Thermal surveys for the Diablotin Black-capped Petrel on Dominica: Results from an expedition during January 2022



April 2022

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SUGGESTED CITATION: Satgé, Y. and G. Millischer. 2022. Thermal surveys for the Diablotin Black-capped Petrel on Dominica: Results from an expedition during January and February 2022. Unpublished report from Environmental Protection in the Caribbean. Green Cove Springs, Florida, USA.

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1 Introduction

The Black-capped petrel (*Pterodroma hasitata*), also known as the Diablotin bird on Dominica, is one of the most threatened seabirds in the western north Atlantic. Its marine distribution includes the western northern Atlantic, the Caribbean Sea (most often near Hispaniola but often ranging southwards to the Caribbean coast of South America), and the Gulf of Mexico (Jodice et al. 2015, Satgé et al. 2019, Leopold et al. 2019, Jodice et al. 2021). The species is currently only known to nest on the island of Hispaniola but breeding is probable in Dominica and suspected in Cuba, Jamaica, and Guadeloupe (Wheeler et al. 2021). Black-capped petrels were widespread in the Greater Antilles in the nineteenth century (Collar et al. 1992) but they are now categorized as Endangered throughout their range (BirdLife International 2018) and are currently being considered by the USFWS (2018a) for listing under the US Endangered Species Act. The current population size is unknown but estimates based on at-sea observations range from 2000 to 4000 individuals, with a fragmented nesting population estimated at 500 to 1000 pairs (BirdLife International 2022), although, to date, only ~100 nests have been found (Wheeler et al. 2021). All known nesting sites (Massif de la Selle in Haiti, and Sierra de Bahoruco and Cordillera Central in the Dominican Republic) are in mountainous areas, more than 1500m above sea level. There, Black-capped petrels nest underground, in the thick understory of steep montane forests, and excavate burrows in limestone crevasses or loose rocks, and soil. Nesting Black-capped petrels are threatened by a variety of human impacts including agricultural land clearing, introduced predators, collision with telecommunication towers, and light pollution. Recent surveys of known nesting areas showed an overall negative trend in population estimates since 2013 (Wheeler et al. 2021). If no major action is taken to halt this decline, the U.S. Fish and Wildlife Service predicts that the two major nesting populations are likely to face extirpation by 2070, a potential loss of up to 85-95% of the currently known breeding population (USFWS 2018b).

The island of Dominica is the designate type locality for the Black-capped Petrel. Widespread in the early 1800's, the species was commercially hunted for local consumption and export to Guadeloupe and Martinique (Simons et al. 2013). Through the mid-1800's, petrels were documented to be nesting on Morne aux Diables, Morne Diablotin, and Morne Fou (Simons et al. 2013). Black-capped Petrel populations diminished into the late-1800's and the last known nesting petrel was found in 1862 (Simons et al. 2013). Expeditions to locate nesting petrels continued through the 1900's, however no new nesting petrels were located (Simons et al. 2013). Records in the early 1930's of "great quantities" of Black-capped Petrels offshore of the capital Roseau, as well as incidental records of hunted petrels still being exported to Guadeloupe and Martinique, provide evidence that the species persisted on Dominica through the 1930's (Simons et al. 2013).

An expedition to search for petrels on Dominica in October/November of 1964 found no evidence of nesting Black-capped Petrels (Wingate 1964). Further, interviews of humans living near historic petrel nesting areas provided no further evidence that petrels persisted on Dominica (Wingate 1964). In the 1970's to 1990's, expeditions in Dominica's forests encountered Black-capped Petrels calling or flying on (Evans 1991). In 1977: petrels heard calling near Morne Diablotin; 1980: birds heard in south parts of island; 1982: small numbers observed along southeast coast and flying inland after dark; 1984, April:

flock offshore of Delices; 1989: bird flying off coast near Morne Fous and potentially coming ashore; 1990: adult bird found grounded in Roseau; and 1997: birds observed flying over Morne Verte (Evans and James 1997).

More recently, additional sightings of Black-capped Petrels on Dominica were reported. [Edit 2026-10-21: after discussing with Arlington James, it appears that the following information is incorrect] ~~In January 2007: an adult petrel was observed walking across the road in the village of Trafalgar;~~ May 2007: a ~~young~~ petrel was found on the ground near the village of Padu and was brought into the Forestry offices, where it later died; ~~2013: a petrel was observed on the ground near the village of Padu and left there; 2015: a petrel was observed on the ground in the village of Morne Prosper and left there~~ (*fide* Arlington James 2015). Between 2001 and 2018, twelve Black-capped Petrels were spotted flying by the island of Guadeloupe towards Dominica (Levesque and Yesou 2018).

Over the last 20 years, Environmental Protection in the Caribbean (EPIC) led five expeditions on Dominica, to look for Black-capped Petrels. In 2001, areas in the southern mountains near Morne Fou were surveyed for nesting birds in burrows and for calling petrels at night: no petrels were detected (Brown and Collier 2001). In 2010, another expedition listened for calling birds at night and, via boat, looked for petrels on the water: no petrels were detected (Lowrie et al. 2012). In January 2015, an expedition used a marine radar unit, night-vision optics, and song-meter recording units to detect the presence of Black-capped Petrels. 968 petrel-like targets were detected, using radar over 20 stations. 8 flying petrels were reported using night-vision. The song-meter units did not detect any petrel calls (Brown 2015). A follow-up effort was completed in 2016 by a joint Grupo Jaragua/American Bird Conservancy team with the intent of finding nesting petrels. The team accomplished eight days of nest searching on Morne Trois Piton, Morne Micotrin, and the ridge connecting the two peaks. No petrel nests were located, although several areas were deemed appropriate for nesting petrels (Rupp et al. 2016). In 2020, marine radar unit and night-vision optics were used once again to monitor the presence of Black-capped Petrels on the island. 240 petrel-like targets were detected, using radar at 8 stations, and 6 flying petrels were reported, using night-vision (Brown 2020). Acoustic monitoring units were also deployed but data have yet to be analyzed.

Building on these efforts, we organized an expedition in January 2022 to use surveying technology not yet used on Dominica, thermal imagery. The objective of this effort was to monitor Black-capped Petrel activity at suspected nesting locations (including, but not limited to, Morne Trois Pitons, Morne Micotrin, and Morne aux Diables) and along flyways to locate potential breeding areas and direct ground searches. This report details the methods and results of this expedition and recommends next steps for the conservation of the Black-capped Petrel on Dominica.

2 Methods

2.1 Survey area

Fieldwork took place on Dominica, at locations where Black-capped Petrel activity was recorded during radar surveys (Brown 2015, Brown 2020). We prioritized areas that had the highest numbers of petrel-

like target detections and selected five main areas: from north to south, Morne aux Diables, lower Layou River, Morne Trois Pitons, Morne Micotrin, and Morne Anglais (Figure 1). Access roads to Morne Diablotin were damaged by recent hurricanes, which prevented us from getting close enough to the mountain to survey. Except for the lower Layou River, we chose survey locations that provided open views of nearby mountains; the location on the lower Layou River provided views of a major flyway (Brown 2015, Brown 2020). We selected survey locations on ridgelines or above cliffs, with low vegetation (<1m) or clearings that allowed unrestricted views of the sky, mountain tops, ridgelines and/or valley where potential petrel activity might occur (Figure 2). When topology and vegetation allowed, we chose locations within 1.5 km of potential nesting sites. 1.5 km is the maximum distance at which a bird the size of a Black-capped Petrel can reasonably be detected with thermal binoculars.

2.2 Observations

From 23 – 31 January, we surveyed flight corridors for potential Black-capped Petrel activity. Black-capped Petrels are most active between sunset and three hours after sunset (Brown et al. 2015, Brown et al. 2020, Satgé et al. 2019) therefore we started our surveys at sunset (or slightly after, depending on logistics and weather) and ended them ~3-6 hours later (Table 1).

