Linda 1994). All six abandoned sites were pasture that had been improved for cattle grazing or sod production. The three occupied sites, some of which had been managed to support cattle grazing, had been burned at 2 to 3 year intervals; the fires may have preserved the suitability of these habitats.

As a general matter, endemic habitat specialists with restricted ranges are sensitive to many environmental factors, including hydrological changes and degradation or loss of habitat. The Sparrow is one of these habitat specialists and is threatened by many of these environmental factors. Changes in hydrological management regimes that render nesting areas too wet during the nesting season may affect this species' ability to reproduce. Overgrazing may eliminate plant species necessary for foraging and reproduction as well as limit the amount of available cover to conceal nests. In native dry prairies, lack of management, or inappropriate fire management practices, can lead to overgrown breeding areas or sites with woody plant invasion, rapidly leading to habitat conditions that are unsuitable for Sparrows. Fire is the primary process that maintains the native prairies. The natural fire-return interval for the dry prairie communities is estimated to be 1-4 years (Abrahamson and Hartnett 1990), and most managed dry prairies are maintained on a 2-3 year burn rotation. The need for frequent and often intensive management of lands that support Sparrows will continue to make their status tenuous. Actions that occur over only 2-3 years, such as local increases in hydroperiod or lack of prescribed burning, may also significantly impact Sparrow populations.

Habitat loss

Estimates of the historical and current extent of dry prairie within central Florida vary substantially. Florida dry prairie is ranked as a G2 (globally imperiled) community type (FNAI and FDNR 1990, Grossman *et al.* 1994). Noss *et al.* (1995) considered ungrazed dry prairie of Florida as an endangered ecosystem (greater than 98 percent habitat loss and continued threat). Although dry prairie area is declining, there are still considerable opportunities to protect dry prairie in south-central Florida (R. Hilsenbeck, The Nature Conservancy, personal communication 1998, cited in Service 1999). However, in central Florida, within the range of the Sparrow, there continues to be a reduction in area and fragmentation of high-quality dry prairie, and an even greater reduction in the number of sites with a continuous fire history and minimal human disturbance (Bridges 1997, cited in Service 1999).

Davis (1967, cited in Shriver and Vickery 1999) estimated 0.83 million ha (2,050,966 acres) of dry prairie habitat existed throughout central Florida. By 1989, Kautz *et al.* (1993) estimated that 0.56 million ha (1,383,200 acres) of dry prairie remained. Although this figure includes areas outside the historic range for dry prairie given in Davis (1967), the figure represents a minimal loss of 667,766 acres, or 33 percent, of the original area. Shriver and Vickery (1999)

flew aerial surveys throughout the former range of the Sparrow to identify and quantify remaining dry prairie habitat. Shriver and Vickery (1999) estimated that 156,000 ha (385,483 acres) of dry prairie habitat existed in 1995, an 81 percent decrease from the 2,050,966 acres estimated in 1967 (Davis 1967, cited in Shriver and Vickery 1999). Of the potential Sparrow habitat identified, 19,400 ha (47,938 acres) of dry prairie (12 percent) is protected at three sites; Three Lakes WMA, Avon Park AFB, and Kissimmee Prairie State Preserve (which includes the National Audubon Society's Ordway-Whittell Kissimmee Prairie Sanctuary).

Continuing trends

Losses of dry prairie have been due to several land-use type conversions, conversion of native prairie to improved pasture (Layne *et al.* 1977, cited in Service 1999), conversion to other agricultural uses, such as citrus groves (Davis 1967, Mealor 1972, DeSelm and Murdock 1993; cited in Service 1999), conversion to planted pine, and, in the past, conversion to eucalyptus (*Eucalyptus* spp.) plantations. Conversion of dry prairie to citrus groves may represent the single greatest threat to existing prairie remnants. Current pasture and rangeland are the areas with the highest feasibility for citrus conversion, since these sites, with supplemental drainage, can provide the well-drained soils required to grow citrus (Pearlstine *et al.* 1995). In southwest Florida alone, the extent of citrus groves has doubled to 60,000 ha (148,200 acres) since 1980, and was projected to reach 80,000 ha (197,600 acres) by the year 2000 (Pearlstine *et al.* 1995).

As of 2001, there are six protected, managed areas in Florida with significant areas of native dry prairie vegetation. Kissimmee Prairie State Preserve, including the National Audubon Society's Ordway-Whittell Kissimmee Prairie Sanctuary, harbors greater than 12,000 ha (29,652 acres) of dry prairie habitat and the largest known population of Sparrows. Three Lakes WMA and Avon Park AFB also contain significant acreage (15,815 acres) of occupied dry prairie habitat. Myakka River State Park in Manatee and Sarasota Counties has approximately 6,800 ha (17,000 acres) of dry prairie (Fitzgerald *et al.* 1995) which has been recently restored. There is one historic record of Sparrows in Manatee County, but this State park is outside of the extant range of the sparrow. Recently, large conservation easements have been obtained on the Bright Hour Ranch in DeSoto County, and at Fish Eating Creek in Glades County. Although the habitat at Fish Eating Creek is in good condition and within the extant range of the Sparrow, recent surveys have revealed no sparrows utilizing either conservation easement. The future of the dry prairie landscape is currently dependent upon the management and protection of native rangelands on cattle ranches in south-central Florida.

Acquisition and protection of lands containing remaining dry prairie habitat have improved the status of the Sparrow since listing. Three primary public properties now support the great majority of the remaining Sparrows. Five of the six known populations of Sparrows occur on public lands, including one population on Three Lakes WMA, one on Kissimmee Prairie State Preserve, and three populations on Avon Park AFR. Additionally, acquisition and restoration of lands has provided potential for Sparrows to disperse onto these sites.

New threats

The history of the individual populations provides additional insight into the status of the Sparrow, including new and continuing threats facing the birds. In 1993-1997, Sparrows were present on the Ordway-Whittell Kissimmee Prairie Sanctuary, but had begun to decline in conjunction with prolonged hydroperiod in native prairies resulting from a levy. In a matter of a few years, the population declined from an estimated 40+ individuals (Gray, personal communication 2002) to none. Sparrows have not been seen on the site since 1998 (Paul Gray, personal communication, cited in Delany *et al.* 2001). This site was added to the adjacent Kissimmee Prairie State Preserve in 2001.

Another population decline was documented on Three Lakes WMA around 1997-1998. In these years, the Sparrow population reached a recorded low of approximately 160 birds, down from a 1993 high count of 220 individuals. By the year 2000, the population had rebounded to 288. The reason(s) for the population fall and subsequent recovery are unknown (Dean and Glass 2000, cited in Dean and Glass 2001).

Currently, another dramatic decline is under way on Avon Park AFR. At this site, the Sparrow occurs in three disjunct populations. Since 1997, the population on Bravo Range declined from 43 to 8 individuals, the population on Echo Range declined from 142 to 92 individuals, and the population on Delta Trail Area/OQ Range declined from 113 to 52 individuals. The total population on Avon Park AFR in 2001 was 152 individuals, half of the total population estimated on the range in 1997.

The declines within the populations are relatively dramatic, but are not synchronous among the geographic areas where the Sparrows now occur. The synchronous decline in all Sparrow populations on Avon Park AFR is cause for concern because a similar pattern of decline has not been previously recorded. However, during the same period of time, the populations at Three Lakes WMA and Kissimmee Prairie State Preserve appear to have grown. While declines of this magnitude may have been a normal part of this subspecies' biology in Florida, the combination of population fluctuation and the currently reduced distribution and amount of available habitat and smaller population size may threaten the persistence of this taxon.

ENVIRONMENTAL BASELINE

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat, designated critical habitat, and ecosystem within the action area. The environmental baseline is a "snapshot" of a species' health at a specified point in time. It does not include the effects of the action under review in the consultation.

Status of the Species/Critical Habitat Within the Action Area

As previously defined, the action area for this project includes the project site, the offsite compensation area and adjacent population of Sparrows on Three Lakes WMA, and lands connecting those sites (Figure 7).

