

Status, Distribution, Current Research and Conservation of Forest Birds of Prey in Cuba

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INTRODUCTION

Cuba's forest raptors (Falconiformes and Strigiformes) are characterised by 1. A numerical imbalance between the resident subspecies (13) and the migratory (3); 2. Grades of endemism low in the higher taxonomic categories; 3. Very low population densities in general; and 4. A continuous tendency towards loss of diversity in all remaining forest areas in the Cuban archipelago. These four basic characteristics are directly related to the geographic situation of Cuba and its adjacent keys, the culture of its inhabitants and an inadequate environmental policy, maintained by all governments since the times of the island's discovery.

The majority of the Cuban raptors apparently derive from a small group of ancestral immigrants, which reached the island by chance or by different routes in different geological eras, and generated a rapid process of speciation, culminating in the present great subspecific diversity.

MATERIALS AND METHODS

All human activities expressed as factors degrading the ecology of the areas here referred to have been personally verified by the author over the past twelve years (1979-1992). The information on introduced species was obtained from personnel connected with the National Enterprise for the Protection of Flora and Fauna of the Ministry of Agriculture.

All names of raptors in this paper follow the Scientific and Common terminology of the sixth AOU Check List, with the exception of those where the Cuban term is added to specify reference to an endemic subspecies.

Relative Abundance and Ecological Density (Table 1) are based, both for calculation and denomination, on Johnson 1978.

STATUS AND DISTRIBUTION

Surveys for the analysis of the relative abundance and ecological density of some of these birds have only localised value. On the other hand, those conducted at the beginning of the 1980s cannot be considered up-to-date, due to the accelerating human exploitation to be seen in almost all localities. For some species the situation is desperate. Since 1930 there have been no confirmed reports of the continued existence of the Cuban Hook-billed Kite *Chondrohierax uncinatus*,

although some investigators have reported it from the vicinity of Duaba Arriba in 1974, and in San Alejo in 1981, both localities in Guantánamo Province (Giraldo Alayon, pers. comm.).

During the last five years 120 days were spent in an attempt to relocate this species and 420 km of forest trails in the Cuchillas de Moa (Holguín Province) and the Cuchillas de Toa (Guantánamo Province) were repeatedly explored, together with 328 km of riverine woods along the Jaguani, Toa and Duaba river basins, but with no results. J. C. Gundlach himself, accustomed to describe the ecological aspects of the birds he collected, listed only 10 individuals from only six localities (Gundlach 1893). There is no doubt that to this naturalist the Cuban Hook-billed Kite was already an extremely rare bird. However, lack of institutional support and of resources to continue the search preclude any positive assertion that it is extinct.

Table 1. Relative Abundance (RA) and Ecological Density (ED) of some Cuban forest raptors in localities with continuous human transformation.

Subspecies	Locality	RA (km)	ED (ha)	Year of analysis
<i>Accipiter g. gundlachi</i>	Ciénaga de Zapata	0.30	0.0015	1985
<i>Accipiter g. wileyi</i>	Sierra Maestra	0.21	0.0035	1986
<i>Buteo j. solitudinis</i>	Cordillera Guaniguanico	0.12	0.0003	1985
<i>Buteo p. cubanensis</i>	Cuchillas de Toa	1.10	0.0014	1988
<i>Falco s. sparveroides</i>	Ciénaga de Zapata	0.36	0.176	1985
<i>Glaucidium s. siju</i>	Ciénaga de Zapata	5.0	0.008	1989
<i>Gymnoglaux l. lawrenci</i>	Cuchillas de Toa	0.28	0.050	1988
<i>Gymnoglaux l. exsul</i>	Ciénaga de Zapata	10.0	0.028	1989

The Cuban Sharp-shinned Hawk *Accipiter striatus* finds itself in much the same situation. There are barely a dozen reports of sightings during the past 28 years, and these, including my own, are not wholly reliable, due to the similarity of the Cuban subspecies to the *velox* race, a winter visitor. Its main population is centred on the Sierra del Rosario (Pinar del Río Province), although it also occurs in the submontane forests of the Escambray mountains (Las Villas and Sancti Spiritus Provinces), the Sierra Maestra (Granma and Santiago de Cuba Provinces) and the Cuchillas del Toa.

The best assessment of the status and distribution of Gundlach's Hawk *Accipiter gundlachi* has been published recently (Wotzkow 1991a); it is highly endangered, although relatively well distributed in two large population centres.

