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*The Birds of*  
**BARBADOS**

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## Editor's Foreword

Two-thirds of the checklists published by the British Ornithologists' Union have concerned the birds of islands or island groups, so this book on the ornithology of Barbados follows a tradition. Regionally, it complements others from the western Atlantic Ocean and Caribbean Sea such as the checklists of the birds of the Cayman Islands, the southern Bahamas, Hispaniola and Barbados's nearest neighbour in the Lesser Antilles, St Lucia. Indeed, the authors have drawn on the earlier lists to compare aspects of the birds of Barbados with those of St Lucia and the Caymans. Barbados is shown to be the least well endowed with breeding species and endemic taxa, in line with predictions of the theory of island biogeography but also because it receives less rain and has no high volcanic forests. But what it lacks in the resident bird categories Barbados makes up for in spades with migrants and vagrants. Highlights of the accounts presented here are the detailed descriptions and analyses of the movements of birds through Barbados and of the subject of vagrancy, often dismissed of little biological importance but here shown to be of major zoogeographical interest. The analyses treat pelagic, non-pelagic waterbirds and land-birds separately and consider their likely origins as well as predicting potential future arrivals and breeders. Many of the unexpected conclusions about origins derive from the authors' particular attention to the subspecific identities of visitors.

The taxonomy of birds has been both confused and illuminated by the advent of molecular biology. Here the authors have taken a conservative route through the quagmire, but they have included a section on molecular insights and, for those species for which molecular data have resolved outstanding issues, provided summaries of the latest thinking. Thus, this checklist becomes the forerunner in what is likely to be a continuing trend in BOU checklists as far as the use of molecular pointers is concerned. In addition, the authors are sanguine about the lack of information on many topics and so have written a research agenda prescribing where future workers on Barbados's birds could find fertile ground for investigation, and many of their suggestions are molecular. Thus, this checklist is quite different in character from what was probably envisaged by the late Maurice Hutt when he began compiling a list of the birds of Barbados in 1954, just the year after James Watson and Francis Crick published their famous paper on the structure of DNA.

One of the principal aims of the British Ornithologists' Union is to contribute to the conservation of the world's birds and the checklists are an important tool for drawing attention to the geographical distributions and abundances of rare, threatened or endangered birds to aid practical protective measures. As in most biomes, anthropogenic changes are the main threats working against Barbados's birds through the removal of vegetative cover, building projects, introduction of exotic plants and animals, interference with water systems and suchlike. At present these threats are unlikely to lead to any global extinctions as only two of Barbados's bird species are listed as threatened (BirdLife International 2000). One, the Piping Plover *Charadrius melodus* (vulnerable), has occurred only once as a vagrant and then well before it was in trouble in its breeding quarters. The other is the Caribbean Coot *Fulica caribaea* (near threatened). However, as explained in this volume, taxonomic revisions may necessitate additions such as the Scaly-breasted Thrasher *Allenia fusca atlanticus*, should its continuing survival be confirmed and if it is eventually upgraded to full species status. This has already been done for the Barbados Bullfinch *Loxigilla barbadensis*, the island's only endemic species, which, thankfully, remains common. But how would we know such details without a book of this sort? P.A. Buckley, Edward B. Massiah, the late Maurice B. Hutt, Francine G. Buckley and the late Hazel F. Hutt deserve our praise and thanks for their painstaking efforts in writing the definitive account of the birds of Barbados for us to enjoy and learn from. Thanks to them all and to the additional photographers who contributed their

pictures to enliven the words, bringing to life the scenes and avifauna of a fascinating island that has so much to offer to those interested in birds, be they casual observers or studious ornithologists.

Robert A. Cheke  
*BOU Checklist Series Editor*  
October 2008

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(California Geological Survey)

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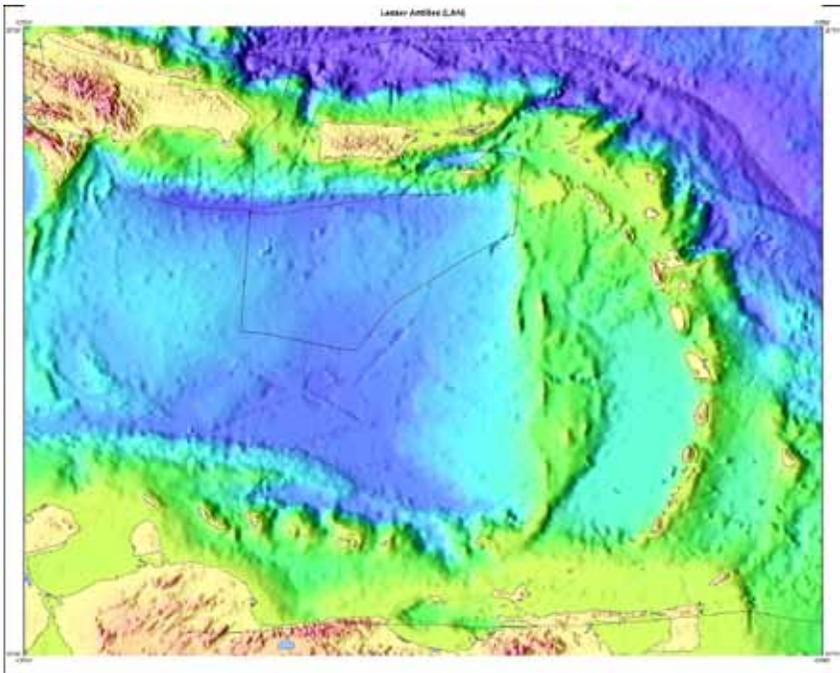
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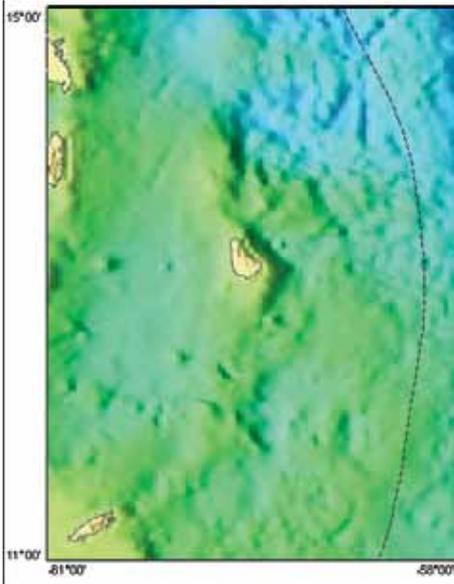
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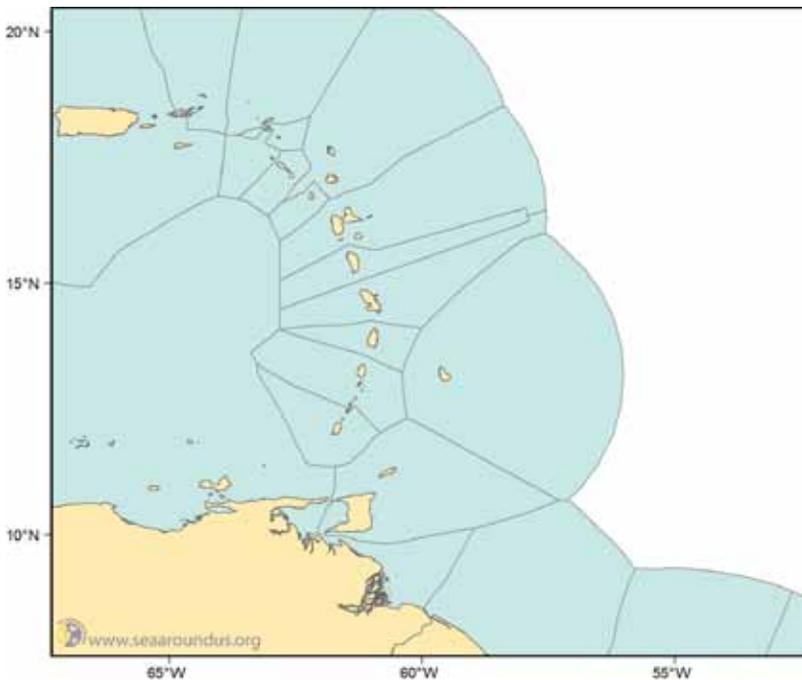
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# THE BARBADOS ECOSYSTEM

## Introduction

Barbados is the Fair Isle of the Caribbean. Situated 160 km east of the main Lesser Antillean chain, directly athwart the northeast trade winds, the island is along major southbound shorebird migration routes. It is *en route* for North American Neotropical migrants, descending as they prepare to make South American landfall; it is only 225 km from Tobago (Plate 1) and is the nearest Lesser Antillean point to the Cape Verde Islands. Barbados collects birds from all of these sources – 261 species to date. Some are annual inter-hemispheric migrants, some are tropical-storm-borne, some wander from the South American coast, many disperse down the Lesser Antilles, and more than a few are unexpected pioneers colonising the Western Hemisphere through a Barbados portal.

Geologically young, Barbados is just 600,000–700,000 years old and lacks the multimillion-year history of vulcanism and the true high-elevation tropical rainforest with attendant endemics characterising the islands of the main Lesser Antillean arc. When first colonised by Europeans in 1627 it was covered with several types of mature tropical forest. Within 40 years – one of the most rapid clearings in history – all native forest of any consequence was gone save one still uncut 20-ha patch that opens an exciting but tiny ecological window into pre-Columbian Barbados.

Barbados today has just a single living endemic bird species, Barbados Bullfinch *Loxigilla barbadensis*, and six endemic subspecies (scientific names for all taxa appearing only in Tables or Appendices are itemised in Appendix 1). Tantalisingly, early colonial accounts hint at the existence of several other endemics, among them a trembler and two parrots. Of these birds there exists no other evidence although two fossil studies detected several more endemics. Barbados's coralline-limestone base, karst topography and barely plumbed midden sites must hold undiscovered avian treasures.

Historically, Barbados appears to have had only a handful of mangrove wetlands and tiny estuaries. Not long after forest clearing, sugar cane was introduced from Brazil, followed by an explosive spread of cultivation. Residents soon became aware that during prolonged bouts of wet weather associated with easterly waves – those progenitors of tropical storms originating in West Africa and following the Intertropical Convergence Zone (ITCZ) across the Atlantic to Barbados – thousands of shorebirds and waterfowl descended on pastures and other open areas. These birds remained to feed for days and weeks and provided extraordinary hunting opportunities. However, as numbers of the species typically shot – American Golden Plover *Pluvialis dominica* and Eskimo Curlew *Numenius borealis* – declined with market gunning in North America, Barbadians realised that numbers of other, less pasture-dependent shorebirds and waterfowl could be increased by the provision of additional reliable freshwater habitat. They then began to construct ponds on their plantations and learned how to manage them to attract birds. The ponds gradually became larger and more elaborate and were transformed into hunting clubs, mostly on the north and east (windward) sides of the island; they typically featured several shallow-water impoundments locally called 'trays' where waterbirds were hunted in season. Today, these ponds plus the sole remaining 'natural' wetlands on Barbados (Graeme Hall and Chancery Lane Swamps) provide the most crucial shore- and waterbird habitat on the island, even though just a few of the artificial ponds are managed to retain water throughout the year.

In the 350 years since forest clearing, woods and genuine forest have begun to reappear, augmented by uncut vestigial tracts and patches of woodland in deep and difficult-to-access limestone gullies. Numbers of breeding land-birds have increased slowly, supplemented by new species from South America and a few introductions. Such wooded areas, especially at the extreme north, south and east ends of the island,

## Topography

Barbados is a small (431 km<sup>2</sup>) relatively low oceanic island 160 km east of the main Lesser Antillean chain's nearest Windward Islands (St Lucia and St Vincent; Fig. 1). Centred at 13° 10' N, 59° 32' W, it is pork chop-shaped, 34 km north to south and 23 km east to west, with a 95-km coastline. Approximate great-circle distances to key locations elsewhere in the Northern Hemisphere are given in Table 1.

Divided into 11 parishes that are customary components of most addresses and locations, Barbados is served (1999) by 1800 km of paved roads, with another 75 km unpaved. With the bulk of its population concentrated along the southwest and west coasts, most of the island presents an unexpectedly open aspect. In 2001, 57% of the island was comprised of sugar cane fields–pasture–hay–crops, 17% forest–woodlands, 21% urban, and 5% golf courses–wetlands–unvegetated (Helmer *et al* 2008). Woodland is severely fragmented, with few large contiguous areas.

Most of Barbados is fringed by a narrow (213 km<sup>2</sup>) adjacent continental shelf supporting species-rich coral reef systems. The 200-m contour profiles the island just 2–3 km offshore, bulging seaward to the northeast, southeast and southwest for 1–2 km. While 1000-m-deep waters are as close as 2 km east of Kitridge Point, Barbados's easternmost land, a raised area called Barbados Bank, with depths as shallow as 300 m (surrounded by waters of 1000–2000 m), extends north from St Lucy for 60 km but has never been explored ornithologically. Neither has another bank southeast of Barbados known as the London Shallows, where strong upwelling is likely (Plates 2 & 3). A 12-nmi territorial sea encloses another 3383 km<sup>2</sup> but owing to its isolated position Barbados's 200-nmi Exclusive Economic Zone (EEZ) embraces 183,436 km<sup>2</sup> – the largest in the Lesser



Figure 1. Map of the Caribbean Basin.

## Geology

### Geomorphology

Barbados is alone among the major middle to southern Lesser Antillean islands in being extremely young and lacking any history of volcanism. It is also 160 km east of the main Windward Island chain, well out amidst the trade winds. Owing to its geological origins it is relatively low in relief, its highest point, Mt Hillaby, reaching just 340 m, with two-thirds of the island ranging from sea-level to 100 m and not quite another third to 200 m.

Although basal rocks in northeast Barbados have been dated to the Late Eocene-Tertiary, 50–70 Ma, these are crustal rocks pushed up as a submerged tectonic mound along the Barbados Ridge. This feature originated, and is still rising, as the South American Plate slid west-northwest under the Caribbean Plate, in the process heating crust that emerged as lava from volcanoes on the Lesser Antillean Ridge from Grenada to Saba along the main Lesser Antillean arc. These present-day islands first appeared in the Miocene 15–30 Ma and are also still rising (Perfit & Williams 1989, Speed & Keller 1993, Machel 1999). Their volcanic soils were doubtless vegetated quickly so they would have had a long history of avian colonisation and evolution.

'Proto-Barbados', by contrast, emerged in fits and starts towards the end of the Pleistocene. For much of its early history it was a combination of coral reefs and low islands periodically eroding, submerging and rebuilding in response to sea-level changes, oceanic and rainwater erosion, and sedimentation. On average it has been rising about 0.3 m per 1000 years. The best evidence (Mesoellela 1967) argues that the core of present-day Barbados emerged 600–700 ka – although this has been unexpectedly challenged by mtDNA data from the endemic Barbados Anole *Anolis extremus* (Thorpe *et al* 2005). Interestingly, 650 ka was about the same time as a postulated Lesser Antillean mass avian extinction (Ricklefs & Bermingham 2001). Originally a circular dome (the centre of the uplift), perhaps two-thirds of this island eventually eroded away; then 300 ka a new one, known today as Christ Church Ridge or Dome, arose to the southwest near present-day Bridgetown, eventually fusing by means of crustal uplift with the by then much smaller main island.

Most of Barbados (some 85%) is covered with a series of raised coral limestone reefs forming terraces of varying size and elevation. This coralline area can in turn be divided into upland and lowland. The upland region forms a rough plateau delimited by the First High Cliff in the parishes of St John, St Joseph and St Thomas, plus parts of St Peter and St James. This upland plateau is bounded in the northwest and south by the Second High Cliff, a raised coral reef escarpment, and in the east by the island's watershed that forms the boundary of the other part of the island – the rugged, eroded, non-coralline Scotland District. The Second High Cliff starts in the north near St Clement's Church, extends west in an irregular pattern to Mt Gilboa, turns south through Mt Brevitor and the cliff above Redmans Village and Edge Hill, then sharply east and becomes less dominant. It forms the prominent Gun Hill Escarpment, continuing across by way of The Mount to Mt Pleasant in St Philip. This was the ancient western shoreline 440–500 ka. The eastern limit of the plateau also forms a moderate to steep escarpment, occasionally sloping, that extends north and southwest via St John's Church, Horse Hill, Castle Grant, Bloomsbury, Mt Misery and Springhead through Cherry Tree Hill to Farley Hill to join the cliffs near Boscobelle, where after weeks of heavy rain in 1901 a major landslide deposited coral rubble over a wide downhill area.

