Ascension Island Biodiversity Action Plan

MASKED BOOBY

Photo: S. Weber

SUMMARY

Taxonomy: Kingdom: Animalia; Phylum: Chordata; Class: Aves; Order: Pelecaniformes; Family: Sulidae; Species: *Sula dactylatra*

Nativeness: Native, breeding

Description: Large, pelagic, ground-nesting seabird with predominantly white plumage and a distinctive orange bill and feet. Adult males and females are morphologically similar but can be distinguished by their calls. Juveniles are greyish brown above with a pale belly. Most prey (mainly flying fish) is obtained by plunge diving from a height of 10-30m. Often feeds in association with schools of tuna that drive prey to the surface.

IUCN Red List status: Least concern LC

Local trend: Probably increasing

Threats: The major threat to masked boobies is overfishing of tuna; secondary threats include invasive alien species, collisions with wind turbines and climate changed-induced habitat alteration.

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DARWIN INITIATIVE

2. Distribution

Global

Masked boobies have a near pan-tropical distribution, occurring in all oceans except the eastern Atlantic, northern Indian Ocean and central-eastern Pacific. Major south Atlantic nesting colonies are located at Atol das Rocas, Brazil (ca. 5000-7000 pairs) [1] and Ascension Island, UK (ca. 4500 pairs) [2], with smaller colonies located on St Helena (UK), Trindade (Brazil), Fernando de Noronha (Brazil) and the Abrolhos Archipelago (Brazil) [3].

Local

Nesting: Masked booby nesting at Ascension Island is currently concentrated on the summit plateau of Boatswain Bird Island and around the Letterbox Peninsula in the east of the Island (Fig. 1). Small numbers of nests can also be found in the vicinity of Cocoanut Bay and Hummock Point (Fig. 1). However, historical records and sub-fossil remains indicate that the species once bred more widely across the coastal lowlands, with putative nesting colonies to the north and east of Sisters Peak and close to South Gannet Hill [4]. The mainland colonies were extirpated by feral cats following human settlement of the island in 1815 and, despite unsuccessful re-colonisation attempts, nesting was confined to Boatswain Bird Island until 2002 when a campaign to eradicate feral cats was initiated [2,5].

Foraging: Masked boobies nesting at Ascension Island forage over a wide expanse of open ocean, although predominantly within the Territory's 200 nm maritime zone (Oppel et al. in review). On average, the foraging trips of breeding birds extend to a maximum of 140 km from the Island, although occasional displacements of over 300 km have been recorded.

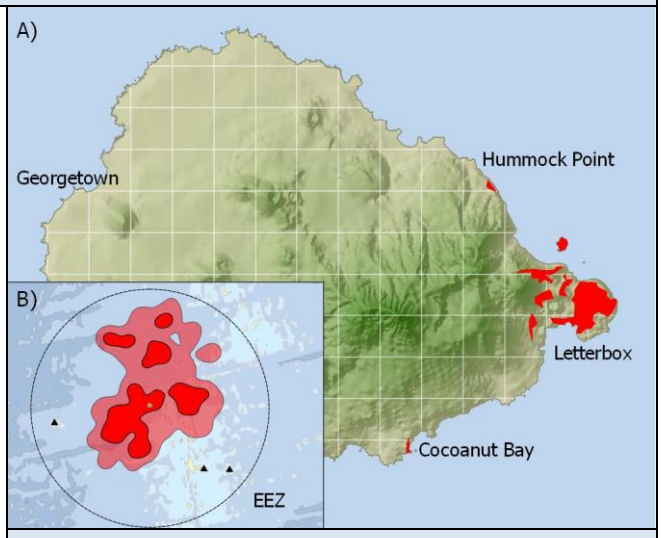

Figure 1: A) Distribution of masked booby nesting colonies as of December 2014 (AIG Conservation Department, unpublished data). Sites at which subfossil remains of masked boobies have been discovered are also shown (digitised from [4,6,7]). B) Foraging distribution of 53 breeding adults tracked using GPS devices. The 50% utilisation distribution (or core use area) is shown in dark red and the 95% utilisation distribution (or home range) in faded red. The boundary of Ascension Island's 200 nm exclusive economic zone (EEZ) is also shown.

