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FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
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Project:	Vero Beach Airport Vegetation Removal Project
County:	Indian River

Dear Mr. Nagy:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion for the proposed Vegetation Removal Project at the Vero Beach Municipal Airport and its effects on the threatened Florida scrub-jay (*Aphelocoma coerulescens*), 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 information provided in the Federal Aviation Administration's (FAA) letter to the Service dated April 19, 2012; information provided by the applicant's consultant; email messages; telephone conversations; and other sources of information. A complete administrative record of this consultation is on file at the South Florida Ecological Services Office, Vero Beach, Florida.

Consultation History

On March 29 and November 30, 2011, and again on March 27, 2012, the Service met with representatives of the FAA and the Vero Beach Municipal Airport to discuss the removal of vegetation near the runways at the airport needed to comply with the FAA's safety regulations.

In a letter to the Service dated April 19, 2012, the FAA determined that proposed Vegetation Removal Project at the Vero Beach Municipal Airport "may affect, and is likely to adversely affect" the threatened Florida scrub-jay and requested that the Service initiate formal consultation for the project.

On June 27, 2012, the Service met with representatives of the Vero Beach Municipal Airport and the City of Vero Beach. Both parties agreed on conservation measures that will be implemented to minimize the project's adverse effects to the Florida scrub-jay.

TAKE PRIDE IN AMERICA

As of April 19, 2012, we have received all the information necessary for initiation of formal consultation on the Florida scrub-jay for this project as required in the regulations governing interagency consultations (50 CFR § 402.14). The Service is providing this Biological Opinion in conclusion of formal consultation.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The City of Vero Beach is proposing safety improvements to the Vero Beach Municipal Airport. The improvements include the removal of vegetation adjacent to the existing operations area (*i.e.*, runways, taxiways, etc.). Trees will be removed from 94.6 acres (ac). In addition, 98.6 ac will be totally cleared of shrubs, trees, and all woody vegetation and this acreage will be maintained as low-stature grasses and herbaceous plants that will be mowed on a regular basis. The purpose of the vegetation removal is to maintain the areas surrounding the airport's runways and taxiways free of obstacles as required by the FAA's safety regulations. The project will also include installation of new chain-link exclusion fence along the perimeter of the operations area. Portions of the existing security fence will be removed. The purpose of the fence is to keep large mammals (primarily the feral hog [*Sus scrofa*]) out of the operations area. The project site is located in Sections 26, 27, 28, 33, 34, and 35, Township 32 South, Range 39 East, Indian River County, Florida (Figure 1).

The proposed action will result in the destruction of habitat currently occupied by the Florida scrub-jay. Surveys for Florida scrub-jays, based on the Service's survey protocol, were conducted at the project site during July and August, 2011. Results of the survey indicate the territories of three family groups (denoted as A, C, and D), consisting of three Florida scrub-jays each, occur within the project footprint (Figure 2). The project will clear approximately 14 ac of occupied scrub-jay habitat. To minimize the adverse effects resulting from the project, the Vero Beach Airport will develop a Habitat Conservation Plan for the entire airport to enhance and manage habitat for the Florida scrub-jay within the airport property.

Action area

Florida Scrub-jay

In determining the action area for this Biological Opinion, the Service evaluated the extent scrub-jays may be affected by the loss of habitat due to this project and the resulting benefits anticipated from the Habitat Conservation Plan that will developed by the Vero Beach Airport. The action area for this project is defined as all lands within the Vero Beach Airport property.

STATUS OF THE SPECIES/CRITICAL HABITAT

This section summarizes Florida scrub-jay biology and ecology as well as information regarding the status and trends of the Florida scrub-jay throughout its entire range. The Service uses this information to assess whether a Federal action is likely to jeopardize the continued existence of the species. The Environmental Baseline section summarizes information on status and trends of

the Florida scrub-jay specifically within the action area. This summary provides the foundation for the Service's assessment of the effects of the proposed action, as presented in the Effects of the Action section. A thorough history of the biology and ecology of the Florida scrub-jay can be found in the *South Florida Multi-Species Recovery Plan* (Service 1999).

Species/critical habitat description

Scrub-jays are about 10 to 12 inches long and weigh about 3 ounces. They are similar in size and shape to blue jays (*Cyanocitta cristata*), but differ significantly in coloration (Woolfenden and Fitzpatrick 1996a). In addition, the scrub-jay lacks the crest, white-tipped wings and tail feathers, black barring, and a bridle seen in the blue jay. The scrub-jay's head, nape, wings, and tail are pale blue, and its body is pale gray on its back and belly. The throat and upper breast are lightly striped and bordered by a pale blue-gray "bib" (Woolfenden and Fitzpatrick 1996a). Scrub-jay sexes are not distinguishable by plumage (Woolfenden and Fitzpatrick 1984), and males, on average, are only slightly larger than females (Woolfenden 1978). The sexes may be identified by a distinct "hiccup" call made only by females (Woolfenden and Fitzpatrick 1984, 1986). Scrub-jays that are less than about 5 months of age are smoky gray on the head and back, and lack the blue crown and nape of adults. Molting occurs between early June and late November and peaks between mid-July and late September (Bancroft and Woolfenden 1982). During late summer and early fall, when the first basic molt is nearly done, fledgling scrub-jays may be indistinguishable from adults in the field (Woolfenden and Fitzpatrick 1984). The wide variety of vocalizations of scrub-jays is described in Woolfenden and Fitzpatrick (1996b).

The Florida scrub-jay is classified within a "superspecies complex" of four species of *Aphelocoma* that are distributed within the United States and Mexico. The western scrub jay (*A. californica*) occurs from southwestern Washington through Baja California, the island scrub-jay (*A. insularis*) is found on Santa Cruz in the Channel Islands of California, Woodhouse's scrub-jay (*A. woodhousii*) occurs from western United States to Oaxaca, Mexico, and the Florida scrub-jay (*A. coerulescens*) is restricted to peninsular Florida (American Ornithologists' Union [AOU] 1983). Other congeneric jays include the Mexican jay or gray-breasted jay (*A. ultramarina*) and the unicolored jay (*A. unicolor*) of Central America and southwest North America (Woolfenden and Fitzpatrick 1996b).

The Florida scrub-jay was originally named *Corvus coerulescens* by Bosc in 1795 and the genus was changed to *Aphelocoma* in 1851 by Cabanis. In 1858, Baird adopted species name *coerulescens*. The Florida scrub-jay has been considered a subspecies (*A. c. coerulescens*) for the past several decades (AOU 1957), but recently regained recognition as a full species (*A. coerulescens*) from the AOU (AOU 1995) based on genetic, morphological, and behavioral differences from the western scrub-jay and the island scrub-jay. This species account references the full species name, *A. coerulescens*, as listed in the Federal Register (Service 1987). The term "scrub-jay" will be used to indicate the Florida scrub-jay throughout the remainder of this document.

Critical habitat has not been designated for the Florida scrub-jay. Therefore, critical habitat will not be affected by the project.

Life history

The scrub-jay prefers xeric oak scrub habitats within the ancient dune systems of peninsular Florida (Laessle 1958, 1968; Myers 1990). This plant community type occurs on well-drained to excessively well-drained sandy soils that are nutrient-poor, and is adapted to periodic drought, and frequent fires (Abrahamson 1984). Xeric oak scrub on the Lake Wales Ridge is characterized by four species of stunted, low-growing oaks: sand live oak (*Quercus geminata*), Chapman oak (*Q. chapmanii*), myrtle oak (*Q. myrtifolia*), and scrub oak (*Q. inopina*) (Myers 1990). Optimal scrub-jay habitat contains the following attributes: (1) 10 to 50 percent bare sand or sparse herbaceous vegetation; (2) greater than 50 percent of the shrub layer made up of scrub oaks; (3) a mosaic of oak scrubs that occur in optimal height (4 to 6 feet) and shorter; (4) less than 15 percent canopy cover; and (5) greater than 984 feet from a forest (Breininger et al. 1998). Woolfenden and Fitzpatrick (1991) reported optimal habitat for scrub-jays on the Lake Wales Ridge contains oaks are 3 to 10 feet high, interspersed with 10 to 50 percent unvegetated, sandy openings, and a sand pine (*Pinus clausa*) canopy of less than 20 percent. Other plant species often found in optimal scrub-jay habiat include: saw palmetto (*Serenoa repens),* scrub palmetto *(Sabal etonia*), Florida rosemary (*Ceratiola ericoides*), and rusty lyonia (*Lyonia ferruginea*).