Parts of this plateau in St Peter, St James and St Thomas are cut by a series of irregular cracks in the coral rock called gullies. Island-wide they total c430 km, 250 km of which are forested, particularly with vines and ferns. Some are kilometres long, as deep as 30 m and as wide as 100 m at the surface. Believed to be erosional features formed by storm-water runoff in heavy bouts of rain (despite local conventional wisdom that some

**Table 2** Geography and avian endemism of Barbados, St Lucia and the Caymans. Original Cayman (Bradley 2000) and St Lucia (Keith 1997) data re-categorised for conformity with Barbados data.

Variable	Caymans	St Lucia	Barbados
Land area (km <sup>2</sup> )	263	616	431
Maximum elevation (m)	44	950	340
Range of mean annual rainfall (mm)	1100–1600	1500–3800	1300–1800
Tropical rainforest present	no	yes	no
Extent of pre-colonial habitat at its post-colonial minimum	≈30%	≈30%	<1%
Lithology	emergent coralline limestone	volcanic basalt	emergent coralline limestone
Age of present island configuration (Ma)	2–5	2–4	0.6
Distances (km) to Cuba (from the Caymans) and Trinidad (from Barbados and St Lucia)	240	330	300
Breeding species (native)	52	60	31
Endemic genera	0	2	0
Endemic species	1	6	1
Endemic subspecies	18	12	6

kaolin clays with medium drainage; Red Browns are similar except for their distinctive subsoil reddish tint.

Soil patterns are changed along leeward coastal terraces by Red Sand soils, light in texture, of low fertility and drying out quickly after rain. Typically, they are excessively arid under dry conditions, decompose humus quickly and hold heat better than surrounding clayey soils. Variations on this theme occur throughout the north and southeast areas of coral limestone, in for example St Philip Plain soils – dark brown friable clays surficially, with montmorillonitics beneath and medium to rapid drainage. St George's Valley and the elevated St John's Valley from Golden Ridge to Claybury and Redland have soils with massive clays, slow drainage, poorly drained sub-soils, and perched water tables – the best sugar cane-producing soils on the island and in its high rainfall area. The pH of all coralline soils exceeds 7.0.

Scotland District Tertiary soils are different, most of the heavy clays of the Lower Scotland series weathering into massive plastic and silty clay-loams, grey-brown or olive-grey in colour with slow drainage, poorly drained sub-soils and above-average moisture content. The Joe's River Mud soils are similar, weathering into dark grey-brown blocky sandy clay-loams with slightly plastic massive sandy clays beneath and impeded drainage. Scotland Sandstone soils in the central part of the District weather into loose or friable loamy sand to silt, or to brown loams with medium to rapid drainage. Around the rim of the District, soils have developed from the Oceanic series, varying considerably from loose yellow loamy sands to marls and massive brown clays, all compacted, poorly structured, and with poorly drained sub-soils restricting root development and draining slowly. Still other District soils are derived from coral limestone boulder trains below the escarpment, from sand dunes in Walker's Savannah, or are of alluvial origin. Much of the foregoing has been adapted from Watts (1966, 1987).

## Climate, weather and winds

Located east of the main Lesser Antillean arc, Barbados is outside the West Indian humid rainforest climate: hot and humid with just 0–2 dry months. Instead Barbados falls within the climatic zone characterising the lower Bahamas, western Cuba, most of Jamaica and the western Caribbean: humid but with 2–5 dry months and lacking high mountains with tropical rainforest. Consequently, the flora and fauna of Barbados reflect its climate,

Airborne spores of several agricultural pathogenic fungi (Sugar Cane Smut, Banana Leaf Spot, Coffee Leaf Rust) native to the Old World have also reached the New World with the trade winds across the tropical Atlantic (Stover 1962, James 1976, Simmonds 1994). Moreover, hundreds of kinds of fungal and bacterial spores as well as viruses have now been isolated from dust samples. These are blamed for increasing environmental and health problems, including the die-off of many West Indian coral reefs from sediment-smothering and the high incidence of asthma on Barbados and Trinidad (Griffin *et al* 2002).

As described in many of the species accounts, the trade winds have also been responsible for transporting most of the Eurafican vagrants that continue to reach Barbados annually, as well as those that have already successfully colonised the Western Hemisphere (Cattle Egret *Bubulcus ibis*, Little Egret *Egretta garzetta*, Glossy Ibis *Plegadis falcinellus*, Curlew Sandpiper *Calidris ferruginea*, Common Black-headed Gull *Larus ridibundus*) or are probably doing so (Garganey *Anas querquedula*, Grey Heron *Ardea cinerea*, Western Reef Heron *Egretta gularis*, Ruff *Philomachus pugnax*, Yellow-legged Gull *L. michahellis*, Lesser Black-backed Gull *L. fuscus*).

## Freshwater and wetlands

Surface freshwater is scarce on Barbados and nearly all of it occurs in small artificial ponds less than 1 ha in area; there are almost no permanently flowing streams or rivers (see above). The island has just one stand-alone (largely) freshwater wetland, although in a few other locations small patches of aquatic vegetation persist, associated with some quasi-natural bodies of freshwater such as the Greenland ponds and Bayfield Pond.

The paramount wetland is Graeme Hall Swamp in Christ Church, the largest on Barbados, now protected in its entirety as Graeme Hall National Environmental Heritage Site and, since December 2005, as a RAMSAR site of international significance. Natural in origin but highly modified, its 33 ha extend east to west for 1200 m paralleling the south coast main road and 650 m north to south, roughly bisected by a path bordering the main drainage channel, its sole connection to the sea. The government-owned 20 ha of wetlands east of the dividing line are dissected by a series of parallel drainage channels and are fed by freshwater springs; various sedges predominate and open water is limited. Drier uplands and fields fringe its northern side. Bird hunting in the western 12 ha ceased about 1970 and shallow rectangular pools were then filled by dredging from the bottom of a 200 × 200-m pond. After this, Red Mangrove *Rhizophora mangle*, found nowhere else on Barbados, and the far more numerous White Mangrove *Laguncularia racemosa* quickly colonised areas adjacent to the drainage canal and saltwater and are now dense and thriving. Barbados's most important heronry is situated there. The entire western area was recently saved from impending development and converted into Graeme Hall Nature Sanctuary. This exemplary, privately funded project opened to the public in May 2004 and comprises bird observation blinds, sensitively emplaced boardwalks, and a visitor centre with a full-time staff of naturalists and educators. Its developed area makes up just 2 ha, reserving the remaining 10 for wildlife use, observation and public education (<http://www.graemehall.com/>). In October 2006 – responding to the proximate threat of a 7-ha water-theme amusement park proposed for government-owned agricultural land immediately north of the wetlands and a major part of its watershed – the entire c100 ha of the Graeme Hall Swamp area (the Nature Sanctuary, the associated government-owned upland watershed area, and the sewage treatment plant) were proposed to comprise Barbados's overdue first national park, to be known as Graeme Hall National Park (<http://www.graemehallnationalpark.org/>).

Barbados gets most of its domestic water from wells and boreholes scattered throughout 23 watersheds that are in turn dependent on rainfall. Adequate supplies of Barbados's excellent drinking water are increasingly threatened, and water demands currently exceed sustainable yield, hence the construction of the Spring Garden

desalination plant in 2001, projected to provide at least 10% of reserve capacity. Annual renewable freshwater resources have recently been estimated at 225,410 m<sup>3</sup> or 49.6 million gallons per day. At its current population these figures allow Barbados an available supply that is well under the 1000 m<sup>3</sup> per capita set internationally as the limit below which a country is classified as 'water scarce', placing Barbados among the world's ten most water-scarce countries. While most drinking water on Barbados is clear, colourless, odourless and tasteless, there have been complaints of taste and discoloured water in small sections of the distribution system that have only occasionally been attributable to maintenance problems. Sporadic reports of a chlorine taste in the water are also sometimes received. More alarming, saltiness has been detected in some watersheds during the dry season, a classic indication of saltwater intrusion induced by excessive extraction.

Groundwater at 79% accounts for the largest proportion of the island's water resources and for 98.6% of its public water supply – because the limestone cap covers 86% of the island. The limestone, up to 100 m thick, is highly permeable, creating a well-developed aquifer system beneath surface catchment areas. Once rainwater has percolated through the limestone it flows from the central highlands towards the sea following the slope of the interface of the limestone and underlying oceanic sediments by underground sheetwater and stream-water flow. Groundwater catchment areas thus lie to the west and south of the central upland area of the island, correlating well with surface catchment areas. Extraction for the supply system relies on pumping from wells or boreholes. The Barbados Water Authority currently pumps around 35 million gallons per day and groundwater also reaches the surface through springs, two of which are also used to augment the public supply system. Groundwater protection policies have had negligible effect on source control of nitrates and pesticides. Water quality risks from agricultural chemicals have seen upward trends in nitrate and atrazine concentrations towards levels unacceptable for drinking water. Although concentrations are still marginally compliant with international standards, strict control of chemical release in these areas is needed. Pre-eminent water resource concerns include the rapidly increasing demand and consumption for residential, commercial, tourism and industrial developments; the increase in agricultural chemicals with the potential to affect ground water quality adversely; the growing risk from the release of hazardous chemicals and substances into the environment; leachate from official and unofficial landfill sites; and reduced rates of aquifer recharge from accelerating runoff associated with urban development. The Government of Barbados is actively considering policy options to address these concerns. The Spring Garden desalination facility was a major first step in this direction.

## **Vegetation and floristics**

Even though persistent northeast trade winds blow most of the year, Barbados's low relief has precluded much orographic precipitation so the island is relatively dry. Its mean annual rainfall is about half that of St Lucia, which has nine mountains taller than 610 m, the highest reaching 950 m, and its impressively vertical montane topography extracts much more moisture from the trade winds because 10% of St Lucia lies above 365 m. As a result, the tall lush and highly diverse tropical rainforests and elfin woodlands typical of St Lucia are lacking on Barbados.

The native Barbados flora arrived by wind and ocean currents and attached to birds but many other plants were deliberately introduced and have since become naturalised. The natural Barbados landscape was also drastically altered by forest cutting. Subsequent agriculture and development led to most of Barbados's indigenous and endemic plants disappearing a few decades after colonisation. In recent years, however, abandonment of marginal agricultural fields has increased the area covered by natural vegetation. Likewise, Barbados's gullies – until the 1950s routinely

and that it was closest to *J. bermudiana*, native to Bermuda, and *J. lucaya*, found in the Bahamas, Cuba and Jamaica. Adams was unable to infer its immediate origin but did conclude that the three West Indian junipers are closely related and collectively derived from North America's *J. virginianus* or its ancestor. Tellingly, he also believed that West Indian junipers evolved following long-distance seed dispersal by birds.

By the time of European colonisation in the early 1600s, Barbados was covered with forest but, unlike the volcanic Antillean-arc forests, its woods were not tropical rainforest. The high centre of the island with good soil and >2000 mm per year of rainfall supported rich mesic tropical hardwoods, while lower and drier elevations averaging 1500 mm per year and sea-coasts with 1000 mm per year grew poorer hardwood and dry scrub forests, respectively. Especially on the windward side of Barbados, woody vegetation was conspicuously stunted and wind-shaped by salt spray. On early historical maps northern parts of St Lucy were marked 'Champaigne Ground', implying open countryside ('*campagne*'), but it is clear from comments by both Colt (1631) and Ligon (1657) that these areas were created by the first colonists.

Vegetative cover on Barbados has been classified under several systems. The Nature Conservancy (TNC 1999) identified only five Barbados plant communities; in order of largest to smallest total area on Barbados they are: succulent evergreen shrub-land (the bulk of the island: >85%); seasonal evergreen-deciduous semi-deciduous forest (nine isolated patches including Turners Hall Wood: 8%); drought-deciduous-mixed evergreen-deciduous thorn woodland (seven isolated patches on the west coast and below-cliff: 4%); littoral (five isolated patches - three in St Lucy, two in Christ Church: 2%); and mangrove (three isolated patches - Graeme Hall, Chancery Lane: 1%). The Barbados National Natural Resources Data Base (Government of Barbados 1998) further divided Barbados's vegetative cover into 11 plant communities, but did not calculate their relative areas. The most useful system is that published by Helmer *et al* (2008), whose recent composite was derived from satellite imagery and simultaneously depicted land use and vegetative-cover types (Plate 6).

The wild plants of Barbados were first discussed by Ligon (1657), since which there have been numerous studies culminating in the seminal *Flora of Barbados* (Gooding *et al* 1965). Howard's (1974-1989) multi-volume *Flora of the Lesser Antilles* serves as the Lesser Antillean floristic base against which individual island floras are compared. At present, about 700 species of wild flowering plants are found in the wild on Barbados. There has been dispute among botanists over how many and which are endemic, but because it reflects the most up-to-date information we follow Government of Barbados (2002), which lists just two: *Phyllanthus andersonii*, a gully shrub, and *Metastelma barbadosense*, a slender climber. Another 23 plant species are considered to require protection at the national level: 15 are known to exist at only one site and another eight are regarded as rare or endangered. In addition, Barbados hosts a number of species endemic to the Lesser Antilles.

## Non-avian vertebrates

### Freshwater fishes

Very little information is available on the Barbados freshwater ichthyofauna and we are aware of only two attempts to collect fish but it is unknown if they resulted in any voucher or tissue specimens being deposited in reference collections. Cattaneo *et al* (1988) surveyed Graeme Hall Swamp, summarising c19 taxa of fish, nine of them juveniles of marine gamefishes. Among the ten taxa breeding there, Guppy *Poecilia reticulata* might possibly be native, but Black Acara *Cichlasoma bimaculatum* and South American Leaf Fish *Polycentrus schomburgki* were probably introduced. Luke & Fields (1998) provided an overview of the island, reporting a total of 25 fish taxa and noting that anadromous American Eels *Anguilla rostrata* occurred in a few Barbados streams when in flow.

Island-wide censuses estimated a population of c14,000 in 1980 and 1994 and they are believed to cause 'millions of dollars' worth of damage to crops annually. They also prey on native and introduced reptiles and on the eggs and nestlings of mostly native birds (Horrocks & Baulu 1988, 1994).

European Hares *Lepus europaeus* were brought to Barbados from England in 1842, successfully bred and then escaped. They quickly spread, were hunted heavily, their populations fluctuating greatly in typical lagomorph cycling. Currently considered rare, no reliable island-wide censuses have ever been attempted but numbers may have increased since the 1980s (M.D. Frost, pers obs).

Small Asian Mongoose *Herpestes javanicus* was introduced in 1882 to control rats in sugar-cane fields, a task it quickly failed to perform (Horst *et al* 2001). Mongooses are devastating predators of terrestrial birds and other vertebrates wherever they are introduced to non-native areas (Henderson 1992, Hays & Conant 2007). On Barbados they may be responsible for the decline and possible extinction of the endemic Barbados Grass Snake. Mongoose introduction to many, but not all, West Indian islands almost caused the extinction of Black-capped Petrel *Pterodroma hasitata* and may have extinguished Jamaica Petrel *Pt. caribbaea*. Mongooses are now ubiquitous on Barbados and every effort should be made to first control and then extirpate them. No other wildlife management action on Barbados would simultaneously benefit so many native organisms and ecosystems.

