

Birds of the British Indian Ocean Territory, Chagos Archipelago, central Indian Ocean

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Introduction

The Chagos Archipelago lies at the end of the Chagos-Laccadive Ridge and is some 500km due South of the Maldives archipelago. It is the final termini for migrating organisms heading South in the central Indian Ocean. It is made up of five islanded atolls centred upon the Great Chagos Bank, the largest atoll structure in the world. The climate is tropical oceanic, hot and humid yet moderated by trade winds. Mean monthly temperatures vary from a maximum of 30.75°C in March to a minimum of 28.03°C in August. The northern atolls of the archipelago are the wettest in the Indian Ocean (Stoddart & Taylor 1971).

The entire archipelago is given over to defence purposes and access is severely restricted (http://www.jncc.defra.gov.uk/pdf/of_biot/pdf accessed 19 July 2015). The history of the Chagos Archipelago, also called the British Indian Ocean Territory (BIOT – hereafter referred to as the Chagos), is out with the scope of this article, further reading on this United Kingdom Overseas Territory's past can be found in the likes of Scott (1963), Edis (1994), Vine (2009) and, Wenban-Smith & Carter (in press). The archipelago and surrounding seas were designated in 2010 as a Marine Protected Area by the British Government, at 640,000km² it is the largest no-take marine reserve in the world. There is a RAMSAR site based upon the largest island of Diego Garcia (http://www.jncc.defra.gov.uk/pdf/of_biot/pdf accessed 19 July 2015).

Young in geological terms, exceedingly remote, flat and truly oceanic having never been connected to a mainland, as would be expected the native terrestrial biodiversity is impoverished. For example, there are no native mammals, extraordinarily this includes bats (Carr 2011a), less than 50 species of native higher plant (Topp & Sheppard 1999) and only two native reptiles (Mortimer & Day 1999). To date, on land only one full species, a moth, has been classified as endemic (Barnett & Emms 1999). The seas of the archipelago are assessed as some of the cleanest in the world and the associated coral reefs are used by scientists as a template for what coral reefs that have suffered little anthropogenic disturbance should look like (Koldeway *et al* 2010: Sheppard *et al* 2013). The story on land is very different. As has happened globally, man's arrival on the islands (in the late 1700's) wrought ecological disaster, primarily through native forest being cleared and the introduction of alien species. In addition to humans, introduced rats, cats, dogs and hogs decimated avian populations, in particular the once abundant breeding seabirds (Bourne 1971).

Bourne (1971) stated that, "The Chagos group occupy a strategic position, not only militarily but ornithologically. They are isolated in the remotest possible position in the tropical Indian Ocean, in a situation lying in the path of both landbird vagrants

from three directions, the east, north and west and seabird migrants from four, the north and south and dispersing east and west along the equatorial counter current systems." Observations post-1971 have proven that Bourne's words were prophetic; landbird and seabird vagrants and migrants are an exciting aspect of birding in the Chagos. The vast majority of migratory species are of northern hemisphere origin (though there is evidence that a limited number of vagrants are from the east and west) and are generally present in the archipelago from September through to March. As more ornithological research is conducted in to seabirds at sea in the Chagos, east–west passage migrants such as Matsudaira's Storm-petrel *Oceanodroma matsudairae* are being recognised as regular at certain times of the year, as are southern hemisphere winter visitors such as Wilson's Storm-petrel *Oceanites oceanicus* (Carr 2014).

In addition to the migrants and vagrants are 18 species of breeding seabirds (Carr 2011a; Carr *et al.* 2013) of which five are in sufficient numbers to qualify 12 islands for IUCN categorised Important Bird Area status (Carr 2006; McGowan *et al.* 2008). It has been proposed that the single island IBA classification for the Chagos be amended to clusters of islands due to the most abundant breeding seabird, Sooty Tern *Onychoprion fuscatus*, periodically deserting islands due to infestations of avian ticks (Carr 2011b; Carr *et al.* 2013).

