

## STATUS AND CONSERVATION OF THE MAGNIFICENT FRIGATEBIRD (*FREGATA MAGNIFICENS*) ON BARBUDA, WEST INDIES

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**Abstract:** The Magnificent Frigatebird (*Fregata magnificens*) ranges widely over much of the West Indies but nests at relatively few sites. It is at risk due to its dependence on coastal roosting and nesting sites, half of which have disappeared in the historic period. As a consequence it is considered one of the most threatened seabirds in the Caribbean. The frigatebird nesting colony on Barbuda has long been considered to be the largest in the Caribbean. A complete census in 2008 revealed 1,743 nests and over 5,000 birds using the site, confirming its stature as the largest colony in the Caribbean. There is no evidence of decline in the nesting population over the past decade. The secure conservation status of this colony is in large part due its management by local authorities as an ecotourism site. This program may be a model for other waterbird and seabird colony sites in the Caribbean.

**Key words:** Antigua, Barbuda, Caribbean, Codrington Lagoon, ecotourism, *Fregata magnificens*, Important Bird Area, Magnificent Frigatebird, nesting, Ramsar Convention, West Indies

**Resumen:** SITUACIÓN Y CONSERVACIÓN DE LA FRAGATA (*FREGATA MAGNIFICENS*) EN BARBUDA, ANTILLAS OCCIDENTALES. La Fragata (*Fregata magnificens*) varía ampliamente en la mayor parte de las Indias Occidentales, pero anida en relativamente pocos lugares. Está en riesgo debido a su dependencia de sitios costeros de descanso y anidación, la mitad de los cuales han desaparecido en el período histórico. Como consecuencia de ello, se considera una de las aves marinas más amenazadas en el Caribe. La colonia de anidación de fragatas en Barbuda ha sido considerada como la más grande en el Caribe. Un censo total en 2008 reveló 1 743 nidos y más de 5 000 aves que utilizan el sitio, lo que confirma su importancia como la mayor colonia en el Caribe. No hay evidencia de disminución de la población de anidación durante la última década. El seguro estado de conservación de esta colonia se debe en gran parte a su gestión por las autoridades locales como un sitio de ecoturismo. Este programa puede ser un modelo para otros sitios de colonias de aves acuáticas y marinas en el Caribe.

**Palabras clave:** anidación, Antigua, Área de Importancia para las Aves, Barbuda, Caribe, Convención de Ramsar, ecoturismo, *Fregata magnificens*, Indias Occidentales, Laguna de Codrington

**Résumé :** STATUT ET CONSERVATION DE LA FRÉGATE SUPERBE (*FREGATA MAGNIFICENS*) À BARBUDA, ANTILLES. La Frégate superbe (*Fregata magnificens*) est présente dans une grande partie des Antilles, mais les sites de nidification sont relativement peu nombreux. L'espèce est menacée en raison de sa dépendance aux sites côtiers de repos et de nidification, la moitié de ces sites ayant déjà disparu. En conséquence, elle est considérée comme l'un des oiseaux marins les plus menacés des Caraïbes. La colonie de l'île de Barbuda a longtemps été considérée comme la plus importante des Caraïbes. Un dénombrement complet en 2008 a révélé 1743 nids et plus de 5000 oiseaux utilisant le site, ce qui confirme son statut de plus grande colonie. Il n'existe aucune preuve de déclin de la population nicheuse au cours des dix dernières années. La pérennité de la protection de cette colonie est en grande partie due à sa gestion par les autorités locales comme un site d'écotourisme. Ce programme pourrait constituer un modèle pour les autres colonies d'oiseaux d'eau et d'oiseaux marins dans les Caraïbes.

**Mots clés :** Antigua, Antilles, Barbuda, Convention de Ramsar, écotourisme, *Fregata magnificens*, Frégate superbe, Lagune de Codrington, nidification, Zones Importantes pour la Conservation des Oiseaux

The Magnificent Frigatebird (*Fregata magnificens*) ranges over much of the West Indies and occurs as well along the Pacific Coast of Central America and Pacific Islands. But over this large range the species nests in relatively few sites (Diamond and Schreiber 2002). Frigatebird species are more dependent than most seabirds on land-based sites because, unlike other seabirds, they do not rest on the water and so require access to nighttime roost sites. And their prolonged nesting season

of 10 mo or more requires prolonged use of colony sites. So, although the Magnificent Frigatebird is a common, even iconic, sight over Caribbean and tropical eastern Pacific waters, its colony and roost sites become a matter of special conservation concern. It is considered to be one of the more threatened seabirds in the Caribbean (Diamond and Schreiber 2002). The frigatebird nesting colony on Barbuda has long been considered to be the largest in the Caribbean (Rafaelle *et al.* 1998). The num-

bers of birds nesting there and their population trend have been variously reported, ranging upwards into the tens of thousands. But despite the conservation importance of the site, censuses have been infrequently conducted or published. The purposes of this paper are to document the size of the colony as of 2008, provide a comparison with available previous information to assess its population trend, and evaluate its conservation status.

