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Important Bird Areas **AMERICAS**

NICARAGUA

Salvadora Morales, Jose Manuel Zolotoff, Mariamar Gutiérrez & Marvin Torrez

The restricted-range Nicaraguan Grackle (*Quiscalus nicaraguensis*) is found mainly around the shores of Lake Nicaragua and Lake Managua. The species defines the secondary area of Lake Nicaragua marshes (SA11).
Photo: Pomares Salmeron

Country facts at a glance

Area:	130,373 km^2
Population (2006):	5,142,098
Capital:	Managua
Altitude:	0–2107 m
Number of IBAs:	33
Total IBA area:	2,710,738 ha
IBA coverage of land area:	19%
Total number of birds:	703
Globally threatened birds:	7
Globally threatened birds in IBAs:	6
Country endemics:	0

General introduction

Nicaragua is located in the center of the Americas, between latitudes 10° and 15° 45' N and longitudes 79° 30' and 80° W. It has a total area of 130,373.47 km^2 and is bordered to the north by Honduras and to the south by Costa Rica. Nicaragua has coasts on the Caribbean to the east and on the Pacific Ocean to the west. The country is divided into 16 departments, 153 municipalities and two autonomous regional governments. Currently, the population of Nicaragua is slightly above 5 million people (MARENA 2007). The majority of the country's inhabitants are concentrated on the Pacific side of Nicaragua, followed by the central region of the country. Nicaragua's official language is Spanish although five indigenous ethnic groups inhabit the Caribbean regions (Miskito, Mayagna, Ramaki, Creollo and Garifuna; INEC 2006), each with their own language.

Nicaragua can be divided into three regions, Pacific, Central and Caribbean. Three geomorphological provinces are found in the former: Pacific coastal plains, Pacific volcanic cordillera and the Nicaraguan depression (MARENA 2007). Vegetation types in this region include dry, cloud and pine forests, mangroves and wetlands, including crater lakes as well as flooded freshwater and saltwater areas. The Central Highlands region is the highest part of the country, reaching a maximum elevation of 2107 m, and consisting of generally rugged terrain and mountainous landscapes, including plateaus, steep slopes, *serranias* and *cordilleras*. The largest tracts of cloud forest are found in this area, as well as some wet tropical forests and the southernmost limits of the American pine-oak forests. The headwaters of all rivers flowing into both the Pacific and the Caribbean have their sources in this region. The Caribbean coastal plains are made up of low-lying, rolling hills, alluvial plains, lakes and marshy wetlands. This region has the largest area of wet tropical forest in the country, as well as pine savannas, riparian forests and wetlands (MARENA 2007). Nicaragua has the largest forested area in Central America, sharing nearly all vegetation types with neighboring countries, as well as associated flora and fauna.

Volcán Maderas (NI012) is a dormant volcano on an island in Lake Nicaragua. The IBA holds six biome-restricted species.
Photo: Salvadora Morales

Conservation and protected area system

Protected areas are defined in Nicaragua as those areas whose "objective is conservation, rational management and restoration of flora, wild fauna and other forms of life" (Galindo *et al*. 2008). The Ministry of Environment and Natural Resources (MARENA) is the government entity responsible for managing the National Protected Areas System (SINAP, in Spanish). Nicaragua has a sound legal framework for conservation, with the most important laws being the General Law on Environment and Natural Resources (Law No. 217), the SINAP strategy and a co-management policy, among others. Since 1988, 72 nationally protected areas and 47 private wildlife reserves have been officially declared. At present, 19 protected areas have officially approved management plans and a further 27 are currently being approved. Twenty-three protected areas have some kind of infrastructure intended for the area's management, such as park warden lodgings and offices, trails, etc.

