Wakulla Seaside Sparrow Biological Status Review Report

March 31, 2011

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
620 South Meridian Street
Tallahassee, Florida 32399-1600

Biological Status Review Report
for the
Wakulla Seaside Sparrow
(*Ammodramus maritimus juncicola*)
March 31, 2011

EXECUTIVE SUMMARY

The Florida Fish and Wildlife Conservation Commission (FWC) directed staff to evaluate all species listed as Threatened or Species of Special Concern as of November 8, 2010 that had not undergone a status review in the past decade. Public information on the status of the Wakulla seaside sparrow was sought from September 17 to November 1, 2010. The three-member Biological Review Group (BRG) met on November 3 - 4, 2010. Group members were Michael F. Delany (FWC lead), Katy NeSmith (Florida Natural Areas Inventory), and Bill Pranty (Avian Ecologist Contractor). In accordance with rule 68A-27.0012, Florida Administrative Code (F.A.C.), the BRG was charged with evaluating the biological status of the Wakulla seaside sparrow using criteria included in definitions in 68A-27.001, F.A.C., and following the protocols in the *Guidelines for Application of the IUCN Red List Criteria at Regional Levels (Version 3.0)* and *Guidelines for Using the IUCN Red List Categories and Criteria (Version 8.1)*. Please visit http://myfwc.com/wildlifehabitats/imperiled/listing-action-petitions/ to view the listing process rule and the criteria found in the definitions.

In late 2010, staff developed the initial draft of this report which included BRG findings and a preliminary listing recommendation from staff. The draft was sent out for peer review and the reviewers' input has been incorporated to create this final report. The draft report, peer reviews, and information received from the public are available as supplemental materials at http://myfwc.com/wildlifehabitats/imperiled/biological-status/.

The BRG concluded from the biological assessment that the Wakulla seaside sparrow met criteria for listing. Staff recommends listing the Wakulla seaside sparrow as a Threatened species.

This work was supported by a Conserve Wildlife Tag grant from the Wildlife Foundation of Florida. FWC staff gratefully acknowledges the assistance of the biological review group members and peer reviewers. Staff thank Michelle Vandeventer who served as a data compiler on the subspecies and edited this report.

BIOLOGICAL INFORMATION

Life History References – Nicholson (1928), Post (1974, 1981), Werner (1975), Post and Greenlaw (1975, 1994, 2000), Post et al. (1983), Greenlaw (1992), Greenlaw and Post (1985), McDonald (1986), Stevenson and Anderson (1994), Hill and Post (2005), and sources cited in McDonald (1983).

Taxonomic Classification – Seaside sparrows (*Ammodramus maritimus*) are classified within the Order Passeriformes belonging to the family Emberizidae (AOU 1983, 1998). The

