

HISTORY OF ORNITHOLOGY IN THE CARIBBEAN

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Resumen. – **Historia de la ornitología en el Caribe.** – El Caribe es un archipiélago de múltiples naciones, idiomas y culturas. Sus territorios se expanden en todo el mar Caribe, describiendo un arco desde el sur de Estados Unidos y Cuba, en el noroeste, en dirección oriental a través de las Antillas Mayores hacia las Menores, y desde las Islas Vírgenes y Antigua-Barbuda hacia el sur, hasta la costa de Sudamérica. La historia de la ornitología en el Caribe es, por tanto, tan variada como sus islas, naciones, habitantes e idiomas. Este artículo revisa la historia de la ornitología desde épocas precolombinas, hacia los primeros asentamientos europeos, la época colonial y los años modernos de independencias políticas, hasta el siglo XXI. La historia está dominada por colecciones, descripciones de las avifaunas y trabajo de campo de ornitólogos europeos y norteamericanos, con la notable excepción de Cuba. Puerto Rico además sobresale por su cercana relación con los Estados Unidos. Proveo ejemplos de trabajos hechos por residentes caribeños cuando es factible aunque, debido a la ausencia de grandes instituciones de investigación, limitaciones de entrenamiento en ciencias biológicas y escasa experiencia práctica en el campo, otras islas del Caribe poseen muy pocos ornitólogos locales. Los esfuerzos de conservación actuales sufrirán las consecuencias de estas deficiencias, a menos que se atiendan pronto.

Abstract. – The Caribbean is a multi-national, multi-lingual, and multi-cultural conglomerate of islands. The territories span the Caribbean Sea in an arc just south of the United States, from Cuba in the northwest, eastwards across the Greater Antilles to the Lesser Antilles, from the Virgin Islands and Antigua/Barbuda south to the coast of South America. The history of ornithology in the Caribbean is thus as varied as its islands, nations, peoples, and languages. This paper traces the history of ornithology across the ages from pre-Columbian days, through first European settlements and colonial days, to the modern age of political independence and into the twenty-first century. The history is mainly dominated by collections, avifauna descriptions and fieldwork by European and North American scientists, with the notable exception of Cuba. Puerto Rico stands out also due to its close connection with the United States. I provide examples of work by residents of the islands wherever possible, but due to the absence of strong research institutions, limitations of training in biological sciences, and no practical ecology experience, other islands in the Caribbean have few local ornithologists. Present-day efforts at conservation will suffer unless this is rectified. *Accepted 13 November 2007.*

Key words: Ornithology, history, Caribbean, Greater Antilles, Lesser Antilles.

INTRODUCTION

The land area of the Caribbean islands covers approximately 240,000 km², with a total of 115 islands not counting cays and rocky islets. This includes larger islands (the Greater Anti-

les including the Bahamas due to ornithological similarities), and a network of smaller islands and many offshore cays and islets forming a complex archipelago. For the purposes of this paper, the island chain is considered, omitting Trinidad and Tobago and the

Caribbean coast of Central and South America. In this paper I attempt to trace a history of the ornithology in the Caribbean islands from the time of the earliest inhabitants to the present, with an emphasis on contributions of residents to the region's ornithology. Knowledge about the Caribbean avifauna is still deficient because some islands in this complex region lack strong research and academic institutions while others, like Puerto Rico and particularly Cuba, have a long tradition of fieldwork and research. Reasons why ornithology in some territories has not developed as strongly as these two islands are suggested. However, with habitat destruction so common on all territories, conservation has become an imperative, so it is timely that studies of the avifauna and habitats should be of paramount importance.

