

Habitat Use and the Distribution of the Cape Sable Sparrow

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Dedication. We dedicate this paper to the late Louis A. Stimson, whose endurance and perseverance in searching for Cape Sable Sparrows contributed so much to our knowledge.

The Cape Sable Sparrow (*Ammospiza maritima mirabilis*), a subspecies of the Seaside Sparrow endemic to extreme southern Florida, has elicited considerable interest and concern since its discovery in the early 1900s. Before being relegated to subspecific status (Eisenmann 1973), it was considered to be the last bird species described from the continental United States (Howell 1919, Stimson 1968). The sparrows were widely believed to have been exterminated from Cape Sable by a hurricane in September 1935 and were not rediscovered there for 35 years (Werner 1971).

The limited distribution, and apparently catastrophic history, of the Cape Sable Sparrow resulted in its being classified as endangered under the original Federal listing of endangered species in 1967. Discoveries, apparent losses, and rediscoveries of sparrow populations in various areas have characterized its known history. One cause of its being little understood is the habitat it occupies. Unlike other races, which are confined to coastal salt marshes, the Cape Sable Sparrow occurs predominantly in inland freshwater marshes. Such unexpected choice of habitat made it less likely for such populations to be discovered, and as a result, the status and distribution of the sparrow have remained poorly known. In an attempt to characterize the distribution and habitat use of the Cape Sable Sparrow, we undertook extensive surveys from 1978 to 1980, and a census covering all available habitat in 1981. As a result, we have found that the sparrow is much more widely distributed than was previously thought. In this paper we document the present range of the Cape Sable Sparrow, characterize its use of habitat, and provide an estimate of its population size.

METHODS

Surveys were conducted in known and suspected Seaside Sparrow habitat in extreme southern Florida, primarily south of US 41 (Fig. 1). Urban and agricultural areas were excluded. Like Werner (1975), we found during this study that sparrows do not use habitat containing trees or brush. As a result, the extensive mangrove, pine, and cypress forests of southern Florida are unsuitable as habitat. Sparrows also do not occur in deeply flooded marshes such as the Sawgrass-dominated areas of the Everglades proper. The typical Seaside Sparrow habitat of cordgrass (salt) marsh occurs along the coast embedded in and on the edge of mangrove forest (Fig. 1). Our census, therefore, covered all of the treeless coastal and inland freshwater marshes and prairies of extreme southern Florida, except the deeper marshes of Shark River Slough, the central core of the Everglades (Fig. 1).

Preliminary surveys were conducted from early April through late June, 1978-1980. We covered easily accessible areas on foot. More remote areas where sparrows had been previously observed and other potential habitat were surveyed using a Bell C-47 helicopter equipped with pontoons. We began our flights at approximately sunrise and continued for 3 to 4 hours. To census a site, we landed and shut off the engine. While walking around the aircraft for about 10 minutes, we listened for singing sparrows. When a singing bird was detected, we moved near and recorded the number of birds seen or heard. In these preliminary surveys, small patches of habitat were covered thoroughly; whereas, in large areas of suitable habitat, we surveyed selected sites several kilometers apart. One

to 10 sites were surveyed each morning. In 1981, we censused all potential habitat systematically from 31 March through 16 June. All potential habitat was gridded into blocks 1 km on the side, which were plotted on U.S. Geological Survey 7.5-minute orthophoto quadrangles. We conducted our census at the intersection of the grid lines. The number of birds seen or heard and characteristics of the plant community were recorded. The exact locations of the survey sites and habitat information are provided in Bass and Kushlan (1982).

At each census location, we were able to hear a sparrow within 200 m. We believe we censused singing birds within an area of 12.6 ha around the helicopter landing point. The number of birds observed in the 12.6 ha-plot represents the minimum number of singing males there, and the density in the plot is taken to be representative of the density of singing males in the adjacent 1 km² block. We obtained a population estimate by multiplying the average density of birds per km² by the number of occupied square kilometers, then doubled the number to include uncounted females.

We characterized the habitat in each plot according to its dominant plant cover. Freshwater prairies and marshes included Muhly prairie, mixed prairie, cordgrass marsh, Sawgrass marsh, Cat-tail marsh, and Black Needlerush marsh. Forest communities included mangrove swamp forest, cypress swamp forest, pine forest, and hammock forest. In nearly all cases, we found sparrows only in the first three plant communities listed. Werner and Woolfenden (this symposium) recognize four habitats: clumped cordgrass prairie, unclumped cordgrass prairie, sparse Sawgrass prairie, and Muhly prairie. Our classification for this paper combines their two cordgrass habitats. Their sparse Sawgrass community is equivalent to our mixed prairie.