Sparrow surveys on the Oak Hammock project site in 2000 detected a solitary singing male Sparrow in the palmetto prairie adjacent to the improved pasture habitat onsite (Figure 5); additional surveys in 2002 detected one or more singing male Sparrows occupying the palmetto prairie in the same area as the individual Sparrow detected in 2000 (Figure 6). Delany *et al.* (1995) determined a mean territory size for Sparrows on Avon Park AFR of 1.8 ha (4.4 acres), with a maximum home range size of 4.82 ha (11.9 acres). Incorporating this data into the distances between sites where Sparrow singing was detected in 2002, the surveys suggest that there are two singing males onsite. The Service considers an average home range size for a breeding pair to be 7.8 acres, therefore, two occupied territories would inhabit approximately 16 acres. Sparrow surveys are designed to identify singing males, and the likelihood of observing female Sparrows on these types of surveys is very low. For example, while conducting point-count monitoring surveys on Three Lakes WMA, staff generally observe only 2-3 females and >100 males (Dean, personal communication 2002b). To interpret these surveys, observers generally assume a 1:1 sex ratio and double the number of males recorded to determine total population size (Walsh *et al.* 1995). Therefore, although no females were observed and surveys performed later in the nesting season did not detect the presence of any Sparrows, as many as four adult birds may be present onsite. At Avon Park AFB a small population of Sparrows was identified (1-2 singing males) early in the nesting season. Later surveys did not detect singing males, however one nest was identified, suggesting that in areas with very low density nesting activity, nesting Sparrows may not sing throughout the nesting season (Perkins, personal communication 2003).

A Service biologist visited the Oak Hammock site on November 8, 2002. The forested nature of the Oak Hammock site made much of the site unsuitable for Sparrows, although many of the patches of prairie found throughout the site were in good condition. The area where surveys detected Sparrows onsite consisted of marginal to good habitat. The area can be described as semi-improved pasture, which with the low cattle density found onsite has come to resemble dry prairie. The bird(s) were identified in an area immediately adjacent to improved pasture. The improved pasture onsite harbored no tertiary structure as is required by Sparrows for habitat suitability. However, the improved pasture provides a treeless horizon for the birds, eliminating an “edge effect” in that direction. The patch of prairie in which the birds were detected is less than 350 acres. Large areas of prairie habitat, possibly greater than 4,000 ha (9,884 acres), are needed to maintain self-sustaining populations of Sparrows (Perkins 1999). Although it is unlikely that the Oak Hammock site could support a self-sustaining population of birds, sink habitats do provide value to wildlife populations. Sink habitats, such as on the Oak Hammock site, provide dispersal habitat and may provide refuge habitat during bad seasons on available source habitat (Perkins 1999).

Three Lakes WMA harbors one of five protected populations on publicly owned lands, the second largest population of protected Sparrows in Florida. This population of birds is approximately 10 miles southwest of the Oak Hammock site, and the birds identified on the Oak Hammock site are likely a subpopulation of the Three Lakes WMA population. An active management program to maintain and enhance the sparrow population on the WMA is in place. Active management includes a prescribed burn plan to maintain and enhance the dry prairie habitat onsite, annual comprehensive point-count surveys on all potential habitat to track the Sparrow population, and an active translocation program to establish additional populations of Sparrows on an additional area of suitable habitat (Figure 9) (Dean and Glass 2001).

Sparrows surveys have been conducted regularly since 1991 on Three Lakes WMA. The population appears to be growing in recent years, and was estimated at 288 in 2000. However a dramatic population decline was observed during 1997-1998 when the population dropped from an estimated 220 individuals to 160 individuals. The reason(s) for the population fall, and subsequent recovery are unknown (Dean and Glass 2000, cited in Dean and Glass 2001).

Private ranches adjacent to these sites support sparrows, but the extent of the population on these areas is largely unknown. In 2000, 1-2 Sparrows were detected on a private ranch to the north of the translocation recipient area. The habitat in which the birds were identified is marginal to poor, and the future of these birds is uncertain. To the east of Three Lakes WMA and south of Lake Marian, Sparrow surveys in 2000 detected two areas of occupied habitat on a private ranch. Surveys detected 22 singing males in one area of occupied habitat and 10-20 pairs of Sparrows occupying another area of prairie habitat. This ranch is currently being managed in a manner which will maintain Sparrow habitat, but the long term future of this subpopulation of birds is unknown. The applicant has worked out an agreement with the ranch owners to place 40 acres of occupied habitat adjacent to Three Lakes WMA under conservation easement. The exact population of birds within the 40 acre area is unknown, however the 40 acres are part of the larger area surveyed in 2000, on which 22 singing males were detected. The placement of these 40 acres under conservation easement guarantees that the habitat will be maintained and preserved in perpetuity, securing the long term future of this area and the birds it supports (Figure 9).

In addition to the ranches described above, large expanses of private cattle ranches can be identified in digital orthoquads within the action area. However the suitability of these areas as Sparrow habitat is unknown. Forested barriers do exist within the action area that may limit Sparrow movements and dispersal to potential habitat within the action area.

Factors Affecting Species Habitat Within the Action Area

Approximately 9,800 acres of dry prairie habitat are preserved on Three Lakes WMA (Shriver and Vickery 1999). Although the habitat is preserved, hydrological conditions have precluded or reduced the reproductive efforts and success of this population of birds in a portion of the preserved habitat. Water levels at Three Lakes WMA have been too high on a small portion of the prairie since 1995, causing flooding. Similar hydrological management problems resulted in flooded nesting areas during the breeding season at Ordway-Whittell Kissimmee Prairie

Sanctuary (within Kissimmee Prairie Preserve); and as a result, there was essentially no reproduction during the 1995, 1996, and 1997 breeding seasons. By 1999, the population of birds utilizing this site had become extirpated (Paul Gray, personal communication, cited in Delany *et al.* 2001).

All privately owned dry prairie and semi-improved pasture could be converted to other uses including improved pasture, citrus groves (Davis 1967, Mealor 1972), and urban development. As stated previously, current pasture and rangeland are the areas with the highest feasibility for citrus conversion, since these sites, with supplemental drainage, can provide the well-drained soils required to grow citrus (Pearlstine *et al.* 1995).

Outside of Three Lakes WMA, the remaining dry prairie habitat within the action area is under private ownership on large cattle ranch operations. Habitat management is the greatest concern on these properties, and the future development or land conversions are also a threat. The open vegetative dry prairie community preferred by Sparrows was historically maintained by lightning-induced fires. Remaining dry prairies are ecologically degraded due to fire suppression. Some ranchers use prescribed burns to improve pasture lands for cattle (Vickery and Shriver 1995). Native central Florida rangelands (*i.e.* dry prairies and flatwoods) are typically burned by ranchers annually or biennially during the winter or early spring months to stimulate forage growth, nutrition, and palatability during the lean winter months (Abrahamson and Hartnett 1990, Sullivan 1994). In addition to fire, rollerchopping may be used to alter the vegetative composition and structure within prairie habitats. It is unknown if the properties under private ownership between the Oak Hammock site and the 40 acres being placed under conservation easement adjacent to Three Lakes WMA manage their properties for the benefit of the dry prairie community.

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the Sparrow, including beneficial effects and interrelated and interdependent actions. This section is subdivided into the Oak Hammock solid waste facility effects and the offsite conservation easement effects.

Oak Hammock

The proposed action is the construction of a solid waste facility and associated structures on agricultural lands currently used for cattle grazing. A subpopulation of Sparrows has been identified onsite. Surveys identified two singing male Sparrows, therefore two pairs or four adult birds, may be occupying the area. The closest known population of birds is approximately 10 miles southwest of the project site, at Three Lakes WMA. Although half of the Oak Hammock site will be preserved and maintained under conservation easement, the remaining prairie resources onsite in the conservation area are unlikely to support a population of Sparrows based on their small size and forested condition. Omni Waste proposes to begin construction of the solid waste facility and all associated roads, borrow pits, and stormwater treatment facilities immediately following permit issuance, which will likely occur during the Sparrow breeding

season. Sparrows have been identified occupying habitat alongside an existing road which will be improved to allow access to the landfill. The prairie habitat in which the birds were identified will be converted into two borrow pits for the solid waste facility. The population of sparrows utilizing the Oak Hammock site will either abandon all nest attempts or become extirpated. The duration of the effects of the proposed action will be permanent.

