



Universiteit
Leiden
The Netherlands

The ornithology of the Baudin expedition (1800-1804)

Jansen, J.J.F.J.

Citation

Jansen, J. J. F. J. (2018, May 22). *The ornithology of the Baudin expedition (1800-1804)*. Retrieved from <https://hdl.handle.net/1887/62332>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/62332>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/62332> holds various files of this Leiden University dissertation

Author: Jansen, Justin J.F.J.

Title: The ornithology of the Baudin expedition (1800-1804)

Date: 2018-05-22

Chapter 3.1

The Baudin Expedition to Tenerife, St. Thomas, St. Croix and Puerto Rico in 1796-98

Justin J.F.J. Jansen and Jérôme Fuchs

Accepted version for: *Journal of Caribbean Ornithology* 2018 (31).

Abstract: The results of archival and collection research into the expedition led by Nicolas Baudin in 1796-1798 to Tenerife, St. Thomas, St. Croix and Puerto Rico are here-in presented. The expedition brought home at least 296 specimens and was the first to collect in St. Thomas, St. Croix and Puerto Rico. Of these, 142+ specimens still survive, the largest single-voyage collection from pre-1800 still available. Accounts of these specimens and those known to have vanished are presented here for the first time, adding to our knowledge of early Caribbean ornithology. The arguments of David K. Wetherbee (1985, 1986) that thefts by the Baudin expedition took place during a foray into Hispaniola are all shown to be suspect. Molecular work identified a Common Barn-owl *Tyto alba ssp* supposedly collected in Puerto Rico, where no Common Barn-owls now occur, as belonging to a clade of owls found in the Netherlands Antilles and Northern and Central America.

Keywords: *Baudin, Virgin Island, Puerto Rico, Tenerife, expedition, Common Barn-owl*

INTRODUCTION

One of the first scientific expeditions to the Caribbean was captained in 1796-1798 by Nicolas-Thomas Baudin (1754-1803), during which the Danish West Indies (now US Virgin Islands) and Puerto Rico were explored. Expeditions before 1800 that brought large numbers of specimens home were not rare (Jansen 2016b), but from only a few do fair numbers survive. To date only 1500-3000 specimens collected before 1800 are still known to exist (Steinheimer 2005).

The purpose of this research is to present the reader with data gathered from the Baudin expedition and to discuss the publications by Wetherbee (1985, 1986). In these papers Wetherbee raised a number of issues concerning, for example: the supposed collectors on the Baudin expedition (e.g. René Maugé, Alejandro Advenier, Antoine Gonzales and J. Louis Hogard), political espionage, the character of Baudin, Baudin selling all the specimens gathered on the voyage and gaining a huge profit, Baudin stealing specimens from Jamaica, Haiti and Trinidad (from the expedition led by Franz Joseph Märter (1784-1788)) and the existence of papers made by Maugé and subsequent destruction of these papers as cover-up for the theft.

The Baudin expedition is especially known for its collection of the type of the now extinct Hispaniolan Parakeet *Psittacara chloropterus maugei* on Puerto Rico (Olson 2015). In addition, some of the collected birds on the expedition were the basis for several other type descriptions (see for example: Voisin and Voisin 2010 (p. 15); 2011 (pp. 16 & 22); 2016 (p. 57)).

Itinerary of the Baudin Expedition

On 30 September 1796, Baudin left La Havre, France, on the 350-ton corvette *Belle Angelique* with four naturalists on board: René Maugé (1757-1802), Anselme Riedlé (1775-1801), André-Pierre Ledru (1761-1825) and Stanislaus Levillain (x-1801). Baudin's goal was to recover

natural history specimens (chiefly living plants and trees, but also birds) collected in China, Malaysia, South Africa and the West Indies (particularly Trinidad) that he had been left behind on his previous voyage on the *Jardinière* in 1795. The ship *Belle Angelique* headed for the Canary Islands, where she docked on 6 November at Puerto de la Cruz on Tenerife and was condemned here as unseaworthy. On 15 March 1797, after a prolonged stay of four months, Baudin left Tenerife for Trinidad with a reduced crew on the American brig *The Fanny*, arriving on Trinidad on 10 April. He only remained there until 21 April, however, as Trinidad had fallen into the hands of the English and Baudin was not allowed to stay any longer, nor were his specimens from the *Jardinière* given back. Determined to make the expedition a success, Baudin decided to collect on other Caribbean islands, heading first to St. Thomas and St. Croix, where he remained from 30 April – 17 July 1797. Due to a lack of space for his growing collections, Baudin replaced *The Fanny* with *The Triumph* at St. Croix and renamed this ship *La Belle Angélique*. He continued to Puerto Rico, where specimens were collected on the north and east of the island from 16 July 1797 to 13 April 1798. Subsequently Baudin returned to France, docking at Fécamp, Normandy, on 7 June 1798.

After collection, the birds were preserved as skins and transported back to France. On arrival in France, the prime bird collector, René Maugé, worked on the collections. In collaboration with Louis Dufresne, senior taxidermist at the Muséum national d'histoire naturelle (MNHN), birds were mounted, as shown by Dufresne's handwriting on the pedestal undersides.

The Common Barn-owl *Tyto alba* ssp collected on the expedition was not recorded until 2016 in Puerto Rico. So, either the Baudin expedition's Barn-owl (MNHN-ZO-2014-457) from there represents the first and sole earlier record or else it was collected elsewhere; therefore, we decided to DNA sample the specimen to try to confirm what taxon was involved.

METHODS

To establish the number of bird specimens collected during the 1796-1798 Baudin expedition that still survive, JFFJ explored the various sections in which birds are stored in the MNHN during seven visits between 2011 and 2017. Additional research was carried out in other collections where specimens exist following exchanges or donations from MNHN, including Naturalis Biodiversity Center, Leiden, the Netherlands (hereafter Naturalis), Naturhistorisches Museum Wien, Austria (NMW) and National Museums Scotland, Edinburgh (NMS). Additional information was received from Musée George-Sand et de la Vallée noire, de la Châtre (MLC) Muséum-Aquarium de Nancy, Nancy, France and Musée vert - Muséum d'histoire naturelle au Mans, France (MHNLM). Relevant literature was also researched. For the specimens that are now lost, it has been presumed that the identification was correct in the acquisition books (MNHN laboratory, Ms ZMO-GalOis 1-5), which were started in roughly 1854.