Muhly prairie is a mixture of grasses, sedges, and forbs in which graminoids predominate. This community occurs on marl soil and has a short (1 to 6 months) hydroperiod. Muhly (*Muhlenbergia filipes*), a bunchgrass, dominates plant community structure in frequency and cover (Olmsted et al. 1980). In some areas Black-top Sedge (*Schoenus nigricans*) is the dominant clumped species, and Muhly is secondary. The bunchgrasses are 60 to 90 cm high. Sawgrass (*Cladium jamaicense*) is a constant associate and is usually 20 to 30 cm taller than Muhly or Black-top Sedge. *Schizachyrium rhizomatum* and *Rhynchospora* sp. also occur. Overall, the community may contain up to 20 species of graminoids and 50 species of forbs. Graminoids make up 98% of plant cover, which varies with hydroperiod, soil depth, and fire history. Large areas of Muhly prairie have sparse, 10 to 25%, cover (Olmsted et al. 1980).

Except for lacking Muhly, mixed prairie is similar in composition to the Muhly prairie. The absence of Muhly changes the structure of the community, by eliminating the grassy clumps. A greater mixture of species includes *Rhynchospora* sp. and grasses, especially *Panicum virgatum*. Sawgrass is always present.

The remaining marsh communities are dominated by their indicator species. Cordgrass marsh is composed primarily of *Spartina bakeri*. Sawgrass marsh has a longer hydroperiod than the prairie communities and occupies the central, deeper-water cores of the

southern Everglades, Shark River Slough, and Taylor Slough (Fig. 1). Cat-tail marsh is dominated by *Typha* sp., up to 3 m tall. Black Needlerush marsh, dominated by *Juncus roemerianus*, occurs within and near the coastal mangrove swamps in inland, nontidal situations.

Mangrove forest swamps are dominated by *Rhizophora mangle*, *Avicennia germinans*, or *Laguncularia racemosa*. Cypress swamp has *Taxodium distichum* as its dominant overstory tree. Big Cypress Swamp, northwest of Shark River Slough, comprises cypress swamp and pine forests of *Pinus elliottii*. Pine forests and hammock forests of tropical hardwoods form the remaining upland complex of plant communities of southern Florida. Much of the area naturally occupied by these communities has been subjected to agricultural and urban development.

RESULTS

History of Known Distribution

The Cape Sable Sparrow was discovered by A. H. Howell in 1918 on the coastal prairie of Cape Sable, at the southwest tip of the Florida peninsula (Howell 1919). The sparrow was found to range along much of the coast west of Flamingo (Fig. 1) (Stimson 1956, Werner 1971). Although Howell (1919) found that sparrows were only "moderately numerous," they were rather widely distributed in the prairies inland from the beach. The population survived the hurricane of 1929 (Howell 1932), but it was widely thought (Nicholson 1938; Stimson 1956, 1968) to have been extirpated by the hurricane of September 1935, despite observations to the contrary (Semple 1936, Dietrich 1938). Burleigh (1939) did not find them on a search in the winter of 1938.

When first discovered, the sparrow occupied seasonally flooded prairie, dominated by short, sparse cordgrass, *Distichlis spicata*, and *Sesuvium portulacastrum* (Holt and Sutton 1926, Semple 1936, Nicholson 1928, Stimson 1954, Werner 1978). Comparison of early descriptions and photographs (Holt and Sutton 1926) with current conditions shows that this area, once occupied by extensive cordgrass marsh, is now dominated by mangroves, bare mud flats, and stands of halophytic forbs (*Batis maritima*, *S. portulacastrum*, *Borrchia frutescens*). The plant community change was initiated by the hurricane of 1935 and resulted in a marked decrease of potential sparrow habitat on Cape Sable. Stimson (1956) searched for and failed to find sparrows there in 1949. Werner and Woolfenden (this symposium) suggest that by the time of that survey most of the habitat may no longer have been suitable for the sparrow. In 1970 Werner (1971) rediscovered sparrows on Cape Sable in several small residual interior stands of cordgrass marsh. At that time, Werner found four singing males and netted five juveniles in a 2-day effort. In much more limited surveys in 1975, one male was found (Werner 1975).

Cape Sable Sparrows were discovered west of the true Everglades (Shark River Slough) in the southeastern Big Cypress Swamp in 1928 (Nicholson 1928). They were separated from the occupied area on Cape Sable by bays and mainland mangrove forests. An error in reporting the location of these observations, later corrected by Stimson (1954, 1956), prevented immediate

