Worthington's Marsh Wren 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
Worthington's Marsh Wren
(*Cistothorus palustris griseus*)
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 Worthington's marsh wren 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) (Appendix 1). In accordance with rule 68A-27.0012, Florida Administrative Code (F.A.C.), the BRG was charged with evaluating the biological status of the Worthington's marsh wren 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 Worthington's marsh wren met listing criteria. FWC staff recommends listing the Worthington's marsh wren 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 thanks Michelle Vandeventer who served as a data compiler on the subspecies and edited this report.

BIOLOGICAL INFORMATION

Life History References – Welter (1935), Kale (1965, 1996), Barclay and Leonard (1985), Stevenson and Anderson (1994), Kroodsma and Verner (1997).

Taxonomic Classification – Marsh wrens (*Cistothorus palustris*) are in the Order Passeriformes assigned to the Family Troglodytidae (Wrens). About 14 subspecies are recognized. Subspecies designation is complex, being based on plumage, wing length, and

geographic lines. Two distinct evolutionary groups, eastern and western, may warrant species status (Kroodsma and Verner 1997). Two subspecies, the Marian's marsh wren (*C. p. mariane*) and the Worthington's marsh wren (*C. p. griseus*), breed in Florida. The Worthington's marsh wren was described by Brewster (1893) from "some odd looking marsh wrens" collected by W. W. Worthington on Sapelo Island, Georgia in 1887. Compared to other subspecies the plumage of the Worthington's marsh wren is paler and more gray. Wheeler (1931) describes the taxonomic history and early distribution of marsh wrens in the Southeast.

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) recorded the presence or absence of marsh wrens at 0.25 km intervals along transects conducted in 1975-1976 by boat and reported the entire population was accessible. He estimated 1,000-2,000 pairs during these surveys (Kale 1996). Similar surveys by McDonald (1988) from 1987-1988 found stable populations relative to Kale's surveys. NeSmith and Jue (2003) conducted point count surveys from 2000-2001 and observed 741 males. The range contraction of the Worthington's marsh wren from Volusia County to the St. Johns River (Stevenson and Anderson 1994, Kale 1996, NeSmith and Jue 2003) represents an estimated 40 percent decrease in extent of occurrence. A consequent population decline is suspected. Although results are based on only 7 routes and may be imprecise for trend estimates, information from the North American Breeding Bird Survey (BBS 2010) indicate a 9.5 percent annual decline in the abundance of marsh wrens in the southeastern coastal plain from 1966-2006. The list of Species of Greatest Conservation Need (FWC 2005) ranks the abundance status of the Worthington's marsh wren as "medium" with a trend status of "stable." The Florida Natural Areas Inventory ranks the Worthington's marsh wren as rare and restricted in distribution globally, and imperiled in distribution in Florida (G5T3/S2). The International Union for the Conservation of Nature (IUCN 2009) ranks the global status of marsh wrens as a species of Least Concern. Point count stations established by NeSmith and Jue (2003) should be surveyed at 5-year intervals to monitor trends in abundance.

Geographic Range and Distribution – Marsh wrens breed in brackish and freshwater marshes of North America from the western and northern continental United States and southern Canada; along the Atlantic coast from Delaware to northern Florida; and along the Gulf coast from mid-peninsula Florida to southern Texas and into Mexico (Kroodsma and Verner 1997). The Marian's marsh wren breeds along the Gulf coast of Florida from Port Richey (Pasco County) to Escambia Bay (Santa Rosa County), and west into southwest Alabama (Stevenson and Anderson 1994, Kale 1996). The Worthington's marsh wren is a resident of salt marshes on the Atlantic coast from South Carolina to the St. Johns River (Duval County, Florida) (Kroodsma and Verner 1997, NeSmith and Jue 2003). Worthington's marsh wrens inhabit tidal marshes dominated by cordgrass (*Spartina alterniflora*) and nest in taller cordgrass along tidal creeks. The wren was formerly found south to New Smyrna, but may have been extirpated due to mangrove invasion (Nicholson 1950). The disappearance of the Worthington's marsh wren from apparently suitable habitat from Matanzas Inlet (St. Johns County) north to the St. Johns River is unexplained (Stevenson and Anderson 1994, Kale 1996, NeSmith and Jue 2003). Florida land cover information (Water Management Districts, photography dates 1999-2008) indicates 200.1-330.3 km^2 of salt marsh habitat within the range of the Worthington's marsh wren. The Florida Breeding Bird Atlas (FWC 2003, 1986-1991) documented confirmed breeding in 6 atlas blocks

within the wren's current range. The subspecies is resident at breeding locations and considered non-migratory. The range of the Worthington's marsh wren extends north into South Carolina, with Florida constituting about 10 percent of the subspecies' range.

Quantitative Analyses – A population viability analysis has not been conducted for the Florida population of the Worthington's marsh wren.