Scrub-jays occupy areas with less scrub oak cover and fewer openings on the Merritt Island/Cape Canaveral Complex in east central Florida and in southwest Florida than typical of xeric oak scrub habitat on the Lake Wales Ridge (Schmalzer and Hinkle 1992b; Breininger et al. 1995; Thaxton and Hingtgen 1996). The predominant plant communities in these localities are oak scrub and scrubby flatwoods. Scrubby flatwoods differ from other scrub communities by containing a sparse canopy of slash pine (*Pinus elliotii*). Scrubby flatwoods usually do not contain sand pines, scrub oak and scrub palmetto, but runner oak (*Q. minima*), turkey oak (*Q. laevis*), bluejack oak (*Q. incana*), and longleaf pine (*Pinus palustris*) have been reported. The scrubby flatwoods within the Kennedy Space Center, in Brevard County, support one of the largest contiguous populations of scrub-jays, and studies conducted there give good descriptions of this habitat type (Schmalzer and Hinkle 1992b).

Much potential scrub-jay habitat occurs as patches of oak scrub within a matrix of little-used habitat of saw palmetto and herbaceous swale marshes (Breininger et al. 1991, 1995). These native matrix habitats supply prey for scrub-jays and habitat for other species of conservation concern. The flammability of native matrix habitats is important for spreading fires into oak scrub (Breininger et al. 1995, 2002). Degradation or replacement of native matrix habitats with habitat fragments and industrial areas attract predators of scrub-jays, such as fish crows (*Corvus ossifragus*), that are rare in most regularly burned, native matrix habitats (Breininger and Schmalzer 1990; Woolfenden and Fitzpatrick 1991). Matrix habitats often develop into woodlands and forests when there is a disruption of fire regimes. These woodlands and forests are not suitable for scrub-jays, decrease the habitat suitability of nearby scrub, attract predators, and further disrupt fire patterns.

Scrub-jays have a social structure that involves cooperative breeding, a trait not observed for the other North American species of scrub-jays (Woolfenden and Fitzpatrick 1984, 1990). Scrub-jays live in families ranging from two birds (a single mated pair) to extended families of eight adults (Woolfenden and Fitzpatrick 1984) and one to four juveniles. Fledgling scrub-jays stay with the breeding pair in their natal territory as "helpers," forming a closely-knit, cooperative family group. Prebreeding numbers are generally reduced to either a pair with no helpers or families of three or four individuals (a pair plus one or two helpers) (Woolfenden and Fitzpatrick 1996a).

Scrub-jays have a well-developed intrafamilial dominance hierarchy with breeder males most dominant, followed by helper males, breeder females, and, finally, female helpers (Woolfenden and Fitzpatrick 1977, 1984). Helpers take part in sentinel duties, territorial defense, predator-mobbing, and the feeding of both nestlings and fledglings (McGowan and Woolfenden 1989, 1990; Stallcup and Woolfenden 1978, Woolfenden and Fitzpatrick 1984). The well-developed sentinel system involves having one individual occupying an exposed perch watching for predators or territory intruders. When a predator is seen, the sentinel scrub-jay gives a distinctive warning call (McGowan and Woolfenden 1989, 1990), and all family members seek cover in dense shrub vegetation (Fitzpatrick et al. 1991).

Scrub-jay pairs occupy year-round, multipurpose territories (Woolfenden and Fitzpatrick 1978, 1984; Fitzpatrick et al. 1991). Territory size averages 22 to 25 ac, with a minimum size of about 12 ac (Woolfenden and Fitzpatrick 1984, 1990; Fitzpatrick et al. 1991). The availability of territories is a limiting factor for scrub-jay populations. Because of this limitation, nonbreeding adult males may stay at the natal territory as helpers for up to 6 years, waiting for either a mate or territory to become available (Woolfenden and Fitzpatrick 1984). Scrub-jays may become breeders in several ways: (1) by replacing a lost breeder on a non-natal territory (Woolfenden and Fitzpatrick 1984); (2) through "territorial budding," where a helper male becomes a breeder in a segment of its natal territory (Woolfenden and Fitzpatrick 1978); (3) by inheriting a natal territory following the death of a breeder; (4) by establishing a new territory between existing territories (Woolfenden and Fitzpatrick 1984); or (5) through "adoption" of an unrelated helper by a neighboring family followed by resident mate replacement (Woolfenden and Fitzpatrick 1984). Territories also can be created by restoring habitat through effective habitat management efforts in areas that are overgrown (Thaxton and Hingtgen 1994).

To become a breeder, a scrub-jay must find a territory and a mate. Evidence presented by Woolfenden and Fitzpatrick (1984) suggests scrub-jays are monogamous. The pair retains ownership and sole breeding privileges in its particular territory year after year. Courtship to form the pair is lengthy and ritualized and involves posturing and vocalizations made by the male to the female (Woolfenden and Fitzpatrick 1996b). Copulation between the pair is generally out of sight of other scrub-jays (Woolfenden and Fitzpatrick 1984). These authors also reported never observing copulation between unpaired scrub-jays or courtship behavior between a female and a scrub-jay other than her mate. Age at first breeding in the scrub-jay varies from 1 to 7 years, although most individuals become breeders between 2 and 4 years of age (Fitzpatrick and Woolfenden 1988). Persistent breeding populations of scrub-jays exist only where there are scrub oaks in sufficient quantity and form to provide an ample winter acorn supply, cover from predators, and nest sites during the spring (Woolfenden and Fitzpatrick 1996b).

Scrub-jay nests are typically constructed in shrubby oaks, at a height of 1.6 to 8.2 feet (Woolfenden 1974). Sand live oak and scrub oak are the preferred shrubs on the Lake Wales Ridge (Woolfenden and Fitzpatrick 1996b), and myrtle oak is favored on the Atlantic Coastal Ridge (Toland 1991) and southern Gulf coast. In suburban areas, scrub-jays nest in the same evergreen oak species as well as in introduced or exotic trees; however, they build their nests in a significantly higher position in these oaks than when in natural scrub habitat (Bowman et al. 1996). Scrub-jay nests are an open cup, about 7 to 8 inches outside diameter and 3 to 4 inches inside diameter. The outer basket is bulky and built of course twigs from oaks and other vegetation, and the inside is lined with tightly wound palmetto or cabbage palm (*Sabal palmetto*) fibers. There is no foreign material as may be present in a blue jay nest (Woolfenden and Fitzpatrick 1996b).

