A new review of the status of the Caribbean Flamingo *Phoenicopterus ruber* in the Dominican Republic and Haiti

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Abstract — The Caribbean Flamingo *Phoenicopterus ruber* is a locally common resident of Hispaniola with numbers augmented significantly by seasonal visitors. We review the existing literature and provide new data on the status of the flamingo in the Dominican Republic and Haiti. We summarize recent counts and compare these with those provided in earlier reviews by Wiley and Wiley (1979), Ottenwalder *et al.* (1990), and Keith *et al.* (2003), and we pay particular attention to reports of flamingos nesting. We conclude with recommendations to advance the conservation and monitoring of this species.

Keywords: Caribbean Flamingo, Phoenicopterus ruber, *Hispaniola, Dominican Republic, Haiti, nesting.*

Introduction

The Caribbean Flamingo *Phoenicopterus ruber* is a locally common resident of Hispaniola, with numbers augmented significantly by seasonal visitors thought to arrive from the Bahamas Islands and Cuba. Although flamingos have been reported on Hispaniola since the arrival of the Spanish and French (Buffon, 1781), and have been most often considered to be locally common, the sites where they have occurred have suffered from habitat change and degradation, and numbers of birds have fluctuated substantially (Keith *et al.*, 2003). The species has bred on the island in the historic past (Keith *et al.*, 2003) and in relatively recent times (Wiley & Wiley, 1979), but the most recent review of the species status (Keith *et al.*, 2003) states that "there are no known active breeding sites now." This contrasts with an earlier important summary of the status of the Caribbean Flamingo in the Dominican Republic and eastern Haiti (Wiley & Wiley, 1979) that reported several nesting colonies in the Dominican Republic in the 1970s.

Because of significant local interest in the status of the Caribbean Flamingo, especially in the Dominican Republic (SEA/DVS, 1994; Espinal, 2006), and the recent formation of the Caribbean Flamingo Conservation Group, we sought to review the existing literature and provide new, more recent data on the status of the flamingo in the Dominican Republic and Haiti. We summarize recent counts and compare these with those provided in earlier reviews by Wiley and Wiley (1979), Ottenwalder *et al.* (1990), and Keith *et al.* (2003), and we pay particular attention to reports of flamingos nesting. We conclude with recommendations to advance the conservation and monitoring of this species.

Methods

Historical data on the distribution and status of the Caribbean Flamingo have been provided by Wetmore and Swales (1931), Wiley and Wiley (1979), Ottenwalder *et al.* (1990), and Keith *et al.* (2003) and are briefly summarized here. Additional data were obtained from members of the Hispaniolan Ornithological Society, national park guards, tour guides and especially from personal observations of the authors.

Results

Below we review population counts of flamingos at all key sites in the Dominican Republic, followed by a similar review of sites in Haiti. We then assess reports of breeding attempts by flamingos in both countries.

Flamingo use areas

Lago Enriquillo — This large, inland lagoon has traditionally been considered one of the most important sites for flamingos on the island. Daily counts have run from 20–30 birds to more than 600 (Wiley & Wiley, 1979), with most concentrating at the eastern end of the lake or near Isla Cabritos. Keith *et al.* (2003) reported a record of nearly 1,000 birds along the southern shore in 1996, but our records suggest a population that fluctuates between 300 and 600. Recent counts include 500 on 14 Sept 1999, 300 on 11 Jan 2002, 500 on 14 Sep 2004, 400

on 16 May 2005, 350 on 27 Sep 2006, and 500–600 on 20 Sep 2007. A series of three tropical storms and hurricanes in late-2007, with extreme amounts of rain, filled Lago Enriquillo to unprecedented levels, resulting in excessively deep water and the emigration of the entire flamingo population. These conditions are expected to persist for months if not years.

Lago del Rincón at Cabral — Also known as Laguna de Cabral, this neighbour of Lago Enriquillo is smaller, less saline, and less frequently used by flamingos. Wiley and Wiley (1979) found only seven birds there, but reported earlier counts of as many as 155. Our observations from 1998–2005 average around 80 flamingos.