The distribution of the Cuban Broad-winged Hawk *Buteo platypterus cubanensis* is the same as at the beginning of the 1980s, as reported by Wotzkow (1985); however, its numbers are decreasing alarmingly in many localities, mainly due to degradation of the natural habitat. The Red-tailed Hawk *Buteo jamaicensis* is, on the other hand, widely distributed throughout the island, present even in small isolated groves, but much hunted by farmers. Between 1982 and 1983 these birds were practically exterminated from the mountain complex of Jaruco (Havana Province), yet in 1991 its status was found to be comparable with that of 1980-81; this could be attributed only to immigrations from North America, from where individuals have already been reported (Wotzkow 1985). However, to judge from the numerous known captures of this species throughout the island, it is doubtful whether its re-establishment is wholly due to the breeding success of neighbouring populations and their subsequent colonisation of vacant ecosystems.

The most abundant and most widely distributed Cuban raptor is the Cuban Kestrel *Falco sparverius sparveroides*. It may be found anywhere, from the densest rain forest to the most intensively cultivated plains. Its habit of using the old nests of woodpeckers, combined with the abundance and diversity of the latter, seems to be the main reason for its high numbers and wide distribution.

Among the owls, one of the least studied is the Burrowing Owl *Speotyto cunicularia*. Its status is completely unknown, and it only occurs in small patches of palm *Sabal parviflora* forest mixed with semi-deciduous elements on sandy soil in the southern portion of the extensive rainy plain of Pinar del Rio Province and the surrounding woods of the Ciénaga de Lanier on the Isle of Pines.

The Cuban Bare-legged Owl *Gymnoglaux lawrenci* is widely distributed in the archipelago. In the Ciénaga de Zapata (Matanzas Province) it is relatively abundant in mixed forests of palm and semi-deciduous trees. However, these concentrations are maintained only during the breeding season and depend on the availability of suitable nest sites.

A similar degree of knowledge exists for the Cuban Pygmy Owl *Glaucidium siju*, the distribution of which is continuous throughout the island, where it even inhabits isolated groves surrounded by cultivated fields.

The status of the Stygian Owl *Asio stygius* is unknown. Its distribution is wide, its most important population centres being concentrated in four main areas: the forests of the Sierra del Rosario, the Ciénaga de Zapata, the pine forests of the mountain complex of the Cuchillas de Moa, Toa and Mayarí, and the Isle of Pines, but it has also been reported in other localities of Sierra Maestra, Escambray and the Guanahacabibes peninsula. Judging by the scarcity of individuals in these areas, however, only very few survive from former larger populations.

CURRENT RESEARCH

For reasons unknown, taxonomy has been the principal subject of study on Cuban raptors for the past century. However, although nearly completed, the systematics of the group requires fresh revisions, above all at subspecific level.

The zoogeography of these birds has not as yet been studied, in spite of ample data in numerous publications and MSS. As a result, no coherent distribution map has as yet been drawn. Furthermore, in Cuba research on raptors at a community level is not outstanding. Even more disheartening is the quality of the auto-ecological studies undertaken in recent years, with very few exceptions. Thus the level of knowledge on the ecology of the forest raptors is quite inadequate. Some species have been moderately studied (Gundlach's Hawk, Red-tailed Hawk, Cuban Kestrel, Cuban Pygmy Owl, Cuban Bare-legged Owl) but there are other species about which virtually nothing is known (Cuban Sharp-shinned Hawk, Cuban Hook-billed Kite, Burrowing Owl and Stygian Owl) (Table 2).

During the last three decades collaboration between specialists increased, but their research has been focused on economic interests and not on conservation of the indigenous fauna. Still more revealing is the fact that Cuban raptors have never been included as a subject for research in the programmes of any scientific institution.

Cuban or foreign biologists have not taken raptors into particular consideration, with the exception of check lists covering remote localities: Garrido & Schwartz (1968); Garrido (1973); Estrada & Novo (1984); Silva & Estrada (1982); Acosta & Berovides (1984); Acosta *et al.* (1984); Estrada & Rodríguez (1984); Garrido *et al.* (1986); García *et al.* (1987); Alayón *et al.* (1987); Acosta *et al.* (1988); Kirkconnel & Posada (1988); Posada *et al.* (1989); Torres *et al.* (1988); Torres & Solana (1987) and García *et al.* (1989), to mention only a few. Apart from these, a few studies on the forest raptors of Cuba: Wotzkow (1985); Berovides & Fernandez (1984); Thiollay (1985); Wotzkow (1985); Wotzkow (1986a, 1986b); Wotzkow & Cruz (1987); García *et al.* (1987); Wotzkow & Wiley (1988); and Wotzkow (1991a, 1991b), together with some other research as yet unpublished, constitute the most recent data on the ecology of these birds (Table 2).