Nesting is synchronous, normally occurring from 1 March through 30 June (Woolfenden and Fitzpatrick 1984). On the Atlantic Coastal Ridge and southern Gulf coast, nesting may be protracted through the end of July. In suburban habitats, nesting is consistently started earlier (March) than in natural scrub habitat (Fleischer 1996), although the reason for this is unknown. Clutch size ranges from one to five eggs, but is typically three or four eggs (Woolfenden and Fitzpatrick 1990). Clutch size is generally larger in suburban habitats, and the birds try to rear more broods per year (Fleischer 1996). Double brooding by as much as 20 percent has been documented on the Atlantic Coastal Ridge and in suburban habitat within the southern Gulf coast, compared to about 2 percent on the Lake Wales Ridge. Scrub-jay eggs measure 1.1 inches x 0.8 inches (length x breadth) (Woolfenden and Fitzpatrick 1996b), and coloration "varies from pea green to pale glaucous green...blotched and spotted with irregularly shaped markings of cinnamon rufous and vinaceous cinnamon, these being generally heaviest about the larger end" (Bendire 1895). Eggs are incubated for 17 to 19 days (Woolfenden 1974), and fledging occurs 15 to 21 days after hatching (Woolfenden 1978). Only the breeding female incubates and broods eggs and nestlings (Woolfenden and Fitzpatrick 1984). Average production of young is two fledglings per pair, per year (Woolfenden and Fitzpatrick 1990; Fitzpatrick et al. 1991), and the presence of helpers improves fledging success (Woolfenden and Fitzpatrick 1990; Mumme 1992). Annual productivity must average at least two young fledged per pair for a population of scrub-jays to support long-term stability (Fitzpatrick et al. 1991).

Fledglings depend upon adults for food for about 10 weeks, during which time they are fed by both breeders and helpers (Woolfenden 1975; McGowan and Woolfenden 1990). Survival of scrub-jay fledglings to yearling age class averages about 35 percent in optimal scrub, while annual survival of both adult males and females averages around 80 percent (Woolfenden and Fitzpatrick 1996b). Data from Archbold Biological Station, however, suggest survival and reproductive success of scrub-jays in suboptimal habitat is lower (Woolfenden and Fitzpatrick 1991). These data help explain why local populations inhabiting unburned, late successional habitats become extirpated. Similarly, data from Indian River County show mean annual productivity declines significantly in suburban areas where Toland (1991) reported productivity averaged 2.2 young fledged per pair in contiguous optimal scrub, 1.8 young fledged per pair in fragmented moderately-developed scrub, and 1.2 young per pair fledged in very fragmented suboptimal scrub. The longest observed lifespan of a scrub-jay is 15.5 years at Archbold Biological Station in Highlands County (Woolfenden and Fitzpatrick 1996b).

Scrub-jays are nonmigratory and permanently territorial. Juveniles stay in their natal territory for up to 6 years before dispersing to become breeders (Woolfenden and Fitzpatrick 1984, 1986). Once scrub-jays pair and become breeders, generally within two territories of their natal area, they stay on their breeding territory until death. In suitable habitat, fewer than 5 percent of scrub-jays disperse more than 5 miles (Stith et al. 1996). All documented long-distance dispersals have been in unsuitable habitat such as woodland, pasture, or suburban plantations. Scrub-jay dispersal behavior is affected by the intervening land uses. Protected scrub habitats will most effectively sustain scrub-jay populations if they are located within surrounding habitat types that can be used and traversed by scrub-jays. Brushy pastures, scrubby corridors along railway and road rights-of-way, and open burned flatwoods offer links for colonization among scrub-jay populations. Stith et al. (1996) believe a dispersal distance of 5 miles is close to the biological maximum for scrub-jays.

Scrub-jays forage mostly on or near the ground, often along the edges of natural or man-made openings. They visually search for food by hopping or running along the ground beneath the scrub or by jumping from shrub to shrub. Insects, particularly orthopterans (*e.g.*, locusts, crickets, grasshoppers, beetles) and lepidopteran (*e.g.*, butterfly and moth) larvae, form most of the animal diet throughout most of the year (Woolfenden and Fitzpatrick 1984). Small vertebrates are eaten when encountered, including frogs and toads (*Hyla femoralis*, *H. squirella,* rarely *Bufo quercicus,* and unidentified tadpoles, lizards (*Anolis carolinensis*, *Chemidophorus sexlineatus*, *Sceloporus woodi*, *Eumeces inexpectatus*, *Neoseps reynoldsi*, *Ophisaurus compressus*, *O. ventralis*), small snakes (*Thamnophus sauritus*, *Opheodrys aestivus*, *Diadophis punctatus*), small rodents (cotton rat [*Sigmodon hispidus*], *Peromyscus polionotus*, black rat [*Rattus rattus*] young), downy chicks of the bobwhite (*Colinus virginianus*), and fledgling common yellowthroat (*Geothlypis trichas*). In suburban areas, scrub-jays will accept supplemental foods once the scrub-jays have learned about them (Woolfenden and Fitzpatrick 1984).

Acorns are the principal plant food (Woolfenden and Fitzpatrick 1984; Fitzpatrick et al. 1991). From August to November each year, scrub-jays may harvest and cache 6,500 to 8,000 oak (*Quercus* spp.) acorns throughout their territory. Acorns are typically buried beneath the surface of bare sand patches in the scrub during fall, and retrieved and consumed year-round, though most are consumed in fall and winter (DeGange et al. 1989). On the Atlantic Coastal Ridge, acorns are often cached in pine trees, either in forks of branches, in distal pine boughs, under bark, or on epiphytic plants, between 1 to 30 feet in height. Other small nuts, fruits, and seeds also are eaten (Woolfenden and Fitzpatrick 1984).

Status and distribution

The scrub-jay was federally listed as threatened in 1987 primarily because of habitat fragmentation, degradation, and loss (Service 1987).

Historically, oak scrub occurred as numerous isolated patches in peninsular Florida. These patches were concentrated along both the Atlantic and Gulf coasts and on the central ridges of the peninsula (Davis 1967). Probably until as recently as the 1950s, scrub-jay populations occurred

in the scrub habitats of 39 of the 40 counties south of, and including Levy, Gilchrist, Alachua, Clay, and Duval Counties. Historically, most of these counties would have contained hundreds or even thousands of breeding pairs (Fitzpatrick et al. 1994). Only the southernmost county, Monroe, lacked scrub-jays (Woolfenden and Fitzpatrick 1996a). Although scrub-jay numbers probably began to decline when European settlement began in Florida (Cox 1987), the decline was first noted in the literature by Byrd (1928). After 40 years of personal observation of the Etonia scrub (now known as Ocala National Forest), Webber (1935) observed many changes to the previously-undisturbed scrub habitat found there, noting "The advent of man has created a new environmental complex."

A state-wide scrub-jay census was last conducted in 1992 and 1993, at which time there were an estimated 4,000 pairs of scrub-jays left in Florida (Fitzpatrick et al. 1994). At that time, the scrub-jay was considered extirpated in ten counties (Alachua, Broward, Clay, Duval, Gilchrist, Hernando, Hendry, Pinellas, and St. Johns), and considered functionally extinct in an additional five counties (Flagler, Hardee, Levy, Orange, and Putnam), where ten or fewer pairs remained. Recent information indicates there are at least 12 to 14 breeding pairs of scrub-jays located within Levy County, higher than previously thought, and there is at least 1 breeding pair of scrub-jays remaining in Clay County. A scrub-jay has been documented in St. Johns County as recently as 2003. Populations are close to becoming extirpated in Gulf coast counties (from Levy south to Collier) (Woolfenden and Fitzpatrick 1996a). In 1992 to 1993, population numbers in 21 of the counties were below 30 or fewer breeding pairs (Fitzpatrick et al. 1994). Based on the amount of destroyed scrub habitat, scrub-jay population loss along the Lake Wales Ridge is 80 percent or more since pre-European settlement (Fitzpatrick et al. 1991). Since the early 1980s, Fitzpatrick et al. (1994) estimated in the northern third of the species' range, the scrub-jay has declined somewhere between 25 and 50 percent. The species may have declined by as much as 25 to 50 percent in the last decade alone (Stith et al. 1996).

On protected lands, scrub-jays have continued to decline due to inadequate habitat management (Stith 1999). However, over the last several years, steps to reverse this decline have occurred, and management of scrub habitat is continuing in many areas of Florida (Hastie and Eckl 1999; Stith 1999; The Nature Conservancy 2001; Turner et al. 2006).