BIOLOGICAL STATUS ASSESSMENT

Threats – The narrow coastal range of the Worthington's marsh wren in Florida makes it vulnerable to habitat loss and fragmentation due to dredging and filling in conjunction with coastal development, construction of private boardwalks and piers, 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, personal communication, C. Parenteau, Florida DEP). Development of adjacent uplands may contribute to habitat degradation. The vulnerability of coastal song birds is exemplified by the rapid decline and extinction of the dusky seaside sparrow (*Ammodramus maritimus nigrescens*) (Delany et al. 1981). 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 habitat loss for the Worthington's marsh wren 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 current condition of salt marsh habitat in Florida is considered "poor and declining" (FWC 2005), but strict regulatory mechanisms and public ownership provide some protection. High tides destroyed up to 21 percent of marsh wren nests during a four year study in Georgia (Kale 1965), where rice rats (*Oryzomys palustris*), raccoons (*Procyon lotor*), and mink (*Mustela vison*) depredated up to 81 percent of nests. Nests sites also may be usurped by rice rats (Stevenson and Anderson 1994).

Population Assessment – FWC listing criteria are based on criteria the IUCN developed 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. These 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 tables below.

In our review of the status of the Worthington's marsh wren, the BRG made the following assumptions and conclusions:

1. Because the time estimated for 3 generations was <10 years, the stipulated period of 10 years was used in assessments.

2. Early estimates of the number of mature individuals ranged from 1,000-2,000 pairs (Kale 1996).

3. More recent surveys (2000-2001) indicated a decline in abundance (NeSmith and Jue 2003).

4. The extent of occurrence was 200.1-330.3 km^2 based on the availability of salt marsh habitat within the range of the wren. NeSmith and Jue (2003) estimated 124 km^2 of potential habitat in northeast Florida.

5. There is evidence of a 40 percent range contraction at the southernmost extent of the subspecies range in Florida. A consequent population decline is suspected.

6. Adult marsh wrens in migratory populations will disperse to locate suitable habitat (Kroodsma and Verner 1997). However, adults in sedentary populations are less likely to disperse (personnel communication, D. Kroodsma). Because of the failure of the Worthington's marsh wren to recolonize habitat south of the St. Johns River a rescue effect from extra-regional populations seems unlikely.

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

8. Listing assessment criteria were applied to the regional (Florida) population of the Worthington's marsh wren.

LISTING RECOMMENDATION

Staff recommends that the Worthington's marsh wren be listed as Threatened because the subspecies meets listing criteria as described in 68A-27.001, F.A.C.

SUMMARY OF THE INDEPENDENT REVIEW

Comments were received from 5 reviewers: Mr. Tylan Dean (U.S. Fish and Wildlife Service), Ms. Sally Jue (Florida Natural Areas Inventory), Dr. Donald Kroodsma (University of Massachusetts, coauthor of the Marsh Wren account in The Birds of North America), Mr. Craig Parenteau (Florida Department of Environmental Protection), and Mr. Paul Sykes (U.S. Geological Survey). Appropriate editorial changes recommended by the reviewers were made to the report. All reviewers concurred with the staff findings and recommendation. Peer reviews are available at MyFWC.com.

One reviewer questioned the reliability of North American Breeding Bird Survey data, which suggested a 9.5% decline annually over 40 years. The BRG, however, recognized that Breeding Bird Survey data may be imprecise and did not rely on those data in making its findings. The same reviewer questioned the accuracy of population estimates by Kale (1996). A brief description of Kale's survey methods (Kale 1983) was added to the report and the reference was included in the Literature Cited section. The BRG group also, however, relied on a population estimate from systematic point count surveys conducted by NeSmith and Jue (2003) in making its findings. Because accurate spatial and temporal information on the status of marsh wrens 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.

A second reviewer suggested that construction of private boardwalks and piers in coastal marsh posed an additional threat to the Worthington's marsh wren. Staff concurred, and added mention of this threat in the report. This additional threat, however, did not result in changes to the findings or staff recommendations.

A third reviewer was uncertain about the specific population being evaluated and questioned why immigration was not expected. A statement that the assessment criteria were applied to the regional (Florida) population of the Worthington's marsh wren was added to the list of assumptions and conclusions. The BRG's rationale for not anticipating a rescue effect from extra-regional populations was clarified in the Regional Assessment section of the work sheet in response to a question raised by this reviewer. This additional information did not result in changes to the findings or staff recommendations.