Laguna de Oviedo — This lagoon on the eastern side of the Barahona Peninsula has become one of the most important sites for flamingos on the island. Wiley and Wiley (1979) reported only 19 birds here, but we have consistently found dozens of flamingos at Oviedo, including careful counts of 80 on 24 Feb 2003 and 200 on 26 Aug 2005. Many of the flamingos found at Oviedo probably move frequently among the other lagoons on the Barahona Peninsula (see below), such that these flamingos might best be considered part of a much larger super-population.

Other lagoons of the Barahona Peninsula — South of the Laguna de Oviedo, a series of coastal lagoons regularly host a large number of flamingos. These rather remote sites, including *Laguna de la Rabiza*, *El Salado de Bucán Base*, and *Laguna Salada*, are seldom censused, but Wiley and Wiley (1979) reported counts of 200–440, and we recently received a report by park guards and tour guides of as many as 2,000 flamingos regularly occurring on the Peninsula. Further to the west, the *Charcos de Cabo Rojo* have not previously been reported as a site for flamingos, but we frequently recorded 15–35 flamingos at these small lagoons, including 32 on 3 Jun 2004, 15 on 6 July 2004, 22 on 16 July 2005 and 30 on 4 Sep 2007.

Bahía de Neiba and Bahía de Ocoa — The coastal area of the Bahía de Neiba has hosted flamingos in the past. Wiley and Wiley (1979) reported the presence of "small numbers" of flamingos at sites such as *Puerto Alejandro* and the adjacent *Laguna de Neiba*. We have counted 150 flamingos at Puerto Alejandro on 15 Sep 2002 and 200 on 19 Sep 2007. Further east, Wiley and Wiley (1979) stated that local residents reported the regular presence of flamingos at *Puerto Viejo*, with Keith *et al.* (2003) reporting 325 individuals at this site. Across the Bahía de Ocoa, the *Salinas de Baní* is frequently visited by birdwatchers who regularly count approximately 70 flamingos at these salt ponds and adjacent wetlands (pers. observ.).