We made observations through long-range cooled thermal binoculars (MATIS LR, Safran, France) affixed on tripods (Figure 3). Unlike night-vision technology, which uses available light and is limited in distance and quality, thermographic technology provides night-time imagery using differences in infrared radiations emitted by objects. The level of infrared radiation produced by an object is a direct function of its temperature, which is independent from the amount of light available. Animals and particularly homeothermic (i.e. “warm-blooded”) animals such as Black-capped Petrels, differ from background temperatures and can therefore be observed with thermal binoculars even when no light is present. In cooled thermal binoculars, a cooling system shields the infrared sensors from the binoculars’ own heat thus making them extremely sensitive to differences in temperature between the objects and background scenes being observed. Images are not displayed as true color but instead as grayscales, with warmest temperatures in white and coolest temperatures in black. It is important to note that, fog/clouds and rain can limit the range of thermal binoculars, due to the scattering of light off droplets of water.

Two observers were present during surveys and one person was observing at all times (i.e. principal binocular). When weather and logistics allowed it, a second person was also observing (secondary binocular)(Table 2). We continuously scanned the sky (up to an altitude of ~55-60°), mountain tops and slopes, ridgelines, and/or valleys in the available field of view (Appendix A). To avoid fatigue, observers exchanged fields of view during the night. A video recorder was attached to the principal binocular. The recorder was manually activated whenever an object of interest was located. The recorder was set on a 15-second loop, thus additionally recording the last 15 seconds before the record was manually activated. Depending on survey locations, binoculars were battery-powered (power supply was limited to ~2.5 hours per battery) or connected to a car battery (unlimited power supply). Two batteries were available.

During the survey effort, we noted observations of flying animals. Additionally, following each survey, we downloaded data onto a laptop and reviewed the recorded videos. Bats are present in Dominica and, at night, larger species can be confused with birds. Therefore, we directed our attention to flying patterns (direct flight vs. erratic flight), flapping frequency (slow vs. fast), time spent gliding or soaring, apparent differences in temperature of different body parts (e.g. entirely warm feathered wing vs. warm arm and cool membrane), and visible body parts (i.e. extended head and tail).

3 Results

During the 9 nights between 23 and 31 January, we surveyed 6 sites, from 11 survey locations. We surveyed some sites more than once. Five sites were adjacent to potential nesting areas and one site was adjacent to a potential flight corridor (Figure 2). On 2 nights (24 and 27 January), skies were clear with strong winds and observations of mountain tops were possible; on 5 nights (23, 25, 26, 29, and 30 January), clouds covered mountain tops and observation were only possible below ~900-1000 m above sea level; and on 2 nights (28 and 31 January), low clouds restricted observations to the lower Layou River flyway (Appendix A). The principal binocular/observer was on effort for 36.5 h, and the secondary binocular/observer for 17.4 h; overall survey effort totaled 53.9 hours (Table 2).

At 20:37 on 25 January, we observed a flying petrel (Appendix A). We first located the flying animal at a distance of ~700-1000 m from the survey site, at a high elevation in the bottom edge of clouds (~900m above sea level)(Figure 4). The animal appeared to fly away from a small saddle in western central Micotrin, flying towards the Caribbean Sea. Using the optical zoom, we could confirm the identification. It displayed strong flapping with long narrow wings. Body and wings appeared “white” (i.e. warmer than the surrounding environment). The head and tail were clearly visible. A video recording is available as a supplement to this report. This is the only petrel we observed during this expedition. We did not hear petrel calls during any of the night surveyed.

On multiple occasions, we observed flying animals performing direct flights sustained over long distances, a flying pattern similar to that of *Pterodroma* petrels. Given the far distance of most of these observations (>500m), we could not confirm identification in the field. Analysis of video recording confirmed these animals as bats: fast flapping frequency, “black” wings (i.e. cool temperatures), no extended head or tail visible. Bats flying with this pattern were going towards mountain zones or away from mountain zones. On several occasions, we also observed two bats flying in tandem, in straight lines or in descending circles, in a fashion similar to courtship and pair-bonding flights in Common Terns (*Sterna hirundo*). Bat activity was more pronounced during nights with no or low wind, from sunset to ~3 h after sunset.

4 Discussion

This survey confirms the presence of the Black-capped Petrel in Dominica. The petrel we observed was flying away from the western ridge of Morne Micotrin although the thick layer of clouds prevented us from precisely seeing where it was coming from on the mountain. This area of Morne Micotrin has been

subject to radar surveys and nest searches in 2016 (Figure 4). Radar surveys reported 127 petrel-like target and 2 petrel observations in 2015, and 21 petrel-like targets in 2020. During the 2016 searches, petrel experts from Grupo Jaragua judged the habitat available on Morne Micotrin appropriate for nesting petrels (Rupp et al. 2016). To date, no petrel nest has been found. An acoustic recorder was deployed in January 2015 but no petrels were detected. Another recorder was deployed in February 2020 but data has yet to be analyzed.

We were not able to observe petrel numbers reported during previous radar surveys. Although the different methodologies used do not allow for direct comparisons between surveys, in Table 3 we list potential explanations that could have contributed to these differences in the number of observed petrels (calendar period, effort, survey locations, detection, small population, and population decrease). We also discuss elements supporting and opposing these hypotheses. Finally, we propose recommendations to address these differences in future surveys.

During our surveys, we observed significant bat activity, starting at dusk and starting to decrease towards the end of our nightly effort (i.e. 3-6 h after sunset). An analysis of nocturnal bat behavior is beyond the subject of this report but we see as important to share some observations that relate to Black-capped Petrel behavior. We observed numerous small insectivorous bats (such as *Myotis sp.* present on the island), which fly with an erratic flying pattern typical of their echolocating hunting technique. However, our nighttime observations also suggest that larger bats, such as the Jamaican Fruit-Bat (*Artibeus jamaicensis*, Dominica's largest bat species to be present at our survey locations), may display a flying pattern more similar to that of seabirds. Indeed, we recorded bat sustaining direct flights over long distances, possibly moving from roosting sites to foraging areas. These bats flew at apparent speeds that were similar to that of the petrel we recorded. Although a definite identification was not possible in the field in most observations, we could confirm identification in video recordings, based on flapping frequency, apparent wing temperature, and general shape. Additionally, in other occasions, we recorded pairs of bats performing tandem flights, i.e. flights in which one individual flies above the other at a short distance, following it in every direction. In seabirds, this behavior is used in courtship and pair-bonding but we do not know the reason for this behavior in bats.

5 Recommendations for future conservation work

Next steps in the conservation of Black-capped Petrel on Dominica should prioritize and intensify the search for nesting areas on the island. We agree with Brown (2020) that the deployment of a full team dedicated to searches for the entire breeding season would be beneficial in locating nesting areas. Dominica offers large expanses of suitable nesting habitat but searching through all of the available habitat may inefficiently use the limited monetary and human resources available. Thus, to maximize opportunities to locate nests, it appears necessary to concentrate search efforts onto priority areas.

As a first step, we recommend focusing search effort to Morne Micotrin, in particular the western slopes (Figure 4). Search effort can be concentrated when petrels are the most active: the nuptial period in October/November and the early incubation period in December/January. The search team, when deployed, would carry out a suite of conservation and research activities including but not limited to:

- Thermal observations from DO05 (Gus' ridge, or a nearby location with adequate viewing opportunities) towards Morne Micotrin and the Middleham valley (principal), and towards the Laudat flyway (secondary), 10-15 nights per period.
- Ground searches in the western slopes of Morne Micotrin, in particular the area below the saddle (i.e. the area not searched in 2016), 15-25 days per period. Optimally, a trained dog should be used to increase chances of locating burrows hidden from human view. Critical to this would be the clearing of access trails to potential areas.
- Deployment of an array of acoustic recorders in the search area, including maintenance and data collection, during the nuptial visit of October/November and during the breeding period from December to May.

Ground searches for petrels can be combined with other conservation and research fieldwork in suitable mountainous habitat (amphibian and reptile conservation, geothermic assessments, etc.)

Additionally, we recommend that the following activities be also considered:

- Marine survey of potential Black-capped Petrel hotspots at sea-mount fishing or whale-watching areas, 6-12 times throughout the year. Locating areas near Dominica where petrels congregate is a first step towards deploying satellite tracking devices on petrels, a method that can provide robust information on nesting areas in Dominica.
- Surveys of human communities near potential nesting areas, to gather information on where petrel hunting occurred in the past and to understand any human/petrel interactions that may occur.
- Once-weekly sea-watch surveys from vantage points near suspected flyways (e.g. mouths of Layou, Pichelin, Rosalie, Castle-Bruce, Hampstead, Manicou, Porthsmouth, or Coulibistrie rivers; offshore Roseau).

