

## The Band-rumped Storm-Petrel Complex (*Oceanodroma castro*) in Maryland Waters

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**Abstract:** The Band-rumped Storm-Petrel (*Oceanodroma castro*) has been known to consist of numerous populations breeding on scattered islands in both the Atlantic and Pacific Oceans. Recent research has identified genetically distinct populations as well as behaviorally distinctive populations in the Atlantic Ocean. Identification of these separate entities at sea is problematic, but in some circumstances, a presumptive identification may be warranted. Pelagic trips in Maryland waters have yielded photographic evidence strongly suggestive of two distinctive types. Museum specimens of hurricane-grounded birds have been consistent with the photographic evidence.

The bird in North America currently known as the Band-rumped Storm-Petrel (*Oceanodroma castro*) (BANP) was first described by Harcourt (1851) as *Thalassidroma castro* from the “Dezerta Islands” in the Madeiran archipelago. In his field guide to eastern birds, Peterson (1947) listed it as an accidental, using the name Madeira Petrel. The American Ornithologists’ Union Check-List (fifth edition) referred to it as Harcourt’s Petrel (AOU 1957). In a revision of his guide, Peterson (1980) called it Band-rumped Storm Petrel (Harcourt’s Storm Petrel). Subsequent gyrations of various checklist committees settled on BANP. As for its status as an accidental, deepwater pelagic trips revealed that it occurs regularly in western Atlantic waters, predominantly in the Gulf Stream.

In the late 1980s, a Ph.D. student at the University of Glasgow, United Kingdom, by the name of Luis Monteiro was studying mercury levels in fish and other vertebrates in the waters around the Azores using the resources of the Department of Oceanography and Fisheries at the University of the Azores (Monteiro et al. 1991). While studying nesting seabirds, he observed that the mercury levels in the “hot” season (April–August) breeding “Madeiran” Storm-Petrels (as BANP are known in Europe) were 50% lower than those in the “cool” season (September–January) breeders, suggesting that they might be discrete populations (Monteiro et al. 1995). Separate seasonal populations of Madeiran Storm-Petrels had been documented in the Galápagos Islands by Snow and Snow (1966). Further studies with his thesis advisor R.W. Furness of the University of Glasgow established that hot-season birds had 5–10% smaller eggs

and body mass but longer tails and tail notches than cool-season birds (Monteiro and Furness 1998). They speculated that the two populations may represent “sympatric speciation through temporal partitioning of reproduction and may be better treated as sibling species.” In addition, preliminary analysis of mitochondrial DNA in collaboration with the laboratory of V.L. Friesen, Queens University, Kingston, Ontario, suggested genetic isolation of the two populations. Tragically, Luis Monteiro was killed in a 1999 plane crash while extending his studies in the Azores.

Before his death, Monteiro had arranged to begin working with Mark Bolton of the Royal Society for the Protection of Birds, United Kingdom, to expand studies of the storm-petrel breeding colonies on various islands in the eastern Atlantic (Figure 1). Vocalization playback experiments (Bolton 2007) showed that hot-season birds in the Azores were non-responsive to the calls of cool-season birds, as well as calls of birds from Cape Verde or the Galápagos Islands. Further mitochondrial DNA studies (Smith et al. 2007) established that the Galápagos Islands and Cape Verde birds diverged from all the other populations at least 150,000 years ago, and that the Azores hot-season birds were distinct from the cool-season birds breeding in the Azores and in other eastern Atlantic islands, having diverged 70,000–154,000 years ago. Moreover, the hot-season birds from the Madeiran Islands also appeared to be diverging from the cool-season birds. More extensive mitochondrial and nuclear DNA studies essentially confirmed these findings and revealed that the Cape Verde hot and cool seasonal populations appeared to be genetically isolated, but morphologically indistinguishable, whereas the two seasonal groups in the Selvagens Islands and Madeiran Islands had slight genetic but some morphometric differences (Friesen et al. 2007) and were possibly in the process of diverging.