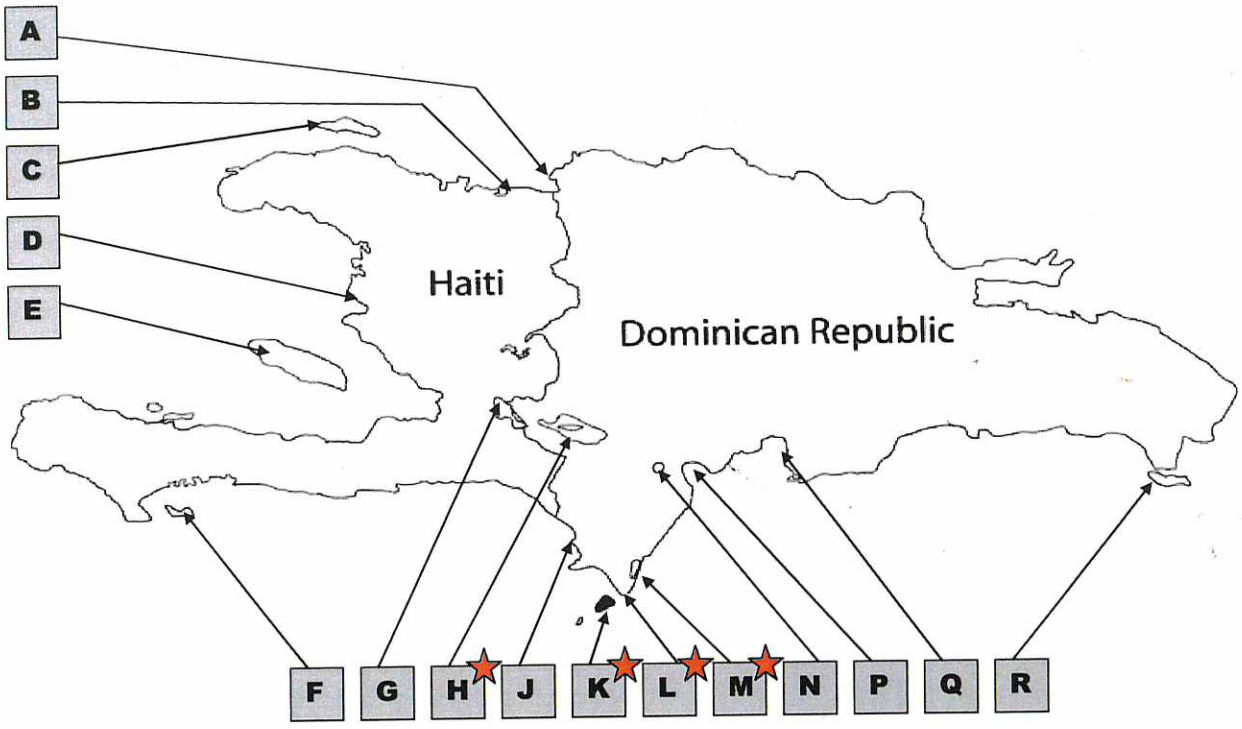

Figure 1. Caribbean Flamingo *Phoenicopterus ruber* use areas and areas where nesting has been attempted since the 1970s (starred) on Hispaniola, including (A) Monte Cristi, Manzanillo Bay and Laguna Saladilla; (B) Liberté Bay; (C) Île de la Tortue; (D) delta of the Artibonite River; (E) Île de la Gonâve; (F) Île-à-Vache; (G) Étang Saumâtre and Trou Caïman; (H) Lago Enriquillo; (J) Charcos de Cabo Rojo; (K) Isla Beata; (L) other lagoons of the Barahona Peninsula, including Laguna de la Rabiza, El Salado de Bucán Base, and Laguna Salada; (M) Laguna de Oviedo; (N) Lago del Rincón at Cabral; (P) Bahía de Neiba, including Puerto Alejandro and Laguna de Neiba; (Q) Bahía de Ocoa, including Puerto Viejo and Salinas de Baní; and (R) Isla Saona.

Laguna Baytoa — Although not previously reported by Wiley and Wiley (1979) or by Keith *et al.* (2003) as a site hosting flamingos, we found 50 birds at this lake in San Juan Province on 17 Sep 2007.

Monte Cristi – Manzanillo coast — Another concentration of flamingos is often reported at lagoons and coastal wetlands in extreme northwestern Dominican Republic. Records in Wiley and Wiley (1979) included small numbers of up to 15–20 flamingos, but Keith *et al.* (2003) added a previously unpublished report of 200–300 flamingos in the *Manzanillo Bay* area in 1951. Our more recent records include only 30 birds at the nearby *Laguna Saladilla* on 18 Oct 2003, and 60 flamingos at the same site on 21 Sep 2007.

Isla Saona — While reports exist of flamingos on Isla Saona (Wiley and Wiley, 1979; Keith *et al.*, 2003), off the southeast corner of Hispaniola, there are no recent counts of this species on the island, or any other indication that Saona is regularly used by flamingos.

Isla Beata — This island, which lies south of the Barahona Peninsula and thus quite close to one of Hispaniola's major concentrations of flamingos, is reputed to host small numbers of flamingos, especially at the lagoons and salinas on the eastern coast of the island (Wiley & Wiley, 1979). Keith *et al.* (2003) reported a high count of 100 flamingos on Beata in January 1990, but few ornithologists have since had the opportunity to visit this island where access is restricted.

In Haiti, flamingos are reported from coastal mangrove lagoons near Liberté Bay, between Grande Saline and Gonaïves, Étang Saumâtre, Trou Caïman, and on the offshore islands of Île de la Gonâve, Île-à-Vache, and Île de la Tortue. Although few data are available from Haiti (Ottenwalder *et al.*, 1990), the following accounts summarize what is known:

Liberté Bay — Flamingo populations from the Liberté Bay area are likely to correspond to those at *Manzanillo Bay* and *Laguna Saladilla* just across the border in northwestern Dominican Republic (see above). Records in Wiley and Wiley (1979) included small numbers of up to 15–20 flamingos in this area. Ottenwalder *et al.* (1990) did not find flamingos in this area, but Keith *et al.* (2003) added a previously unpublished report of 200–300 flamingos in the *Liberté Bay-Manzanillo Bay* area in 1951.