Finally, we also recommend providing Black-capped Petrel outreach lesson plans to primary school, high school, and college aged youth (optimally, 2 lessons per week, island-wide, from January to May). Educational material may be obtained from the International Black-capped Petrel Conservation Group.

6 Acknowledgements

We thank Stephen Durand and Eugene Felix for organizing this search effort. We thank Mr. Minchinton Burton and Bradley Guye for granting us permission to conduct fieldwork in National Parks. We also thank Jacqueline André for facilitating our stay in Dominica, and Jeanelle Brisbane for helping with fieldwork. Thierry Dupoux at Safran graciously allowed us to use the thermal binoculars. Jennifer Wheeler helped with travel logistics. This effort was funded by ABC and BirdsCaribbean. Finally, but very importantly, we warmly thank Mr. Gus of Laudat for generously welcoming us on his property, which allowed us to observe the flying petrel.

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Table 1. Details of survey locations used during the January 2022 thermal binocular survey of Black-capped Petrels on Dominica.

Site Code	Site Name	Latitude	Longitude	Area observed	Elevation (m)	Distance from nearest sea (km)	Nearest sea	Distance from nearest mountain (km)	Nearest mountain
DO01	Gus' Place	15.33708	-61.33269	Micotrin, Trois Piton	620	6.5	Caribbean	1.5	Micotrin
DO02	Freshwater Saddle	15.33903	-61.31231	Trafalgar flyway, Watt-Anglais chain	830	7.0	Caribbean	0.8	Micotrin
DO03	Freshwater Dam	15.34064	-61.30864	Micotrin, Trafalgar flyway, Watt-Anglais chain	770	6.5	Atlantic	1.2	Micotrin
DO04	Boiling Road	15.34669	-61.31180	Trois Piton	790	6.7	Atlantic	1.0	Micotrin
DO05	Gus' Ridge	15.33711	-61.33297	Micotrin, Trois Piton	630	6.5	Caribbean	1.5	Micotrin
DO06	Green Hill	15.36607	-61.36035	Trois Piton	530	3.8	Caribbean	3.4	Trois Pitons
DO07	Warner	15.39842	-61.40338	Lower Layou River	330	1.8	Caribbean	8.5	Trois Pitons
DO08	Bellevue Ridge	15.27841	-61.34286	Morne Anglais	640	3.4	Caribbean	1.4	Anglais
DO09	Morne Aux Diables West	15.61397	-61.44769	Morne aux Diables	400	1.8	Caribbean	1.1	Aux Diables
DO10	Morne aux Diables crater	15.61913	-61.43661	Morne aux Diables	500	1.5	Dominica Passage	0.7	Aux Diables
DO11	Calvin's Place	15.40160	-61.41794	Lower Layou River	90	1.0	Caribbean	10.5	Diablotin/Trois Pitons

Table 2. Details of observation effort during the January 2022 thermal binocular survey of Black-capped Petrels on Dominica.

			Observer 1			Observer 2		
Date	**Site Code**	**Site Name**	**Start time**	**End time**	**Effort (h)**	**Start time**	**End time**	**Effort (h)**
2022-01-23	DO01	Gus' Place	19:00	22:53	3.88	-	-	-
2022-01-24	DO02	Freshwater Saddle	19:00	21:54	2.90	-	-	-
2022-01-24	DO03	Freshwater Dam	22:07	23:00	0.88	-	-	-
2022-01-25	DO04	Boiling Road	0:11	0:30	0.32	-	-	-
2022-01-25	DO05	Gus' Ridge	17:59	23:59	6.00	-	-	-
2022-01-26	DO06	Gus' Ridge	18:00	21:22	3.37	18:22	20:00	1.63
2022-01-26	DO03	Freshwater Dam	22:00	23:00	1.00	-	-	-
2022-01-27	DO06	Green Hill	18:10	22:05	3.92	18:30	22:05	3.58
2022-01-28	DO07	Warner	18:00	20:35	2.58	18:10	20:50	2.67
2022-01-29	DO08	Bellevue Ridge	18:00	22:30	4.50	18:20	22:30	4.17
2022-01-30	DO09	Morne Aux Diables West	18:00	21:00	3.00	18:30	21:00	2.50
2022-01-30	DO10	Morne aux Diables crater	21:30	22:30	1.00	-	-	-
2022-01-31	DO11	Calvin's Place	18:10	21:20	3.17	18:30	21:20	2.83
			Total Observer 1 (h):		**36.52**	**Total Observer 2 (h):**		**17.38**

Table 3. Analysis of the main hypotheses explaining the limited results of the January 2022 thermal binocular survey of Black-capped Petrels on Dominica.

Explanation	Hypothesis	Elements supporting the hypothesis	Elements opposing the hypothesis	Recommendations
Calendar period	The period used during this survey was not optimal because petrels were not present at the time: we may have chosen a time in the annual cycle when petrels are not as numerous (e.g. pre-breeding exodus) or as active (e.g. incubation or chick-rearing) over the island (Appendix B).	The phenology of Black-capped Petrels nesting on Dominica is not known. The encounter of a grounded fledgling in May 2007 suggests that petrels on the island may be breeding 1-1.5 months earlier than those on Hispaniola, which typically fledge in June. If this is the case, then the 2022 survey period overlapped with the end of incubation and the start of hatching, a time when Black-capped Petrels are present but show limited activity.	Radar surveys were conducted at similar dates in 2015 and 2020 yet reported significant petrel activity.	Choose a calendar period when petrel activity is more intense: nuptial visit in October; egg-laying period in early December. Spread effort throughout the breeding period (e.g. biweekly or monthly).
Effort	The effort was not sustained enough, or too dispersed throughout the island, to locate numerous petrels.	- During periods of low activity, petrels may parsimoniously return to nesting sites. Dispersing survey locations throughout the island, and spending only one night at most locations, may have prevented from observing irregularly returning petrels. - Surveys did not last enough into the night and missed petrels returning later.	- Radar surveys had similar levels of effort at similar dates, locations, and hours yet located significant numbers of petrels. Radar surveys found no petrel activity beyond 3 hours after sunset. - Except on 28 January, all thermal surveys lasted beyond 3 hours after sunset.	Increase effort: concentrate effort at limited number of locations, or repeat surveys regularly throughout optimal periods.

Explanation	Hypothesis	Elements supporting the hypothesis	Elements opposing the hypothesis	Recommendations
Survey locations	Survey locations were not located near nesting areas.	Survey locations were limited by the availability of open terrain with clear visibility towards potential nesting areas. These locations may have been too far from nesting areas or on wrong sides of mountains.	Radar surveys were conducted at the same locations, with a similar detection radius yet detected significant petrel activity.	Seek survey locations that are closer to potential nesting areas, or on flyways/slopes not yet surveyed (e.g. south-facing slopes of Morne aux Diables, Atlantic slopes of Morne Trois Pitons). Concentrate effort on a limited number of optimal locations.
Detection	Petrels were present but were not detected.	- Radar surveys were conducted at the same locations at similar dates yet detected significant petrel activity. - Clouds hid petrel activity at high altitudes.	- Survey locations provided a clear, unobstructed field of view towards potential nesting areas. During most survey nights, two observers continuously scanned the field of view. - When present, clouds were high enough to allow observations on most parts of potential nesting areas. Petrels flying inland are expected to come from the sea level and to gradually gain altitude as they fly along river flyways. Except during two nights when mountains were obstructed by low clouds (28 and 31 January), flyways remained unobstructed and any petrel flying inland would have been visible. - Additionally, petrels do not directly fly into nesting areas but circle around their nest site for several minutes. Such activity increases the possibility for detection.	Combine thermal and radar surveys: use radar to detect flying animals, and thermal to confirm identification. Test differences in detection.

