

REPORT OF THE WHITE-CROWNED PIGEON
(*PATAGIOENAS LEUCOCEPHALA*) WORKING GROUP

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JAMAICA

BRANDON HAY discussed the Jamaican monitoring program of the White-crowned Pigeon (*Patagioenas leucocephala*) since 1999. Hunting in Jamaica is managed by the Minister of the Environment through the Natural Resources Conservation Authority (NRCA). Management decisions are made by recommendations from a special committee of the "Authority" known as the Game Birds Sub-committee. Their recommendations are provided to the Minister of the Environment who determines the regulations for each year by declaration. All hunting fees are collected and administered directly by the NRCA so hunting revenue can be used directly to support research and monitoring of Jamaica's game birds.

Many hunters in Jamaica believe that most of the columbids shot in Jamaica are coming from other islands such as Hispaniola and Cuba. The timing of hunting coincides with the time when young birds are flying in flocks. Although much of the hunting here is conducted in the coastal areas, surveys indicate there is not much nesting in coastal areas, unlike the Florida Keys.

Prior to 1999, most of the hunting data available for Jamaica was taken from hunters who are required to return a questionnaire at the end of each season. The data are used to generate annual hunting reports and the hunting regulations for the next season are being based solely on data from the hunters' returns. Analysis of the existing hunting data suggests that population trends and hunting effort has remained relatively stable over the last decade (although hunting has been suspended in periods after a severe hurricane). It is well known, however, that hunters rarely provide accurate information in their returns and this makes interpretations based on those data potentially unreliable.

The NRCA is therefore attempting to establish a more reliable field monitoring and management program using flight line counts to supplement existing information. Flight line counts in 2006 were rough, did not use distance sampling, and were more of a presence-or-absence study; furthermore,

there was a wide range in skill level of observers. This year (2007) there were bureaucracy issues preventing someone from being hired on time to run the flight line counts.

A large project was proposed to write a grant proposal for money to conduct pigeon research simultaneously in Jamaica and Cuba. A proposal in Jamaica is needed now for continuing flight-line counts and starting a radio-telemetry study. Frank Rivera mentioned that Jamaica should look into the probability of being a stopover for migrant pigeons, thus a telemetry study would be good here. Also, it would be useful to place transmitters on nesting pigeons from the mountain highlands to see where they go.

FLORIDA

Gina Zimmerman (and Ken Meyer) of the Avian Research and Conservation Institute (ARCI) summarized their research in Florida since 2004. They used radio telemetry to study habitat selection, range sizes, survival, and wintering behavior of the United States breeding population of White-crowned Pigeons, which is limited to extreme southern Florida. There have been two broad projects: "Foraging habitats, winter residency, survival, and philopatry of adult White-crowned Pigeons in the lower Florida Keys" (2004-2006, project completed and final report published); and "Enduring effects of hurricanes and additive human threats for five avian species of greatest conservation need in the Florida Keys" (2006-2008, in progress). Funding has been provided by the Florida Fish and Wildlife Conservation Commission, National Fish and Wildlife Foundation, Felburn Foundation, and Disney Wildlife Conservation Fund. In addition, ARCI participated in the third meeting of the International White-crowned Pigeon Working Group in Big Pine Key, Florida, in 2005. The goals of ARCI are to:

1. Determine the spatial and habitat needs, particularly in the lower Florida Keys.
2. Estimate sizes and intensity of use of foraging ranges of individual radio-tagged pigeons.
3. Estimate annual survival of radio-tagged

adults.

4. Determine the proportion of the United States breeding population that overwinters in Florida.

5. Estimate the extent of adult philopatry to breeding and foraging ranges.

6. Estimate population size and contribute to a long-term database for monitoring trends.

7. Identify the major threats to the United States population within and beyond Florida.

8. Collaborate in an international effort to identify and address range-wide conservation needs of the White-crowned Pigeons and to develop a species-level management plan.

ARCI's flight-line counts, which represent the most thorough attempt to estimate numbers in the lower Florida Keys, increased the population estimate by 50-60%. The 127 radio-tagged pigeons produced foraging data revealing a very large range in size of feeding patches, from single trees to large stands. Tracking also showed how the distribution and occurrence of high-value forage can be interspersed among other types of vegetation (e.g., small patches of dense hammock vegetation in the mid-story of unburned pine rockland forest). A larger proportion of the Florida breeding population (15-20%) winters in Florida than had been previously thought. Given the hunting pressure at Caribbean wintering destinations and the risks of over-water migration, Florida winter residency could influence survival rates, population trends, and selection for migration behavior in this species. The limited winter telemetry data for the Bahamas yielded the first evidence of winter philopatry. The simpler of two survival analyses produced three annual estimates of 43-69%. Combining yearly cohorts, 54% survived for 1 year after being marked. Overall, the model-based survival estimates were higher, ranging from 55-95%. This analysis also revealed two important correlates of survival: trapping location and mass (the latter had a significant positive effect on survival). The significant correlations between trapping location, mass, and survival are an important result, suggesting that some foraging habitat habitually occupied by large numbers of White-crowned Pigeons might be of relatively poor quality. Most adult White-crowned Pigeons in the study consistently showed strong fidelity to feeding areas within and between nesting seasons.