PRE-1500: EARLIEST INHABITANTS

The earliest inhabitants of the Caribbean islands were Amerindians, such as the Taínos, Caribs, and Guana-Hatabey. Little is known about their customs, beliefs, and “world view,” but some artifacts provide information. Taíno objects often bear images of skulls, bats, and birds, and it is known that nocturnal species (birds and bats) represented the souls of the dead. Examination of fossil sites and caves provide evidence that Taíno food consisted of vegetables, frogs, turtles, iguanas, fish, and birds (“a number of pigeons, flightless birds, seabirds and shorebirds...”) (Wing 2001). Some animals were kept captive or became tame, and these could easily be transported in long-distance migrations, particularly from South America, but also from one island to another (Wing 2001). In comparison to other islands such as Cuba, Puerto Rico and Hispaniola, little archaeological work has taken place on Jamaica (Howard 1956); but one artifact discovered in about 1792 is an example of Taíno symbolism. The “Bird

Man” is thought to represent a “zemi,” probably a household deity. The figure is about 89 cm tall; it has the head of a long-billed bird and the body of a human male (Handler 1977). The closest likeness that can be attributed is that the bird was inspired by the Jamaican Crow (*Corvus jamaicensis*).

1500-1799: “DISCOVERY” AND COLONIZATION

The age of “discovery” and colonization covers from 1500 to the 1700s and accounts exist from explorers, missionaries and colonists. Among the first was only a summary from the four expeditions of Christopher Columbus, because the most detailed observations were lost in a shipwreck (Keith *et al.* 2003). Most data were anecdotal, until the report of Gonzalo Fernández de Oviedo y Valdez (1478-1557) who was appointed commander of the castle of Santo Domingo in 1535. He later returned to Spain and was appointed Historian of the Spanish Indies. The first part of his work on the history of the period spent in Spanish colonies appeared as *Historia General y Natural de las Indias Occidentales* (Oviedo y Valdez 1535). This work is probably the earliest – and among the better – treatment of the natural history of Hispaniola, with illustrations and excellent descriptions (Keith *et al.* 2003).

Early colonists often brought birds with them, or introduced other species later. During visits to Jamaica, John Taylor (1664-?) and Hans Sloane (1660-1753) both describe birds that are not native to the island of Jamaica. Taylor spent about two years and kept a record of his visit including descriptions of flora and fauna. Among the birds he mentions are introduced species such as turkeys (*Meleagris gallopavo*), “tame ducks of the Muscovy breed” (*Cairina moschata*) and “plenty of Guinea hens” (*Numida meleagris*); migrant species (mostly water birds): “shovelers” (*Anas*

clypeata) and “widgeon” (*A. americana*). However, he also described local species like Limpkin (*Aramus guarauna*; called ‘Cluckinghen’) and “multitudes of green parrots of a small size and of two sorts ...” and a “marcough [macaw] ... as big as an European pheasant cock.” Taylor also writes of parrots that “are brought to Jamaica and sold at reasonable prices”, such as African Gray Parrot (*Psittacus erithacus*) and Cuban Parrot (*Amazona leucocephala*) (Taylor c. 1686). This illustrates how non-native species were transported to or within the Caribbean. It is known that sailors sometimes carried parrots from one country to another (Sloane 1707–1725). The introduction of exotic species continued. Lady Nugent (1771?–1834), the American wife of the British Governor of the island, wrote during her return trip to England from Jamaica in 1805: “Alas! One of my most beautiful Curaçao birds died in the night ...” (Nugent 1966).

The Englishman Hans Sloane came to Jamaica as physician to the Governor in 1687–1688. In those years he traveled extensively, amassing and documenting a large collection of human artifacts, animals and, particularly, plants. Doubtless his scientific background aided the collection of valuable information. Results of his expedition were published in two volumes. His extensive collections served to form the basis of the British Museum. Sloane’s descriptions of birds in Jamaica provide a valuable record of species on the island at that time, believing as he did – and contrary to many scientists of the time – that detailed observation, recording and interpretation of natural phenomena was a legitimate study (Rice 2002).

This was a prolific period in the general history of ornithology as, while birds of the Caribbean were being discovered, the first edition of Linnaeus’ *Systema Naturae* was in preparation and later published (Linnaeus 1735). When the French colonized Haiti after

the Treaty of Ryswick in 1697, specimens and observations were sent to France, contributing to collections and to the illustrations of Buffon’s *Histoire Naturelle des Oiseaux* (Buffon 1770–1786).