Explanation	Hypothesis	Elements supporting the hypothesis	Elements opposing the hypothesis	Recommendations
Small population size	Petrels were present but in very small numbers.	- Only one petrel was observed during our survey. - Only a limited number of grounded petrels have been reported despite significant human presence near potential nesting areas and on major flyways.	- Radar surveys report a significant number of petrel-like targets on the island. - The petrel population on Hispaniola is suspected to be significantly bigger than the one on Dominica. Yet, as in Dominica, few grounded birds are reported on Hispaniola.	Conduct surveys when petrel activity is more intense: nuptial visit in October; egg-laying period in early December. Spread effort throughout the breeding period (e.g. biweekly or monthly).
Population decrease	Petrels were not present, due to a sharp population decrease.	Radar survey in 2015 and 2020 reported a decline in petrel-like targets observed between those dates. The lack of observations during the 2022 survey may reflect further decline.	- 2020 radar survey reported 240 petrel-like targets with a maximum of 90 petrel-like targets at Bellevue-Chopin. Only an acute event of major importance could have caused such a population to decline in such a short time. Between 2020 and 2022, no event affected terrestrial areas in Dominica, and no major oil spill (the only plausible even that could affect such a number of birds at sea) was reported in the petrel marine range. - It is not possible to directly compare results of radar and thermal surveys, as different methodologies have been used.	Combine thermal and radar surveys to assess differences in detection and allow for comparisons of results.

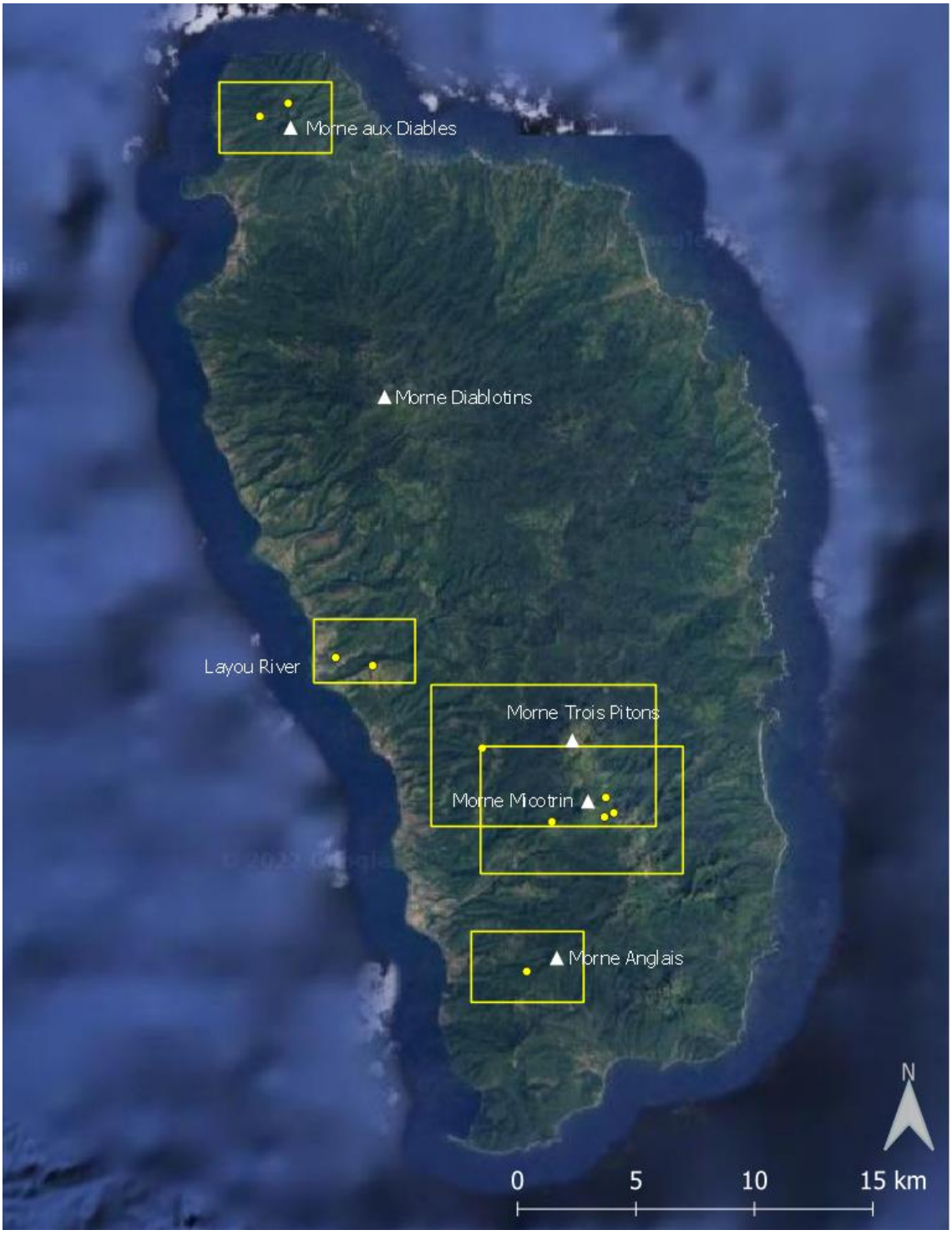
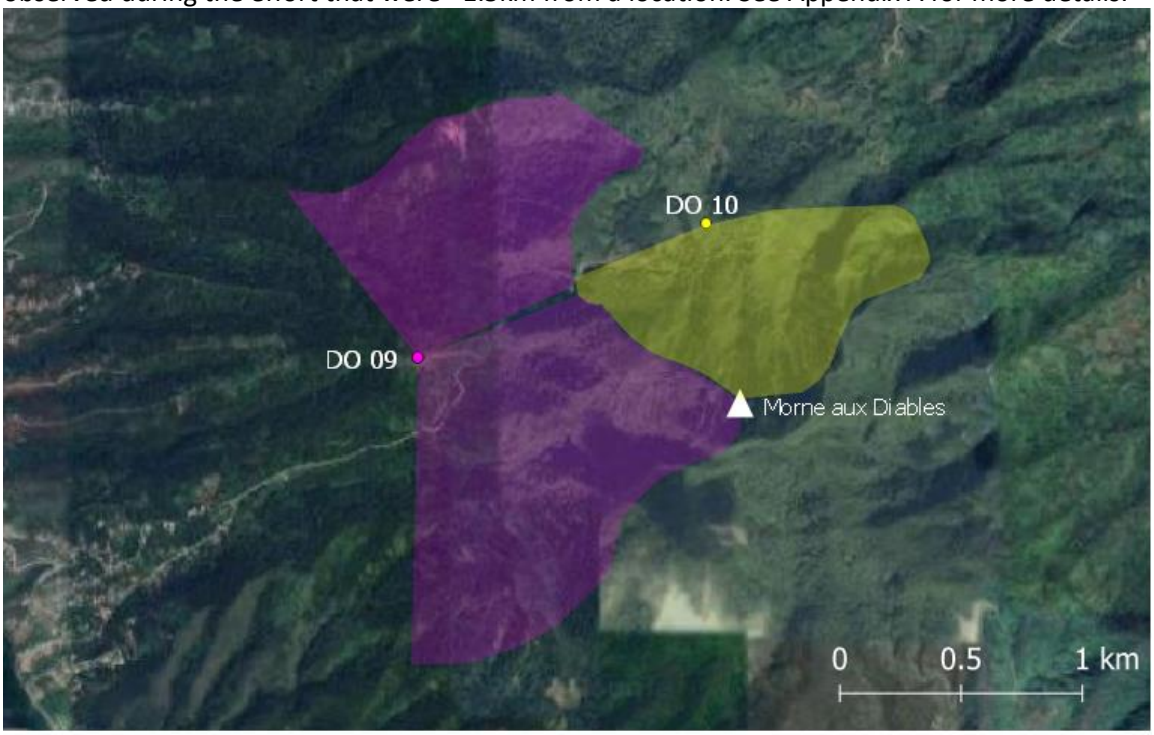


Figure 1. Areas surveyed during the January 2022 thermal binocular effort for Black-capped Petrels on Dominica.