There is also a small number of resident breeding land-birds that are made up of natural colonists whose origins and present taxonomical status is of interest, and of introduced exotics, the provenance and taxonomic status of which is a matter of some debate.

Between 2005 and 2013 there was an unprecedented amount of bird recording in the archipelago as there were two active ornithologists resident on Diego Garcia, and a number of scientific expeditions had been granted permission to visit the area (Carr 2011a, 2014). This heightened activity resulted in over 25 species new to the Chagos being recorded, most with accompanying confirmatory photographs.

The aim of this article is to discuss species that occur in the Chagos that may be of interest to birders in the Indian Subcontinent.

Potential weather influences

It is of note that the weather pattern in the Chagos could influence the time of arrival of any vagrant from the Chagos to the north. Between October and April, when the majority of species are at the peak of breeding, winds are light or moderate, and generally from the north-west. Between December and February the Inter-Tropical Convergence Zone (ITCZ) is either over, or just south of, the Chagos, then it moves north. For the rest of the year, the

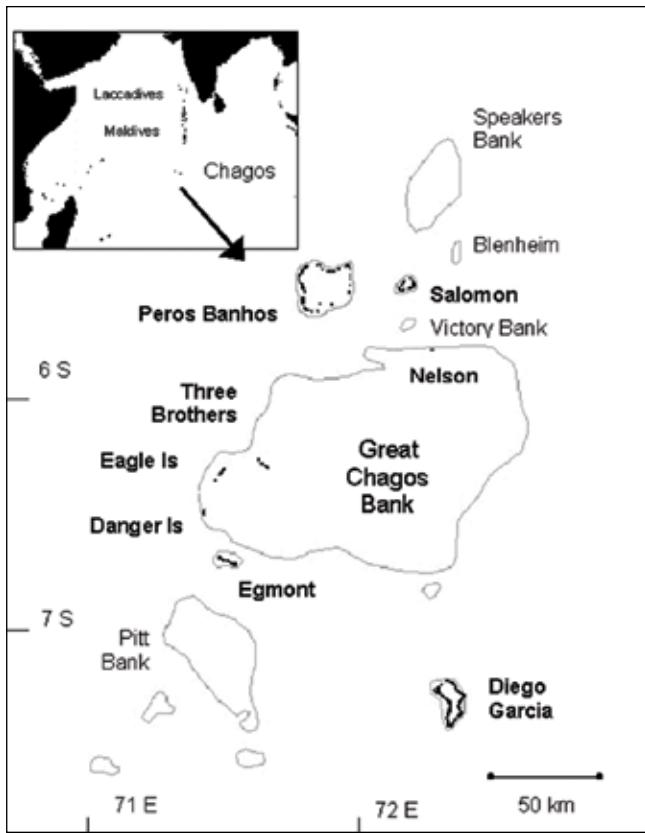


Fig. 1. The Chagos Archipelago.

south-eastern trades blow strongly, and potentially these could bring inexperienced young birds north.

General information

The recording area used for the Chagos in this article is as defined in Carr (2011a) and loosely encompasses the BIOT Economic Exclusion Zone from 02°–11°S, 68°–76°W. Nomenclature follows Dickinson & Remsen (2013) for non-passerines and Dickinson & Christidis (2014) for passerines. The Appendix provides a tabulated reference to all birds that have claimed to have been recorded in the region.

