White-crowned Pigeon 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
White-crowned Pigeon
(*Patagioenas leucocephala*)
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 white-crowned pigeon 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 Karl E. Miller (FWC lead), Kenneth D. Meyer (Avian Research and Conservation Institute), and Oron "Sonny" Bass (National Park Service) (Appendix 1). In accordance with rule 68A-27.0012, Florida Administrative Code (F.A.C.), the White-crowned Pigeon BRG was charged with evaluating the biological status of the white-crowned pigeon 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 (2004)*. 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 white-crowned pigeon met at least one listing criterion. Based on the literature review and the BRG findings, FWC staff recommend listing the white-crowned pigeon 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 would also like to thank Michelle Van Deventer who served as a data compiler for the species.

BIOLOGICAL INFORMATION

Life History References – Strong and Bancroft (1994), Strong et al. (1994), Bancroft (1996), Bancroft et al. (2000), Bancroft and Bowman (2001), Wells and Wells (2001), Florida Fish and Wildlife Conservation Commission (2003), BirdLife International (2008).

Taxonomic Classification – The white-crowned pigeon was previously placed in the genus *Columba* but is now included in the *Patagioenas* genus of New World pigeons. There are no recognized subspecies (Bancroft and Bowman 2001).

Geographic Range and Distribution – The white-crowned pigeon is a subtropical frugivorous species occurring in low-lying forest habitats with ample fruiting trees. Breeding range for the species is centered on the Bahamas and Greater Antilles, although populations extend into southern Florida, the Lesser Antilles, and the Caribbean coast of southeastern Mexico and Central America. Its range in the United States is restricted to Florida Bay, Biscayne Bay, and the Florida Keys, although a few individuals probably nest inland in Monroe and Miami-Dade counties (Bancroft and Bowman 2001, Florida Fish and Wildlife Conservation Commission 2003). In Florida, nesting occurs almost exclusively on mangrove islands; nesting birds fly to islands to forage on fruit-bearing trees (Bancroft and Bowman 2001). The BRG estimated the range in Florida, or total extent of occurrence, at <5,000 km^2 and noted that a large majority of this area was open water; the land area actually occupied by white-crowned pigeons in Florida is probably <1,250 km^2.

Some white-crowned pigeons that breed in Florida overwinter in Florida, while most migrate south or southeast for the winter (Robertson and Woolfenden 1992, Bancroft 1996). Band recoveries suggest that most white-crowned pigeons breeding in Florida winter in the Bahamas (Bancroft and Bowman 2001).

Population Status and Trend – Strong et al. (1994) estimated the population of nesting white-crowned pigeons in Florida Bay, Biscayne Bay and Barnes Sound in the upper Florida Keys at 5,055 pairs in 1991. Pairs nesting in other parts of southern Florida and the Florida Keys were not systematically surveyed during that time period, but were estimated at 2,500 pairs (Bancroft and Bowman 2001). Estimates for the statewide population range from approximately 7,500 pairs (Bancroft and Bowman 2001) to 10,000 pairs (T. Bancroft, cited in Robertson and Woolfenden 1992) to as many as 12,000 pairs (Meyer and Wilmers 2006). Larger population estimates reflect recent and more complete flight-line count data from the lower Florida Keys (3,500 – 5,600 pairs; Meyer and Wilmers 2006), although those data have a wide confidence interval.

Population trend is not well understood, primarily because of wide variation in the intensity and geographic coverage of surveys over different time periods. Apparent increases in population estimates over time likely reflect improved survey methods and more complete coverage of white-crowned pigeon habitat. In Florida Bay, white-crowned pigeon numbers appear to have been declining during the last 15 years (S. Bass, *personal communication*) but quantitative data are unavailable. In the lower Florida Keys, the species appears overall relatively stable; annual flight-line counts show steady population declines within Key West National Wildlife Refuge since Hurricane Dennis in 2005 but population increases within Great White Heron National Wildlife Refuge during the same time period (T. Wilmers, *unpublished data*). Trend data for the upper Florida Keys are not available.

The Bahamas are estimated to hold up to 30,000 breeding pairs, and the largest nesting population is believed to be in Cuba, although data are lacking (Bancroft and Bowman 2001; A. Kirkconnell, *personal communication* to K. Meyer).

Quantitative Analyses – We are not aware of a population viability analysis using demographic data for white-crowned pigeon in Florida.