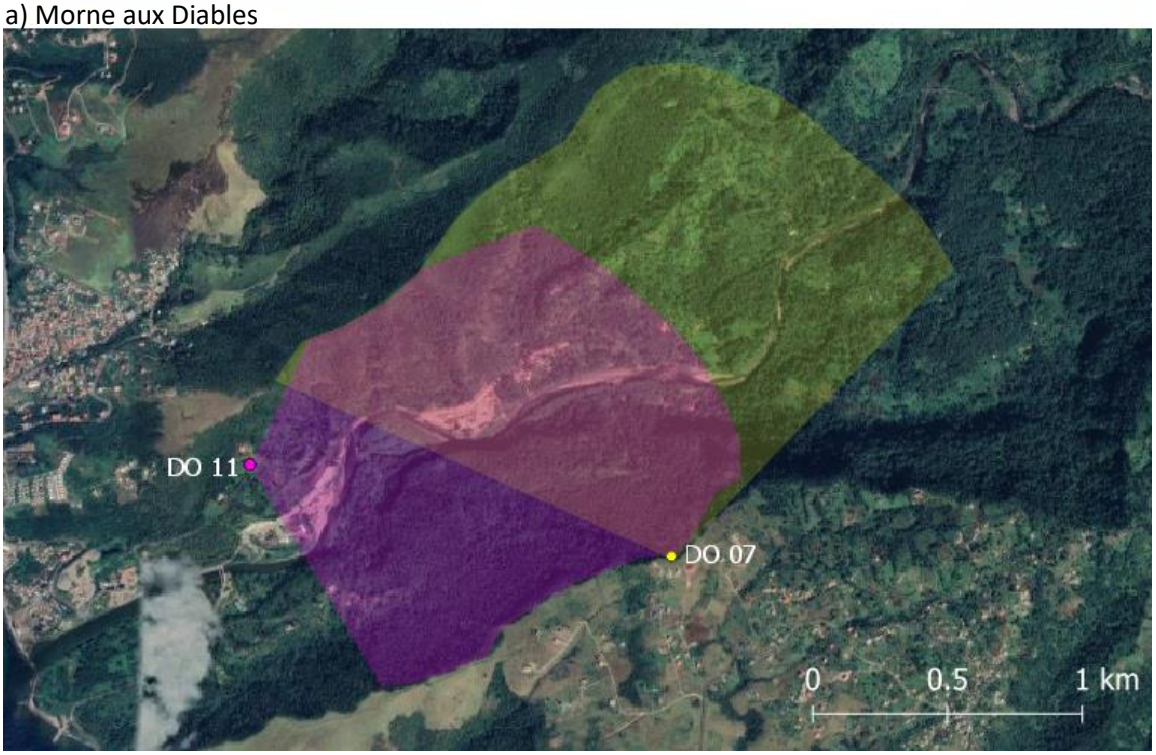
Polygons indicate survey areas; circles indicate survey locations.

Figure 2. Locations surveyed during the January 2022 thermal binocular effort for Black-capped Petrels on Dominica.

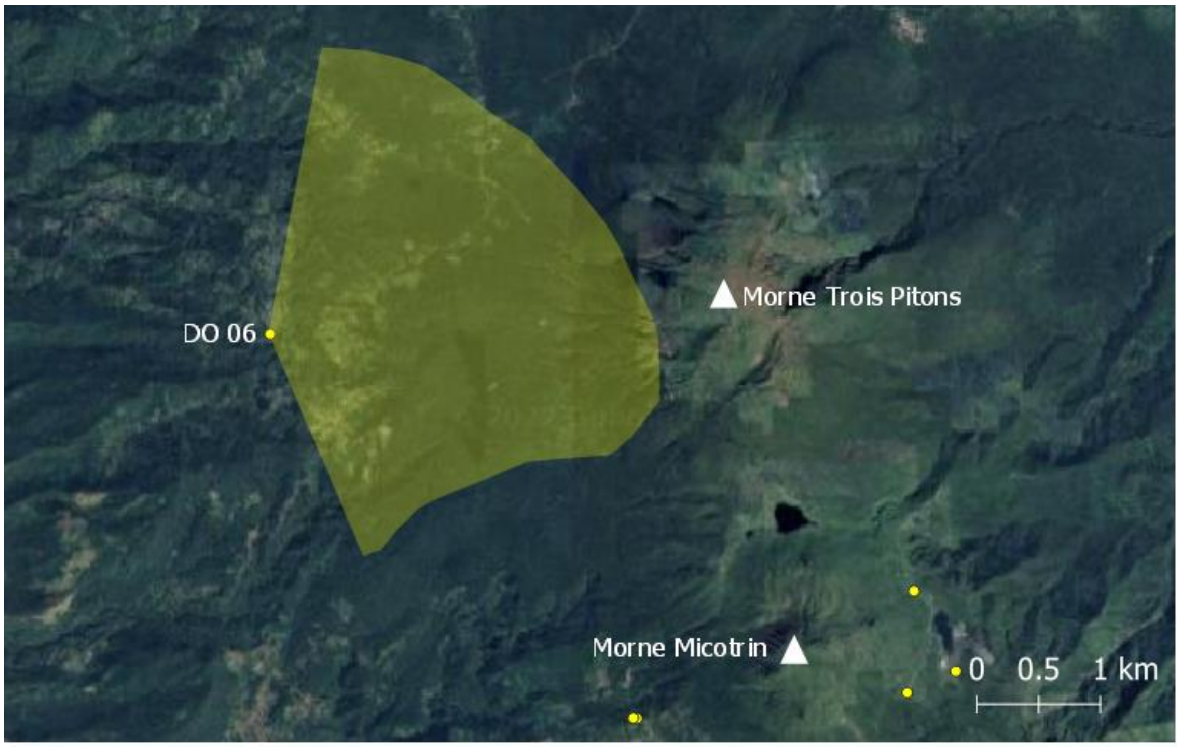
Circles indicate survey locations. Colors represent different survey locations. Shading locates areas observed during the effort that were <1.5km from a location. See Appendix A for more details.