Stith (1999) utilized a spatially explicit, individual-based population model developed specifically for the scrub-jay to complete a metapopulation viability analysis of the species. The species' range was divided into 21 metapopulations demographically isolated from each other. Metapopulations are defined as collections of relatively discrete demographic populations distributed over the landscape; these populations are connected within the metapopulations through dispersal or migration (Hanski and Gilpin 1991). A series of simulations were run for each of the 21 metapopulations based on different scenarios of reserve design ranging from the minimal configuration consisting of only currently protected patches of scrub (no acquisition option) to the maximum configuration, where all remaining significant scrub patches were acquired for protection (complete acquisition option) (Stith 1999). The assumption was made that all areas that were protected were also restored and properly managed.

Results from Stith's (1999) simulation model included estimates of extinction, quasi-extinction (the probability of a scrub-jay metapopulation falling below 10 pairs), and percent population decline. These were then used to rank the different state-wide metapopulations by vulnerability. The model predicted five metapopulations (Northeast Lake, Martin, Merritt Island, Ocala National Forest, and Lake Wales Ridge) have low risk of quasi-extinction. Two of the five (Martin and Northeast Lake), however, experienced significant population declines under the "no acquisition" option; the probability for survival of both of these metapopulations could be improved with more acquisitions.

Eleven of the remaining 21 metapopulations were shown to be highly vulnerable to quasi-extinction if no more habitats were acquired (Central Brevard, North Brevard, Central Charlotte, Northwest Charlotte, Citrus, Lee, Levy, Manatee, Pasco, St. Lucie, and West Volusia). The model predicted the risk of quasi-extinction would be greatly reduced for 7 of the 11 metapopulations (Central Brevard, North Brevard, Central Charlotte, Northwest Charlotte, Levy, St. Lucie, and West Volusia) by acquiring all or most of the remaining scrub habitat. The model predicted the remaining four metapopulations (Citrus, Lee, Manatee, and Pasco) would moderately benefit if more acquisitions were made.

Stith (1999) classified two metapopulations (South Brevard and Sarasota) as moderately vulnerable with a moderate potential for improvement; they both had one or more fairly stable populations of scrub-jays under protection, but the model predicted population declines. The rest of the metapopulations could collapse without further acquisitions, making the protected populations there vulnerable to epidemics or other catastrophes.

Three of the metapopulations evaluated by Stith (1999) (Flagler, Central Lake, and South Palm Beach) were classified as highly vulnerable to quasi-extinction and had low potential for improvement, since little or no habitat is available to acquire or restore.

Current threats

Habitat loss

Scrub habitats have continued to decline throughout peninsular Florida since listing occurred, and habitat destruction continues to be one of the main threats to the scrub-jay. Cox (1987) noted local extirpations and major decreases in numbers of scrub-jays and attributed them to the clearing of scrub for housing and citrus groves. Eighty (80) percent or more of the scrub habitats have been destroyed along the Lake Wales Ridge since pre-European settlement (Turner et al. 2006). Fernald (1989), Fitzpatrick et al. (1991), and Woolfenden and Fitzpatrick (1996a) noted habitat losses due to agriculture, silviculture, and commercial and residential development have continued to play a role in the decline in numbers of scrub-jays throughout the state. State-wide, estimates of scrub habitat loss range from 70 to 90 percent (Woolfenden and Fitzpatrick 1996a). Various populations of scrub-jays within the species' range have been monitored closely, and more precise estimates of habitat loss in these locations are available (Snodgrass et al. 1993; Thaxton and Hingtgen 1996).

Toland (1999) estimated about 70 to 78 percent of pre-European settlement scrub habitats had been converted to other uses in Brevard County. This is due mainly to development activity and citrus conversion, which were the most important factors that contributed to the scrub-jay decline between 1940 and 1990. A total of only 10,656 ac of scrub and scrubby flatwoods remain in Brevard County (excluding Federal ownership), of which only 1,600 ac (15 percent) is in public ownership for the purposes of conservation. Less than 1,977 ac of an estimated pre-European settlement of 14,826 ac of scrubby flatwoods habitat remain in Sarasota County, mostly occurring in patches averaging less than 2.5 ac in size (Thaxton and Hingtgen 1996). Only 10,673 ac of viable coastal scrub and scrubby flatwoods remained in the Treasure Coast region of Florida (Indian River, Saint Lucie, Martin, and Palm Beach counties) according to Fernald (1989). He estimated 95 percent of scrub had already been destroyed for development purposes in Palm Beach County.

Habitat destruction not only reduces the amount of area scrub-jays can occupy, but also increases fragmentation of habitat. As more scrub habitat is altered, the habitat is cut into smaller and smaller pieces, separated from other patches by larger distances; such fragmentation increases the probability of inbreeding and genetic isolation, which is likely to increase extinction probability (Fitzpatrick et al. 1991; Woolfenden and Fitzpatrick 1991; Stith et al. 1996; Thaxton and Hingtgen 1996). Dispersal distances of scrub-jays in fragmented habitat are further than in optimal unfragmented habitats, and demographic success is poor (Thaxton and Hingtgen 1996; Breininger 1999).

Predation

Most scrub-jay mortality results from predation (Woolfenden and Fitzpatrick 1996b). The second most frequent cause may be disease, or predation on disease-weakened scrub-jays (Woolfenden and Fitzpatrick 1996b). Known predators of scrub-jays are listed by Woolfenden and Fitzpatrick (1990, 1996a, 1996b), Fitzpatrick et al. (1991), Schaub et al. (1992), and Breininger (1999); the list includes eastern coachwhip (*Masticophis flagellum*, known to eat adults, nestlings, and fledglings), eastern indigo snake (*Drymarchon corais couperi*, known to eat adults and fledglings), black racer (*Coluber constrictor*, known to eat eggs), pine snake (*Pituophus melanoleuous*), and corn snake (*E. guttata*). Mammalian predators include bobcats (*Lynx rufus*), raccoons (*Procyon lotor*), sometimes cotton rats (known to eat eggs), black rats, and free-roaming cats (*Felis catus*, known to eat adults). Franzreb and Puschock (2004) also have documented spotted skunks (*Spilogale putorius*) and grey fox (*Urocyon cinereoargenteus*) as mammalian predators of scrub-jay nests. Fitzpatrick et al. (1991) postulate populations of free-roaming cats are able to eliminate small populations of scrub-jays. Avian nest predators include the great horned owl (*Bubo virginianus*), eastern screech-owl (*Otus asio*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), fish crow, boat-tailed grackle (*Quiscalus major*), common grackle (*Q. quiscula*), American crow (*Corvus brachyrhynchos*), blue jay, and swallow-tailed kites (*Elanoides forficatus*).

Fitzpatrick et al. (1991) reported that overgrown scrub habitats are often occupied by the blue jay, which may be one factor limiting scrub-jay populations in such areas. Raptors which seem to be important predators of adult scrub-jays are merlin (*Falco columbarius*), sharp-shinned

hawk (*Accipiter striatus*), Cooper's hawk (*A. cooperii*), and northern harrier. During migration and winter, these four raptor species are present in areas which contain scrub habitat, and scrub-jays may experience frequent confrontations (as many as one pursuit a day) with them (Woolfenden and Fitzpatrick 1990).

In coastal scrub, Woolfenden and Fitzpatrick (1996b) report scrub-jays are vulnerable to predation by raptors in October, March, and April, when high densities of migrating accipiters and falcons are present. Woolfenden and Fitzpatrick (1996b) and Toland (1999) suggest hunting efficiency for scrub-jay predators is increased in overgrown scrub habitats. Bowman and Averill (1993) noted scrub-jays occupying fragments of scrub found in or near housing developments were more prone to predation by house cats and competition from blue jays and mockingbirds (*Mimus* spp.). Woolfenden and Fitzpatrick (1996a, 1996b) stated proximity to housing developments (and increased exposure to domestic cats) needs to be taken into consideration when designing scrub preserves. Young scrub-jays are especially vulnerable to ground predators (*e.g.*, snakes and mammals) before they are fully capable of sustained flight.