For DNA sampling a tissue sample from one of the toe pads was collected from the Common Barn-owl brought back on the expedition for genetic analysis (executed at 9 February 2016). We extracted DNA using the Qiagen kit, following the manufacturer's protocol but doubled quantities and added DTT to facilitate the digestion of the tissue. A short fragment of the Cytochrome b was amplified and sequenced using primers Tyto-cytb470L: 5' TCCCAT-TYCACCATACTTCTC and Tyto-cytb580H: 5' GGTGAGTGGGTTGCTGGTG 3' and compared to existing Cytochrome b sequences from *Tyto* species and subspecies (Wink *et al.* 2009, Aliabadian *et al.* 2016); the fragment retained for the analyses was 620 bp long and corresponds to the positions 13830 to 14449 of the nearly complete *Tyto alba* mitochondrial genome (EU410491; Pratt *et al.* 2009). Gene tree reconstruction of the unique haplotypes was performed using Bayesian inference (BI), as implemented in MrBayes 3.2 (Ronquist *et al.* 2012). We used the *nst=mixed* and *rates=invgamma* options so that model uncertainty could be considered during the phylogenetic reconstruction. Four Metropolis-coupled MCMC chains (one cold and three heated) were run for 10⁶ iterations with trees sampled every 103 iterations.

RESULTS

Number of collected specimens

According to Wetherbee (1985: 171, 1986: 51-54), François Marie Daudin, who put Baudin's



Fig. 3-001 | PUERTO DE LA CRUZ, Tenerife,
4 November 2016 (Justin JFJ Jansen).
The ship was docked here in 1796-1797.

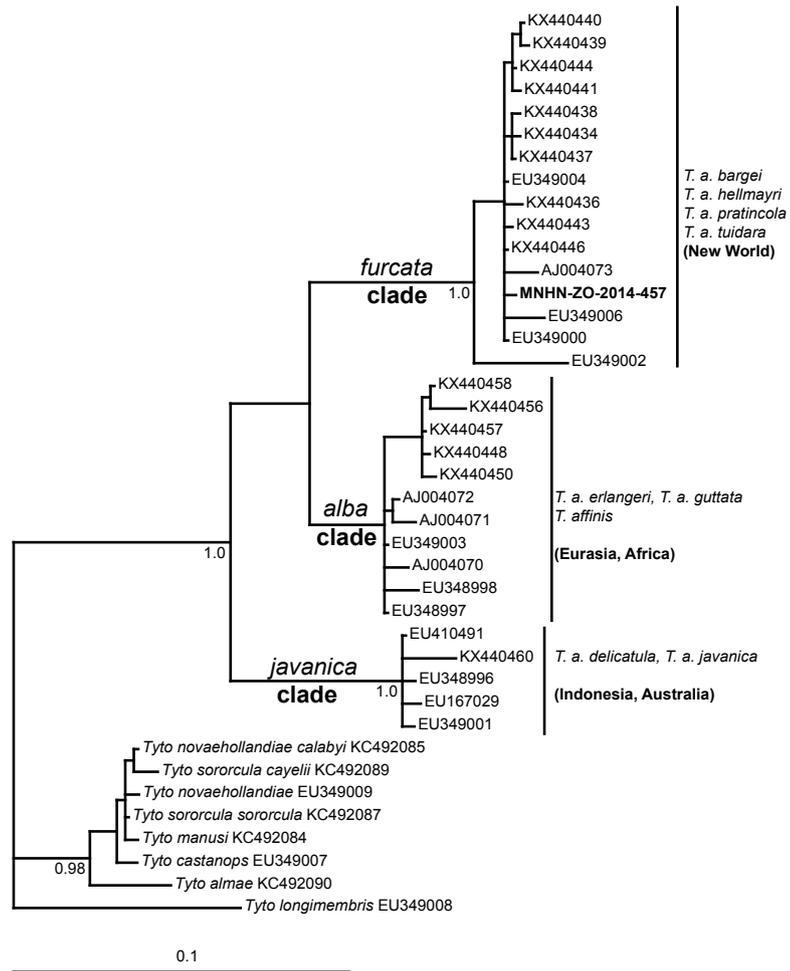


Fig. 3-002 | The majority rule (50%) consensus trees resulting from the Bayesian analyses of the Cytochrome b sequences from *Tyto* species. Numbers next to leaves represent Genbank accession numbers. Numbers close to nodes refer to posterior probabilities greater than 0.95.



birds on display in the Paris Museum soon after the expedition's return, saw 700 specimens and listed 94 species. However, Daudin also quoted a notice of receipt of specimens from the expedition signed by Jean-Baptiste de Lamarck of 450 specimens of birds (Wetherbee 1986: 29). According to another source, 296 birds from the expedition arrived at the MNHN on 2 March 1800 (Geoffroy Saint-Hilaire 1809, Jansen 2015a: 84). The actual number is therefore unknown due to the discrepancies in numbers and sources. By 1809 only 210 were still present (Jansen 2015a: 84). No original inventory could be found in the Laboratory or Library of the MNHN or in the Archives Nationales at Pierrefit-sur-Seine.

When Baudin subsequently visited Tenerife in 1800, he accessed a crate with birds he had left behind in 1797. Jangoux (2009: 324-325) mentions the crate contained, 'One hundred and twenty stuffed birds forming thirty-three species from Tenerife'.

The 195 specimens found in the various books in MNHN and in museums abroad are listed in Table 3-001. Maugé, the expedition's primary bird collector, was a skilled taxidermist and most likely responsible for the skinning and preparation of the entire bird collection, hence the large number of specimens that survive today. No less than 96 species were documented (table 3-001), from 195 specimens, of which 142 were found, 33 not found (but could still be present) and 20 had exited (to unknown destination) the collections researched.

Origin of the specimens

All the surviving specimens carry no original labels, nor is there any diary or original list from the voyage that contains information on the specific specimens. Information for these specimens is available on the pedestal label, pedestal underside and in the acquisition books. In the latter, information can also be found for the "not found" and exited specimens. It is interesting to note that the information on the pedestal undersides was a co-production by Maugé and Louis Dufresne (Dufresne's handwriting was recognisable), whereas information in the acquisition books and on the labels, is from an unknown secondary source (maybe another source of information present at the time), and sometimes differs from the pedestal undersides.