Species accounts: Migrants & vagrants

Australian Shelduck *Tadorna tadornoides*

Australian Shelduck [50] is restricted as a breeding species to southern Australia, though is expanding its range and has recently bred in New Zealand. It is noted for its vagrancy and has been recorded on many oceanic islands including Raoul Island and Kermadec Islands in the Pacific some 3000 km from Australia (<http://nzbirdsonline.org.nz>; accessed on 13 February 2015). Of the Chagos, Guzman (2003) reports "Five juveniles...in Sept 2002. A month later, I saw and took pictures of the two adult pairs." Photographs of these birds have been published (Carr 2011a) and there is no doubt as to the authenticity of the record. How these birds arrived on Diego Garcia, some 4700 km from the west coast of Australia is a mystery, however, with their preponderance for oceanic vagrancy it does not appear unrealistic to assume they arrived under their own steam. Further, it is hard to imagine a small flock of ducks stowing away on a ship, and sea



50. Australian-Shelducks

passages between Australia and Diego Garcia are very seldom undertaken. This suspected vagrancy has implications for Indian birders as, had these birds not found sanctuary at sewage works in the Chagos, their next north-bound stop could have been either the Maldives or the southern Indian coast.

Tahiti Petrel *Pseudobulweria rostrata*

Pterodroma petrels should be expected in the northern Indian Ocean, especially Barau's Petrel *P. baraui* (Stahl & Bartle 1991; van den Berg et al. 1991; Praveen et al. 2013), and the "Round Island Petrel" *Pterodroma* sp. Unpublished tracking data of birds from Round Island, Mauritius, has demonstrated that birds from this island move far and wide across the Indian Ocean; and the Atlantic and Pacific (Nicoll, Zoological Society of London, pers.



Photos: Peter Carr

51. Tahiti Petrel

comm.). Carr (2014) photographed a *Pterodroma* petrel in the Chagos on 23 November 2012 that was identified as a Tahiti Petrel [51], this was later confirmed by Capt. Neil Cheshire and Dr. Charles Anderson. Definite and probable sightings in the Indian Ocean of this vagrant from the Pacific are increasing, and it may only be a matter of time before it is added to the Indian bird checklist.

Shearwater species *Puffinus* sp.

A single small *Puffinus* shearwater was photographed in flight near Nelson's Island on the northern rim of the Great Chagos Bank on 04 April 2015. The bird was noticeably browner and had a more extensive collar (saddlebags) than the local breeding Tropical Shearwater. At the time of writing the identity of this bird is still being discussed though Persian Shearwater *Puffinus persicus* is emerging as a strong candidate.

Bulwer's Petrel *Bulweria bulwerii*

An increase in dedicated pelagic expeditions in the Chagos since 2012 has revealed the Bulwer's Petrel [52] to be not uncommon there in the northern hemisphere winter months. For example, ten individual birds were recorded through 21–29 November 2012 (Carr 2014) and a further seven during 10–25 January 2015 [Carr, Zoological Society of London (henceforth, ZSL), unpublished].

Jouanin's Petrel *Bulweria fallax*

Despite distribution maps, in Harrison (1983), and Onley & Scofield (2007), indicating that this species occurs in or near the Chagos, there are only two records to date. A January 1960 record exists in Bourne (1971), and Carr (2014) claims a second bird sighted on 01 August 2014. Either the species is being under-recorded / misidentified or it remains further west in the



52. Bulwer's Petrel

Photos: Peter Carr



53. Matsudaira's Storm-petrel

central Indian Ocean than the published literature suggests.

White-faced Storm-petrel *Pelagodroma marina*

A distinctive species that is similar to the previous one, the literature suggests it should be recorded in Chagos waters. To date there are four records, the last being on 26 November 2012 (Carr 2014). It is unlikely this species is being missed or misidentified in the Chagos and the lack of records is attributable to either the lack of pelagic recording or, it does not transit through or disperse to the central Indian Ocean.

Black-bellied Storm-petrel *Fregetta tropica*

Onley & Scofield (2007) give the distribution of this southern hemisphere breeder as Indian Ocean-wide in the non-breeding season. There remains a single record in Chagos waters from June 1964 (Bourne 1971). Despite the limited *dedicated* pelagic recording, the author has undertaken numerous transits (30+) from Diego Garcia to the northern atolls on the BIOT Patrol Vessel since 2008, it is safe to state that this species is at least, extremely rare in Chagos waters.