Finally, with the addition of breeding, molt timing, and feather isotope-based diet data, Bolton et al. (2008) concluded “that the hot-season Azores population should be considered a new species for which we propose the name *Oceanodroma monteiroi*, Monteiro’s Storm-Petrel.” By extension, that means that the cool-season birds are also a full species that seems to be distributed among the eastern North Atlantic islands with the beginnings of hot/cool divergence.

The vocalizations of the various populations of BANP were recorded on their breeding grounds and showed significant differences easily discerned by ear in the field, a strong indicator of speciation. These studies are summarized in a remarkable book, *Petrels Night and Day: A Sound Approach Guide* (Robb et al. 2008). The book largely recounts Robb’s adventures while obtaining his recordings, but does summarize what knowledge we have to help us differentiate the four northeastern Atlantic populations of BANP. (It also covers such



**Figure 1. Band-rumped Storm-Petrel colonial nesting islands in the eastern Atlantic Ocean. (Map data © 2017 Google, Inst. Geogr. National)**

identification problems as Fea's/Zino's/Desertas Petrels (*Pterodroma feae/P. madeira/P. deserta*), Cory's/Scopoli's/Cape Verde Shearwaters (*Calonectris diomedea borealis/C. diomedea diomedea/C. edwardsii*), and a host of other pelagic species.)

The four populations of BANP studied were: 1) the hot-season breeder from the Azores, Monteiro's Storm-Petrel (*Oceanodroma monteiroi*); 2) the longest-standing divergent taxon from the Cape Verde Islands, which they call Cape Verde Storm-Petrel (*O. jabejabe*); 3) the hot-season breeders from Madeira, the Selvagens Islands, and Canary Islands which retain the name Madeiran Storm-Petrel (*O. castro*); and 4) the cool-season breeders from the northeast Atlantic which they call "Grant's" Storm-Petrel but which also retain the scientific name *O. castro*. Thus Robb et al. (2008) acknowledge the strong DNA evidence (Friesen et al. 2007) that the "Grant's" population is not genetically distinct from the hot-season breeding Madeiran populations. Furthermore, "Grant's" has not been formally described as a separate taxon. Yet, the distinctive vocalizations of all four populations provide a mechanism for assortative mating and thus point to the beginnings of speciation. Just as it is wise to monitor subspecies of all taxa, perhaps it is equally wise to monitor the two populations of *O. castro* storm-petrels for conservation purposes. Since it may be possible to distinguish the cool-season and hot-season populations as they visit western Atlantic waters, they will be described separately in this paper with the caveat that many may not be distinguishable beyond the BANP level.

## DIFFERENTIATING CHARACTERS

In preparing his seabird book, Steve Howell (2012) spent several spring seasons joining Brian Patteson's "Spring Blitz" (*Seabirding Pelagic Trips*, Hatteras, North Carolina) consisting of as many as 16 trips in a row, as well as numerous summer trips. Using such features as adult primary molt stage and morphological differences, he determined that 80–90% of BANP in the Gulf Stream were cool-season breeders which he called "presumed Grant's". The others were mostly presumed Madeiran hot-season breeders, with an occasional outlier, the unlikely Cape Verde or Monteiro's (Howell et al. 2010). Digital photography has greatly aided in the determination of molt and structural characters, but close views with binoculars can often show the critical features. It is important to have experience with "Grant's" as the other three vary from "Grant's" only subtly. Also, note that single photos, or a brief look, can often give the impression of a significant tail notch, since viewing a keel-shaped tail from an angle will make it appear deeply notched even if it is not. Tail notch, stage of adult primary molt, wing and body shape, carpal bar length, and relative width of the rump band are key features to separate the forms, but often the forms have to remain undifferentiated.