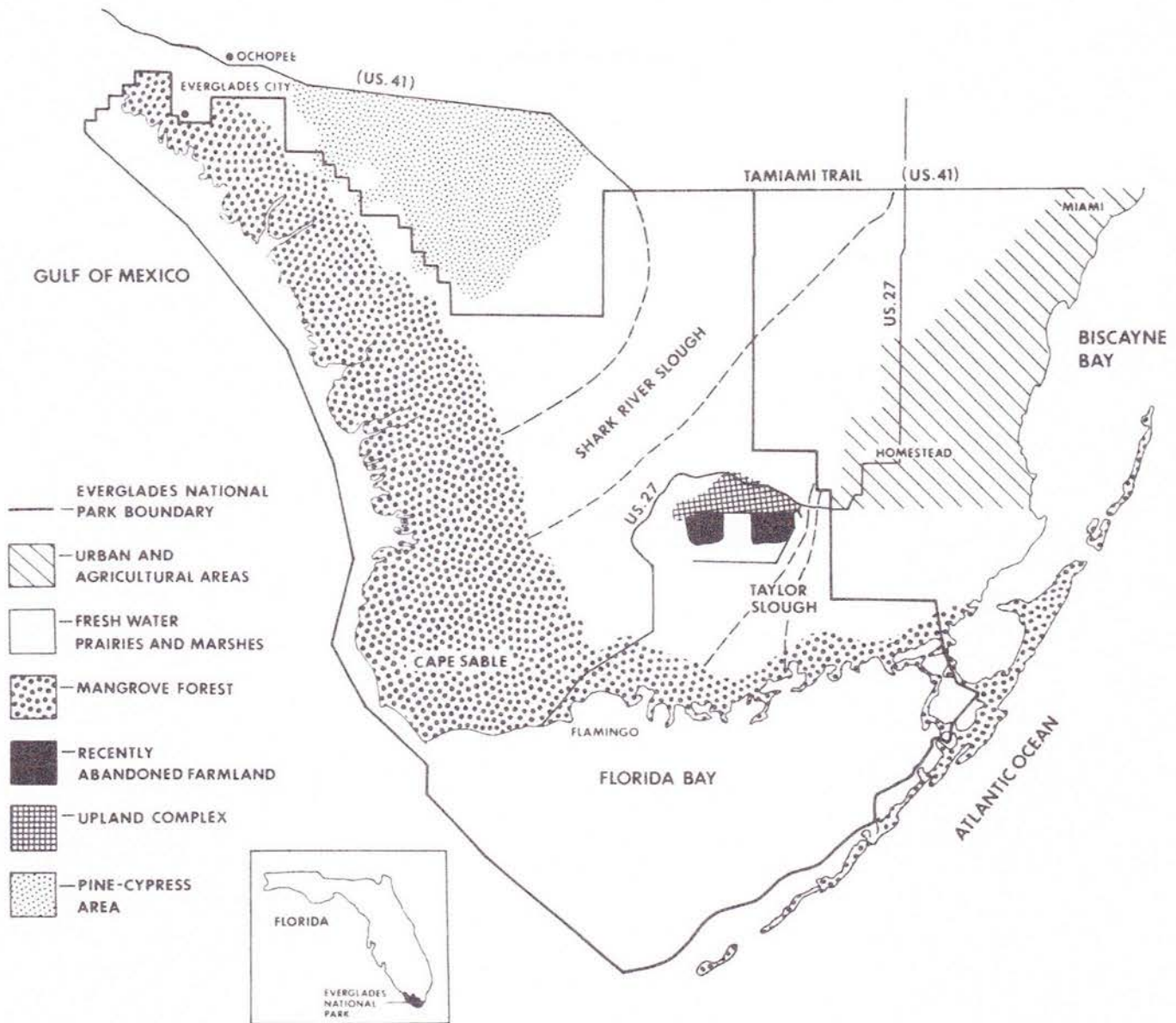


Fig. 1. Map of extreme southern Florida, showing localities, major plant communities, and physiographic areas.

confirmation of this discovery. Our knowledge of the distribution of sparrows in this area during the 1950s resulted from the work of Stimson and his colleagues (Stimson 1956 and references therein). He found that the sparrows were widely distributed as far east as the western edge of the southern Everglades. However, by the early 1960s, he (Stimson 1968) concluded that the population had been extirpated by widespread and frequent fires. Birds were found in the area in surveys conducted from 1970 to 1975, but Werner and Woolfenden (this symposium) concluded that they were rare at that time.

Sparrows were found in coastal marshes near Ochopee in 1942 (Anderson 1942). By the mid-1950s, Stimson (1956) determined that the birds were dispersed south of Ochopee in marshes between the mangrove swamps and cypress swamps. He reported a hiatus in distribution between these sparrows and those in the southern Big Cypress Swamp. In recent decades the habitat in these marshes has been changing. From 1970

to 1975, it appeared to Werner (1975) that *Juncus roemerianus* and *Eleocharis* sp. were replacing *Spartina bakeri* and *Distichlis spicata*. Mangroves also have shown a long-term encroachment inland, although this invasion may have been checked by freezes in 1977. Some of these changes were probably associated with altered hydrologic conditions in the area and with a high frequency of fires. Werner (1975) found sparrows at six scattered sites in this area from 1970 through 1975 and noted a decline in both the number of sites and number of individuals seen during the course of his study.