National protected areas represent 17% or 2,208,957 ha of the country's area. There are also 6868 ha in private wildlife reserves (MARENA 2007). At international level, two Biosphere Reserves have been designated in Nicaragua, Bosawas and Río San Juan reserves as well as eight Ramsar sites. Natural forest cover in Nicaragua in 2000 was 56,246 km^2 according to the Ministry of Agriculture, Livestock and Forestry (MAGFOR), representing 41% of the country's area, of which 17,587 km^2 are within protected areas (MARENA 2007).

Nicaragua is party to several international conventions, among them, the Convention on Biological Diversity, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ramsar Convention on Wetlands and the Convention for the Protection of Flora, Fauna and Natural Scenic Beauties of America.

The country does not have a bird conservation strategy covering threatened species or specific actions for their conservation. However, two instruments are used by relevant authorities for conservation purposes: the IUCN red list and the CITES appendices to identify species for which a closed season is implemented. Nevertheless, a formal mechanism to conserve globally threatened species does not exist, nor does a national red list of threatened species. Despite these shortfalls, birds are the most studied of all vertebrate groups in the country, and an organized group of national researchers exists, belonging to different NGOs, private reserves as well as the Universidad Nacional Autónoma de Nicaragua.

Several historical scientific expeditions have generated baseline information on bird presence and status, such as those led by Miller & Griscom in 1923 and Thomas Howell, who published a manuscript on the birds of Nicaragua in 1972 as a result of his field trips. The first comprehensive bird lists for Nicaragua used both the above publications as their basis. More recently, the first research and training activities in ornithology began in 1997, although the majority of research projects began after December 2002, when seven Monitoring Overwintering Survival (MoSI) stations were set up in different areas of the country. Despite these efforts, information regarding birds is still incipient in the country and very few publications exist. Recently, a national data base was established, compiling all bird data generated at MoSI stations, thanks to the joint collaboration of organizations such as Friends of the Earth, Fundación Cocibolca, FUNDAR, Fauna & Flora International, USAID and national researchers.

> "A national data base was recently established, compiling all bird data from MoSI stations."

Several threats to birds exist, the most serious being habitat loss due to deforestation and in some specific cases, commercial hunting (for export) or subsistence hunting (Martínez-Sánchez *et al*. 2001). Above all, this is due to a lack of real protection for key habitats. Other threats include loss of wetlands due to excessive use of water for agriculture, expansion of prawn farms, pollution of wetlands due to agricultural chemicals and a general lack of environmental awareness.

The river Coco forms the border between Nicaragua and Honduras.
Photo: Dan Griffith

Ornithological importance

Nicaragua has a total of 706 species (Martínez-Sánchez 2007), of which 20 are globally threatened or Near Threatened (BirdLife International 2007; Table 1), including three Endangered (EN), four Vulnerable (VU) and 13 Near Threatened (NT). In as little as the last six years, at least 39 new species have been added to the country list, and this is expected to grow as new information is received.

Table 1. Globally threatened and Near Threatened species in Nicaragua

Species	IUCN Red list category	No. of IBAs where species trigger A1 criterion
Crax rubra	NT	12
Ara ambiguus	EN	10
Procnias tricarunculatus	VU	7
Pharomachrus mocinno	NT	5
Morphnus guianensis	NT	4
Passerina ciris	NT	4
Penelopina nigra	VU	3
Vermivora chrysoptera	NT	3
Harpia harpyja	NT	2
Cyrtonyx ocellatus	NT	1
Electron carinatum	VU	1
Aphanotriccus capitalis	VU	1
Dendroica chrysoparia	EN	1
Pterodroma hasitata	EN	n/a
Charadrius melodus	NT	n/a
Tryngites subruficollis	NT	n/a
Sterna elegans	NT	n/a
Patagioenas leucocephala	NT	n/a
Contopus cooperi	NT	n/a
Vireo bellii	NT	n/a