Multiple Hatteras, North Carolina, pelagic trips in a row are a good way to become familiar with these birds as they frequent the Gulf Stream—which is reached in two hours—and are readily compared with Wilson’s Storm-Petrels (*Oceanites oceanicus*). In May and June, some of the molt differences can be most pronounced. The most useful character in identifying “Grant’s” in the spring is the stage of primary molt which is a complex subject reviewed in detail in Howell et al. (2010) and in Flood and Fisher (2011). In short, molt proceeds from the innermost to the outermost primaries. In the spring, “Grant’s” exhibit two to four worn outer primaries with new or missing inner primaries, whereas hot-season breeders should have, for the most part, completed primary molt. However, any non-molting bird could be a juvenile of any population and non-breeders could be following unknown molt schedules, so extreme caution is necessary. As usual, multiple characters should be considered. In recent years, finding BANP in Maryland waters has now become a regular feature of *See Life Paulagics* trips out of Lewes, Delaware, with some spectacular numbers, and comparable photos (Table 2). The key factor is that these are 18-hour overnight trips beyond the edge of the continental shelf in depths of 1000 fathoms (6,000 ft) or more. BANP are now an expected species on summer trips from Brooklyn, New York; Cape May, New Jersey; and Lewes, Delaware, with *See Life Paulagics*.

The storm-petrels we see are apparently in a clockwise rotation around the Atlantic and are using the Gulf Stream to propel them back to their respective breeding grounds. Adults are usually in the process of completing primary molt prior to breeding. Occasional exceptions could be juveniles from cool-season breeders or non-breeding adults, which add to the confusion. To add a further caution, keep in mind that there are southern Atlantic breeders on Saint Helena and Ascension Islands whose migratory movements, morphometrics and molt schedules are unknown.

#### Cool-season breeding Madeiran (“Grant’s”) Storm-Petrel (*Oceanodroma castro*)

This may be the default population in the western Atlantic. A cool-season breeder banded by Luis Monteiro in the Azores was collected in the Gulf of Mexico on 31 May 1993 (Woolfenden et al. 2001), so we know Azores birds can come this way. From August to March, 3000–5000 pairs breed in the cool season on the Azores, Berlengas, Canary Islands, and the Madeiran Archipelago including Desertas and the Selvagens Islands (Robb et al. 2008). Egg-laying occurs from early October to December (Friesen et al. 2007). Adult primary molt is primarily from February to August, but with the latest recorded on 17 October (Bolton et al. 2008) so they usually exhibit one to four faded outer primaries in May and June, fewer in July (Robb et al. 2008). “Grant’s” typically has long, narrow wings, not unlike Leach’s Storm-Petrel, *Oceanodroma leucorhoa* (Howell et al. 2010). The wing width can vary with wind and flight conditions and single photos can capture extremes that may not be typical. The

upper tail covert band is narrow, uniform in width and about 30–40% of the overall tail projection (Robb et al. 2008). The tail notch ( $\bar{x} = 3.53 \text{ mm} \pm 1.47 \text{ SD}$ ; range 1–7 mm [ $\bar{x} = 0.14 \text{ in} \pm 0.06 \text{ SD}$ ; range 0.04–0.28 in]) is usually inconspicuous, making the long tail appear square (Bolton et al. 2008).

#### Monteiro's Storm-Petrel (*Oceanodroma monteiroi*)

About 300 pairs breed in the hot season from March to September in the Azores (Bolton et al. 2008). Egg-laying occurs in May to early July (Bolton et al. 2008). Primary molt is from August to February (Robb et al. 2008), but the last date recorded was 17 May (Bolton et al. 2008), so a worn outer primary in May or a shed inner primary in August are possible (Robb et al. 2008). The body is some 5–10% lighter than “Grant’s”, but the wings and tail are similar in length, making both proportionately longer than in “Grant’s” (Bolton et al. 2008). The result is lighter wing loading in Monteiro’s, making it possibly more buoyant. The carpal bar is more pronounced than in the other populations and extends to the joint (Bolton et al. 2008). The carpal bar is subtle and does not reach the joint in the other three populations. When soaring, the wings are uniformly broad to a somewhat rounded tip (see Robb et al. 2008, pages 242–243, and Howell et al. 2010). The rump band is variable in width. The tail notch ( $\bar{x} = 7.81 \text{ mm} \pm 2.3 \text{ SD}$ ; range 1–14 mm [ $\bar{x} = 0.31 \text{ in} \pm 0.09 \text{ SD}$ ; range 0.04–0.55 in]) when deepest could be conspicuous from all angles (Bolton et al. 2008). Monteiro’s apparently remains in the Azores year-round, while “Grant’s” leaves the Azores after the breeding season, thus accounting for the different mercury levels found by Luis Monteiro (Bolton et al. 2008). [One wonders if the added mercury is acquired by “Grant’s” in the western Atlantic from fallout of airborne mercury derived from coal-fired power plants.] Any Monteiro’s Storm-Petrels in the western Atlantic are probably non-breeding adults or juveniles.