Sparrows were reported east of the true Everglades in Taylor Slough in 1972 (Ogden 1972). These birds occupy the prairie west of Homestead, north into the East Everglades, and southwest in Taylor Slough to the mangroves (Fig. 1). Werner (1975) found this population to be patchily distributed over an area of about 10,000 ha. The sparrow apparently existed in this area before its official discovery, as a previously overlooked

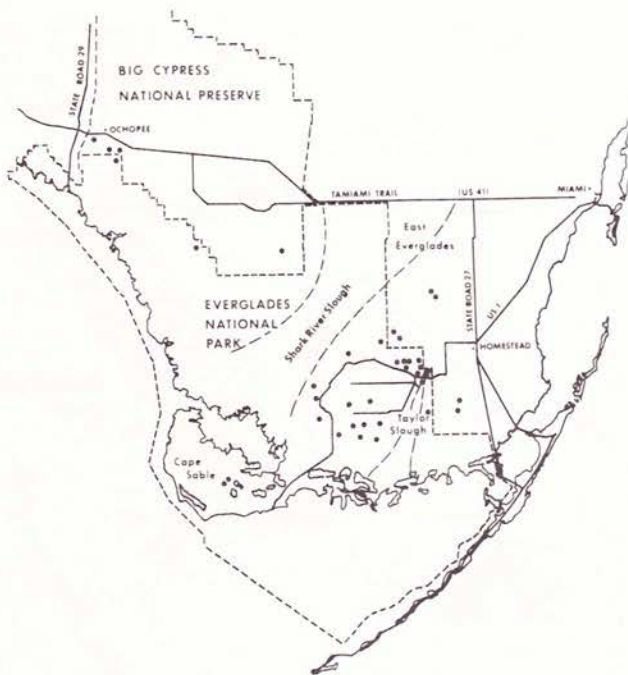


Fig. 2. Known distribution of the Cape Sable Sparrow from 1970 through 1975. Locations where sparrows were found by Werner (1975) are indicated by dots.

observation occurred in 1957 (Werner and Woolfenden, this symposium). Based on his surveys in 1974 and 1975, Werner concluded that this area supported most of the remaining sparrow population. Using information on sparrow density from his study plots, he estimated the population there to be between 1,900 and 2,800 birds (Werner 1978).

In the early 1970s, therefore, Werner (1975) had found that the sparrow persisted in each of the areas where it had previously been known to exist, but that very few individuals remained at Ochopee, on Cape Sable, or in the southern Big Cypress Swamp. Birds near Ochopee were undergoing a decline, whereas birds on Cape Sable were confined to small patches of remnant cordgrass marsh. The largest population was the newly discovered one near Taylor Slough. Figure 2 summarizes the sparrow's known range at the end of Werner's study.

Combining Werner's information with that of earlier workers, we can estimate the maximum known historic range of the Cape Sable Sparrow from 1918 through 1975 (Fig. 3). As discussed above, it appears that not all areas were occupied simultaneously, nor was each area densely occupied throughout the historical period.

Censuses of 1978-1981

In our preliminary censuses conducted from 1978 through 1980, we attempted to determine the location and status of persisting populations (Fig. 4, 5, 6). Details of the results are provided in Bass and Kushlan (1982). In 1978, censusing places where Werner had last found birds, we heard or saw birds at two sites on Cape Sable, at one site near Ochopee, and at 11 of 12 sites surveyed

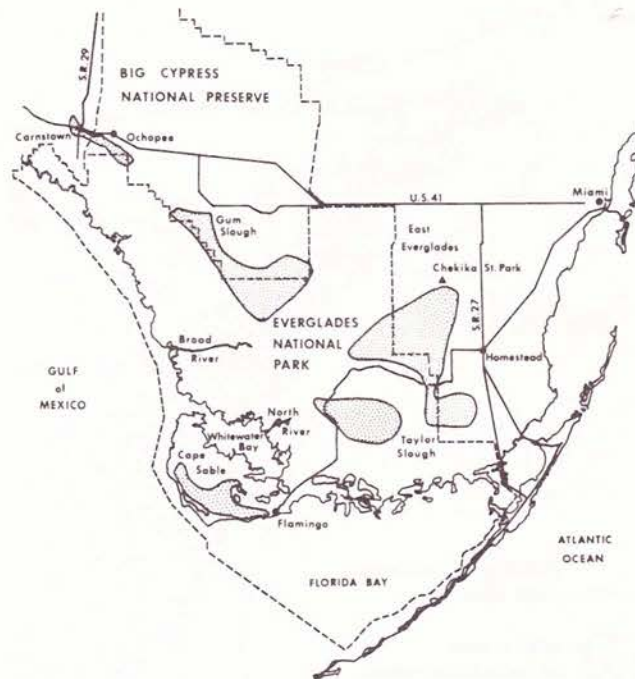


Fig. 3. Maximum extent of the known range of Cape Sable Sparrows, 1918 through 1975. The sparrow was probably absent from some of these areas through some or most of the period.

in Taylor Slough. In 1979, we were unable to find birds in their previous locations on Cape Sable, because most of that habitat had burned that year. We found birds at two sites near Ochopee and in 11 of 20 sites surveyed near Taylor Slough. In 1980, we were unable to find birds on Cape Sable or near Ochopee. A more extensive survey in the Big Cypress Swamp uncovered birds at 12 of 21 sites. We also found sparrows at 32 of 50 sites censused near Taylor Slough.