scientific name was officially changed from *Ammospiza maritima* to *Ammodramus maritimus* in 1982 (AOU 1983, 1998). Taxonomic history is complex (Austin 1983) with three species once recognized (AOU 1957). Nine subspecies are generally accepted on the basis of plumage, geographical distribution, and migratory behavior (AOU 1957, Post and Greenlaw 1994). Some subspecies are weakly differentiated, while others are quite distinct in appearance (Kale, 1983, McDonald 1988). The sedentary nature of seaside sparrows in the southeastern United States probably contributed to the evolution of subspecies (Beecher 1955, Funderburg and Quay 1983), as has the Pleistocene history of the Florida peninsula (Avise and Walker 1998, Johnson and Cicero 2004). The nominate race (*A. m. maritimus*) was described by Alexander Wilson in 1811 (Austin 1983) from specimens collected in New Jersey. The Wakulla seaside sparrow (*A. m. juncicola)* was first described in 1920 with a taxonomic revision of seaside sparrows by Griscom and Nichols (1920) and has remained a valid subspecies (AOU 1957). The Wakulla seaside sparrow is one of five subspecies that are resident in the coastal marshes of Florida (Kale 1983). The northernmost subspecies (*A. m. maritimus*) is migratory and winters in coastal marshes of Florida's Atlantic coast (Post and Greenlaw 1994). The four other resident seaside sparrows in Florida are the MacGillivray's seaside sparrow (*A. m. macgillivraii*), the endangered (USFWS 1999) Cape Sable seaside sparrow (*A. m. mirabilis*), the Scott's seaside sparrow (*A. m. peninsulae*), and the Louisiana seaside sparrow (*A. m. fisheri*). Two extinct Florida subspecies are the Smyrna seaside sparrow (*A. m. pelonotus*) and the dusky seaside sparrow (*A. m. nigrescens*). One other subspecies, *A. m. sennetti*, is found along the Texas coast. Genetic examination of seaside sparrows in Florida found evidence of two phylogenetically distinct groups between Atlantic and Gulf coast subspecies (Avise and Nelson 1989). There appears to be an overlap in range and a morphological gradation between Scott's seaside sparrows and Wakulla seaside sparrows along the northeast Gulf coast at Dixie County (Kale 1983). Based on distribution and weakly developed morphological characteristics, Kale (1996) and McDonald (1988) recommended merging the Scott's and Wakulla seaside sparrows into one subspecies. Because the Scott's seaside sparrow has taxonomic precedence, this broadened subspecies would be *A. m. peninsulae*. Subspecies designation is in need of revision. However, taxonomic changes should follow a modern study of geographic variation (Post and Greenlaw 1994).

Population Status and Trend – Difficulty in conducting surveys in relatively inaccessible salt marsh has limited monitoring, and historic information on abundance is sparse. Kale (1983) conducted surveys along the Gulf coast of Florida during 1979, but did not provide an estimate of abundance for this subspecies. He failed to find the subspecies in parts of its known range along the Florida panhandle, but did find a previously unknown population (50-65 pairs) in the marshes of Hogtown Bayou in Walton County (Kale 1983). Populations may be fluctuating. Wakulla seaside sparrows were found as far west as St. Vincent Island (Franklin County) during surveys conducted in 2010 (see Geographic Range and Distribution below). Surveys by McDonald (1988) in 1987 estimated between 5,000-10,000 individuals, but included both Scott's and Wakulla seaside sparrows. Based on her surveys and results from Kale (1983), she concluded that "populations appear to be stable" and "in no immediate threat of decline" with estimates for *A. m. juncicola* in the "several thousands." With a few exceptions within the range of the subspecies, birds appeared to be "numerous and to be found generally in all salt marshes where there is suitable *Spartina-Juncus* habitat" (McDonald 1988). The Florida Natural Areas Inventory ranks the combined populations of Wakulla seaside sparrows and Scott's seaside sparrows as rare and restricted in distribution globally and in Florida (G4T3Q/S3).

Although results are based on only five routes and may be imprecise, trend information from the North American Breeding Bird Survey (BBS 2010) indicate a -1.5 percent annual decline in the abundance of seaside sparrows in Florida from 1966-2007. The FWC list of species of greatest conservation need (FWC 2005) ranks the status of the Wakulla seaside sparrow as "abundant" with a "stable" population. The International Union for the Conservation of Nature (IUCN 2009) ranks the global status of the seaside sparrow as a species of Least Concern. An array of point count stations (see Ralph et al. 1995) should be established within the range of the Wakulla seaside sparrow and surveys conducted at five-year intervals to monitor trends in abundance.