1800–1849: ERA OF COLLECTING

In the first half of the XIX century the era of private collecting was in full swing. As the original inhabitants of the islands did not have a written language and were for the most part exterminated, Europeans, and later North Americans, compiled natural history information during visits to the islands for varying periods. Museums in metropolitan countries were recently established, and for a number of years collections remained the property of gentlemen and/or scientists until they were sold or donated to national institutions. Some of the information published was the work of naturalists who may or may not have made the collections themselves; on the other hand, others – not necessarily professional scientists – collected information and specimens during a tour of duty on the islands, either in the civil service or the military (e.g., Sloane). The nationality of collecting expeditions and collectors in the Caribbean was varied. As a result many of the type specimens of Caribbean birds are now found overseas, and not within the territory of origin.

Nicholas Aylward Vigors (1785–1840), an Irishman and first Secretary of the Zoological Society (UK), published a list of 45 species from Cuba (Vigors 1827). The information was based on a collection made by William Sharp Macleay, a British civil servant stationed in Habana from 1825 until 1836.

In 1810 André Pierre Ledru (1761–1825), a French naturalist, took part in an expedition from which he amassed a large collection of plants, insects and birds. Ledru’s work was the first detailed study of the birds of Puerto Rico

and the Virgin Islands (Ledru 1810). However, some of the species listed do not occur on the island (Wiley 2000).

Thirty years later, Philip Henry Gosse (1810–1888), English, decided to collect in the tropics settling on Jamaica where he remained for 18 months from December 1844 to 1846 (Thwaite 2002). Two publications resulted from his work on the island: *Birds of Jamaica* (Gosse 1847) and *A Naturalist's Sojourn in Jamaica* (Gosse 1851). Although most efforts at that time concentrated on collections of specimens, Gosse was unusual in recording stomach contents, habits, measurements and nesting.

1850–1899: FROM COLLECTING TO DESCRIPTION

A natural progression took place as collecting was followed by accounts with descriptive information. Charles Cory (1857–1921), founding member of the American Ornithologists' Union, made five trips to the Caribbean and also sent out collectors. Over many years, Cory published several papers on Caribbean birds and, in 1889, he published the *Birds of the West Indies*, with 555 species noted and 350 described in detail; he also recorded the presence of North American species in the region, and included a bibliography (Cory 1889).

The little known F. A. Ober (1849–1913), a travel writer, hunter, and naturalist from the US, collected in the Lesser Antilles for the Smithsonian Institution (Steadman *et al.* 1997). He collected 20 new species, including two named after him: Lesser Antillean Flycatcher (*Myiarchus oberi*) and Montserrat Oriole (*Icterus oberi*). Ober was one of the few ornithologists to visit St. Johns, Virgin Islands at this time, collecting 21 specimens, including the type of Caribbean Coot (*Fulica caribaea*) in 1880 (Robertson 1962).

During the 19th century, a few island resi-

dents also undertook collections and descriptions of birds. Because they were present year round, these pioneers provided the first data on the biology of many species, taking into account habitat, feeding and breeding. Among them was W. T. March (1795–1872), a Jamaican who collected specimens and corresponded with, among others, Spencer Baird of the Smithsonian Institution (Banks & Hole 1993). Baird published notes from his letters (e.g., March 1864). Although little is written about the role March played in Jamaica's ornithology, he appears to be among the first native naturalists of the Caribbean. Together with Richard Hill (1795–1872), who assisted P. H. Gosse (Gosse 1847, 1851), they contributed to early knowledge of the avifauna of the island, and March's notes were consulted by eminent authors such as David Lack, and are still valuable today. March's specimens are now found in various collections overseas, some of them mislabeled as "W. (T.) Marsh" or "W. W. Marsh" (Banks & Hole 1993).

Juan Gundlach (1810–1879) came to Cuba in 1839 from Marburg, Germany and, except for brief visits to Puerto Rico, he remained in Cuba for the rest of his life. He published species lists in 1846 (207 species), and 1850 (222), and brought the count up to 263 species in the first major work on the birds of Cuba (Gundlach 1893). He also contributed papers on other aspects of natural history of the island (e.g., Gundlach 1877). Birds named after him include Cuban Vireo (*Vireo gundlachi*) and Bahama Mockingbird (*Mimus gundlachi*). He also published on the birds and mammals of Puerto Rico (Gundlach 1878). Most of the specimens collected by Gundlach remained in Cuba and were not dispersed to overseas institutions, helping to establish in Cuba a first class collection for study and comparison (Wiley *et al.* in press).

