Roseate Spoonbill 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
Roseate Spoonbill
(*Platalea ajaja*)
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 roseate spoonbill was sought from September 17, 2010 to November 1, 2010. The three member Biological Review Group (BRG) met on November 3 - 4, 2010. Group members were James A. Rodgers (FWC lead), Mark Cook (South Florida Water Management District), Peter C. Frederick (University of Florida), and Jerry Lorenz (Audubon of Florida) (Appendix 1). In accordance with rule 68A-27.0012, Florida Administrative Code (F.A.C.), the Roseate Spoonbill BRG was charged with evaluating the biological status of the roseate spoonbill 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 (2003)* and *Guidelines for Using the IUCN Red List Categories and Criteria Version 8.1 (2010)*. 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 roseate spoonbill BRG concluded from the biological assessment that the roseate spoonbill met the "population very small or restricted" listing criterion, D2. Based on the literature review, information received from the public, and the BRG findings, FWC staff recommends listing the roseate spoonbill 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 also would like to thank Michelle VanDeventer who served as a data compiler on the species and assisted with writing an early draft of this report, and Caly Murphy and Pam Lister who assisted with logistic support and editing of the final report.

BIOLOGICAL INFORMATION

Taxonomic Classification – Roseate spoonbills (*Platalea ajaja*) are members of the Family Threskiornithidae, which include other spoonbill species and ibises. The roseate spoonbill was previously in the monotypic genus *Ajaia*.

Geographic Range and Distribution – The roseate spoonbill is the only spoonbill species that inhabits the western hemisphere. The species is a resident breeder in South America, generally east of the Andes, and coastal areas of Central America, the Caribbean, and the Gulf of Mexico (Dumas 2000). Mangrove islands and occasionally dredge-spoil islands are the preferred nesting habitat for the species. In Florida, the largest breeding populations are in Florida Bay, with additional breeding sites in Tampa Bay on the Gulf coast and Brevard County on the Atlantic coast (Powell et al. 1989, Kale et al. 1992, Ogden 1994, Rodgers et al. 1996, Rodgers et al. 1999, Florida Fish and Wildlife Conservation Commission 2003, Dugger et al. 2005, Cook and Kobza 2009). The global population is estimated at approximately 150,000–200,000 individuals, with >30,000 individuals in North America and an estimated 5,500 breeding pairs in the U.S. (Kushlan et al. 2002, Hunter et al. 2006, IUCN 2009).

Life History References – Bjork and Powell 1994, Rodgers et al. 1996, Dumas 2000, Hoyer et al. 2005, Lorenz 2000, Lorenz et al. 2002, Lorenz et al. 2008, IUCN 2009, Lantz et al. 2010.

BIOLOGICAL STATUS ASSESSMENT

Threats – Roseate spoonbill populations were reduced to only 15 pairs towards the end of the plume trade era through the early 1900s, but numbers expanded following legal protections and enforcement of conservation areas (Runde et al. 1991, Rodgers et al. 1996, Dumas 2000). Current threats to the species are not well understood, but degradation or loss of habitat due to coastal development, hydrologic alterations to wetlands, and reductions to important prey sources are of primary concern (Davis et al. 2005, Lorenz 2000, Lorenz et al. 2002). Like other wading birds that depend on fragile estuaries and wetlands for foraging and breeding, roseate spoonbills are at risk of exposure to persistent contaminants such as heavy metals and pesticides (Beyer et al. 1997, Spalding et al. 1997). Oil spill impacts to critical breeding and foraging sites, recreational disturbance at foraging and breeding sites, adverse weather during key breeding periods, human disturbance at nesting colonies, and increased pressure from predators are also concerns (Dumas 2000; Rodgers and Schwikert 2003, Stolen 2003). The North American Waterbird Conservation Plan ranks the roseate spoonbill in the "Moderate Concern" category for conservation status (Kushlan et al. 2002).

Population Assessment – Ground surveys by FWC and Audubon Society biologists determined that the roseate spoonbill population was between 550-750 pairs in Tampa Bay and Florida Bay during the late 1980s (Runde 1991) but less than 500 pairs during the 2000s (Lorenz et al. 2002, Lorenz et al. 2008). This was in comparison to an estimated 2,500 individuals in the late 1970s (Powell et al. 1989). Unfortunately, aerial surveys of wading bird populations have been shown to include error margins that raise questions about their validity and usefulness in determining trends (Rodgers et al. 2005, Conroy et al. 2008, Green et al. 2008). Additionally, annual surveys of breeding pairs of colonial waterbirds in the Everglades region have indicated that nesting numbers for wading birds can be highly variable from season to season. In 1995-1996, the breeding population was estimated to be 1,000–1,100 pairs statewide (R.T. Paul, unpublished data). For the 2009 season, 316 roseate spoonbill nests were documented in Florida Bay, which was below the mean number of about 543 nests recorded each year since the 1984-1985 breeding season (Cook and Kobza 2009). Islands at the mouth of the Alafia River in

Tampa Bay are also historically important sites for breeding colonies of roseate spoonbills. In 2004, 370 pairs nested at this location (Audubon of Florida, unpublished data).

