

**Interim Report on Black-capped Petrel:
Field Research on Hispaniola, 2008-2009**

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This is an informal report from the field on our Black-capped Petrel (BCPE) research in Hispaniola in 2008 and 2009. To speed dissemination in anticipation of impending research and conservation planning meetings, I have written this report based on field notes and early drafts of a more formal article. What lacks in polish may it compensate with timeliness to inform and spur our group's interest, research and conservation efforts for this critically endangered bird species.

It fell to me to lead the fieldwork in 2008 and 2009, but my efforts would have amounted to far less without the support, encouragement and advice of collaborators, advisors, field assistants and funders listed in the acknowledgments. Credit is due especially to the project's co-PI's: John Gerwin, who helped lure me into working on BCPE by making it sound like a fun challenge, and Eduardo Iñigo-Elias who supported and facilitated realization of this project at the Cornell Lab of Ornithology.

I begin with quotes from other BCPE researchers that summarize the current conservation status of BCPE, and describe the challenges of advancing research and conservation on this species. Next, I briefly outline the most recent published fieldwork on breeding BCPE, followed by accomplishments of our current fieldwork at each field site, and a brief description of current work at Parc La Visite to investigate the interactions between local people and the remaining broadleaf forest. Last is a summary of chief BCPE research findings on Hispaniola in 2008-2009. The lack of recommendations for future work is intentional, pending completion of the current field season.

The level of detail may exceed the needs and interest of some, but because Hispaniola, and especially Haiti, is unfamiliar to most, and because of the current

level of interest in conservation status of BCPE, I have tried to err on the side of too much detail.

It is clear that the Black-capped Petrel is well down the path to extinction. The combined effects of habitat loss, harvesting by humans, and predation by introduced mammals have wiped out populations of Gadfly Petrels throughout the Caribbean Basin, and they are rapidly extinguishing the few remaining breeding colonies. If there is to be any hope of conserving this species, efforts to delineate the remaining nesting areas and assess the viability of the remaining populations must be initiated immediately. (Simons et al., 2002)

This is an uncomfortably problematic bird to work on, requiring substantial effort for little certain reward. In most cases what is first needed is simply the location of colonies, which could be highly exacting in itself; but the subsequent study and management of these colonies would probably also need to be on a scale virtually unknown for a nocturnal seabird nesting in tropical forest. The problem is compounded rather than ameliorated by the fact that as many as five nations may host breeding populations (particularly if the suspicion that a major undiscovered site exists): each of the countries involved can claim to have higher individual priorities. (Collar et al., 1992)

In the quotes above, Simons et al. (2002) signals the urgency of action to conserve the critically endangered BCPE while Collar et al. (1992) cautions that this undertaking is not trivial. This statement by Collar et al. may also help to answer why few researchers have focused their efforts on breeding BCPE since Wingate (1964) first discovered them nesting on Haiti's Massif de La Selle. Despite the difficulty of fieldwork, breeding BCPE have not been entirely neglected. For details on earlier fieldwork, species distribution and conservation status, see Collar et al. (1992) and Lee (2000). Here is a brief overview of the most recent published work of which I am aware.

On Dominica, Collier et al. (2001) found no evidence of nesting BCPE, based on one night of listening surveys with audio playback in January 2001, and inspection of dozens of potential burrows.

On the south coast of Cuba, Lee and Viña (1992) listened from a sea cliff on one night in January 1992, and observed BCPE apparently from far out at sea coming close to the coast at night to feed, but not flying up into the mountains. Based on examination of specimens, review of literature, interviews with locals and their field observations, they concluded that reports of BCPE breeding in Cuba were without basis. However, more recently, Norton et al. (2004) reported others' sightings on the south coast of Cuba of dozens of BCPE offshore at dusk, then "seen and heard flying inland up a small valley" after dark. These observations are compelling evidence for a breeding population on Cuba.

Working in the Dominican Republic at Loma del Toro, D.S. Lee and J.C. Haney (pers. obs. cited in Lee and Viña 1993, Lee 2000) reported "roughly 5 pairs" based on observations in January 1990. At this site on an afternoon in mid April 1996, Williams et al. (1996) reported hearing calls, that they presumed to emanate from the BPCE nest burrows. They located fresh and old BCPE feces, and one unoccupied burrow. Also at Loma del Toro, Simons et al. (2002) dedicated a week to listening surveys and nest searching. They located one active nest, and generated a population estimate of "probably less than 200 breeding pairs," with a caveat regarding difficulty of estimates due to highly variable listening conditions, and lack of reliable natural history data on which to base inferences.