Matsudaira's Storm-petrel *Oceanodroma matsudaira*

The recent upsurge in pelagic expeditions in the Chagos has revealed this species [53] to be present in at least November with a minimum of 30 individual birds sighted through 21–26 November 2012. Of interest, 25 of these birds were associated with seamounts, and the remaining five were recorded above a shallow bank (Carr 2014). As these particular marine habitats are seldom visited by ornithologists in the Chagos it remains to be ascertained whether these birds only transit through the central Indian Ocean to and from breeding grounds in the Pacific and

wintering grounds off Africa, as commonly believed (Onley & Scofield 2007) or, if they remain in the Chagos for at least some of the non-breeding season, associating with specific marine upwelling areas. No storm-petrels of any species were recorded over the same sites in January 2015 (Carr, ZSL, unpubl.).

Dimorphic Egret *Egretta garzetta dimorpha*

Appendix F2 a. of the Diego Garcia Integrated Natural Resources Management Plan (DGINRMP 2005) under the heading for this species states, "This is the first record of the dimorphic egret at Diego Garcia [sic]. A single individual was observed and photographed on 1 February 1995 at the sand pit. The most notable item about this sighting is that the bird is banded (ringed)". The caption has an accompanying photograph and can be viewed at www.zianet.com/tedmorris/dg/2005NRMP-Appendixf-birdsandmammals.pdf. The defunct website www.worldbirds.com holds a further series of records, probably relating to a long-staying individual on Diego Garcia between October 2009 and March 2011. In view of the taxonomic uncertainty of this species, the difficulty of positively identifying this species group out of breeding plumage, and the African distribution of this subspecies and therefore, an unlikely candidate for vagrancy to the central Indian Ocean, it is wise to leave these records as unconfirmed.

Christmas Frigatebird *Fregata andrewsi*

There have been a series of sightings of suspected juvenile Christmas Frigatebirds from the Chagos since 2009 (Carr, ZSL, pers. obs.). Photographs of these birds have been circulated amongst frigatebird experts, including David J. James (see James 2004). The verdict on the identification of these birds has never been conclusive (though the majority opted for Christmas Frigatebird in all cases), and therefore this species remains as a "possible" in the Chagos. In view of its vagrancy in the Indian Ocean it remains a very strong candidate for a positive sighting.

Lanner Falcon *Falco biarmicus*

There is a report of a pair (sic) of Lanner Falcon being present on Diego Garcia for at least two days in February 2002 (Editor's Note in Guzman 2003). These birds were photographed, but to date the photographs have not been traced. Lanner Falcon migrates locally in West Africa and tend towards nomadism in the east and south of its range (Ferguson-Lees & Christie 2001); therefore it is not a strong candidate for vagrancy to the central Indian Ocean. However, one of the finders of these birds was a part-time falconer, another was a credible and published botanist with a thorough understanding of the requirements of identification and to the significance of this record; therefore it is presumed that this record is correct. What is not known is the provenance of these birds. It appears unlikely that they were escaped falconry birds due to the absence of jesses; ship-assistance is also unlikely due to the lack of traffic through the Chagos. However unlikely, all factors point towards these birds being genuine vagrants.

European Honey-buzzard *Pernis apivorus*

There are two records of this species [54] from the Chagos probably relating to the same bird. The first encounter was on 20 September 2012, the second on 22 October 2012. Both