Biological Status Review—The review group concluded the roseate spoonbill met the "population very small or restricted" listing criterion, D2. See Table 1 for details.

Regional Application—The review group concluded there was no change in the recommendation for the roseate spoonbill. See Table 2 for details.

LISTING RECOMMENDATION

Staff recommends listing the roseate spoonbill as a Threatened species.

SUMMARY OF THE INDEPENDENT REVIEW

Comments were received from 3 reviewers. The full text of peer reviews is available at MyFWC.com.

Malcolm C. Coulter, Specialist Group on Storks, Ibises, and Spoonbills: Coulter agreed with the findings of the BSR panel and stated "…you have chosen to use the IUCN guidelines…This is an excellent choice…I am familiar with the IUCN guidelines…They are complex, thorough and also straight forward. In evaluating the draft, I found everything to be in order…It was well-done and thorough."

William E. Davis, Jr., Boston University: Davis made several editorial suggestions for clarity and one correction for a citation on the BSR. He agreed with the findings of the BSR panel and stated "I found the methodology, data, analysis, and interpretation to be appropriate. The historical aspects were thoroughly researched and the literature cited was extensive and appropriate. The biological information and accuracy appears complete…I find the argument for listing the Roseate Spoonbill under D2 criteria persuasive."

James A. Kushlan, Heron Specialist Group: Kushlan provided considerable dialogue on the perceived sources of plausible or specific threats to the Florida population and how the nesting population was dispersed in order to meet the restricted number of nesting locations in criterion D2. The BSR panel dealt with the uncertainty of possible future threats to the species including climate change and provided justification for the species meeting criterion D2 in the BSR report. In summary, Kushlan agreed with the findings of the BSR panel and stated "The Statewide Population Assessment is well done…Due recognition is given to the high degree of uncertainty of estimates…the history of ground counts of nests is used to provide relatively reliable data on population size and trends…The Review Group's assessment of both current population size and trend seem very reasonable…Importantly, the Geographic Range evaluation for both Extent of Occurrence (EO) and Area of Occupancy (AO) are sound."

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Table 1. Biological status review information findings for the roseate spoonbill in Florida.

Biological Status Review Information Findings	Species/taxon:	**Roseate Spoonbill**
	Date:	11/03/10
	Assessors:	Rodgers, Lorenz, Cook, Frederick
	Generation length:	15 years

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]	Large declines in population occurred prior to 1965. Since 1965, number of nests/individuals has been stable to slight increase in numbers.	E	N	National Park Service (Everglades NP) and National Audubon Society (Tavernier and Tampa Bay Sanctuary) unpublished database.
(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]	Large declines in population occurred prior to 1965. Since 1965, number of nests/individuals has been stable to slight increase in numbers.	E	N	National Park Service (Everglades NP) and National Audubon Society (Tavernier and Tampa Bay Sanctuary) unpublished database.
(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]	All breeding sites on either public (both federal and state) or conservation (NAS) protected lands, including most nesting sites in mangrove and foraging sites in freshwater habitats are in public management. If sea-level rise occurs 45 years in the future, the species may benefit by increased foraging habitat created, especially in south Florida. Less rainfall may or may not impact foraging habitat but it is suspected to result in less prey availability only at freshwater habitats.	I	N	FWC/SFWMD/NAS/ENP databases and atlas information.
(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]	Florida population in 1965 estimated 358 nests (736 individuals) statewide (nesting only occurred in and near vicinity of Florida Bay); however, the estimated current population is about 900 nests (pairs) or minimum of 1800 mature individuals in Florida as the south Florida population has slightly increased and the Tampa Bay colonies have increased since 1977 from 0 to circa 400+ nests.	E	N	National Park Service (Everglades NP) and National Audubon Society (Tavernier and Tampa Bay Sanctuary) unpublished database.
[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	Estimated as 59,900 km^2.	E	N	See notes for EOO.
(b)2. Area of occupancy < 2,000 km^2 (772 mi^2)	Estimated as 20,000 km^2.	E	N	See notes for AOO.
AND at least 2 of the following:				
a. Severely fragmented or exist in ≤ 10 locations				
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				
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				
(C) Population Size and Trend				
Population size estimate to number fewer than 10,000 mature individuals AND EITHER	Florida population in 1965 estimated 358 nests (736 individuals) statewide (nesting only occurred in and near vicinity of Florida Bay); however, the estimated current population is about 900 nests (pairs) or minimum of 1800 mature individuals in Florida as the south Florida population has slightly increased and the Tampa Bay colonies have increased since 1977 from 0 to circa 400+ nests.	E	Y	National Park Service (Everglades NP) and National Audubon Society (Tavernier and Tampa Bay Sanctuary) unpublished database.
(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	Data analysis shows a clear trend of a slow increase in population size and range during the last 45 years. Largest colony in Florida today is circa 400 nests.	E	N	National Park Service (Everglades NP) and National Audubon Society (Jerry Lorenz, in Tavernier and Tampa Bay Sanctuary) unpublished database.
(c)2. A continuing decline, observed, projected, or inferred in numbers of mature individuals AND at least one of the following:	Population in Florida is slowly increasing.	E	N	
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				
b. Extreme fluctuations in number of mature individuals				
(D) Population Very Small or Restricted, EITHER				
(d)1. Population estimated to number fewer than 1,000 mature individuals; OR	Estimated to be a minimum of 1,800 mature individuals.	E	N	
(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	Despite relatively large AOO and AOE values given in footnote below, the actual nesting locations are very restricted and possibly only 4-5 locations (made up of multiple small, closely-spaced colonies of various sizes) but most of the Florida population is only within 3 locations. Oil spill in Tampa Bay or sea level rise effecting mangrove habitat in	E	Y	National Park Service (Everglades NP) and National Audubon Society (Tavernier and Tampa Bay Sanctuary) unpublished database.