A few of the birds found originate from locations not visited by the Baudin expedition. Examples include Ring-tailed Pigeon *Patagioenas caribaea* (MNHN-ZO-MO-2002-534) from Jamaica (Wetherbee 1986: 51 & 245; Voisin *et al.* 2005: 845), Violaceous Quail-dove *Geotrygon v. violacea* (MNHN-ZO-MO-2003-2670) (Voisin *et al.* 2005: 861) from mainland South-America, Tropical Screech-owl *Megascops choliba crucigerus* (MNHN-ZO-MO-2010-287) probably from Trinidad (Voisin & Voisin 2011), Baltimore Oriole *Icterus galbula* (according to the pedestal underside from Haiti) and a Common Barn-owl *Tyto alba ssp* (MNHN-ZO-2014-457), one of the mainland subspecies of the Americas (Dickinson & van Remsen 2013: 256). Among birds not found are a Giant Snipe *Gallinago undulata*, which occurs on mainland South America (MNHN A.C. 13223) and Loggerhead Shrike *Lanius ludovicianus ssp* (MNHN A.C. 9999), which occurs on mainland Northern America. In La Châtre there is a Rufescent Tiger-heron *Tigrisoma lineatum* from main-



Fig. 3-003 | JARDÍN BOTÁNICO PUERTO DE LA CRUZ, Tenerife, 4 November 2016 (Justin JFJ Jansen).
André-Pierre Ledrú (crew-member of the Baudin expedition), was the first to catalogue the species grown in the Gardens. He proposed a systematic organization of the collections based on the Linnean classification of 1753.

land South America from the Baudin expedition, donated by Maugé (Gouraud 2014: 23). In NMS, there was a Spotted Tody-flycatcher *Todirostrum maculatum* from mainland South America, but it is no longer present, and at Naturalis there is a Hepatic Tanager *Piranga hepatica* ssp (RMNH.AVES.164.225) present that originates from the mainland of South and North America.

Incorrectly labelled in the acquisition books as from the ‘Americas’ is the Puerto Rican Flycatcher *Myiarchus antillarum* (initially labelled as White-winged Becard *Pachyramphus polychopterus*) (MNHN A.C. 3621), which is not present anymore.

Olson (2015) stated clearly that both Hispaniolan Parakeets were collected on Puerto Rico, and not from Mona Island (contra Wetherbee 1992: 51), although on the pedestal underside ‘Antilles’ is recorded for the MNHN-bird as the collecting location (Voisin & Voisin 2008: 474).

At least four watercolours (Antonio Gonzâlès) were made on the voyage, as shown in Jangoux (2009) (contained in MNHN, Bibliothèque centrale, Ms 49).

Spread of the specimens

In 1815, at least 35 expedition birds were in the private collection of Louis Dufresne (Dufresne 1815), the museum’s senior taxidermist who regularly exchanged birds with the MNHN (Jansen 2016: 17). Dufresne’s specimens up to 1819 ended up in Edinburgh, now NMS (Sweet 1970). Most specimens now in the NMW went there as French reparations following the Vienna Treaty at the end of the Napoleonic Wars (Bauer & Wagner 2012), although some may have arrived earlier due to unregistered exchanges with the MNHN. Coenraad Jacob Temminck, first director of the Rijksmuseum van Natuurlijke Historie (today Naturalis Biodiversity Center, Leiden, the Netherlands), often visited the MNHN for study purposes (his sisters also lived in Paris), enabling him to acquire many birds in exchanges (van Lynden-de Bruïne 2001). Also, birds ended up with private collectors such as the Baillon family (Gouraud 2014), and J. Duchesne de Lamotte received in 1810 two birds from the expedition (manuscript kept in the Laboratory at the MNHN, with title *Journal commence le premier Janvier 1759*).

From a manuscript kept in the Laboratory at the MNHN, with *Journal commence le premier Janvier 1759* on its cover written by Louis Dufresne, we find notes on specimens – now lost – sent to François-Marie Daudin on 22 March 1803 (four), Gustaf von Paykull in 1805 (one), and to an unspecified Italian Museum (they became spread to either Padua, Pavia or Bologna) on 12 October 1812 (two Puerto Rican Lizard-cuckoo and a heron). For other collections with Baudin specimens see table 3-001.

Common Barn-owl

Puerto Rico is given as the origin of the barn-owl in the MNHN, documented on the pedestal



and in the acquisition books. The Common Barn-owl is listed for Puerto Rico, but only on the basis of 6 records from 1947 onwards (Raffaele 1989) and first nesting in 2015 (Thorstrom and Gallardo 2017: 522); it is not recorded on the Virgin Islands (Raffaele *et al.* 2003: 100). Therefore, the Baudin specimen was subject to additional morphological and molecular analyses, comparing it to the New World subspecies *bargei* and *hellmayri* (Netherland Antilles), *tuidara* (Brazil and southern South America) and *pratincola* (North America). Its tail and bill measurements fall within the range of *pratincola*, but its wing-length falls below the range for this subspecies mentioned by Prins *et al.* (2003: 145) (table 3-002). The other taxa also appear to be excluded on morphological grounds: *bargei* (wing and tail measurements are too long), *hellmayri* (excluded on tail-length) and *tuidara* (excluded on tail-length). Therefore, to try to establish the taxonomic identity of the Baudin specimen, we sequenced a short fragment of its mitochondrial Cytochrome b (101 bp, Genbank accession number MG668890); however, the short fragment of DNA obtained from MNHN-ZO-2014-457 did not allow us to distinguish it from among the other New World subspecies, in the 620 bp alignment (fig. 3-002). Unfortunately, the validity of New World subspecies appears to be difficult to ascertain based on mitochondrial data (Aliabadian *et al.* 2016).

Wetherbee

Wetherbee (1986: 59) assumed that specimens from the Baudin expedition originating from locations not visited during the voyage had been stolen from the Franz Bredemeyer-Joseph Märter expedition (1783-85), which visited Hispaniola, Jamaica and Puerto Rico. However, most, if not all, material from the Bredemeyer-Märter expedition was brought back to Austria (Böhm 2010: 31-34), except for some Caribbean material that was stolen in Málaga in 1791 (Madriñán 2013: 74). The Baudin expedition took place between 30 September 1796 and 7 June 1798 and the specimens arrived in MNHN in 1800, so it is unclear what Wetherbee's source was.

Wetherbee also believed that Baudin



Fig. 3-004 | COMMON BARN-OWL *Strix alba* ssp.,
23 February 2015, MNHN-ZO-2014-457
(Phil W Koken / © MNHN).



Fig. 3-005 | PUERTO RICAN MANGO *Anthracothorax aurulentus*,
20 September 2016, MNHN-ZO-MO-2001-976 (Justin JFJ Jansen / © MNHN).



Fig. 3-006 | PUERTO RICAN MANGO *Anthracothorax aurulentus*,
20 September 2016, MNHN-ZO-MO-2001-975 (Justin JFJ Jansen / © MNHN).

sent three of his naturalists (Alejandro Advenier, Antonio Gonzales and Louis Hogard) on a secret mission to Hispaniola to covertly collect material; however, they returned in 1799 with Michel-Étienne Descourtilz, and it should be noted that the latter did not mention encountering the 3 men (Descourtilz 1809, contra Wetherbee 1985: 171).