Approximately 609 acres of palmetto prairie exist on the project site, 387 of which will be impacted by the construction of the solid waste facility. A small portion (Figures 5 and 6) of the palmetto prairie is currently occupied by Sparrows. The Service considers an average home range size for a breeding pair to be 7.8 acres, therefore, two occupied territories would inhabit approximately 16 acres. The prairie has not been managed to provide optimum conditions for Sparrows. The proposed action will result in direct impacts and loss of all occupied habitat onsite. To help minimize effects to the two plus Sparrows detected onsite, Omni Waste has agreed that the initial land clearing and/or ground disturbance of borrow pits A and B will occur outside the nesting season.

The effects of habitat and population loss are best assessed through a population viability analysis (PVA). Vickery and Perkins (2001) are currently developing a PVA for the Sparrow, which is still in draft form. The PVA agrees with previous research by Perkins (1999), which predicts that large areas of prairie habitat, possibly greater than 4,000 ha (9,884 acres), are needed to maintain self-sustaining populations of Sparrows. Therefore, it is unlikely that the Oak Hammock site would be able to sustain a population of Sparrows long term. Additionally, the Oak Hammock site is surrounded by other privately owned cattle ranches which may support additional Sparrows or Sparrow habitat, and do not provide barriers for Sparrow dispersal. The two singing males identified onsite, and their potential mates, represent less than 1 percent of the total known population and less than 1 percent of the known sparrows occupying this northern portion of their extant range. Displacement of two pairs of adults does not represent a significant impact to Sparrows in this northern portion of their extant range. Sparrows are capable of traveling widely across the landscape and may be able to relocate to a new area if their current habitat is significantly altered. Therefore, the proposed action will not result in further fragmentation of Sparrow populations in this northern part of their range.

In addition to the direct impacts to the occupied site and the displacement of adult sparrows, introduction of a large solid waste facility may represent an effective barrier in the otherwise unobstructed expanse of open lands within the region, which is primarily composed of improved pasture and small tracts of rowcrops. Sparrows have not been known to disperse over developed areas, however the 1,090-acre solid waste project is a relatively small area when compared to the surrounding landscape and should not reduce the likelihood of dispersal to surrounding lands.

Offsite conservation easement

A conservation easement will be placed over 40 acres of occupied habitat adjacent to Three Lakes WMA. The 40-acre tract is located approximately 10 miles south of the Oak Hammock site and within the action area. The 40-acre tract will be maintained in its current state and

managed in perpetuity for the benefit of many species including the Sparrow. Management activities may include low density cattle grazing and prescribed burns as necessary to maintain habitat suitability.

Placing the 40-acre tract under conservation easement will result in a net benefit to the Sparrow. The habitat is adjacent to the publicly owned Three Lakes WMA and the population of birds onsite is likely a subpopulation of the birds occupying the dry prairie on Three Lakes WMA. The placement of habitat under conservation easement adjacent to larger parcels already under protection and management will benefit the Sparrow by removing future threats of habitat loss due to conversion or succession and increase the effective size and genetic diversity of protected populations. Larger population sizes typically correspond to increasing probabilities of persistence when considered in the context of population viability (Vickery and Perkins, 2001)

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The great majority of the action area for this project is under public ownership at Three Lakes WMA and will continue to be maintained and preserved in the future. Additional privately owned rangelands exist within the action area. Sparrows are difficult to locate and distributional surveys have not assessed Sparrow status on all private lands in the action area. It is likely that small populations of Sparrows have been undetected in the past and will be undetected in the future. The greatest threat to these rangelands is, similar to all rangelands and remaining dry prairie in central Florida, land use conversions. The action area is within Osceola County, and within the greater Orlando area. Osceola County is experiencing continued expansion and growth, the population of Osceola County was 172,493 in 2000 and is projected to increase to 269,646 by 2010. This equates to a greater than 4 percent growth rate per year. Additionally the population growth is predicted to be higher in unincorporated Osceola County than in the cities (Osceola County 2002). Although the Service is unaware of any future proposed actions which may affect the Sparrow, the developmental pressures in Osceola County and the trend of land use conversions within the range of the Sparrows are reasonably likely to continue.

SUMMARY OF EFFECTS

The proposed action will permanently convert occupied habitat into two borrow pits and an improved road, causing the loss of all suitable habitat onsite. The population of Sparrows utilizing the Oak Hammock site will either abandon all nest attempts or become extirpated. However, based on the location of the project site within the northern most extant range of the species, the relatively small size of the project site, and the availability of potentially suitable habitat on surrounding rangelands, the project should not cause any further fragmentation of available Sparrow habitat. However, the placement of 40 acres of occupied habitat adjacent to a

large tract of protected and managed occupied habitat will benefit the Sparrow by removing future threats of habitat loss due to conversion or succession and increase the effective size and genetic diversity of protected populations.

The recovery objectives of the 1999 MSRP for the Sparrow are (1) to prevent any further loss, fragmentation, and degradation of habitat within the Kissimmee River basin; (2) to protect and manage at least 10 sites containing stable, self-sustaining populations of 50 to 100 breeding pairs of Sparrows within the historic range of the species; and (3) that Sparrows on each of these sites exhibit a population increase, sustained as a 2-year running average greater than zero, over at least 6 years. One habitat-level recovery action identified in the 1999 MSRP for the Sparrow is to protect and enhance currently occupied habitat. The MSRP specifically identifies protecting occupied habitat adjacent to Three Lakes WMA, which is identified as critical to the survival and recovery of the sparrow. The placement of the 40-acre tract of occupied Sparrow habitat adjacent to Three Lakes WMA under conservation easement addresses this habitat-level recovery action. Additionally the conservation easement addresses the continuing management of the 40 acres for the benefit of the Sparrow. The draft conservation easement has been included as Appendix A.

CONCLUSION

After reviewing the status of the Sparrow, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the development of the Omni Waste Oak Hammock solid waste facility, as proposed, is not likely to jeopardize the continued existence of the Sparrow. No critical habitat has been designated for this species, therefore, none will be affected.

III. INCIDENTAL TAKE STATEMENT

Sections 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in action 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Corps or Omni Waste must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service anticipates incidental take of Sparrows will be difficult to detect for the following reason(s): the small body size of the sparrow makes it unlikely that dead or impaired specimens will be found, nests are well hidden in vegetation, and the reproductive output for each pair is unknown. However, all birds occupying habitat that will be converted to the solid waste facility will be lost at the time of construction due to the loss of all suitable habitat onsite. The incidental take of adult Sparrows is expected to be in the form of harm or injury due to habitat loss, harassment, disturbance, and direct take of nests. Based on the results from Service approved protocol for identifying adult singing male Sparrows, the Service believes that the incidental take will not be more than four adult birds and their nesting productivity. Vickery and Perkins (2001) report average annual productivity per pair between 2.8 and 3.5 per year. A conservative estimate of young birds would be three individuals per pair. Therefore, the Service believes that the incidental take will not exceed 10 birds.

The Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize take of Sparrows:

Minimize adverse affects to breeding, through the timing of the initial land clearing or ground disturbance associated with borrow pits A and B (Figure 2).