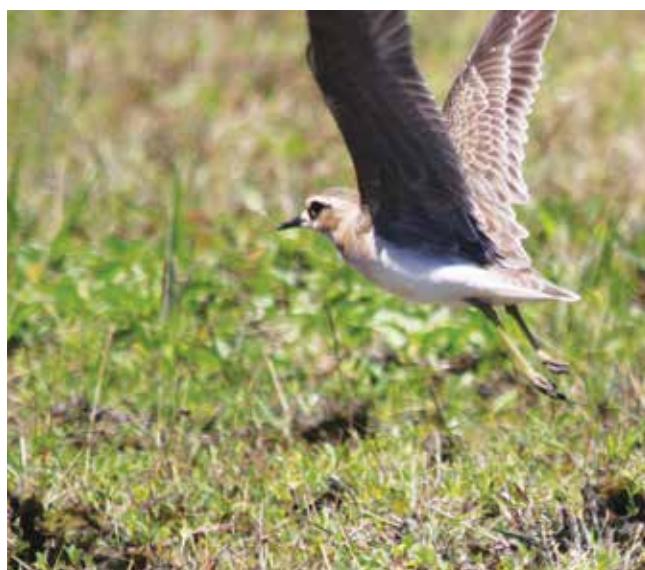


54. European-Honey Buzzard

sightings were from the same area on the main island of Diego Garcia. Photographs of this bird were shared for identification purposes (Carr 2014). There are seven records to date from the Seychelles (SBRC 2015), not unexpected, being further west and closer to this species' migration routes. There are no records from the Maldives (Anderson 2011, and records therein), possibly suggesting this is an unlikely candidate in India.

Oriental Plover *Charadrius veredus*

A well-photographed juvenile was present on Diego Garcia from 18 September to 14 November 2012 (Carr 2014). Perhaps, surprisingly, this species [55] has not been recorded in the Maldives (Anderson 2011, and records therein); yet there are five records for the Seychelles (SBRC 2015). Breeding in northern China, and wintering in Indonesia and northern Australia



55. Oriental Plover



56. Far Eastern Curlew

(Hayman *et al.* 1986) this highly migratory species is prone to vagrancy, e.g., Thailand (Ogle 1992), and therefore was not totally unexpected in the Chagos.

Far Eastern Curlew *Numenius madagascariensis*

A single bird [56] of this IUCN classified Vulnerable species was present on Diego Garcia through 04–06 November 2007 (Carr 2011a). Breeding in eastern Russia, and wintering mainly in Australia, this species has been recorded west to Thailand, Vietnam, Malaysia, and Singapore (BirdLife International 2015). Although seemingly prone to westerly vagrancy, the scarcity



Photos: Peter Carr
57. Grey-tailed Tattler

of this species makes it an unlikely candidate to be recorded outside of known migration routes and stopovers.

Grey-tailed Tattler *Heteroscelus brevipes*

Since the first record of this IUCN classified Near-threatened species [57] in 1995 (DG INRMP 2005), there have been a further six from throughout the year, all on Diego Garcia (Carr 2011a, 2014). These oceanic island vagrants to the central Indian Ocean are consistent with this species' known extraordinary wanderings (Van Giles *et al.* 2014b).

Red-necked Stint *Calidris ruficollis*

Carr (2011a) gives the details of the historic claims of this species in the Chagos, only one of which has been deemed to have enough supporting evidence to have been accepted as "beyond reasonable doubt," due to the difficulties of identification in anything other than breeding plumage. The only record with confirmatory photographs is of a single bird on Diego Garcia on 12 November 2009. Breeding in north-eastern Siberia and northern and western Alaska, with a migration route along the East Asian–Australasian Flyway to Australia (BirdLife International 2015), this species is prone to vagrancy and should be expected in both, the Chagos, and India.

Long-toed Stint *Calidris subminuta*

There are now double figure records of this distinctive little wader in the Chagos, all from Diego Garcia, and all during the northern hemisphere winter months. The earliest migrant was found on 20 September 2011, the latest on 08 April 2010. Given that part of the breeding population winters in eastern India, and Sri Lanka, and some birds migrate overland to South-east Asian, and Philippine wintering grounds (Van Giles & Wiersma 1996), vagrants to the Chagos are unsurprising.



58. Pectoral Sandpiper

Pectoral Sandpiper *Calidris melanotos*

Up to six birds [58] have been found and well photographed on Diego Garcia between 2007 and 2012; the earliest on 14 October 2012, and the latest on 20 January 2009. It is surprising that despite this species' noted tendency for vagrancy, e.g., nine records for the Seychelles (SBRC 2015), Hawaiian Islands, Morocco, and Kazakhstan (Van Giles *et al.* 2014a), it has not been found on the Maldives to date (Anderson 2011, and records therein).