Wetherbee (1985) also states that the Green Mango *Anthracothonax viridis* and Puerto Rican Emerald *Chlorostilbon maugeus* (two) specimens had disappeared from MNHN-galleries, although all three type specimens are still present (Jouanin 1950: 8, accessed by JJ at 20 September 2016).

Ledru (1810) lists 94 species, including several birds with “Saint Domingue” (=Hispaniola) in their origins (reprinted in Wetherbee 1985: 48-50); however, “Saint Domingue” is not written on the pedestals or labels of any Baudin specimen nor in the acquisition books, nor are any of the Baudin specimens Hispaniolan endemics. Furthermore, M. Luthier and M. La Reveillere had sent at least 114 birds from ‘San Dominique’ and ‘Amerique’ to the MNHN around September 1799 (Jansen 2015a: 87). Ledru’s (1810) list is anyway suspect, as it includes birds such as “Le pic vert du Bengale” (“Green Bengal Woodpecker”), a location surely not visited by the expedition.

DISCUSSION

Wetherbee’s ideas in general has already been questioned as fanciful by several authors (for example Walters 1995, Wiley & Kirwan 2013, Olson 2015: 4), and our investigations amply confirm previous doubts expressed. What was missed by Wetherbee, but shown in the next voyage captained by Baudin, to Australia and Timor (1800-1804), is the fact that many specimens were purchased at markets or received as donations (Jansen 2014c). Baudin and his crew purchased or received donations in Sydney, Australia, Mauritius and South Africa, including specimens from locations not visited on the voyage (for example Sierra Leone, Madagascar, New Zealand, Tonga, Java) (Jansen 2014c, 2017b). During the Caribbean voyage, large villages like Port of Spain (Trinidad) and San Juan (Puerto Rico) were visited, and live birds from other countries could easily be purchased here.

According to Steinheimer (2005), a total of 1500-3000 bird specimens collected prior to 1800 survive today. Among these, the 142 surviving specimens from the Baudin’s Caribbean Voyage comprise the largest collection from a single voyage pre-1800 which still survives.



Fig. 3-007 | WHITE-NECKED CROW

Corvus leucognaphalus,

20 December 2016,

MNHN-ZO-2011-579

(Justin JFJ Jansen / © MNHN).

Table. 3-001 | The taxonomy followed del Hoyo & Collar (2014, 2016). Identification of specimens no longer present (including exchanged/given away) is based on the species name available of the specimen in MNHN (acquisition books) and other collections were specimens

| Species | Latin Name | Col. Loc. | Reg.no. Individual |
|-----------------------------------|----------------------------------|-------------|--|
| Crested Guan | <i>Penelope purpurascens</i> | Puerto Rico | MNHN A.C. 11907 |
| Masked Duck | <i>Nomonyx dominicus</i> | Puerto Rico | MNHN A.C. 15492 |
| American Wigeon | <i>Anas americana</i> | Puerto Rico | MNHN A.C. 15317 |
| American Wigeon | <i>Anas americana</i> | Puerto Rico | MNHN A.C. 15318 (exit in 1930) |
| West Indian Whistling-duck | <i>Dendrocygna arborea</i> | Antilles | MNHN A.C. 15199 |
| West Indian Whistling-duck | <i>Dendrocygna arborea</i> | Antilles | NMS, Dufrense 1818: 33 (not found) |
| West Indian Whistling-duck | <i>Dendrocygna arborea</i> | Antilles | NMS, Dufrense 1818: 33 (destroyed in 1892) |
| Rock Pigeon | <i>Columba livia</i> | Tenerife | MNHN A.C. 11336 |
| White-crowned Pigeon | <i>Patagioenas leucocephala</i> | Puerto Rico | MNHN A.C. 11375 |
| White-crowned Pigeon | <i>Patagioenas leucocephala</i> | Puerto Rico | MNHN A.C. 11376 |
| Bare-eyed Pigeon | <i>Patagioenas corensis</i> | Puerto Rico | MNHN A.C. 11381 |
| Scaly-naped Pigeon | <i>Patagioenas squamosa</i> | Puerto Rico | MNHN-ZO-MO-2002-540 |
| Scaly-naped Pigeon | <i>Patagioenas squamosa</i> | Puerto Rico | MNHN-ZO-MO-2002-541 |
| Scaly-naped Pigeon | <i>Patagioenas squamosa</i> | Puerto Rico | NMS_Z 1819.20.1.72 |
| Scaly-naped Pigeon | <i>Patagioenas squamosa</i> | Puerto Rico | NMW 44.588 |
| Ring-tailed Pigeon | <i>Patagioenas caribaea</i> | | MNHN-ZO-MO-2002-534 |
| Key West Quail-dove | <i>Geotrygon chrysis</i> | Puerto Rico | MNHN A.C. 11525 |
| Key West Quail-dove | <i>Geotrygon chrysis</i> | Puerto Rico | MNHN A.C. 11527 |
| Key West Quail-dove | <i>Geotrygon chrysis</i> | Puerto Rico | NMW 1815.XXXVII.220 (not found) |
| Violaceous Quail-dove | <i>Geotrygon violacea</i> | | MNHN-ZO-MO-2003-2670 |
| Ruddy Quail-dove | <i>Geotrygon montana</i> | | NMS_Z 1929.186.61 |
| Mourning Dove | <i>Zenaida macroura</i> | Puerto Rico | MNHN A.C. 11642 |
| Common Ground Dove | <i>Columbina passerina</i> | | NMS_Z 1929.186.108 |
| Antillean Mango | <i>Anthracothorax aurulentus</i> | St Thomas | MNHN A.C. 4536 |
| Antillean Mango | <i>Anthracothorax aurulentus</i> | St Thomas | MNHN-ZO-MO-2001-975 |
| Antillean Mango | <i>Anthracothorax aurulentus</i> | St Thomas | MNHN-ZO-MO-2001-976 |
| Antillean Mango | <i>Anthracothorax aurulentus</i> | St Thomas | NMS, Dufresne 1818: 7 (destroyed in 1892) |
| Antillean Mango | <i>Anthracothorax aurulentus</i> | St Thomas | NMS, Dufresne 1818: 7 (destroyed in 1892) |
| Antillean Mango | <i>Anthracothorax aurulentus</i> | St Thomas | NMS, Dufresne 1818: 7 (destroyed in 1892) |
| Green Mango | <i>Anthracothorax viridis</i> | Puerto Rico | MNHN-ZO-MO-2001-978 |
| Green Mango | <i>Anthracothorax viridis</i> | Puerto Rico | NMW 1807.V.87 (not found) |

were located. The interpretation of collection locality is based on information in the acquisition books or pedestal underside. Acronyms are explained in the Materials and methods.