	Florida Bay could impact a major portion of the Florida population.			
(E) Quantitative Analyses				
e1. Showing the probability of extinction in the wild is at least 10% within 100 years	No analysis has been done but number of individuals appears to be increasing slowly.	E	N	

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 criterion.	D2
Is species/taxon endemic to Florida? (Y/N)	No
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.	D2

Table 2. Biological status review information for the regional assessment for the roseate spoonbill.

1	Biological Status Review Information Regional Assessment	Species/taxon: Roseate Spoonbill
2		Date: 11/3/10
3		Assessors: Rodgers, Lorenz, Cook, Frederick
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.	No, breeding species in Florida.
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.	No. Though there is evidence from banded birds the species may occasionally come into the state, the number of immigrants (especially from Cuba, Texas) is estimated to be insignificant to augment the breeding population in Florida.
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	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.

Additional Notes - In our review of the status of the roseate spoonbill, the Biological Review Group made the following assumptions and conclusions:

- Generation time: Average of first breeders is about 3.5 years (J. Lorenz, NAS, unpublished data) and maximum breeding age is 19 years of age based on banded/mark-resighting data from south Florida. Modeled maximum age is estimated to be about 32 years of age but modeled average longevity is only about 25 years. We decided the mid-point between 3.5 and 25 years of age is about 15 years. Thus our time period for evaluation is 3x15 years=45 years or a beginning year of 1965.
- Extent of Occurrence (EOO): spoonbills are observed as a nesting/foraging species in both freshwater and estuarine wetlands regions mostly south of the I-4 corridor, which is roughly calculated as 37,500 miles^2 or 59,900 km^2.
- Area of Occurrence (AOO): Maximum AOO equates to the wetlands used for foraging, which makes up on average about 1/3 of the area of the actual land boundary in Florida, and is estimated to be a minimum of 20,000 km^2 or 12,500 miles^2.

APPENDIX 1. **Brief biographies of the Roseate spoonbill Biological Review Group members.**

Mark I. Cook has a M.S. in Ecology from the University of Durham, UK and Ph.D. in Ecology from Glasgow University, UK. He is a senior environmental scientist with the South Florida Water Management District. His expertise is in the behavioral ecology, conservation biology, habitat quality and reproductive success, and restoration ecology related to wading bird foraging and reproductive performance especially applied to hydrologic management and restoration issues in the Everglades. He has published numerous papers on the food ecology of wading birds.

Peter C. Frederick received a Ph.D. in Zoology from the University of North Carolina. He is Research Professor at the University of Florida. His expertise is in the areas of wetland ecology, ecotoxicology, and avian ecology of wading birds, especially with the wood stork, great egret, and white ibis and the Everglades. He has published numerous papers on waterbird ecology, pesticide contamination, population biology, and habitat requirements of wading birds in Florida.

Jerome J. Lorenz received a M.S. in Zoology from Miami University and a Ph.D. in Marine Biology and Fisheries from the University of Miami. Since 1989 Jerry has been a staff scientist for the Audubon Society and has been primary investigator of the National Audubon Society's Florida Bay Estuarine Research Project since 1992. This project focuses on the impact of water management in the southern Everglades on the coastal ecosystems of Florida Bay. In 2005, he became the state research director for Audubon of Florida. He serves as a member on numerous advisory committees and has published numerous papers.

James A. Rodgers received a M.S. from Louisiana State University and a Ph.D. from the University of South Florida. Since joining the FWC in 1980, he has worked on snail kites, double-crested cormorants, several species of wading birds including little blue herons and wood storks, development of buffer distances for waterbirds, pesticide contamination, and population genetics of birds. He was elected a Fellow of the American Ornithologist Union in 2009 and has published numerous papers on the breeding and nesting ecology of waterbirds. He has published numerous papers on the food ecology of wading birds.

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

Most information received by FWC staff was anecdotal and consisted of general observations of presence or absence of the species in Florida. Information from Ann Hodgson (Tampa Bay Sanctuaries, NAS) on the status of the species in the Tampa Bay region was used in the review of the species by the BSR panel on November 3-4, 2010.