Endemic Bird Areas (EBAs) are identified by assemblages of two or more restricted-range species (with ranges less than 50,000 km^2; see Methods). Three EBAs (of 78 in the Americas) are partly within Nicaragua as well as one Secondary Area. These are: North Central American Pacific slope (EBA 017), including species such as White-bellied Chachalaca (*Ortalis leucogastra*) and Blue-tailed Hummingbird (*Amazilia cyanura*), among others; North Central American highlands (EBA 018) for which there are six species in Nicaragua, including Bushy-crested Jay (*Cyanocorax melanocyaneus*), Ocellated Quail (*Cyrtonyx ocellatus*), Green-breasted Mountain-gem (*Lampornis sybillae*), Highland Guan (*Penelopina nigra*); and Central American Caribbean slope (EBA 019) which includes Tawny-chested Flycatcher (*Aphanotriccus capitalis*), Snowy Cotinga (*Carpodectes nitidus*), Streak-crowned Antvireo (*Dysithamnus striaticeps*), Nicaraguan Seed-finch (*Oryzoborus nuttingi*), Grey-headed Piprites (*Piprites griseiceps*), Black-throated Wren (*Thryothorus atrogularis*) and Lattice-tailed Trogon (*Trogon clathratus*). The secondary area, Lake Nicaragua marshes (SA11) was identified for Nicaraguan Grackle (*Quiscalus nicaraguensis*) and is located within microhabitats surrounding Lake Managua (or Xolotlán) and Lake Nicaragua (or Cocibolca; Zolotoff *et al*. 2006).

Emerald-chinned Hummingbird (*Abeillia abeillei*)
Photo: Georges Duriaux

Northern Royal Flycatcher (*Onychorhynchus mexicanus*)
Photo: Dan Griffith

At least 59 species of birds are restricted to biomes or zoogeographic regions in Nicaragua. According to Stotz *et al*. (1996), Latin America is divided into 22 biomes, of which three are in Nicaragua: Madrean highlands (MAH), Pacific arid slope (PAS) and Gulf-Caribbean slope (GCS).

According to a preliminary compilation of data by BirdLife International (2006), there are 210 species of migratory birds in Central America (62% of all migratory species in the Americas), of which 190 have been recorded in Nicaragua. Of these, 32 have both migratory and resident populations, 121 overwinter and 37 are considered as passage only (Morales *et al*. 2007). By region, 126 have been recorded from the Pacific, 112 in the north central region and 96 in the Caribbean. In the Pacific region, 22 migratory species are responsible for the majority of records, among which are Blue-winged Teal (*Anas discors*), Common Teal (*Anas crecca*), Lesser Scaup (*Aythya affinis*), Swainson's Thrush (*Catharus ustulatus*), Wood Thrush (*Hylocichla mustelina*) and Painted Bunting (*Passerina ciris*). Several of the species recorded in the north central region are exclusive to this region, among which are Golden-cheeked Warbler (*Dendroica chrysoparia*), Cape May Warbler (*Dendroica tigrina*) and Whip-poor-will (*Caprimulgus vociferus*). The Caribbean region has not been studied extensively and precise information is not available on the status of migratory species.

Yellow-naped Amazon (*Amazona auropalliata*)
Photo: Evan Bowen-Jones

The Near Threatened Golden-winged Warbler (*Vermivora chrysoptera*) is one of many migratory species passing through or overwintering in Nicaraguan IBAs.
Photo: Mariamar Gutiérrez

IBA overview

First efforts to identify Important Bird Areas in Nicaragua were part of an independent initiative by Fundación Cocibolca in 2001. This initiative allowed for the field evaluation of potential bird conservation areas. In 2006, a formal process of IBA identification was begun in collaboration with BirdLife International. Two workshops were held with ornithologists working in the country and different departments of the Ministry of Environment and Natural Resources.