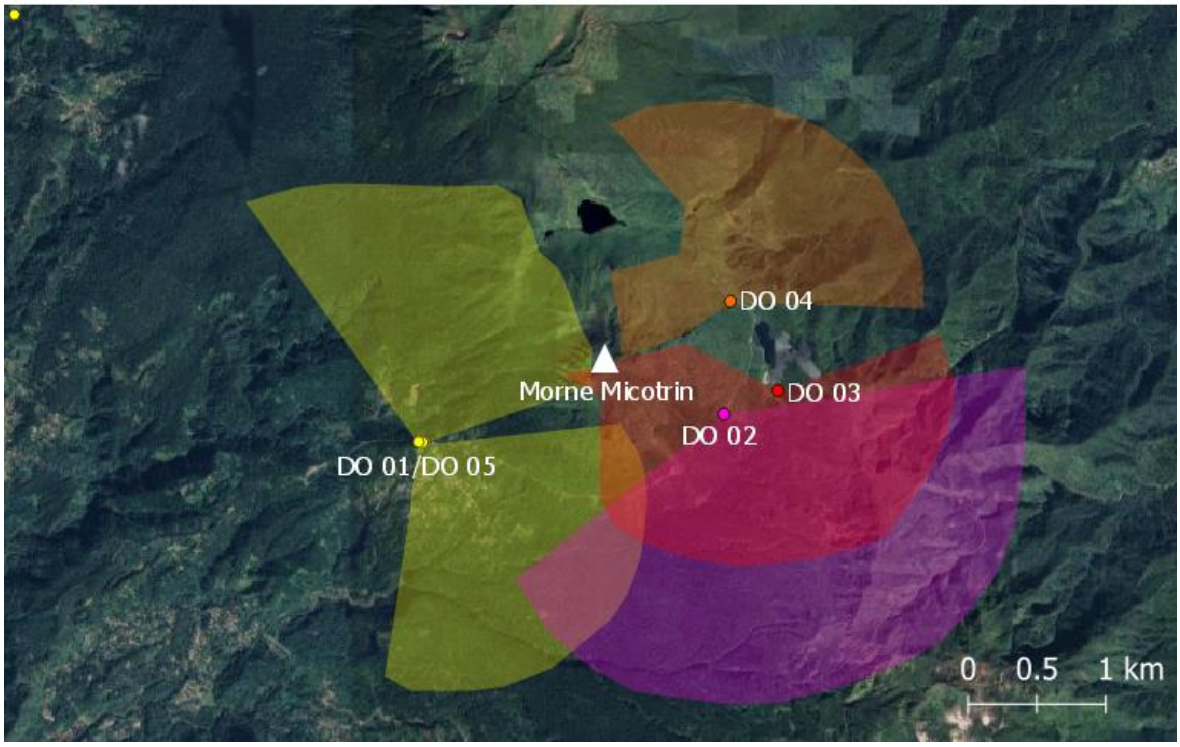
a) Morne aux Diables



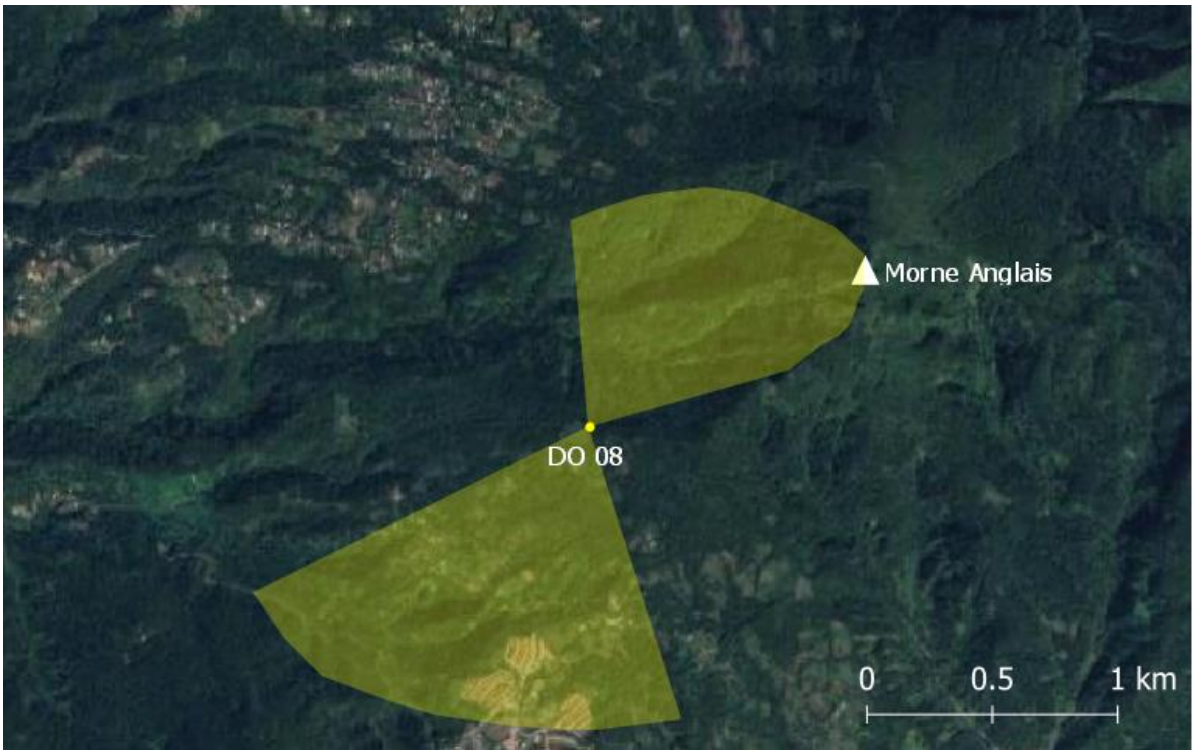
b) Lower Layou River



c) Morne Trois Pitons



b) Morne Micotrin



e) Morne Anglais



Figure 3. Thermal binoculars and set up used during the January 2022 thermal binocular survey for Black-capped Petrels on Dominica.

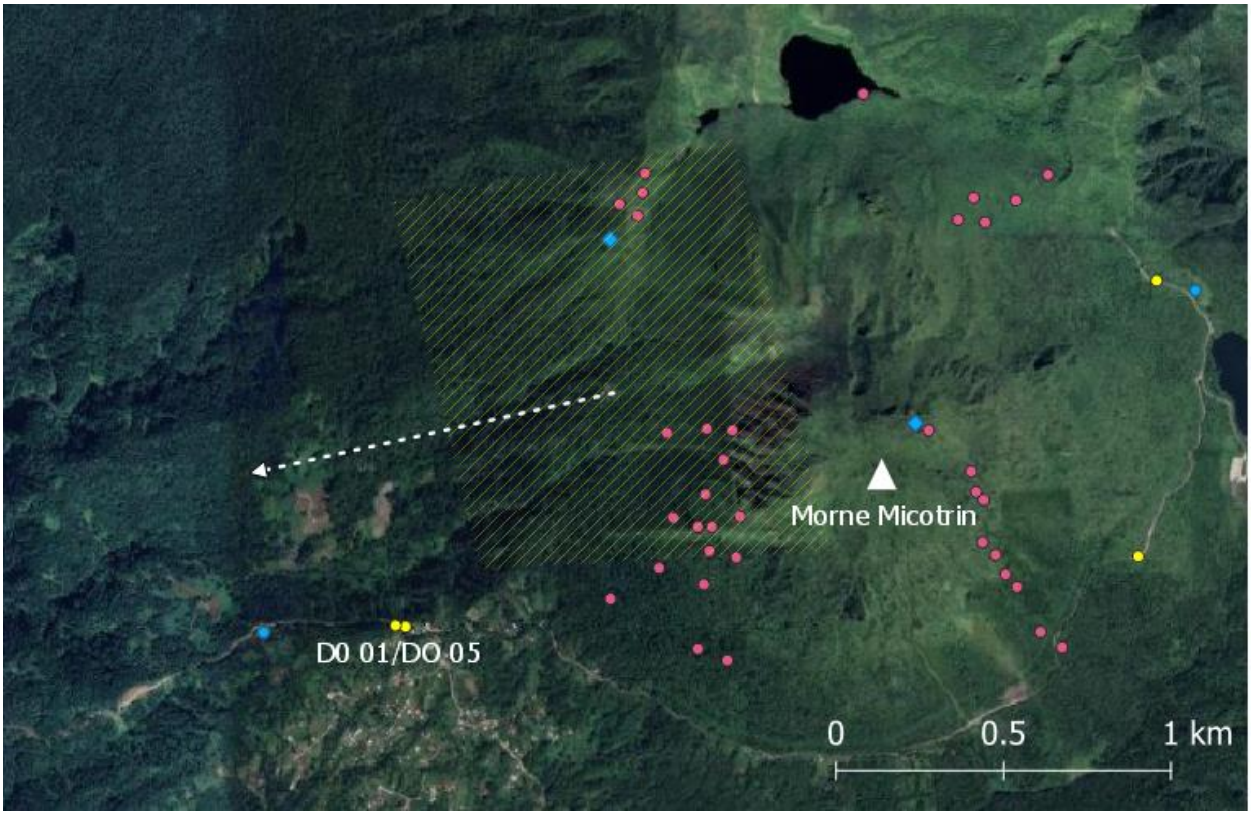


Figure 4. Conservation activity in the Morne Micotrin area of Dominica.

Dashed line and arrow represent general flight path of the Black-capped Petrel observed during the January 2022 effort. Yellow circles locate survey locations during the January 2022; blue circles locate radar locations during 2015 and 2020 efforts; blue diamonds locate deployment locations for acoustic recording units in 2015 and 2020; pink circles locate locations searched during the 2016 effort. Yellow hashed area locates the general area recommended for future search effort.

