



United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Memorandum

To: Janet Mizzi, Chief of Planning and Permitting, Southeast Regional Office

From: *Craig Aubrey*
Larry Williams, Field Supervisor, South Florida Ecological Services Office

Subject: Biological Opinion Addressing Effects of Amending Recovery Permit TE20020A-0 for Reed Noss' research on the Florida Grasshopper Sparrow Research

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion based on the proposed amendment of section 10(a)(1)(A) recovery permit TE20020A-0 to conduct research on the endangered Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) (FGS) throughout the species' current and historic range within DeSoto, Glades, Hardee, Hendry, Okeechobee, Polk, Highlands, Manatee, and Osceola Counties, Florida, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*).

This Biological Opinion is based on published literature, research reports, the permit application and subsequent correspondence, telephone conversations, field investigations, and other sources of information. A complete administrative record of this consultation is on file at the South Florida Ecological Services Office (SFESO) in Vero Beach, Florida.

Consultation History

On April 5, 2012, the SFESO received a request from the Service's Southeast Regional Office (RO) for formal consultation on the amendment of TE20020A-0.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

Pursuant to section 10(a)(1)(A) of the ESA, the Service proposes to amend recovery permit TE20020A-0 to the applicant, Dr. Reed Noss, for take of FGSs while conducting research on FGS demography and population dynamics. Activities currently authorized under permit TE20020A-0 allow for the harassment of up to 200 individual FGSs (nestlings, juveniles, and adults) per year, and the injury or death of up to two percent of banded FGSs per year over 5 years. Dr. Noss has requested his permit be amended to allow blood collection from 40 of those 200 individual FGSs per year in order to better evaluate genetic diversity within remaining populations. These additional activities are described below. Dr. Noss and his staff have over 30 years of experience working with the FGS and other imperiled sparrows performing the research outlined in his current permit.



Collecting blood from nestlings

Either the brachial vein will be pricked with a 27 gauge needle, or the ulnar vein in the wing will be punctured with a 28 gauge needle, to obtain a heparanized microhematocrit capillary tube of blood from each nestling. This sample will be no more than 25 microliters (μ l) and far below the maximum amount recommended by the American Ornithologist's Union (AOU). The blood will then be transferred to a vial with 0.5 milliliters (ml) of lysis buffer and stored at room temperature until subsequent analysis at the University of Central Florida. These samples will be used for molecular genetic analyses to facilitate studies on the role of inbreeding within FGS population declines. These samples will also serve as a resource for future captive breeding programs, if pursued. All recommendations of the AOU and The Ornithological Council (OSNA) for nesting studies will be followed while conducting these protocols (AOU 1988; OSNA 1997).

After processing, the authorized persons shall ensure that all birds are apparently healthy and that all bleeding has stopped. Cotton wads used to stop bleeding will be removed from the birds and the birds will be carefully placed back in the nest.

Collecting blood from adults and subadults

If a blood sample had not been previously obtained from the captured bird, then a sample will be taken using the same protocols identified for nestlings. For each adult or juvenile trapped a blood sample of up to 0.5 percent of the body weight of the bird will be collected. OSNA (1997) standards allow for up to 1 percent of the body weight of the bird to be taken at any given time without negative impacts to the animal.

The action area is defined as all areas within the range of the FGS to be affected directly or indirectly by the Federal action. The Service has determined the action area for this project is DeSoto, Glades, Hardee, Hendry, Highlands, Manatee, Okeechobee, Osceola, and Polk Counties (Figure 1).

STATUS OF THE SPECIES/CRITICAL HABITAT

The following discussion is summarized from the South Florida Multi-Species Recovery Plan (MSRP) (Service 1999), the 5-year status review (Service 2008), as well as from recent research publications and monitoring reports.

Species/critical habitat description

The FGS is one of four North American subspecies of grasshopper sparrow, and is endemic to the dry prairie region of central and southern Florida. Based on declines in suitable habitat and population size, the National Audubon Society placed the FGS on its blue list in 1974. The FGS was listed as endangered by the State of Florida in 1977. The Service listed the FGS as endangered on July 31, 1986, due to habitat degradation and loss, primarily as a result of conversion of native dry prairie vegetation to improved pasture (51 FR 27495).

The FGS is a small, short-tailed, flat-headed sparrow averaging 13 centimeters (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. Adult FGSs are whitish underneath, unstreaked, with a buff throat and breast. Juvenile FGSs have streaked breasts. The ventral color pattern resembles that of the Bachman's sparrow. The rectrices of the FGS are pointed, the lores are light gray to reddish-yellow, and the bend of the wing is yellow. Its bill is thick at the base and its feet are flesh-colored (Vickery 1996).

The FGS is marked with a longer bill and longer tarsi than the northern subspecies, *A. s. pratensis*. The FGS also has a much darker, blackish dorsum than *A. s. pratensis*, with more grayish flanks (Dean 2001). Adult Henslow's sparrows (*A. henslowii*) and Le Conte's sparrows (*A. leconteii*) are similar in appearance to the FGS, but they both have ventral streaking, which is lacking in adult FGS (Stevenson and Anderson 1994). And, although the juveniles of these three different subspecies would be difficult to distinguish visually from one another, only the FGS breeds in Florida. Therefore, there is no overlap in juvenile distribution.

During the breeding season, male and female FGSs can be distinguished in the hand by the presence of a cloacal protuberance in the male or a brood patch in the female. Gender may also be determined based on wing chord length and body weight, but this method is not reliable due to some degree of overlap between the genders. Female FGSs are generally smaller and proportionally heavier than males (Delany et al. 1994).

The FGS is most easily located and identified by its song, which 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" (Vickery 1996). FGSs sing while perched upon dead palmetto leaves, dead oak twigs, staggerbush (*Lyonia* spp.), and tarflower (*Befaria racemosa*) between 15 and 90 cm in height (Nicholson 1936; Delany et al. 1995). They may also sing from the ground (Dean 2001).

Life history

FGSs are strongly habitat-specific, occupying only the native fire-maintained dry prairie vegetation community and a few semi-improved pasture sites that superficially resemble the dry prairie community and were presumably dry prairie prior to conversion to pasture. The 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) (Florida Natural Areas Inventory [FNAI] and Florida Department of Natural Resources [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.

FGS habitat consists primarily of large, expansive patches of contiguous native dry prairie vegetation that have been regularly maintained with fire. Dry prairie vegetation is composed of a diverse variety of species, including grasses, forbs, and shrubs. Orzell and Bridges (2004) report over 650 vascular plant taxa have been recorded within dry prairies. Habitat characteristics that are important for FGSs include high percentage of bare ground cover and low vegetation height (30 to 70 cm) (Delany et al. 1985). Both of these characteristics are maintained by frequent fire. Some dry prairies may be artifacts of clear-cutting, unnaturally frequent burning, livestock grazing, and alteration of hydrology (Abrahamson and Hartnett 1990).

When compared with habitat of other grasshopper sparrow subspecies, that used by *A. s. floridanus* 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 the 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 hectares (ha), are needed to maintain self-sustaining populations of FGSs (Perkins 1999, Perkins and Vickery 2001).