Hope for extirpation of mongooses is offered by the Barbados history of Common Raccoon *Procyon lotor*, once so ruinously abundant that by 1679 it too was a bounty animal. It is now considered to have been extirpated. The last one was found dead near Bathsheba, St Joseph, in 1964. Based on the dentition of one collected in 1920, Barbados raccoons had been distinguished from those of North and Central America and designated a separate species, 'Barbados Raccoon' *Procyon gloveralleni*, even though *lotor* from Florida and Georgia occasionally occurred with similar dentition. Recent taxonomic analysis (Helgen & Wilson 2003), however, has confirmed that Barbados raccoons were merely *P. lotor*, their dentition and proximity indicating introduction from southeast North America. Raccoons on New Providence Island (Bahamas) and Guadeloupe, likewise formerly believed to be endemics (*P. maynardi* and *P. minor*, respectively), have also proved to be *lotor* introduced from southeast North America.

Norway or Brown Rat *Rattus norvegicus*, Black Rat *R. rattus* and House Mouse *Mus musculus* are also widespread, having arrived with the earliest colonists, but their direct effects on native wildlife are unquantified. The same may be said for feral and free-ranging domestic dogs *Canis familiaris* and cats *Felis sylvestris*. European Hogs *Sus scrofa*, released on Barbados in the 1500s to give succour to shipwrecked sailors, were apparently still present when Ligon (1657) visited Barbados.

## Historical synopsis

### Prehistoric era

When the British colonised Barbados in 1627 there were no Amerindians resident nor had there been any for 100+ years, at least as reported by Portuguese sailors. If true, any damage to Barbados ecosystems that native peoples may have done earlier would have been mitigated and an essentially natural ecosystem restored by 1627 – except for a possible population of feral hogs (see *Colonial and modern eras* below). Nonetheless, it took European colonists just 40 years to clear nearly all forest and convert Barbados into a giant sugar plantation.

Barbados had not always been uninhabited. Around 4 ka the first Barbados Amerindians, originating in Trinidad and adjacent northern South America, arrived in the Pre-ceramic or Archaic age in a wave across the Lesser Antilles. They lived in small communities along shorelines as fisher-gatherers, practised no agriculture and had no domesticated animals. Such tools as they used were made of wood, modified

had diminished from 20,133 to 13,375 ha – just as ‘pastures, hay, inactive agriculture and drought woodland’ had increased from 1922 to 10,276 ha. ‘Urban, unvegetated, and golf courses’ had doubled from 5037 to 10,885 ha, and ‘dry scrub woodland’ had jumped tenfold to 6351 ha. Nonetheless, in all but the most rugged terrain the island’s general aspect remains remarkably open. See Fig. 5 and Plate 6 for land use distributions in 1980 and 2001, respectively.

Barbados has never had more than a tiny export fishery but commercial and individual fishing for local consumption is important. Local delicacies include fish-cakes and flying fish; dolphin (‘mahi-mahi’), swordfish, marlin, kingfish, bonito, barracuda, groupers and several species of shark are also widely caught. The largest commercial fishery sites are Oistins, Speightstown and Bridgetown (Mohammed *et al* 2003).

Before 1950, tourism played a small economic role but it overtook sugar-cane as the prime contributor to the island’s economy after the advent of cheap air travel. Excluding cruise ship passengers, by 1988 some 450,000 tourists were visiting annually, from both North America and Europe. Tourism led to development of the leeward southwest and west coasts and the inevitable ditching, draining and filling of the few remaining wetlands there. Graeme Hall Swamp has almost uniquely avoided this juggernaut.

From 1627 onwards Barbados was a British colony with a resident governor. As winds of independence blew throughout the old British empire, Antigua, Barbados, the Cayman Islands, Dominica, Grenada, Jamaica, Montserrat, St Kitts–Nevis–Anguilla, St Lucia, St Vincent, Trinidad and Tobago in 1958 formed the Federation of the West Indies, often simply called the West Indian Federation. But still under British control and with internecine disputes over customs, movements and the like, it was dissolved by mutual agreement four years later. Not long thereafter nearly all members had proclaimed its independence from the United Kingdom, Barbados doing so on 30 November 1966, when it became a sovereign and independent state within the British Commonwealth.

## Conservation concerns

Most current environmental problems on Barbados relate to pressures on island ecology from extensive residential land subdivision; commercial, industrial and tourism development; and agriculture. The bulk of the island’s population and infrastructure is concentrated in the southwest urban corridor, and the Caribbean coast is the focal point of the island’s tourism sector and a large residential population. Development has led to encroachment of buildings into the active beach zone, loss and degradation of wetlands, degeneration of reefs and coastal water quality, and loss of coastal woodlands and beach access. A major problem for certain birds has been the accelerating disappearance of the remaining sandy beaches along the south and west coasts, perhaps from reduced sediment input–entrainment and changes in wave climates from unknown, perhaps uncontrollable, causes. Sensible land-use policy has encouraged growth along this section of the coastline – admirably to allow concentration of agriculture and water supply protection in the interior – but has had some unintended environmental consequences.

Flooding is another anthropogenically enhanced hazard. Surface drainage is a normal year-round occurrence in the Scotland District, but in limestone areas prolonged heavy rainfall causes flooding in densely populated low-lying areas on the west and south coasts of the island. Runoff carries pesticides and nutrient-rich fertilisers to the ocean, adversely affecting the marine environment, especially reefs, and transports solid and organic wastes from gullies to the sea. Reef studies (Lewis 2002, 2006) have documented increases in filamentous algae, decreases in coralline algae and declining fish. On patch-reefs there has been a significant loss of area covered by single-species hard-corals, while multi-species hard-corals have shown bleaching, damage from boat moorings and sediment smothering in several locations – all attributed to deteriorating water quality as well as to over-fishing.

*Progne dominicensis* is probably naturally habitat-limited. Mangrove forest is the scarcest limiting habitat on Barbados that is still shrinking. That in Graeme Hall Swamp is now preserved in the new Nature Sanctuary, yet is still vulnerable for two reasons: (1) control of the sole sluice gate allowing vital seawater in and floodwater out is not in the hands of sanctuary operators, and (2) the otherwise environmentally beneficial South Coast Sewerage Treatment Plant allows raw sewage to discharge directly into the wetland in the event of plant failure – a common but ecologically dangerous design. Chancery Lane, a major shorebird stopover and overwintering site, is still unprotected and the remnant mangrove area at Speightstown is also at risk although perhaps already too small to be of significance to mangrove birds. Mature forest of any type is a scarce and restricted habitat, and remnants of west coast woodland persist only in a few rocky parts of St Lucy. Turners Hall Wood and the gullies offer unique habitat for many Barbados land-birds year-round but are not now under specific threat. On the other hand, the undercliff woods where Scaly-breasted Thrasher might still survive are all in private hands and, given rising land prices and commanding views of the Atlantic, could easily succumb to development. The most important bird sites already formally conserved are Graeme Hall Swamp and Turners Hall Wood but others should also be, including Chancery Lane Swamp, Long Pond, Harrison Point, Hackleton's Cliff underwoods and the major gullies.

Legal shorebird hunting has been a Barbados tradition for at least 250 years and is regarded by some Barbadians as equivalent to the widespread waterfowl hunting of temperate areas. The privately funded and maintained hunting-club impoundments collectively offer much constant, essential, waterbird habitat at the expense of sometimes heavy but episodic hunting between July and October, just as temperate-zone wildlife refuges also do. Although largely unregulated, many clubs have tried to maintain a code of conduct discouraging the hunting of protected shorebirds (Hudsonian Godwit *Limosa haemastica*, Upland Sandpiper *Bartramia longicauda*, Buff-breasted Sandpiper *Tryngites subruficollis*) and there has been some support for a voluntary ban on certain non-traditional hunting practices, but it is widely admitted that self-policing on its own has been ineffective and that tighter government controls are necessary. A Wild Birds Protection Act (1907, amended on several occasions) forbids the killing, wounding or harvesting of 46 protected species or taking their feathers but lacks a more comprehensive list of species, defined hunting seasons and realistic bag limits with systematic enforcement. Barbados has yet to sign a few key Western Hemisphere treaties and conventions protecting migratory species, so there is still room for improvement.

The government of Barbados recognises that the absence of any legislation for the general protection of its terrestrial resources, flora and fauna must be corrected. Under the ambit of the Convention on Biodiversity to which it is a signatory, it has taken the first major step in preparing a comprehensive National Biodiversity Strategy and Action Plan (Government of Barbados 2002). Among its many excellent recommendations for multi-faceted preservation and limited-use natural areas are details for a proposed National Park in the Scotland District, a number of National Forests, a system of Natural Corridors and Linkages plus Special Study Areas for each of Chancery Lane, the inland escarpments and the gullies. Although Barbados may still be the only Caribbean country without a national park (Farley Hill N.P. is only a small historical site despite its name), the just-proposed Graeme Hall National Park (page 13) might erase that dubious distinction even before a Scotland District National Park is manifest.

## Avifauna

### Historical accounts

Unlike the main Lesser Antillean arc volcanic islands with tropical rainforests and striking endemic species and genera, Barbados has received relatively slight ornithological

attention. Nonetheless, its ornithological data are of three kinds that also bracket three successive periods.

The ornithological history began with one of the first books written about the island, by Richard Ligon (1657), resident in the 1640s when Barbados had not yet been fully cleared of native forest. His bird descriptions are often identifiable with known species but equally frequently can be mystifying. Sir Hans Sloane (1707–1725), writing of a journey from Suriname to Jamaica that included Barbados in passing, mentioned an otherwise unidentified ‘parrot’ from Barbados and numerous seabirds in the vicinity. Griffith Hughes’s (1750) descriptions were a bit better than Ligon’s but he also referred to some birds that defy identification and a few of his vernacular names are obscure. He was the first to report on the Audubon’s Shearwater colony on Bird Rock in St Lucy, where he lived. Sir Robert Schomburgk’s (1848) approach was much closer to modern classification and nomenclature but still provides a few puzzlers: his ‘breeding’ Merlins *Falco columbarius* were surely American Kestrels *F. sparverius*. Nonetheless, he did record the first specimen of Ruff for the Western Hemisphere, a species still much in evidence on Barbados. See page 63 for a discussion of these authors’ and others’ avian apocrypha and comparison of the birds they reported.

### **Museum collectors and collections**

In the 1860s a few collectors sent skins to museums (Theodore Gill, A. Wildeboer to the USNM; William B. Richardson, Charles B. Cory to the FMNH; see page 61 for museum names). Following short papers on Barbados birds in British publications after Schomburgk (1848) – several of whose specimens are still in the NHM – the era of true Barbadian ornithology began in the 1880s–1890s when ornithologists Cory, Robert Ridgway and Carl Sundevall began describing new species and subspecies from Barbados, although two veteran Antillean collectors (Frederick Ober, USNM; Charles J. Maynard, FMNH) evidently never made it there. Also in the 1880s, British soldier-naturalist Col. Henry W. Feilden, a resident for several years, began compiling data on his and others’ observations as well as on specimens shot by hunters. Nearly all of Feilden’s specimens are still extant but scattered (NHM, CUM, NMS) and have been examined and verified in preparing this book. His detailed publications, especially Feilden (1889a), are still useful and are the first scientific publications on the occurrence, geographical distribution and numbers of Barbados birds. Austin Clark was present for four months in 1903 and 1904 and his resulting monograph on the birds of the southern Lesser Antilles (Clark 1905) compared Barbados, St Vincent, the Grenadines and Grenada. One hundred years later it too is still a goldmine of carefully crafted, scientifically buttressed information; only its nomenclature is dated. His specimens are in the MCZ. Michael J. Nicoll and Percy R. Lowe collected a few skins for the NHM between 1904 and 1907, as did Frank M. Chapman and Rollo H. Beck in the mid 1910s and Gerald Thayer in the 1920s for the AMNH, while Gerrit Miller (in 1924) and Stuart Danforth and associates (in the 1930s) collected for the USNM.

James Bond, lifelong student of West Indian ornithology, collected (ANSP) sparingly on his few visits to Barbados during his active West Indian fieldwork period (1920s–1960s). His *Check-list of Birds of the West Indies* (1956) incorporated much Barbados information, typically without supporting data, and together with its 27 *Supplements* (1956–1987) has become a curiously selective clearing-house for additional information about Barbados birdlife. In the mid-1950s visiting Canadian collector Wilfred J. Plowden-Wardlaw took many specimens of interest that are now in the YPM. The most extensive recent collecting occurred in the 1960s by Albert Schwartz and associates (Schwartz & Klinikowski 1963, 1965), although much of that splendid series was lost to insect damage; some of its remnants are in the USNM but most are in the LSUM. Hutt secured many singular specimens in the 1954–1965 period for the ANSP, and the handful of fossil and sub-fossil birds collected from Ragged Point are in the UFM. No scientific student of

many attempts to do so. The problem is that 'commonness' is a relative, not absolute, term that is a function of taxonomic group, trophic level, sociability, habitat needs and detectability. Major differences in interpretation of these terms occur when they are applied to migrants, breeding species or winter residents. For instance, boreal wintering raptors and wintering sparrows (buntings) can each be considered 'common' yet differ in abundance per unit area by orders of magnitude. In addition, various shorthand approaches that have been devised over the years often also use confounded terms in attempts to encapsulate the complete regional status of bird species in one term or short phrase; they seldom work as intended. We have therefore striven to characterise all species by both frequency of occurrence and abundance, using ordinary (but here undefined) abundance terms. Most useful are counts per unit time, distance or area, which we give whenever available.

### **Vagrancy**

When a species has occurred just a handful of times in very small numbers and is also a great distance from its expected geographical range, the concepts of frequency of occurrence and numerical abundance converge. More than 100 years ago two terms came into widespread use to categorise such individuals: 'accidental' and 'casual'. Both embody 19th century beliefs that vagrants were mistakes or accidents of nature. In addition, both can have identical meanings: 'happening by chance, unintentionally or unexpectedly', and 'accidental; due to chance' and casual can have a secondary meaning of trivial. Moreover, the point where 'accidental' ends and 'casual' begins is arbitrary. A parsimonious and objective solution to this semantic and scientific dilemma is to abandon both terms in avian distribution studies and, as many have already done (eg Roberson *et al* 1999), replace them with the objective descriptor 'vagrant' that is quantified by the number of occurrences ('Vagrant, 8 records'). This is the approach we have adopted.

Vagrants often occur with regularity in repeatable locations even if only in single-digit numbers, yet their biological significance has infrequently attracted scientific attention even as their widespread incidence proclaims their importance. Their frequency of occurrence, geographical distribution and numbers are known to signify impending or ongoing range expansions (eg Little Egret in the Western Hemisphere: this book), high annual breeding productivity (Veit 1997, 2000), extreme weather events (McLaren *et al* 1999, 2006) or undetected migration routes and patterns (this book). Whatever their origins, vagrants do not constitute occasional, trivial, random events and so are worthy of attention. Here we define vagrants as taxa *that have occurred locally ten or fewer times*, recognising that the simplicity and arbitrariness of this definition obscure pertinent biological considerations, among them that (1) a notion of 'significantly out-of-range' should be incorporated because vagrancy loses meaning when applied to species known to be regular and even abundant short distances away, although an exception might be made for sedentary island taxa; (2) it is not uncommon for presumed vagrants to prove to be of regular occurrence once sufficient field data have been amassed; and (3) many species regularly pass undetected over or near a given area unless suitable habitat appears or is made available – shorebirds and Neotropical migrants offering numerous Barbados examples. Nonetheless, application of a more precise vagrant definition would require more data than are available, so we have reluctantly opted for this abridged version. In all cases, we have tried to quantify instances of infrequent or irregular occurrence by some modifying metric.

One exception to our definition of vagrancy involves seabirds that we have reason to believe visit Barbados waters annually, perhaps in thousands, yet are nearly never detected even at sea. Hence, vagrant will not be applied to a Barbados pelagic species unless two criteria are met simultaneously: (1) it is truly far out of range and unexpected, with zero to ten previous records from Barbados waters, and (2) with zero to ten previous

**Table 3** Composition of the Barbados avifauna. The number of alien breeding waterbird species differs from other tables because Fulvous Whistling Duck, White-cheeked Pintail and Ruddy Duck have been coded here only for their natural occurrences.