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the ESA, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. Initial land clearing or ground disturbance of the areas defined as borrow Pits A and B in Figure 2 must occur outside of the nesting season, defined as April 1 – June 15.
2. Monitor Sparrows within the palmetto prairie immediately adjacent to the improved pasture within the solid waste facility footprint (Figure 1). The monitoring plan will be submitted to the Service for review within 60 days after the date of this biological opinion. Monitoring will be designed to document the extent of the Sparrow population prior to the initial ground clearing or disturbance within borrow pits A and B and will continue to document the response of Sparrows to construction activities should suitable habitat continue to exist as the landfill is being constructed. A monitoring report that complies with the requirements of 50 CFR part 402.14(i)(3) will be submitted to the Corps and Service at the completion of construction.
3. Care must be taken in handling any dead specimens of proposed or listed species that are found in the project area to preserve biological material in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, notify the Service at the address provided. Initial notification must be made to Fish and Wildlife Service Law Enforcement Office, 9721 Executive Center Drive, Suite 206, St. Petersburg, Florida 33702 (813-570-5398). Additional notification must be made to the Service's South Florida Ecological Services Office, 1339 20th Street, Vero Beach, Florida 32960 (772-562-3909).

IV. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Attempt to capture and relocate all Sparrows on the Oak Hammock site to a tract of publicly owned and maintained dry prairie habitat, such as the Ordway-Whittell Kissimmee Prairie tract within the Kissimmee Prairie Preserve.

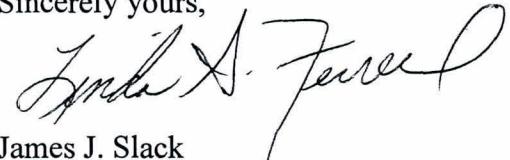
For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

V. REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the November 5, 2002, request. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions, please contact Deborah Pierce at 772-562-3909, extension 293.

Sincerely yours,



James J. Slack
Field Supervisor
South Florida Ecological Services Office

cc:

Corps, Merritt Island, Florida (Stephen Brooker)
EPA, West Palm Beach, Florida (Ron Miedema)
FWC, Vero Beach, Florida (Rick Brust)
SFWMD, Orlando, Florida
Omni Waste of Osceola County, LLC, Kissimmee, Florida

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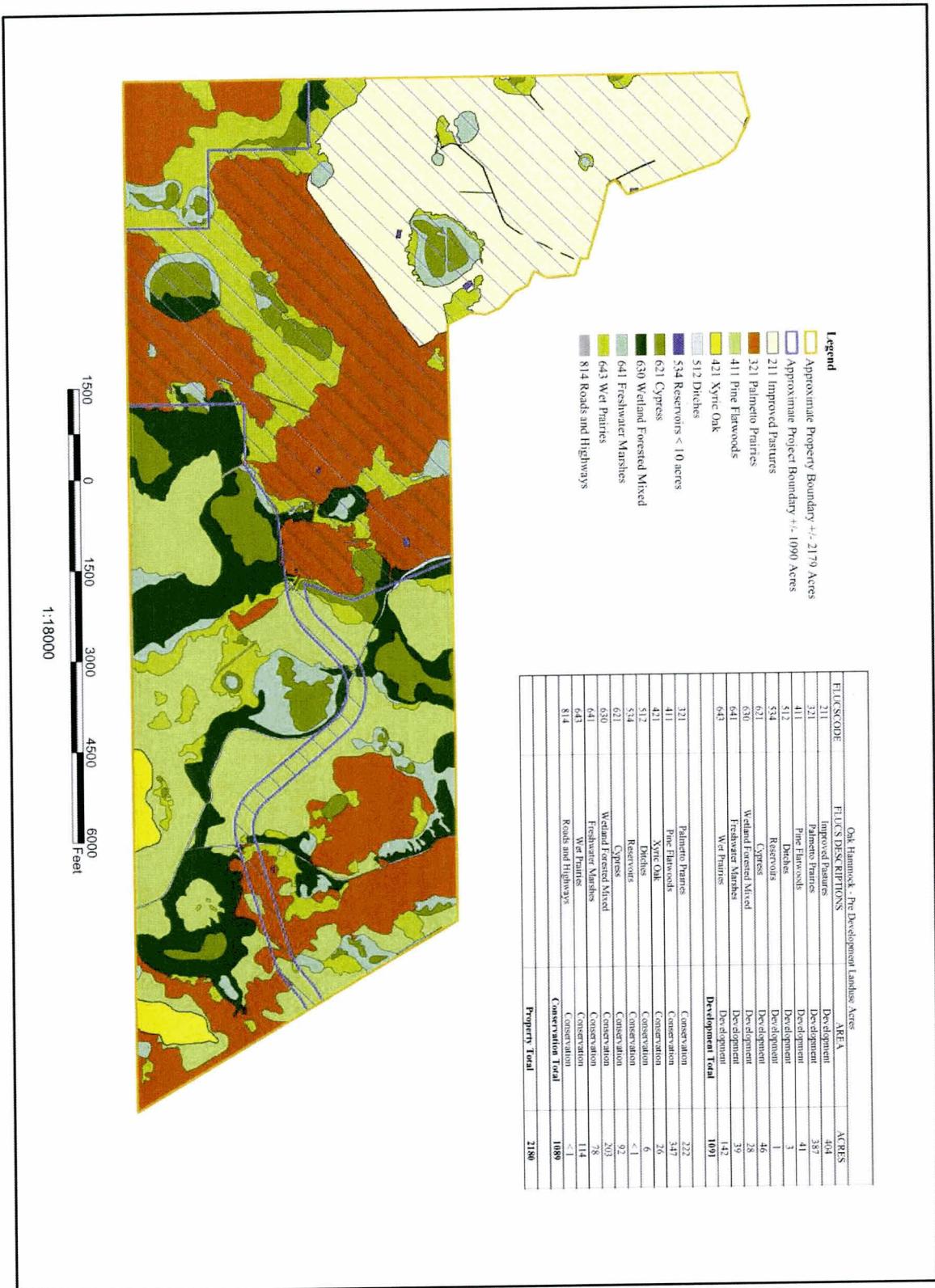
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Bcc: Reading Biological Opinion

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Project Number: 3972-003

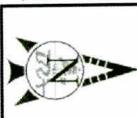
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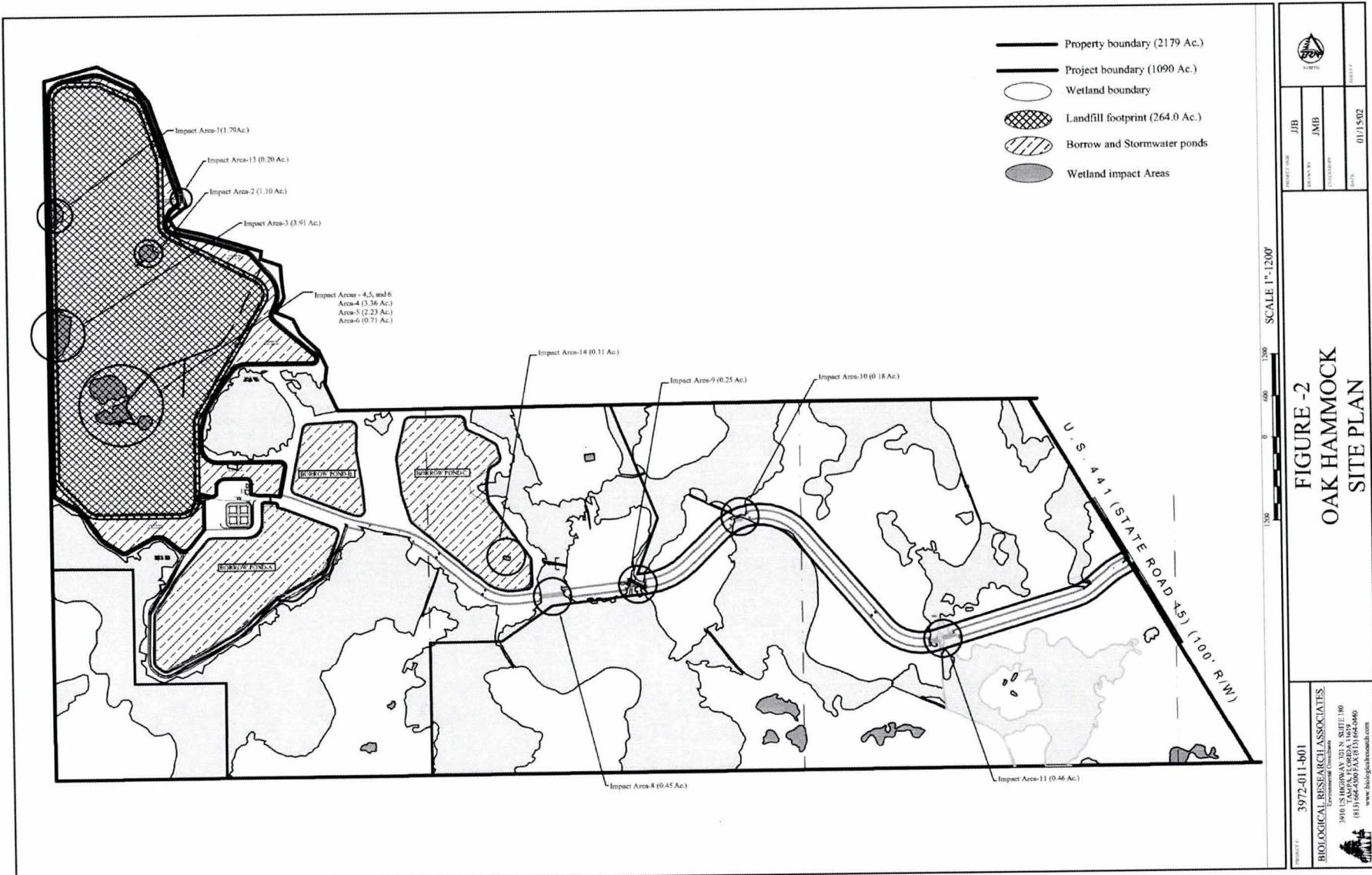
Figure 1
Oak Hammock Disposal Facility
FLUCFCS Map
Osceola County, Florida