Parasites

The scrub-jay hosts two protozoan blood parasites (*Plasmodium cathemerium* and *Haemoproteus danilewskyi*), but incidence is low (Woolfenden and Fitzpatrick 1996b). Several scrub-jays sick from these two agents in March 1992 survived to become breeders. The scrub-jay carries at least three types of mosquito-borne encephalitis: St. Louis, eastern equine, and "Highlands jay" (Woolfenden and Fitzpatrick 1996b). Of particular concern is the arrival of West Nile virus (the agent of another type of encephalitis) in Florida during 2001 (Stark and Kazanis 2001); since corvids have been particularly susceptible to the disease in states north of Florida, it is expected scrub-jays will be affected (Breininger et al. 2003).

Woolfenden and Fitzpatrick (1996b) noted three episodes of elevated mortality (especially among juveniles) in 26 years at Archbold Biological Station. Each of these incidents occurred in conjunction with elevated water levels following unusually heavy rains in the fall, although high mortality does not occur in all such years. During the most severe of these presumed epidemics (August 1979 through March 1980), all but one of the juvenile cohort and almost half of the breeding adults died (Woolfenden and Fitzpatrick 1984, 1990). The 1979 through 1980 incident coincided with a known outbreak of eastern equine encephalitis among domestic birds in central Florida (Woolfenden and Fitzpatrick 1996b). From the fall of 1997 through the spring of 1998, the continuing population decline of scrub-jays along the Atlantic coast and in central Florida may have been augmented by an epidemic of unknown origin (Breininger 1999).

At Cape Canaveral Air Force Station, Stevens and Hardesty (1999) noted a decline in juvenile survival from 60 to 70 percent in the preceding years to only 22 percent in 1997 and 1998. It stayed low (only 25 percent) in 1998 and 1999 before again climbing into the mid-60 percent range. Also, adult survival dropped from 70 to 80 percent survival in the preceding years to 50 to 60 percent in 1997 and 1998. Overall, their annual surveys documented the largest 1-year drop (pairs decreased by 17 percent and birds by 20 percent) in this population at the same time as the presumed state-wide epidemic.

In the winter-summer of 1973, 15 species of intestinal parasitic fauna (including 8 nematodes, 5 trematodes, 1 cestode, and 1 acanthocephalan) were found in 45 scrub-jays collected in south-central Florida; the parasite load was attributed to a varied arthropod diet (Kinsella 1974). These naturally-occurring parasites are not believed to have a negative impact on scrub-jay population levels.

Larvae of the burrowing fly, *Philornis porteri*, occur irregularly on scrub-jay nestlings. The species pupates in the base of the nest; larvae locate in nasal openings, mouth flanges, bases of flight feathers, and toes; apparently no serious effect on the scrub-jay host occurs (Woolfenden and Fitzpatrick 1996b). Additionally, one undescribed chewing louse (*Myrsidea* sp.) (Woolfenden and Fitzpatrick 1996b), one wing-feather mite (*Pterodectes* sp.), two chiggers (*Eutrombicula lipovskyana* and *E. alfreddugesi*), and a flea (sticktight flea [*Echidnophaga gallinacea*]) (Woolfenden and Fitzpatrick 1996b) occur on some individuals, usually at low densities. Nymphs and larvae of four ticks (*Amblyomma americanum*, *A. tuberculatum*, *Haemaphysalis leporispalustris*, and *Ixodes scapularis*) are known to occur on scrub-jays, as well as the larvae of the tick *A. maculatum* (Woolfenden and Fitzpatrick 1996b). These naturally-occurring parasites were not believed to have a negative impact on scrub-jay population levels; however, a recent study of the impact of the sticktight flea on scrub-jays indicates that low fitness and death can be caused by this parasite (Boughton et al. 2006). The host vector for this flea was a domestic dog (*Canis familiaris*), suggesting introduction of human pets into scrub-jay areas may increase parasite loads and reduce fitness.

Inadequacy of existing regulatory mechanisms

Woolfenden and Fitzpatrick (1996a) state the importance of enforcing existing Federal laws regarding the management of Federal lands as natural ecosystems for the long-term survival of the scrub-jay. The Service consults regularly on activities on Federal lands which may affect scrub-jays and also works with private landowners through the section 10(a)(1)(B) incidental take permitting process of the Act when take is likely to occur and no Federal nexus is present. Florida's State Comprehensive Plan and Growth Management Act of 1985 is administered mostly by regional and local governments. Regional Planning Councils administer the law through Development of Regional Impact Reviews; at the local level, although comprehensive plans contain policy statements and natural resource protection objectives, they are only effective if counties and municipalities enact and enforce ordinances. As a general rule, counties have not enacted and enforced ordinances that are effective in protecting scrub-jays (Fernald 1989).

The Wildlife Code of the State of Florida (Chapter 68A, Florida Administrative Code) prohibits taking of individuals of threatened species, or parts thereof, or their nests or eggs, except as authorized. The statute does not prohibit clearing of habitat occupied by protected species, which limits the ability of the FWC to protect the scrub-jay and its habitat.

Other natural or anthropogenic factors

Human interference with natural fire regimes has a had a major role in the decline of the scrub-jay and may exceed habitat loss as the single most important threat to the species (Woolfenden and Fitzpatrick 1991, 1996a; Fitzpatrick et al. 1994; Schaub et al. 1992; Stith et al. 1996;

Breininger et al. 1999). Lightning strikes cause virtually all naturally-occurring fires in south Florida scrub habitat (Abrahamson 1984; Hofstetter 1984; Woolfenden and Fitzpatrick 1990) and fire has been known to be important in maintenance of scrub habitat for decades (Nash 1895; Harper 1927; Webber 1935; Davis 1943; Laessle 1968; Abrahamson et al. 1984). Human efforts to prevent and/or control natural fires have allowed scrub vegetation to become too dense and tall to support populations of scrub-jays. Although scrub-jays can persist for many years in overgrown habitats, their long-term persistence is doubtful (Swain et al. 1995; Stith et al. 1996; Root 1998; Breininger et al. 2001). The overgrowth of scrub-jay habitats due to fire suppression is resulting in the decline of local populations of scrub-jays throughout the State (Woolfenden and Fitzpatrick 1984, 1990, 1991, 1996a; Schaub et al. 1992; Stith et al. 1996; Breininger et al. 1999; Fernald 1989; Percival et al. 1995; Thaxton and Hingtgen 1996; Toland 1999; Duncan and Breininger 1998; Schmalzer and Boyle 1998; Duncan et al. 1999).

Stith et al. (1996) estimated at least 2,100 breeding pairs of scrub-jays were living in overgrown habitat. Toland (1999) reported most of Brevard County's remaining scrub (estimated to be only 15 percent of the original acreage) is overgrown due to fire suppression. He further suggests the overgrowth of scrub habitats reduces the number and size of sand openings which are crucial not only to scrub-jays, but also many other scrub plants and animals. Reduction in the number of potential scrub-jay nesting sites, acorn cache sites, and foraging sites presents a problem for scrub-jays. It appears overgrowth of scrub results not only in the decline of species diversity and abundance, but also in a reduction in the percentage of open sandy patches (Fernald 1989; Woolfenden and Fitzpatrick 1996b). Fitzpatrick et al. (1994) believed fire suppression was just as responsible as habitat loss in the decline of the scrub-jay, especially in the northern third of its range. Likewise, the continued population decline of scrub-jays within Brevard County between 1991 and 1999 has been attributed mainly to the overgrowth of remaining habitat patches (Breininger et al. 2001). Breininger et al. (1999) concluded optimal habitat management is essential in fragmented ecosystems maintained by periodic fire, especially to lessen risks of decline and extinction resulting from epidemics and hurricanes.