| Species | Latin Name | Col. Loc. | Reg.no. Individual |
|----------------------------|-------------------------------|-------------|---|
| Green Mango | <i>Anthracothorax viridis</i> | Puerto Rico | NMS, Dufresne 1818: 30 (destroyed in 1890) |
| Green Mango | <i>Anthracothorax viridis</i> | Puerto Rico | Naturalis, Temminck 1807: 71 (not found) |
| Green Mango | <i>Anthracothorax viridis</i> | Puerto Rico | Naturalis, Temminck 1807: 71 (not found) |
| Green-throated Carib | <i>Eulampis holosericeus</i> | Puerto Rico | MNHN A.C. 4532 |
| Green-throated Carib | <i>Eulampis holosericeus</i> | Puerto Rico | NMS, Dufresne 1818: 7 (destroyed in 1906) |
| Green-throated Carib | <i>Eulampis holosericeus</i> | Puerto Rico | NMS, Dufresne 1818: 7 (destroyed in 1906) |
| Puerto Rican Emerald | <i>Chlorostilbon maugaeus</i> | Puerto Rico | MNHN-ZO-MO-2001-952 |
| Puerto Rican Emerald | <i>Chlorostilbon maugaeus</i> | Puerto Rico | MNHN-ZO-MO-2001-953 |
| Puerto Rican Emerald | <i>Chlorostilbon maugaeus</i> | Puerto Rico | NMS, Dufresne 1818: 8 (not found) |
| Puerto Rican Emerald | <i>Chlorostilbon maugaeus</i> | Puerto Rico | NMS, Dufresne 1818: 8 (not found) |
| Puerto Rican Emerald | <i>Chlorostilbon maugaeus</i> | Puerto Rico | NMS, Dufresne 1818: 8 (not found) |
| Puerto Rican Emerald | <i>Chlorostilbon maugaeus</i> | Puerto Rico | Naturalis, Temminck 1807: 84-85 (not found) |
| Puerto Rican Lizard-cuckoo | <i>Coccyzus vieilloti</i> | Puerto Rico | MNHN A.C. 1839 |
| Puerto Rican Lizard-cuckoo | <i>Coccyzus vieilloti</i> | Puerto Rico | MNHN A.C. 1840 |
| Puerto Rican Lizard-cuckoo | <i>Coccyzus vieilloti</i> | Puerto Rico | NMW 44.637 |
| Puerto Rican Lizard-cuckoo | <i>Coccyzus vieilloti</i> | Puerto Rico | RMNH.AVES.216005 |
| Puerto Rican Lizard-cuckoo | <i>Coccyzus vieilloti</i> | Puerto Rico | NMS_Z 1929.186.95 |
| Mangrove Cuckoo | <i>Coccyzus minor</i> | Puerto Rico | MNHN-MO-ZO-1997-1209 |
| Mangrove Cuckoo | <i>Coccyzus minor</i> | Puerto Rico | NMW 44.637 |
| Purple Gallinule | <i>Porphyrio martinicus</i> | Puerto Rico | MNHN A.C. 13672 (not found) |
| Common Gallinule | <i>Gallinula galeata</i> | Puerto Rico | MNHN A.C. 13699 (not found) |
| Spotted Sandpiper | <i>Actitis macularius</i> | Puerto Rico | MNHN A.C. 13408 |
| Spotted Sandpiper | <i>Actitis macularius</i> | Puerto Rico | MNHN A.C. 13409 |
| Limpkin | <i>Aramus guarauna</i> | Puerto Rico | MNHN A.C. 13528 |
| Limpkin | <i>Aramus guarauna</i> | Puerto Rico | MLC.2011.0.103 |
| Cory's Shearwater | <i>Calonectris borealis</i> | Tenerife | MNHN-ZO-2011-588 |
| Brown Pelican | <i>Pelecanus occidentalis</i> | St Thomas | MNHN A.C. 14181 (exit in 1930) |
| Rufescent Tiger-heron | <i>Tigrisoma lineatum</i> | | MLC.2010.0.120 |
| Least Bittern | <i>Ixobrychus exilis</i> | | NMW 39.623 |
| Yellow-crowned Night-heron | <i>Nyctanassa violacea</i> | Puerto Rico | MNHN A.C. 14037 |
| Yellow-crowned Night-heron | <i>Nyctanassa violacea</i> | Puerto Rico | MLC.2010.0.114 |