CONSERVATION

Conservation policies in Cuba are complex and not clearly defined. As an instrument for legal protection of the environment and the rational use of natural resources, the Law 33/81 was adopted by the National Assembly of Popular Power on the 27th December 1980 (Academia de Ciencias 1983), but the powers contained in Sections III and IV have never been implemented, so that the law is inoperative.

The COMARNA (National Commission for Protection of the Environment and Rational Use of Natural Resources) is, within the Cabinet of Ministers, the instrument through which the government dictates policy in matters of conservation at a national level. The provincial commissions for the environment technically advised by the COMARNA are managed by the local organs of Popular Power, and it is through them that conservation at provincial level should be carried out. However, the National Executive Board of Silviculture of the Ministry of Agriculture (MINAGRI) is also responsible for conservation activities, which it should undertake through its different provincial dependencies and the National Corps of Game-keepers. Within this same Ministry the National Enterprise for the Protection of Flora and Fauna controls 73 reserves (in different IUCN categories). The ACC (Cuban Academy of Sciences), for its part, directs research related to conservation through the Institute of Ecology and Systematics.

Table 2. Present situation of ecological knowledge on Cuban forest raptors: (a) status, (b) distribution, (c) foraging ecology, (d) basic ecology, (e) reproductive ecology, (f) aspects related to general behaviour and, with reference to the migratory species, (g) zones habitually frequented in their temporary distribution, and (h) aspects related to feeding.

SPECIES	BIOLOGICAL ASPECTS KNOWN
FALCONIFORMES	
<i>Chondrohierax u. wilsoni</i>	c
<i>Accipiter g. gundlachi</i>	a,b,c,d,e,f,
<i>Accipiter g. wileyi</i>	a,b,c,f
<i>Accipiter s. fringilloides</i>	-
<i>Accipiter s. velox</i>	g
<i>Buteo j. solitudinis</i>	a,b,c,d,e,f
<i>Buteo p. platypterus</i>	g,h
<i>Buteo p. cubanensis</i>	a,b,c,f
<i>Falco s. sparverius</i>	g,h
<i>Falco s. sparveroides</i>	a,b,c,d,e,f,
STRIGIFORMES	
<i>Speotyto c. floridana</i>	b
<i>Glaucidium s. siju</i>	a,b,c,d,e,f
<i>Glaucidium s. vittatum</i>	-
<i>Gymnoglaux l. lawrenci</i>	b,c,f
<i>Gymnoglaux l. exsul</i>	a,b,d,e,f
<i>Asio s. signatus</i>	b,c,f

From all the above one would think that conservation in Cuba should function without any problems, but bureaucracy, administrative vices and lack of collaboration between the various institutions gravely impair the efficiency of the system.

The National Institute for Physical Planning (IPF), which authorises or otherwise the use of land, has on the other hand yielded to pressure from development sectors in the government to exploit protected areas for economic benefit. It may be asserted that in 90% of the protected areas

many tourists, mining and forest exploitations are now being pursued, in which the conservation element is largely ignored. Thus the official system is daily violated in many ways.

To pinpoint the causes contributing to the dwindling diversity of forest raptor populations, despite such an array of institutions, it is necessary to define the principal and most regular types of human activity in Cuba. Since early days, and particularly since 1959, Cuban wildlife has been submitted to intense, irrational exploitation and, frankly, to bad management of the country's natural resources. After 1990 a special situation arose: the deep economic crisis has led the country, so far as natural resources are concerned, back to the state which prevailed in the days of colonisation. One example of this is the massive consumption of natural fuels (wood and coal), for both domestic and industrial use. Table 3 shows the principal factors and potentially damaging actions affecting the forest ecosystems and the raptors inhabiting them.

Table 3. Degrading factors detrimental to the forest ecosystems and their raptor populations (B) Beneficial effects, (IM) Individual mortality, (TP) Temporary problems (nesting failure, etc.), (DD) Diminution of habitat diversity, (PD) Physiological diminution for reproduction, and (DC) Diminution of essential components of the habitat (e.g. nest sites or food supply).