Woolfenden and Fitzpatrick (1996a) cautioned fire applied too often to scrub habitat can also result in local extirpations of scrub-jays. Data from Archbold Biological Station show fire-return intervals varying between 8 and 15 years are optimal for long-term maintenance of productive scrub-jay populations in central Florida (Woolfenden and Fitzpatrick 1996b). These intervals also correspond with those yielding healthy populations of listed scrub plants (Menges and Kohfeldt 1995; Menges and Hawkes 1998). Optimal fire-return intervals may, however, be shorter in coastal habitats (Schmalzer and Hinkle 1992a; Schmalzer and Hinkle 1992b).

Fitzpatrick et al. (1991, 1994) and Woolfenden and Fitzpatrick (1996a) expressed concern for the management practices taking place on Federal lands at Ocala National Forest, Merritt Island National Wildlife Refuge at the Kennedy Space Center, and Cape Canaveral Air Force Station, all supporting large contiguous populations of scrub-jays. They predicted fire suppression and/or too frequent fires (on the latter two) and silvicultural activities involving the cultivation of sand pine on Ocala National Forest would be responsible for declines of scrub-jays in these large contiguous areas of scrub. These areas should be those where populations are most secure

because of Federal agencies' responsibilities under section 7(a)(1) of the Act. Monitoring of scrub-jay populations, demography, and nesting success is ongoing on all of these properties to assess the effectiveness of management practices in meeting scrub-jay recovery objectives.

Housing and commercial developments within scrub habitats are accompanied by the development of roads. Since scrub-jays often forage along roadsides and other openings in the scrub, they are often killed by passing cars. Research by Mumme et al. (2000) along a two-lane paved road indicated clusters of scrub-jay territories found next to the roadside represented population sinks (breeder mortality exceeds production of breeding-age recruits), which could be supported only by immigration. Since this species may be attracted to roadsides because of their open habitat characteristics, vehicular mortality presents a significant and growing management problem throughout the remaining range of the scrub-jay (Dreschel et al. 1990; Mumme et al. 2000), and proximity to high-speed paved roads needs to be considered when designing scrub preserves (Woolfenden and Fitzpatrick 1996a).

Another potential problem in suburban areas supporting scrub-jays is supplemental feeding by humans (Bowman and Averill 1993; Woolfenden and Fitzpatrick 1996a; Bowman 1998). The presence of additional food may allow scrub-jays to persist in fragmented habitats, but recruitment in these populations is lower than in native habitats. However, even though human-feeding may postpone local extirpations, long-term survival cannot be ensured in the absence of protecting native oak scrub habitat necessary for nesting. Scrub-jays in suburban settings often nest high in tall shrubbery. These nests are susceptible to destruction when windy conditions occur during the nesting season (Woolfenden and Fitzpatrick 1996b; Bowman 1998).

Hurricanes pose a potential risk for scrub-jays, although the exact impact of such catastrophic events is unknown. Breininger et al. (1999) modeled the effects of epidemics and hurricanes on scrub-jay populations in varying levels of habitat quality. Small populations of scrub-jays are more vulnerable to extirpation where epidemics and hurricanes are common. Storm surge from Category Three to Five hurricanes could inundate entire small populations of scrub-jays, and existing habitat fragmentation could prevent repopulation of affected areas. However, this model also predicted that long-term habitat degradation had greater influence on extinction risk than hurricanes or epidemics. Preliminary results of the impact of Hurricane Charley on the Charlotte County scrub-jay populations indicates that at least one member of all 20 family groups surveyed after the storm passed had survived (Miller 2006).

Fernald (1989) reported many of the relatively few remaining patches of scrub within the Treasure Coast region of Florida had been degraded by trails created by off-road vehicles, illegal dumping of construction debris, abandoned cars and appliances, or household waste. The invasion of these areas by exotic species, including Brazilian pepper (*Schinus terebinthifolius*), white cypress-pine (*Callitris glaucophylla*), and Australian pine (*Casuarina equisetifolia*) also was a problem. Other human-induced impacts identified by Fernald (1989) include the introduction of domestic dogs and free-roaming cats, black rats, greenhouse frogs (*Eleutherodactylus planirostris*), giant toads (*Bufo marinus*), Cuban tree frogs (*Osteopilus septentrionalis*), brown anoles (*Anolis sagrei*), and other exotic animal species. These exotic species may compete with scrub-jays for space and food.

Analysis of the species/critical habitat likely to be affected

The Florida scrub-jay is a passerine bird that occurs in the xeric oak-scrub habitats of Florida. Habitat loss due to development and fire suppression is the greatest threat to the scrub-jay. Remaining scrub-jay habitat on private lands is especially vulnerable based on projections of future human population growth and the expected concomitant increase in residential and commercial development.

The FAA has determined the proposed vegetation removal at the Vero Beach Airport project "may affect and is likely to adversely affect" the Florida scrub-jay. The Service concurs with the FAA's determination and finds the project will result in adverse effects to the Florida scrub-jay and its habitat. The project's adverse effects to the Florida scrub-jay will be discussed in the remainder of this Biological Opinion. Critical habitat has not been designated for the Florida scrub-jay and will not be affected.

ENVIRONMENTAL BASELINE

The environmental baseline includes the past and present impacts of all Federal, State, private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions, which are contemporaneous with the consultation in progress.

Climate change

Climate change is evident from observations of increases in average global air and ocean temperatures, widespread melting of snow and ice, and rising sea level, according to the Intergovernmental Panel on Climate Change (IPCC) Report (2007). The IPCC Report describes natural ecosystem changes with potential wide-spread effects on organisms from marine mammals to migratory birds. The potential for rapid climate change poses a significant challenge for fish and wildlife conservation. Species' abundance and distribution are dynamic, relative to a variety of factors, including climate. As climate changes, the abundance and distribution of fish and wildlife will also change. Highly specialized or endemic species are likely to be most susceptible to the stresses of changing climate. Based on these findings and other similar studies, the Department of the Interior requires agencies under its direction to consider potential climate change effects as part of their long-range planning activities (Service 2007).

Climate change at the global level drives changes in weather at the regional level, although weather is also strongly affected by season and by local effects (*e.g.*, elevation, topography, latitude, proximity to the ocean). Temperatures are predicted to rise from 2°C to 5°C for North America by the end of this century (IPCC 2007). Other processes to be affected by this projected warming include rainfall (amount, seasonal timing and distribution), storms (frequency and intensity), and sea level rise. However, the exact magnitude, direction and distribution of these changes at the regional level are not well understood or easy to predict. Seasonal change and local geography make prediction of the effects of climate change at any location variable. Current predictive models offer a wide range of predicted changes.

Prior to the 2007 IPCC Report, Titus and Narayanan (1995) modeled the probability of sea level rise based on global warming. They estimated the increase in global temperatures could likely raise sea level 6 inches by 2050 and 13 inches by 2100. While these estimates are lower than the estimates described in the IPCC Report (2007), Titus and Narayanan's (1995) modeling efforts developed probability-based projections that can be added to local tide-gauge trends to estimate future sea level at specific locations.

Climatic changes in south Florida could exacerbate current land management challenges involving habitat fragmentation, urbanization, invasive species, disease, parasites, and water management (Pearlstine 2008). Global warming will be a particular challenge for endangered, threatened, and other "at risk" species. It is difficult to estimate, with any degree of precision, which species will be affected by climate change or exactly how they will be affected. The Service will use Strategic Habitat Conservation planning, an adaptive science-driven process that begins with explicit trust resource population objectives, as the framework for adjusting our management strategies in response to climate change (Service 2006).