#### Hot-season breeding Madeiran Storm-Petrel (*Oceanodroma castro*)

From March to October, 2000–4000 pairs breed in the hot season on the Madeiran Archipelago including the Desertas and the Selvagens Islands, and in the Canary Islands (Robb et al. 2008). Egg-laying takes place in May–June and June–July (Friesen et al. 2007). Adult primary molt is from August/September to February, so none is expected from May to July, with perhaps only a shed inner primary late in August (Robb et al. 2008). Madeiran is smaller, chunkier and blacker than either “Grant’s” or Monteiro’s (Howell et al. 2010), possibly with a fine bill in females (6.08 mm [0.24 in] at the tube, 5.19 mm [0.20 in] at the gonys; specimen USNM 189861) or heavy in males (6.57 mm [0.26 in] at the tube, 5.58 mm [0.22 in] at the gonys; specimen USNM 189860) (Table 1) (see Howell [2012, page 371, figures 167 and 168, and pages 376–377, figures S3.4 and S3.9]). Both the male and the female museum specimens had worn outer primaries, bill lengths of 14.65 mm [0.58 in] and rump bands of 1.5 cm [0.6 in] but the male’s body was 3 cm [1.2 in] longer than the female’s and the tail notch was 3 mm [0.1 in] compared to none in the female. The slight tail

notch is sometimes visible, and the wings and tail are shorter than in “Grant’s” (Howell et al. 2010). The rump band is narrow and often shows scattered black flecks, seen less frequently in “Grant’s”, or an occasional gray central dividing line (Howell et al. 2010).

Cape Verde Storm-Petrel (*Oceanodroma jabejabe*)

Possibly low thousands breed from October to June on the Cape Verde Islands, with two overlapping populations covering both hot and cool seasons. Egg-laying occurs from October to May (Friesen et al. 2007). Primary molt occurs from about March to December, so spring and summer birds could exhibit virtually any stage of primary molt. Cape Verde is smaller than “Grant’s” and Monteiro’s with a longer bill (Murphy 1924, Howell et al. 2010). The wings may be broader than “Grant’s” and the uppertail covert band relatively wider than “Grant’s”, but this may be speculation (Robb et al. 2008). For example, a specimen from Cape Verde (USNM 197701, Table 1), a female collected 17 May 1922, had fresh primaries, a 1.5 cm [0.6 in] rump band and a 5 mm [0.2 in] tail notch, measurements very similar to hot-season Madeiran birds. Likewise, another specimen, a male collected on 11 July 1971 (USNM 525795) at Saint Helena in the South Atlantic Ocean, had fresh primaries, a 1.7–2.0 cm [0.7–0.8 in] rump band and a 3–5 mm [0.1–0.2 in] tail notch.

**Table 1. Band-rumped Storm-Petrel specimens from the eastern Atlantic Ocean housed at the Division of Birds, National Museum of Natural History, Smithsonian Institution, Washington, DC (NMNH 2018).**

Catalog Number	Sex	Preparation	Collection Location	Collection Date	Collector
USNM 189860	♂	skin: whole	Porto Santo, Porto Santo Island, Madeira Islands	14 Oct 1902	W.F. Rosenberg
USNM 189861	♀	skin: whole	Porto Santo, Porto Santo Island, Madeira Islands	12 Sep 1902	W.F. Rosenberg
USNM 197701 <sup>a</sup>	♀	skin: whole	Raso Island, Cape Verde	17 May 1922	J.G. Correia
USNM 490825	♂, adult	skin: partial, flat; skeleton: whole;	Egg Island, Egg Harbor; Saint Helena	11 Jul 1971	--
USNM 491205	--	skeleton: partial, miscellaneous bones	Egg Island, Saint Helena	11 Jul 1971	--
USNM 525795	♂, adult	skin: whole; skeleton: partial, trunk	Egg Island, 1 mile offshore, Saint Helena	11 Jul 1971	--
USNM B 42699	--	egg(s)	Ilho Da Baixo [sic], Madeira Islands	11 Jul 1907	E. Schmitz

<sup>a</sup> Note: Although the NMNH (2018) online database gives the Catalog Number for the Cape Verde specimen as USNM 364910, the specimen tag reads USNM 197701.