| Species | Latin Name | Col. Loc. | Reg.no. Individual |
|--------------------------|-------------------------------------|-------------|---|
| Green-backed Heron | <i>Butorides striata</i> | Puerto Rico | MNHN A.C. 13951 |
| Green-backed Heron | <i>Butorides striata</i> | Puerto Rico | MNHN A.C. 13954 |
| Green-backed Heron | <i>Butorides striata</i> | Puerto Rico | MNHN A.C. 13952 (exit in 1879) |
| Little Blue Heron | <i>Egretta caerulea</i> | Puerto Rico | MNHN A.C. 13918 |
| Little Blue Heron | <i>Egretta caerulea</i> | Puerto Rico | MLC.2010.0.92 |
| Little Blue Heron | <i>Egretta caerulea</i> | Puerto Rico | Nancy 2013.0.183 |
| American Golden Plover | <i>Pluvialis dominica</i> | | MNHN A.C. 12890 |
| Wilson's Plover | <i>Charadrius wilsonia</i> | | MNHN A.C. 12937a |
| Upland Sandpiper | <i>Bartramia longicauda</i> | Antilles | MNHN A.C. 13420 (exit in 1879) |
| Sanderling | <i>Calidris alba</i> | | MNHN A.C. 13272 (not found) |
| Pectoral Sandpiper | <i>Calidris melanotos</i> | | MNHN A.C. 13315 (not found) |
| Pectoral Sandpiper | <i>Calidris melanotos</i> | | MNHN A.C. 13316 (not found) |
| Wilson's Snipe | <i>Gallinago delicata</i> | Puerto Rico | MNHN A.C. 13207 |
| Giant Snipe | <i>Gallinago undulata</i> | | MNHN A.C. 13223 (not found) |
| Brown Noddy | <i>Anous stolidus</i> | St Thomas | MNHN A.C. 14758 |
| Solitary Sandpiper | <i>Tringa solitaria</i> | | MNHN A.C. 13402 |
| Bonaparte's Gull | <i>Chroicocephalus philadelphia</i> | USA | MNHN A.C. 14611 (not found) |
| Lesser Yellowlegs | <i>Tringa flavipes</i> | | MNHN A.C. 13382 |
| Laughing Gull | <i>Leucophaeus atricilla</i> | St Thomas | MNHN A.C. 14558 |
| Laughing Gull | <i>Leucophaeus atricilla</i> | St Thomas | MNHN A.C. 14566 |
| Short-eared Owl | <i>Asio flammeus</i> | Puerto Rico | NMW 44.077 |
| Short-eared Owl | <i>Asio flammeus</i> | Puerto Rico | NMS, Dufresne 1818:4 (destroyed in 1894) |
| Red-tailed Hawk | <i>Buteo jamaicensis</i> | Antilles | MNHN A.C. 245 (not found) |
| Common Barn-owl | <i>Tyto alba</i> | Puerto Rico | MNHN-ZO-2014-457 |
| Puerto Rican Screech-owl | <i>Megascops nudipes</i> | Puerto Rico | MNHN-ZO-MO-2010-272 |
| Puerto Rican Screech-owl | <i>Megascops nudipes</i> | Puerto Rico | MNHN-ZO-MO-201-273 |
| Puerto Rican Screech-owl | <i>Megascops nudipes</i> | Puerto Rico | NMW 40.527 |
| Puerto Rican Screech-owl | <i>Megascops nudipes</i> | Puerto Rico | NMS, Dufresne 1818: 3 (destroyed in 1894) |
| Tropical Screech-owl | <i>Megascops choliba</i> | Puerto Rico | MNHN-ZO-MO-2010-287 |
| Puerto Rican Tody | <i>Todus mexicanus</i> | Puerto Rico | MNHN-ZO-MO-1996-487 |
| Puerto Rican Woodpecker | <i>Melanerpes portoricensis</i> | Puerto Rico | MNHN-MO-ZO-2009-929 |
| Puerto Rican Woodpecker | <i>Melanerpes portoricensis</i> | Puerto Rico | MNHN-MO-ZO-2009-930 |
| Puerto Rican Woodpecker | <i>Melanerpes portoricensis</i> | Puerto Rico | NMS_Z 1929.186.19 |
| Puerto Rican Woodpecker | <i>Melanerpes portoricensis</i> | Puerto Rico | NMS, Dufresne 1818: 23 (exit) |
| Eurasian Kestrel | <i>Falco tinnunculus</i> | Tenerife | MNHN A.C. 431 |

| Species | Latin Name | Col. Loc. | Reg.no. Individual |
|-------------------------|--------------------------------|----------------------|------------------------------------|
| Eurasian Kestrel | <i>Falco tinnunculus</i> | Tenerife | MNHN A.C. 432 (exit) |
| Eurasian Kestrel | <i>Falco tinnunculus</i> | Tenerife | MNHN A.C. 435 (exit) |
| American Kestrel | <i>Falco sparverius</i> | St Thomas | MNHN A.C. 468 |
| Merlin | <i>Falco columbarius</i> | Puerto Rico | MNHN A.C. 404 |
| Puerto Rican Parrot | <i>Amazona vittata</i> | Puerto Rico | MNHN A.C. 1206 |
| Puerto Rican Parrot | <i>Amazona vittata</i> | Puerto Rico | RMNH.AVES.209332 |
| Puerto Rican Parrot | <i>Amazona vittata</i> | Puerto Rico | MHNLM 2003.9.910 |
| Hispaniolan Parakeet | <i>Psittacara chloropterus</i> | Antilles | MNHN-MO-ZO-2004-132 |
| Hispaniolan Parakeet | <i>Psittacara chloropterus</i> | Antilles | RMNH.AVES.110079 |
| Spotted Tody-flycatcher | <i>Todirostrum maculatum</i> | Antilles | NMS, Dufresne 1818: 30 (not found) |
| Caribbean Elaenia | <i>Elaenia martinica</i> | Puerto Rico | MNHN A.C. 3733 |
| Gray Kingbird | <i>Tyrannus dominicensis</i> | Puerto Rico | MNHN A.C. 3786 |
| Gray Kingbird | <i>Tyrannus dominicensis</i> | Puerto Rico | MNHN A.C. 3787 |
| Gray Kingbird | <i>Tyrannus dominicensis</i> | Puerto Rico | MNHN A.C. 3793 |
| Puerto Rican Flycatcher | <i>Myiarchus antillarum</i> | Amerique meridionale | MNHN A.C. 3809 |
| Puerto Rican Flycatcher | <i>Myiarchus antillarum</i> | Amerique meridionale | MNHN A.C. 3810 |
| Puerto Rican Flycatcher | <i>Myiarchus antillarum</i> | Amerique meridionale | MNHN A.C. 3621 (not found) |
| Puerto Rican Vireo | <i>Vireo latimeri</i> | Puerto Rico | MNHN-ZO-2013-1309 |
| Puerto Rican Vireo | <i>Vireo latimeri</i> | Puerto Rico | MNHN-ZO-2013-1310 |
| Black-whiskered Vireo | <i>Vireo altiloquus</i> | Puerto Rico | MNHN A.C. 9529 |
| Black-whiskered Vireo | <i>Vireo altiloquus</i> | Puerto Rico | NMS_Z 1929.186.17a |
| Black-whiskered Vireo | <i>Vireo altiloquus</i> | Puerto Rico | NMS_Z 1929.186.17b |
| Loggerhead Shrike | <i>Lanius ludovicianus</i> | | MNHN A.C. 9999 (not found) |
| Common Raven | <i>Corvus corax</i> | Tenerife | MNHN A.C. 5391 |
| White-necked Crow | <i>Corvus leucognaphalus</i> | Antilles | MNHN-ZO-2011-579 |
| White-necked Crow | <i>Corvus leucognaphalus</i> | Antilles | NMW 31.954 |
| Grey Wagtail | <i>Motacilla cinerea</i> | Tenerife | MNHN A.C. 8219 |
| Grey Wagtail | <i>Motacilla cinerea</i> | Tenerife | MNHN A.C. 8220 |
| Common Chaffinch | <i>Fringilla coelebs</i> | Tenerife | MNHN-ZO-2013-1290 |
| Common Chaffinch | <i>Fringilla coelebs</i> | Tenerife | MNHN-ZO-2013-1293 |
| Common Chaffinch | <i>Fringilla coelebs</i> | Tenerife | NMS_Z 1819.20.1.31 |
| Antillean Euphonia | <i>Euphonia flavifrons</i> | | MNHN A.C. 7970 |
| Antillean Euphonia | <i>Euphonia flavifrons</i> | | MNHN A.C. 7972 |
| Antillean Euphonia | <i>Euphonia flavifrons</i> | | NMS, Dufresne 1818: 64 (not found) |
| Antillean Euphonia | <i>Euphonia flavifrons</i> | | NMS, Dufresne 1818: 64 (not found) |