Juan Lembeye (1816–1889), a Spanish naturalist, produced *Aves de la Isla de Cuba*

(Lembeye 1850). He lived in Cuba from the 1830s to the 1860s and discovered the Cuban Solitaire (*Myadestes elisabeth*) and Yellow-headed Warbler (*Teretistris fernandinae*); he is also honoured in the Cuban Gnatcatcher (*Poliioptila lembeyei*).

At this time, few islands had institutions devoted to the study of natural history, so most collectors shipped specimens back to their country and institution of origin. Currently, the Field Museum of Natural History, Chicago, holds over 15,000 specimens of Caribbean bird species, including over 3000 from Bahamas; 2911 from Dominican Republic, and the majority of Cory's collections. Meanwhile the Museum of Zoology at Cambridge University has about 1500 Caribbean specimens (e.g., 760 from Jamaica, 153 from Dominica, 120 from Barbados, 103 from Bahamas; mostly from the Strickland Collection and Alfred Newton).

Cuba is an exception as in 1839 the Cuban zoologist Felipe Poey y Aloy (1799–1891) founded the “Museo de Historia Natural” and, with Fernández de Castro, assisted in the creation of the first Academy of Science (natural, physical and medical) in 1861. Nearly half of the specimens collected in Cuba have remained there, particularly those of Juan Gundlach. The Instituto de Ecología y Sistemática, Academia de Ciencias de Cuba currently holds 3200 bird specimens, of which 63 are type specimens.

Several Englishmen, including Gosse, and later Alfred Newton (1829–1907) of Cambridge University, were prominent collectors primarily in the British colonies of the Caribbean. Newton collected on a number of the islands (Jamaica, Hispaniola, Cuba, Virgin Islands, Lesser Antilles) and requested William Nock to collect specimens of the Jamaican Petrel (*Pterodroma caribbaea*) in the Blue Mountains of Jamaica. Nock, from the Royal Botanic Gardens at Kew, in Britain, visited Jamaica in 1874 and was assigned to Cinchona

Botanical Gardens on a ridge at a height of 1374–1676 m a.s.l. (Eyre 1966). In 1879 he collected 22 specimens, the last birds collected in the wild (Imber 1991).

An incident of note during this period was the introduction in 1872 of the invasive indian mongoose (*Herpestes javanicus*) into Jamaica to control rodents and snakes (Scott 1903). From the original nine brought into Jamaica, some offspring were sent to other islands in the Caribbean. Before 20 years had passed, concern was being expressed about the effect of this animal in Jamaica. A committee was set up in 1890 by the Governor, Sir Henry Blake “to enquire fully, whether the mongoose is destructive of poultry, game and other useful creatures, and whether it is expedient that measures be taken to reduce the number of the mongoose...” (Anonymous 1891). At this enquiry Mr. Herbert T. Thomas, Inspector of Constabulary for the parish of St. Thomas, declared “I am informed that they have extinguished the Booby duck” (i.e., Jamaican Petrel). In an insightful conclusion, the report suggested, “that a law should be passed prohibiting the introduction and turning loose of any animal which might, as in the case of the mongoose, become a scourge to the country, and so disturb the equilibrium of nature” This comment predates Wetmore's remarks (1927) regarding the introduction of exotic birds in Puerto Rico (Wiley 1996).

W. E. D. Scott (1852-1910) visited Jamaica from November 1890 to March 1891 and he spent most of his time in the parish of Portland (Scott 1903). His copious notes on over 180 species included food items and nesting seasons, a result of prompt preparation of the specimens collected. Of particular interest is his reflections on species described or listed by others but not found by him, comments on apparent depredation by the mongoose, and an account of a fruitless search for the Jamaican Petrel (Scott 1891).

1900–1939: FIELD EXPLORATIONS

Field explorations took prominence from 1900 onwards. Thomas Barbour (1884–1946) of Harvard University took a particular interest in Cuba, where he collected many specimens with the assistance of Fermín Zanón Cervera (1880–1945), Spanish, a well known hunter. The Zapata Wren (*Ferminia cerverai*) bears both his names. In Barbour (1943), two local scientists are mentioned, Brother León and Dr. Carlos de la Torre, who were training students in natural history studies. Of interest are remarks about Cuba’s “participation in a convention for nature protection throughout the Americas and the establishment of reserves for the preservation of the fauna and flora”.