This 3-year survey period demonstrated a continued retraction of sparrow distribution from that of 1975 at Ochopee and at Cape Sable, with birds not being found at these sites in the last year of the survey. However, the rediscovery of a large and well-dispersed population west of Shark River Slough and expansion of the known distribution of sparrows near Taylor Slough suggested that a substantial total population remained. To determine precisely the distribution of the remaining birds, censuses were made 1 km apart throughout the known or otherwise suitable range. All prairie habitat was surveyed along with adjacent marginal habitat dominated by Sawgrass, cypress trees, mangrove trees, or hammocks.

The results show that, as of 1981, the Cape Sable Sparrow was widely distributed over large areas of southern Florida west and east of Shark River Slough (Fig. 7). The location of all spots censused and the data obtained at each are given in Bass and Kushlan (1982). Overall, 864 locations representing 864 km² were censused (Table 1). We found 278 or 32% of these locations to be occupied by Cape Sable Sparrows. Sparrows therefore occurred over 27,800 ha.

The census results for each of four subpopulations are shown in Table 1. We saw no sparrows at five sites

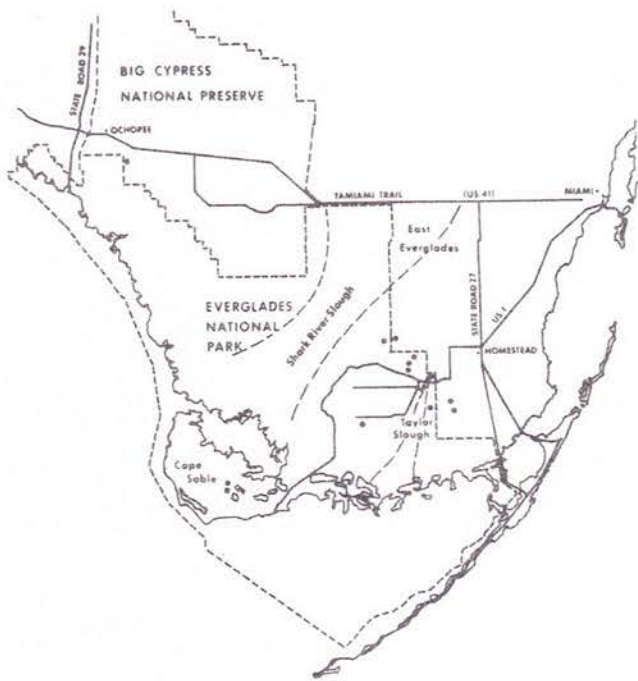


Fig. 4. Locations where Cape Sable Sparrows were found in 1978.

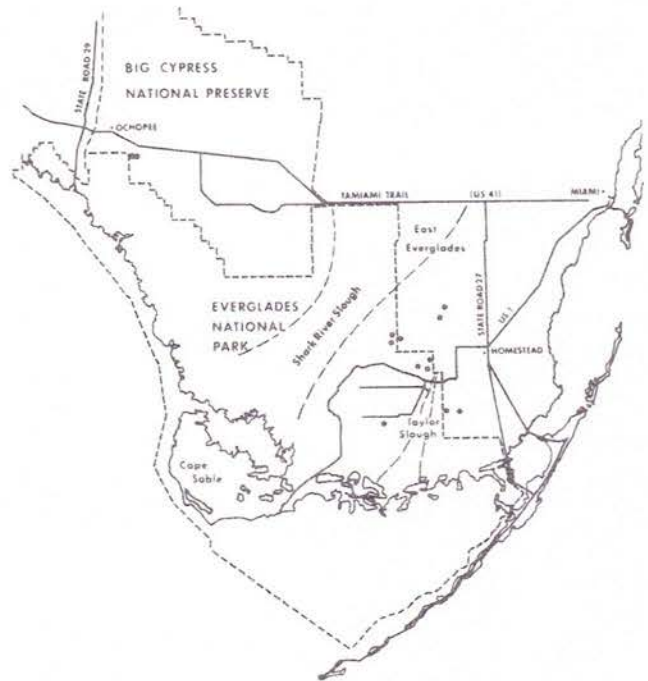


Fig. 5. Locations where Cape Sable Sparrows were found in 1979.

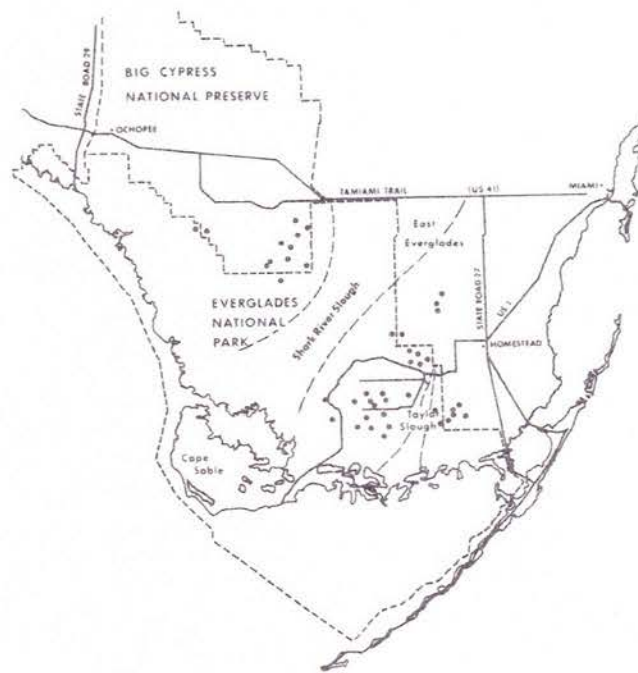


Fig. 6. Locations where Cape Sable Sparrows were found in 1980.

