

Conservation status of Black-capped Petrels (*Pterodroma hasitata*):
colony surveys at Sierra de Baoruco, Dominican Republic, January 2002



Black-capped Petrel photographed off the
North Carolina coast by Brian Patterson

submitted by

Theodore R. Simons
Jaime Collazo
Cooperative Fish and Wildlife Research Unit
Department of Zoology
201 David Clark Labs
North Carolina State University
Raleigh, North Carolina 27695
919-515-2689
tsimons@ncsu.edu
jaime_collazo@ncsu.edu

and

David Lee
John Gerwin
NC Museum of Natural Sciences
210 N. Dawson Street
Raleigh, NC 27603
(919) 715-2600
cbirds1002@aol.com
ncs1416@mindspring.com

December 2002

Background:

The Caribbean once supported significant breeding populations of Gadfly Petrels, pelagic seabirds in the genus *Pterodroma*. The Jamaica Petrel (*Pterodroma caribbaea*) disappeared from Jamaica shortly after the Small Indian Mongoose (*Herpestes auropunctatus*) was introduced in 1872 (van Halewyn and Norton 1984). The Black-capped Petrel or Diablotin (*Pterodroma hasitata*), became extinct on Martinique in pre-Columbian times, apparently as a result of harvesting by Carib Indians (Pinchon 1967; Wetmore 1952), and on Guadeloupe around 1850 (Bent 1922; Pinchon 1967), again due to exploitation by humans for food and fuel. Black-capped Petrels were also thought to breed in the mountains of eastern Cuba (Bond 1978) but Lee and Vina (1993) found no evidence of nesting during surveys conducted in 1992. Black-capped Petrels were long thought extinct until Wingate (1964) discovered substantial breeding populations in the Massif del la Selle and Massif de la Hotte of southeastern Haiti in 1961. The species apparently survived along cliff faces of the inland mountains that were inaccessible to both humans and mongooses. Wingate estimated a population of at least 2,000 breeding pairs in 1961. Subsequent surveys by Woods (1987) indicated that the population had declined by 40% due to the combined effects of habitat destruction, predation by introduced mammals, and harvesting by humans. Recent estimates suggest that less than 2,000 pairs remain in Haiti (Gochfield et al. 1994, Lee 2000) and the species is currently listed as threatened (Collier et al. 1992). A small colony also persists adjacent to the Haiti colonies in the Sierra de Baoruco in the Dominican Republic (Ottenwalder and Vargas 1979; Lee and Vina 1993, Lee 2000). Birds were heard calling at an inland site near Diablotin Mountain on Dominica in 1977 (van Halewyn and Norton 1984) but direct evidence of nesting is lacking. Current evidence indicates that waters in or adjacent to the Gulf Stream between north Florida and southern Virginia and areas off the southeast coast of Cuba comprise the primary foraging areas for breeding Black-capped Petrels (Haney 1987). The main foraging areas appear to be directly east of Cape Hatteras, North Carolina. However, some birds are found with regularity off the coasts of South Carolina and Georgia. Concentrations occurring during winter, when peak breeding activity is underway, is suggestive of breeding birds foraging along the Gulf Stream moving to and from breeding colonies (Lee 1984, 1995).

Goals and objectives:

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. A visit by the principal investigators to the Dominican Republic colony site in the Sierra de Baoruco in November 2000 confirmed the persistence of a breeding population at this site. Reconnaissance of the area indicated that a thorough survey would require a two week expedition involving approximately six biologists. The purpose of this project was to evaluate the current status of breeding populations in the Dominican Republic. Work was conducted in partnership with scientists from the Dominican National Parks Program which has a strong interest in developing a conservation plan for this species.

Results:

With funding from the USFWS the USGS, and North Carolina Museum of Natural Sciences, a Research Work Order for the project was established in August 2001 (Appendix A). During the fall of 2001 an expedition team of biologists and technical climbers was assembled. The team consisted of Ted Simons, Jaime Collazo, Kendrick

Weeks, Jeremy Lichstein, Gordon Brown, Jim Lyons, and Ross Davenport of North Carolina State University, John Gerwin of the North Carolina Museum of Natural History, and Mathew McKowan of the National Audubon Society. Team members received training in basic technical climbing and belaying techniques in Raleigh on two occasions, and climbing, field, and safety gear were assembled in November and December. We departed for the Dominican Republic on 14 January and spent several days in Santo Domingo purchasing supplies making logistic arrangements, and picking up vehicles. We determined that helicopter support was only available out of Santo Domingo, and that the cost of ferrying aircraft to our study sites was prohibitive, so we decided not to conduct surveys by helicopter. On 17 January we drove to the Dominican National Park Service ranger hut in the Sierra de Baoruco where we established a field camp. We were joined by Andreas Schubert and James Scott of the Dominican National Park Service and three local park rangers (Figure 1).