Alexander Wetmore (1886–1978) visited Puerto Rico for nine months between 1911–1912, and within four years published *The Birds of Porto Rico* (Wetmore 1916). An expanded version, which included the Virgin Islands, contained valuable observations and became part of the 1919–1940 Scientific Survey of Puerto Rico (Wetmore 1927). He also studied the avifauna of Hispaniola and published, with B. H. Swales (1879–1928), a landmark book on the birds of Haiti and the Dominican Republic (Wetmore & Swales 1931). Hispaniola provided much fossil remains of birds for study when, in 1925, the mammalogist Gerrit Miller, Jr. (1869–1956) commenced investigations in middens and caves that were being explored. Wetmore was the first to undertake a study of avian paleontology of the islands, becoming an authority on the extinct Pleistocene birds of the Caribbean. He also did extensive work in systematics.

Puerto Rico became an unincorporated territory of the United States in 1917. The growth of institutions of biological investigation was enhanced by the creation in 1939 of the Institute of Tropical Forestry, later to

become the International Institute of Tropical Forestry. Stuart Danforth (1900–1938) lived in Puerto Rico for 16 years, where his father was professor of biology at the College of Agriculture at Mayaguez. Later he continued fieldwork with an emphasis on ornithology, and also undertook research on other islands of the Caribbean. His legacy includes the *Los Pájaros de Puerto Rico* (Danforth 1936), the first popular work on birds in Spanish (Allen 1939). He also spent a summer on Jamaica and listed 88 species, with brief notes on distribution, behavior and some stomach contents (Danforth 1926).

One of the best-known authors within the Caribbean, James Bond (1900–1989), made his first of many trips to the islands in 1927 to study the birds of Haiti, and later the Dominican Republic. The first edition of his *Birds of the West Indies* was published in 1936, which included descriptions of habitat, nesting and song (Bond 1936). Though not written as a field guide (Parkes 1989), the book soon became the main reference for anyone interested in birding or ornithology of the region. Before this publication, knowledge about the birds of the Caribbean was the special interest of naturalists and ornithologists, too few of them native to the islands. His *Checklist of the Birds of the West Indies* first appeared in 1940, with supplements and later editions reflecting a growing knowledge and analysis of the zoogeography of the Caribbean avifauna (Bond 1940).

1940–1969: GROWTH OF LOCAL INTEREST

As political awareness and cohesion grew among the residents of the islands, consciousness of the natural world began to stir. Towards the late 1950s, urbanization, population growth and natural resources exploitation experienced a dramatic increase. As a result, the landscape was reshaped quickly.

The 1940s to 1960s witnessed the genesis of local interest in natural history in some territories, as evidenced by the formation in 1940 of the Natural History Society of Jamaica at the Natural History Division of the Institute of Jamaica (Levy 1996), with many local bird observations and articles published (e.g., Natural History Society of Jamaica 1940–55). In 1945, the Wildlife Protection Act was promulgated to address hunting and fishing concerns.

Informal meetings of a group of bird enthusiasts in the mid-1950s culminated in the formation of the Gosse Bird Club of Jamaica in 1963, which published the *Broadsheet*, and today, 47 years later, it still exists. Over a number of years, Lisa Salmon (1904–2000) wrote extensively on nature for local newspapers, describing bird behavior and commenting on conservation issues. She became the ‘doyenne’ of local birders and the earliest local conservationist (Gosse Bird Club 2000). In 1989 she was honored by the Society of Caribbean Ornithology.

Bird banding was undertaken by Charles Henry Blake (1901–1981) in Jamaica between 1953 and 1956; subsequently, in 1975, a permit from the U.S. Fish and Wildlife Service was granted to the Gosse Bird Club to band migrant birds, with Robert Sutton (1943–2002) name as Master Bander (Levy 1989). Unfortunately, the banding program did not expand and was sporadic with few studies or results ever published.

The University of the West Indies initiated courses in Jamaica in 1948 and commenced teaching zoology, with little emphasis on studies of native species, and no permanent terrestrial research station to date.