Geographic Range and Distribution – Seaside sparrows are restricted to coastal salt and brackish marshes from New Hampshire to southern Texas (Post and Greenlaw 1994). Populations north of Virginia are usually migratory and some Gulf coast populations may shift longitudinally (Robbins 1983). Surveys by Kale (1983) from 1979-1981 found Wakulla seaside sparrows "abundant" in coastal marshes of Taylor, Jefferson, and Wakulla counties, Florida. Howell (1932) found Wakulla seaside sparrows on the bay side of St. Vincent Island, Franklin County, and collected two males south of Panama City at St. Andrews Bay, Bay County. However, Kale (1983) did not find seaside sparrows at these locations. Surveys by McDonald (1988) and NeSmith and Jue (1999, in Taylor County only) confirmed the results of Kale (1983). The historic range of the Wakulla seaside sparrow appears to be from south Taylor County to St. Andrews Bay, Bay County. More recently, Wakulla seaside sparrows (9-27 birds, range of averages from 3 repeated measures) were detected at each of 4 transects between Taylor County (29.39984, -83.20731) and Franklin County (St. Vincent Island, 29.68065, -85.08717) in 2010 (FWC, unpublished data). Christmas Bird Counts confirm populations in western Franklin County (26.68, -85.08) and Gulf County (29.75, -85.30) (personal communication, J. S. Greenlaw). The Florida Breeding Bird Atlas project (FWC 2003, 1986-1991) documented confirmed and probable breeding at 23 atlas blocks within this range. Florida land cover information (Water Management Districts, photography dates 1999-2008) indicates 191.3-275.2 km^2 of potential salt marsh habitat within the range of the Wakulla seaside sparrow. The subspecies is resident at breeding locations and is considered non-migratory.

Quantitative Analyses - A population viability analysis (PVA) conducted for the combined populations of Wakulla seaside sparrows and Scott's seaside sparrows using baseline demographic parameters, and models using both all potential habitat and habitat located on protected lands found a 0% chance of extinction or decline in abundance within the next 100 years (Endries et al. 2009).

BIOLOGICAL STATUS ASSESSMENT

Threats – The narrow coastal range of the Wakulla seaside sparrow makes it vulnerable to habitat loss and fragmentation due to dredging and filling in conjunction with coastal development, impoundments for mosquito control and waterfowl, flooding from severe storms and hydrological changes, sea level rise, chemical and oil spills, and disposal of dredged material (Montague and Wiegert 1990, FWC 2005). Development of adjacent uplands also may contribute to habitat degradation. The vulnerability of resident seaside sparrows is exemplified by the rapid decline and extinction of the dusky seaside sparrow (Delany et al. 1981), and extreme fluctuations in the number of Cape Sable seaside sparrows (Federal Register 2007).

Climate change is a potential threat at the southern extent of its range where salt marsh habitat may be lost to the invasion of mangroves as the climate warms (Stevenson and Anderson 1994). Sea level rise also may lead to coastal problems and habitat loss in Florida (Walton 2007). However, responses of most species, especially short-lived species, to future climate change are not understood well enough to predict impacts (Akcakaya et al. 2006). The seaside sparrow is a species of "management concern" throughout most of its breeding range because of habitat loss and alteration (Greenlaw 1992). The current condition of salt marsh habitats in Florida is considered "poor and declining" (FWC 2005). While there has been some loss and degradation of Gulf coast salt marsh (Alexander et al. 1986), strict regulatory protections and public ownership provide some protection. Seaside sparrows require coastal wetlands that include a mosaic of dense and sparse herbaceous vegetation maintained by intertidal disturbance and fire. Seaside sparrows along the Gulf coast require a mixture of smooth cordgrass (*Spartina alternaflora*), black needle rush (*Juncus romerianus*), and seashore saltgrass (*Distichlis spicata*). Seaside sparrows will abandon salt marsh sites when the density of invading woody vegetation (especially mangroves) reaches a critical density. Nests are vulnerable to loss from predation, with mortality rates in Florida higher than those at other locations (Post et al. 1983). The activity of rice rats (*Oryzomys palustris*) influences habitat use by Gulf coast seaside sparrows and the two species compete for nesting sites (Post 1981).