ACTIONS	(B)	(IM)	(TP)	(DD)	(PD)	(DC)
EXTRACTION						
a) Commercialisation		x	x	x		x
b) Unselective forest clearance		x	x	x		x
c) Illegal hunting		x	x	x		
d) Depredation and vandalism		x	x	x		x
e) Erroneous research		x	x			
CONVERSION						
f) Physical alterations of the habitat	x	x	x	x		x
RECREATION						
g) Camping		x	x			
CONTAMINATION						
h) Chemicals			x ¹	x	x	
i) Noise pollution			x ¹			
j) Introduction of exotic species		x	x	x		x

¹In these two examples the temporary problems could only occur if the contamination directly affected breeding adults.

EXTRACTION

A. Commercialisation

Cuba exploits for export a considerable number of animals. FAUNICUBA and other such enterprises are directly in charge of the extraction of molluscs, fish, reptiles and birds which form the basic food of many birds of prey. One notorious example is the commercialisation of the Polymita Snail, endemic to the forests of eastern Cuba, and it is quite probable that the disappearance of the Cuban Hook-billed Kite is directly related to the scarcity of this food source. The Polymita travels all over the world in the form of necklaces, earrings, brooches, paperweights, etc. which INTUR (National Institute for Tourism) sells to foreign tourists.

Even within the Cuban Academy of Sciences there is the EMIDICT (Enterprise for the Import and Distribution of Science and Technique) which for many years has promoted the export of live specimens of our indigenous fauna. In the same way, a Cuban-Spanish enterprise of recent creation, INGECO S.A. (Enterprise of Engineering and Ecology) also exports commercial products, the raw material of which is drawn from the Cuban fauna.

Although the direct commercialisation of raptors is not extensive, there unfortunately exists a black market in which they are becoming increasingly involved. Devotees of Afro-Cuban folklore and illegal cock fighters make use of the bones, feathers, fat, eggs and claws of birds of prey, so that dozens of raptors are shot and sold.

B. Non-selective tree-felling

The "Plan Turquino", a project created and implemented by the government, has accelerated destruction of many forested areas throughout the country. Its aim is to foster agricultural self-sufficiency among more isolated sections of the population. However, the methods most used (non-selective felling, slash and burn, bull-dozer etc.) threaten the eventual disappearance of important biotopes, leading in turn to a declining rainfall, increased erosion and the loss of biological diversity.

C. Illegal hunting

In Cuba, illegal hunting is the general rule for two reasons: 1) lack of adequate scientific bases for the hunting law in force, and 2) uncontrolled and continuous violation of this law. The lack is due to the scarcity of population studies on the species listed in the law, and the violations stem from officially unauthorised and indiscriminate hunting within protected areas, even during close seasons. These violations are committed extensively throughout the country, occasionally even by the very people responsible for conservation within the areas in question. Examples of such activity are the extermination of the Red-tailed Hawk by farmers in the vicinity of Jaruco, and the indiscriminate killing of raptors to the north of Cayo Coco (Ciego de Avila Province) carried out by the wardens of the Enterprise for the Protection of Flora and Fauna. In both cases it was claimed that this was done purely to "protect" domestic fowl and pigeons.

The trapping of live raptors for falconry has been confirmed in several localities. In 19 checks carried out by the author the birds died, due to inability to provide the necessary quantity or quality of food or to faulty handling, whilst a few escaped during the training period.

D. Depredation and vandalism

This category includes the empirical use of many faunistic resources, as well as their destruction without purpose, or motivated by prejudice and ignorance. Among the most general practices are: 1) the habitual taking of eggs for use in religious rites; 2) the taking of chicks for partial or total use in fetishist rites and initiations; and 3) the habit, rooted in many sectors of society, of eating the adult birds.

E. Harmful research practices

Amongst the ornithologists and other students of the country's fauna examples abound in which the wrongful methods employed directly or indirectly affect a considerable number of forest raptors. Thus careless inspection of nests often leads to predation by rodents, mustelines and snakes, with loss of eggs or chicks. Or modifications are made to the surroundings of the nest to facilitate photography or periodic inspection. It can happen that the canopy above a nest has been completely stripped of leaves in order to obtain a better light, and birds frequently abandon their nests due to an excessive number of visitors.

HABITAT CHANGE

The intensive effort at present being made to increase agricultural output is rapidly changing

the physiognomy of many natural areas.

Drainage of the Laguna de Ariguanabo, the importance of which as a natural refuge for birds has been recognised since the last century, has caused the migratory or resident raptors using this lake and its adjacent forests to be mere records of the past.