Category	Waterbirds	Land-birds	Total
Breeders (native)	13	18	31
Breeders (alien)	2	5	7
Resident non-breeders	2	0	2
Pelagic visitors or migrants	20	–	20
Mainly southbound migrants	25	14	39
Mainly northbound migrants	0	2	2
North- and southbound migrants	6	2	8
Winter residents/ visitors	20	2	22
Irregular visitors from Eurafica	1	0	1
Irregular visitors from South America	0	1	1
Irregular visitors from North America	2	0	2
Irregular visitors from West Indies	4	0	4
Irregular visitors from Asia	0	0	0
Vagrants from Eurafica	25	5	30
Vagrants from South America	12	5	17
Vagrants from North America	16	36	52
Vagrants from West Indies	2	8	10
Vagrants from Asia	1	0	1
Alien non-breeders and extirpated breeders	0	12	12
<b>Totals</b>	<b>151</b>	<b>110</b>	<b>261</b>

records from the entire Caribbean. At present, no such species has been recorded in Barbados waters.

### The species of Barbados birds

The species total for Barbados on 31 August 2008 stood at 261 (Table 3, Appendix 2). Our working assumption has been that all species except those introduced have occurred on Barbados naturally and, especially with potential alien species, we have worked to confirm or refute it. Whenever we have failed to refute our wildness assumption we have accepted the species' occurrence on Barbados as natural; cf Grassland Yellow Finch *Sicalis luteola*. Also, we acknowledge that birds routinely make use of human devices ranging from bird feeders to ships at sea, so we do not automatically consider any species that has reached Barbados by ship as alien unless there is unassailable evidence that while aboard ships the birds were not free and unrestrained. House Crow is an exemplar of a species that has reached Barbados on its own by ship, most likely from an unknown alien population. Introduced species that once bred on Barbados and eventually died out are also accorded a place on the Barbados list, but the occasional non-breeding escape or release is not.

If Barbados's present land-bird breeding species richness is plotted against its area (MacArthur & Wilson 1967, Ricklefs 2000), it does have a depauperate avifauna in comparison with other areas of similar size. After accounting for isolation and absence of high-elevation volcanoes with attendant rainforest, for its size, pre-colonial Barbados

# SYSTEMATIC LIST

## Introduction

### Taxonomy and nomenclature

We have followed Dickinson (2003) for higher-level classification and for species sequences within families and genera. English names follow Gill & Wright (2006) except where our species-level taxonomy dictated otherwise (Appendix 20) and in two other instances where we have retained traditional North American names.

We endorse the Comprehensive Biological Species Concept (CBSC) articulated by Johnson *et al* (1999), rejecting as they did the Phylogenetic Species Concept (PSC) and kin because they offer few improvements in avian taxonomy while introducing many problems. See Newton (2003) and Coyne & Orr (2004, especially pages 25–48 and 447–472) for extended discussion of species concepts and processes. Some PSC perspectives are nonetheless informative. For instance, many allopatric taxa currently regarded as subspecies, especially intercontinental and inter-island ‘representatives’, have after examination by molecular and other techniques been shown to meet criteria for valid biological species, particularly in the West Indies and between North America and Eurasia. We suspect that many more will do so also and the species-level taxonomic approach that we have taken – recognising as species those forms already split, especially in Europe, or whose biology and distribution appear to preclude conspecificity – accentuates interspecific differences rather than blurring them. And it is difficult to recover pooled and untagged data for lumped forms should they later be split. An example pertinent to this book was Murphy’s (1992) lumping of Little Egret and Western Reef Heron in a paper attempting to document their arrival and spread in the Western Hemisphere. Accordingly, the splits we have followed in this book are conservative in minimising such problems for future authors.

The last formal assessment of ‘North American’ subspecies by the AOU was in the 5th edition of its *Check-list* (1957), ages ago scientifically; moreover, that edition only covered ‘North America’ north of the USA–Mexico border. The last complete treatment of West Indian subspecies was Bond (1956), now equally out of date. As well, there have been few recent taxonomic works addressing subspecific variation across entire families or orders, an exception being the multivariate morphometric analysis of selected shorebird subspecies by Engelmoer & Roselaar (1998). In some instances, we have been able to find recent subspecies assessments at the species, species-pair and species-group level; various species accounts in the *Birds of North America* (Poole & Gill 1991–2002) series have been particularly helpful as was Restall *et al* (2007) and Phillips’s idiosyncratic but informative pair of books (1986, 1991). However, our default standard for subspecies taxonomy was also Dickinson (2003) owing to its breadth, depth, scientific rigour, bibliography and conservative approach. Its use offered the added benefit of recency and we have followed it in nearly all cases, although a comprehensive treatment of subspecific variation in West Indian birds is sorely needed. For a current discussion of the utility, genetic basis and rigorous statistical definition of subspecies in an ornithological context see Patten & Unitt (2002).

The subspecies concept has been of late criticised on several grounds (Zink 2004, but see Phillimore & Owens 2006), particularly that morphological features are often discordant with haplotype frequencies and so do not reflect phylogenetic histories. Subspecies are also charged with too often describing variation lacking any genetic basis (= ecotypic, ecophenotypic) or being merely clinal. Although these are interesting scientific topics, for our purposes the most useful aspect of subspecific identification is demonstrating zoogeographical origins (Ball & Avise 1992). As our species accounts show, there have been more than a few surprises in this regard, and without being able to infer origin in this way our understanding of the Barbados avifauna would have

been much the poorer. Still, several species lacking useful subspecific differences could nonetheless be arriving routinely on Barbados from both North America and Eurasia; Sand Martin is a prime candidate. In addition to DNA comparisons, techniques such as stable-isotope analysis (Hobson 1999) may have to be employed in such cases if we are to establish their origins. For various reasons no valid subspecies of White-faced Whistling Duck *Dendrocygna viduata*, Fulvous Whistling Duck, Blue-winged Teal, Northern Shoveler *Anas clypeata*, Northern Pintail, Glossy Ibis, Magnificent Frigatebird *Fregata magnificens*, Piping Plover *Charadrius melodus*, American Oystercatcher, Common Black-headed Gull, Laughing Gull, Least Tern, Yellow-billed Cuckoo, Red-eyed Vireo, Caribbean Martin, Northern Parula, Myrtle Warbler, American Redstart or Northern Waterthrush, among others, are recognised herein. Yet several of these species could also be reaching Barbados from different sources even though this is not yet demonstrable.

## Status and distribution data sources

### Publications and ringing records

When placing each Barbados species in a zoogeographical context, it was necessary to amass accurate up-to-date information on its status elsewhere in the Western Hemisphere, the West Indies and the Lesser Antilles. To this end, the paradigmatic published-article compendium is Wiley's (2000) *Bibliography of Ornithology in the West Indies*, an enviably thorough work providing many unsuspected but invaluable references. It was supplemented by Voous (1955, 1957, 1983), Blake (1977), Cramp *et al* (1977–1994), De Schauensee & Phelps (1978), Pashley & Hamilton (1990), Evans (1990), French (1991), del Hoyo *et al* (1991–2007), Loftin (1992), Tostain *et al* (1992), Haverschmidt & Mees (1994), Paynter (1995), Keith (1997), Steadman *et al* (1997), AOU (1998), Raffaele *et al* (1998), Bradley (2000), Keith *et al* (2003), Oberle (2006), Restall *et al* (2007) and Kirkconnell *et al* MS., plus websites and checklists for Guadeloupe, Trinidad & Tobago, Guyana and Suriname. Unpublished current status information was also received from a variety of people for Bermuda, the Bahamas, Cuba, Puerto Rico, the Virgin Islands, St Martin, Martinique, Dominica, St Lucia, St Vincent, the Grenadines, Grenada, Aruba, Curaçao and Bonaire.

The Neotropical Bird Club serial *Cotinga* has proved to be the best published source of up-to-date distributional information for all of South America, while quarterly 'West Indies Region' columns in the serial variously named *American Birds*, *Field Notes* and now *North American Birds* have played the same role for the West Indies. Also useful when viewed with considerable circumspection have been the 4th edition (1956) of Bond's West Indian *Check-list* and its 27 Supplements (1956–1987). Other essential reference periodicals have included *El Pitirre* (now the *Journal of Caribbean Ornithology*) and the *Caribbean Journal of Science*. Much technically 'unpublished' information has come from Internet sources, notably the monthly listserv-website of recent occurrences known as the *Southeastern Caribbean Bird Alert*, begun in 1999 and cited herein as SCBA (<http://www.wow.net/tfnc/rarebird.html>). It is a valuable source of up-to-date, often unpublished, Caribbean distributional data. Recently, a committee was formed to begin compiling a checklist of South American bird species (<http://www.museum.lsu.edu/~Remsen/SACCBaseline.html>) that has also been useful in placing Barbados vagrants in a Southern Hemisphere context. Finally, much unpublished information has come directly from active observers within and without the West Indies.

The U.S. Bird Banding Laboratory, EURING and the British Trust for Ornithology graciously made available complete lists of recoveries of birds from Barbados and the Lesser Antilles, the bulk of which have never been published.

**Museum collections**

<b>AMNH</b>	American Museum of Natural History, New York, NY, USA
<b>ANSP</b>	Academy of Natural Sciences, Philadelphia, PA, USA
<b>BDSM</b>	Barbados Museum, St Michael, Barbados
<b>CUM</b>	Cambridge University Museum, Cambridge, UK
<b>FMNH</b>	Field Museum of Natural History, Chicago, IL, USA
<b>LM</b>	Liverpool Museum, Liverpool, UK
<b>LSUM</b>	Louisiana State University Museum, Baton Rouge, LA, USA
<b>MCZ</b>	Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA
<b>NHM</b>	Natural History Museum [ex British Museum (Natural History)], Tring, UK
<b>NMS</b>	National Museum of Science, Edinburgh, Scotland
<b>ROM</b>	Royal Ontario Museum, Toronto, Canada
<b>UFM</b>	University of Florida Museum, Gainesville, FL, USA
<b>USNM</b>	US National Museum, Washington DC, USA
<b>YPM</b>	Peabody Museum, Yale University, New Haven, CT, USA
<b>ZMA</b>	Zoologisch Museum, Amsterdam, The Netherlands

**Observers cited in text**

<b>AB</b>	Alistair Binnie	<b>DIS</b>	David I. Smith
<b>AJ</b>	Alvaro Jaramillo	<b>DM</b>	Daniel Mirecki
<b>APH</b>	A.P. Hutchinson	<b>DMa</b>	Dennis Manning
<b>ARK</b>	Allan R. Keith	<b>DN</b>	David Narins
<b>BB</b>	Barry Blake	<b>DP</b>	David Pomerantz
<b>BL</b>	Bruce Lambert	<b>DPe</b>	Diorys Perez
<b>CB</b>	Colin Bayley	<b>DW</b>	David Waight
<b>CF</b>	Clement Foster	<b>EAB</b>	E.A. Beachell
<b>ChB</b>	Christine Blake	<b>EBM</b>	Edward B. Massiah
<b>CGM</b>	C.G. Massiah	<b>EG</b>	Edwin Glassman
<b>CJM</b>	C.J. Manning	<b>EH</b>	Edward Haslett
<b>CLW</b>	C.L. Walker	<b>EJA</b>	Edward J. Abraham
<b>CM</b>	Colin McNamee	<b>EW</b>	E. Webster
<b>CR</b>	Courtney Rookes	<b>FBH</b>	Floyd B. Hayes
<b>CS</b>	Clarence Skinner	<b>FCA</b>	Mrs F.C.K. Anderson
<b>CSM</b>	C.S. Manning	<b>FGB</b>	Francine G. Buckley
<b>CT</b>	Chris Thirkell	<b>FP</b>	Fred Peterkin
<b>CW</b>	Colin Wall	<b>GB</b>	Greg Braun
<b>DA</b>	David Archer	<b>GC</b>	Glenn Carmichael
<b>DB</b>	David Brooks	<b>GEW</b>	George E. Watson
<b>DBM</b>	Douglas B. McNair	<b>GG</b>	Geoffrey Gooding
<b>DE</b>	D. Elcock	<b>GM</b>	George Manning
<b>DDG</b>	Daniel D. Gibson	<b>GS</b>	Geoffrey Skeete
<b>DH</b>	David Hunte	<b>GT</b>	Gerald Thayer

## Enigmatic historical taxa

Ligon (1657), Hughes (1750) and Schomburgk (1848) offered the earliest first-hand accounts of Barbados birds. In many cases those they named and sometimes described are ascribable to living species, but there remain several that cannot be so equated with complete confidence. The most captivating are the following:

### *Buteo* sp. *Buteo* ?*platypterus* ?*jamaicensis*

Ligon reported a resident Barbados 'bussard', Hughes mentioned no raptors at all and Schomburgk's sole (1848) resident raptor he called *B. jamaicensis* (Red-tailed Hawk), a species that has not been found in modern times but which is the only *Buteo* known from Barbados fossils (Brodkorb 1964). Still, when Ligon was writing Barbados had not been fully cleared of native forest cover, a condition more favourable to *platypterus*, the current resident *Buteo* of the southern Lesser Antilles and known as a recent vagrant to Barbados. Indeed, his description ('... somewhat less [= smaller] than our grey Bussard [Common or Eurasian Buzzard *B. buteo*] in England [and] somewhat swifter of wing') favours Broad-wing.

### 'Barbados Parakeet' *Aratinga* sp.

Hughes mentioned a small frugivorous parrot 'about the bigness of a thrush' which he called 'the Parakite', noting that 'it feeds on all manner of berries, popaws, and ripe plantains, residing chiefly in inaccessible gullies'. Schomburgk may have confirmed its continuing existence into the mid-1800s, referring to an 'indigenous Small Parakeet, or Love Bird *Psittacus passerinus*'. Confusingly, this scientific name was also used by Danforth (1938) for the Barbados *Forpus*, a taxon unrecorded there before Anderson (1935) and Danforth. But the gullies must not have been inaccessible enough, for it was soon extirpated; no other authors mention it. *Aratinga* parakeets were historically plentiful in European settlements on other Lesser Antillean islands such as Barbuda, Guadeloupe, Dominica and Martinique only to be quickly extirpated. Fortunately the generic affinities of the Barbados parakeet can be reduced to *Aratinga* because Hughes also described seeing in his travels a small 'parakite' on Guadeloupe we know from other sources to have been an *Aratinga*. Furthermore, Hughes also noted 'its resemblance in make [= shape], but not in plumage, to the small green Parakite' on Guadeloupe, which was 'all green, with a red crown and pale bill' (Clark 1905). The *Aratinga* on Barbados was evidently another Lesser Antillean endemic even if we do not know its plumage and bare-part colours. We agree with Williams & Steadman (2001) that although human transport of parrots does occur, endemism is a more likely explanation for Lesser Antillean parrot distribution. Perhaps badly needed archaeological and palaeontological fieldwork will remove all doubt.

### 'Barbados Amazon' *Amazona* ?*barbadensis*

There may also have been an endemic *Amazona* on Barbados at the time of European colonisation. Although only Sloane (1707–1725) among early visitors wrote of a 'parrot' but frustratingly no parakeet, contemporary naturalists (Albin, Edwards, Latham, Brisson) were convinced that Barbados did host an *Amazona*, and it was named by Gmelin in 1788 as *A. barbadensis*. This name is currently applied to Yellow-shouldered Amazon, classified as Vulnerable by BirdLife International (2000) and now restricted to the extreme north coast of Venezuela and a few offshore islands: Bonaire, formerly Aruba, Isla Blanquilla, and Isla the latter two not far from (Table 1) and of similar habitat to east coast areas of Barbados. If the foregoing authors were correct about a Barbados Amazon, it could have been a race of Yellow-shouldered or a closely related endemic species. Several European authors in the 18th century believed *barbadensis* was allied with the 'amazonica group' whose closest member *A. amazonica* breeds on nearby Trinidad and Tobago and is ironically now established on Barbados in a feral

population. Gmelin's type may not have come from Barbados so no certain 'Barbados Amazon' specimens are known. However, this is also true for extinct macaws from Montserrat, Guadeloupe, Marie Galante, Dominica and Martinique; *Aratingas* (see 'Barbados Parakeet' above); and extinct Amazons from Barbuda, Antigua, Montserrat, Guadeloupe, Marie Galante, Martinique and Grenada. Predictably, Ottens-Wainright *et al* (2004) demonstrated that southern Lesser Antillean Amazons came from nearby South America, in contrast to Greater Antillean Amazons whose origin was Central America. And although Williams & Steadman (2001) did not mention any Barbados *Amazona* they believed it 'likely that most or all West Indian islands did sustain their own **sets** [*emphasis added*] of indigenous, if not endemic, species of macaws, parakeets, and parrots'. Given contemporary historical belief that Barbados did host an Amazon we are unable to dismiss its existence peremptorily. Perhaps future archaeological and palaeontological research will resolve the issue.