FGSs can be reproductively successful in pastures dominated by non-native sod-forming grasses that are ungrazed and overgrown in some cases (Mulholland and Small 2001). However, as pastures become intensively managed and native vegetation components and bare ground are eliminated, FGS populations may decrease or disappear (Delany and Linda 1994). Little is known about what characteristics of pastures dominated by non-native species may result in occupancy by FGSs. Field observations have revealed use of non-native habitats including Bahia pastures with nearly 100 percent ground cover (Dean 2001). FGS appear to prefer pasture sites containing some structural diversity, such as bunchgrasses (*Andropogon* spp., *Aristida* spp., *Schizacyrium* spp.), small shrubs (*Asimina* spp., *Myrica cerifera*, *Serenoa repens*, and others), and forbs (*Eupatorium* spp., *Solidago* spp., and others) (Dean 2001). Appropriate management of Bahia pastures to maintain grasshopper sparrow habitat remains largely unknown.

FGSs are secretive by nature, and have few behaviors or characteristics that enable them to be readily located or identified. They are almost exclusively terrestrial, spending nearly all of their time on the ground. During the breeding season, males perch, sing, and perform short territorial display flights for a few hours each day. Females are rarely seen, and can only be regularly observed when carrying food to nestlings. Outside of the breeding season, FGSs become much more secretive than during the breeding season, and generally do not vocalize or fly except in response to disturbance. In general, FGSs prefer to avoid disturbances by running along the ground and generally only fly if a potential predator approaches within 2 to 3 m. FGSs form pair bonds during the breeding season, but remain solitary for the remainder of the season, and rarely interact with other FGSs outside of the breeding season.

During the breeding season, FGSs form breeding aggregations within suitable habitat (Delany 1996), and individual male sparrows set up territories within the breeding aggregations. Territories tend to be widely and irregularly spaced, often with un-defended space between adjacent territories. Territories are rarely tightly-packed within a prairie area. Territory density has been shown to be related to the time since habitat has burned. Shriver (1996) and Shriver

and Vickery (2001) report significant declines in territory density as time since fire increases, but see Delany et al. (2002). Delany et al. (1995) found mean breeding territory size for FGSs at APAFR to be 1.80 ha, with a maximum size of 4.82 ha. As the time since last fire increases, territories are reported to be established less frequently (Walsh et al. 1995), and FGS home ranges become larger (Delany et al. 1992). Male FGSs defend their territory boundaries from the time territories are established through incubation (Delany et al. 1995). After the young hatch, territory defense becomes less rigorous (Smith 1968). Adult FGSs exhibit strong site-fidelity to nesting territories, although individuals have been observed traveling as far as 4 kilometers (km) from the nesting territories during winter months. The majority of males (86 percent [Delany et al. 1995]; 100 percent [Dean 2001]) remain on the same territory in consecutive years.

Male FGSs generally begin singing in mid-March. Their singing usually diminishes by late June, although they continue to sing through August (Dean 2001). Following summer burns, males may sing more frequently than they do in unburned areas (Vickery 1996; Shriver 1996; Shriver et al. 1996). Males may sing throughout the day, although they sing more frequently from sunrise to 9:00 a.m. and 15 minutes before sunset (Vickery 1996). FGSs have two distinctly different songs (Vickery 1996), and when establishing breeding territories, they are reported to sing the shorter primary song (Smith 1959); the sustained, or secondary song, is thought to play a role in attracting a mate and maintaining a pair bond (Vickery 1996).

FGSs begin nest-building activities approximately 4 weeks after the onset of territorial singing (Vickery 1996). Nests are located on the ground in shallow (less than 3.2 cm deep) excavations in the sand substrate (Delany and Linda 1998a; Delany and Linda 1998b); the rims are level or slightly above the ground. The nests are dome-shaped and constructed of narrow-leaved grasses and grass-like monocots, such as wiregrass (*Aristida beyrichina*), bluestems (*Andropogon* spp.), and yellow-eyed grass (*Xyris* spp.). The outer diameter averages 10.3 cm, the inside diameter averages 6.9 cm, and the height averages 7.7 cm. The mean orifice width is 5.1 cm (Delany and Linda 1998a). Nests are typically shielded by dwarf shrubs (*i.e.*, saw palmetto [*Serenoa repens*]) and dwarf live oak, rather than grass clumps as reported for other subspecies, and nest opening directions are randomly oriented (Delany and Linda 1998a). Nests are placed within patches of dense vegetation, surrounded by an area of more open vegetation, possibly to provide visual shielding from potential predators while still allowing adults easy access to nests from the ground (Delany and Linda 1998b). When delivering food to nestlings, adults alight on the ground 2 to 5 m from the nest and proceed to the nest on foot.

Egg-laying is reported to begin as early as late 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 (McNair 1986; Smith 1968). Perkins et al. (2003) report mean clutch sizes of 3.47 ($n = 17$) at APAFR, 3.56 ($n = 9$) at TLWMA, and 3.75 ($n = 4$) at KPPSP. Eggs are white, smooth, slightly glossy, and lightly speckled and spotted with reddish-brown markings. These markings are generally sharp and well-defined, either scattered over the entire egg or concentrated toward the large end.

Female FGSs incubate their eggs 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. If a nest is destroyed, the female may make a new one in approximately 10 to 12 days (Dean 2001). Considering the duration necessary to complete a single reproductive cycle, three to four successful clutches are possible within a single breeding season (Vickery 1996; Perkins 1999) and multiple clutches are common (Vickery 1996). Nesting activity late in the season regularly occurs, and Perkins (1999) reported 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).

FGS hatchlings are altricial and are brooded by the female for 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. This behavior has not been documented in FGSs. Both parents continue to provide care after young fledge from the nest, though the amount of time they do so before the young become independent is poorly documented (Vickery 1996). In Florida, fledglings are reported to aggregate in loose flocks with no parental care 3 to 4 weeks after 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 juveniles may travel widely across the landscape (Dean 2001; Miller 2005).

During the non-breeding season, FGSs appear to expand their scope of movements. As determined through radio telemetry, the average home range size during the non-breeding season was 29.0 ha, with individual home ranges varying from 1.0 to 173.6 ha (Dean 2001). In addition, nearly 40 percent of individuals used more than one spatially distinct home range during the course of the non-breeding season. These home ranges were not mutually exclusive, however, and home ranges of many different individuals overlapped (Dean 2001). A FGS originally banded as a juvenile at OQ Range in APAFR was recaptured at KPPSP 6.5 years later, approximately 30 km from the original capture site. This bird is the first marked individual to leave one of the six extant populations and be recaptured in another, and this movement constitutes a record for overall distance traveled by an individual FGS (Miller 2005).

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

FGSs forage on the ground or just above it. An examination of the contents of 10 stomachs of FGSs from the Kissimmee prairie region found 69 percent "animal matter" (insects) and 31 percent vegetation (Howell 1932). Identified insects included grasshoppers, crickets, beetles, weevils, and 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). FGSs switch to a seed-dominated diet during the non-nesting season, but still consume some animal matter (Vickery and Dean 1997).

Population Dynamics

FGSs 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 not all singing males are paired, with as many as 15 to 23 percent of males identified as unpaired (Vickery and Perkins 2001). The difficulty of observing female sparrows makes accurate determination of sex ratios, pairing, or the lack of pairing, difficult.

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 pair each year, though this level of productivity is likely uncommon. Nest success (defined as fledging at least one young) rates are generally low, and nest success rates range between 11 and 38 percent. Accounting for the number of nesting attempts and observed nest success, Vickery and Perkins (2001) report an average annual productivity per pair of 2.8 to 3.5 young 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 combined with variability in depredation and nest failure rates may result in widely varying reproductive success among years.