Status of the species within the action area

Florida scrub-jays have been documented to occur in the action area and within the project footprint. Scrub-jay surveys, based on the Service's survey guidance, were conducted by the applicant's consultant within suitable habitat at the Vero Beach Airport property during July and August, 2011. The area surveyed included the project footprint. Results of the survey indicate that the territories of four family groups (denoted as A, B, C, and D) consisting of 11 individual birds occur on the airport property (Figure 2). Scrub-jay families A, C, and D each contain three individuals consisting of one male adult, one female adult, and one juvenile bird of unknown sex. Scrub-jay family B contains one adult male and one adult female bird.

The proposed vegetation clearing will impact 14 ac of scrub habitat within the territories of scrub-jay families A, C, and D and the proposed tree-trimming will result in disturbance to 6.2 acres of scrub habitat within the territories of scrub-jay families A, C, and D. The total acreages for each territory, as well as those areas to be impacted, are shown in the table below. To minimize the adverse effects resulting from the project, the Vero Beach Airport will develop a Habitat Conservation Plan to enhance and manage habitat for the Florida scrub-jay within the airport property.

Table 1: Details on the scrub-jay families occurring at the Vero Beach Municipal Airport, and the anticipated effects of the proposed project.

Family	No. Birds	Total Territory size (ac)	Clearing (ac)	Tree-trimming (ac)	Undisturbed (ac)
A	3 (1M, 1F, 1J)	24.7	5.4	0.9	18.4
B	2 (1M, 1F)	17.7	0.0	0.0	17.7
C	3 (1M, 1F, 1J)	15.2	1.1	1.0	13.1
D	3 (1M, 1F, 1J)	28.3	7.5	4.3	16.5
	Total:	85.9	14.0	6.2	65.7

Factors affecting the species environment within the action area

Scrub-jay habitat in the action area has become degraded and overgrown due to the lack of fire or management in the action area. Overgrown vegetation in scrub habitats is known to significantly reduce the quality of these habitats to scrub-jays (Breininger et al. 1996; Fitzpatrick et al. 1991; Woolfenden and Fitzpatrick 1996b). Scrub-jays are adapted to early successional habitat conditions. Lack of fire or management results in the loss of open areas scrub-jays use to cache acorns and forage for prey. Moreover, overgrown conditions favor predators and competitors of scrub-jays (Miller and Stith 2002).

Operation of the existing airport facility represents a potential threat of injuries or mortalities to scrub-jays resulting from collisions with aircraft. However, scrub-jays are a highly vagile and low-flying species that, by habit, seldom move a significant distance away from their territory. Therefore, it is unlikely scrub-jays would fly into the flight paths of aircraft, and collisions with aircraft are unlikely.

EFFECTS OF THE ACTION

This section analyzes the direct and indirect effects of the proposed action and interrelated and independent actions on the scrub-jay and its habitat.

Factors to be considered

Land clearing projects may directly affect the scrub-jay and its habitat. Direct effects are primarily habitat based and may include: (1) the permanent loss and fragmentation of scrub-jay habitat; and (2) harassment of scrub-jays due to land clearing activities. Indirect effects to the scrub-jay are not expected to result from the project.

Scrub-jays occur on or near the project footprint year-round. Land clearing will result in permanent loss of a portion of the existing vegetation on the project site. The project will likely be completed within a few months. The disturbance associated with the project will be permanent and result in the loss of habitat currently available to the scrub-jay.

Beneficial effects

Beneficial effects are those effects of the proposed action that are completely positive, without any adverse effects to the listed species or its critical habitat. The beneficial effects of the project to the scrub-jay include the enhancement of 88.4 ac of currently unoccupied scrub-jay habitat and 6.2 ac of occupied scrub-jay habitat resulting from tree removal at the project site. Tree removal will enhance scrub-jay habitat by providing a lower stature and more open vegetation structure preferred by the species.

Direct effects

Direct effects are those effects caused by the proposed action at the time of construction, and are reasonably certain to occur. The direct effects that this project will have on the scrub-jay within the action area are discussed below.

The proposed land clearing associated with the vegetation removal project will result in the loss of 14 ac of occupied scrub-jay habitat within three active scrub-jay territories (5.4 ac [21.86%] within the territory of family A, 1.1 ac [7.24%] within the territory of family C, and 7.5 ac [26.50%] within the territory of family D) (Figure 2, Table 1). In addition, 98.6 ac of currently unoccupied and potential scrub-jay habitat will be lost due to the project. These lands will be cleared of all shrubs, trees and woody vegetation, and maintained as low stature grasses and herbaceous plants that will be mowed on a regular basis. The cleared land will be unsuitable as nesting and foraging habitat for the scrub-jay. However, scrub-jays could potentially use at least a portion of the cleared lands for storing acorns.

The tree removal and land clearing activities are not expected to result in the direct mortality of adult or nestling scrub-jays. Scrub-jays are intelligent and will likely avoid areas where tree removal and land clearing are taking place. The destruction of a scrub-jay nest is also unlikely because the land clearing activities will occur outside the nesting season of the scrub-jay. Nonetheless, the tree removal and land clearing activities are expected to result in harassment to scrub-jays at the project site. Scrub-jays may respond to the harassment by persisting within the affected territory, shifting their territory to other nearby xeric uplands, or abandoning the project area completely.

Interrelated and interdependent actions

An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. Interrelated or interdependent actions are not expected to result from the project.

Indirect effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects are not expected to result from the project.

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 unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

To minimize the project's impacts to the scrub-jay, the Vero Beach Airport is proposing to develop a Habitat Conservation Plan for future development activities that adversely affect scrub-jays and their habitat within the airport property. Consequently, the Service has not identified any additional cumulative effects that are likely to occur within the action area.

CONCLUSION

After reviewing the current status of the scrub-jay, 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 project, as proposed, is not likely to jeopardize the continued existence of the Florida scrub-jay. Critical habitat for the scrub-jay has not been designated, and will not be affected. Vegetation removal activities associated with the project will result in the permanent loss of 14 ac of potential scrub-jay habitat, and harassment to at least three families of scrub-jays known to occur within the project footprint. However, the loss of this habitat and the harassment resulting from the project construction and operation of the roadway is not expected to appreciably affect the overall survival and recovery of the scrub-jay.

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 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, including 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 such taking is in compliance with the terms and conditions of this incidental take statement.

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service has reviewed the biological information for this species, information presented by the applicant's consultant, and other available information relevant to this action. Incidental take of the Florida scrub-jay in the form of harm (*i.e.*, the loss of 14 ac of occupied habitat in the project footprint) and harassment (*i.e.*, disturbance to scrub-jays resulting from vegetation clearing activity) is expected from the action. The Service has chosen not to quantify the level of incidental take in terms of a specific number of birds because documenting the adverse effects of loss of habitat and disturbance on survival and reproduction of scrub-jays from the project is problematic. Instead, we have quantified take as the amount of scrub-jay habitat lost due to the project. The project will result in the loss of 14 ac of habitat within the project footprint. The Service has determined this amount of anticipated take is not likely to result in jeopardy to the species. If this amount of take is exceeded during the course of this action; such take would represent new information requiring review of the reasonable and prudent measures provided. In this instance, the Federal agency must immediately request reinitiation and provide modification of the reasonable and prudent measures.

EFFECT OF THE TAKE

In the accompanying Biological Opinion, the Service determined this amount of anticipated take is not likely to result in jeopardy to the Florida scrub-jay. Critical habitat has not been designated for the Florida scrub-jay and will not be affected.