**'Barn Owl' sp.** *Tyto cf glaucops*

Schomburgk noted without further details that '*Strix flammea*' (the first scientific name for modern Barn Owl *Tyto alba*) was indigenous to Barbados. Ligon, Sloane (1707–1725) and Hughes did not mention it but Feilden (1889a) did. There are at least two unconfirmed recent reports: (1) in the mid-1950s Ian Walker identified a Barn Owl at an unstated location; (2) J.A. Marshall shot an unidentified owl 'in the 1970s' near East Point while hunting hares at night, but the recent occurrence of Barbados's first Short-eared Owl tempers the record's attribution to Barn Owl. Given Barbados's limestone topography and cave incidence plus the occurrence of 'Barn Owls' currently or historically on Dominica, St Lucia (?), St Vincent, the Grenadines and Grenada, we predict discovery of a Barbados population preserved as fossils. Taxonomically, all West Indian Barn Owls had long been considered one species *T. alba*. Hispaniolan Ashy-faced Owl *T. glaucops* has now been separated from *T. alba* by Bruce (1999) who also moved the reddish-faced southern Lesser Antilles endemic races *nigrescens* and *insularis* into *T. glaucops*. However, Keith *et al* (2003) considered *T. glaucops* to be monotypic and further suggested that Lesser Antillean 'Barn Owls' should now be evaluated for specific status.

**Trembler sp.** *Cinlocerthia* sp.

An unexpected 'historical' bird from Barbados was chronicled by Ligon: 'like a Thrush, of a melancholy look, her feathers never smooth, but always ruffled, as if she were mewing, her head down, her shoulders up, as if her neck were broke. This bird has for [song] three or four notes, the loudest and sweetest, that I have ever heard; if she had variety, certainly no bird could go beyond her; she looks alwayes as if she were sick or melancholy' – a fine description of a trembler. Hughes tantalisingly referred to what we assume was the same species as 'a solitary Bird ... known by the Name of the Quaking Thrush'. Schomburgk also referred to a 'Quaking Thrush' for which he used Gmelin's name *Turdus Jamaicensis* (*sic*). Given the shy nature of living tremblers it could have been a now extinct endemic species or Brown Trembler *C. ruficauda*, which occurs today in the Lesser Antilles from Saba to Grenada; no Barbados specimens are known. Its arrival on Barbados, set apart from the main Lesser Antillean chain throughout its history, at first seems puzzling. But insight into tremblers' historical distribution and dispersal potential is offered by late Holocene fossils from Antigua (Pregill *et al* 1988) and modern vagrancy of Brown Trembler to St Thomas, St Eustatius and Antigua (Raffaele *et al* 1998).

## Historical apocrypha

There remain some others not readily allocable to living species. Ligon contributed eight:

- a hawk 'in an evening just at Sun setting, which is the time the Bats rise, and so are to a good height; and at a downcome this *Barbary Faulcon* took one of them and

carried it away' (Bat Falcon *Falco rufifigularis* is known as a vagrant to Grenada but Peregrines also hunt bats);

- 'another ... not much unlike a Wren but big as a Thrush; and this is as merry and jolly as the other [the trembler, above] is sad; and she sits on a stick, jets [= defecates], and lifts up her train [= tail], looking with so earnest and merry a countenance, as if she would invite you to come to her, and will sit till you come very near her' (Pearly-eyed Thrasher? Scaly-breasted Thrasher?);
- 'a bird the colour of a Feldefare [= northern Europe's Fieldfare *Turdus pilaris*] but the head seems too big for her body, and for that reason they call her a Counsellor [*sic*]; her flying is extream wanton; and for her tune [= song], 'tis such as I have not heard any like her, not for the sweetness, but for the strangeness of it, for she performs that with her voice, that no instrument can play, nor no voice sing, but hers; and that is quarter notes, her song being composed of five notes, and every one a quarter of a note higher than the other' [American Bare-eyed Thrush? Clark (1905) without comment assumed that it referred to '*Margarops* sp.'];
- five with no information beyond their colloquial names: 'Haysocks' (old English name for Dunnock *Prunella modularis*; Barbados Bullfinch?), 'Yellow-Hamer' (Grassland Yellow Finch? Golden Warbler?), 'Titmice', and two hunted shorebirds 'Oxen' (American Golden Plover?) and 'Kine' (archaic plural for cows; Eskimo Curlew?).

Hughes added five more:

- 'the Thrush ... much resembling in her Note the English Thrush [probably Song Thrush *Turdus philomelos*]. As soon as the Day appears, she mounts up like a Lark into the Air, almost out of sight' [Tropical Mockingbird? Clark (1905) assumed without comment that it referred to '*Margarops* sp.'];
- 'the Cotton-tree Bird. This is a yellowish Bird, about the bigness of a small sparrow, and is chiefly to be seen among Cotton-trees' [Antillean Euphonia? Clark (1905) offered Blackpoll Warbler];
- 'The Pivet. Altho' this bird feeds upon fruit, its Bill is of the same Make with those of the carnivorous Kind [= hooked at the tip?]; and it intirely subsists by Berries, or such-like Fruit of Trees. It is no small Instance of the Wisdom of Providence, that there is not a Month in the Year, but some Trees, or Shrubs, bear ripe fruit of one kind or another; so that these have literally the Food provided for them in due Season. A Pivet is about the Bigness and colour of our largest kind of Sparrows [= Barbados Bullfinch], and hath a wild chirping Note. They are chiefly to be seen where there is the most Variety of ripe Fruit' (Caribbean Elaenia? Black-whiskered Vireo?);
- 'The Wren. This, excepting its Note and Bill, differs very little from the Thrush, as to its Plumage and Bigness: its Bill is somewhat more sharp-pointed and longer, than that of the Thrush. It is most commonly to be seen in the Wood near Hackleton's Clift, and feeds chiefly upon Oranges, and such wild fruit, as well as upon Lizards' [Scaly-breasted Thrasher? Clark (1905) assumed without further comment that it referred to an unknown *Allenia* on Barbados];
- 'The Spanish Lacker. This differs very little, if any thing, from a Pivet, but by its note. It feeds chiefly upon Poison-tree Berries, and such wild Fruit. This bird is most commonly to be seen near Hackleton's Clift' [Yellow-bellied Elaenia *Elaenia flavogaster*? Clark (1905) assumed without comment that it referred to Black-whiskered Vireo, a species Schomburgk called 'Monkey Bird' and which he referred to '*Vireo olivacea*'].

Schomburgk mentioned without details just another two:

- '*Tachornis phoenicobia*? The Swift'. His scientific name is that for Antillean Palm Swift, known as a vagrant no closer than Puerto Rico, but his '?' leaves this identification open. [Clark (1905) suggested *Chaetura* sp.];

- ‘*Turdus mustellinus*, the common Thrush’ [American Bare-eyed Thrush? Clark (1905) assumed without comment that it referred to ‘*Margarops* sp.’].

It is difficult even to assay the degree to which the same taxa are being described by each of the above authors, although elucidation might possibly follow extensive analysis of contemporaneous historical correspondence and similar documents.

### Unsupported species

While preparing this book we encountered 50 species ascribed to or reported from Barbados that ultimately proved to be inconclusive as to their identification, occurrence or wild origin. Most have reached the literature so we address them here. Note that this enumeration excludes all historical taxa (above), plus individual escapes and incidental releases that have never led to viable breeding populations. In the last category are Mute Swan *Cygnus olor*, Muscovy Duck *Cairina moschata*, Chukar Partridge *Alectoris chukar*, Helmeted Guineafowl *Numida meleagris*, African Collared (= ‘Ringed Turtle’) Dove *Streptopelia roseogrisea*, Sulphur-crested Cockatoo *Cacatua galerita*, Blue-headed Parrot *Pionis menstruus*, St Vincent Amazon *Amazona guildingii* and Java Sparrow *Padda oryzivora* among others. Some of the following species are possible natural vagrants or even breeders; cf Appendices 11 and 12.

#### Canada Goose *Branta canadensis*

Vaguely reported by Sloane (1707–1725) as having been seen on Barbados but dismissed by Clark (1905) and Bond (1956). Nearest records are from the Greater Antilles and Caymans.

#### Snow Goose *Anser caerulescens*

One reported shot by hunters on 10 November 1975 (Hutt MS., AOU 1998, Raffaele *et al* 1998) lacked identification details. Known to have occurred at least twice on Trinidad (ffrench 1991) and on Guadeloupe in November–December 2007, so its presence on Barbados would not be regionally unprecedented.

#### American Black Duck *Anas rubripes*

Reported without details by Schomburgk (1848) as ‘occurring’ on Barbados, so dismissed by Clark (1905) and Bond (1956). Black Duck is known as a vagrant to the Bahamas, Puerto Rico, the Virgin Islands and Guadeloupe and recently bred in the Azores (Dubois 2002), so remains a possibility.

#### Cinnamon Teal *Anas cyanoptera*

Reported shot on 12 October 1963 and 11 November 1979 (Hutt MS., Evans 1990, Raffaele *et al* 1998) but the meagre descriptions did not eliminate reddish Blue-winged Teal. North American vagrants have been recorded no closer than Antigua but one on Grenada was more likely of South American origin.

#### Redhead *Aythya americana*

Reported shot by hunters on 14 November 1951, 11 November 1952, 27 October 1955 (two) and 17 November 1955 (five; Hutt MS., Raffaele *et al* 1998). Regrettably, no descriptions were provided and on Barbados the colloquial name ‘redhead’ is often applied to female Lesser Scaup and perhaps also Ring-necked Duck. Genuine vagrants have been recorded no closer than Jamaica and Hispaniola.

#### Bufflehead *Bucephala albeola*

Bond (1962) corrected ‘Barbados’ in a footnote in Bond (1956) to ‘Barbuda’. Bufflehead is ‘rare’ in Cuba and a vagrant to Jamaica, Puerto Rico, St Martin and possibly also St Lucia.

**Common Goldeneye** *Bucephala clangula*

Reported without details as having occurred on Barbados by Cory (1889) and copied by Bent (1925); dismissed by Bond (1956) and Hutt (MS.). Known from the West Indies only as a vagrant to the Bahamas.

**Black-browed Albatross** *Thalassarche melanophrys*

A report from Graeme Hall Swamp (!) on 1 February 1959 is problematic (Hutt MS.). This species was collected on 12 November 1956 from a small flock (*sic*) off Martinique (Bond 1959) and one or more were in the Bahamas between December 1997 and June 1998.

**Bulwer's Petrel** *Bulweria bulwerii*

Reported after a storm at North Point 8 August 1973 but Brown and Black Noddies could not be excluded. A tubenose seen briefly at sea west of Barbados in late April 2000 was also believed to be this species. Bulwer's Petrel was unknown to Raffaele *et al* (1998) although one was found dead (?prospecting) on Soldado Rock off southwest Trinidad on 23 January 1961, and singles have been seen off Aruba, Curaçao and Bonaire; French Guiana; Dominica April 2003; Guadeloupe in massive seabird movements on 11 June 2003 and in June 2006 and 2007, March 2008, and suspected there on 12 June and 5 July 2003. It is thus probably annual in Barbados EEZ abyssal waters (Cramp *et al* 1977) where in 1965 singles were seen on 10 June 465 km east, on 30 May 1024 km southeast and on 7 June 1143 km southeast (DDG).

**Band-rumped Storm Petrel** *Oceanodroma castro*

One recent sight report (24 April 2000) while probably correct did not have enough information for this species' addition to the Barbados list. This blue-water, highly pelagic species (also known as Harcourt's and Madeiran Storm Petrel) breeding in the eastern North Atlantic and wintering or dispersing to the west is known from Cuba, Antigua and Brazil so it probably occurs in Barbados waters at or near the 200-nmi EEZ limit. Greatly complicating matters, molecular work indicates multiple species nested within '*O. castro*' (Smith *et al* 2007). [N.B.: a well-seen dark-rumped storm petrel at sea south of Barbados 29 April 2000 was not identified to species. We are aware of no Atlantic Ocean record of any dark-rumped Leach's Storm Petrel but Swinhoe's Storm Petrel *O. monorhis* has since 1983 been discovered at several locations in the Western Palearctic in Leach's colonies, so is prospecting if not colonising Atlantic and Mediterranean waters. Photographed off the Outer Banks of North Carolina in August 1998 (O'Brien *et al* 1999) and June 2008 (Howell & Patteson 2008c).]

**Least Grebe** *Tachybaptus dominicus*

Barbados was inadvertently included in the species' range map in Raffaele *et al* (1998). Least Grebe has reached Dominica and Grenada, and so must be considered to be a potential Barbados vagrant and even coloniser, most probably from South America.

**Black Vulture** *Coragyps atratus*

A vagrant to the Bahamas, Cuba and Jamaica from North America, and occasionally Grenada from South America, this is a potential vagrant to Barbados from the south. Nevertheless, a report without details by a visiting Canadian biologist of >100 Black Vultures on 5 February 1965 (Bond 1965) is baffling.

**Swallow-tailed Kite** *Elanoides forficatus*

Barbados was inadvertently included in the species' range map in Raffaele *et al* (1998). Swallow-tailed Kite has occurred on Tobago, breeds not uncommonly in Trinidad, has reached Jamaica, Hispaniola and Puerto Rico, records are increasing on the Cayman

Islands, Aruba's first was videotaped in March 2003, and it has also occurred recently on Antigua, Guadeloupe and Grenada. It is a reasonable possibility on Barbados.

**Common (or Eurasian) Kestrel** *Falco tinnunculus*

A female or first-CY male medium-sized kestrel (not *F. sparverius*) was seen in flight at Newcastle on 1 February 2003 (RWB) during a period of hazy weather associated with a major Sahara dust incursion. The brief view obtained did not allow elimination of Lesser Kestrel *F. naumanni*. Coincidentally, one week later a female Common Kestrel was found in central Florida. Apart from another 20 or so North American records, it is also known from Bermuda, Martinique, Trinidad, French Guiana (four times) and Brazil.

**Clapper Rail** *Rallus longirostris*

Included in Raffaele *et al* (1998) based on two reports in Hutt (MS.) but one was a vague hunter's tale and the other may not have been seen well. Small populations of *caribaeus* are resident on islands as close as Guadeloupe and Isla Margarita, but the species seems to have no history of intra-Antillean vagrancy.

**Wattled Jacana** *Jacana jacana*

A previously unknown photograph of a 'jacana' found at night on 15 January 1993 revealed a juvenile Purple Gallinule (a well-known mid-'winter' nocturnal migrant). Even though breeding as close as Trinidad and having reached Bonaire, this jacana is not known for vagrancy; it would be new to the West Indies.

**Black-tailed Godwit** *Limosa limosa*

Two different godwits in captivity on Barbados and claimed to be *limosa* (perhaps the source for AOU 1998) were examined alive in April 1993 by PAB, FGB, MDF and EBM and both were found to be large but typical female Hudsonian Godwits. Authentic recent occurrences from St Kitts and Trinidad mark this as a species to be anticipated on Barbados.

**Bar-tailed Godwit** *Limosa lapponica*

An alleged flock of ten at Fosters in mid-September 1990 whence nine were 'shot' was never documented, nor was another shot individual claimed a week later in St Philip – perhaps the source of the Barbados report in Norton (1991). A numerous Eurafican migrant, it has occurred on Bermuda (a group of three), St Croix, Venezuela, French Guiana and Fernando de Naronha (Brazil), so it is anticipated on Barbados. But as both nominate *lapponica* (Eurasia) and *baueri* (Alaska-Siberia) are known from eastern North America, subspecies should never be presumed.