on Cape Sable, representing total coverage of all available habitat there. Similarly, we found no birds near Ochopee. In Taylor Slough and the southern Big Cypress Swamp, however, we counted over 400 birds at the 278 sites. Of the 396 plots surveyed near Taylor Slough, 39%

were occupied by sparrows. The high percentage of occupied census plots reflects the clear demarcation between suitable prairie habitat and the surrounding unsuitable habitats of tall Sawgrass marsh, pine forest, mangrove forest, hammock forest, or developed land, which we did not census. As a result, the periphery of the census area was well defined, and most of our census plots were in suitable habitat. The 28% occupancy of the Big Cypress area was due to the complex interdigitation of marginally unsuitable habitats and isolated patches of prairie habitat that required censusing. The habitat in the two large areas occupied by sparrows is probably grossly equivalent because the number of birds per occupied site was similar.

Habitat Use

During the 1981 census, we also determined characteristics of the habitat used by Cape Sable Sparrows. Most birds occurred in habitat dominated by the grass, *Muhlenbergia*, and 67% of the occupied habitat was Muhly prairie (Table 2). Muhly and the similar mixed prairie together accounted for 96% of the habitat occupied by sparrows. Furthermore, half of all Muhly and mixed prairie habitats surveyed, which included essentially all of that available in the study area, supported sparrows. We also found sparrows in 8 of 61 sites dominated by cordgrass and at two plots that contained cypress trees.

It is conceivable that the value of habitat to sparrows could be indexed by the number of singing male birds seen per occupied site. Within the admittedly coarse resolution of this method, it does not appear that the occupied habitats were grossly dissimilar. The situation is more complicated than our census revealed, however, because Werner (1975) and Taylor (this symposium) found differences in density of breeding birds related to the sites' fire history.

TABLE 1. Cape Sable Sparrows found on censuses conducted in 1981 in four areas of southern Florida.

Subpopulation areas	Number of sites	Number of sites occupied	Number of birds seen	Percent of sites occupied	Birds per site	Birds per occupied site
Taylor Slough	396	155	248	39	0.6	1.6
Big Cypress	441	123	168	28	0.4	1.4
Ochopee	22	0	0	0	0	0
Cape Sable	5	0	0	0	0	0
Totals	864	278	416	32	0.5	1.5

TABLE 2. Habitats occupied by Cape Sable Sparrows in 1981.

Habitat type	Number of sites	Number of sites occupied	Number of birds seen	Percent of sites occupied	Birds per site	Birds per occupied site
Muhly prairie	371 (43) ¹	186 (67) ²	290	50	0.8	1.6
Mixed prairie	164 (19)	82 (29)	111	50	0.7	1.4
Cordgrass marsh	61 (7)	8 (3)	12	13	0.2	1.5
Sawgrass marsh	175 (20)	0 (0)	0	0	0	0
Other	93 (11)	2 (1)	3	2	0.03	1.5

¹Percentage of total habitat surveyed.

²Percentage of total habitat occupied.

Population Estimate

Using the area covered by each of our census plots, we estimate the population of adult Cape Sable Sparrows in 1981 to be 6,640, or rounded to 6,600. Werner (1976) had estimated that the Cape Sable Sparrow population in 1975 was between 2,000 and 3,000 birds. He arrived at this figure by extrapolating population densities within measured plots in Taylor Slough over the area of known occurrence. The range of estimates, set by extrapolating sparrow density on good and on poor plots, was 1,800 to 27,800 individuals. However, considering only the study site most typical of Taylor Slough as a whole, he estimated the population there to be 1,900 to 2,800 sparrows. Having found very few sparrows in areas other than Taylor Slough, he suggested that this subpopulation accounted for 95% of the population and thereby incremented his estimate slightly to account for other birds. Our data suggest that in 1981, the Taylor Slough population accounted for 3,700 sparrows. The primary difference between the two estimates of total population (3,000 vs 6,600) is in our addition of the Big Cypress subpopulation. Because we undoubtedly did not count all birds at each stop, we consider our estimate to be a minimum one. Thus we conclude that the Cape Sable Sparrow population seems to be in excess of 6,600 adults as of 1981.