A total of 33 Important Bird Areas have been identified and designated in Nicaragua (Table 2, Figure 1). Of these, 27 are part of the National System of Protected Areas, two are private nature reserves and four have no legal protection (NI007, NI028, NI030, NI032). Twenty-one IBAs meet criterion A1, covering five of the six globally threatened species in the country (Table 1). The only threatened species not represented in the IBA network is Black-capped Petrel (*Pterodroma hasitata*) as well as four Near Threatened species: White-crowned Pigeon (*Patagioenas leucocephala*), Elegant Tern (*Sterna elegans*), Buff-breasted Sandpiper (*Tryngites subruficollis*) and Bell's Vireo (*Vireo bellii*). Eighteen IBAs meet A2 and A3 criteria, although 10 restricted-range or biome-restricted species are not represented in any IBA. Three IBAs meet A4 criteria, these are: Laguna de Tisma (NI009), Archipiélago Solentiname (NI022) and Isla Booby Cay (NI031).

The majority of Nicaragua's ecosystems are represented in IBAs, wetlands are the least represented in the IBA network, especially those of the Caribbean region. Important areas for shorebirds were not included due to a lack of information.

Table 2. Important Bird Areas in Nicaragua

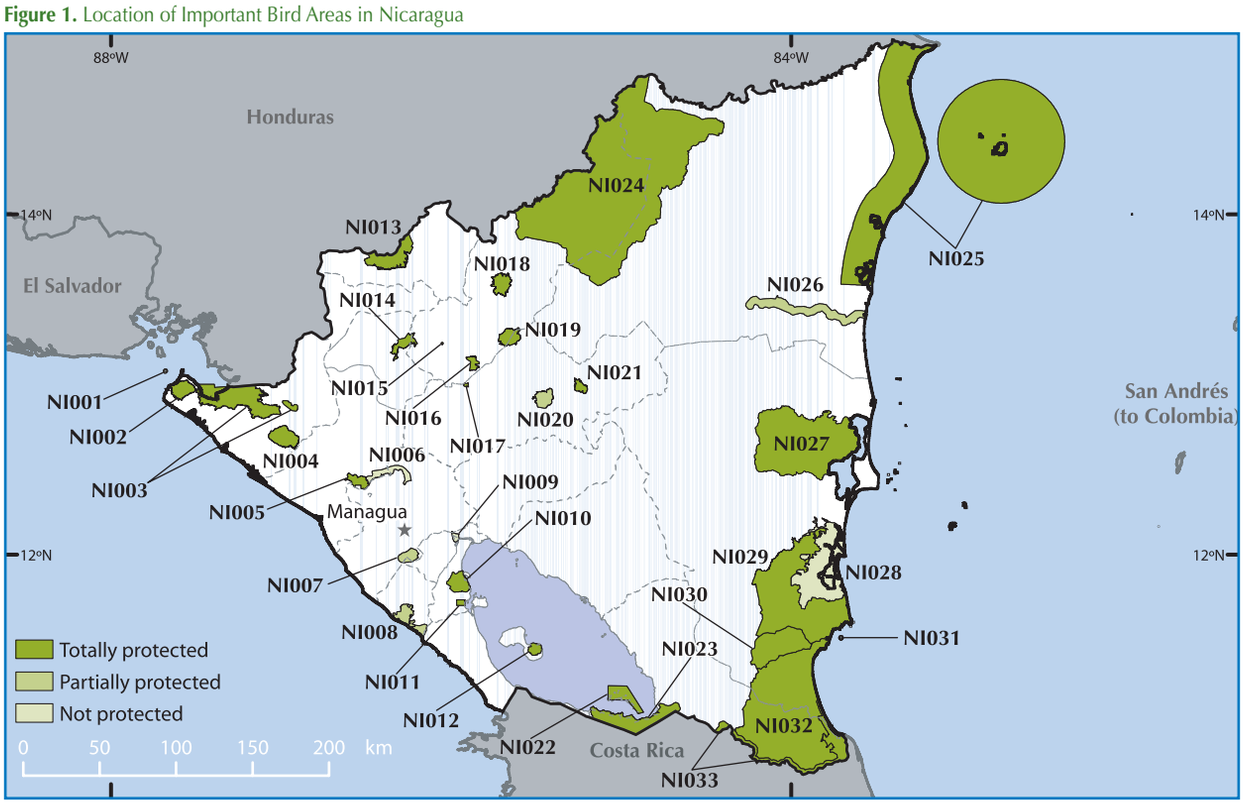
IBA code	IBA name	Adm unit	Area (ha)	A1				A2	A3	A4			
				CR	EN	VU	NT			A4i	A4ii	A4iii	A4iv
NI001	Farallones de Cosiguina	Chinandega	573							X			
NI002	Volcán Cosiguina	Chinandega	11,946				1		X				
NI003	Delta del Estero Real y Llanos de Apacunca	Chinandega	86,821						X				
NI004	Complejo Volcánico San Cristóbal-Casita-Chonco	Chinandega	22,561					X	X				
NI005	Complejo Volcánico Momotombo	León, Managua	6,386					X	X				
NI006	Humedales del Norte del Lago de Managua	León, Managua	11,952					X					
NI007	Chocoyero - El Brujo y paisaje aledaño	Managua, Masaya	8,127				2		X				
NI008	Río Escalante-Chococente-Tecomapa	Rivas	4,732						X				
NI009	Laguna de Tisma	Granada, Masaya	2,056					X	X	X		X	
NI010	Volcán Mombacho	Granada	13,886				1	X	X				
NI011	Domitila	Granada	1,915					X	X				
NI012	Volcán Maderas	Rivas	5,097					X	X				
NI013	Cordillera Dipilto-Jalapa	Nueva Segovia	31,689		1		2	X	X				