Little is known about the timing, extent, or frequency of dispersal by juvenile sparrows, though most agree that juveniles are the most likely group to disperse (Vickery and Perkins 2001). This represents one of the most important remaining information gaps about FGS ecology. Genetics studies indicate little genetic differentiation among spatially distinct populations, suggesting either relatively regular movement of individuals among the disjunct populations, or recent isolation of the populations (Delany et al. 2000). In 2003, Miller (2005) documented the first known dispersal between disjunct populations when a FGS originally banded as a juvenile on OQ Range in APAFR was recaptured at KPPSP. Besides this one observation, there are no empirical data available to calculate rates of dispersal among populations. The number of dispersing individuals may be too low to have a demographic effect on any of the populations, but may be sufficient to maintain genetic diversity (Delany et al. 2000).

Estimates of annual adult male survival rates range between 0.24 and 0.83 for different populations and different years (Delany et al. 1993; Perkins and Vickery 2001). Average adult annual survival rates are 0.48 and 0.53 at APAFR and TLWMA, respectively. Delany et al. (1993) estimated a pooled annual survival rate of 0.598 at APAFR. These results suggest that annual adult survival rates are variable, with an average slightly above 50 percent. Juvenile survival rates have never been directly estimated, but Perkins and Vickery (2001) estimated the average juvenile survival rate to be 0.35 through indirect calculations. Results of a 3-year banding study indicate a mean life expectancy of 1.95 years for male birds that are at least 1 year old ($n = 48$) (Delany et al. 1993). The longevity record for FGSs is 7 years (Dean et al. 1998; Miller 2005). Because there is no information on the survival and life expectancy of females, it can only be assumed that female survival rates approximate those of males.

Studies at APAFR and TLWMA have recorded several predation events for radio-marked adult FGS. Potential or probable predators include mammals, snakes, and birds (Perkins et al. 1998; Dean 2001). The main cause of adult mortality appears to be predation, primarily by wintering

raptors (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 (*Buteo lineatus*) are the only common raptor that occurs in dry prairies during the breeding season and they do not regularly prey on birds (Meyer 1999). Loggerhead shrikes (*Lanius ludovicianus*) are known to prey on adult FGSs year-round, but FGSs are not common prey and are only rarely captured. Other predators known to take eggs or nestlings include the striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale putorius*), raccoon (*Procyon lotor*), longtailed weasel (*Mustela frenata*), foxes (*Urocyon* sp. and *Vulpes* sp.), cats (*Felis* spp.), feral hogs (*Sus scrofa*), snakes, and possibly armadillos (*Dasypus novemcinctus*) (Vickery 1996).

Status and Distribution

The current known range of the species is limited to Highlands, Okeechobee, Osceola, and Polk Counties. Early records for abundance and distribution of FGSs are scarce, though it is believed the species was once more numerous and widespread than it is today (Delany 1996). Howell's (1932) observations of FGSs suggest population numbers were greater during the early 1930s. Breeding colony size at that time was apparently 3 to 19 pairs, although precise survey data for the early 20th century are not available (Howell 1932; Smith 1968; McNair 1986). Apparently, FGS numbers were never constant or predictable. Nicholson (1936) noted "grasshopper sparrows do not occupy all apparently suitable habitats, and the species fluctuates considerably in abundance from year to year." This is further supported in the final rule that added FGS to the list of endangered species, which stated "The habitat needs of the species are specific, and its presence in any one area over a long term cannot be predicted or assured" (51 FR 27492).

Because the FGS is closely associated with dry prairie habitats, trends in the amount and condition of dry prairie habitat within central Florida probably mirror the trends in the range-wide FGS population. Estimates of the historical and current extent of dry prairie within central Florida vary greatly. Florida dry prairie, the only place where FGS occur, is ranked as a G2 (globally imperiled) community type (FNAI and FDNR 1990; Grossman et al. 1994). In central Florida, within the range of the FGS, 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 that have been consistently burned and that have minimal human disturbance (Cole et al. 1994; Bridges 1997).

Obtaining consistent estimates of historical and existing areas of dry prairie vegetation is difficult. Kautz et al. (1993), based upon calculations from an early vegetation map of Florida (Davis 1967), estimate that 0.83 million ha, or 5.9 percent, of pre-settlement Florida was covered with dry prairie. By 1989, they estimate that 0.56 million ha of dry prairie remained. Although this figure includes areas outside the historic range for dry prairie given in Davis (1967), it represents a loss of 0.27 million ha, or 33 percent, of the original area.

Aerial surveys of dry prairie habitat indicated that only 156,000 ha of dry prairie habitat existed in 1995 (Shriver and Vickery 1999), an 81 percent decrease from the 0.83 million ha estimated from 1967 (Davis 1967). FGS habitat loss is due to conversion of dry prairie to improved pasture (Layne et al. 1977) and agricultural uses such as citrus groves (Davis 1967; Meador 1972; DeSelm and Murdock 1993), pine plantations, exotic sod-forming grasses, row-crops, and,

historically, eucalyptus (*Eucalyptus* spp.) plantations. Conversion of dry prairie to citrus groves may represent the single greatest threat to existing prairie remnants. Lack of burning may have degraded additional prairie habitat.

Delany et al. (2005) reported efforts to identify dry prairie remnants through remote sensing indicated a remaining dry prairie area of 64,821 ha in Florida, with the majority of the remaining prairie occurring on conservation lands. Follow-up surveys of 12 privately-owned dry prairie areas failed to locate any FGSs that had not been previously documented. Delany (2006) conducted additional detailed assessments of the habitat condition of dry prairie patches through helicopter surveys, and reported 44,933 ha of dry prairie remained in a condition that represented potential FGS habitat, with 69 percent of this area occurring on existing conservation lands.

In general, endemic habitat specialists with restricted ranges, such as the FGS, are sensitive to many environmental factors, including hydrological changes and degradation or loss of habitat. Changes in hydrological management regimes that render nesting areas too wet during the nesting season may affect the FGSs 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. These conditions can rapidly lead to habitat conditions that are unsuitable for FGSs.

Fire is the primary process that maintains native prairies. The natural fire-return interval for dry prairie communities is estimated to be 1 to 4 years (Abrahamson and Hartnett 1990) and most managed dry prairies are maintained on a 2- to 3-year burn rotation. The need for frequent and often intensive management of lands that support FGS will continue to make its status tenuous. Actions that occur over only 2 to 3 years, such as local increases in hydroperiod or lack of prescribed burning, may also significantly and detrimentally impact FGS populations.

Records of FGS occurrence and abundance are sparse, making accurate assessment of historic populations nearly impossible. Between 1927 and 1945, many sightings of FGS 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 FGS 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 Florida Fish and Wildlife Conservation Commission (FWC), formerly the Florida Game and Freshwater Fish Commission, began conducting surveys for the FGS in the 1980s, the historic sightings identified above gave little insight into FGS abundance (Delany et al. 1985, Stevenson and Anderson 1994). Since that time, more detailed survey information has become available, and at least cursory information on abundance was provided in most subsequent reports of FGS occurrence. However, thorough and consistent surveys were not regularly conducted at occupied sites until the early 1990s.