BIOLOGICAL STATUS ASSESSMENT

Threats – The white-crowned pigeon global population is assessed as Near Threatened according to IUCN Red List Category and Criteria due to the fact that it is restricted to low-lying areas subject to intense habitat degradation and deforestation (BirdLife International 2008). Hunting of this species was a threat to populations during the late 1800s and early 1900s, but protection measures have been beneficial to reducing this threat in Florida. However, white-crowned pigeons that breed in Florida continue to be heavily hunted on their wintering grounds, especially in the Bahamas (Bancroft and Bowman 2001, Wells and Wells 2001, Meyer and Wilmers 2006). Bancroft and Bowman (2001) list hunting and harvesting, pesticides and other contaminants, collisions with structures or objects, degradation of habitat, and direct human/research impacts as primary threats to white-crowned pigeons. Nest predation by raccoons and other mammals is also a documented threat (Strong et al. 1991).

The Florida white-crowned pigeon subpopulation is contained within Monroe County, where it is vulnerable to hurricane events, both because of its location and its restricted range. Historical storm records corroborate the vulnerability of these geographic locations. The hurricanes of 2004-2005 eliminated substantial areas of nesting habitat in the lower Florida Keys, including Barrocuta Key, Little Crane Key, Upper Harbor Key, Little Spanish Key Mangrove, and Joe Ingram Key (T. Wilmers, *personal communication*). Recovery of black mangrove forest has been extremely slow. Increasing frequency of severe tropical storms and hurricanes (Webster et al. 2006) are expected to degrade and reduce the available nesting habitat for the species. In addition, critical foraging habitat continues to decline. For example, the areal extent of tropical hardwood hammocks in the upper Florida Keys declined by 31% between 1991 and 2004 (Karim and Main 2009).

Population Assessment – Please refer to the Biological Status Review Information Findings Table for the findings of the BRG. The white-crowned pigeon met at least one listing criterion; Geographic Range Size and Fragmentation and Decline (B1+2ab(iii)).

Regional Assessment of Subpopulations – Please refer to the Biological Status Review Information Table for the regional assessment of the BRG. There was no change from the initial finding because of a lack of evidence for significant immigration from outside of Florida.

Evidence is lacking for significant immigration into Florida from the Bahamas. Existing band recoveries suggest that white-crowned pigeons banded as nestlings in the Bahamas rarely move to Florida (Bancroft and Bowman 2001). In addition, subpopulations outside of Florida (especially in the Bahamas) are expected to continue to decline principally because of unregulated hunting pressure and habitat loss and degradation (e.g., Arendt et al. 1979, Wiley 1979, Norton and Seaman 1985, Strong and Johnson 2001, Meyer and Wilmers 2006, Hay 2008).

LISTING RECOMMENDATION

Staff recommend listing the white-crowned pigeon as a Threatened species.

SUMMARY OF THE INDEPENDENT REVIEWS

Comments were received from 4 reviewers: Dr. Reed Bowman (Archbold Biological Station), Dr. John Lloyd (Ecostudies Institute), Dr. Jerry Lorenz (Audubon of Florida), and Mr. Tom Wilmers (Florida Keys National Wildlife Refuge). All reviewers concurred with the staff recommendation for listing. Lloyd stated "I commend the BRG for providing a thorough review of available data and for providing an analysis that clearly demonstrates why white-crowned pigeons should be listed as Threatened." Lorenz stated that the BRG "used the most appropriate and up-to-date materials" in making their determination. Appropriate editorial changes recommended by reviewers were made to the report. No changes were made that affected the findings or staff recommendations. Peer reviews are available at http://www.myfwc.com.

While all reviewers concurred with the staff recommendation, one reviewer suggested that the species also may have met criterion A4: An observed, estimated, inferred, projected, or suspected population size reduction of at least 30% over a 10-year or 3-generation time period, whichever is longer. Bowman suggested that the current population size is likely much lower than the maximum estimate of 12,000 from Meyer and Wilmers (2006) because of continued impacts from the 2004-2005 hurricanes and because of possible declines in the upper Florida Keys. After reviewing all available information, the BRG determined that wide variation in the intensity and geographic coverage of surveys over different time periods prohibited conclusive determination of a population trend anywhere near 30%. The most recent population data (Meyer and Wilmers 2006; T. Wilmers, *unpublished data*) indicate that population declines in parts of the lower Florida Keys have been at least partially offset by increases in other parts of the lower Florida Keys. Moreover, no information on population trend is available from the upper Florida Keys.

Two reviewers, Bowman and Lloyd, believed that future threats to white-crowned pigeon habitat were underestimated because predicted sea-level rise was not considered by the BRG. However, the BRG did not consider the future impact of sea level rise on white-crowned pigeon habitat because sea level is not expected to change appreciably within the next 10 years, the time span over which this species was evaluated (see Akcakaya et al. 2006).