Virgilio Biaggi (b. 1913) accompanied Danforth in his fieldwork and became author of many papers from the 1950s, including his *Las Aves de Puerto Rico*, with sections on the history of Puerto Rican ornithology, migra-

tion and wildlife conservation that appeared in 1970 (Bond 1971).

There was a strong development in universities in Puerto Rico that encouraged studies in natural sciences. Graduates of these universities remained in, or returned to, the island and further enhanced the development of ornithology. The *Caribbean Journal of Science* began publication in 1961.

A new arrival in the Dominican Republic in 1964 was Annabelle Dod who studied and helped to popularize resident bird species with the book *Aves de la República Dominicana* (Dod 1978). Her efforts stimulated research on several species, though researchers came mainly from metropolitan countries, except David Wingate from the Bahamas, who studied Black-capped Petrels (*Pterodroma hasitata*) (Latta *et al.* 2006).

In the 1960s concerns grew about forest and natural habitat loss in the Caribbean. The Breeding Bird Survey was initiated in 1966 to monitor the populations of North American migrants. This had the effect of stimulating project funds being made available for the study of North American winter migrants in the Caribbean.

1970–1989: GROWTH OF THE CARIBBEAN MOVEMENT

After a quiet period in the 1940s–1950s, work in Puerto Rico accelerated from the late 1960s onward, with new field studies and remarkable findings, as the discovery of a new species, the Elfin-woods Warbler (*Dendroica angelae*) (Wiley 1996).

Although alarm had been raised about the status of the Puerto Rican Parrot (*Amazona vittata vittata*) as early as the late 1940s, a detailed study was carried out beginning in 1953 by José A. Rodríguez-Vidal (Rodríguez-Vidal 1959). In 1968 a parrot conservation program was set up, focusing on survival of the wild populations, and studies on the spe-

cies biology (Snyder *et al.* 1987). This program continues to make progress today. Many research projects have been undertaken by North American researchers in Puerto Rico, including a long-term bird banding study in the Guanica Forest (Faaborg & Winters 1980). To date, research has been copious in Puerto Rico, notably by Herbert Raffaele, David Belitsky, James Wiley, Raúl Pérez-Rivera and Frank Rivera-Milan (Wiley 1996). In 1983, Raffaele published the first edition of *A Guide to the Birds of Puerto Rico and the Virgin Islands*, with a revised edition in 1989 (Raffaele 1989). The influence of the U.S. Fish and Wildlife Service and cooperation with the Departamento de Recursos Naturales de Puerto Rico has been important in the development of ornithology at this island. Nevertheless, as Wiley (1996) notes, basic information of preferred habitat, feeding ecology, and breeding biology on most species is still lacking.

In the late 1970s the Ornithological Society of Puerto Rico was formed due to the leadership and energy of Jorge Moreno. His continued efforts resulted in the first meeting of the Society for the Conservation and Study of Caribbean Birds (formerly Society of Caribbean Ornithology) in 1987. The Society's publication *El Pitirre* (now *Journal of Caribbean Ornithology*) commenced in 1988.

In the mid-1970s, a conservation program for the St. Lucia Parrot (*Amazona versicolor*) began, as it was found that its wild population numbered about 100 birds. The Jersey Wildlife Preservation Trust (UK) and the local Department of Forestry combined to try to increase awareness about the species status and threats (led by Paul Butler and the late Gabriel Charles). The campaign involved government and private sector participants, as well as education and public awareness. The parrot was declared the National Bird in 1979 and legislation was updated to protect this and other species as well as for wildlife habi-

tats. Recent figures indicate that population numbers range from 250–300 individuals. This successful campaign became a model for other projects on some Caribbean islands, including St. Vincent, Dominica, the Bahamas and Jamaica.

David Lack undertook field explorations of land birds in Jamaica, examining the biogeography of the avifauna, which resulted in the landmark book *Island Biology* (Lack 1976). Also, Alexander Cruz studied the Jamaican Woodpecker (*Melanerpes radiolatus*) (Cruz 1977). Thirty years after the first book on Jamaican birds authored by a Jamaican had appeared (Jeffrey-Smith 1956), Audrey Downer and Robert Sutton published a new guide (Downer & Sutton 1990).