Appendix A: Survey notes

Date: 23 January 2022

Location: DO01: Gus' Place (Laudat crossing)
Location details: 50 m west of Laudat/Freshwater crossing. On terrace above road.
Coordinates: 15.33708, -61.33269
Number of observers: 1
Observer #1: Direction of observation/Flyway: NW to NNE.
Observer #2: Direction of observation/Flyway:
Observation notes: Good view towards SW to S side of Morne Trois Pitons and W to SW side of Morne Micotrin. SW base of Micotrin partly hidden by a tree to the east of observation site. View possible from bottom of valley to top of Micotrin.
Start time: 1900
Weather on start: Clouds at top of Trois Piton and Micotrin (~1000m). Clouds in Freshwater area. Wind from E. Few showers.
End time: 2253
Weather on end: Similar to start.
Reason for ending: Combination of bad weather and drained batteries.
Observations: Bats observed in good numbers. Some bats observed flying in straight line from W to E towards Micotrin.
Total confirmed: 0
Total suspected: 0
Comments: Most bats observed with typical flying pattern: fast flapping, fluttering. Some bats observed flying in a similar fashion to petrels: straight line from downstream to upstream of valley, direct flight. Some observed at large distance: x6 zoom needed to identify animal type. Some bats observed flying in pairs.

Date: 24 January 2022

Location: DO02: Freshwater Saddle
Location details: 20 m west of high point on Freshwater Rd.
Coordinates: 15.33903, -61.31231
Number of observers: 1
Observer #1: Direction of observation/Flyway: E to SW
Observer #2: Direction of observation/Flyway:
Observation notes: Good view towards the Morne Watt-Nichols-Anglais chain to ESE; open view downstream of Roseau flyway to SW; limited view of SE-S of Micotrin (too close). Majority of observation effort spent on the Watt-Anglais chain and Roseau flyway.
Start time: 1900
Weather on start: Clear night. Light wind.
End time: 2154
Weather on end: Similar to start.
Reason for ending: End of battery; no observations; limited view of Micotrin.

Observations: Bats observed in good numbers. Some bats observed flying in straight line from W to E in Roseau flyway.
Total confirmed: 0
Total suspected: 0
Comments: NA

Location: DO03: Freshwater Dam
Location details: Far end of Freshwater Dam.
Coordinates: 15.34064, -61.30864
Number of observers: 1
Observer #1: Direction of observation/Flyway: SE to NW
Observer #2: Direction of observation/Flyway:
Observation notes: Good view towards the Morne Watt-Nichols-Anglais chain to SE; open view downstream of Roseau flyway to SW; Good view of Eastern face of Micotrin and ESE slopes of Trois Piton. Majority of observation effort spent on Micotrin to Trois Piton.
Start time: 2207
Weather on start: Clear night. Light wind.
End time: 2300
Weather on end: Similar to start.
Reason for ending: No observations.
Observations: Bats observed in good numbers.
Total confirmed: 0
Total suspected: 0
Comments: NA

Location: DO04: Boiling Road
Location details: Hotwater spring on Boiling Lake Rd.
Coordinates: 15.34063, -61.30864
Number of observers: 1
Observer #1: Direction of observation/Flyway: N to NE
Observer #2: Direction of observation/Flyway:
Observation notes: Good view towards the ESE slopes of Trois Piton and Atlantic flyways.
Start time: 0011
Weather on start: Clear night. Light wind.
End time: 0030
Weather on end: Similar to start.
Reason for ending: Battery.
Observations: Bats observed in good numbers.
Total confirmed: 0
Total suspected: 0
Comments: NA

Date: 25 January 2022

Location: DO05: Gus' Ridge (Laudat ridge)

Location details: 100 m west of Laudat/Freshwater crossing. On steep narrow ridge above Laudat Rd.
Coordinates: 15.33711, -61.33297
Number of observers: 1
Observer #1: Direction of observation/Flyway: NW to E.
Observer #2: Direction of observation/Flyway:
Observation notes: Good view towards SW to S side of Morne Trois Pitons. Good view towards W face of Morne Micotrin. No observations between 1850-1900, 2000-2005 (rain showers).
Start time: 1800 (optical binocular); 1819 (thermal binocular)
Weather on start: Strong wind coming from NNW, gusts. Clouds on mountain tops (~1000m). Clouds came down to ~900m. Wind stopped ~2100
End time: 2400
Weather on end: Similar to start.
Reason for ending: End of battery.
Observations: No bat activity until wind stopped. 1 BCPE observed at 2040: caught as small dot, high in bottom edge of clouds, ~900m, around small saddle in W central Micotrin. x6 zoom allowed confirmation. Flying in straight line from Micotrin towards Caribbean Sea. Strong flapping; long narrow wings, "white" wings (i.e. homeothermic, unlike bats, which have "grey" wings cooled by surrounding colder air); head and tail visible. Drops down a few meters to check on a passing bird then performs small circular flight to regain altitude before resuming straight flight towards Caribbean.
Total confirmed: 1
Total suspected: 0
Comments: NA

Date: 26 January 2022

Location: DO05: Gus' Ridge (Laudat ridge)
Location details: 100 m west of Laudat/Freshwater crossing. On steep narrow ridge above Laudat Rd.
Coordinates: 15.33711, -61.33297
Number of observers: 2
Observer #1: Direction of observation/Flyway: NW to E.
Observer #2: Direction of observation/Flyway: S to E.
Observation notes: Observer #1: Good view towards SW to S side of Morne Trois Pitons; good view towards W face of Morne Micotrin. Observer #2: Good views from S slope of Micotrin to Morne Watt-Nichols-Anglais chain; good view of Roseau flyway from Trafalgar Falls to top. Observer #2: on effort from 1822 to 2000 (battery).
Start time: 1800 (optical binocular); 1822 (thermal binoculars #1 and #2)
Weather on start: Very strong wind coming from NNW, gusts. Clouds on mountain tops (~1000m). Clouds came down to ~900m.
End time: 2122 (observer #1); 2000 (observer #2)
Weather on end: Similar to start.
Reason for ending: End of battery.
Observations: Very limited bat activity on both flyways. No petrel activity on either flyway despite clear, open view on both sides, from bottom of valleys to high altitudes.
Total confirmed: 0
Total suspected: 0

Comments: NA

Location: DO03: Freshwater Dam
Location details: Far end of Freshwater Dam.
Coordinates: 15.34064, -61.30864
Number of observers: 1
Observer #1: Direction of observation/Flyway: SW to NW
Observer #2: Direction of observation/Flyway:
Observation notes: Good view of Eastern face of Micotrin and ESE slopes of Trois Piton. Majority of observation effort spent on Micotrin to Trois Piton. Low clouds, coming in later in effort.
Start time: 2200
Weather on start: Low clouds (~850m), wind gusts from E.
End time: 2300
Weather on end: Clouds came down (~800m), rain.
Reason for ending: No observations; weather.
Observations: Bats observed in good numbers.
Total confirmed: 0
Total suspected: 0
Comments: Binocular plugged on car battery.

Date: 27 January 2022

Location: DO06: Green Hill (Sylvania)
Location details: On side of road. Small space to park truck and set up equipment.
Coordinates: 15.36607, -61.36035
Number of observers: 2
Observer #1: Direction of observation/Flyway: N to E.
Observer #2: Direction of observation/Flyway: E to SE.
Observation notes: Observer #1: Good view of the Layou flyway to NW Trois Pitons; good views of W face of Trois Pitons. Observer #2: Good views of W face of Trois Pitons; good view of ridge between Laudat flyway and Canefield flyway; Morne Micotrin visible to the SE.
Start time: 1810 (optical binocular); 1815 (thermal binocular #1); 1830 (thermal binocular #2).
Weather on start: Clear above head. Clouds at top of Trois Pitons.
End time: 2205 (observers #1 and #2).
Weather on end: Clear above head. Clouds descending to base of Trois Pitons.
Reason for ending: Weather; no sighting.
Observations: Several targets flying high (~900-1000m ASL) in straight, direct flights away from Trois Pitons (to NW or SW). Most picked up in front of Trois Pitons. Recordings confirmed identification as bats. 20-30 observations. “Typical” bat flights (fluttering, fast turns) also observed closer to the forest.
Total confirmed: 0
Total suspected: 0
Comments: Forestry staff member (Mr. Hypolite) owns house with very good viewing conditions of Morne Trois Pitons (15.361939, -61.35989).