During 1980 to 1982, the FWC conducted surveys of previously recorded FGS locations and searched other areas of potential habitat (Delany et al. 1985). Of the seven sites where FGS had been previously reported, only one was found to support FGSs during the 1980 to 1982 surveys. Additional searches of potential habitat that has not been previously surveyed for FGSs documented their presence in six additional locations (Delany and Cox 1986). Additional surveys were conducted in 1984 and documented sparrows at these same sites, but also recorded FGSs at one new site and found FGSs at one site where they had been absent in 1982 surveys, for a total of nine occupied sites (Delany and Cox 1986). Assuming that all males recorded during these surveys were mated, a minimum total population size of 282 individuals resulted (Delany and Cox 1986).

In 1989 to 1992, the same sites where FGSs had been recorded during 1984 were again visited by FWC personnel. Only three of the sites still supported FGSs, two of which were on public lands (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. Fires may have preserved the suitability of these habitats. Several additional areas of potential FGS habitat were also surveyed during 1989 to 1992 and FGSs were found at 2 new sites, including an additional population on public lands (Echo Range on APAFR), for a total of 5 sites. These early surveys provided good information on FGS occurrence and distribution, but did not accurately represent abundance at each site since surveys of available habitat were not comprehensive where FGSs were located (Delany 2005).

Since the 1989 to 1992 surveys, occasional surveys of limited sites have been conducted whenever opportunities arise. These surveys have resulted in the discovery of five additional properties where FGSs occurred. Nesting FGSs were located on a site in Okeechobee that was proposed for development in 1992 (Turner and DeLotelle 1992), but FGS surveys have not been conducted on the site since 1992. One additional small population of FGS was located in 1997 (Delany et al. 1999) on APAFR (Bravo Range) and one population was found on private lands in 2001 (Biological Research Associates 2001). FGSs were also documented on a private ranch immediately adjacent to the area occupied by FGSs on TLWMA (Perkins and Vickery 2001) and these birds are presumed to be functionally part of the TLWMA population. A small population of FGSs were also reported on the National Audubon Society's Ordway-Whittell Kissimmee Prairie Sanctuary in the early 1990s, and FGSs on the site were intensively monitored from 1993 to 1999 (Shriver 1996; Perkins 1999).

Since the early 1990s, several additional sites where FGSs had occurred have been abandoned. On the Ordway-Whittell Kissimmee Prairie Sanctuary, hydrologic impacts that resulted from installation of a dyke on adjacent property artificially flooded the site starting in 1996. By 1999, the FGS had been extirpated. Since acquisition by the Florida Department of Environmental Protection, restoration of adjacent habitat to establish a corridor between the property and the larger prairies of the KPPSP has improved habitat and FGSs were recorded again in 2002. However, breeding activity has not been documented since then. Surveys conducted by FWC and Service staff in 2002 of Bright Hour Ranch in DeSoto County where FGSs were reported by Delany and Linda (1994) failed to locate FGSs and they are presumed to be extirpated from this site.

In 2001 to 2002, Vickery and Perkins (2002) conducted FGS surveys on some private lands that had been identified as potential FGS habitat and where they could gain access in an attempt to locate additional FGS populations. These surveys failed to locate any additional sparrow populations. In 2002 to 2004, Delany et al. (2005) also conducted surveys on private properties that had been identified as potential FGS habitat, and again, these surveys failed to locate additional FGS populations.

Since Delany's first efforts to assess FGS populations range-wide in the early 1980s (Delany et al. 1985), surveys have recorded a general decline in the distribution and occurrence of FGSs. Of the 14 sites where FGSs have been documented to occur, only 5 remain occupied, and 4 of these are on public lands. In addition, recent surveys of private lands have failed to document FGS on other sites. Despite several survey efforts, there have been no records of FGSs outside of the upper Kissimmee River basin since the early 1990s, and this represents a large reduction in the species' distribution. Additional surveys are needed to confirm this change in distribution.

Today, three large tracts of publicly-owned land contain the largest and most-studied populations of FGS. There is one population at KPPSP, which now includes the Ordway-Whittell Kissimmee Prairie Sanctuary (managed by the National Audubon Society until ownership was transferred in 2001). This preserve, acquired in 1996, has the largest contiguous block of dry prairie in public ownership (more than 12,000 ha) and the largest known population of FGS. It also provides a corridor between other protected sites. There is another population of FGS at TLWMA, which has approximately 2,500 ha of suitable, occupied habitat, and another disjunct patch of suitable habitat (861 ha) where FGSs did not occur, but to which FGSs were translocated in 2001 and 2002 (Dean and Glass 2001a). There are three populations at APAFR, which has approximately 2,400 ha of suitable FGS habitat. Survey efforts during the 2003 breeding season failed to detect any FGSs in one of the three population sites at APAFR (Bravo Range). One FGS was detected during 2004 surveys, but the future of this population is quite tenuous. Efforts to improve habitat suitability conducted in 2005 at APAFR included mechanical treatment of woody vegetation and removal of pine plantations adjacent to dry prairie sites. These efforts will result in a larger area of potential FGS habitat through continued restoration and maintenance.

Surveys for FGSs have been conducted regularly at KPPSP since 1999 (Mulholland and Small 2001), at TLWMA since 1991 (Dean and Glass 2001b), and at APAFR since 1982 (Delany et al. 2001). Monitoring efforts from 1999 to 2004 indicate the total population size at these three primary sites ranged from approximately 340 to 640 individuals, though the population sizes are variable among years. In 2003, surveys estimated the population size at these three sites at under 350 individuals, largely due to declines at APAFR and KPPSP. This was the lowest total population estimate recorded. In 2004, estimates of the overall population were higher than in 2003 at TLWMA and KPPSP, while APAFR populations remained essentially unchanged (Tucker et al. 2010; Delany 2011). In 2005, FGS population size estimates were down from 2004 at TLWMA and KPPSP, and were again relatively unchanged at APAFR (Delany 2005; Tucker et al. 2010; Delany 2011).

FGS numbers have remained relatively stable at TLWMA since monitoring was initiated in 1991, although a population decline was documented during 1996 to 1998 (Dean and Glass 2001b). The FGS population reached a recorded low of 168 birds in 1998, down from a high count in 1993 of 220 individuals. By the year 2000, the population had rebounded to 280. Reasons for the population decline and subsequent recovery are unknown and may simply represent a normal range of variability in the population. Surveys conducted in 2004, revealed 124 singing males in the primary population, and 6 to 7 singing males in the translocation area (Tucker et al. 2010; Delany 2011). If a 1:1 sex ratio is applied to the singing males, the current FGSs population at TLWMA is estimated at 262 birds. In 2005, 114 males were detected in the primary population, and 2 males were reported in the translocation area for a total estimated population size of 232 individuals (Delany 2005; Delany 2011). In 2006, 112 males were recorded in the primary population, and 1 to 2 males were recorded in the translocation area, for a population estimate of 228 individuals (Hannon 2007). Subsequent point counts at TLWMA have yielded 125, 142, 89, 91, and 61 singing males during 2007 to 2011, respectively (Schrott 2007, Schrott 2008, Schrott 2009, Schrott 2010, Schrott 2011).

The total population size reported at APAFR during 2002 was 162 sparrows (Delany 2002) distributed between three disjunct populations (Bravo, Echo, and Delta Trail Area-OQ Ranges), with the largest of the three (Echo Range) supporting over 100 sparrows. In 2003, the FGS population at APAFR declined significantly. Archbold Biological Station personnel conducted monitoring in 2003 and, before the completion of the second of three survey repetitions, surveyors were alarmed by the small number of sparrows they were hearing. After completing the second of three rounds of the surveys, a total of seven male FGSs had been detected. After all routine surveys had been completed, as well as additional intensive surveys, a total of 12 male sparrows had been detected. No sparrows were detected in the smallest population (Bravo Range) and the remaining 24 sparrows were distributed between two populations (Delta Trail Area-OQ and Echo Ranges).