## CAUTIONS IN ASSIGNING SPECIFIC NAMES TO BANP

Even though there are statistically significant differences among the four populations of BANP in several morphological measures such as wing and tail length or tail notch, the ranges are wide enough to render broad overlap. Thus, in one study at sea east of Madeira in late April 2009, Shirihai (2009) found extensive variation in tail notch, color, and rump band thickness “virtually comprising the spectrum of variation shown in Robb et al. (2008) for the four forms...” Oddly, the vast majority of the birds were closer to what Robb et al. (2008) described as “Grant’s” at a time when the hot-season Madeiran birds were the expected population, yet they did not exhibit the advanced primary molt Howell et al. (2010) observed off Hatteras. One interpretation would be that the Madeiran birds include all the described morphological forms. But it is possible that non-breeding birds from various populations gather in favorable feeding grounds. Testing these hypotheses, or others, will require considerably more field work.

Flood and Fisher (2011) state that they “have been unable to make any advances in establishing differences that may assist in the confident identification of the various populations at sea...” Obviously, the at-sea identification of the four populations is fraught with uncertainty, yet under some circumstances, it seems possible to make tentative assignments to one form or another. The best example is in the spring when cool-season breeding “Grant’s” exhibit conspicuous late stage primary molt. Even then, Howell et al. (2010) refer to them as “presumed “Grant’s” and the non-molting birds as “possible Madeiran”.

While many, if not most, BANP should be left without further assignments, birds outside the range of overlap and exhibiting a complete set of characters for any one form may deserve the “presumed” or “possible” notation. The possibility of adding such carefully considered data points to an evolving field ought to be a source of encouragement for pelagic birders armed with digital cameras. If further field work should produce useful criteria for distinguishing island or seasonal specific populations, a library of digital photographs could be invaluable.

## IDENTIFYING STORM-PETRELS PHOTOGRAPHED IN MARYLAND WATERS

Ideally, observations would be best made in the spring when late stage primary molt flags presumed “Grant’s”. As it turns out, most of the trips have been in August (Table 2) when Monteiro’s could be in early stages and Cape Verde in any stage of primary molt. Nevertheless, the ten August trips that yielded photos produced many examples with features consistent with typical “Grant’s” Storm-Petrels. (Figure 2) These birds show long tails and wings with no primary molt,



**Table 2. Band-rumped Storm-Petrel specimens and reports chronologically listed in the Maryland/District of Columbia Records Committee database (MD/DCRC 2018a, 2018b).** (Note: Multiple listings for the same date indicate individual submittals by various observers. In these situations, the numbers of birds will differ based on the documentation submitted by each observer. Although multiple submittals can occur on the same date, they are not necessarily for the same bird[s].)