Figure 1. 2002 Black-capped Petrel expedition team. Standing left to right; Jose, Carlos, Jeremy Lichstein, Matthew McKowan, Gordon Brown, Kendrick Weeks, Ross Davenport, Jaime Collazo, Tono. Sitting; Ted Simons, Jim Lyons, John Gerwin.

The team spent the next seven days surveying potential nesting areas over an area of approximately 20 km² (Figure 2). Most cliffs could only be traversed using climbing gear, and conditions proved to be quite dangerous due to the crumbling nature of the fossilized coral bedrock (Figure 3).

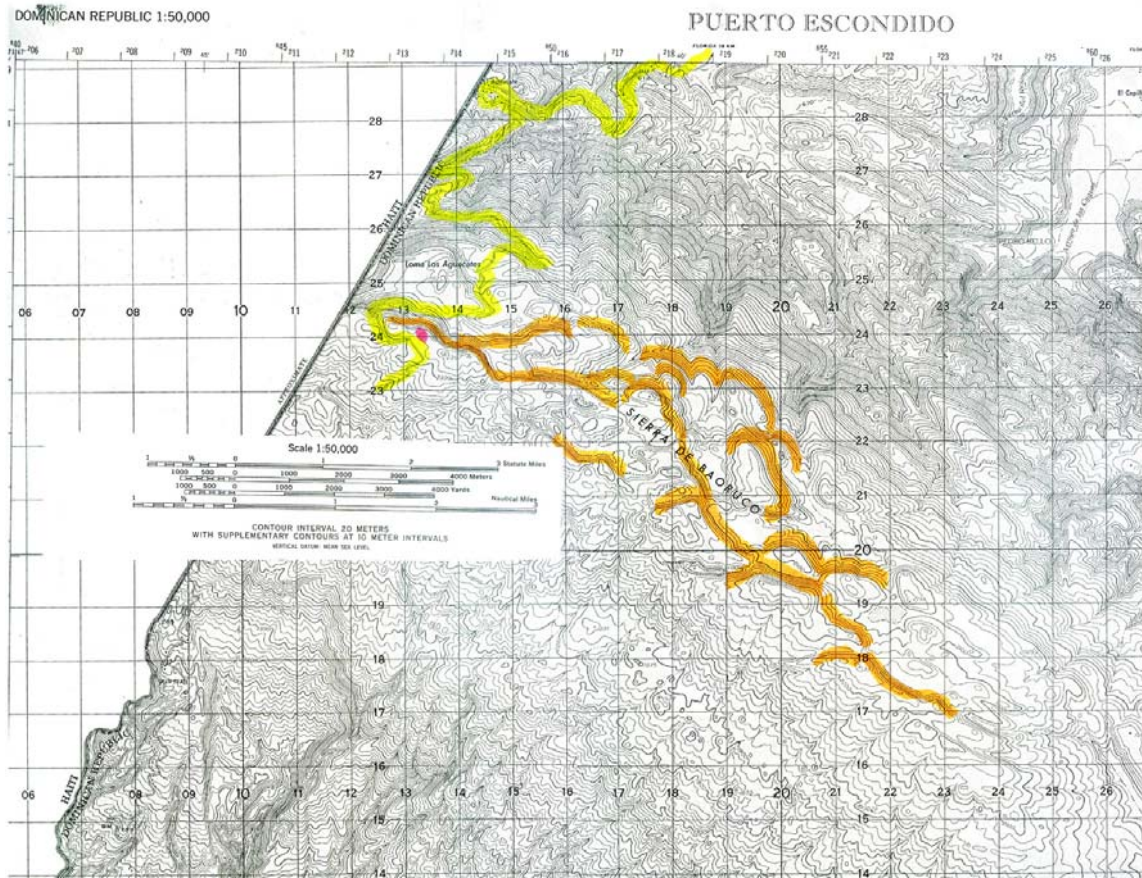


Figure 2. Black-capped Petrel nesting habitat, Sierra De Baoruco. Yellow = access road through border crossing at Loma Los Aguacates, orange = potential nesting habitat, pink = location of base camp at Park Ranger hut.



Figure 3. Surveying cliff habitats. Left, Ted Simons, right, Kendrick Weeks.

Access to the cliffs along the ridge to the east of camp was hampered by extremely dense vegetation. In many areas it was necessary to cut trails to reach the cliff face.