Population Assessment – The IUCN developed criteria for the evaluation of extinction risk for any taxon, with the exception of micro-organisms (IUCN 2010). Each taxon must be assessed against all criteria, but if the taxon meets any of the criteria under a particular category it qualifies as threatened. IUCN criteria use the terms observed, estimated, projected, inferred, and suspected to refer to the quality of information used to assess the status of a species. The assessment criteria can be applied at a regional (Florida) level with a consideration of the status and impact of extra-regional populations (IUCN 2003). Findings from the BRG are included in the Biological Status Review Information Findings table below.

LISTING RECOMMENDATION

Staff recommends that the Wakulla seaside sparrow be listed as a Threatened species because the subspecies meets listing criteria as described in 68A-27.001, F.A.C.

SUMMARY OF THE INDEPENDENT REVIEW

Comments were received from 3 reviewers: Dr. Jon S. Greenlaw (Emeritus Professor of Biology, Long Island University, coauthor of the Seaside Sparrow account in The Birds of North America), Mr. Ken Tracey (Florida Ornithological Society), and Dr. Tom Webber (Bird Collection Manager, Florida Museum of Natural History). Appropriate editorial changes recommended by the reviewers were made to the report and additional information provided was incorporated. No changes were recommended that would affect the findings or staff recommendation. All reviewers concurred with the staff recommendation. Peer reviews are available at MyFWC.com.

One reviewer commented that although historical population estimates were "scientifically weak", the criteria for listing were "clearly met." The BRG made use of all

available information on population size and distribution in making its finding. Because accurate spatial and temporal information on the status of seaside sparrows is needed to predict their ability to persist and determine appropriate management strategies, the BRG recommended standardized point count surveys be conducted at 5 year intervals to monitor populations.

LITERATURE CITED

Akcakaya, H. R., S. H. M. Butchart, G. M. Mace, S. N. Stuart, and C. Hilton-Taylor. 2006. Use and misuse of the IUCN Red List criteria in projecting climate change impacts on biodiversity. Global Change Biology 12:2037-2043.

Alexander, C. E., M. A. Broutman, and D. W. Field. 1986. An inventory of coastal wetlands of the USA. U.S. Dept. Commerce, National Oceanic and Atmospheric Administration, Washington, D.C.

AOU. 1957. Check-list of North American Birds, 5th Edition. American Ornithologists' Union, Baltimore, Maryland.

AOU. 1983. Check-list of North American Birds, 6th Edition. American Ornithologists' Union, Washington, D.C.

AOU. 1998. Check-list of North American Birds 7th Edition. American Ornithologists' Union, Washington, D.C.

Austin, O. L. 1983. The Seaside Sparrow assemblage: a review of its history and biology, Pgs. 13-17 *In*, The Seaside Sparrow, Its Biology and Management. North Carolina Biological Survey and North Carolina State Museum.

Avise, J. C., and W. S. Nelson. 1989. Molecular genetic relationships of the extinct dusky seaside sparrow. Science 234:646-648.

Avise, J. C., and D. Walker. 1998. Pleistocene phylogeographic effects on avian populations and the speciation process. Proceedings of the Royal Society of London B 265:457-463.

Beecher, W. J. 1955. Late-Pleistocene isolation in salt-marsh sparrows. Ecology 36:23-28.

Breeding Bird Survey Summary and Analysis, version 98.1. 2010. North American Breeding Bird Survey Trend Results, Seaside Sparrow *Ammodramus maritimus* http://www.mbr-pwrc.usgs.gov/cgi-bin/atlasa99.pl?05500&1&07

Delany, M. F., W. Leenhouts, B. Sauselein, and H. W. Kale II. 1981. The 1980 dusky seaside sparrow survey. Florida Field Naturalist 9:64-67.

Endries, M., B. Stys, G. Mohr, G. Kratimenos, S. Langley, K. Root, and R. Kautz. 2009. Wildlife Habitat Conservation Needs in Florida. Fish and Wildlife Research Institute Technical Report TR-15. *x* + 178 p.