Coastal Grande Saline and Gonaïves — This region, which includes the Artibonite River delta was not reported as flamingo habitat by Wiley and Wiley (1979) who limited their report to eastern Haiti, but Ottenwalder *et al.* (1990) observed variable numbers of up to several hundred individuals on over-flights in the early 1980s, and Keith *et al.* (2003) reported as many as 1,000 flamingos in marshes in this region in January 2000.

Étang Saumâtre and *Trou Caïman* — These lagoons which, like Lago Enriquillo and Lago del Rincón at Cabral, are remnants of the marine strait that formally divided Hispaniola, have historically hosted large numbers of flamingos (Wiley & Wiley, 1979). Few recent counts exist for either of these lakes, although Wiley and Wiley (1979) reported as many as 300 flamingos at *Étang Saumâtre* in January 1976, Ottenwalder *et al.* (1990) called these lakes "one of the most important flamingo sites of Hispaniola," and we counted 75 flamingos at the western end of the same lake on 15 Sep 2005.

Haitian islands — Reports exist of flamingos from the offshore islands of *Île de la Gonâve*, *Île-à-Vache*, and *Île de la Tortue*, but we are aware of no recent counts from any of these sites. Ottenwalder *et al.* (1990), during over-flights in November 1982 and May 1983, found no flamingos on Île-à-Vache, but as many as 50 in 1982 and 1983 on both Île de la Gonâve and Île de la Tortue.

Flamingo breeding sites

Keith *et al.* (2003) reviewed the many localities where the Caribbean Flamingo was thought to have bred in the past, including Lago Enriquillo, Laguna de Oviedo and Lago Limón (Independencia Province) in the Dominican Republic. In Haiti, reports from the past of nesting flamingos have come from Gonaïves, Étang Saumâtre, and Liberté Bay. Additional accounts of nesting have come from the offshore islands of Isla Beata and Île de la Gonâve. The Caribbean Flamingo is not known to have bred in Haiti since 1928 (Ottenwalder *et al.*, 1990). The most recent breeding attempts that have been reported have all occurred in the Dominican Republic and were summarized by Wiley and Wiley (1979). These included nests at *Lago Enriquillo* in 1975 and 1977, *El Salado de Bucán Base* in 1977 and 1978, *Laguna Salada* in the same time period, and on *Isla Beata* where eggs were harvested in 1971. Since then, according to tour guides and park guards based at Laguna de Oviedo, sporadic attempts at nesting have taken place at *El Salado de Bucán Base*, including 2007. But these birds apparently do not lay eggs, or are unsuccessful in their nesting attempts because of disturbance by local fisherman. No other nesting attempts are known from the past 30 years.

Discussion

It is apparent that the number of flamingos recorded on Hispaniola fluctuates substantially from year to year. As Keith *et al.* (2003) have pointed out, the flamingo is "a strong flyer (and) this species might be

encountered at almost any favourable feeding locality along the entire coast of the island." Numbers of flamingos on the island apparently depend on breeding success at the large colony on Great Inagua, Bahamas, but other birds may also come from Cuba (Sprunt, 1975; Ottenwalder, 1991). The dependence of Hispaniolan flamingo numbers on immigration from populations from Cuba and the Bahamas (Sprunt, 1975; Wiley & Wiley, 1979; Keith *et al.*, 2003; Latta *et al.*, 2006), has been supported by band returns and the occurrence of sub-adult birds accompanying adults.

Assessing population trends of flamingos on Hispaniola is made difficult by the anecdotal nature of many early reports of flamingos, and especially by the unpredictable influx of birds from nesting sites on other islands (Keith *et al.*, 2003). Despite the loss of some traditional feeding areas, such as Lago Limón (Wiley & Wiley, 1979) and perhaps some of the Haitian sites where persecution may be high, Keith *et al.* (2003) and Latta *et al.* (2006) concluded that on balance the Caribbean Flamingo appears to have become more numerous from 1930 to the present day.