NI014	Miraflor	Estelí	9,323			1	2	X	X				
NI015	El Jaguar	Jinotega	120			2	1	X	X				
NI016	Cerro Datanlí-El Diablo	Jinotega	4,278			1	1	X					
NI017	Cerro Arenal	Matagalpa	554			2	2	X					
NI018	Cerro Kilambe	Jinotega	12,598			1	1						
NI019	Macizo Peñas Blancas	Jinotega, Región Autónoma del Atlántico Norte	11,813			1	2						
NI020	Serranía de Quirragua y paisaje aledaño	Matagalpa	10,663						X				
NI021	Cerro Musun	Matagalpa	5,663		1	1	1						
NI022	Archipiélago Solentiname	Región Autónoma del Atlántico Sur	17,454									X	
NI023	Los Guatuzos	Región Autónoma del Atlántico Sur	43,540				1	X	X				
NI024	Bosawas	Jinotega, Región Autónoma del Atlántico Norte	774,175		1	2	4	X	X				
NI025	Cayos Miskitos y paisaje terrestre	Región Autónoma del Atlántico Norte	512,795		1								
NI026	Ríos Prinzapolka/Alamikamba	Región Autónoma del Atlántico Norte	44,573		1		2	X	X				
NI027	Wawashan	Región Autónoma del Atlántico Sur	224,324		1		1	X					
NI028	Bahía de Bluefields y paisaje aledaño	Región Autónoma del Atlántico Sur	110,307		1			X					
NI029	Cerro Silva	Región Autónoma del Atlántico Sur	291,461		1		1						
NI030	Punta Gorda	Región Autónoma del Atlántico Sur	60,376		1		2						
NI031	Isla Booby Cay	Región Autónoma del Atlántico Sur	649								X		
NI032	Indio Maíz	Región Autónoma del Atlántico Sur	321,256		1	1	2	X	X				
NI033	Río San Juan - La Inmaculada Concepcion de Maria	Región Autónoma del Atlántico Sur	47,075		1		2						

For information on trigger species at each IBA, see individual site accounts at BirdLife's Data Zone: www.birdlife.org/datazone/sites/

El Jaguar (NI015) is one of three IBAs in Nicaragua holding populations of the Vulnerable Highland Guan (*Penelopina nigra*) whose formerly large population has undergone a rapid decline. Photo: Georges Duriaux

According to an analysis of IBA data, the most important sites for migratory birds are located in the north central region of the country, in terms of Passeriformes and threatened species. The Caribbean is the most important region as a route for migratory birds. According to data from three MoSI stations, many more individuals of migratory species are passing through during peak passage months than those overwintering.