The FGS populations have been in decline at APAFR since the late 1990s (Delaney et al. 2001). Between 1997 and 2002, the population on Bravo Range declined from 43 to 8 individuals, the population on Echo Range declined from 142 to 104 individuals, and the population on Delta Trail Area-OQ Range declined from 113 to 50 individuals. The total population on APAFR in 2002 was 162 individuals, half of the total population estimated in 1997 (298 FGSs). However, the declines in FGS populations at APAFR detected during the 2003 breeding season were all over 80 percent, which is significantly greater in magnitude than declines in previous years (Dean 2001). Based on annual survival rates reported by Perkins and Vickery (2001) of 48.2 to 53.3 percent, the rate of decline during 2003 at APAFR, is consistent with complete reproductive failure and nearly double the normal adult mortality rate.

In 2004 and 2005, the FGS populations at APAFR remained relatively stable with 3 to 4 males in the Delta Trail-OQ Range area, and 8 to 12 males in the Echo Range area (Tucker et al. 2010). A total of 11 males were recorded on APAFR in 2006, with 6 occurring in Echo Range and 5 on OQ Range (Tucker et al. 2010). A total of 10 males were detected in 2007 at APAFR, 8 of which were banded in previous years. The three males found at OQ were old (one was 3 and two were 4 or more years old), raising concern about the population there. A total of six nests were

located; two of six were second nests. At least three of the nests fledged three or more young (Schrott 2007). During 2008, point counts and other surveys found 9 to 11 males at APAFR. Two males were found on OQ Range, and six males were detected at Echo Range, and three were observed with females (Schrott 2008). Two nests each were found in the territories of two pairs, and each pair fledged one nest. Nine territories were confirmed at APAFR during 2009, seven on Echo Range and two on OQ (Schrott 2009). Two confirmed FGS males were found on APAFR's Echo Range, and one on OQ during 2010, with an overall estimate only eight birds occurring on APAFR (Schrott 2010). Only two male FGSP were detected at APAFR, again the lowest since monitoring began. Both birds were on Echo Range, and no FGSP were detected in the Delta-OQ area for the first time, raising the possibility that this aggregation has been extirpated. No females were detected, and no breeding activity was detected (Schrott 2011).

Concurrent with the decline at APAFR, the FGS population at KPPSP declined by 44 percent in 2003, from 234 in 2002 to 129 singing males (Tucker et al. 2010; Delany 2011). This is the first year there has been a significant decline at KPPSP since monitoring was initiated in 1999. Surveys conducted in 2004, revealed 107 singing males in the primary prairie site where the point-count arrays are established (up from 87 in 2003) (Tucker et al. 2010; Delany 2011). Because the entire site was not surveyed, the 107 birds represent the minimum population size. If a 1:1 sex ratio is applied to the singing males, the minimum FGS population at KPPSP is estimated at 214 birds. During 2005, only 68 males were recorded on standardized surveys (Tucker et al. 2010; Delany 2011), which equates to a total minimum population estimate of 176 individuals. In 2006, a total of 72 male FGSs was recorded on surveys, but this total includes 10 males detected on a new survey plot that was established in 2006 and had not been previously surveyed. Comparing only the results from those plots that have been surveyed consistently in recent years yields a total of 62 males and a minimum population estimate of 124 individuals. This is the lowest population estimate recorded in consistent surveys since they were established. Subsequent point counts at KPPSP have yielded 56, 86, 89, 52 and 21 singing males during 2007 to 2011, respectively (Schrott 2007, Schrott 2008, Schrott 2009, Schrott 2010, Schrott 2011). The numbers of males detected in 2011 were the lowest point count on record for KPPSP (Schrott 2011).

Although declines of such magnitude may have been a normal part of the biology of the FGS, the combination of population fluctuation, the currently reduced distribution and amount of available habitat, and smaller population size may threaten the persistence of this subspecies. No one has thoroughly screened FGS for diseases or blood parasites; however, the prevalence of West Nile Virus, Eastern Equine Encephalitis, and St. Louis Encephalitis are on the rise in Florida and should be considered. In February 2006, a radio-tagged Florida grasshopper sparrow died at KPPSP as a result of a species of *Mycobacterium*, which causes tuberculosis (Terrell 2006). The species of mycobacterium has not yet been identified, and the prevalence of this disease remains unknown.

Outside of public lands, much of the additional suitable FGS habitat is found on a few large, private cattle ranches. These ranches support FGSs, but the extent of the population there is largely unknown. 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 FGS, surveys have not

documented FGSs utilizing either conservation easement (Vickery and Perkins 2001; Service unpublished data). 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. Conversion of native prairie vegetation for agricultural or development purposes continues to occur, and continues to pose a threat to the FGS.

Habitat management, development, and land conversion are of serious concern on private lands. The open vegetative dry prairie community preferred by FGS was historically maintained by lightning-induced fires. These fires occurred primarily during the summer growing season between June and August. Many of the remaining dry prairies are ecologically degraded due to fire suppression. Deviation in fire intensity, fire return interval, and seasonality from the natural fire regime of frequent growing-season burns is perhaps the most significant management factor determining vegetation structure and composition of dry prairie communities (Dye 1997; Bridges 1997). Loss of groundcover species, changes in pine density and recruitment, invasion of non-constituent oaks, and excessive shrub growth have been documented from dry prairies with long periods (circa 35 years) of fire exclusion (Dye 1997). When dry prairie is frequently burned, saw palmetto is typically of small stature and sparsely distributed, but it tends to increase in stature and density when fire is absent or infrequent. Although fire is beneficial to the FGS and necessary to maintain its habitat, FGS densities decline 2 or more years following a burn event (Vickery and Shriver 1995).

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 for cattle during the lean winter months (Abrahamson and Hartnett 1990; Sullivan 1994). Ranchers also burn native pastures to maintain openness, reduce shrub cover, reduce fuel accumulations, and improve wildlife habitat (Abrahamson and Harnett 1990). In addition to fire, rollerchopping may be used to alter the vegetative composition and structure within prairie habitats. Roller chopping in winter may initially produce the fastest reduction of shrub cover and increased herbaceous growth (Fitzgerald et al. 1995). However, the remaining biomass is greater after roller chopping than after a burn. It is important to note roller chopping cannot fully replace the function of fire, since wiregrass is dependent on summer fires to complete its reproductive cycle. Allowing wiregrass to bloom results in greater seed production; which may increase winter forage for the FGS. In addition, roller chopping disturbs the soil, thereby producing conditions that increase invasion by exotic invasive species.

ENVIRONMENTAL BASELINE

The environmental baseline includes the effects of past and ongoing human and natural factors leading to current status of the species and their habitats.

Status of the species within the action area

Since the action area includes the current and historical range of the FGS, the information contained in the section titled *Status of the Species* and the subsection titled *Status and Distribution* establishes the status of the species within the action area for the FGS. The information from these sections is incorporated here by reference.

No critical habitat has been designated for the FGS.