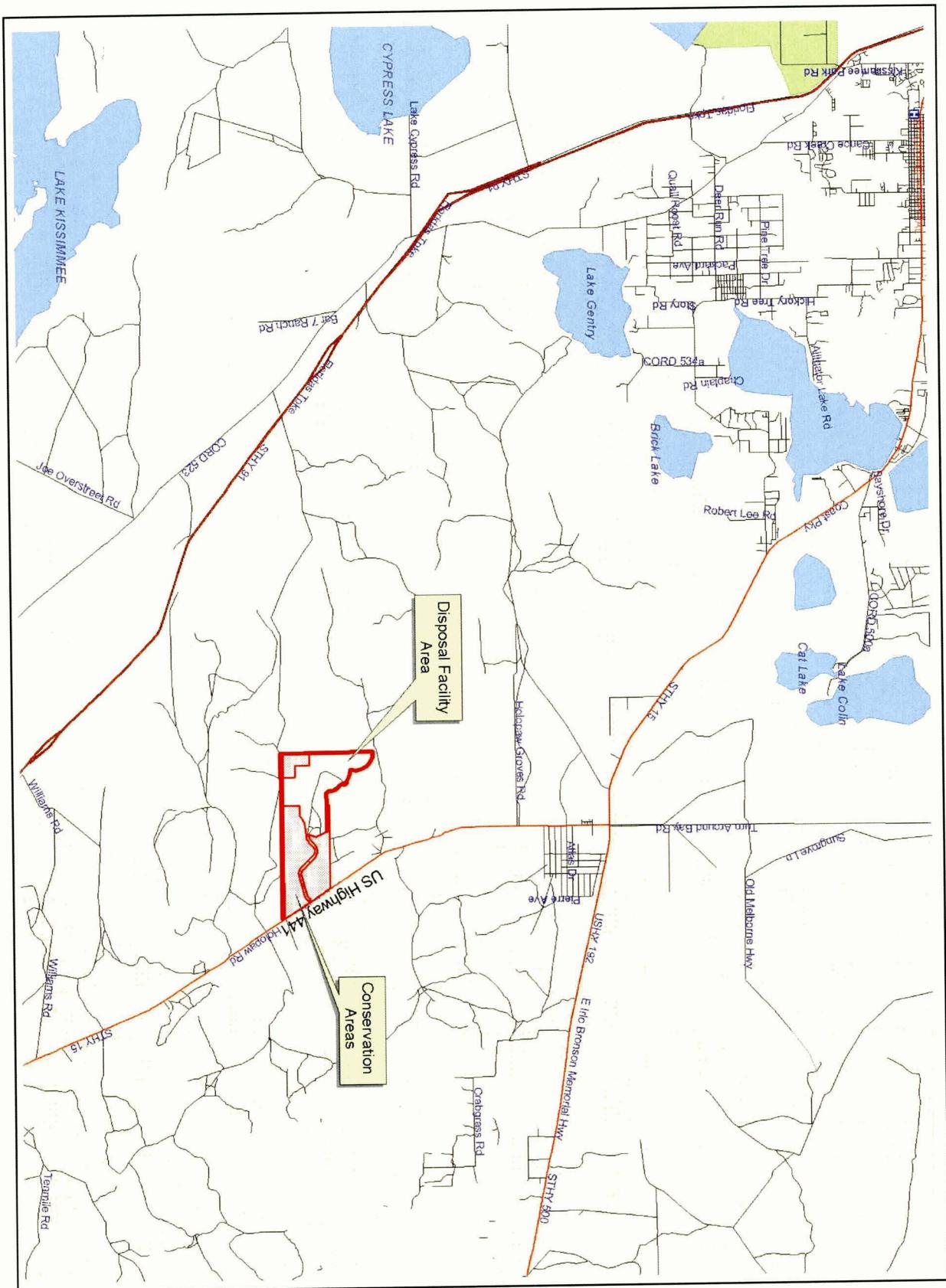
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Preparation Date:
 16 April, 2002
 Revision Date:
 Project Manager:
 JJB
 GIS Operator:
 WAC
 GIS QA/QC:





Project Number: 3972-003

APR Name: soils-location.apr

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Figure 3
Oak Hammock Conservation Area
Location Map
Osceola County, Florida

Preparation Date:

15 April 2002
08/14/02

Revision Date:
08/14/02

Project Manager:
JHR

GIS Operator:
LBS

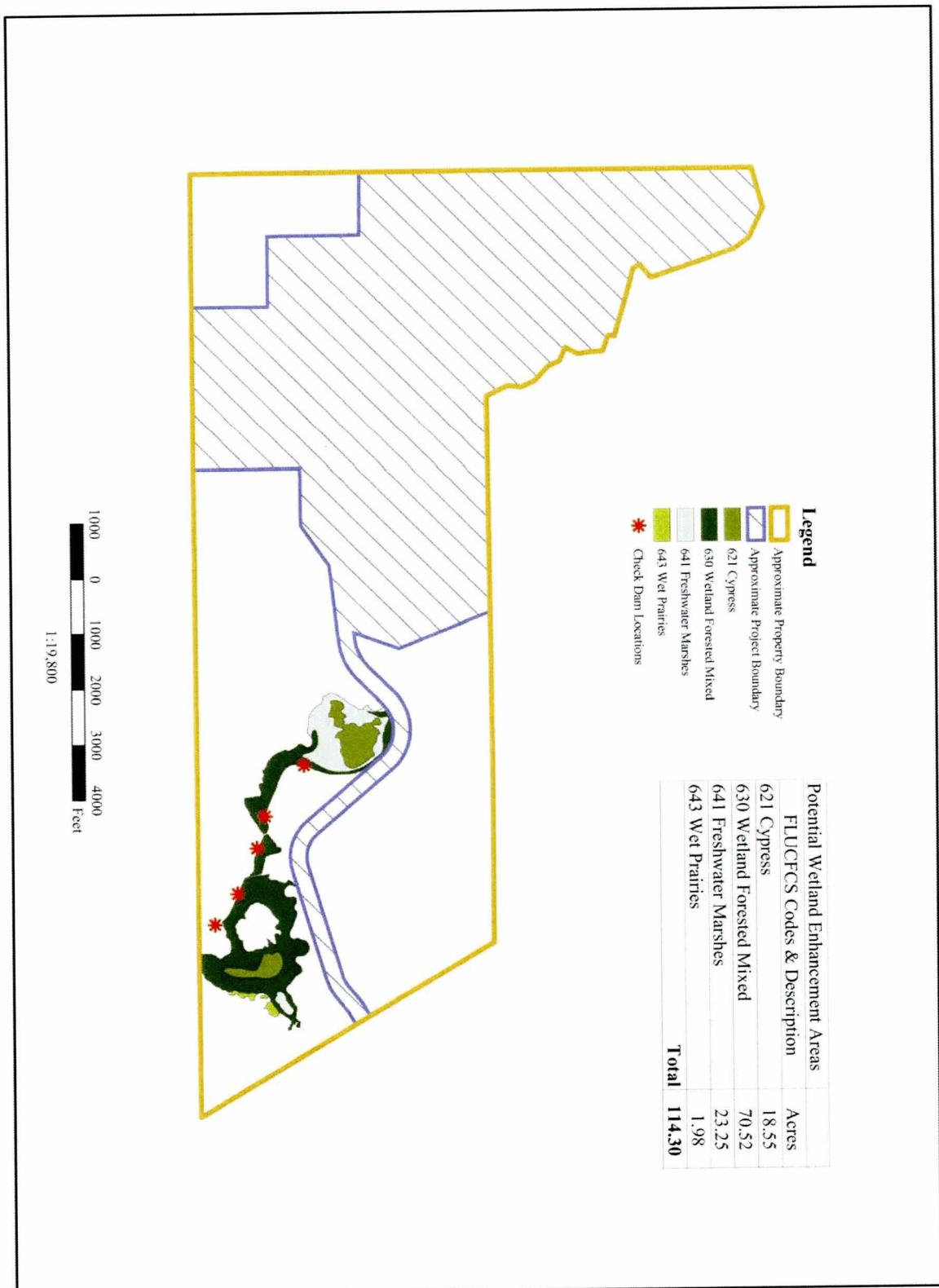
GIS QA/QC:
None



1" = 2 miles

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Project Number: 3972-003

Project Name: enhancement_areas.mxd

Filename: fig-4_wet-enhancement.pdf



Preparation Date:
16 April, 2002
Revision Date:
Project Manager:
JJB
GIS Operator:
WAC
GIS QA/QC:

Figure 4
Oak Hammock Conservation Area
Wetland Enhancement Area Map
Osceola County, Florida

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Project Number: 3972.011.18H

APR Name: Edificeair

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GIS Operator:
WAC
GIS QN/QC:

Figure 5
Oak Hammock Conservation Area
Wildlife Sightings, March-April 2000
Osceola County, Florida

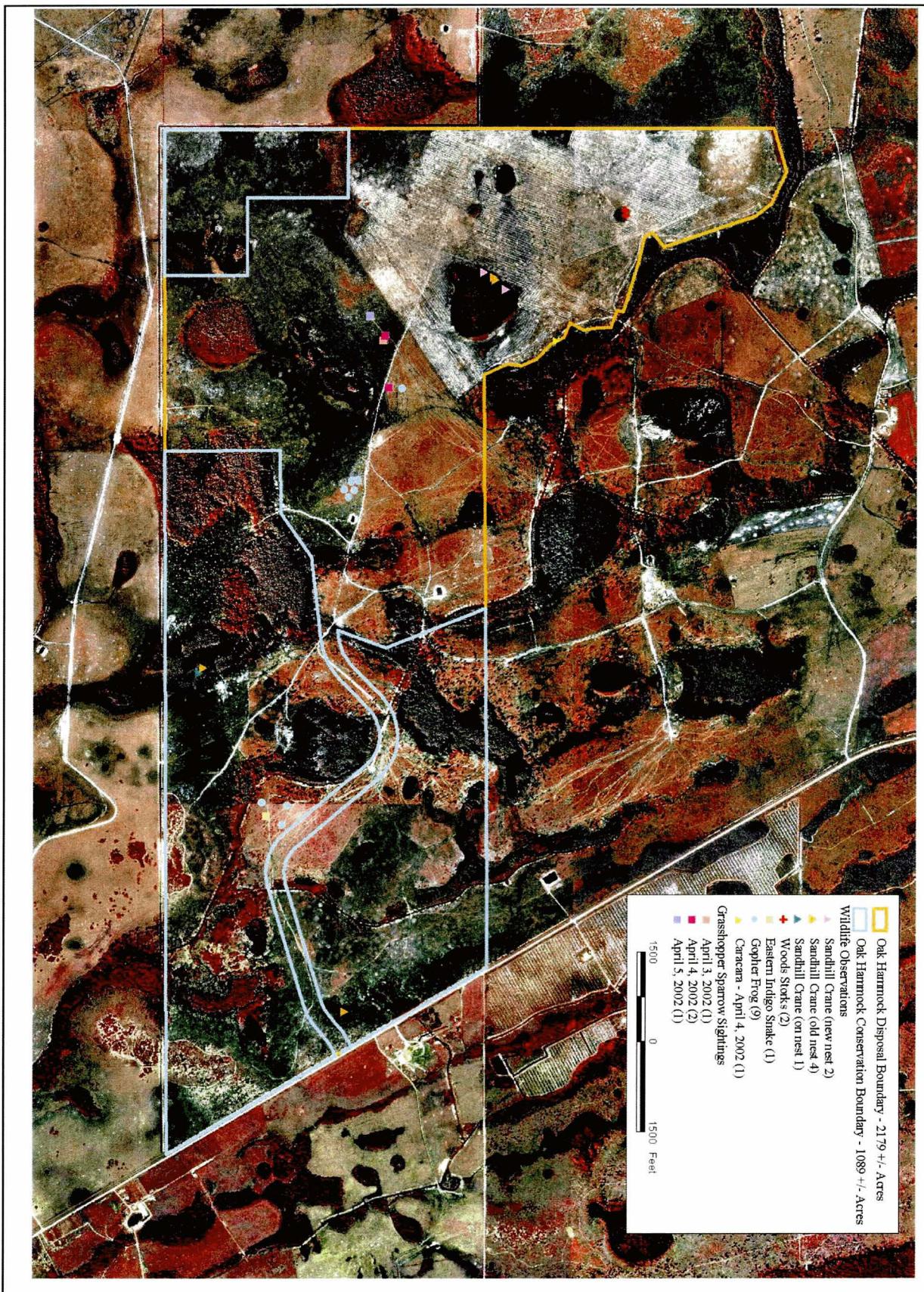
Preparation Date:
17 April, 2002

Revision Date:
None

Project Manager:
JJB

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Project Number: 3972-011-B01

APR Name: Wildlife.apr

Filename: ce.fig.6_sightings02.gdb



GIS Operator:
LRS

GIS QA/QC:

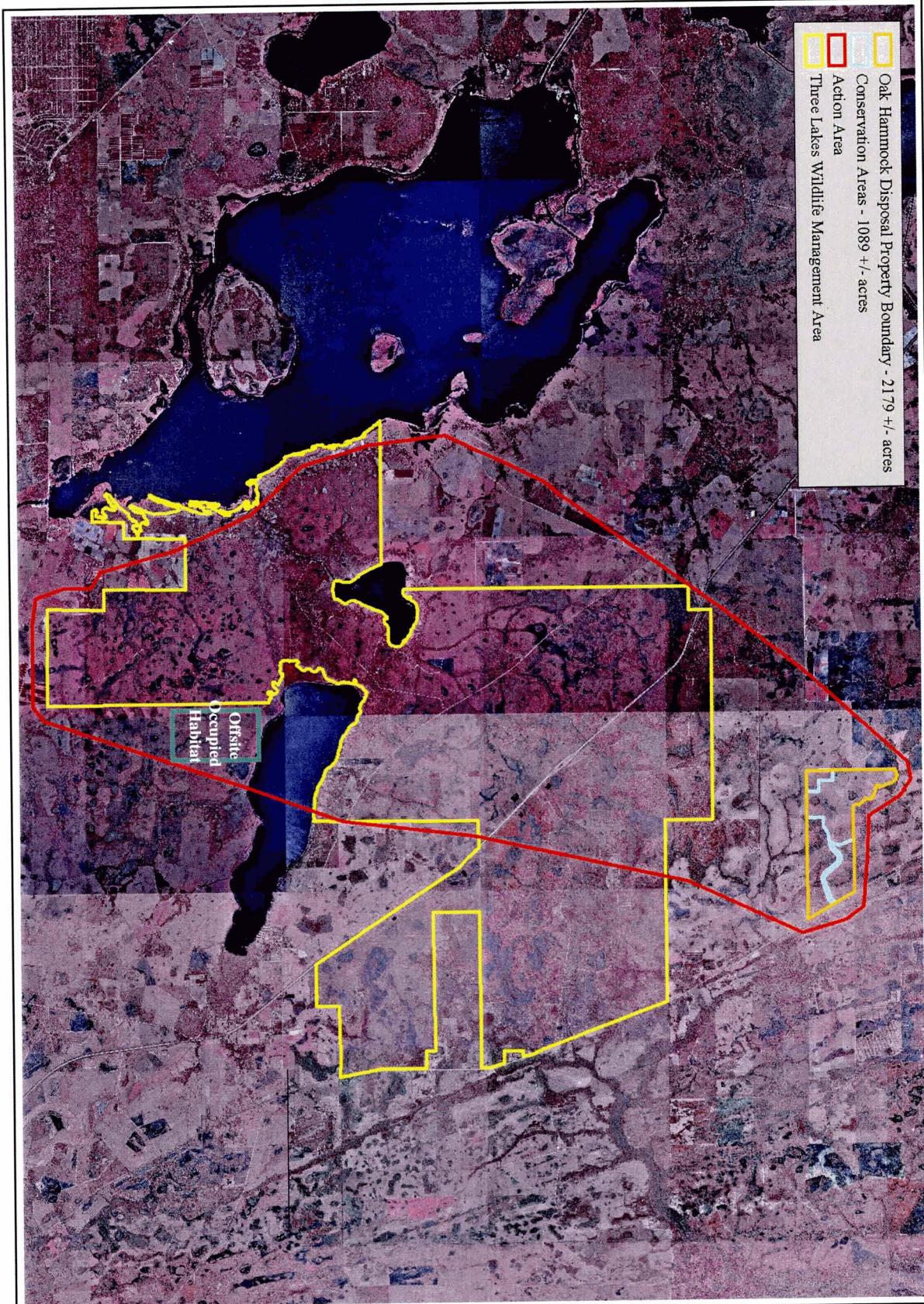
Figure 6
Oak Hammock Conservation Area
Wildlife Sightings, March-April 2002
Osceola County, Florida

Preparation Date:
19 April, 2002
Revision Date:
Project Manager:
JJB

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Project Number: 3972-011

APR Name: flucfs.apr

File name: fig7-actionarea.p5



GIS QA/QC:
GIS Operator: LBS

Figure 7
Action Area for the Omni Waste
Oak Hammock Project
Imagery: 1999 USGS DOQQ

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Figure 8. Six known breeding populations of Sparrows

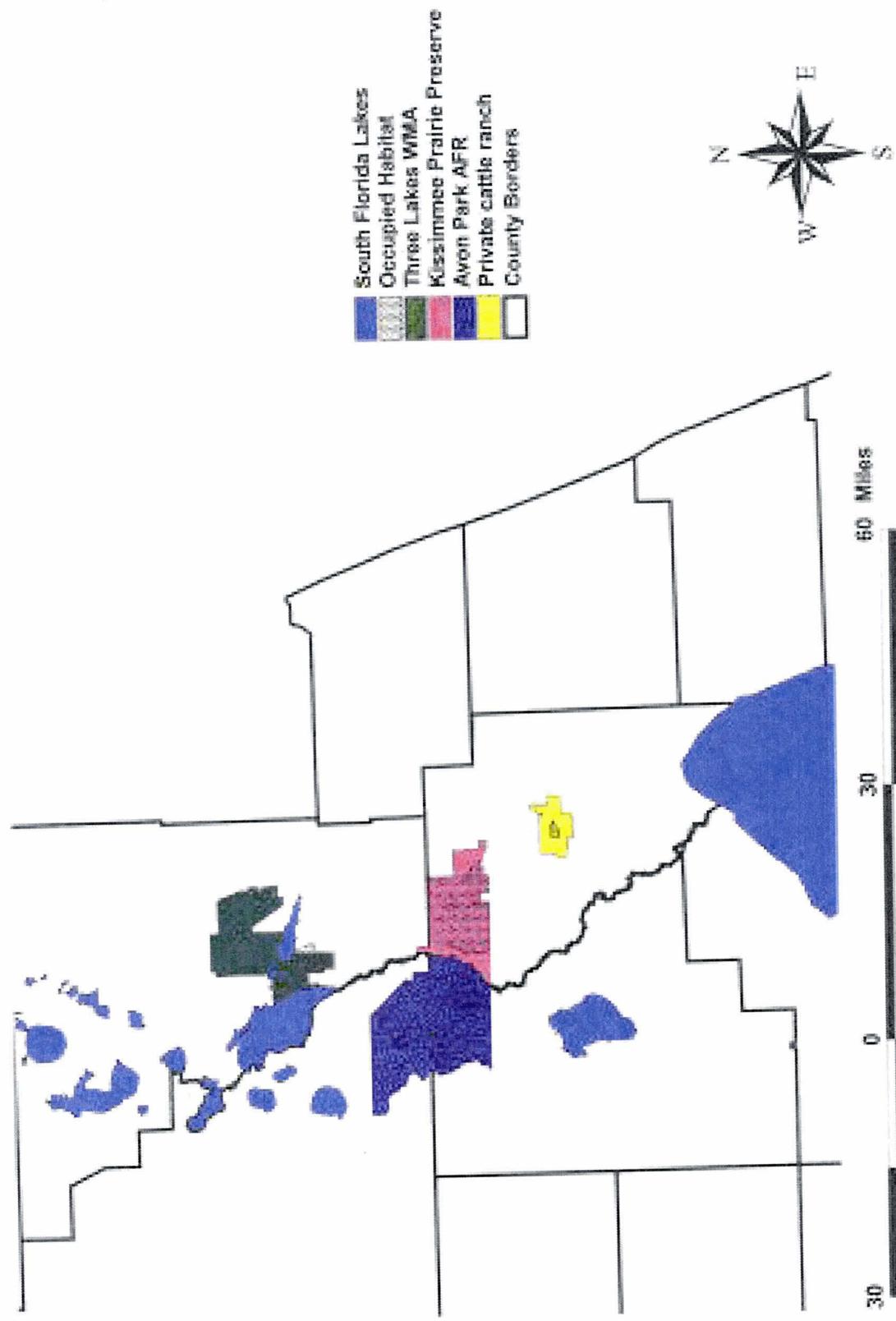
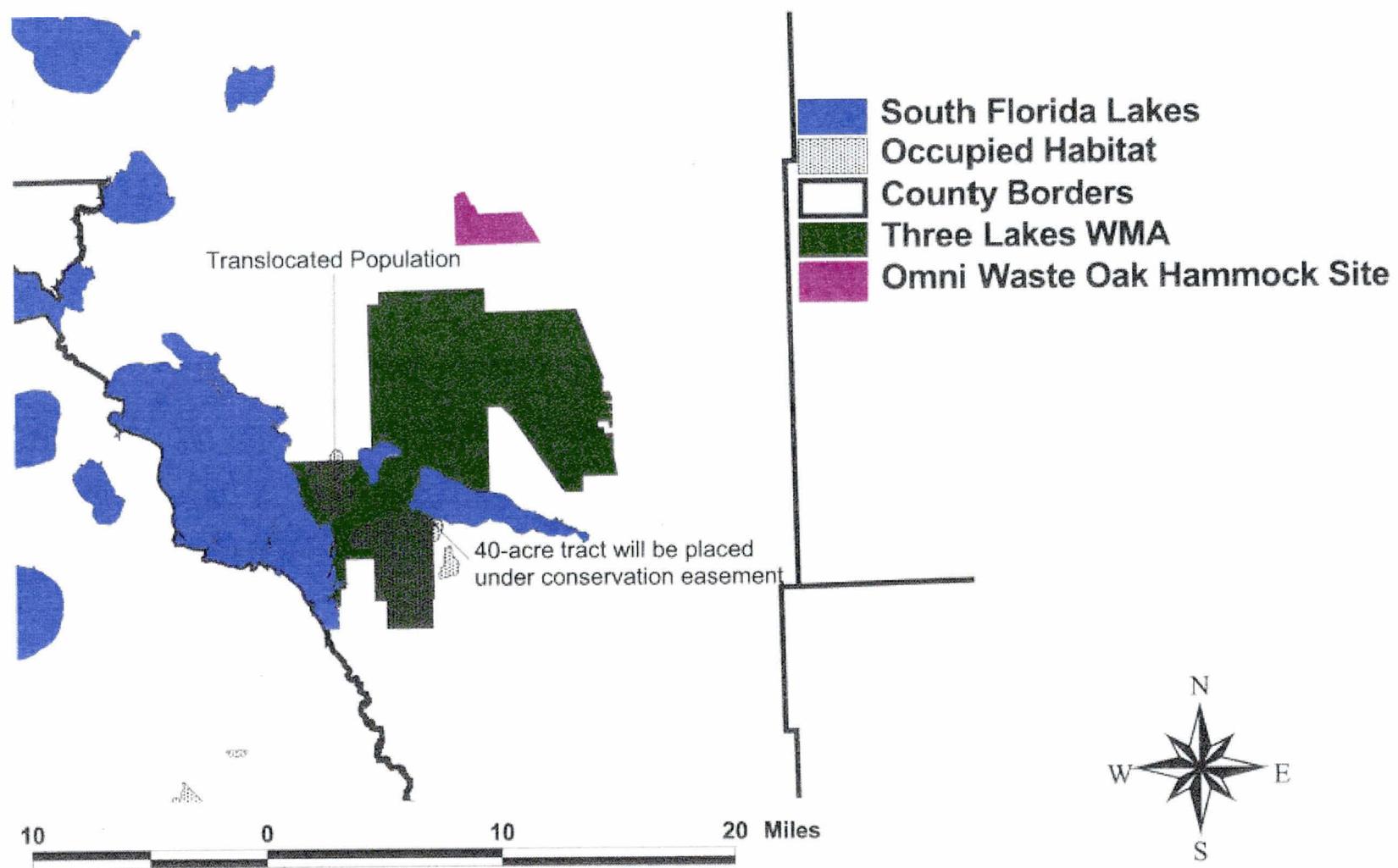