While numbers of flamingos may be generally stable or increasing, we suggest that conservationists should be most concerned with the loss of breeding colonies on Hispaniola, and the apparent continued disruption to birds attempting to nest. Ottenwalder (1988) and UNESCO (1997) have pointed out that flamingos are found only in areas with a low human density. Nesting attempts throughout the island have been disrupted by the harvesting of eggs, introduction of cattle, and burning for forage (Wiley & Wiley, 1979), so that human pressure has probably directly resulted in the reduction of flamingo range and disappearance of breeding colonies (Ottenwalder, 1988). Human disturbance is probably responsible for our observation that there have been no verified nesting attempts since Wiley and Wiley (1979) reported on several disrupted nesting colonies 30 years ago. As those authors also pointed out, "human disturbance of nesting attempts has undoubtedly prevented flamingo breeding colonies from expanding in the Dominican Republic." In addition, there is a growing threat from the capture and sale of flamingos for placement as decorative waterfowl in private lakes of wealthy individuals, and especially at resorts and hotels located in the eastern Dominican Republic.

Conservation recommendations

We recommend six critical steps be taken to help conserve and expand the Caribbean Flamingo population of Hispaniola. These steps include:
(1) Because the Hispaniolan population is derived from the breeding colonies on Inagua and Cuba, and because flamingos are known to wander widely, results from a population monitoring program on Hispaniola would be difficult if not impossible to interpret except within the context of a wider, pan-Caribbean census. We support the implementation of a Caribbean-wide census, but see little value in expending valuable time and energy systematically counting flamingos on Hispaniola only.

(2) We recommend a more regular and detailed monitoring of the nesting areas known to be recently favoured by the flamingo. This monitoring should focus on protecting nesting areas from human disturbance, and should incorporate a community education component to help encourage local people to share in the protection of this important natural resource. These areas should include Lago Enriquillo, Laguna de Oviedo, El Salado de Bucán Base, Laguna Salada, and Isla Beata. That these sites are all currently in protected areas, including Isla Cabritos National Park, Jaragua National Park, and the Jaragua-Bahoruco-Enriquillo International Biosphere Reserve, should facilitate protection and monitoring efforts.

(3) Pressure the governmental authorities responsible for these protected areas to manage them effectively so as to reduce disturbance to nesting flamingos. This should include support for, and collaboration with, national and international non-governmental organizations with a shared interest in flamingo conservation in the Dominican Republic and Haiti.

(4) Encourage governmental authorities to enforce laws prohibiting the hunting, capture, sale or possession of flamingos, and prosecute individuals and corporations responsible for this trade.

(5) Address the variety of problems facing coastal areas through holistic, interdisciplinary actions towards more sustainable development. This should result in more environmentally sound, socially equitable, and culturally appropriate development of coastal areas, as outlined for example in UNESCO (1997).

(6) Support and cooperate with international colleagues involved in flamingo conservation in the region through the Caribbean Flamingo Conservation Group.

Unfortunately we note that most of these very same conservation measures for the flamingo on Hispaniola were previously outlined by Wiley and Wiley (1979), Ottenwalder (1988), Ottenwalder *et al.* (1990), and echoed by Keith *et al.* (2003). A full 30 years after the recommendations first published by Wiley and Wiley (1979), we still have to report that the situation has not improved for the Caribbean Flamingo in the Dominican Republic and Haiti, and

that there is in fact abundant evidence that the situation has deteriorated, perhaps dramatically, at least in terms of nesting conditions. Based on data reported here, we suggest that the apparent loss of all breeding colonies, and the recent growing popularity of wild-caught flamingos in gardens and lagoons of private homes and commercial hotels and resorts, has created a situation anathema to the maintenance of healthy, reproducing populations of flamingos in the Dominican Republic and Haiti.

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