Factors affecting species environment within the action area

In addition to the range-wide threats previously identified, monitoring and research efforts underway at KPPSP, APAFR, and TLWMA are expected to harass the FGS populations at those locations. Recovery permit TE697819-2, authorizes monitoring, research, and disease screening at KPPSP and other sites and states injury or mortality will not exceed three FGS per year for 2 years at that site. Recovery Permit 824723-7 states injury or mortality will not exceed one FGS at APAFR per year. FWC personnel will routinely conduct research and monitoring activities involving FGSs that may result in harassment as authorized under a Cooperative Agreement between the Service and the FWC pursuant to section 6 of the Act.

Prescribed burning is regularly conducted within FGS habitat on all three of the public properties that support FGS populations and this prescribed burning is important to maintain habitat in a condition suitable to FGS. Growing-season prescribed burning and naturally-ignited fires during the growing season within occupied FGS habitat may destroy FGS nests, but also results in nearly immediate improvements in habitat quality that allows FGS to re-nest shortly following fires. Growing season prescribed burning is currently applied at TLWMA and KPPSP. Prescribed burning outside of the FGS nesting season also maintains habitat in a favorable condition, but does not affect FGS nesting. Areas that are not burned at least every 2 to 3 years may not remain suitable for FGS occupancy and land managers that do not burn prairie habitat for 4 or 5 years render these unburned areas unsuitable for FGS.

A Biological Opinion issued in 2003 for a landfill project in Osceola County states incidental take associated with that project will not exceed 10 FGSs. These individuals were considered a subpopulation of birds identified at TLWMA. In association with this project, 13.3 ha of occupied FGS habitat adjacent to TLWMA were placed under conservation easement. The placement of habitat under a conservation easement adjacent to larger parcels already under protection and management benefited the FGS by removing future threats of habitat loss due to conversion or succession and increased the effective size and genetic diversity of the protected population at TLWMA. Larger population sizes typically correspond to increasing probabilities of persistence when considered in the context of population viability (Vickery and Perkins 2001; Vickery and Perkins 2002).

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the species and/or critical habitat and its interrelated and interdependent activities. All activities authorized by the Service under section 10(a)(1)(A) of the Act must meet permit issuance criteria at 50 CFR § 17.22 and 17.32. All activities considered must be justified in relation to enhancement of survival and recovery, effects to the wildlife species, peer review, and qualifications of permittees. By definition, authorized activities should benefit species recovery with minimal adverse effects by qualified permittees.

Factors to be considered

The FGS research program conducted by Dr. Noss has provided critical information about the species demography and population dynamics, and allowed biologists to identify serious threats to the persistence of FGS populations. Amendment of this research will allow biologists and resource managers to continue to evaluate the status of the FGS and identify potential threats and conservation opportunities.

Analysis for effects of the action

Beneficial Effects – Results of from this research will help assess the status of the FGS population and identify threats to the species. Samples collected will be used in genetic analysis to investigation the role of inbreeding within FGS population declines. These samples will also serve as a resource for future captive breeding programs, if pursued. These studies will allow managers to address potential limiting factors and better manage for conditions that will sustain and recover the species.

Adverse Effects – Handling and blood collection of the FGS may result in incidental injury or death of individuals. While this type of effect is uncommon with proper training or experience in handling of birds, the potential for such injuries or deaths remains.

Species' response to the proposed action

Although the Applicant does not anticipate any injury or mortality of FGS, the capturing, banding, and blood sampling may result in injury or mortality of some individuals.

To help prevent and reduce possible impacts, researchers will conduct observations of each FGS following blood collection to look for and record any possible adverse behaviors. If it is determined blood collection is having a detrimental impact on nestling, juvenile, or adult FGSs, sample collection will be ceased immediately.

Dr. Noss and his staff have over 30 years of experience working with the FGS and other imperiled sparrows performing the research outlined in his current permit. Therefore, few adverse impacts are anticipated to occur. The expected benefit of the proposed research is that it will ultimately aid in the recovery of the FGS.

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 Act.

The action area includes several counties in a rapidly growing state, and we can expect urban, agricultural, and industrial development throughout the action area to continue. This can be predicted from the existing zoning and county land use plans. Any residential developments that may affect listed species would be subject to regulation under either section 7 or 10 of the Act and would be considered a Federal action. However, considerable residential developments may

also occur in select counties within the action area that have no existing regulatory mechanisms to include Service involvement.

FGSs are difficult to locate and distributional surveys have not assessed sparrow status on all private lands in the action area. It is likely small populations of sparrows have been undetected in the past and will be undetected in the future. Shriver and Vickery (1999) estimated approximately 155,805 ha of suitable habitat remains in all of central Florida. The South Florida Water Management District (District) estimates between 2,833 and 4,047 ha of pasture, and/or dry prairie habitat has been converted to other uses between the years of 1990 to 1995 in Okeechobee County alone (K. Butts, District, personal communication, 2002). These areas were not surveyed for the presence of the FGS, and the effects of these conversions are not known. It is likely conversions from dry prairie to other habitats have occurred in other counties within the range of the FGS without surveys and this trend of land use conversions within the range of the FGS is reasonably likely to continue. Continued loss of dry prairie habitat reduces the likelihood that FGSs will survive and recover in the wild.

Management practices in KPPSP and TLWMA continue to improve and managers at these sites are seeking to restore the dry prairie within their boundaries (*e.g.*, through prescribed burning, habitat restoration, and hydrological restoration) resulting in better habitat for FGS population expansion. Any actions at APAFR affecting FGSs will require section 7 consultation. Overall, the status of the FGS is tenuous. Its populations on protected lands have experienced recent, severe declines and the pattern of conversion or degradation of habitat under private ownership is likely to continue. This will likely result in the loss of small undocumented populations of FGS and continued reduction in the species distribution. Regarding the currently proposed action, adverse effects will occur. However, this permit and subsequent research on the FGS will lead to an improved understanding of the natural history and biology of this endangered species. It is imperative we understand the causes behind the recent population decline so we can address future management options for the FGS. Identification of limiting factors is an essential first step in improving habitats for FGS and in working to achieve recovery. Research resulting from the issuance of the proposed permit could also lead to modification of current land management strategies for the maximum benefit of the species. The net effect of the proposed permit is beneficial.

SUMMARY OF EFFECTS

Although short-term and permanent minimal adverse effects may occur, this type of effect is uncommon during research activities, especially given the nature of the techniques proposed and experience of the Applicant. Blood samples collected will be used in genetic analysis to investigate the role of inbreeding within FGS population declines. These samples will also serve as a resource for future captive breeding programs, if pursued. These studies will allow managers to address potential limiting factors and better manage for conditions that will sustain and recover the species. The net effect of the research is beneficial.

CONCLUSION

After reviewing the status of the FGS, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion the

issuance of a recovery permit to conduct research, as proposed, is not likely to jeopardize the continued existence of the species. No critical habitat has been designated for this species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act 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 Act 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 Service so 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 Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (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 Applicant 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 the proposed action will result in incidental take of the FGS during capture, handling, blood collection and monitoring. Handling and blood collection associated with research and monitoring may result in the injury or death of FGSSs, but is expected to be covered by the existing take allowance in permit TE20020A-0 for the harassment of up to 200 birds per year and the injury or death of up to 2 percent of banded FGSSs per year. Incidental take is expected to be in the form of injury, mortality, or harassment.