In Haiti, Rimmer et al. (2005) surveyed two nights between Pic La Visite and Tet Cabaio in February of 2005, detecting only a handful of vocalizing birds. In Macaya Biosphere Reserve, Rimmer et al. (2006) surveyed two nights on Pic Formon in February of 2006 and detected two birds in flight, one calling, one mute. John Gerwin and I participated in that trip, and had planned to visit La Visite for ten days directly afterwards, but social unrest surrounding the presidential election forced cancelation.

John Gerwin and I then planned a 20-day field trip to Massif de La Selle for January 2008, but cancelled again, this time due to logistical snags. However I was able to lead a scaled-down self-funded trip, thanks to the quick intervention of Yves-Andre Wainwright of Fondation Seguin, James Rhoads, a field anthropologist experienced in Haiti, and Anderson Jean, a recent agronomy graduate from Les Cayes, Haiti.

On that trip, we verified travel and site logistics, and surveyed nightly from 6-14 January, covering most of the distance from Pic La Visite to Tet Bernard, and one south-facing cliff face. We detected several concentrations of possibly dozens or more of calling birds at several points along the escarpment. A bird landed at our feet once in January 2008 when we had headlamps on while taking notes. We photographed and released it.

In November 2008, we conducted two brief scouting trips to determine site accessibility and condition in wake of the four hurricanes that struck Haiti in the fall of that year. For us, access was not more difficult than on previous trips, and storm damage to vegetation was not evident, although people reported high numbers of livestock killed. Here are details of our chief activities and accomplishments on these trips:

1-10 November 2008: Pic Macaya advance scouting trip

-Verify logistics, to access site from Port-au-Prince (PAP) by plane, hired truck, and on foot with hired mules up to Village of Formon at base of Pic Formon. Pic Formon is another 2-4 hr hike. Macaya is 3-4 hr beyond that.

-In two days cutters re-cut trail grown over since 2006. We advance to within 1km of the Formon-Macaya saddle (locally known as Fraz or Pa Lon Kont) but due to time constraints, leave the rest for a planned January 2009 trip.

- Survey for BCPE at end of cut trail (on north face of Formon, still >1km from BCPE area), but detect none.
- Find that the roof of the field station at Kay Michel is missing. It appears to have been scavenged, possibly to replace roofing that local houses lost in the hurricanes.

11-15 November 2008: Parc La Visite scouting trip

- Verify logistics, to access site from PAP on public transport via Kenskoff, and Furcy, then on foot to La Visite with hired mules to carry baggage.
- Survey two nights on Tet Opak and Tet Blòkòs known (from our January 2008 work) to have relatively high BCPE abundance. Detect calling BCPE in same areas, and roughly same abundance as Jan 2008. Return on foot and public transport via Furcy, Kenskoff to PAP.

January - February 2009 Survey expeditions

We initially plan to visit each of the three known BCPE breeding areas, at Loma del Toro, Pic Macaya and La Visite. However, the Macaya trip we must postpone until November 2009 because several key Haitian and North American team members are unavailable. Instead of visiting Macaya, we substitute a brief trip to Valle Nuevo, in the Dominican Republic. Below are details of our chief accomplishments on these trips:

8-18 January 2009: Loma del Toro

Dominican Republic, Sierra de Bahoruco National Park. This field site is <1 km from the Haitian border.

- Conduct nightly surveys along the cliff face for 10-40 minutes every 300-500m. Detect at most a handful of birds calling at any one spot. Numbers may be reduced by light of the full moon on some nights.
- Re-locate a nest found by Ted Simons et al. in 2002 and deploy a motion-sensitive camera there. We will recover this device later in 2009.
- Visit a reputed "new" BCPE site several km from the known site. Detect what sounds like two calling birds, but determine with a spotlight that it is actually two separate pairs circling in courtship flight. This is less of a new site, and more an extension of the Loma del Toro site.
- Deploy an Automated Recording Unit from Cornell Lab of O's Bioacoustics Research Program at this "new" site. We choose this site because its location in a canyon is much more protected from wind than the north-facing cliff face where Simons and others found the nest in 2002. We will recover this device later in 2009.

23 January - 3 February: La Visite

Haiti, Massif de la Selle. This field site 20km SE of PAP is ostensibly inside Parc National La Visite, but the park borders are not legally defined. It is by far the most important confirmed breeding site for BCPE (Wingate 1964, Woods et al. 1992, Collar et al. 1992, Lee 2000)

- Along top of escarpment, we resurvey several locations that had high vocal activity when we visited in January 2009 and November 2008. Once again we detect similarly high vocal activity. There seem to be as many as two dozen vocalizing

birds at some of the more active sites. Vocal activity extends from roughly one hour after sunset and tapers off around 4-5 hours later. Activity is less on clear moonlit nights, but on foggy moonlit nights it does not appear to decrease much compared to dark nights. On bright moonlit nights when the top of the fog layer is below the top of the escarpment, BCPE seem to fly inside the fog, but are occasionally audible or visible above it.