In the winter of 1986–1987, cooperation began between Bird Studies Canada and Cuban ornithologists to study migrant birds. Other ornithologists such as Orlando Garrido, Arturo Kirkconnel, and Professor Orlando Torres (University of Habana) carry on the strong scientific and ornithological tradition of Cuba. Garrido is remarkably one of the most prolific Caribbean authors working in a range of topics including taxonomy, biogeography, and natural history (Wiley 2000).

1990–2000s: CONSERVATION

In the 1990s and into the new millennium, fieldwork engaged more local persons. For instance, in Jamaica, a study of the breeding biology of the Black-billed Parrot (*Amazona agilis*) was done by Susan Koenig using a number of residents as assistants (Koenig 1999); and research staff of the International Institute of Tropical Forestry visited the Dominican Republic and worked mainly on migrant species, using local assistants as much as possible (Latta & Wunderle 1996).

The real successor to Bond's *Birds of the*

West Indies was published in 1998, a fully illustrated guide. The book contains the most up to date information on distribution of birds in the West Indies (omitting Trinidad and Tobago) (Raffaele *et al.* 1998). A smaller field guide based on the 1998 work was issued in 2003, with basic information for identification along with the illustrations from the larger edition (Raffaele *et al.* 2003). Updated field guides specific to particular islands are now available for Cuba (Garrido & Kirkconnell 2000), Lesser Antilles (Bénito-Espinal & Hautcastel 2005), the Bahamas and Turks and Caicos (Hallett 2006), Hispaniola (Keith *et al.* 2004, Latta *et al.* 2006), Dominica (James *et al.* 2005), the Cayman Islands (Bradley 2000), and Haiti (Sergile 2006). All these guides make information on native avifauna more readily available for residents.

The Society for the Conservation and Study of Caribbean Birds has fostered participation of islanders and helped develop ornithological and conservation skills. Due to the exchange of information and expertise, a number of projects have resulted from meetings of the Society where island biologists meet counterparts from North America and Europe, for example, the West Indian Whistling-Duck and Wetlands Conservation Project, and the annual Caribbean Endemic Bird Festival. Further, BirdLife International projects address conservation of birds at risk through the identification of Important Bird Areas on all of the Greater Antilles (D. Wege pers. com.).

Alarmed at the growing loss of biological diversity, many Caribbean countries signed the Convention on Biological Diversity (CBD) in 1992. Although ratification may not always be reflected in direct action by Caribbean governments, nor in their policies, it has influenced the work of international conservation organizations and brought cooperation with local government departments or non-government organizations.

THE FUTURE

Vuilleumier (2003), in his review of the historical and current state of Neotropical ornithology recognized the contribution of *El Pitirre*, published since 1987 by the Society for the Conservation and Study of Caribbean Birds (formerly the Society of Caribbean Ornithology), for Caribbean ornithology. Also, he stated that “ever larger numbers of ornithologists, especially younger ones, carry out research on Neotropical birds, and more of them than ever before are native to and resident in Latin America.” But, is this true of the Caribbean? Without strong academic preparation this is difficult to achieve. Further, without the assurance of a career that will maintain these young people, there is no certainty that those trained will not take jobs in other endeavours or in other countries. Today, the noticeable lack of native biologists on some islands is demonstrated in the number of research projects that are still carried out by overseas scientists. Can individual islands support specialist biologists? At present, there are severe limitations of training, little guidance in field studies, and almost no practical ecology experience. In territories with a limited economic base, non-government organizations find it difficult to survive. Smaller islands in the archipelago, such as the Lesser Antilles, suffer considerably the same syndrome, worsened by not having a research institute or university within the territory.

However, a few positive signs are emerging. The Sociedad Ornitológica de la Española (established in 2001) is the only Dominican institution whose members are fully trained and capable of conducting research on the local avifauna. La Société Audubon Haïti was established in 2003, named after Jean-Jacques Audubon (1785–1851) who was born in this island; it works mostly on education issues with some surveys included (S. Latta pers. com.).

It must be acknowledged though that without the research and publications of European and North American institutions and universities ornithology would still be in its infancy on many islands in the Caribbean.

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