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

EFFECT OF THE TAKE

In the accompanying Biological Opinion, the Service determined this level of anticipated take is not likely to result in jeopardy to the species. Because critical habitat has not been designated, destruction or adverse modification of critical habitat will not result.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of FGSs:

1. The Applicant and designated agents must be qualified to carry out the activities described in the Biological Opinion;
2. The Service will ensure the Applicant and designated agents incorporate appropriate minimization measures into field research protocols;
3. All reports shall be submitted to the FWC and Service;
4. State and Federal agencies identified in the Terms and Conditions (see below) shall be notified immediately upon locating a dead, injured, or sick FGS; and
5. Permittee must cease all activities if take in the form of death or injury occurs.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. The Service shall require the Applicant and designated agents acting on behalf of the Applicant to furnish resumes or summary of qualifications demonstrating their ability to safely conduct the proposed research. Only those individuals who can demonstrate that they have sufficient experience and training with FGSs will be permitted to conduct the proposed research.
2. The Service shall specify as a condition of the permit that all blood collection of FGSs will employ standard techniques, as outlined in the description of the proposed action or the permittee shall first receive Service approval for any other techniques. All individuals will be closely monitored blood collection and if side effects are seen at any time these studies will cease.
3. The Service shall specify annual reporting requirements in the permit. Those reporting requirements that are normally outlined in the section 10(a)(1)(A) permit will satisfy the reporting/monitoring requirements pursuant to section 7 of the Act and its implementing regulations.
4. The Service shall include the following condition in the permit: Upon locating a dead, injured, or sick specimen, initial notification must be made within 24 hours to the nearest Service Law Enforcement Office (Fish and Wildlife Service; 9549 Koger Boulevard, Suite 111; St. Petersburg, Florida 33702; 727-570-5398). Secondary notification should be made to the FWC, South Region (3900 Drane Field Road; Lakeland, Florida 33811-1299; 800-282-8002). Care should be taken in handling sick or injured specimens to

ensure effective treatment and care or in the handling of dead specimens to preserve biological material in the best possible state for later analysis as to the cause of death. In conjunction with the care of sick or injured specimens or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure evidence intrinsic to the specimen is not unnecessarily disturbed.

5. Permittee and designated agents acting on behalf of the permittee will be conditioned to immediately cease all activities if an individual FGS is injured or killed due to the project and to report any such injury or mortality to the Service (Field Supervisor, South Florida Ecological Services Office; 1339 20th Street; Vero Beach, FL 32960; 772-562-3909; and Permit Coordinator; 1875 Century Boulevard, Suite 200; Atlanta, Georgia 30345-3301; 404-679-4176).

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act 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. The Service is not proposing any conservation recommendations at this time.

REINITIATION NOTICE

This concludes formal consultation on this action as outlined in the request. As required by 50 CFR 402.16, reinitiation of formal consultation is required if:

1. The amount or extent of incidental take is exceeded;
2. New information reveals effects of the 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 Elizabeth Landrum, at 772-469-4304, or Sandra Sneckenberger, at 772-469-4321.

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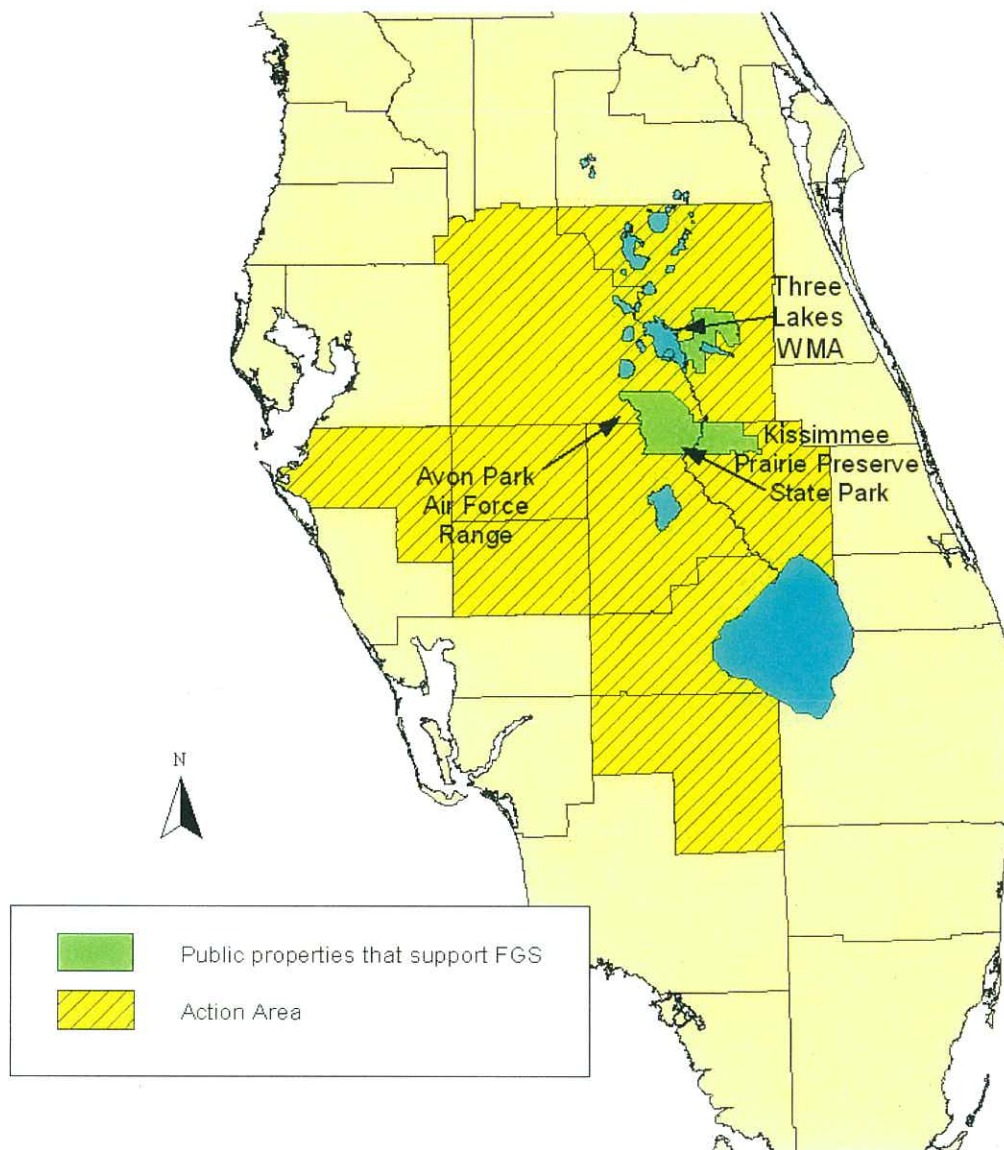
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Figure 1. Action Area and the three public properties that support FGS populations.



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Regional Office_Noss amended BO.docx)

March, 2005

**SOUTHEAST REGION
INTRA-SERVICE SECTION 7
BIOLOGICAL EVALUATION FORM**

[Federally endangered, threatened, and candidate species]

[Note: This form provides the outline of information needed for intra-Service consultation. If additional space is needed, attach additional sheets, or set up this form to accommodate your responses.]