DISCUSSION

Our census data suggest that the Cape Sable Sparrow has a larger population than previously thought. Over 6,600 birds are widely distributed over much of its

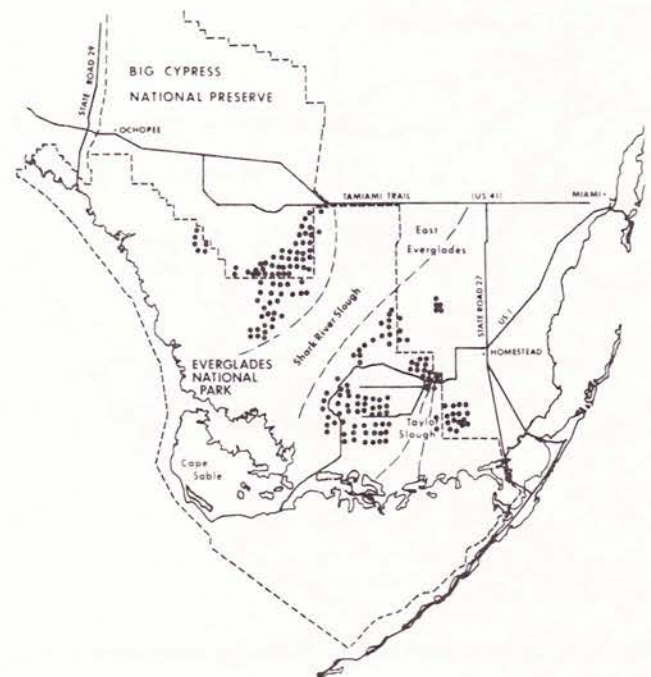


Fig. 7. Distribution of Cape Sable Sparrows based on censuses conducted in 1981. Suitable habitat was censused at locations 1 km apart. Because of the map scale, not all occupied sites are shown.

maximally occupied historic range (Fig. 3, 7). Despite this optimistic result, it is apparent that two subpopulations have been extirpated or at least reduced to very low numbers. These coastal populations, should they persist, are now marginal relative to the remaining population, which is concentrated in the extensive marsh prairies of inland southern Florida. The apparent loss of birds from Cape Sable seems primarily a natural phenomenon reflecting changes in the vegetation regime, whereas the loss of birds from the Ochopee area was probably man-caused by means of drainage and fires (Kushlan et al. 1982).

Current and future threats to the Cape Sable Sparrow seem to be habitat alteration from hurricanes, fire, drainage, and development. The nature of these threats and proposals for management are discussed in Kushlan et al. (1982). Hurricanes appear to have caused substantial, apparently irreversible, changes to some coastal habitat. Werner and Woolfenden (this symposium) concluded that the birds probably are able to survive the direct effect of hurricanes. Long-term habitat change, however, may have a devastating effect, as was demonstrated on Cape Sable. Too frequent or too severe fire, especially combined with drainage, can markedly affect sparrows. Werner (1975) and Taylor (this symposium) discuss the role of fire and its use as a management tool.

The greatest threat at present to an extant population is in the East Everglades, where loss of habitat is occurring due to drainage, frequent fires, invasion of exotic trees, and agricultural and urban development. Contraction of the population because of loss of habitat has rendered parts of the proclaimed critical habitat unsuitable for sparrows. This can be seen by comparing the critical habitat as of 1981 to present distribution of sparrows (Fig. 8) in the East Everglades. Should it be considered desirable to preserve that segment of the population, specific management is required to protect this habitat. Birds in the East Everglades have become an increasingly isolated and marginal group.

The apparent disappearance and reappearance of the Cape Sable Sparrow from known habitat is a matter of some interest. Much of the lack of information on the sparrow's historic distribution is undoubtedly a result of the difficulty in gaining access to much of the area. It also is related to the occurrence of the Cape Sable Sparrow over vast areas of freshwater marsh, where self-respecting Seaside Sparrows had not been expected to occur. However, we do not believe that all the reported disappearances are artifactual. We doubt that the birds were missed by Stimson (1956) on Cape Sable in 1949, by Werner (1975) in the Big Cypress in the early 1970s, or by Robertson (1955) in Taylor Slough in the early 1950s. Considering the dramatic effects of fire on habitat occupancy by sparrows (Werner 1975; Taylor, this symposium), it seems likely that fires covering large areas too frequently would render considerable habitat unsuitable. Reoccupancy would require a slow recolonization for this fairly sedentary bird. This conclusion suggests that unnatural fire must be controlled and used as a management tool in sparrow habitat (Kushlan et al. 1982; Taylor, this symposium) and that our population estimate may represent a high point in a fluctuating population cycle.