Sharp-tailed Sandpiper *Calidris acuminata*

Five birds have been recorded between 2009 and 2012, all found on Diego Garcia in the northern hemisphere winter. The earliest record was on 08 September 2011 and the latest record on 13 December 2009. A noted vagrant to archipelagos, with a north–south migration broadly from Siberia to Australia (Van Giles *et al.* 2013), this species' [59] appearance in the Chagos fits comfortably with other such migratory shorebirds recorded there.

Collared Pratincole *Glareola pratincola*

There are two records from the Chagos to date, both on Diego Garcia, both associated with Oriental Pratincole *G. maldivarum*. The first bird was found and photographed on 26 December 2009 and remained until 08 March 2010. The second bird was found on 02 October and last seen on 14 November 2012. Presumably, these birds were the nominate race that breeds east to Kazakhstan and Pakistan (Maclean & Kirwan 2013).

Kelp Gull *Larus dominicanus*

As noted by Praveen *et al* (2014), there is one extraordinary record from Nelson's Island on 07 February 1975 produced by a UK Joint Services Expedition; a description of this bird is contained in the expedition report. It is unlikely that this southern



59. Sharp-tailed Sandpiper

hemisphere species was given passage to the Chagos and it may help to prove Bourne's (1971) prophetic words that migrants and vagrants should be expected in the Chagos from the four points of the compass. There is a second record of a black-backed gull *Larus fuscus*-type that was seen briefly on Diego Garcia on 26 May 2005 (Carr 2005). Due to the lack of detail, this bird was not given specific species status (Carr 2011a).

Arctic Tern *Sterna paradisaea*

The status of this species in the Chagos is now in question. There have been several claims since 1996 (Carr 2011a), though subsequent examination of photographs of some of these birds have shown them to be Common Tern *Sterna hirundo* in non-breeding plumage. It is not out of the question that Arctic Tern are found on passage in the Chagos, especially in the southern waters. However, until evidence that puts the record "beyond reasonable doubt" is produced, this species has been placed on the hypothetical list. There are no records to date of this species from either the Seychelles (SBRC 2015), or the Maldives (Anderson 2011, and records therein).

Black Tern *Chlidonias niger*

Carr (2013, 2014) records the story behind the extraordinary discovery of at least three of "One of the most contentious species recorded in India" (Praveen *et al.* 2014) in a breeding colony of Sooty Tern on South Brother Island on 26 July 2010. Of particular interest is the date of occurrence, and the plumage of these birds. All the birds in the photographs have black breasts and heads, with white lower bellies, and crucially, all white underwings (near full adult breeding plumage) [60]. White-winged Tern *Chlidonias leucopterus*, that are annual migrants in small numbers in the Chagos retain black on their axillaries until at least December, and often until they depart northward in February. There has been another claim by a UK Joint Services Expedition of a single bird in the Egmont Islands on 01 February 1975, but as there is no



60. Three Black Terns in a flock of Sooty Terns.

supporting evidence this record is unconfirmed (Carr 2011a).

White-throated Needletail *Hirundapus caudacutus*

A single record exists of a lone bird photographed on Diego Garcia during 03–08 November 2007 (Carr 2008). It is presumed this bird was the highly migratory nominate, rather than the more sedentary, Himalayan Needletail *H. c. nudipes*. Whilst the photographs were clear enough to identify the species, sub-specific identification is not possible from them.

Common Swift *Apus apus*

This species has been categorised as "...a very rare but seemingly annual overshooting migrant..." in the Chagos (Carr 2011a). Presumably, these birds are of the subspecies *A. a. pekinensis* that have a broadly similar migration pattern from Asia to East and South Africa (Chantler et al. 2015) as Amur Falcon *Falco amurensis*, which is also very rare but an annual visitor in the Chagos.