- Record vocalizations, but distance (usually $\geq 100\text{m}$) and ambient noise (near constant wind, drums, music, livestock, livestock bells, etc.) prevent high quality recordings.

- Set up a single large-mesh 12m mist net at 2-4m high on four nights that we do not survey (~12 net hours total). On some nights the distinctive whoosh of wings is audible 2-15m above the net. There seem to be at least a few areas along the top of the cliff where the birds pass much more frequently than others, as often as 2-3 per minute. We played a loop recording of BCPE vocalizations on a small Radio Shack speaker for about half the net hours.

- Capture two BCPE in the net, which we photograph and release. Neither has a brood patch. These may be younger birds (<4-5 yr) prospecting for mates and nesting sites, possibly digging a nest burrow.

- Attach a radio transmitter to one of the birds. Experienced advice on attachment methods includes duct tape, glue and zip-ties. We choose to duct-tape it to the base of three retrices. Photography and handling are difficult due to the inexperience of field assistants. After release, we do not detect a radio signal, despite checking for it on five subsequent nights.

- A guide captures one BCPE that lands in the light of his headlamp as we walk home one late night. We photograph and release it.

- Over the course of 4 nights, conduct a rapid, but arduous resurvey of the cliff line (13 km) from La Visite to Tet Bernard, stopping to listen for 3-5 min every 75-250 m. Locate a half dozen vocal aggregations. Wingate called these "colonies", however it is unclear if BCPE nest in tight aggregations (i.e., colonies) or are more evenly dispersed (or both), and how the locations of their vocalizing aggregations relate to their actual nest sites. On the westernmost 2 km of cliff (Pic La Visite, Pic Cabaio), original forest has been almost entirely converted to pasture, agriculture or bare rock. In comparison to Wingate's findings, our detections of BCPE here were sparse, and we consider them likely extirpated from this area.

- Conduct surveys at Mòn d Enfer, a south-facing cliff, 5km to the SW of the main cliff, where it appears that Wingate (see map in 1964 article) found BCPE. We detect no birds, and locals knowledgeable about BCPE appearance, nesting habits and voice confirm that BCPE have not been detected at this location for many years. Thus it appears likely that petrels no longer nest in at least three specific sites where Wingate detected them in 1963.

- Locate one nest in three days of searching. It is situated in the middle of a trail that leads to a new forest clearing on the steep north-facing cliff. Evidence of BCPE nesting is a few scattered body feathers at mouth of the burrow, and a few more inside a cleanly excavated cavity in the fractured bedrock. We cannot see far enough inside the cavity to determine its contents.

-Confirm that nest searching at La Visite is difficult. Via large clearings in the cliff, access to the cliff-side forest is not difficult, but traversing the cliff inside the forest is. Movement on the steep cliff with thick twisted, wet vine-laden vegetation and crumbling limestone both underfoot and overhead is a challenging mix of rock climbing, tree climbing and caving. Speed of movement can be 100-300 m/hr and slower at night. Ropes would probably make it more cumbersome but not safer.

- When time allows, we record GPS coordinates of new clearings encountered. New clearings are common and extensive, some >1 ha.

-Using Google Earth Pro and the most recent imagery from 2005, we determine that the largest remnant patch of intact broadleaf forest was <230 ha. The maximum length was 7.2 km. Maximum width was 520 m, minimum width was 40 m, and average width was 385 m. We are awaiting current coverage from the Centre National de l'Information Géo-Spatiale (CNIGS) to determine current patch size.

24-26 February 2009: Valle Nuevo

-Visit Valle Nuevo National Park (by 4x4 truck) in the Central Cordillera of the DR to scout for BCPE. A dead bird was found and photographed there in 2005 (Eladio Fernandez, pers. com.)

-On two nights we survey 3 peaks >2100 m in elevation and a dozen other lowland locations (on the 2000 m altiplano), but record zero detections. Alto de la Bandera appears to be the most likely site for nesting birds, but it is a military zone and we are unable to obtain access on short notice.

10 March 2009: Valle Nuevo

Revisit Valle Nuevo National Park (by 4x4 truck) in the Central Cordillera of the DR to work on Golden Swallow project, but take the opportunity to scout for BCPE on Alto de la Bandera as far as military authorities permit us to ascend. It is a clear, calm, cold (<0°C) moonlit night and we detect no BCPE.