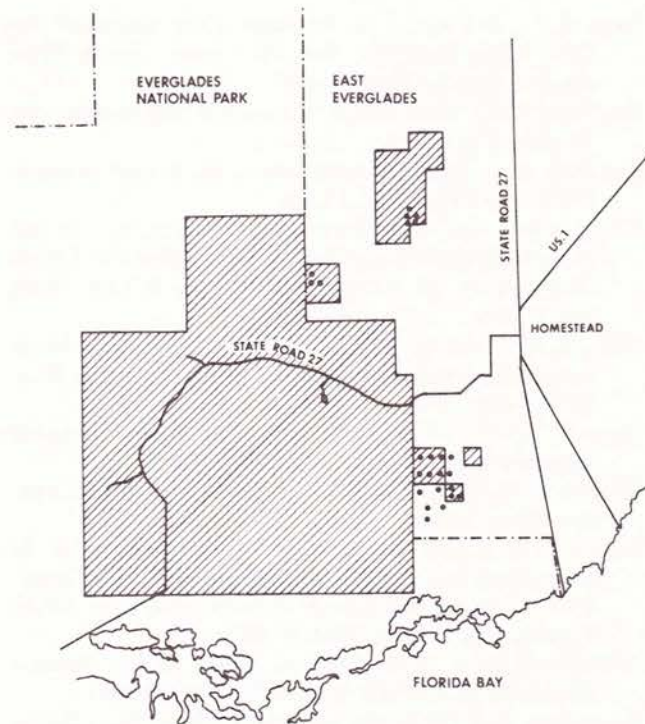


Fig. 8. Critical habitat of the Cape Sable Sparrow compared with current distribution of birds in the East Everglades. Much of the isolated habitat in the East Everglades is no longer suitable for the birds.

Nonetheless, as of 1981, a substantial population persists over a large area of freshwater Muhly and mixed-species marsh. The population is influenced by fire, water conditions, and plant community distribution. Peripheral population segments are threatened by man-caused habitat disruption, but the preponderance of the population is under Federal jurisdiction in Everglades National Park and Big Cypress National Preserve. We conclude that the status of the Cape Sable Sparrow is more secure than previously thought, but the persistence of marginal peripheral populations requires direct management, and the survival of the subspecies depends on maintenance of natural water and fire regimes.

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LITERATURE CITED

- Anderson, W. 1942. Rediscovery of Cape Sable Seaside Sparrow in Collier County. *Florida Nat.* 16:12.

- Bass, O. L., Jr., and J. A. Kushlan. 1982. Status of the Cape Sable Sparrow. Nat. Park Serv., South Florida Res. Center Rept. T-672.
- Burleigh, T. D. 1939. Notes on a recent trip to southern Florida. Florida Nat. 12:95-96.
- Dietrich, A. L. 1938. Observations of birds seen in south Florida. Florida Nat. 11:101.
- Eisenmann, E. (chairman). 1973. Thirty-second supplement to the American Ornithologists' Union Check-list of North American Birds. Auk 90:411-419.
- Holt, E. G., and G. M. Sutton. 1926. Notes on birds observed in southern Florida. Ann. Carnegie Mus. 16:435-436.
- Howell, A. H. 1919. Description of a new Seaside Sparrow from Florida. Auk 36:86-87.
- Howell, A. H. 1932. Florida Bird Life. Coward-McCann, Inc., New York.
- Kushlan, J. A., O. L. Bass Jr., L. L. Loope, W. B. Robertson Jr., P. C. Rosendahl, and D. L. Taylor. 1982. Cape Sable Sparrow Management Plan. South Florida Res. Center Rept. M-660.
- Nicholson, D. J. 1928. Nesting habits of the Seaside Sparrows in Florida. Wilson Bull. 40:234-237.
- Nicholson, D. J. 1938. An historical trip to Cape Sable, Fla. Florida Nat. 11:41-44.
- Ogden, J. C. 1972. Florida region. Amer. Birds 26:852.
- Olmsted, I. C., L. L. Loope, and R. Rintz. 1980. A survey and baseline analysis of aspects of the vegetation of Taylor Slough. Nat. Park Serv., South Florida Res. Center Tech. Rept. T-515.
- Robertson, W. R., Jr. 1955. An Analysis of the Breeding-bird Populations of Tropical Florida in Relation to Vegetation. Ph.D. thesis. Univ. Illinois, Urbana.
- Semple, J. B. 1936. The Cape Sable Sparrow and hurricanes. Auk 53:341.
- Stimson, L. A. 1954. Cape Sable Seaside Sparrows: *Ammodramospiza mirabilis* (Howell). Pages 479-481 in Florida Bird Life, A. Sprunt Jr. Coward-McCann, New York.
- Stimson, L. A. 1956. The Cape Sable Seaside Sparrow: Its former and present distribution. Auk 73:489-502.
- Stimson, L. A. 1968. Cape Sable Sparrow. Pages 859-868 in Life Histories of North American Cardinals, Grosbeaks, Buntings, Towhees, Finches, Sparrows, and Allies, A. C. Bent (O. L. Austin Jr., editor). U.S. Nat. Mus. Bull. 237, Part 2.
- Werner, H. W. 1971. Cape Sable Sparrows rediscovered on Cape Sable. Auk 88:432.
- Werner, H. W. 1975. The Biology of the Cape Sable Sparrow. Rept. to U.S. Fish and Wildlife Serv. Everglades Nat. Park, Homestead, Fla.
- Werner, H. W. 1976. Distribution, Habitat, and Origin of the Cape Sable Seaside Sparrow. M.A. thesis, Univ. South Florida.
- Werner, H. W. 1978. Cape Sable Seaside Sparrow. Pages 19-20 in Rare and Endangered Biota of Florida, Vol. 2: Birds (H. W. Kale II, editor). Univ. Presses of Florida, Gainesville.