Federal Register. 2007. Endangered and Threatened Wildlife and Plants; Critical habitat Revised Designation for the Cape Sable Seaside Sparrow; Final Rule. Vol. 72, No. 214.

FWC. 2003. Florida Fish and Wildlife Conservation Commission. Florida's breeding bird atlas: A collaborative study of Florida's birdlife. http://www.myfwc.com/bba/ (Accessed 10/12/2010).

FWC. 2005. Florida Fish and Wildlife Conservation Commission. Florida's Wildlife Legacy Initiative Action Plan. http://myfwc.com/conservation/special-initiatives/fwli/ (Accessed 10/25/2010 and weblink updated 3/31/11).

Funderberg, J. B., Jr., and T. L. Quay. 1983. Distributional evolution of the seaside sparrow. Pgs. 19-27 *In*, The Seaside Sparrow, Its Biology and Management. North Carolina Biological Survey and North Carolina State Museum.

Greenlaw, J. S. 1992. Seaside Sparrow, *Ammodramus maritimus*. Pgs. 211-232 *In* Migratory nongame birds of management concern in the northeast (K. J. Schneider and D. M. Pence, eds.) U.S. Fish and Wildlife Service. Newton Corners, MA.

Greenlaw, J. S., and W. Post. 1985. Evolution of monogamy in Seaside Sparrows, Ammodramus maritimus: tests of hypotheses. Animal Behaviour 33:373-383.

Griscom, L., and J. T. Nichols. 1920. A revision of the seaside sparrows. Abst. Proc. Linnaean Soc., New York 32:18-30.

Hill, C. E., and W. Post. 2005. Extra-pair paternity in seaside sparrows. Journal of Field Ornithology 76:119-126.

Howell, A. H. 1932. Florida bird life. Coward-McCann Inc., New York. 579 pp.

IUCN. 2003. Guidelines for Application of IUCN Red List Criteria at Regional Levels: Version 3.0. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK. ii + 26 pp.

IUCN. 2009. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. http://www.iucnredlist.org/apps/redlist/details/149696/0 Accessed 10/12/2010).

IUCN. 2010. IUCN Red List Categories and Criteria: Version 8.1. Prepared by the Standards and petitions Subcommittee in March 2010. Downloadable from http://intranet.iucn.org/webfiles/doc/SSC/RedListGuidelines.pdf.

Johnson, N. K., and C. Cicero. 2004. New mitochondrial DNA data affirm the importance of Pleistocene speciation in North American birds. Evolution 58:1122-1130.

Kale, H. W., II. 1983. Distribution, habitat, and status of breeding seaside sparrows in Florida. Pgs. 41-48 *In*, The Seaside Sparrow, Its Biology and Management. North Carolina Biological Survey and North Carolina State Museum.

Kale, H. W., II. 1996. Seaside Sparrows. Pgs. 608-615, *In* J. A. Rodgers, Jr., H. W. Kale II, and H. T. Smith (Eds.), Rare and endangered biota of Florida. Vol. 5, Birds. University Press of Florida, Gainesville. 688 pp.

McDonald, M. V. 1983. An annotated bibliography of the seaside sparrow. Pgs. 77-86, *In* The Seaside Sparrow, Its Biology and Management. North Carolina Biological Survey and North Carolina State Museum.

McDonald, M. V. 1986. The ecology and vocalizations of Scott's Seaside Sparrows (*Ammodramus maritimus peninsulae*). Ph.D. Dissertation. University of Florida, Gainesville.

McDonald, M. V. 1988. Status survey of two Florida seaside sparrows and taxonomic review of the seaside sparrow assemblage. Florida Cooperative Fish and Wildlife Research Unit, University of Florida. Technical Report No. 32.

Montague, C. L., and R. G. Wiegert. 1990. Salt Marshes, Pgs. 481-516 *In* R. L. Myers and J. J. Ewel (Eds.), Ecosystems of Florida. University of Central Florida Press, Orlando.