The "Plan Turquino", already referred to, is, among national projects, the most harmful one to the forested mountain slopes in the Cuchillas de Moa and Toa, Sierra Maestra, Escambray and the mountains of Guaniguanico (Pina del Río Province). The system has led to wide-scale shifting agriculture, with the usual devastating effects of impoverished soil, erosion, tree-felling and abandonment of unproductive lots.

The destruction of many small patches of woodland within the cultivated areas destroys the local insect fauna and eliminates these "islands" as refuges for *Buteo jamaicensis*, *Accipiter gundlachi*, *Falco sparverius*, *Glaucidium siju* and *Gymnoglaux lawrenci*.

The construction or widening of roads and trails within the forest is another prejudicial factor. In the Ciénaga de Zapata electrification along these routes has caused an increase in the mortality of such species as Gundlach's Hawk, Stygian Owl, kestrels etc. — birds which generally fly below the canopy and collide with the electric cables. In areas like Cayo Coco, the number of raptors killed by vehicles is also notorious. The actual figures are not known, but many ecosystems remain virtually empty of raptors as a result.

RECREATION

So-called "Popular Camping" has increased in recent years. It is a practice in which nearly all the detrimental factors mentioned above are to be found. The low cultural level of those working in conservation only compounds all the errors possible in the management of a forest ecosystem. The hiring of airguns, authorisation of bonfires and unlimited hiking within protected areas all impair the biological diversity in general and forest raptors in particular.

POLLUTION

A. Chemicals

The most general form of environmental contamination derives from spraying with organochlorinated products and chemical fertilisers over a wide variety of crops. In many localities these substances leach into the river network; in others the wind favours their dispersal. Most prejudicial is the lack of state control over the adverse effects. The rice fields of Pina del Río, Matanzas, Camaguey and Granma are the most notable centres of such contamination. The results of any research corroborating the levels of toxicity are not made public, and this is in fact one of the worst facets of the Cuban Academy of Sciences' environmental policy.

B. Noise pollution

Low-level flying over the forest canopy and the detonation of explosives in military manoeuvres or mining work are the two most common elements of noise pollution. The use of large helicopters in low-level flights causes further damage. The Ciénaga de Zapata, Sierra Maestra and the Cuchillas de Moa, Toa and Baracoa, are areas where tourist flights, forest patrols and the dropping of newspapers affect the forest ecosystem almost daily.

C. Introduction of exotic species

The present Government of Cuba has completely ignored the danger inherent in the introduction of exotic species, especially in the ecosystems of the islands, and the archipelago has become one of the most notorious examples in the world for arbitrary introductions.

In the last century the White-tailed Deer *Odocoileus virginianus* and the mongoose *Herpestes auropunctatus* were introduced, the former to increase the variety of game species and the latter to act as a biological control against rodents. The effects, familiar to the management of COMARNA, MINAGRI, ACC and Popular Power, have been disastrous, yet far from embarking

on the eradication of these two animals, destroyers of the forest and of ground-nesting bird populations, other species have continued to be introduced without scruple.

The 1980s marked the beginning of what will soon become an ecological crisis by reason of the introduction of dozens of species of a markedly destructive nature. Thus several monkey species (*Macaca* spp.) were released on Cayo Rosario (Special Municipality of the Isle of Pines) to be later used for medical research. These have depredated the vegetation and fauna of this key, have dispersed to other nearby keys and amply confirm the disastrous character of the so-called "controlled introduction policy". Likewise, a nostalgia for "safaris" has promoted the introduction, even within protected areas, of such game species as *Tavassu tajacu*, *Hydrochoerus hydrocharis*, *Sus scropha*, *Cervus canadensis*, *Dama dama*, *Cervus elaphus*, *Guis musimon* and various other species of antelope and birds, mainly from South America. Because of this, the future of the ecosystems is in danger and the situation of the indigenous species becomes ever more insecure. Cuba became a signatory to CITES in 1990 and efforts are being made to prevent the country from running out of crocodiles, flamingos and many other species, but export on a tourist level continues, at least institutionally.

To illustrate the ecological disaster threatening Cuba, one cannot do better than quote Antonio Iraizoz, a journalist genuinely concerned over the conservation of Cuban wildlife, who wrote: "Let us not keep on destroying trees, because if we continue to do so there will not remain a single piece of wood on which to hang ourselves!" (Iraizoz 1949).

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Everglade Kite *Rostrhamus sociabilis*