**Red Phalarope** *Phalaropus fulicarius*

A report of a 'swimming sandpiper at sea' may be the source of the Barbados Red Phalarope in Hutt (MS.) and by extension AOU (1998); a 'small phalarope' reportedly flew into Congo Road in the 1980s but details are lacking. Extrapolating from other records, Red-necked (*P. lobatus*) not Red is the marine phalarope more likely to be seen in the West Indies – eg one on Guadeloupe in September 2003.

**Yellow-legged Gull** *Larus michahellis*

Four first-CY gulls resident at Pile Bay from 15 January to 25 March 2000 were reported to have included at least one Yellow-legged Gull. Five years later another first-CY at Chancery Lane 6-24 November 2005 alongside a 2nd- or 3rd-CY Lesser Black-backed was similarly identified. When numerous photographs of the four from 2000 were made available, identification responses from European gull authorities conflicted. Suggestions

included *L. m. atlantis* (original identification), Lesser Black-backed Gull and American Herring Gull, but with no consensus. Images of the 2005 individual (nominate *michahellis* was suspected) again provoked a split of European opinion between Yellow-legged and Lesser Black-backed. Despite their finders' strong belief that some form of Yellow-legged Gull occurred on Barbados in 2000 and 2005, in the absence of European concurrence we are constrained to place both reports here. Another adult gull with yellow legs at Oistins on 6 May 2007, seen well but briefly in flight and perched alongside Laughing Gulls (EBM, DN), was also thought to be *L. michahellis*. Yellow-legged Gull may be in the process of colonising the New World: *L. m. atlantis* has been collected in the Gulf of St Lawrence (Wilds & Czaplak 1994) and is believed to be the identity of the 1-2 that have wintered annually in Newfoundland since the early 1990s (B. Mactavish, pers comm); others not identified to race or matching nominate *michahellis* have been reported along the western Atlantic coast south to North Carolina and Puerto Rico. For identification see Garner & Quinn (1997), Garner *et al* (1997), Jonsson (1998a), Dubois (2001) and Elliott (2008) - for *atlantis*, plus Malling Olsen & Larsson (2004). For moults and identification of all Western Hemisphere gulls, see Howell & Dunn (2007).

#### **Forster's Tern** *Sterna forsteri*

A 1st-CY reported without any description 'along the southeast coast' in late August 1991 would have been the first for Barbados. Nonetheless, recent occurrences on St Martin, Barbuda, Antigua, Montserrat, Guadeloupe, St Vincent, the Grenadines, Grenada and off Brazil mark it as a likely future species.

#### **Great Skua** *Catharacta skua*

The West Indian, indeed the North Atlantic, *Catharacta* story is still being written. Before the late 1970s it was assumed that only Great occurred in the North Atlantic; then South Polar *C. maccormicki* was found to be the default summer skua in at least the western Atlantic. Recently, the first two North Atlantic Subantarctic (= Brown) Skuas *C. antarctica* were reported in the same year in Britain (Votier *et al* 2004). The true relative numbers of all skua taxa in the North Atlantic, variously species or subspecies, remain to be clarified but field and even in-hand identification techniques are primitive: the British Subantarctics were identified molecularly, but this identification has now been retracted (Votier *et al* 2007). Although ringing returns prove that *skua* winters regularly in the Caribbean (at least three UK-bred birds have been recovered as close as Guyana), none has yet been found in Barbados waters. Fresh juvenile and bright adult *skua* are ordinarily recognisable, as are light-morph *maccormicki*. To complicate matters *maccormicki* occurs in three recognised morphs while *skua* and *antarctica* each have 'light' and 'dark' variants not yet treated as true colour-morphs. At the moment all we can safely say is that western North Atlantic and Caribbean ringing, specimen and sight records show *C. skua* to be the default boreal-winter species, *C. maccormicki* the default boreal-summer species and *C. antarctica* to be exceedingly infrequent, if it occurs at all, in the boreal summer. The state of the art in skua identification remains Malling Olsen & Larsson (1997), but is somewhat out of date; see additional references in the South Polar Skua species account (page 155). In summary, old records of Barbados skuas were assumed to be *skua* and while the only *Catharacta* record in Hutt (MS.) was first considered *skua* but later *maccormicki* based on date of occurrence, on present knowledge it must be relegated to *Catharacta* sp. The same may be said for all but one of the handful of recent skua sight reports from Barbados waters.

#### **Long-tailed Jaeger** *Stercorarius longicaudus*

A light-morph adult Long-tailed Jaeger seen at sea west of Barbados on 1 May 1959 appears to have been a Parasitic. Its report (Hutt MS.) as Long-tailed is presumably the source for Evans (1990), AOU (1998) and Raffaele *et al* (1998). That said, adult jaegers

with extremely long central rectrices seen at sea 55 km west of Barbados on 10 April 1997 and 11 km south on 29 April 2003 (both EBM) were thought to have been Long-tails. Indeed, all three may have been, as dates and locations are appropriate for northward-migrating Long-tails (eg now annual off Guadeloupe Mar – Jun, maximum 7 in 2 h 22 May 2008: A.J. Levesque, pers comm).

**White-crowned Pigeon** *Columba leucocephala*

Barbados was inadvertently included in the species' range map in Raffaele *et al* (1998). It occurs on all other main islands in the Lesser Antilles and so is possible on Barbados, although its preferred mangrove habitat there is restricted.

**Bridled Quail-Dove** *Geotrygon mystacea*

Barbados was inadvertently included in the species' range map in Raffaele *et al* (1998). A sedentary dense forest species, it would seem unlikely to occur on modern Barbados.

**Ruddy Quail-Dove** *Geotrygon montana*

Barbados was inadvertently included in the species' range map in Raffaele *et al* (1998). Generally a sedentary dense forest species, it would seem unlikely to occur on modern Barbados.

**Brown-throated Parakeet** *Aratinga pertinax*

The medium-sized feral parrots found in the Bridgetown area since the 1950s and identified in Hutt (MS.) as 'Caribbean Parakeet' now carry this English name. Resident from Panama east to northeastern Brazil, they have been introduced to some West Indian islands, but not to Barbados. It would seem that some of the introduced Amazons (page 161) had been misidentified as *Aratinga*.

**Monk Parakeet** *Myiopsitta monachus*

Presumed escapes or releases were originally reported occurring by Clark (1905) and repeated by Watson (1993), but there is no evidence of any attempt to establish a breeding population.

**Mangrove Cuckoo** *Cuculus minor*

Barbados was inadvertently included in the species' range map in Raffaele *et al* (1998). It does occur on all other main islands in the Lesser Antilles, and so is a potential vagrant to Barbados.

**Chuck-will's-widow** *Caprimulgus carolinensis*

Nocturnal nightjars seen in Bridgetown 9 October 1997 and at Coles on 1 March 2000 (three) showed no white in their primaries or tails in flight but descriptions were inadequate for firm identification. Chuck-will's-widow overwintered on St Martin in 2001–2 and 2002–3 and has occurred as a vagrant to Aruba, Curaçao, Bonaire and Venezuela, so occurrence on Barbados would not be unprecedented in the southern Caribbean. Intriguingly, the longish tails and pointed wings bent at the wrist are also consistent with Oilbird *Steatornis caripensis*. Although as yet unknown in the Lesser Antilles, it has occurred as a vagrant to Tobago and the Netherlands Antilles, each time after considerable flight over water.

**White-tailed Nightjar** *Caprimulgus cayennensis*

A mysterious species on Barbados, first reported by MBH & HFH in April 1963 and sporadically through 1988 (Hutt MS., the source for Evans 1990 and Raffaele *et al* 1998). No specimens were saved and we know of no written descriptions. All attempts to

relocate this species between 1993 and 2005 in areas where it had been originally reported failed but did turn up presumed Common Nighthawks *Chordeiles minor*. Subsequent investigation hints that Hutt's nightjar identification as White-tailed may have been largely by a process of elimination. That he never reported their presence to Bond, whom he kept informed of new birds on Barbados, affirms his ambivalence. We believe this species does not occur on Barbados today and perhaps never did.

**Grey-rumped Swift** *Chaetura cinereiventris*

A small *Chaetura* sp. seen well at Codrington College on 21 June 1956 (Rff, pers comm) was neither a Chimney nor a Short-tailed Swift. A 'longish tail' points to this species, which has been reported from Bermuda and Hispaniola, rather than the similar but noticeably short-tailed Lesser Antillean Swift *C. martinica*.

**Common Swift** *Apus apus*

A 'questionable sight record' from Barbados in AOU (1998) is erroneous, actually pertaining to Grenada (Bond 1973).

**Ruby Topaz** *Chrysolampis mosquitus*

A dismantled skin in the ROM is labelled 'said to be from Barbados'. ROM collection manager Brad Millen (pers comm to PAB) believes it was 'from a curio case of specimens donated to Queen's University Museum of Biology in 1904 and then exchanged to ROM on 1 May 1940 with 80 other birds'. While a Barbados origin is possible, Trinidad & Tobago is far more likely; except for one Grenada record it is unknown in the Lesser Antilles.

**Tufted Coquette** *Lophornis ornata*

A June 1998 multiple-observer Jack-in-the-Box Gully report with a drawing of a possible female may have been correct but the bird was never relocated. An uncommon but widespread breeder on Trinidad, it has heretofore not been reported from the West Indies or the AOU *Check-list* area.

**Ruby-throated Hummingbird** *Archilochus colubris*

Mentioned by Feilden (1889a) as having been so accurately described to him that he had no doubts that it occurred on Barbados. This account has been overlooked by all except Clark (1905) who credited it. We do not, as the evidence falls short of compelling. Nearest vagrant occurrences seem to be in the Cayman Islands, Jamaica, Hispaniola and Puerto Rico.

**Ringed Kingfisher** *Ceryle torquata*

Barbados was inadvertently included in Evans's (1990) Lesser Antilles checklist. It is a not uncommon resident on Guadeloupe, Dominica and Martinique and has occurred as a vagrant to Montserrat and Grenada (the latter identified as nominate *torquata* from Trinidad and South America), so is possible on Barbados although its preferred river-lake-reservoir habitat is restricted there.

**Willow Flycatcher** *Empidonax traillii*

One was reported in error from Graeme Hall Swamp in the winter of 1990-1991 (Hutt MS.).

**Least Flycatcher** *Empidonax minimus*

Shown in table 1 in Arendt (1992) as having occurred on Barbados but his source is not given. In the West Indies this species is known only as a vagrant to Cuba, the Cayman Islands and Hispaniola.

**Warbling Vireo** *Vireo gilvus*

Shown in table 1 in Arendt (1992) as having occurred on Barbados but his source is not given. In the West Indies this species is known only as a vagrant to Cuba and Jamaica.

**Yellow-green Vireo** *Vireo flavoviridis*

Reported in the AOU *Check-list* (1998) as having occurred on Barbados but the source is not given. This species is unknown from the West Indies.

**Violet-green Swallow** *Tachycineta thalassina*

Like everything on Plowden-Wardlaw's (1953, 1954) unannotated and unrefereed list of species of Barbados and St Lucia birds that was copied uncritically from Bond and other sources, his mention of this species in the '2nd edition' of his pamphlet came out of the blue. Furthermore, it replaced without comment his '1st edition's' Tree Swallow, a species unknown in the Lesser Antilles until 2000. Violet-green has never been detected in the Caribbean.

**Cave Swallow** *Petrochelidon fulva*

Reported without details 13–25 September 1990 and 27 August–3 September 1991 by a visitor unaware of the true status of *Petrochelidon* swallows on Barbados. Cave Swallow is a common breeder in the Greater Antilles, some populations wintering southward in unknown locations. It has occurred as a vagrant to Bermuda, the Bahamas, Guadeloupe, Martinique, St Lucia, St Vincent, the Grenadines and Curaçao, but has yet to be detected on Barbados despite searching. Garrido *et al* (1999) split Cave Swallow (*sensu lato*) into largely West Indian Fulvous *P. fulva* and mainland Cave (*sensu stricto*) *P. pelodroma*, further dividing Fulvous into four West Indian races: nominate *fulva* (Hispaniola and Gonave, resident), *cavicola* (Cuba and Isle of Pines, 'apparently partly migratory'), *poeciloma* (Jamaica, 'apparently nonmigratory'), and *puertoricensis* (Puerto Rico, resident) plus *citata* (Yucatan and adjacent Chiapas, resident). Their excellent table 1 compares plumage features of all populations in the complex.

**Grey Catbird** *Dumetella carolinensis*

Shown in table 1 in Arendt (1992) as having occurred on Barbados, and although no source is given it may have been one seen by P. William and Susan Smith (pers comm) 'not well enough to be certain' near Graeme Hall Swamp during the first week of November 1988. In the West Indies this species is uncommon to rare in the Greater Antilles and a vagrant only as far southeast as Puerto Rico and Anguilla.

**Common Waxbill** *Estrilda astrild*

Collected by Clark (1905; specimen in MCZ) and presumed to be an escape although a feral population could have been established by then on Barbados, as on Bermuda, Puerto Rico and Trinidad (the last a potential source of natural vagrants). Not reported with certainty by any other authors save Bond (1956) who may have been parroting Clark.

**Palm Warbler** *Dendroica palmarum*

Arendt's (1992) table 1 is the source for Raffaele *et al* (1998) but we have no record of this species having occurred on Barbados. Palm Warbler winters in the Greater Antilles

and was described from Hispaniola but because it has occurred in the Lesser Antilles on Saba, Guadeloupe, Dominica and St Lucia and also in the Netherlands Antilles and western Venezuela, it would not be unexpected on Barbados.

**Yellow-headed Blackbird** *Xanthocephalus xanthocephalus*

Reported by Bond (1956), Arendt (1992), AOU (1998) and others as having occurred on Barbados, the source being the unique 1887 specimen of Yellow-headed Blackbird (page 195) correctly reported by Feilden (1889a) as *Agelaius ictercephalus* but that Clark (1905) and subsequent authors took to mean North American Yellow-headed Blackbird. Yellow-headed Blackbird is known in the West Indies only as a vagrant to the Bahamas, Cuba, the Cayman Islands and Puerto Rico.

**Green Honeycreeper** *Chlorophanes spiza*

A dismantled skin in the ROM is labelled 'said to be from Barbados'. ROM collection manager Brad Millen (pers comm to PAB) believes it was 'from a curio case of specimens donated to Queen's University Museum of Biology in 1904 and then exchanged to ROM on 1 May 1940 with 80 other birds'. Although a Barbados origin is possible, Trinidad & Tobago is far more likely; the species is unknown from the Lesser Antilles.

**Chestnut-bellied Seed Finch** *Oryzoborus angolensis*

A singing male resident at Turners Hall Wood 18 December 1955–23 June 1957 (Rff, Mff) then not seen again except on 3 October 1957 (NH) was presumed to be an escape. Although the native Trinidad population has now been almost extirpated by cage-bird trafficking, it was in better condition then (Rff, pers comm), so natural vagrancy cannot be excluded (Tobago's first, assuming a wild origin, occurred on 23 June 2006: SCBA). This is the first West Indian record we know of but by the 1980s a small breeding population derived from escaped individuals had become established on Martinique (Feldmann *et al* 1999). Sometimes lumped with Thick-billed Seed Finch *O. funereus* in Lesser Seed Finch *O. angolensis sensu lato*.

**Red-crested Cardinal** *Paroaria coronata*

Seen by Clark (1905; quoted by Bond 1956) who stated that it was probably an 'escaped cage [-bird], as I could find no evidence [it] had been intentionally liberated'. He added that 'many additional species have been found in an apparently feral state on Barbados, but as none of them appear to have become established, a list of them would be merely a waste of space'.