Figure 9. Occupied Habitat on and around Three Lakes WMA



CONSERVATION EASEMENT

STATE OF FLORIDA
COUNTY OF

KNOW ALL PERSONS BY THESE PRESENTS THAT in consideration for the payments by Omni Waste of Osceola County, LLC, to Adams Ranch, Inc. (Adams), the receipt and sufficiency of which are hereby acknowledged, Adams (Grantor) has granted to the State of Florida Department of Environmental Protection, 3319 Maguire Boulevard, Suite 232, Orlando, Florida (Grantee), a Conservation Easement in accordance with Section 704.06, Florida Statutes, in and over the real property in Osceola County, Florida, as set forth in the legal description attached hereto and incorporated herein as Exhibit A.

As used herein, the term Grantor shall include any successor or assignee of the Grantor, and the term Grantee shall include any successor or assignee of the Grantee.

It is the purpose and intent of this Conservation Easement to assure that the subject lands will be retained and maintained forever predominantly in the natural vegetative and hydrological condition existing at the time of execution of this Conservation Easement.

Except for such specific activities as are authorized by the Department of Environmental Protection, the following activities are prohibited on the property subject to this Conservation Easement:

- (a) Construction or placing of buildings, roads, signs, billboards, or other advertising, utilities, or other structures on or above the ground.
- (b) Dumping or placing of soil or other substances or material as landfill or dumping or placing trash, waste, or unsightly or offensive materials.
- (c) Removal or destruction of trees, shrubs, or other vegetation; with exception of nuisance and exotic plant species as may be required by Grantee;
- (d) Excavation, dredging, or removal of loam, peat, gravel, soil, rock, or other material substances in such manner as to affect the surface.
- (e) Surface use except for purposes that permit the land or water areas to remain in its natural condition.
- (f) Activity detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation.
- (g) Acts or uses detrimental to such aforementioned retention and maintenance of land or water areas; and
- (h) Acts or uses detrimental to the preservation of any features or aspects of the property having historical, archaeological or cultural significance.

Notwithstanding the provisions of paragraphs (a) – (h), above, the property subject to this conservation easement may continue to be used for hunting and cattle grazing, subject to the limitations set forth in the following three paragraphs.

Any hunting must be conducted in strict compliance with all applicable local, state and federal laws.

The Grantor may allow cattle grazing on the property that is subject to this Conservation Easement, consistent with Adams' current practices. New barns, buildings, watering holes, roads and other permanent improvements shall not be constructed on the property, but existing fences, unimproved roads, trails, and drainage systems may be used and maintained. Minor or incidental impacts associated with the use of the existing unimproved roads or trails for authorized hunting and cattle ranching activities shall not be deemed a violation of this Conservation Easement.

The property may be burned periodically. The property also may be roller-chopped if necessary to maintain the property in a condition that is suitable for use by the Florida Grasshopper Sparrow. Any prescribed burn or roller-chopping must be conducted in compliance with an approved wildlife management plan and all applicable laws, and shall be subject to any conditions required by any agency with jurisdiction over the Grantor's actions.

It is understood that the granting of this Conservation Easement entitles the Grantee or its authorized representatives to enter the above-described land in a reasonable manner and at reasonable times to assure compliance. The Grantee shall provide reasonable advance notice to the Grantor before entering the property.

The Grantor on behalf of itself and its successors or assigns hereby agrees to bear all costs and liability to the operation and maintenance of the lands subject to this Conservation Easement in the natural vegetative and hydrologic condition existing at the time of execution of this Conservation Easement. The Grantor does hereby indemnify and hold harmless the Grantee from same. The Conservation Easement hereby granted and the obligation to retain and maintain the land forever predominantly in the vegetative and hydrologic condition as herein specified shall run with the land and shall be binding upon the Grantor and its successors and assigns, and shall inure to the benefit of the Grantee and its successors and assigns.

The terms and conditions of this Conservation Easement may be enforced by the Grantee by injunctive relief and other appropriate available remedies. In any enforcement action in which Grantee prevails, Grantor shall bear the costs of restoring the land to the natural vegetative and hydrologic condition existing at the time of execution of this Conservation Easement. These remedies are in addition to any other remedy, fine or penalty which may be applicable under Chapter 403, Florida Statutes.

Any forbearance on behalf of the Grantee to exercise its rights in the event of the failure of Grantor to comply with the provisions of this Conservation Easement shall not be deemed or construed to be a waiver of the Grantee's rights thereunder in the event of any subsequent failure of the Grantor to comply.

IN WITNESS WHEREOF, Grantor has hereto set Grantor's hand and seal on this day of ____, 200-.

Signed, sealed and delivered in our presence of:

WITNESS

By: _____
GRANTOR

WITNESS

ACKNOWLEDGMENT

The foregoing instrument was acknowledged before me this _____ (date), by _____ (name of officer or agent), of _____ (name of Corporation), a _____ (State or place of incorporation) corporation, on behalf of the corporation.

(Seal)

State of Florida

Notary Public

My Commission
Expires:

Prepared by:
(Name and address)