Accurate population modeling will require refinement of estimates of annual survival, which will require greater effort and success (at substantial cost) to confirm the fates of radio-tagged pigeons whose signals are lost. Storms during critical peri-

ods of the nesting cycle can have substantial impacts on nesting success. More severe weather, such as tropical storms or hurricanes, can cause very large-scale nest failures and habitat destruction that limits nesting effort in subsequent years. Our limited knowledge of critical demographic rates makes it difficult to predict the effects of different frequencies of destructive weather events. It is clear, however, that the small US population of White-crowned Pigeons is vulnerable to such stochastic natural processes. These risks are aggravated by ongoing habitat degradation and impacts on survival on the winter range.

In Florida, the two most important management needs are: regulating development that clears native vegetation in the Florida Keys, because any loss of this increasingly rare community threatens the ecological integrity of the Florida Keys; and fire management, which brings the interests of plant, animal, and human communities into conflict. No patch of native fruiting vegetation in the Florida Keys should be considered too small to be of value to White-crowned Pigeons rearing young. Land-use permitting must take this species's foraging needs into account in all decisions affecting the extent and quality of native hardwood vegetation.

We strongly recommend that the individual sub-populations of White-crowned Pigeons scattered throughout the Caribbean Basin be studied in sufficient depth to determine each one's size, status and trends, and management needs. It is vitally important that threats be identified and addressed with management action. Harvest levels and seasons should be based on sound data. In the absence of reliable information, hunting should be strictly limited until population monitoring can establish abundance and trends and demographic study can justify greater hunting pressure. Once sustainable harvest levels have been determined, regulation and enforcement must be put in place to assure compliance. Cooperative and collaborative research and conservation planning linking national efforts across the White-crowned Pigeon's entire Caribbean range are essential if we are to ensure persistence of this highly mobile species and the threatened tropical hardwood community with which its future is inextricably linked.

PUERTO RICO AND THE BAHAMAS

Frank Rivera discussed the status of White-crowned Pigeons in Puerto Rico and the Bahamas. A question arose about collecting feathers for stable isotope analysis. Colorado State has a good lab for

such an analysis. Pigeons molt continuously and may not drop feathers at colonies, so it may be necessary to trap adults. Also, isotope analysis is weaker in southern latitudes and, since the Caribbean islands are so close to one another, it may not be helpful. In Puerto Rico, pigeons nest all over and are spread out, not in colonies. On Abaco Island of the Bahamas, nesting is spread out on the main island but is concentrated on smaller offshore islands. Huge flocks have been observed at Inagua Island, Bahamas, but it is unknown whether they are breeding or migratory.

Flight-line counts need further testing as indices of abundance of nesting pairs. Flight-line counts and number of nesting pairs probably correlate poorly in areas where pigeons nest in small aggregations or are spread out (e.g., coastal and lower montane forests of the Puerto Rican mainland, Vieques, Culebra and Mona islands, pine and dry forest of Great Abaco, and dry forests of Great Inagua and Grand Cayman). Moreover, counts should be adjusted for detection probability and account for the effect of environmental, species, and observer covariates.

Telemetry studies should be conducted to better understand the daily and seasonal movements of White-crowned Pigeons in coastal and montane areas of Jamaica, Puerto Rico, and other islands.

The peak nest density (number of active nests/unit area) occurs between May and June in Puerto Rico, but nesting occurs year-round. Based on survey data and observations, nest density is suspected to peak between May and June in Abaco, Inagua, and Grand Cayman, and nesting may be more synchronous on Abaco than on Inagua and Grand Cayman due to rainfall and food availability.

Game and nongame columbid populations are monitored annually (March-August) using distance sampling to estimate density (number of individuals / unit area) and population size (number of individuals in a given area) in Puerto Rico and territories. Distance-sampling survey data have been collected on Abaco, Inagua, Grand Cayman, and St. Croix. Training of biologists at government agencies, universities, and non-government organizations should be conducted to initiate management-

based monitoring efforts in Jamaica, the Dominican Republic, and other Caribbean islands.

DOMINICAN REPUBLIC

Yvonne Arias summarized research in the Dominican Republic. The Environmental Department is organizing a group to monitor game birds. There have been censuses in the Jaragua Bioreserve for 10-12 years, but the data have not been published. A corridor has been proposed to link the bioreserve to other places, bringing animals to where the plants are and other resources. A management plan with flagship species has been produced. The White-crowned Pigeon is hunted at the Jaragua Bioreserve and pigeons are poached while nesting. Traditionally people have eaten squabs from the nests. Poachers often fake permits and wealthy people, including some government officials and visitors from Puerto Rico, often hunt illegally. Photographic evidence has been obtained of such individuals entering the reserve with guards to hunt illegally. The wealthy poachers hunt mostly during weekends and have more authority than the guards. There is one hunting organization that respects the rules, but the others do not. This group should be encouraged to advise the other groups to respect the rules. A proposal has been prepared for submission to the Central America Free Trade Agreement to impose stiff penalties on poachers.

US VIRGIN ISLANDS

Carol Cramer-Burke discussed White-crowned Pigeons in St. Croix, US Virgin Islands. Local residents often hunt squabs and raise them in cages. The Great Pond reserve has a number of nests. There are only four licenced hunters in St. Croix. Doug McNair has conducted considerable research on White-crowned Pigeons on St. Croix.

HAITI

Samson Compere discussed White-crowned Pigeons in Haiti. Thus far there have not been any formal surveys, but there are 5-6 years of some sparse data. Residents do not understand the importance of birds and just kill them. There is a legal hunting season with permits.