Date: 28 January 2022

Location: DO07: Warner
Location details: Left bank of Layou River (southern bank). At the edge of drop-off; backyard and garbage chute of one house before last on that street.
Coordinates: 15.39842, -61.40338
Number of observers: 2
Observer #1: Direction of observation/Flyway: W to NNE.
Observer #2: Direction of observation/Flyway: W to NNE.
Observation notes: Observer #1: Good view of the lower Layou flyway to NNE; ridge and sky. Observer #2: Good view of the lower Layou flyway to NNE; ridge and valley.
Start time: 1800 (optical binocular); 1810 (thermal binoculars).
Weather on start: Cloudy with some blue sky. Clouds at 600m ASL. Light wind.
End time: 2035 (#1), 2050 (#2).
Weather on end: Similar to start.
Reason for ending: Battery; no sighting.
Observations: Limited flying activity. Bats observed in small numbers.
Total confirmed: 0
Total suspected: 0
Comments: Mr "Sensal" lives two houses down from our survey location and is described as a person with good knowledge of the natural world.

Date: 29 January 2022

Location: DO08: Bellevue Ridge
Location details: At new construction site; a bit lower altitude and 200-m west of Bellevue communication tower.
Coordinates: 15.27841, -61.34286
Number of observers: 2
Observer #1: Direction of observation/Flyway: N to NNE.
Observer #2: Direction of observation/Flyway: SW to S.
Observation notes: Observer #1: Obstructed view of upper Morne Anglais flyway; open view directly N of survey location (~5°, including mid- to higher slopes of valley, ridge and sky); open view of peak and higher parts of Morne Anglais (slope, ridges and sky). Observer #2: Clear view of from Morne Carnot (to the SW) to Morne Plat Pays (to the S).
Start time: 1800 (optical binocular); 1810 (# 1 thermal binocular – on car battery), 1820 (#2 thermal binocular).
Weather on start: Clear sky. Windy. Peak of Morne Anglais in an out of clouds.
End time: 2230 (#1 and 2).
Weather on end: Similar to start; clouds lower on Morne Anglais
Reason for ending: No sightings.
Observations: Substantial flying activity. Bats observed in both flyways.
Total confirmed: 0
Total suspected: 0

Comments: Below survey location, just below the trail to Bellevue telecommunication tower, lives a young man who claims to "sometimes see" Black-capped Petrels.
"I know the bird you're talking about. I saw it a few times. It's black and white, yeah? I've seen it flying here in the afternoon. Also a good place is Layou. They fly up Layou. You look at the cliff [to the North] and you can see it." YS played a recording of BCPE calls. "I've never heard it. It doesn't make sounds. I put seeds for the birds and sometimes it comes."

Date: 30 January 2022

Location: DO09: Morne Aux Diables, western slopes.
Location details: Last hairpin turn on road (coming from Portsmouth); good elevated viewpoint.
Coordinates: 15.61397, -61.44769
Number of observers: 2
Observer #1: Direction of observation/Flyway: N to E.
Observer #2: Direction of observation/Flyway: E to SE.
Observation notes: Observer #1: Clear view of Clifton flyway (flyway that feeds into crater), all the way to western pass. Observer #2: Clear view of Guillet flyway (flyway that feeds to western slopes of Morne aux Diables), all the way to western pass. Stopped for rain between 2000-2020.
Start time: 1800 (optical binocular); 1830 (# 1 and #2).
Weather on start: Clear sky. Windy. Peak of Morne aux Diables in clouds. Few light showers.
End time: 2100 (#1 and 2).
Weather on end: Similar to start.
Reason for ending: Batteries.
Observations: Limited bat activity.
Total confirmed: 0
Total suspected: 0
Comments:

Location: DO10: Morne Aux Diables, crater.
Location details: Side of road, on eastern slope of crater.
Coordinates: 15.61913, -61.43661
Number of observers: 1
Observer #1: Direction of observation/Flyway: SSE to W.
Observer #2: Direction of observation/Flyway: NA
Observation notes: View of center (north-facing) slopes of Morne aux Diables, from eastern flyway to western pass. Peak of Morne aux Diables hidden by clouds.
Start time: 2130.
Weather on start: Light wind. Peak of Morne aux Diables in clouds.
End time: 22230.
Weather on end: Clouds came down to altitude of pass.
Reason for ending: Clouds.
Observations:
Total confirmed: 0
Total suspected: 0
Comments:

Date: 31 January 2022

Location: DO11: Calvin's Place.
Location details: Right bank of Layou River (northern bank). At the eastern edge of a property overlooking the upper Layou river.
Coordinates: 15.4016, -61.41794
Number of observers: 2
Observer #1: Direction of observation/Flyway: NNE to S.
Observer #2: Direction of observation/Flyway: NNE to S.
Observation notes: Observer #1 and #2: Clear views of Layou river flyway, including bank slopes on both sides. Clear view from river up to 500m in elevation.
Start time: 1810 (optical binocular); 1830 (# 1 and #2).
Weather on start: Cloudy sky. Clouds at ~500m ALS. Wind coming down the valley. Light showers (2030).
End time: 2120 (#1 and 2).
Weather on end: Similar to start.
Reason for ending: Batteries.
Observations: Bat activity. Numerous large bats on slopes of northern bank.
Total confirmed: 0
Total suspected: 0
Comments:

Appendix B: Phenology diagram of Diablotin Black-capped Petrel

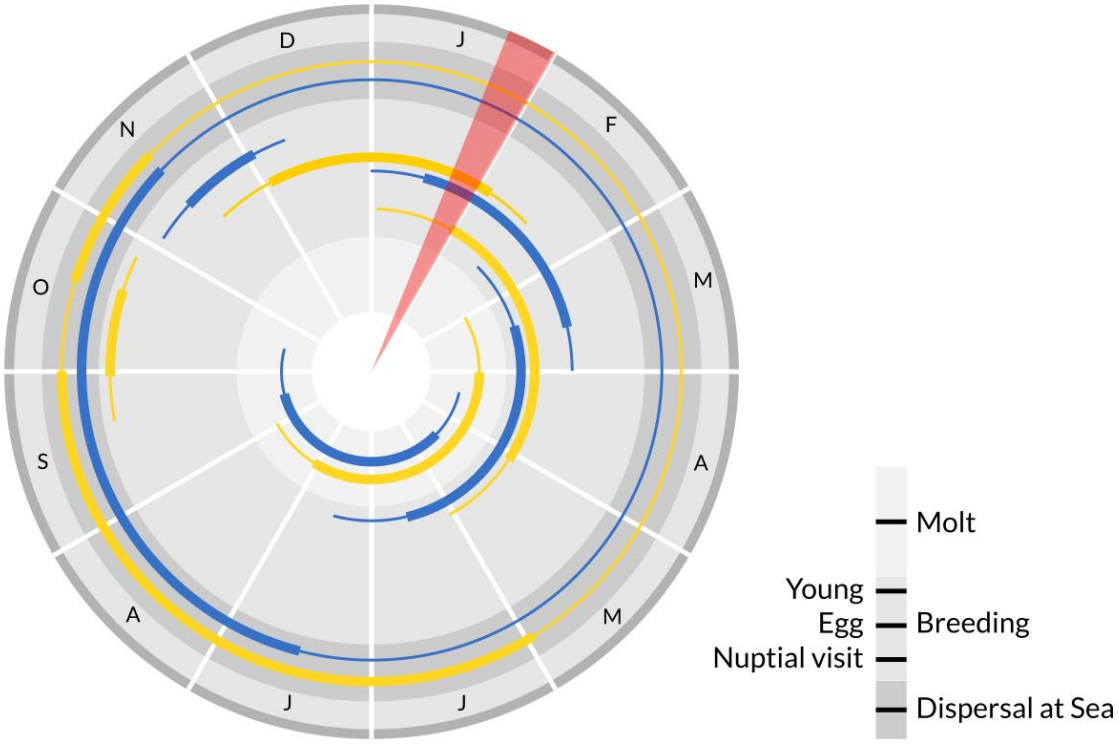


Figure B5. Phenology diagram of Diablotin Black-capped Petrel.

Phenology of petrels breeding on Hispaniola is shown in blue; suspected phenology of petrels breeding on Dominica is shown in yellow. Red shading shows the survey period for this report. Adapted from Simons et al. 2013.