Originating Person: Cameron Shaw

Telephone Number: 904/731-3191 E-Mail: Cameron_shaw@fws.gov

Date: 4/5/12

PROJECT NAME (Grant Title/Number): TE-20020A Noss

I. Service Program:

XX Ecological Services

___ Federal Aid

___ Clean Vessel Act

___ Coastal Wetlands

___ Endangered Species Section 6

___ Partners for Fish and Wildlife

___ Sport Fish Restoration

___ Wildlife Restoration

___ Fisheries

___ Refuges/Wildlife

II. State/Agency: Florida

III. Station Name: Endangered Species/Ecological Services, Atlanta, Georgia

IV. Description of Proposed Action (attach additional pages as needed): Amend permit TE20020A-0 to allow for collection of blood samples.

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence map: Figure 1

B. Complete the following table:

Table 1. Listed/proposed species/critical habitat that occur or may occur within the project area:

SPECIES/CRITICAL HABITAT	STATUS ¹
Florida Grasshopper Sparrow	E

¹STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

March, 2005

VI. Location (attach map):

- A. Ecoregion Number and Name:** 53 – South Florida
- B. County and State:** Osceola, Polk, Highlands, and Okeechobee Counties, Florida
- C. Section, township, and range (or latitude and longitude):** Kissimmee Prairie State Preserve ~ 27.587214, -81.058925; Avon Park Air Force Range ~ 27.582651, -81.218123; and Three Lakes Wildlife Management Area ~ 27.840902, -81.145103
- D. Distance (miles) and direction to nearest town:** Kissimmee Prairie State Preserve is about 16 mile east of Sebring; Avon Park Air Force Range is about 5 miles northeast of Sebring; and Three Lakes Wildlife Management Area is about 8 miles west of Kenansville.
- E. Species/habitat occurrence:** Figure 1

VII. Determination of Effects:

- A. Explanation of effects of the action on species and critical habitats in item V. B. (attach additional pages as needed):**

Table 2. Project impacts to listed/proposed species/critical habitat.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Florida Grasshopper Sparrow	Potential injury/mortality during capture/handling operations

- B. Explanation of actions to be implemented to reduce adverse effects:**

Table 3. Conservation measures proposed to minimize or eliminate adverse impacts to proposed/listed species, critical habitat.

SPECIES/ CRITICAL HABITAT	ACTIONS TO MINIMIZE IMPACTS
Florida Grasshopper Sparrow	Refer to Species Biological Opinion

March, 2005

VIII. Effect Determination and Response Requested:

Table 4. The effect determination and response requested for impacts to each proposed/listed species/critical habitat.

SPECIES/ CRITICAL HABITAT	DETERMINATION ¹			RESPONSE ¹ REQUESTED
	NE	NA	AA	
Florida Grasshopper Sparrow			XX	Consultation

¹DETERMINATION/RESPONSE REQUESTED:

NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but a AConcurrence@ is recommended for a complete Administrative Record.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a AConcurrence@.

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is AFormal Consultation@. Response Requested for proposed or candidate species is AConference@.

(s) Cameron Shaw
Signature (originating station)

4/5/12
Date

Permit Biologist
Title

If the project description changes or incidental take exceeds that which has been exempted under section 9 of the Act, then the Ecological Services Field Office must be contacted.

IX. Reviewing Ecological Services Office Evaluation:

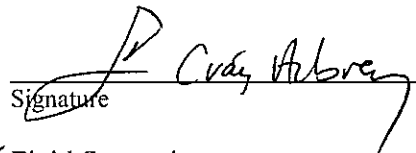
A. Concurrence _____ Non-concurrence _____

B. Formal consultation required XX

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):


Signature

4/23/12
Date

for Field Supervisor
Title

South Florida Ecological Services Office
Office

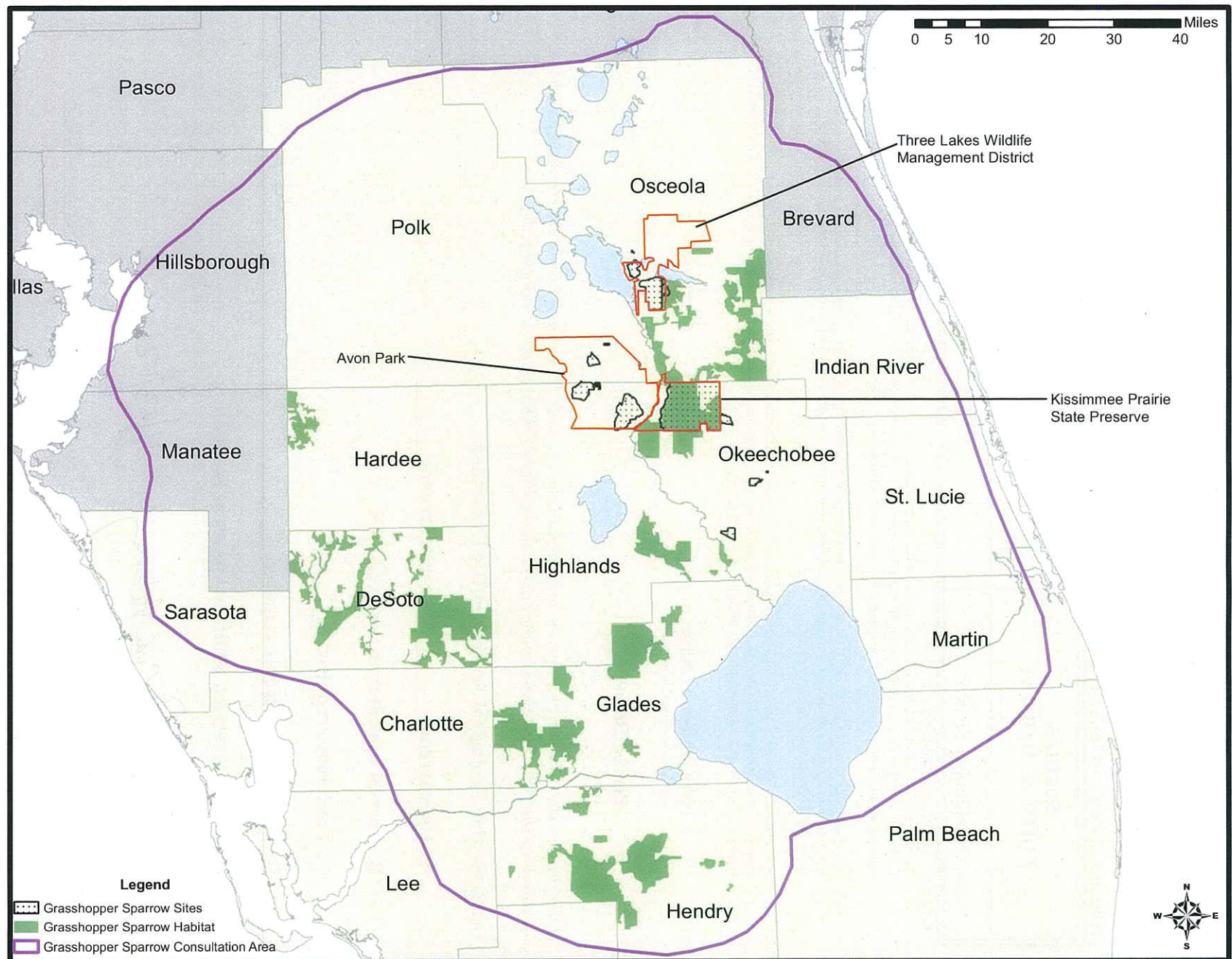


Figure 1. Florida Grasshopper Sparrow study areas.

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