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Biological Status Review Information
Findings

Species/taxon:	Worthington's Marsh Wren
Date:	11/03/10
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	200.1 km^2 of potential salt marsh within range	E	Y	St. Johns River Water Management District, photography dates 1999-2008
(b)2. Area of occupancy < 2,000 km^2 (772 mi^2)	not available			
AND at least 2 of the following:				
a. Severely fragmented or exist in ≤ 10 locations	Exists in one location that is threatened by a single event such as a hurricane or oil/chemical spill	I	Y	FWC (2003), NeSmith and Jue (2003)

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, and v). A range contraction of 40% (from 330.3 to 200.1 km2) of salt marsh habitat infers a population reduction. 741 males detected in 2000-2001 versus 1000-2000 pairs estimated in 1975-1976 indicates a decline of 26% based on the lower estimate of 1000; (iii) The current condition of salt marsh habitat in Florida is poor and declining.	O/E/I	Y	Kale (1996), NeSmith and Jue (2003), FWC (2005)
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	unknown			
(C) Population Size and Trend				
Population size estimate to number fewer than 10,000 mature individuals AND EITHER	1000-2000 pairs estimated in 1975-1976; 741 singing males observed (741 pairs inferred) in 2000-2001	O/E	Y	Kale (1996), NeSmith and Jue (2003)
(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:	741 singing males observed (741 pairs inferred) in 2000-2001 represents an estimated decline of at least 26% from 1000-2000 pairs estimated in 1975-1976	O/E	Y	Kale (1996), NeSmith and Jue (2003)
a. Population structure in the form of EITHER				
(i) No subpopulation estimated to contain more than 1000 mature individuals; OR				
(ii) All mature individuals are in one subpopulation	All mature individuals in one intermixing subpopulation	I	Y	NeSmith and Jue (2003)
b. Extreme fluctuations in number of mature individuals	unknown			
(D) Population Very Small or Restricted, EITHER				
(d)1. Population estimated to number fewer than 1,000 mature individuals; OR	741 singing males observed (741 pairs inferred) in 2000-2001	O	N	NeSmith and Jue (2003)
(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 one location that is prone to the effects of human activities or stochastic events within a short time period in an uncertain future	I	Y	FWC (2003), NeSmith and Jue (2003)
(E) Quantitative Analyses				
e1. Showing the probability of extinction in the wild is at least 10% within 100 years	not available			
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	B1(a)(b i, ii, iii, iv, v); C2(a ii); D2			
	\			

Is species/taxon endemic to Florida? (Y/N)	N
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.	
Final Finding (Meets at least one of the criteria OR Does not meet any of the criteria)	Reason (which criteria/sub-criteria are met)
No change from initial finding	B1(a)(b i, ii, iii, iv, v); C2(a ii); D2

1	Biological Status Review Information Regional Assessment Species/taxon:	Worthington's Marsh Wren
2	Date:	11/3/10
3	Assessors:	Michael Delany, Katy NeSmith, and Bill Pranty
4		
5		
6		
7		
8	Initial finding	Supporting Information
9		
10	2a. Is the species/taxon a non-breeding visitor? (Y/N/DK). If 2a is YES, go to line 18. If 2a is NO or DO NOT KNOW, go to line 11.	N
11	2b. Does the Florida population experience any significant immigration of propagules capable of reproducing in Florida? (Y/N/DK). If 2b is YES, go to line 12. If 2b is NO or DO NOT KNOW, go to line 17.	DK. Adult marsh wrens in sedentary populations are unlikely to disperse (personal communication, D. Kroodsma). Because of the failure to recolonize habitat south of the St. Johns River, a rescue effect from extra-regional populations seems unlikely.
12	2c. Is the immigration expected to decrease? (Y/N/DK). If 2c is YES or DO NOT KNOW, go to line 13. If 2c is NO go to line 16.	
13	2d. Is the Florida population a sink? (Y/N/DK). If 2d is YES, go to line 14. If 2d is NO or DO NOT KNOW, go to line 15.	
14	If 2d is YES - Upgrade from initial finding (more imperiled)	
15	If 2d is NO or DO NOT KNOW - No change from initial finding	
16	If 2c is NO or DO NOT KNOW- Downgrade from initial finding (less imperiled)	
17	If 2b is NO or DO NOT KNOW - No change from initial finding	
18	2e. Are the conditions outside Florida deteriorating? (Y/N/DK). If 2e is YES or DO NOT KNOW, go to line 24. If 2e is NO go to line 19.	
19	2f. Are the conditions within Florida deteriorating? (Y/N/DK). If 2f is YES or DO NOT KNOW, go to line 23. If 2f is NO, go to line 20.	
20	2g. Can the breeding population rescue the Florida population should it decline? (Y/N/DK). If 2g is YES, go to line 21. If 2g is NO or DO NOT KNOW, go to line 22.	
21	If 2g is YES - Downgrade from initial finding (less imperiled)	
22	If 2g is NO or DO NOT KNOW - No change from initial finding	
23	If 2f is YES or DO NOT KNOW - No change from initial finding	
24	If 2e is YES or DO NOT KNOW - No change from initial finding	
25		
26	Final finding	No change from initial finding

APPENDIX 1. Brief biographies of the Worthington's marsh wren 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, 2010 through November 1, 2010.

No public comments were received during the public information solicitation period.