| Species | Latin Name | Col. Loc. | Reg.no. Individual |
|-----------------------------|--------------------------------|-------------|--|
| Atlantic Canary | <i>Serinus canaria</i> | Tenerife | MNHN A.C. 7499 |
| Atlantic Canary | <i>Serinus canaria</i> | Tenerife | MNHN A.C. 7500 |
| Atlantic Canary | <i>Serinus canaria</i> | Tenerife | NMS, Dufresne 1818: 58 (not found) |
| Chipping Sparrow | <i>Spizella passerina</i> | Puerto Rico | MNHN A.C. 6948 (not found) |
| Northern Waterthrush | <i>Parkesia noveboracensis</i> | | NMW 65.510 |
| Ovenbird | <i>Seiurus aurocapilla</i> | Puerto Rico | MNHN A.C. 9277 |
| Ovenbird | <i>Seiurus aurocapilla</i> | Puerto Rico | MNHN A.C. 9278 |
| Common Yellowthroat | <i>Geothlypis trichas</i> | | MNHN A.C. 9211 |
| Common Yellowthroat | <i>Geothlypis trichas</i> | | MNHN A.C. 9216 |
| Northern Parula | <i>Parula americana</i> | Puerto Rico | MNHN A.C. 9202 |
| Northern Parula | <i>Parula americana</i> | Puerto Rico | MNHN A.C. 9204 |
| American Redstart | <i>Setophaga ruticilla</i> | Puerto Rico | MNHN A.C. 9264 |
| American Redstart | <i>Setophaga ruticilla</i> | Puerto Rico | MNHN A.C. 9265 |
| American Redstart | <i>Setophaga ruticilla</i> | Puerto Rico | MNHN A.C. 9266 |
| American Redstart | <i>Setophaga ruticilla</i> | Puerto Rico | NMS, Dufresne 1818: 72 (destroyed in 1892) |
| American Redstart | <i>Setophaga ruticilla</i> | Puerto Rico | NMS, Dufresne 1818: 72 (destroyed in 1892) |
| Palm Warbler | <i>Setophaga palmarum</i> | Puerto Rico | MNHN A.C. 9160 |
| Myrtle Warbler | <i>Setophaga coronata</i> | Puerto Rico | MNHN A.C. 9152 |
| Myrtle Warbler | <i>Setophaga coronata</i> | Puerto Rico | MNHN A.C. 9153 |
| Prairie Warbler | <i>Setophaga discolor</i> | Puerto Rico | MNHN A.C. 9184 |
| Prairie Warbler | <i>Setophaga discolor</i> | Puerto Rico | MNHN A.C. 9187 |
| Prairie Warbler | <i>Setophaga discolor</i> | Puerto Rico | NMS_Z 1929.186.15 |
| Prairie Warbler | <i>Setophaga discolor</i> | Puerto Rico | NMS, Dufresne 1818: 76 (exit) |
| Baltimore Oriole | <i>Icterus galbula</i> | Haiti? | MNHN A.C. 6103 (not found) |
| Puerto Rican Oriole | <i>Icterus portoricensis</i> | Puerto Rico | MNHN A.C. 6104 |
| Puerto Rican Oriole | <i>Icterus portoricensis</i> | Puerto Rico | MNHN A.C. 6106 |
| Puerto Rican Oriole | <i>Icterus portoricensis</i> | Puerto Rico | MNHN A.C. 6107 |
| Puerto Rican Oriole | <i>Icterus portoricensis</i> | Puerto Rico | MNHN A.C. 6109 |
| Yellow-shouldered Blackbird | <i>Agelaius xanthomus</i> | St Thomas | MNHN A.C. 6165a |
| Greater Antillean Grackle | <i>Quiscalus niger</i> | Puerto Rico | MNHN A.C. 5899bis |
| Greater Antillean Grackle | <i>Quiscalus niger</i> | Puerto Rico | MNHN A.C. 5894 (exit in 1885) |
| Greater Antillean Grackle | <i>Quiscalus niger</i> | Puerto Rico | RMNH.AVES.168821 |
| Purple Martin | <i>Progne subis</i> | Antilles | NMW 1815.XXXVI.58 (not found) |
| Caribbean Martin | <i>Progne dominicensis</i> | Puerto Rico | MNHN A.C. 10918 |
| Caribbean Martin | <i>Progne dominicensis</i> | Puerto Rico | MNHN A.C. 10924 |