3. Status

GLOBAL	Population estimate: Unknown	IUCN status: Least concern

The global population size has not been formerly assessed, although Pitman et al. [8] speculate that it is probably upward of 225,000 breeding pairs. Masked boobies are believed to be decreasing globally but the rate of decline does not meet thresholds for Vulnerable under the IUCN Red List classification scheme [9].

LOCAL	Population estimate: >4,500 breeding pairs	Local trend: Probably increasing

Due to the inaccessibility of the main masked booby colony on Boatswain Bird Island, assessment of population size and trends is challenging. Dorward estimated 1,300 pairs nesting on Boatswain Bird Island in 1958 [5] and Ratcliffe et al. estimated that there were 4,500 pairs breeding on Boatswain Bird Island at the peak of nesting in 2002 [2]. Recent population trends may be more readily inferred from the rapid recovery of mainland nesting colonies since the start of the feral cat eradication, increasing from 3 nests in 2002 to a minimum of 1,537 nests in 2015 [2] (AIG Conservation Dept. unpublished data). However, despite recent growth, the population is likely to be considerably smaller than it once was. Historical accounts and charts suggest that impressive booby colonies once occurred across many parts of the main island but disappeared sometime between 1840 and 1880 as a result of cat predation [10].

4. Ecology

Habitat & diet

Masked boobies are amongst the most pelagic species of the Sulidae family, preferring to forage over deep water [11], often in association with subsurface predators such as dolphins and yellowfin tuna (*Thunnus albacares*) [12]. Flying fish feature prominently in their diets [5,11]; however, at least 11 prey species have been identified in regurgitates at Ascension Island, including large numbers of juvenile redlip blennies *Ophioblennius atlanticus* [5]. Masked boobies breed on tropical oceanic islands and nest on bare ground, showing a preference for open, level terrain with sand or gravel substrates [5].

Reproduction & life history

Masked boobies typically lay clutches of two eggs, although only a single chick is fledged [5]. Eggs are incubated for around 6 weeks and chicks fledge at approximately 5.5 months, although parents may continue to feed their young at the nest site for a further 3 - 4 weeks [5]. Breeding success at Ascension Island is comparatively low at 9-37 % [2,5]. Egg laying is frequently reported to peak between May and July [5], although there is clearly substantial variation in breeding phenology among years (AIG Conservation unpublished data).

Taxonomy & population structure

Masked boobies nesting at Ascension Island are genetically distinct from Caribbean and Indo-Pacific populations [13]. No phylogenetic analyses have been conducted within the South Atlantic, however there are no recorded migrations of ringed birds between Ascension Island and either Brazilian or St Helenian nesting populations, suggesting limited demographic connectivity.

4. Threats*

5.4.4 Fishing & harvesting aquatic resources: Unintentional effects, large scale	**Impact:**	MEDIUM

Ascension Island lies within an area of high tuna long-lining effort [14], which poses both direct and indirect threats to seabirds. Although local observer data are lacking, evidence from national fisheries observer programmes in the Atlantic, Pacific and Indian Oceans suggest that direct mortality of boobies due to incidental capture in pelagic longlines is very low [15–17], probably because these species prefer active prey and do not typically pursue fishing vessels in search of discards [14,18]. The indirect impacts of fishing on marine food webs may therefore be of greater concern. Although masked boobies feed by plunge diving, they are only able to access prey within the top two metres of the water column [19]. Consequently they rely heavily upon subsurface predators, such as yellowfin tuna, to drive their prey within reach [12]. Declines in tuna abundance linked to overfishing would therefore have potentially significant impacts on masked booby survival and breeding success. The Atlantic yellowfin and bigeye tuna fisheries are currently regarded as sustainable by the regional regulator, ICCAT, although there has been a long term decline in their populations since the 1960s [20]. The impact this has had on masked boobies is unknown.