NeSmith, K., and S. Jue. 1999. The status of Scott's seaside sparrow in Taylor County, Florida: an FNAI ecological inventory. Unpublished report. Florida Natural Areas Inventory. Tallahassee, FL.

Nicholson, D. J. 1928. Nesting habits of the seaside sparrows in Florida. Wilson Bulletin 40:225-237.

Post, W. 1974. Functional analysis of space-related behavior in the seaside sparrow. Ecology 55:564-575.

Post, W. 1981. The influence of rice rats *Oryzomys palustris* on the habitat use of the seaside sparrow *Ammospiza maritime*. Behavioral Ecology and Sociobiology 9:35-40.

Post, W., and J. S. Greenlaw. 1975. Seaside sparrow displays: their function in social organization and habitat. Auk 92:461-492.

Post, W., and J. S. Greenlaw. 1994. Seaside Sparrow (*Ammodramus maritimus*). In The Birds of North America, No. 127 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of natural Sciences; Washington, D.C; The American Ornithologists' Union.

Post, W., and J. S. Greenlaw. 2000. The present and future of the Cape Sable seaside sparrow. Florida Field Naturalist 28:93-160.

Post, W., J. S. Greenlaw, T. L. Merriam, and L. A. Wood. 1983. Comparative ecology of Northern and Southern populations of the seaside sparrow. Pgs. 123-136 *In*, The Seaside Sparrow, Its Biology and Management. North Carolina Biological Survey and North Carolina State Museum.

Ralph, C. J., S. Droege, and J. R. Sauer. 1995. Managing and monitoring birds using point counts: standards and applications. Pages 161-168 *In*, C. J. Ralph, J. R. Sauer, and S. Droege, technical editors. Monitoring bird populations by point counts. General technical report PSW-GTR-149, Pacific Southwest Research Station, Forest Service, U.S. Dept. Agric.

Robbins, C. S. 1983. Distribution and migration of the seaside sparrow. Pgs. 31-39 *In*, The Seaside Sparrow, Its Biology and Management. North Carolina Biological Survey and North Carolina State Museum.

Stevenson, H. M., and B. H. Anderson. 1994. The Birdlife of Florida. University Press of Florida. Gainesville, FL.

USFWS. 1999. South Florida multi-species recovery plan. U.S. Fish and Wildlife Service, Vero Beach, FL, USA.

Walton, T. L., Jr. 2007. Projected sea level rise in Florida. Ocean Engineering 34:1832-1840.

Werner, H. W. 1975. The biology of the Cape Sable Sparrow. Unpublished report submitted to Everglades National Park, Homestead, FL.

Biological Status Review Information Findings	Species/taxon:	Wakulla Seaside Sparrow
	Date:	11/04/10
	Assessors:	Michael Delany, Katy NeSmith, and Bill Pranty
	Generation length:	Estimated <3 years; IUCN 10-year period was used

Criterion/Listing Measure	Data/Information	Data Type*	Sub-Criterion Met?	References
*Data Types - observed (O), estimated (E), inferred (I), suspected (S), or projected (P). Sub-Criterion met - yes (Y) or no (N).				
(A) Population Size Reduction, ANY of				
(a)1. An observed, estimated, inferred or suspected population size reduction of at least 50% over the last 10 years or 3 generations, whichever is longer, where the causes of the reduction are clearly reversible and understood and ceased[1]	not available			
(a)2. An observed, estimated, inferred or suspected population size reduction of at least 30% over the last 10 years or 3 generations, whichever is longer, where the reduction or its causes may not have ceased or may not be understood or may not be reversible[1]	not available			
(a)3. A population size reduction of at least 30% projected or suspected to be met within the next 10 years or 3 generations, whichever is longer (up to a maximum of 100 years) [1]	not available			
(a)4. An observed, estimated, inferred, projected or suspected population size reduction of at least 30% over any 10 year or 3 generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased or may not be understood or may not be reversible.[1]	not available			
[1] based on (and specifying) any of the following: (a) direct observation; (b) an index of abundance appropriate to the taxon; (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat; (d) actual or potential levels of exploitation; (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.				
(B) Geographic Range, EITHER				
(b)1. Extent of occurrence < 20,000 km^2 (7,722 mi^2) OR	191.3-275.2 km^2 of potential salt marsh habitat within range.	E	Y	Northwest and Suwannee River Water Management Districts, photography dates 1999-2008.
(b)2. Area of occupancy < 2,000 km^2 (772 mi^2)				
AND at least 2 of the following:				