Figure 1. Location of Important Bird Areas in Nicaragua



Opportunities

The identification of Important Bird Areas represents an important initial effort in Nicaragua, yet still requires official ratification on the part of the government and local organizations working towards bird conservation. However, this limiting factor becomes an opportunity, given that it will permit the State's participation in this process, as well as influencing policy on management and research within protected areas identified as IBAs. Existing information on birds is basic, and more ornithological data is required for specific areas, applicable to management and conservation. The (lack of) publication of results is another important factor which needs to be addressed.

The IBA identification process is based on field data for each of the areas, providing a worthwhile opportunity to analyze protected area delimitation in the country (Box 1) as well as the definition of protected area management categories. This process, recognized internationally by BirdLife International, has provided an aggregate value to the current protected area system in the country. In some cases, the IBA network has provided justification for future analyses, in terms of declaration of new protected areas or for increasing the size of existing parks.

At least 12 MoSI stations are currently operating in seven IBAs. This has led to an important opportunity to link these sites to MoSI stations, and thus generate long-term ornithological information allowing a more detailed evaluation of bird communities in these IBAs. It also provides the opportunity to carry out activities, such as scientific tourism, training and environmental education with local communities.

During IBA identification, a large body of ornithological information was compiled, providing a better understanding of information gaps in different areas. This has also highlighted the need to continue generating information on the part of those who work within IBAs. Activities related to biological monitoring carried out by local park staff should be linked to this data compilation with a view to gaining a better understanding of key species, both at regional and national level.

"The IBA network has provided a justification for the declaration of new protected areas or for increasing the size of existing parks."

"New IBAs will almost certainly be declared in the Caribbean region in the future, once information is available."

Future priorities for the IBA program include acquiring in-depth knowledge of bird distributions in Nicaragua with emphasis on key species or populations of nationally threatened birds, given that all information compiled so far is based on international criteria. A landscape scale analysis is also necessary. An analysis is also needed on the functioning of biological corridors in little-known regions of Nicaragua. Some regions of the country require more research effort, for example, in the Caribbean region, where few data exist, and new IBAs will almost certainly be declared in the future, once information is available.