| Species | Latin Name | Col. Loc. | Reg.no. Individual |
|-------------------------------|----------------------------------|-------------|--|
| Hepatic Tanager | <i>Piranga hepatica</i> | | RMNH.AVES.164225 |
| Hepatic Tanager | <i>Piranga hepatica</i> | | Naturalis, Temminck 1807: 78 (not found) |
| Hepatic Tanager | <i>Piranga hepatica</i> | | NMS, Dufresne 1818: 10 (not found) |
| Bananaquit | <i>Coereba flaveola</i> | Puerto Rico | MNHN A.C. 10410a |
| Puerto Rican Bullfinch | <i>Pyrrhulagra portoricensis</i> | Puerto Rico | MNHN A.C. 7110 |
| Puerto Rican Bullfinch | <i>Pyrrhulagra portoricensis</i> | Puerto Rico | MNHN-ZO-2013-1304 |
| Puerto Rican Bullfinch | <i>Pyrrhulagra portoricensis</i> | Puerto Rico | MNHN-ZO-2013-1212 |
| Puerto Rican Bullfinch | <i>Pyrrhulagra portoricensis</i> | Puerto Rico | NMW 65.986 |
| Puerto Rican Bullfinch | <i>Pyrrhulagra portoricensis</i> | Puerto Rico | NMS_Z 1819.20.1.33 |
| Puerto Rican Bullfinch | <i>Pyrrhulagra portoricensis</i> | Puerto Rico | RMNH.AVES.110037 |
| Yellow-faced Grassquit | <i>Tiaris olivaceus</i> | Puerto Rico | MNHN A.C. 7128 |
| Yellow-faced Grassquit | <i>Tiaris olivaceus</i> | Puerto Rico | MNHN A.C. 7129 |
| Yellow-faced Grassquit | <i>Tiaris olivaceus</i> | Puerto Rico | MNHN A.C. 6852 |
| Yellow-faced Grassquit | <i>Tiaris olivaceus</i> | Puerto Rico | NMS_Z 1819.20.1.27 |
| Yellow-faced Grassquit | <i>Tiaris olivaceus</i> | Puerto Rico | NMW 66.404 |
| Canary Islands Tit | <i>Parus teneriffae</i> | Tenerife | MNHN-ZO-2012-671 |
| Canary Islands Tit | <i>Parus teneriffae</i> | Tenerife | NMS_Z 1929.186.60 |
| Canary Islands Tit | <i>Parus teneriffae</i> | Tenerife | NMW 33.878 |
| Lesser Short-toed Lark | <i>Calandrella rufescens</i> | Tenerife | MNHN A.C. 8083 (not found) |
| Lesser Short-toed Lark | <i>Calandrella rufescens</i> | Tenerife | MNHN A.C. 8084 (not found) |
| Cave Swallow | <i>Petrochelidon fulva</i> | | MNHN A.C. 11084 |
| Cave Swallow | <i>Petrochelidon fulva</i> | | MNHN A.C. 11093 |
| Willow Warbler | <i>Phylloscopus trochilus</i> | Tenerife | MNHN A.C. 8778 (not found) |
| Sardinian Warbler | <i>Sylvia melanocephala</i> | Tenerife | MNHN A.C. 8823 (exit in 1977) |
| Spectacled Warbler | <i>Sylvia conspicillata</i> | Tenerife | MNHN A.C. 8838 (not found) |
| Pearly-eyed Thrasher | <i>Margarops fuscatus</i> | Puerto Rico | MNHN A.C. 8567 |
| Pearly-eyed Thrasher | <i>Margarops fuscatus</i> | Puerto Rico | NMS, Dufresne 1818: 65 (destroyed in 1892) |
| Red-legged Thrush | <i>Turdus plumbeus</i> | | MNHN A.C. 8550 (not found) |

Table. 3-002 | Measurements of Barn-owls *Tyto alba* of the New World group. Data of both sexes combined are summarized in the following order: average (standard deviation; sample size) range (taken from Prins *et al.* 2003). Measurements were taken according to Svensson (1992). Morphometric analysis does not include just-fledged specimens. The *Tyto alba* ssp specimen is MNHN-ZO-2014-457.

| | <i>Tyto alba</i> ssp. | <i>Tyto alba</i> bargei | <i>Tyto alba</i> hellmayri | <i>Tyto alba</i> pratincola | <i>Tyto alba</i> tuidara |
|----------------------|-----------------------|--------------------------|----------------------------|-----------------------------|--------------------------|
| wing | 320 | 253.9 (3.88;15) 245-260 | 327.8 (7.55;25) 312-342 | 342.4 (7.48;13) 331-354 | 303.8 (11.0;6) 292-321 |
| tail | 141 | 99.2 (2.46;14) 96-108 | 126.6 (5.43;24) 118-136 | 134.0 (4.86;13) 127-141 | 118.2 (5.38;6) 110-124 |
| tarsus | 82.3 (r), 79.8 (l) | 55.8 (1.87;14) 51.5-59.5 | 72.0 (2.12;27) 69.5-78.0 | 73.6 (2.69;13) 69.5-78.0 | 66.2 (2.91;6) 62.4-69.3 |
| bill to skull | 37.2 | 34.1 (1.33;15) 32.2-36.5 | 39.1 (2.00;16) 36.6-42.8 | 39.1 (2.42;13) 35.5-42.6 | 35.3 (0.85;6) 34.3-36.4 |
| length | 1007 | | | | |



Fig. 3-008 | WHITE-CROWNED PIGEON *Patagioenas leucocephala*,
20 September 2016, MNHN A.C. 11375 & MNHN A.C. 11376 (Justin JFJ Jansen / © MNHN).



Fig. 3-009 | PUERTO RICAN SCREECH-OWL
Megascops nudipes,
 21 March 2017,
 MNHN-ZO-MO-2010-272
 (Justin JFJ Jansen/ © MNHN).



Fig. 3-010 | HISPANIOLAN PARAKEET *Psittacara chloropterus mauei*,
 20 September 2016, MNHN-MO-ZO-2004-132 (Justin JFJ Jansen / © MNHN).



Fig. 3-011 | PUERTO RICAN WOODPECKER *Melanerpes portoricensis*,
20 September 2016, MNHN-MO-ZO-2009-929 & MNHN-MO-ZO-2009-930
(Justin JFJ Jansen / © MNHN).



Fig. 3-012 | COMMON CHAFFINCH *Fringilla coelebs canariensis*,
20 September 2016, MNHN-ZO-2013-1290 & MNHN-ZO-2013-1293
(Justin JFJ Jansen / © MNHN).



Fig. 3-013 | PUERTO RICAN VIREO *Vireo latimeri*,
20 September 2016,
MNHN-ZO-2013-1309 & MNHN-ZO-2013-1310
(Justin JFJ Jansen / © MNHN).



Fig. 3-014 | CORY'S SHEARWATER *Calonectris borealis*,
20 September 2016, MNHN-ZO-2011-588 (Justin JFJ Jansen / © MNHN).



Fig. 3-015 | ISLAND CANARY *Serinus canaria*,
20 September 2016, MNHN-ZO-2013-1290 & MNHN-ZO-2013-1293
(Justin JFJ Jansen / © MNHN).



Fig. 3-016 | AFRICAN BLUE TIT *Parus t. teneriffae*,
20 December 2016, MNHN-ZO-2012-671
(Justin JFJ Jansen / © MNHN).



Fig. 3-017 | PUERTO RICAN LIZARD-CUCKOO
Coccyzus vieilloti,
28 February 2017, NMW 44.637
(Alex Bos / © NMW).



Fig. 3-018 | NORTHERN WATERTHRUSH
Parkesia noveboracensis ssp.,
28 February 2017, NMW 65.510
(Alex Bos / © NMW).



Fig. 3-019 | GREEN MANGO *Anthracothorax viridis*,
20 September 2016, MNHN-ZO-MO-2001-978 (Justin JFJ Jansen / © MNHN).



Fig. 3-020 | PUERTO RICAN EMERALD *Chlorostilbon maugaeus*,
20 September 2016, MNHN-ZO-MO-2001-952 & MNHN-ZO-MO-2001-953
(Justin JFJ Jansen / © MNHN).