Nocturnal surveys of calling birds were conducted along a foot path at the base of the cliffs in grid cells 24-13 to 24-18 (Figure 2). Birds generally began calling about an hour after sunset and calling continued for several hours.

We estimated a maximum of 7-10 birds calling simultaneously on any evening but it is very difficult to infer much about the size of the breeding population from these estimates. Listening conditions varied dramatically from night to night due to wind, rain, and fog, and the relationship between the number of calling birds, breeding chronology, and breeding population size is unknown. Surveys of closely related Dark-rumped Petrels (Simons and Hodges 1998), suggest that this level of activity represents a breeding population of 10's to low 100's of breeding pairs.

Evidence of previous nesting (signs of excavation, droppings, bones of adults and chicks, and egg shell fragments) were found in several locations but only one active nest was found. At 12:00 on 20 January 2002 evidence of an active burrow was located halfway down the uppermost cliff in grid cell 24-14, UTM 2024479E, 0213055N (Figure 2). Freshly excavated dirt containing egg shell fragments below a large boulder, and evidence that pine needles and sticks were being dragged into the burrow suggested that birds were in the process of preparing their nest (Figure 3). No bird or nest was visible from the burrow entrance. A toothpick barrier was placed across the burrow entrance to monitor the departure or arrival of birds (Figure 4).

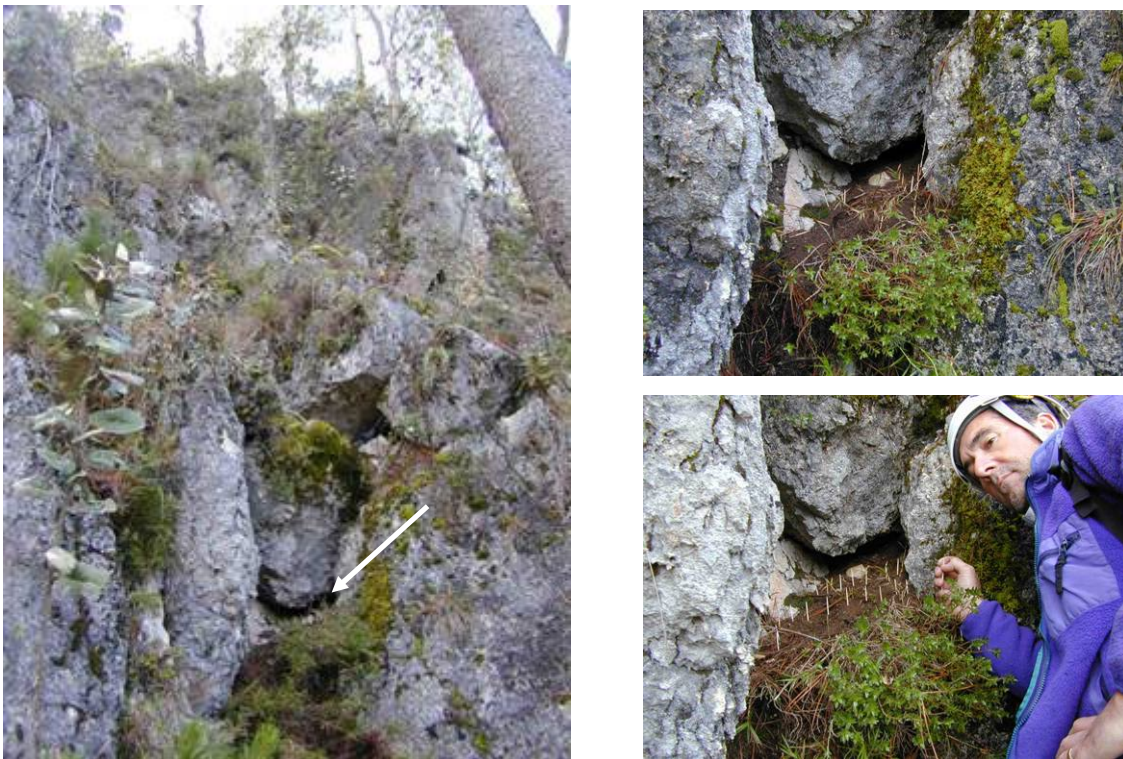


Figure 4. Active Black-capped Petrel burrow. Left, location of burrow in cliff face. Upper right, close up of burrow entrance. Lower right, toothpick barrier at burrow entrance.