Control Number	Date	Location	Number of Birds	Photos	Status/ Decision
1999-060	29 AUG 1893	DC: Anacostia, SE, Anacostia River, 11th Street Bridge (formerly Navy Yard Bridge)	1 adult ♀ (USNM 154436), shot from a flock of 3 or 4	yes	Accepted
1999-059	30 AUG 1893	DC: Capitol Hill	1 adult ♀ (USNM 293176)	yes	Accepted
2014-078	17 AUG 1991	MD: Pelagic Zone, Atlantic Ocean, near Washington Canyon 37° 33.27' N, 74° 07.97' W	1	yes	Ready
2014-079	14 AUG 1993	MD: Pelagic Zone, Atlantic Ocean, Poor Man's Canyon	11	no	Reviewable
1997-735	17 AUG 1997	MD: Pelagic Zone, Atlantic Ocean, Baltimore Canyon	1	no	Accepted
2003-120	19 SEP 2003	DC: Potomac River, between Memorial Bridge and the 14th Street Bridge	1	no	Unreviewable
2010-165	03 JUL 2004	MD: Pelagic Zone, Atlantic Ocean, 38° 02.5' N, 70° 39.97' W	1	?	Retracted
2010-004	13 JUL 2006	MD: Scotland, St. Mary's County, Chesapeake Bay	1	no	Ready
2007-092	24 AUG 2007	MD: Pelagic Zone, Atlantic Ocean 38° 13.468' N, 73° 16.131' W	1	yes	Ready
2010-145	15 AUG 2010	MD: Pelagic Zone, Atlantic Ocean 38° 26' 41.83" N, 73° 21' 05.80" W	3	yes	Ready
2010-148	19 AUG 2010	MD: Pelagic Zone, Atlantic Ocean	5	yes	Ready
2012-080	25 AUG 2012	MD: Pelagic Zone, Atlantic Ocean	128	yes	Ready
2013-033	30 JUL 2013	MD: Pelagic Zone, Atlantic Ocean	18	no	Reviewable
2013-034	30 JUL 2013	MD: Pelagic Zone, Atlantic Ocean	6	no	Reviewable
2013-048	31 JUL 2013	MD: Pelagic Zone, Atlantic Ocean	2	no	Reviewable
2013-053	31 JUL 2013	MD: Pelagic Zone, Atlantic Ocean	1	no	Reviewable
2013-055	31 JUL 2013	MD: Pelagic Zone, Atlantic Ocean	2	no	Reviewable
2013-058	31 JUL 2013	MD: Pelagic Zone, Atlantic Ocean	4	no	Reviewable
2013-059	17 AUG 2013	MD: Pelagic Zone, Atlantic Ocean	40	yes	Ready
2013-061	17 AUG 2013	MD: Pelagic Zone, Atlantic Ocean	1	pending	Reviewable
2013-063	17 AUG 2013	MD: Pelagic Zone, Atlantic Ocean	1	no	Unreviewable
2014-057	23 AUG 2014	MD: Pelagic Zone, Atlantic Ocean	22	yes	Ready
2016-033	04 JUN 2016	MD: Pelagic Zone, Atlantic Ocean	1	yes	Ready
2016-037	21 AUG 2016	MD: Pelagic Zone, Atlantic Ocean	81	yes	Ready
2018-003	20 AUG 2017	MD: Pelagic Zone, Atlantic Ocean	25	yes	Ready



**Figure 2: Presumed adult “Grant’s” [Band-rumped] Storm-Petrel.**

Photographed in late August when early stage inner primary molt occurs in Monteiro’s and any stage primary molt could occur in Cape Verde. The wings of “Grant’s” typically are long and narrow with a weak carpal bar that fades toward the joint. The tail is long with no apparent notch and the rump band is narrow (but can show some variability). An adult Monteiro’s, which could have a tail notch of any depth, has a prominent carpal bar that extends to the joint and a smaller body than “Grant’s”. A hot-season Madeiran would have shorter wings and tail with a chunkier body (Figure 3). Comparison with nearby Wilson’s Storm-Petrels is helpful as Grant’s and Monteiro’s are noticeably larger and Madeiran is somewhat closer in size. When not in powered flight, the hand of all BANP can be broader and less pointed. Photographed by Paul Guris on 25 August 2012.



**Figure 3: Presumed adult hot-season Madeiran [Band-rumped] Storm-Petrel with all fresh primaries.** Photographed in June when adult “Grant’s” and some but not all Cape Verde should be exhibiting primary molt. Adult Monteiro’s would also be fully molted, but longer winged with a prominent carpal bar that extends to the joint and typically but not necessarily have a pronounced tail notch. The wings and tail of Madeiran are shorter than “Grant’s” (Figure 2). The pale carpal bar falls short of the joint. The rump band is similar to that of “Grant’s” but often shows scattered black flecks or a faint dusky dividing line. A bird in this plumage in August would be extremely difficult to differentiate from “Grant’s”, except perhaps on size and rump band markings. To complicate matters, the primary molt schedules of juveniles and non-breeding adults of any population are not known. Photographed by Alex Lamoreaux on 4 June 2016.