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Biological Status Review Information
Findings

Species/taxon: White-crowned Pigeon
Date: 11/04/10
Assessors: Karl Miller, Ken Meyer, Sonny Bass

Generation length: 2-3 yrs

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]			N	
(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]			N	
(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]			N	
(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]			N	
[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	Occurs only in portions of Monroe County and Miami-Dade County; total areal extent estimated <5000 km^2.	E	Y	FWC land cover map; Strong et al. (1994); Bancroft and Bowman (2001); Florida Fish & Wildlife Conservation Commission (2003); Meyer and Wilmers (2006); S. Bass and T. Wilmers, personal communications.
(b)2. Area of occupancy < 2,000 km^2 (772 mi^2)	Land area is <25% of extent of occurrence (i.e.,< 1250 km^2); at any time no more than 1/3 of keys and islands (ca. 400 km^2) are occupied.	E, I	Y	Strong et al. (1994); Florida Fish & Wildlife Conservation Commission (2003); Meyer and Wilmers (2006); S. Bass and T. Wilmers, personal communications.

AND at least 2 of the following:				
a. Severely fragmented or exist in ≤ 10 locations	Exist in 3-4 "locations" where tropical weather events can severely impact all breeding individuals; vulnerability of these geographic locations corroborated by historical storm records for Florida Keys, Florida Bay, and Biscayne Bay.	E	Y	See B1 and B2 above.
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	Increasing frequency of severe tropical storms and hurricanes have caused long-term habitat destruction. Black mangrove nesting substrate especially affected and does not regenerate for decades. Hurricanes during 2004-2005 resulted in partial or complete loss of nesting substrate in large portions of Lower Keys, including Barrocuta Keys, Little Crane Key, Upper Harbor Key, Little Spanish Key Mangrove, Joe Ingram Key.	I, P	Y (ii,iii)	Meyer and Wilmers (2006); T. Wilmers, unpublished data; Karim and Main (2009).
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	Annual fluctuation in number of nesting attempts can be extreme, possibly tied to variation in food abundance; however, evidence inconclusive for extreme fluctuation in area of occupancy or number of individuals.		N	Bancroft (1996), Strong and Johnson (2001).
(C)Population Size and Trend				
Population size estimate to number fewer than 10,000 mature individuals AND EITHER	Statewide population likely to be 10,000 - 12,000 pairs.		N	Meyer and Wilmers (2006).
(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			N	
(c)2. A continuing decline, observed, projected, or inferred in numbers of mature individuals AND at least one of the following:				
a. Population structure in the form of EITHER			N	
(i) No subpopulation estimated to contain more than 1000 mature individuals; OR				
(ii) All mature individuals are in one subpopulation			N	

b. Extreme fluctuations in number of mature individuals			N	
(D)Population Very Small or Restricted, EITHER				
(d)1. Population estimated to number fewer than 1,000 mature individuals; OR			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			N	
(E)Quantitative Analyses				
e1. Showing the probability of extinction in the wild is at least 10% within 100 years			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 of criteria	B1+2ab(ii,iii)
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)
Meets at least one of criteria	B1+2ab(ii,iii)

1	Biological Status Review Information Regional Assessment	Species/taxon: White-crowned Pigeon
2		Date: 11/04/10
3		Assessors: Karl Miller, Ken Meyer, and
4		Sonny Bass
5		
6		
7		
8	Initial finding	
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
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.	Do not know (suspect No)
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 regional 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
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	Meets at least one criterion

APPENDIX 1. Brief biographies of the White-crowned Pigeon Biological Review Group members.

Karl E. Miller received his Ph.D. from the University of Florida and is currently the Upland Nongame Bird Leader for FWC's Fish and Wildlife Research Institute. Miller has more than 15 years experience implementing research and monitoring projects for imperiled birds and mammals in Florida, with more than 50 articles or book chapters published in scientific journals or popular magazines. Miller's expertise is focused on the population ecology and community ecology of raptors, woodpeckers, and songbirds.

Kenneth D. Meyer received his Ph.D. from the University of North Carolina, Chapel Hill, and is Director and Research Ecologist for the Avian Research and Conservation Institute. Meyer has conducted research on the behavioral ecology, migration, and population status of some of Florida's most imperiled and area-restricted bird species, including swallow-tailed kite, short-tailed hawk, and white-crowned pigeon. Meyer also serves as adjunct faculty member in the Department of Wildlife Ecology and Conservation at the University of Florida.

Oron "Sonny" Bass is Supervisory Wildlife Biologist at the Daniel Beard Research Center in Everglades National Park, where he has led research and monitoring projects on imperiled birds and mammals for the past three decades. Bass's expertise includes the conservation biology of bald eagles, ospreys, Cape Sable seaside sparrows, and Florida panthers, especially in relation to habitat quality and water management issues in the Everglades.

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

No information about this species was received during the public information request period.