#### STUDY SITES AND METHODS

The Barbuda frigatebird colony is located in the Frigatebird Sanctuary in the northwestern portion of the Codrington Lagoon (17°36' N, 61°50' W), in the nation of Antigua and Barbuda. The lagoon has long been recognized for its conservation importance. It is proposed as an Important Bird Area by BirdLife International based on occupancy by the Barbuda Warbler (*Dendroica subita*) and is recognized as a Ramsar Wetland of International Importance (BirdLife International 2008). The lagoon incorporates 352 ha of shallow water bordered by Red Mangroves (*Rhizophora mangle*), with a single shallow creek connecting the lagoon to the Caribbean Sea. The frigatebirds nest on top of clumps of short (1-3 m tall) Red Mangrove bushes.

The colony site was censused on 23 March 2008 from a shallow-draft boat. Due to the low height of the vegetation, all nests were readily counted individually. Most nests contained chicks 1-2 mo old; none appeared to be near fledging and many fewer nests had eggs or small nestlings, suggesting that nesting was relatively synchronized and was in its 2nd or 3rd mo. In the entire colony only four males were observed displaying with inflated pouches, and most nests were still being attended by adult males. Based on the biology of the species (Trivelpiece and Ferraris 1987, Osorno 1999), these observations suggest that the colony was counted at the optimal time as most nests had been started, fledging had not yet occurred, and all nests were readily discernable. It is likely that the census accounted for nearly all of the nesting effort for the year.

#### RESULTS AND DISCUSSION

The census found 1,743 active nests, 1,550 adults, and 50 yearlings in the colony and an average of about 200 birds in the air over the colony. An estimate of the total number of birds at the colony site would be about 5,300 (two adults per nest plus one chick per counted nest plus the counted sub-adults, rounded up). The number of birds and nests reported as using the site has been subject to some

exuberance over the years. The number given to tourists ranges upwards of 10,000 to 20,000 birds (Cameron 2002, pers. obs.). In the literature, the most commonly reported colony size is about 2,500 nests, sometimes converted to 5,000 birds (Raffaele *et al.* 1998, BirdLife International 2008). The results of the current study, for both conservation and touristic purposes, can be stated as over 1,700 nests and over 5,000 birds at its annual peak.

The Codrington Sound, Barbuda frigatebird colony has long been considered the largest in the Caribbean (Halewijn and Norton 1984). The present census result confirms this. The next largest colonies are fewer than a thousand nests, such as Pedro Cays in Jamaica, Great Tobago in British Virgin Islands, and St. Giles Island in Tobago (Bradley and Norton 2009, E. A. Schreiber pers. comm.). The West Indian population of Magnificent Frigatebirds is considered to be under threat with half of the known colonies having been extirpated in historic times (Schreiber 2000). As a result, the conservation of the largest remaining colony takes on added value for its importance to the species as a whole. With the West Indies population estimated to be 4,300-5,300 individuals (Lindsey *et al.* 2000), the colony is of critical importance and deserving of recognition as a regionally important bird area because of the frigatebirds present there. This is the only frigatebird colony site in the Caribbean known to be regularly patrolled and protected (Diamond and Schreiber 2002). Fortunately, the protection level of this site is extremely high, as it is the focus of an excellent ecotourism program managed by the local community council on Barbuda. Guides visit the site almost daily, bringing tourists from Antigua to see the colony, and so provide protection for the birds and their nests.

The colony has not often been censused. Diamond (1973) estimated that in 1971 there were about 2,500 pairs in the colony. This number has a lot of uncertainty as it is based on extrapolation of a small area of the colony site, which was at a different and more difficult-to-access site location. Nonetheless, this number has been used frequently (Halewijn and Norton 1984, Raffaele *et al.* 1998, BirdLife International 2008). The colony shifted location after a hurricane in 1995 (Schreiber and A. W. Diamond pers. comm.). By 1996, Schreiber estimated, although did not fully count, that there were 1,500-2,000 nests; and in 1997, she estimated there were 1,900-2,000 nests (Schreiber pers. comm.). This is the time when the warden's ecotourism program was finalized. Although it is possible that the

colony decreased in size from the 1970s to the mid-1990s, the nest-by-nest census of the current study is midway within the historic range of the estimates for 1996-1997. Thus, it would seem that there is no evidence of a decrease in the size of this nesting colony over the past ten years. Furthermore, the colony has not shifted location during this time (Diamond and Schreiber 2002). The inference of a stable trend is congruent with reports from local guides. It appears that the nesting population has been stable during the period that it has been part of the local ecotourism program. While additional protective measures and better and more frequent monitoring are desirable, it is encouraging that the status of the colony remains secure, no doubt due to the protection and management provided by the ecotourism program.

The success of the conservation program for this colony suggests that it might be a model for other waterbird and seabird colony sites in the Caribbean. The colony is under the management of the local community, patrolled by wardens employed by the community, and secured by having its boundaries delimited by ropes and floats. Each day in season dozens of visitors from Antigua are taken by guides to the colony, provided with an up-close experience, and an educational lecture. The colony site provides an important economic benefit for the local community, which therefore provides a rationale for the protection of the colony and also the entire Codrington Lagoon.

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