a. Severely fragmented or exist in ≤ 10 locations	Exists in <10 locations that are threatened by single events such as a hurricane or oil/chemical spill. "Local populations are subject to high rates of chance extinction."	I/S	Y	FWC (2003), J. S. Greenlaw pers. comm., 4 Nov 2010
b. Continuing decline, observed, inferred or projected in any of the following: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent, and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals	(i, ii, iii, iv) contraction at the northwestern extent of range; (iii) The current condition of salt marsh habitat in Florida is poor and declining; (v) A 1.3% annual decline in seaside sparrow numbers estimated from 1966-2007 is projected to continue	O/E	Y	Howell (1932), Kale (1983), FWC (2005), USGS Breeding Bird Survey data for Florida
c. Extreme fluctuations in any of the following: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals	Fluctuation in extent of occurrence and number of locations in Florida panhandle. "…subpopulations may be subject to extreme fluctuations…"	O/I	Y	Howell (1932), Kale (1983), FWC unpublished survey results, 2010; J.S. Greenlaw pers. comm., 29 Oct 2010
(C) Population Size and Trend				
Population size estimate to number fewer than 10,000 mature individuals AND EITHER	McDonald (1988) estimated "several thousand" Wakulla seaside sparrows and a combined total of 5000-10,000 Wakulla and Scott's seaside sparrows in 1987-1988. Kale (1996) estimated a combined total of 5000-10,000 pairs in 1979-1980 and 1987. NeSmith and Jue (1999) estimated 5500 Wakulla seaside sparrows in Taylor County in 1999. Although estimates vary and some include Scott's seaside sparrows, the BSR Group believes that the preponderance of evidence indicates that the criterion of fewer than 10,000 mature individuals is met.	E	Y	McDonald (1988), NeSmith and Jue (1999), Kale (1996)
(c)1. An estimated continuing decline of at least 10% in 10 years or 3 generations, whichever is longer (up to a maximum of 100 years in the future) OR	not available			
(c)2. A continuing decline, observed, projected, or inferred in numbers of mature individuals AND at least one of the following:	A 1.3% annual decline in seaside sparrow numbers estimated from 1966-2007 is projected to continue	E	Y	USGS Breeding Bird Survey data for Florida
a. Population structure in the form of EITHER	5500 estimated in Taylor County in 1999	E	N	NeSmith and Jue (1999)
(i) No subpopulation estimated to contain more than 1000 mature individuals; OR				
(ii) All mature individuals are in one subpopulation	unknown			
b. Extreme fluctuations in number of mature individuals	Vulnerability of seaside sparrows in Florida is exemplified by rapid decline and extirpation and extreme fluctuations in numbers.	I	Y	Delany et al. (1981), Federal Register (2007)
(D) Population Very Small or Restricted, EITHER				

(d)1. Population estimated to number fewer than 1,000 mature individuals; OR	not applicable			
(d)2. Population with a very restricted area of occupancy (typically less than 20 km^2 [8 mi^2]) or number of locations (typically 5 or fewer) such that it is prone to the effects of human activities or stochastic events within a short time period in an uncertain future	Exists in <5 locations that are prone to the effects of human activities or stochastic events within a short time period in an uncertain future	I	Y	FWC (2003)
(E) Quantitative Analyses				
e1. Showing the probability of extinction in the wild is at least 10% within 100 years	not applicable; PVA included two subspecies	E	N	Endries et al. (2009)