**Taxa described from Barbados**

Eleven taxa have been described from Barbados, most originally as subspecies (Table 12). Barbados Bullfinch has recently been restored to species rank based on new molecular, morphological and ecological data and now becomes the island's sole extant endemic species. Of the remaining 10, Oberholser's Barbados Green Heron *Butorides virescens barbadensis* has been uniformly rejected as another of his clinal microtaxa and is now subsumed within *maculata*. For similar reasons we do not accept Bond's Barbados Moorhen as its supposedly diagnostic features are easily accommodated within Lesser Antillean *cerceris*. The last eight are distinctive and accepted by most taxonomists. Of these the hummingbird, elaenia, thrasher, warbler, Bananaquit and grackle are restricted to Barbados, an impressive degree of endemism for a young island. The dove occurs on Barbados and St Vincent, and the vireo breeds from St Croix to Grenada. However, the recently described thrasher may be extinct, and the grackle's exact relationship to all other 'Carib Grackles' is currently being examined molecularly.

**Table 12** Taxa described from Barbados ( $n = 11$ ) and the locations of their type specimens. Those endemic to Barbados are shown in boldface; brackets indicate subspecies not generally accepted. See page 61 for museum abbreviations. ? = location of type specimen unknown.

Taxon	Type
[Green Heron <i>Butorides virescens</i> <b>barbadensis</b> Oberholser 1912]	MCZ
[Common Moorhen <i>Gallinula chloropus</i> <b>barbadensis</b> Bond 1954]	ANSP
Common Ground Dove <i>Columbina passerina antillarum</i> (Lowe 1908)	NHM
Antillean Crested Hummingbird <i>Orthorhyncus</i> c. <b>crisatus</b> (Linnaeus 1758)	?
Caribbean Elaenia <i>Elaenia martinica</i> <b>barbadensis</b> Cory 1888	FMNH
Black-whiskered Vireo <i>Vireo altiloquus barbadensis</i> (Ridgway 1874)	USNM
Scaly-breasted Thrasher <i>Alenia fusca atlanticus</i> (Buden 1993)	AMNH
Golden Warbler <i>Dendroica</i> p. <b>petechia</b> (Linnaeus 1766)	USNM
Carib Grackle <i>Quiscalus lugubris</i> <b>fortirostris</b> Lawrence 1868	?
Bananaquit <i>Coereba flaveola</i> <b>barbadensis</b> (Ridgway 1873)	USNM
Barbados Bullfinch <i>Loxigilla</i> <b>barbadensis</b> Cory 1886	FMNH

### Status codes and conventions

Every species in the Systematic List is given one of the following BOU **Status Codes** at the beginning of its species account to encapsulate its Barbados status:

<b>RB</b>	Resident breeder
<b>(R)B</b>	Breeder but residence uncertain
<b>MB</b>	Migratory breeder
<b>IB</b>	Introduced breeder
<b>I(B)</b>	Introduced but breeding uncertain
<b>RN</b>	Variably resident non-breeder
<b>WV</b>	Non-breeding winter visitor or resident
<b>PM</b>	Passage migrant; pelagic migrant or visitor
<b>FPM</b>	Former passage migrant
<b>SM</b>	Scarce (= Irregular) migrant
<b>SV</b>	Non-breeding summer visitor or resident
<b>SAA</b>	Ship-assisted alien
<b>V(I)</b>	Vagrant from an introduced population
<b>V</b>	Vagrant
<b>EN</b>	Endemic to Barbados
<b>EX</b>	Extirpated or extinct
<b>?</b>	Indicates doubt about all or part of the status designation.

### Other species account conventions include:

- additional English vernacular names shown may be onomatopoeic, hunters', local, American (versus British), or follow from different species-level taxonomy;
- global and West Indian distributions are given for all species so readers can easily place every Barbados species in increasingly broader zoogeographical contexts;
- 'West Indies' in every species account's range (but only there) should be construed to embrace Bermuda, the Bahamas, the Greater Antilles, the Caymans, the Virgin Islands, the Lesser Antilles, the Netherlands Antilles, Venezuela's offshore islands, Trinidad & Tobago, the Guianas and the intervening northern coastline of South America;

- unless stated otherwise enumerated records for every species involve only single individuals and collectively constitute all known and accepted Barbados records;
- being redundant, the word 'bird(s)' has been intentionally omitted following all counts;
- to the extent possible, every record is given with the *sine qua non* metadata for any distributional study: species, number, age and sex (if determinable), place, date, and datum originator or source;
- *ageing* (cf *aging*) is the technical process of determining an individual bird's age;
- excepting introductions, all species and individuals are assumed to have reached Barbados unassisted, and unaided ship-riding does not vitiate the notion of 'unassisted';
- all species recorded on Barbados are monotypic unless stated otherwise;
- whenever used, the phrase 'valid species' denotes *only* biological species as articulated by Johnson *et al* (1999), and never any of its recently proposed alternative species concepts (phylogenetic, evolutionary, ecological, etc.);
- identification references pertain to state-of-the-art techniques for taxa that may be, or even are, occurring regularly but undetected on Barbados owing to field identification limitations.

### Note added in proof

#### **Black-legged Kittiwake** *Rissa tridactyla*

An adult found with a broken leg on 6 Feb 2009 at an unstated east coast location was brought alive by its anonymous finder to Graeme Hall Nature Sanctuary where it died 3 days later (*vide* RC, RWB). It was followed by a second adult, dead 17 Feb on the east coast 0.5 km south of Long Pond (EBM: photographed), and then on 21 Feb by a 1st-CY flying past Inch Marlowe (EBM). These were part of an unprecedented incursion into the Caribbean, often of emaciated, moribund, or freshly dead adults. As of 6 May 2009 there were records from at least Cuba, Guadeloupe, Dominica, Barbados, Tobago, Trinidad, Suriname, Guyana, Venezuela, Panama (Pacific side), Costa Rica, and Yucatan — many of multiple individuals. The causes of this event are obscure, but it is tempting to relate it to a major European irruption occurring at the same time to the Pyrenees, Switzerland, Italy, and even Turkey. Formerly all but unknown in the southern Lesser Antilles — the only earlier records were from Guadeloupe (2) and St Lucia (1) — this species had previously only been found farther south than Barbados once each on Trinidad and in Peru. This is the 262nd accepted species for Barbados.

#### **Grey-hooded Gull** *Larus cirrocephalus*

An adult was photographed on 30 May 2009 at Congo Road (EBM). It was presumably nominate *cirrocephalus* from coastal central and southern South America, the form more likely to have occurred as a vagrant north to Panama (1) and to Florida (1). This is the 263rd accepted species for Barbados.

## ODONTOPHORIDAE

### Northern Bobwhite

*Colinus virginianus*  
(Linnaeus 1758)

**I(B), EX**

Quail

**World** Resident from Wyoming E to Massachusetts, S to Guatemala, Florida and West Indies.

**West Indies** Native to Cuba; successfully introduced to Bahamas, Hispaniola, Puerto Rico and Virgin Islands; unsuccessfully S to St Kitts, Guadeloupe, Martinique and Barbados.

**Barbados** Mentioned by Schomburgk (1848). Feilden (1889a) oddly called it a 'very rare visitor' with two Sep records, one shot (presumably *not* migratory *Coturnix coturnix*). It was reputedly introduced in unknown numbers in the 1800s (?source population), probably bred, but was soon extirpated (Clark 1905).

## ANATIDAE

### White-faced Whistling Duck

*Dendrocygna viduata*  
(Linnaeus 1766)

**V**

**World** Two disjunct populations: Africa S of Sahara to Angola, Natal and Madagascar; and Costa Rica to Panama, Colombia, Venezuela, (formerly Trinidad) and Guyana, S to Bolivia, Argentina, Uruguay and Brazil.

**West Indies** Vagrant to Cuba, Hispaniola, Puerto Rico, Barbados and Netherlands Antilles.

**Barbados** One record: flock of 27 Graeme Hall Swamp in Sep 1887, one of which shot and placed in aviary where identity confirmed one year later (Feilden 1889a).

**Comments** The absence of subspecific differentiation between South American and African populations argues for relatively recent or re-occurring invasions from Africa. All Antillean records were pre-1927, and might have been part of an earlier population retraction at the northern edge of its range (eg extirpated as breeder from Trinidad and Suriname). However, Suriname, Trinidad and Netherlands Antilles records since the 1970s suggest this trend may now be reversing.

### Black-bellied Whistling Duck

*Dendrocygna autumnalis*  
(Linnaeus 1758)

**RB, SM**

Whistling Duck, Wicisisi

**World** Resident from northwestern Mexico E to Louisiana, S through Central and South America to Peru, Argentina, Paraguay and Brazil, plus Cuba and Barbados in West Indies.

**West Indies** Perhaps increasing; breeds on Cuba, Barbados, Trinidad and Tobago; otherwise only occasional wanderer to Bahamas, Caymans, Jamaica, Hispaniola, St Croix, Netherlands Antilles and southern Lesser Antilles. 3 St Lucia records.

**Barbados** First noted by Clark (1905) who encountered 3 'in woods about upper reaches of Joe's River' 7 Sep 1903, collecting one a week later (present location unknown). Increasing modern records, mostly in summer and autumn after southerly winds: 18 Brighton 6–9 Aug 1943 (CB); 9 (3 shot) Fosters 4 Jul 1959 and 4 (3 shot) Graeme Hall Swamp 6 Jul 1959 (examined by MBH); 35 Graeme Hall Swamp 25 Mar 1965 (MBH, same day as Glossy Ibis incursion); 3 shot unknown location 7 Mar 1978 (Hutt MS.); 11 Graeme Hall Swamp 19 Mar 1981 (MBH); 3 Coles Dec 1991 (DA); 20 Packers 30 Aug 1992 (*fide* EBM); 6 Packers mid Aug 1994, one still present in Oct (reported to MDF); Cluffs 1 Sep 1996 (EBM, MDF); 2 Coles 16–17 Aug 1999 (MDF, EBM). In 1998, several small groups arrived late Feb, some lingering: eg 3 Graeme Hall 22 Feb–6 Mar (MGa, MDF, EBM); Arch Pond 25 Feb (EBM); 2 Packers 25 Feb (EBM); Coles 4 Mar (MDF); 5 Greenland 15–28 Mar with 2 until 16 May (EBM, MDF); Golden Grove 25 Apr–5 Jul (MDF, EBM, MGa). First bred in late 2002 after which unclear whether some (eg 2 Fosters 16 Oct 2003; 2 overwintering in 2004; 6 Graeme Hall Swamp 29 May 2006) were local breeders or their offspring, new arrivals, or both, but 8 East Point 5 Jun 2005 (EBM), 11 Packers 31 Dec 2006 (MDF *et al*) probably new arrivals. Other wild birds likely, as hunters claim to shoot them occasionally.

**Breeding** Flock of 20–30 in St Philip Mar 2002 (reported to MDF) possibly source of pair with 12 ducklings at The Hope 29 Sep 2002 (BL). In 2007 (?same) pair bred again at The Hope plus another pair at Searles Plantation in Christ Church (*fide* KSW); on 20 Jan 2008 (?another) pair with 7 ducklings at Packers (EBM); in Oct–Nov 2008 at least 3 more pairs with 'many ducklings' at Carrington (RB).

**Comments** The subspecific taxonomy of Black-bellied Whistling Duck confusingly changed when Banks (1978) corrected the name of the South American race from *discolor* to nominate *autumnalis* and of North American nominate *autumnalis* to *fulgens*. Summer and autumn individuals are presumably from South America, as are other Barbados arrivals after southerly winds, and hence *autumnalis* (= former *discolor*) as 3 specimens from St Lucia are identified (Keith 1997). The source of spring birds is less clear but this would be an odd time for arrival of Cuban or North American *fulgens* (= former *autumnalis*). Fortunately both forms are identifiable in the field (James & Thompson 2001) so the issue should be resolvable. We know of no extant skins even though Blake (1977) called *autumnalis* (= former *discolor*) the only form to have occurred on Barbados. Black-bellied has shown an irruption pattern similar to but more recent and less expansive than Fulvous and is now colonising southern Florida and southern Great Plains, while occurring as a vagrant far to the N and E of its historical range. *Fulgens* is in captivity on Barbados but on a much smaller scale than *autumnalis*; captive breeding has been unsuccessful and to our knowledge no introductions into the wild of either race have occurred. Also known as fossils from the Spring Bay site (page 55).

**West Indian Whistling Duck**

*Dendrocygna arborea*  
(Linnaeus 1758)

V

**World** West Indian endemic.

**West Indies** Endemic; rare and perhaps declining local resident of Bahamas, Cuba, Caymans, Jamaica, Hispaniola, Puerto Rico, Virgin Islands, Barbuda, Antigua and Guadeloupe; vagrant to Bermuda, Dominica, Martinique, Barbados and Grenada.

**Barbados** One modern record: 4 well described Graeme Hall Swamp 26 Jan–4 Feb 1961 (MBH). Reported without details by Schomburgk (1848); known from Spring Bay fossils.

**Fulvous Whistling Duck**

*Dendrocygna bicolor*  
(Vieillot 1816)

**IB, SM**

Wicisisi

**World** Resident in four disjunct areas: Africa E to Burma; southern California E to southern Florida and S to Costa Rica; Greater Antilles; and South America from Colombia E to French Guiana (including Trinidad & Tobago, nearest wild breeders) and S to Argentina.

**West Indies** Breeds on Cuba, Hispaniola and Puerto Rico; wanders to Bermuda, Bahamas, Lesser Antilles (once on St Lucia: 1965 flock of 200), Netherlands Antilles and Trinidad & Tobago; records may be confounded by various introduction attempts.

**Barbados** Irregular autumn and spring visitor, unknown pre-1962. Most records concentrated 1963–65 (Hutt MS.): 1 shot out of flock of 7 in Sep 1962 (identified by KDF); 70 at several locations in N and E 18–21 Oct 1962; singles several locations 9–17 Nov 1963; 7 Worthing View 3 Dec 1963; 80 Inch Marlowe 7 Dec 1963; 36 Chancery Lane 20 Feb 1964; 50 Graeme Hall Swamp 21 Mar 1964; 2–6 several locations 14 Oct–11 Nov 1964; 27 Golden Grove ‘autumn of 1964’ (*fide* MBH); 20 at unnamed location 2 Dec 1964; 100 off Speightstown 20 Feb 1965, and 150–200 (75 shot) Graeme Hall Swamp–Worthing View 21 Feb (MBH, JB). Few in next 40 years: 2 Andrews 9 Nov 1977 (reported to MBH); 40 Congo Road spring early 1980s (GS); 3 Graeme Hall 3 Apr 1984 (MBH, AB); trapped Edgcombe ‘late 1980s’ (GS); 1–2 seemingly wild East Point–Greenland 7 Mar 1998 during Black-bellied Whistling Duck influx (MGa, MDF, EBM, TD, JRD).

**Breeding** Birds from several sources imported and bred successfully in captivity. Besides occasional escapes, several unsuccessful introduction attempts (eg 7 in Graeme Hall Swamp Dec 1996 and others at Golden Grove same year quickly disappearing) until 4–6 pairs released 1999–2000 at Royal Westmoreland golf course successfully bred there, reaching artificially fed but free-flying population of 42+ by 2006 (KSW) and confounding future records of wild individuals.

**Comments** The absence of subspecific differentiation between Western Hemisphere and African populations argues for relatively recent or re-occurring invasions from Africa. Fulvous is another proven wanderer given to sudden and unpredictable irruptions over great distances that sometimes lead to new breeding populations (Madge & Burn 1988). In the 1950s it began to disperse in large numbers from its North American breeding centre in Mexico, and southwestern and south-central USA (Baird 1963). First recorded in West Indies on Cuba in 1943 and was breeding there by 1964 (Bond 1964, 1965). Bond (1966) opined that the ‘great increase in the Cuban population may have instigated its extraordinary spread throughout Bahamas and Antilles noted from 1960 to 1965’. While perhaps in part true, it is also possible that northern South America was the source of Barbados immigrants at that time and since.

**Specimens** USNM

**Brant***Branta bernicla*  
(Linnaeus 1758)**V**

Brant Goose, Brent

**World** Holarctic, with High Arctic breeding populations in Canada, Greenland, Svalbard, Franz Josef Land and Russia; winters S to Baja California, Florida, southern France, China and Korea; individuals from all populations wander widely.