8.1.2 Invasive non-native/alien species/diseases: named species	**Impact:**	LOW

Feral cats were previously the major threat to masked boobies on Ascension Island [21] but were successfully eradicated between 2001 and 2006 [2]. Ship rats (*Rattus rattus*) still occur in all mainland habitats, including the booby nesting colonies of the Letterbox Peninsula [22], and appear to be rapidly increasing in number following the feral cat eradication [23]. They are not generally considered to be a significant predator of booby eggs and chicks [8,24,25], although data from Ascension Island is lacking. The rapid spread of invasive, drought tolerant shrubs such as *Prosopis juliflora*, *Psidium guajava* and *Nicotiana glauca* over much of Ascension Island's previously barren coastal lowlands also poses a potential threat to ground nesting seabirds. These species have not yet reached the booby nesting colonies of the Letterbox Peninsula, but unless their spread is controlled it is likely that encroachment will occur in future. Several perennial and annual weeds such as *Waltheria indica*, *Heliotropium curassivicum*, *Chenopodiastrum murale* and wild tomato (*Solanum* sp.) are also increasingly expanding their range into the seabird nesting areas of the Letterbox Peninsula. Masked boobies require a clear, flat area to take off and land and tend to avoid nesting in areas of dense vegetation [8], so the spread of weeds could significantly reduce the extent of suitable nesting habitat.

11.1 Climate change & severe weather: habitat shifting and alteration	**Impact:**	UNKNOWN

Few data exist on the interactions between climate, oceanography and seabird productivity at Ascension Island; however, it appears that the importance of the Island as a seabird breeding station relates to its position within a zone of seasonally elevated productivity driven by the westward-flowing South Equatorial Current [10,26]. Any changes in current strength and position as a result of climate change could therefore have significant impacts on the productivity of the marine ecosystem and food availability for seabirds. Indeed, mass seabird breeding failures periodically occur at Ascension Island and there is circumstantial evidence to suggest that these are related to climate anomalies such as ENSO [27].

3.3 Energy production & mining: renewable energy	**Impact:**	LOW

In April 2010**,** five 53.5 m wind turbines were erected adjacent to the BBC power station complex at English Bay [28] and have since become a small but consistent source of seabird mortality. The turbines sit on an important coastal fly-way for birds commuting to and from Boatswain Bird Island [27] and are estimated to kill 30-40 seabirds annually, 40 % of which are masked boobies (AIG Conservation, unpublished data).

*Threats are classified and scored according to the IUCN-CMP Unified Classification of Direct Threats [29]

5. Relevant policies and legislation

International

Ascension Island and Boatswain Bird Island are currently designated as Important Bird Areas by birdlife international.

Local

Masked boobies are protected under the Wildlife Protection Ordinance 2013, which prohibits the killing, capture or taking of seabirds or their eggs on Ascension Island without license.

The majority of masked booby nesting is contained within protected areas designated under the National Protected Areas Order 2014. Boatswain Bird Island is designated as a Sanctuary, and the Letterbox Peninsula is designated as a Nature Reserve. The National Protected Areas Regulations 2014 restrict all forms of development within protected areas and prohibit access to Boatswain Bird Island without permit.

6. Management notes

Preventing over-fishing and preserving foraging associations between tuna and seabirds is probably the most pressing management issue facing masked boobies, but may be difficult to influence locally due to the highly migratory nature of tuna species. Regional stock management at the ICCAT level may therefore be the only effective means of achieving this goal. Nonetheless, research into the behaviour of tuna within Ascension Island's marine zone is urgently needed to establish whether more resident populations exist that can be effectively protected at a local level. A 2014 review of Ascension's inshore and offshore fisheries conducted by Cefas [30,31] and an earlier report by Envirofish [32] proposed a number of measures to strengthen fisheries management within Ascension Island's EEZ, including improved licensing, enforcement and data collection. There are also growing calls to close offshore areas to commercial fishing of any kind, subject to alternative funding sources being found to meet the costs of enforcement. Irrespective of the final model of marine protection that is adopted, monitoring of seabird productivity and population trends will continue to form an important part of any broadly based system for assessing the health of Ascension's marine ecosystem. Masked boobies in particular are accessible indicator species and regular monitoring of fledging success should be continued indefinitely, supplemented if possible by periodic dietary studies and GPS tracking to characterise any shifts in foraging behaviour.

Following the eradication of feral cats, threats to nesting masked boobies are now thought to be relatively minor. However, without management, some degradation of nesting habitat by invasive weeds will almost certainly occur in the long-term. Preventing the spread of woody species into the important nesting areas of the Letterbox Peninsula should still be practical through frequent, low-level management and would be best organised through a formal site management plan to give continuity of action. Although rat predation is not thought to be significant for boobies, periodic monitoring of rat densities on the Letterbox Peninsula would also be prudent to establish long term trends and detect emergent threats.

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