Initial Finding (Meets at least one of the criteria OR Does not meet any of the criteria)	Reason (which criteria/sub-criteria are met)
Meets at least one of the criteria	B1ab(i, ii, iii, iv, v); C2b; D2
Is species/taxon endemic to Florida? (Y/N)	Y
If Yes, your initial finding is your final finding. Copy the initial finding and reason to the final finding space below. If No, complete the regional assessment sheet and copy the final finding from that sheet to the space below.	
	Reason (which criteria/sub-criteria are met)
Meets at least one of the criteria	B1ab (i, ii, iii, iv, v); C2b; D2

Additional Notes:

In our review of the status of the Wakulla seaside sparrow, the Biological Review Group made the following assumptions and conclusions:

1. Because the time estimated for 3 generations was <10 years, the IUCN criteria (2010) stipulation of 10 years was used in assessments.

2. The sparrow is endemic to Florida.

3. The condition of salt marsh habitat in Florida is considered to be poor and declining (FWC 2005).

4. There is evidence of a population decline based on data from the USGS Breeding Bird Survey.

5. The early estimate of the number of mature individuals appears to be "a few thousand pairs" (McDonald 1986).

6. The extent of occurrence was 191.3-275.2 km^2 based on the availability of salt marsh habitat within the range of the sparrow.

7. Based on surveys conducted from 1978 to 2010, there is evidence of range contraction and fluctuation in occupied locations along the coast of the Florida panhandle.

APPENDIX 1. Brief biographies of the Wakulla seaside sparrow Biological Review Group members.

Michael F. Delany (M.S., Wildlife Ecology, University of Maryland Appalachian Laboratory) is an Associate Research Scientist with the Florida Fish and Wildlife Conservation Commission (FWC). He started work with the FWC in 1979 and is the Florida coordinator for the U.S. Geological Survey's Breeding Bird Survey and the U.S. Fish and Wildlife Service's eastern painted bunting monitoring program. Mike is principal investigator for field studies of the endangered Florida grasshopper sparrow. Studies addressing management needs for grasshopper sparrows, dusky seaside sparrows, American alligators, and Northern bobwhite resulted in over 40 publications. He is a Certified Wildlife Biologist with the Wildlife Society.

Katy NeSmith (M.S., Biological Science, Florida State University) is a zoologist with the Florida Natural Areas Inventory (FNAI). Katy is responsible for collecting and processing rare animal occurrence data, concentrating on birds; conducting field surveys for rare animals (past surveys include seaside sparrow, marsh wren, limpkin, Florida scrub-jay, red-cockaded woodpecker, and gopher tortoise); and identifying, evaluating, and describing high priority natural areas in Florida. She has worked on county inventories and has been involved in several current and historic natural community mapping projects.

Bill Pranty is an avian ecologist who has studied Florida Scrub-Jays, Florida Grasshopper Sparrows, and Painted Buntings for the Florida Fish and Wildlife Conservation Commission and Archbold Biological Station. He compiles bird observations for the Florida Ornithological Society, and edits the Christmas Bird Counts in Florida for National Audubon. He is keenly interested in documenting Florida's avifauna, with an emphasis on rare and exotic species. Bill is the author of *A Birder's Guide to Florida* (American Birding Association 1996 and 2005), and co-author of *Birds of Florida* (Lone Pine Press 2006).

APPENDIX 2. Summary of letters and emails received during the solicitation of information from the public comment period of September 17 through November 1, 2010.

Dr. Jon S. Greenlaw provided an assessment of the vulnerability status of the Scott's Seaside Sparrow and Wakulla Seaside Sparrow, providing information on abundance, extent of occurrence, population fragmentation and fluctuations.

Mr. Ken Tracey provided an assessment of the vulnerability status of the Scott's Seaside Sparrow and Wakulla Seaside Sparrow, providing information on abundance, extent of occurrence, habitat loss, and potential threats.