**West Indies** Vagrant to Yucatan, Puerto Rico and Barbados.

**Barbados** One record (Feilden 1889a): 'My authority is Mr. J.P. Massiah, who shot the bird in question at Chancery Lane on November 15<sup>th</sup>, 1876. His accurate description leaves no doubt in my mind that the bird was of this species. During an experience of over 30 years, Mr. Massiah has never seen but this one wild goose in Barbados, nor could I hear from any other source of wild geese having been seen or obtained, except in this single instance'.

**Comments** The world's brant (= brent) had long been treated as two species (Brant and Black Brant) before being lumped. Now many Europeans have re-split them into Pale-bellied Brent *B. hrota*, Dark-bellied Brent *B. bernicla* and Black Brant *B. nigricans*; on Barbados, only *hrota* is likely. Feilden was a careful British naturalist who knew brant-brent well personally and who had high standards for admission of any species to his Barbados list; Clark (1905) agreed with Feilden's assessment. Unlike some other early and vague waterfowl reports from Barbados (Canada Goose, Mallard, American Black Duck, Common Goldeneye) and even though a second-hand report, the source and details of this appropriately saltwater record weigh heavily in its favour. In addition mid-Nov is precisely when southbound brant wander, overshoot or join other waterfowl flocks. That this still occurs is affirmed by the *hrota* on Tenerife in Canaries 24 Jan-14 Mar 1992 (T. Clarke, pers comm).

**Orinoco Goose***Neochen jubata*  
(Spix 1825)**V**

**World** Widespread but local in riverine systems in South America E of Andes from Venezuela and Guianas S to Bolivia, Paraguay and Argentina.

**West Indies** Vagrant to Barbados and Jamaica; unrecorded on Trinidad & Tobago or Netherlands Antilles.

**Barbados** One record: 2 pairs (or 2 adults and 2 flying young) Long Pond 19 Mar 1995 (HA, EBM). This group wandered about Barbados in diminishing numbers over next 10 days: 3 Northumberland 25 Mar (MDF, ChB), and 2 Coles 29 Mar (MDF).

**Comments** Identifiable photographs were examined of this sole modern record for West Indies. Presumably from the Orinoco Delta 450 km SSW of Barbados, their arrival coincided with the unusual combination of a southwesterly jetstream and full moon tidal flooding at the same time as Andean thawing and subsequent swelling of the Orinoco River. In spring Orinoco floodwaters extending many miles N may carry floating vegetation long distances, and this phenomenon is accepted by herpetologists as explanation for several odd Lesser Antillean distributions (Hedges 2001). Interestingly, fossil bones of a possibly endemic *Neochen* were found on Barbados in the 1960s (page 56).

**Wood Duck***Aix sponsa*  
(Linnaeus 1758)**IB**

**World** Breeds across North America from southern Canada S to California, Florida and Cuba; winters throughout more southerly portions of breeding range, extending beyond them erratically.

**West Indies** Breeds in Cuba; vagrant to Hispaniola (ringed in Wisconsin), Caymans, Puerto Rico, Saba (ringed in Quebec); introduced to Caymans and Barbados, perhaps elsewhere.

**Barbados** Introduced, but may occasionally occur naturally as unsubstantiated rumours persist of wild individuals shot at hunting-club impoundments and the species has reached Azores.

**Breeding** 4–6 pairs released 1999–2000 at Royal Westmoreland where they may still be breeding although few young appear to survive (population c15 in 2004). One paired with a White-cheeked Pintail produced several hybrid young, the last of which was not seen after 2004.

**Eurasian Wigeon***Anas penelope*  
Linnaeus 1758**V**

**World** Breeds from Iceland E to Siberia and S across northern Europe to Transcaucasia; withdraws slightly from northern parts of range in winter when moves S to northern and eastern Africa and E to China and Philippines; regular in North America and conceivably breeds in Canadian Arctic.

**West Indies** Bermuda, Bahamas, Hispaniola, Puerto Rico, Barbuda (ringed in Iceland), Barbados, Grenada and Venezuela.

**Barbados** Vagrant, 7 records: female shot (BDSM) Lisbon Vale 9 Oct 1935 (Anderson 1935); 3 shot Graeme Hall Swamp 22 Dec 1943–9 Jan 1944 (identified by JRP); 1st-CY male East Point–Coles 4 Dec 1994 (arrived with Common Black-headed and Great Black-backed Gulls during period of strong NE trade winds) to 18 Mar 1995 (MDF, EBM, EJA), joined by female 27 Jan–9 Mar 1995 (MDF); female Alaska 2–30 Nov 1997 (MDF, EBM *et al*); male, female East Point 23 Nov 2003, and 3 females 21 Dec 2003–21 Jan 2004 (EBM, RWB, MDF).

**Comments** Most probably originate in Eurafrika, not North America.

**Specimen** BDSM

**American Wigeon***Anas americana*  
Gmelin 1789**WV**

Baldpate, White-belly

**World** Breeds from Alaska E across Canada to Nova Scotia and S to British Columbia and California and E to central Atlantic coast; retreats S in winter, reaching Panama, Colombia, Venezuela, Trinidad & Tobago and Suriname.

**West Indies** Erratically local winter distribution: most regular on Cuba, becoming increasingly less common southeastward in Greater and Lesser Antilles. 5 St Lucia records.

**Barbados** Although hunters claimed to have shot species previously, no confirmed reports until mid-1950s when large flocks (exceptionally to 40) appeared, a phenomenon still

unduplicated (Hutt MS.). Uncommon southbound migrant and winter visitor, especially at hunting-club impoundments, not recorded every year. Occurs in small parties (<6) on freshwater ponds, mainly in Nov and departing by late Dec. Overwintering first noted in 1992-93; 1-5 overwintered 7 times from 1992-93 to 2003-04, remaining until Mar. Infrequent Mar-Apr northbound migrant. Extreme dates 31 Aug-3 Apr.

**Mallard**

*Anas platyrhynchos*  
Linnaeus 1758

**IB**

**World** Breeds from Greenland E to Siberia and S from Mediterranean E to Japan; in North America from Alaska E to Maine and S from Baja California E at least to Virginia; winters over breeding range, but also southward in North America to Mexico and Florida; wanders widely.

**West Indies** Introduced on many islands but also infrequent in winter in Bahamas and Cuba and Jamaica. Vagrant to Hispaniola (ringed in New Brunswick), Puerto Rico, Virgin Islands, St Martin, Antigua, Guadeloupe, Dominica, St Vincent, Grenadines and Grenada (some records >100 years old) plus Bonaire; uncertainly recorded in Venezuela and on Trinidad & Tobago. Unrecorded and never introduced on St Lucia.

**Barbados** Only unacceptable reports (Hughes 1750, Plowden-Wardlaw 1954) before its introduction, despite hunters' claims to have shot Mallards before the 1950s. Apparently introduced in unknown numbers in mid-1980s on private ponds, where phenotypically faulty individuals have been pairing with feral-domestic Muscovy Ducks, but no breeding or population data available.

**Comments** Nominate *platyrhynchos* is nearly global in distribution.

**Blue-winged Teal**

*Anas discors*  
Linnaeus 1766

**WV**

Teal

**World** Breeds from Alaska E across Canada to Newfoundland and S from California E to Texas and North Carolina; winters from California E to North Carolina, thence S through Central America to Peru, Argentina and Brazil, plus West Indies.

**West Indies** Most frequent and numerous dabbling duck in migration and winter, known from all or nearly all islands including St Lucia; alleged breeding in Jan on Grenada (Wells 1887).

**Barbados** First noted by Schomburgk (1848). Most common wild duck, regular and numerous southbound migrant and winter visitor from late Sep (sometimes late Aug) through Nov, most later migrants presumably overwintering. Winter occurrences infrequent and in low numbers from mid-1950s to early 1990s, when they began to increase; numbers fluctuate annually depending on local pond water levels. Since 1993 bulk of overwinterers at East Point (70-300) with much smaller numbers elsewhere. CBC maximum: 232, Dec 1998. Most overwinterers depart *en masse* mid-Mar-mid-Apr. Northbound passage slight and less discernible in recent years with increasing winter residents; some pre-breeders remain to Jun.

**Comments** 104 recoveries from Barbados had been ringed in central and eastern United States and Canada. Same-year captures ranged from 12 to 93 days.

**Specimens** BDSM, CUM, YPM

# APPENDIX 1

Scientific names of birds mentioned only in Tables or Appendices.

English name	Scientific name
Comb Duck	<i>Sarkidiornis melanotos</i>
Gadwall	<i>Anas strepera</i>
Red-breasted Merganser	<i>Mergus serrator</i>
Wood Stork	<i>Mycteria americana</i>
Roseate Spoonbill	<i>Ajaia ajaja</i>
Squacco Heron	<i>Ardeola ralloides</i>
Yellow-billed Egret	<i>Egretta intermedia</i>
Reddish Egret	<i>Egretta rufescens</i>
American White Pelican	<i>Pelecanus occidentalis</i>
Neotropic Cormorant	<i>Phalacrocorax brasilianus</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Yellow-headed Caracara	<i>Milvago chimachima</i>
White-tailed Kite	<i>Elanus leucurus</i>
Plumbeous Kite	<i>Ictinia plumbea</i>
Common Black Hawk	<i>Buteogallus anthracinus</i>
Marsh Sandpiper	<i>Tringa stagnatalis</i>
Green Sandpiper	<i>Tringa ochropus</i>
Red-necked Stint	<i>Calidris ruficollis</i>
Temminck's Stint	<i>Calidris temminckii</i>
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>
Audouin's Gull	<i>Larus audouinii</i>
Sabine's Gull	<i>Xema sabini</i>
Large-billed Tern	<i>Phaetusa simplex</i>
European Turtle Dove	<i>Streptopelia turtur</i>
Mourning Dove	<i>Zenaida macroura</i>
White-winged Dove	<i>Zenaida asiatica</i>
Caribbean Dove	<i>Leptotila jamaicensis</i>
Cuban Amazon	<i>Amazona leucocephala</i>
St Lucia Amazon	<i>Amazona versicolor</i>
Burrowing Owl	<i>Athene cucularia</i>
Rufous Nightjar	<i>Caprimulgus rufus</i>
Pallid Swift	<i>Apus pallidus</i>
West Indian Woodpecker	<i>Melanerpes superciliiaris</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
Northern Flicker	<i>Colaptes auratus</i>
Eastern Phoebe	<i>Sayornis phoebe</i>
St Lucia Pewee	<i>Contopus oberi</i>
Streaked Flycatcher	<i>Myiodynastes maculatus</i>
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Loggerhead Kingbird	<i>Tyrannus caudifasciatus</i>
Swainson's Flycatcher	<i>Myiarchus swainsoni</i>
Grenada Flycatcher	<i>Myiarchus nugator</i>
La Sagra's Flycatcher	<i>Myiarchus sagrae</i>
Lesser Antillean Flycatcher	<i>Myiarchus oberi</i>
White-eyed Vireo	<i>Vireo griseus</i>
Thick-billed Vireo	<i>Vireo crassirostris</i>
Philadelphia Vireo	<i>Vireo philadelphicus</i>
Yucatan Vireo	<i>Vireo magister</i>
Cedar Waxwing	<i>Bombycilla cedrorum</i>
Red-rumped Swallow	<i>Cecropis daurica</i>

## APPENDIX 5

Non-pelagic water- (upper) and land-bird (lower) migrants on Barbados, St Lucia and the Caymans. Original Cayman (Bradley 2000) and St Lucia (Keith 1997) data re-categorised for conformity with Barbados data.

Caymans ( <i>n</i> = 50)	St Lucia ( <i>n</i> = 24)	Barbados ( <i>n</i> = 49)
Grey Plover	Grey Plover	American Golden Plover
Semipalmated Plover	Semipalmated Plover	Grey Plover
Wilson's Snipe	Wilson's Snipe	Semipalmated Plover
Short-billed Dowitcher	Short-billed Dowitcher	Killdeer
Upland Sandpiper	Hudsonian Curlew	Wilson's Snipe
Greater Yellowlegs	Greater Yellowlegs	Short-billed Dowitcher
Lesser Yellowlegs	Lesser Yellowlegs	Hudsonian Godwit
Solitary Sandpiper	Solitary Sandpiper	Eskimo Curlew
Western Willet	Eastern Willet	Hudsonian Curlew
Ruddy Turnstone	Spotted Sandpiper	Upland Sandpiper
Sanderling	Ruddy Turnstone	Greater Yellowlegs
Semipalmated Sandpiper	Sanderling	Lesser Yellowlegs
Western Sandpiper	Semipalmated Sandpiper	Eastern Willet
Least Sandpiper	Western Sandpiper	Western Willet
White-rumped Sandpiper	Least Sandpiper	Ruddy Turnstone
Pectoral Sandpiper	White-rumped Sandpiper	Red Knot
Stilt Sandpiper	Pectoral Sandpiper	Sanderling
American Black Tern	Common Tern	Semipalmated Sandpiper
		Western Sandpiper
American Kestrel	Peregrine Falcon	Least Sandpiper
Merlin	American Black Swift	White-rumped Sandpiper
Peregrine Falcon	Belted Kingfisher	Pectoral Sandpiper
American Harrier	Barn Swallow	Stilt Sandpiper
Yellow-billed Cuckoo	American Redstart	Buff-breasted Sandpiper
Chimney Swift	Northern Waterthrush	Ruff
Eastern Kingbird		Wilson's Phalarope
White-eyed Vireo		Gull-billed Tern
Red-eyed Vireo		Common Tern
Sand Martin		Roseate Tern
Purple Martin		Least Tern
No. Rough-winged Swallow		American Black Tern
Barn Swallow		
American Cliff Swallow		Merlin
Swainson's Thrush		Peregrine Falcon
Tennessee Warbler		Yellow-billed Cuckoo
Chestnut-sided Warbler		Common Nighthawk
American Yellow Warbler		Red-eyed Vireo
Blackpoll Warbler		Sand Martin
Bay-breasted Warbler		Barn Swallow
Blackburnian Warbler		American Cliff Swallow
Magnolia Warbler		Northern Parula
Louisiana Waterthrush		American Yellow Warbler
Kentucky Warbler		Myrtle Warbler
Baltimore Oriole		Blackpoll Warbler
Bobolink		Black-and-white Warbler
Grasshopper Sparrow		American Redstart
Summer Tanager		Prothonotary Warbler
Scarlet Tanager		Northern Waterthrush

# APPENDIX 14

Regional first occurrences from Barbados.

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## Western Hemisphere ( $n = 11$ )

Garganey	Common Black-headed Gull
Little Bittern	Whiskered Tern
Little Egret	Common Cuckoo ( <i>canorus/bangsi</i> )
Western Reef Heron	Alpine Swift
Ruff	House Crow
Collared Pratincole	

## AOU Check-list Area ( $n = 14$ )

Garganey	Common Black-headed Gull
Little Bittern	Whiskered Tern
Purple Heron	Eurasian Black Tern
Little Egret	Common Cuckoo
Western Reef Heron	Alpine Swift
Ruff	House Crow
Collared Pratincole	Yellow-hooded Blackbird

## West Indies ( $n = 39$ )

Brant	Ruff
Garganey	Collared Pratincole
Eurasian Teal	Wilson's Phalarope
Little Bittern	Kelp Gull
Purple Heron	Common Black-headed Gull
Little Egret	Little Gull
Western Reef Heron	Whiskered Tern
Northern Lapwing	White-winged Tern
Southern Lapwing	Eurasian Black Tern
Pacific Golden Plover	Common Cuckoo
Common Ringed Plover	Alpine Swift
Jack Snipe	House Crow
Long-billed Dowitcher	Common House Martin
Whimbrel	Southern House Wren
Spotted Redshank	Northern Wheatear
Common Greenshank	White Wagtail
Wood Sandpiper	Yellow-hooded Blackbird
Terek Sandpiper	Giant Cowbird
Little Stint	Grassland Yellow Finch
Curlew Sandpiper	

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