We returned to the burrow on 22 January and the toothpicks were still standing, indicating that no birds had arrived or departed in the preceding 48 hrs. We then partially excavated the loose dirt at the burrow entrance to obtain a better view of the interior of the burrow. Eggshell and bone fragments in the soil indicated that the burrow had been in use for many years. With the entrance enlarged it was now possible to see the entire cavity beneath the boulder. An adult Black-capped Petrel resting on a well-constructed nest was clearly visible approximately 1 m from the burrow entrance. The bird was facing away from the entrance and the white rump and upper tail coverts, black tail, white under tail coverts, and black wing tips were clearly visible. A well defined 30 cm diameter nest cup lined with pine needles was visible around the bird. The bird appeared to be incubating, but it was not possible to reach the bird or the nest. To our knowledge this is the first active Black-capped Petrel nest ever described.

We returned to the nest the next day and found the toothpick barriers flattened, indicating that the bird had departed the burrow. Further examination revealed a newly constructed nest lined with dry, brown, pine needles. There was no egg in the nest. These observations indicate that the bird observed was probably a male who had been waiting in the burrow for the return of its mate. Male Dark-rumped Petrels frequently visit their burrows prior to egg laying in expectation of their mate's return. Females generally engage in an extended pre-laying absence from the colony, apparently acquiring the nutritional reserves necessary for egg production. Males generally visit the burrow several times during this period, and if they are in the burrow when the female returns to lay, they begin the first incubation shift. If the male is absent when the female returns, she begins incubation but exchanges duties with the male as soon as he returns. It is possible that the bird observed was a pre-breeding adult prospecting for a nest site, but the well constructed nest and evidence of previous breeding attempts suggest the bird was a breeding adult male.

We left the Sierra de Baoruco on 24 January and returned to Santo Domingo. We met with Dominican colleagues the following day and returned to the United States on 26 January.

Future work:

The Black-capped Petrel colony in the Sierra de Baoruco represents the only known breeding population in the Dominican Republic. It appears to be a small population (probably less than 200 breeding pairs) which represents the easternmost extension of the species' core breeding population in the Massif del la Selle, some 50 km due west in Haiti. The Haitian population, estimated by Wingate to be at least 2000 pairs in 1961, is thought to have declined substantially over the past 40 years, but reliable recent survey data are lacking. Although the Baoruco population is currently protected within the boundaries of a designated national park, the Haitian population lacks any protection. Land conversion and deforestation which have continued apace in recent years have likely put this population in extreme jeopardy (Figure 5).



Figure 5. View from the Sierra de Baoruco toward the Massif del la Selle, Haiti. The tree line in the foreground represents the boundary between protected forests in the Dominican Republic and private lands in Haiti.

Our present objective is to return to the colony site in 2003-4 and assess the status of Baoruco nesting colony using a portable radar. The radar, a Furuno color plotting surveillance X-band radar transmitting at 9,410 MHz, is similar to the one described in Cooper et al. (1991). The radar will be mounted on a vehicle to make it portable, and using a continuous plotting function will have a range of 0.75 nm/1.5 km. This method has been used successfully to describe the distribution and movements of Hawaiian Dark-rumped Petrels (*Pterodroma phaeopygia sandwichensis*) and Newell's (Townsend's) Shearwaters (*Puffinus auricularis newelli*) in the Hawaiian Islands (Day and Cooper 1995). We believe radar surveys will provide the best estimate of the size of the Baoruco population and that testing and calibrating the radar on the smaller population in the Dominican Republic will make future surveys in Haiti feasible. We have developed a proposal (Appendix B) for this research which we hope to apply to Black-capped Petrels in the Dominican Republic and Haiti, and migrating shorebirds and passerines in the southeastern United States.

We have also proposed to study the at-sea movement and distribution of rare seabirds using data loggers (Appendix C). Lotek Technologies (www.lotek.com/ltd.htm) has recently developed small and relatively inexpensive data loggers that make it possible to collect movement data from birds over large spatial and temporal scales (Weimerskirch and Wilson 2000). The loggers which currently weigh as little as 16 g use time and light intensity to continuously calculate and store locations with an accuracy of approximately 1⁰ of latitude. Use of the loggers requires that birds be captured twice, once to attach the loggers (usually glued to a leg band), and a second time (up to 10 years later) to remove the logger and download the data. Deployment of

these loggers on threatened and endangered seabirds holds the potential to provide valuable new information on the distribution and movement of birds at sea. We have proposed a pilot study to attach data loggers to 10 adult Dark-rumped Petrels at Haleakala National Park, Maui, Hawaii, during the 2003 breeding season and to recapture birds in 2004 to retrieve the loggers and movement data. A banding program for Dark-rumped Petrels begun at Haleakala in 1979 (Simons 1983) has been continued by NPS staff who have captured as many as 40 adult birds in a single breeding season using Havahart traps placed over burrow entrances. Adult Dark-rumped Petrels weigh between 350 and 650 g (Simons and Hodges 1998). Loggers will only be deployed on birds weighing more than 525 g to ensure that they do not exceed 3% of adult weight. Loggers weighing less than 10 g are currently under development by Lotek which would permit the deployment of loggers on smaller birds such as Black-capped Petrels.