Current Work, April-May 2009

At the time of this writing, we are initiating a collaboration with Birdlife International, Fondation Seguin, Société Audubon Haïti. Dr. Jacques Pollini, a Visiting Fellow at Cornell University who specializes in research on interactions between people and their environment at forest frontiers, is leading the research to take place immediately, in May 2009. We are collaborating closely with Fondation Seguin and Société Audubon Haïti to shape our objectives to dovetail with ongoing conservation efforts in the park. Objectives are likely to include:

- Analysis of the land use dynamics, focusing of the largest fragment of intact broadleaf forest fragment where BCPE nests.
- Coarse estimation of the opportunity cost of halting broadleaf forest clearing and unsustainable resource extraction.
- Analysis of local institutions and their capacity and interests in conserving the remaining natural forest and its resources.

Summary of Findings from 2008-2009 BCPE Fieldwork to Date

- Travel logistics are neither prohibitively complicated nor expensive, especially if one can hike a few hours instead of drive a vehicle.
- Despite Haiti's reputation for social unrest, for us personal safety has not been a major concern, either for travel or at field sites, if one takes sensible precautions.
- Haitian field assistants are essential as cultural and language interpreters. Fieldwork can hinge on their participation so to ensure availability we need to find and train more people to establish at least a small cadre of reliable field assistants with whom to work.
- Haitians with formal training in field biology are few. We have, however been able to work with several interested, motivated agronomists. Thus far the individuals with whom we have worked started with modest experience in science, research and fieldwork. We are training them in field methods, and also are actively seeking additional training opportunities for them on other projects, on Hispaniola and abroad, to expand their experience and capacity.
- As noted by other researchers (Wingate 1964, Lee & Viña 1993, Simons et al. 2002, etc.), estimating numbers of birds by listening for calling individuals is difficult. Complicating factors for us included variable distance to birds (10-400 m), environmental conditions (darkness, fog, wind), ambient noise (wind, music, drums, livestock), and bird behavior (variable calling rates, flight speed and trajectory). Alternate methods such as radar or night vision may provide better counts (Day and Cooper 1995).
- At La Visite it is possible to find nests, but number of nests per unit effort was low. There is concern that intensive nest searching and frequent monitoring of nests might lead locals to also search for nests and to increase exploitation of the adults or nestlings for food.
- At La Visite it is possible to capture birds in mist nets. Our success in catching two birds with a single 12m net in about 12 net hours suggest that a larger number of nets, placed higher, enhanced with louder playback (Pololski and Kress 1992) could yield a fair sample size. At Loma del Toro we did not find a convenient deforested site with a high density of flying BCPE where we could attempt netting birds.
- It is unclear under what conditions BCPE come to ground due to the effect of artificial light. Each night we tried to spotlight them with a bright (PrincetonTec Apex, 5-Watt) headlamp, but without visible effect on their behavior. The two birds that landed near headlamps, did so on foggy nights, near moderate or dim headlamps. These conditions are common, but we captured few in this manner.
- Attaching radio transmitters to determine at-sea distributions and basic life history details should be a high priority. Since many vocalizing and courting BCPE at nesting areas in January and February are likely to be young non-breeders, net captures of breeding adults should take place in November. If birds can be captured at nests, the best time would be just after chicks hatch when parental visits are most frequent (T. Simons, pers. comm.). This would be around mid February.
- The steep, rocky, thickly-forested north slope at La Visite appears to be excellent for the burrows that the BCPE excavate to build their nests. Loma del Toro, in contrast is very rocky with much less broadleaf vegetation, and far less soil in most

areas. Numbers of BCPE at La Visite appear to exceed those at Loma del Toro by a factor of ten or more.

-Locals interviewed who lived more than about 1km from the cliffs seldom reported familiarity with BCPE. In contrast, those living close to the nesting cliffs often could describe their vocalizations, and some could describe their nesting behavior accurately. If locals reports of only occasional consumption of BCPE is accurate, then it would not appear that human consumption is less of a mortality factor than, habitat loss and introduced mammalian predators.

-Rapid clearing of the La Visite broadleaf forest for charcoal production, lumber, and conversion to agricultural and grazing land is quickly destroying the most important remaining confirmed breeding refuge for this species. As the tree cover and soil are lost, rehabilitation of the cliffs as nesting BCPE habitat becomes increasingly unlikely.

-Because of continuing habitat loss, without timely intervention, further declines in the global populations and increasing vulnerability of BCPE to extinction are inevitable.

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