REASONABLE AND PRUDENT MEASURES

When providing an incidental take statement, the Service is required to give reasonable and prudent measures it considers necessary or appropriate to minimize the take along with terms and conditions that must be complied with, to implement the reasonable and prudent measures. Furthermore, the Service must also specify procedures to be used to handle or dispose of any individuals taken. The Service finds the following reasonable and prudent measures are necessary and appropriate to reduce take and to minimize the direct and indirect effects of the proposed project on the scrub-jay:

1. Minimize the adverse effects of harm and harassment to the scrub-jay by implementing an appropriate scrub-jay habitat compensation and management plan. As indicated below in Condition number 1, the Vero Beach Municipal Airport will achieve this reasonable and prudent measure through the development and implementation of a Habitat Conservation Plan (HCP) that comprehensively addresses remaining Florida scrub-jay habitat at the Vero Beach Municipal Airport. The Service finds that, if permitted, the implementation of an airport-wide HCP at the Vero Beach Airport will improve scrub-jay habitat in a larger area and provide greater conservation benefits to the species than typically would be realized through other types of scrub-jay habitat compensation and management plans provided to the Service.

2. Minimize the adverse effects of the action to the scrub-jay through appropriate timing of vegetation removal.

3. Notify the Service of any unauthorized take of scrub-jays.

TERMS AND CONDITIONS

To implement the above reasonable and prudent measures, the Service has outlined the following terms and conditions. In accordance with the Interagency Cooperation Regulation (50 CFR 402), these terms and conditions <u>must be</u> complied with to implement the reasonable and prudent measures:

1. Within 36 months of the date of this Biological Opinion, staff and/or agents of the Vero Beach Municipal Airport will develop a HCP for the enhancement and long-term management of Florida scrub-jay habitat throughout the airport property, and apply for an Incidental Take permit under section 10(a)(1)(B) of the Act for future activities within the airport property that may adversely affect the Florida scrub-jay.

2. If condition number 1 is not met, the Vero Beach Municipal Airport will submit an alternate compensation plan to the FAA and Service for review and approval, to minimize the impacts to 14 acres of occupied Florida scrub-jay habitat described in this Biological Opinion. The alternate compensation plan shall either meet the Service's current guidelines for assessing minimization/mitigation needs for the Florida scrub-jay, or otherwise be acceptable to the Service. The alternate compensation plan must be submitted to the Service no later than 42 months from the date of this Biological Opinion and, once approved, must be implemented no later than 48 months from the date of the Biological Opinion.

3. Vegetation removal activities may not occur within occupied scrub-jay habitat on the project site during the scrub-jay nesting season (March 1 to June 30).

4. Upon locating a dead scrub-jay specimen, initial notification must be made to the nearest Service Law Enforcement Office (Mr. Robert Register; U.S. Fish and Wildlife Service; 1339 20th Street; Vero Beach, Florida 33962; 772-469-4224). Secondary notification should be made to the FWC; Northeast Region, 1239 S.W. 10th Street; Ocala, Florida, 34471-0323; 352-732-1225. Care must be taken in handling any dead specimens of proposed or listed species found in the project area to preserve the specimen or its remains in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure 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 Act. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure the terms and conditions are appropriate and effective.

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 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 - CLOSING STATEMENT

This concludes formal consultation on the Vero Beach Airport Vegetation Removal project. As provided in 50 CFR Section 402.16, reinitiation of formal consultation is required when discretionary Federal agency involvement or control over the action has been retained and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect Act listed species or critical habitat in a manner or to an extent not considered in this Biological Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the Act listed species or critical habitat not considered in this Biological Opinion; or (4) a new species is listed or critical habitat is 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.

Thank you for your cooperation in the effort to protect fish and wildlife resources. If you have any questions regarding this project, please contact John Wrublik at 772-469-4282.

Sincerely yours,

for Craig Aubrey

Larry Williams
Field Supervisor
South Florida Ecological Services Office

cc: electronic only
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Figure 1. Location map of the Vero Beach Municipal Airport project site in Indian River County, Florida.

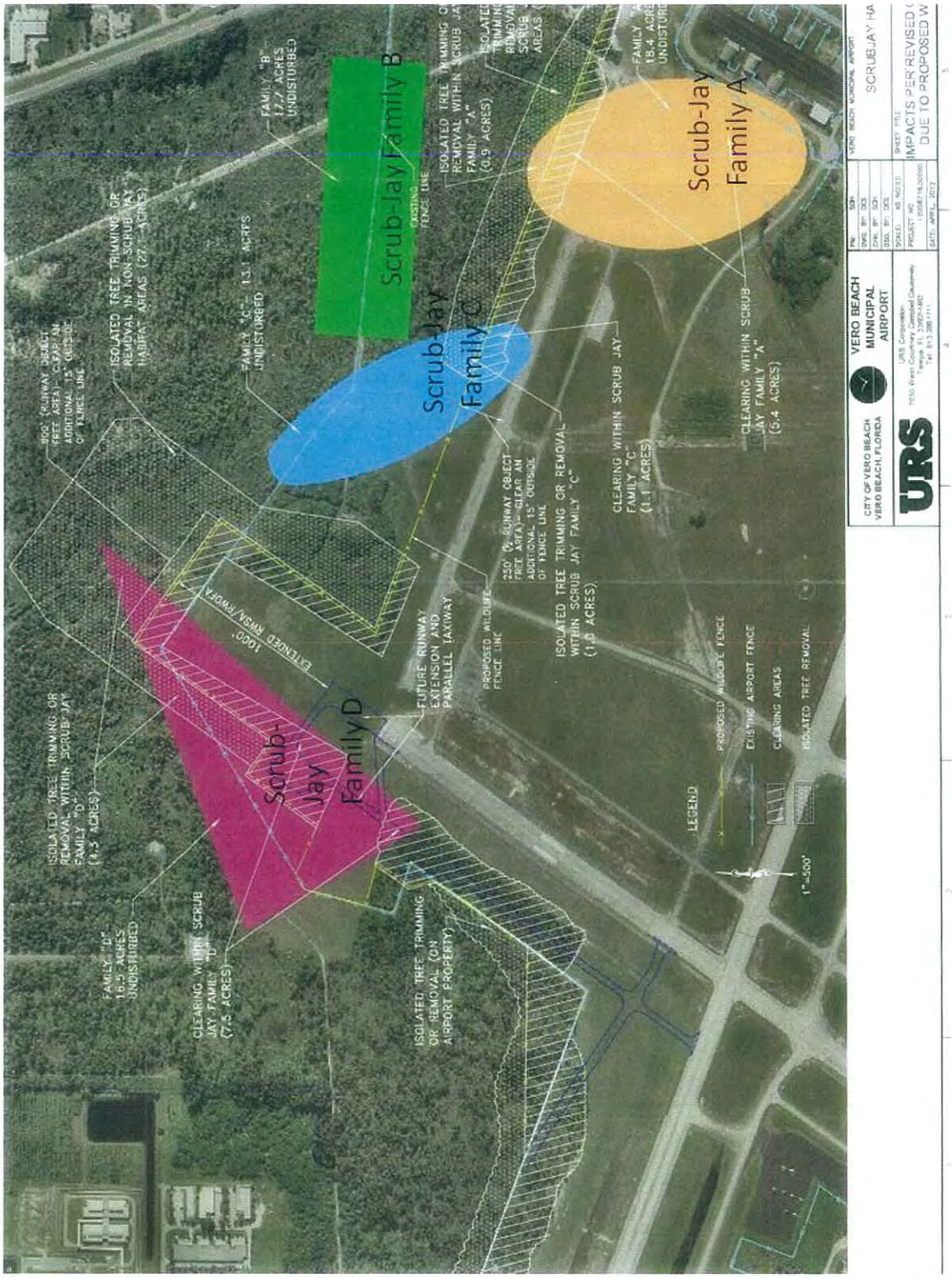

Figure 2. Territories of Florida-scrub jay families at the Vero Beach Municipal Airport documented during surveys conducted in 2011.