little or no tail notch, a narrow rump band, and a pale carpal bar that does not extend as far as the joint. The lone June trip found a possible hot-season Madeiran Storm-Petrel that exhibited no wing molt, shorter wings and tail than in “Grant’s”, a slight tail notch, and a narrow rump band with scattered black flecks. (Figure 3) This distribution of presumed “Grant’s” and possible hot-season Madeiran is as expected given the ratio seen by Howell et al. (2010) off of Hatteras. No molting birds were photographed, which should also rule out most Cape Verde and adult Monteiro’s. Table 2 summarizes the reports submitted to the MD/DC Records Committee from the observers on various pelagic trips in Maryland waters.

One other June trip in 1986 came across a storm-petrel at Poor Man’s Canyon that was the first BANP that either Brian Patteson or I had ever seen, but it was not photographed to my knowledge. The bird glided directly beneath the bow pulpit. It was brown with long wings that were uniformly broad from base to a somewhat rounded tip and showed no obvious sign of molt. The shape was similar to the bird in Howell (2010, figure 23). The rump band was even-edged with a slight cream color and the tail had a pronounced notch as seen from directly above. The seas were calm with little wind, and the bird flew about 0.6 m (2 ft) above the surface with accipiter-like flapping and gliding. It is possible that this was a Monteiro’s Storm-Petrel, but we will never know for sure.

The Smithsonian collection contains two hurricane-related BANP from the District of Columbia: USNM 154436 and USNM 293176 collected on 29 and 30 August, respectively, in 1893 (Table 3). Both were females with fresh primaries, narrow rump bands (2.0–2.5 cm [0.8–1.0 in] and 1.5 cm [0.6 in], respectively), and shallow tail notches (3–4 mm [0.1–0.2 in] and 1–2 mm [0.0–0.1 in], respectively). A similar, although male, specimen (USNM 567674) was collected by Richard A. Rowlett in Delaware on 14 August 1975 (rump band 2 cm [0.8 in], tail notch 3–4 mm [0.1–0.2 in]). All three appear to be presumed “Grant’s” but require further morphometric study.

## SUMMARY

As far as identification of BANP forms in Maryland waters, there is no evidence of Cape Verde and only a single sighting of a bird that might possibly have been a Monteiro’s Storm-Petrel. cursory examination of museum specimens collected in Delaware and the District of Columbia suggests that they are presumed “Grant’s”. Many of the digital photographs submitted to the MD/DC Records Committee show characteristics consistent with “Grant’s” and similar to the presumed “Grant’s” documented by Howell et al. (2010) out of Hatteras, North Carolina. Similarly, a single spring BANP photo shows characteristics consistent with the possible hot-season Madeiran that comprises 10–20% of the BANP seen off Hatteras (Howell et al. 2010). More trips, particularly in the

spring, could produce more convincing evidence, given the high quality of the digital photos submitted to the Maryland/District of Columbia Records Committee in recent years. If further taxonomic changes should be forthcoming, a collection of such photos could be an important addition to the literature and expand our knowledge of the Maryland avifauna.

**Table 3. Band-rumped Storm-Petrel specimens from the United States Mid-Atlantic region housed at the Division of Birds, National Museum of Natural History, Smithsonian Institution, Washington, DC (NMNH 2018).**

Catalog Number	Sex	Preparation	Collection Location	Collection Date	Collector
USNM 154436	♀ adult	skin: whole	Navy Yard Bridge, District of Columbia	29 AUG 1893	W. Palmer
USNM 293176	♀ adult	skin: whole	Capitol Hill, District of Columbia	30 AUG 1893	W. Palmer
USNM 566873	♀	skin: whole	Morehead City, Carteret County, North Carolina	1971	J.O. Fussell
USNM 567674	♂	skin: whole	72 miles east of Rehoboth Beach, Delaware	14 AUG 1975	R.A. Rowlett
USNM 602013	♀	skin: whole; mixed tissue sample, frozen (Birds 10K Genome)	Nelson County, Virginia	18 SEP 2004	A. Hale, B. Fiske

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