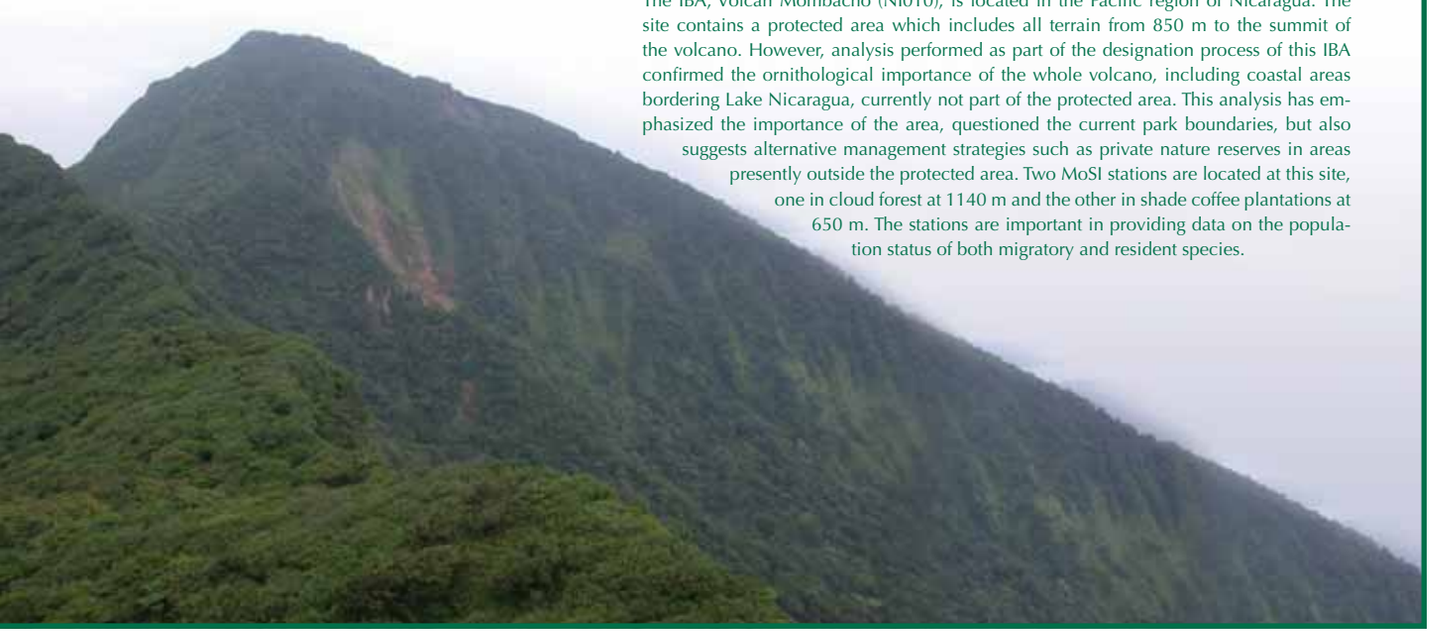
An important medium-term step is obtaining official recognition of IBAs on the part of the Nicaraguan State, as well as recognition by reserve managers and local government. Awareness raising on the IBA program is also necessary at national level, in order for the Nicaraguan community to recognize the country's IBAs and become part of efforts towards their conservation.

IBA designation has been a key part of the identification process of Key Biodiversity Areas (KBAs) in Nicaragua, an initiative begun by Conservation International through Fundación Cocibolca in 2007. Evidence for this comes from the fact that of the 17 KBAs identified, 14 are IBAs. Furthermore, IBAs also coincide with KBAs selected as "High Conservation Priority" and "High Research Priority" KBAs in Nicaragua (Zolotoff & Lezama 2007).

Box 1

IBA designation leads to reconsideration of national park boundaries

The IBA, Volcán Mombacho (NI010), is located in the Pacific region of Nicaragua. The site contains a protected area which includes all terrain from 850 m to the summit of the volcano. However, analysis performed as part of the designation process of this IBA confirmed the ornithological importance of the whole volcano, including coastal areas bordering Lake Nicaragua, currently not part of the protected area. This analysis has emphasized the importance of the area, questioned the current park boundaries, but also suggests alternative management strategies such as private nature reserves in areas presently outside the protected area. Two MoSI stations are located at this site, one in cloud forest at 1140 m and the other in shade coffee plantations at 650 m. The stations are important in providing data on the population status of both migratory and resident species.



Volcán Mombacho (NI010)
Photo: Jose Manuel Zolotoff

IBA designation provides impetus for bellbird monitoring strategy

Box 2

The Natural Reserve and IBA, Volcán Maderas (NI012) holds the only population of the Vulnerable Three-wattled Bellbird (*Procnias tricarunculatus*) in the Pacific region of Nicaragua. As a result of the site's designation as an IBA, two organizations have developed a strategy to monitor the bellbird's population, in addition to implementing research on its ecology and distribution within the area. This will allow the definition of important habitats for the species within the reserve and improve conservation actions focused on this habitat.

Three-wattled Bellbird (*Procnias tricarunculatus*) Photo: Juan Criado

Volcán Maderas (NI012). Photo: Fabricio Díaz

Further information

Data sources

Reports on the IBA program, database entries for each IBA and trigger species available from J. M. Zolotoff-Pallais and at http://www.Bio-nica.info (also includes research on birds and other taxa).

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