LITERATURE CITED:

- Bent, A.C. 1922. Life histories of North American petrels and pelicans and their allies. Bulletin U.S. National Museum 121, 325 pp.
- Bond, J. 1978. Twenty-second supplement to the check-list of birds of the West Indies (1956). The Acad. Nat. Sci. Phil. 20 pp.
- Collier, N.J., L.P. Gonzaga, N. Krabbe, A. Madrono Neito, L.G. Naranio, T.A. Parker, III, and D.C. Wege. 1992. Threatened birds of the Americas. ICBP/IUCN Red Data Book, 3rd ed., pt. 2. Smith. Inst. Press. Washington, DC. 1,150 pp.
- Cooper, B. A., R. H. Day, R. J. Ritchie, and C. L. Cranor. 1991. An improved marine radar system for studies of bird migration. *Journal of Field Ornithology* 62: 367–377.
- Day, R. H., and B. A. Cooper. 1995. Patterns of movement of Dark-rumped Petrels and Newell's Shearwaters on Kauai. *Condor* 97: 1011–1027.
- Gochfield, M., J. Burger, A. Haynes-Sutton, R. van Halewyn, and J.E. Salvina. 1994. Successful approaches to seabird protection in the West Indies. Pp. 186-209 in: Nettleship, D.N., J. Burger, and M. Gochfield (eds.), *Seabirds and islands: threats case studies and action plans*. Birdlife conservation series no. 1. 318 pp.
- Haney, J.C. 1987. Aspects of the pelagic ecology and known behavior of the Black-capped Petrel (*Pterodroma hasitata*). *Wilson Bull.* 102: 141-151.
- Lee, D.S. 1984 Petrels and Storm Petrels in North Carolina's off shore waters: including species previously unrecorded for North America. *Am. Birds* 38: 151-163.
- Lee, D.S. 1995. Marine birds off the coast of North Carolina. *Chat* 51: 40-42.
- Lee, D.S. 2000. Status and conservation priorities for Black-capped Petrels in the West Indies. Pp. 11-18 in: Schreiber, E.A. and D.S. Lee (eds.), *Status and conservation of West Indian seabirds*. Society of Caribbean Ornithology, Special Publication no. 1, 223 pp.
- Lee, D.S. and N. Vina. 1993. A re-evaluation of the status of the endangered Black-capped Petrel, *Pterodroma hasitata*, in Cuba. *Ornithological Neotropical* 4: 99-101.
- Ottenwalder, J.A. and T. Vargas M. 1979. Nueva localidad para el Diablotin en la Republica Dominicana. *Naturalista Posta* 36/79: 185-186.
- Pinchon, R. 1967. Quelques aspects de la nature aux Antilles. Fort-de-France. 254 pp.
- Schreiber, E.A. and D.S. Lee (eds.). 2000. *Status and conservation of West Indian seabirds*. Society of Caribbean Ornithology, Special Publication no. 1, 223 pp.
- Simons, T.R. and C.N. Hodges. 1998. The Dark-rumped Petrel (*Pterodroma phaeopygia*) In: *The Birds of North America*, No. 345 (A. Poole, and F. Gill, eds.). The Birds of North America Inc., Philadelphia, PA, 24 pp.

- Van Halewyn, R. and R.L. Norton. 1984. The status and conservation of seabirds in the Caribbean. Pp. 169-222 in: Croxall, J.P., P.G. Evans, and R.W. Schreiber (eds.), Status and conservation of the world's seabirds. ICBP Tech. Publ., No. 2. 778 pp.
- Weimerskirch, H., N.P. Brothers, and P. Jouventin. 1997. *Biological Conservation* 79: 257-270.
- Weimerskirch, H. and R.P. Wilson. 2000. Oceanic respite for Wandering Albatross. *Nature* 406: 955-956.
- Wetmore, A. 1952. A record of the Black-capped Petrel, *Pterodroma hasitata*, in Martinique. *Auk* 69: 460.
- Wingate, D.B. 1964. Discovery of breeding Black-capped Petrels on Hispaniola. *Auk* 81: 147-159.
- Woods, C. 1987. The threatened and endangered birds of Haiti: lost horizons and new hopes. Pp 385-429 in: Proceedings 1987 Jean Delacour/IFCB Symposium on breeding birds in captivity. North Hollywood, CA. Int. Found. Cons. Birds.