Species accounts: Introduced species

Cattle Egret *Bubulcus ibis*

Vagrant Cattle Egrets have been recorded on Diego Garcia since the first ornithological records were published, with Bourne (1886) collecting a male of the Asiatic subspecies *B. i. coromandas* [sic] there in 1885. In 1955, 12 birds were introduced from the Seychelles to control pests (Lever 2005) so were presumably of the disputed *B. i. seychellarum* subspecies, or the nominate one, depending upon which taxonomist is followed. Immigration is still occurring, with Carr (2011a, 2015) noting vagrant birds throughout the archipelago between 2008 and 2015. Carr (2015), when reviewing the subspecies of Cattle Egret in the Chagos states that "...with naturally occurring vagrants that most likely arrive from the north (and therefore should be [Eastern Cattle Egret] *coromandus*) and introduced birds from the Seychelles (that are either [Western Cattle Egret] *ibis* or *seychellarum* dependent upon which taxonomist is followed), the question remains as to which "species" breeds on Diego Garcia? Reviewing a limited number of photographs of breeding plumage Cattle Egret taken through 2005–2014 on Diego Garcia, based upon the plate in Hancock & Kushlan (1984, p. 28 - that best depicts the breeding bill colour as well as plumage), both *ibis* and *coromandus* breed in BIOT....". On Diego Garcia these subspecies freely interbreed. There are potential implications for the Indian Bird List, and elsewhere, if these birds are dispersing and the national bird list separates *B. i. coromandus* from the nominate, at the species level.

Madagascar Turtle-dove *Nesoenas picturata*

This species only occurs on Diego Garcia atoll, on the main island plus the nearby East and Middle Islands. It has a total population of 100–200 breeding pairs and is equally seen in and around urban areas as it is in the remaining forested areas (Carr 2011a). The provenance and taxonomic status of this species in the Chagos is presently speculative, at best. To establish its date of arrival Lever (2005) quotes a personal communication of 2004 with Stafford who suggests the species could be native to the Chagos, though Benson (1970) suggests pirates introduced them in the seventeenth or eighteenth centuries as a food source. If the birds in the Chagos are not an endemic subspecies then it

is likely they were introduced from the Seychelles as suggested by Hutson (1975) as most of the other introduced birds were. It is not unreasonable to believe they were originally introduced as a food source, and subsequently, either escaped, or were released. As to the taxonomic status, Bourne (1971) supports the endemic subspecies *N. p. chuni*; more recently, Baptista et al. (1997) says the nominate was most likely introduced and is probably now hybridising with introduced *N. p. comorensis*, whilst Benson (1970) advocates that the Chagos birds deserve sub-specific recognition under the name of *N. p. limbata*. Plainly, further research is required and DNA analysis would be of some benefit. Fortunately, this species does not appear to tend towards vagrancy and is unlikely to wander northward to India or to the Maldives from the Chagos.

Zebra Dove *Geopelia striata*

This species was introduced in 1960 to the Chagos by Raymond Mein, a Seychellois worker on Diego Garcia (Lever 2005). It is only found on the main island of Diego Garcia where there is a population of 100–200 breeding pairs. Similar to the turtle-dove above, this species appears very sedentary and has not even colonised islands in the same atoll, so is unlikely to appear on Indian shores from the Chagos.

Madagascar Red Fody *Foudia madagascariensis*

From the founding stock introduced sometime before 1884 (Lever 2005), this species has successfully colonised every island in the archipelago that is capable of sustaining a population, some as small as four hectares (Carr 2011a). It is also regularly seen flying between islands in atolls (Carr, ZSL, pers. obs.). With its' successful colonisation of all islands of the Chagos and an obvious apparent readiness to cross open water, it may be a candidate for vagrancy northwards to either the Maldives or to India.

Species accounts: Breeding seabird species

Wedge-tailed Shearwater *Puffinus pacificus*

The commonest shearwater in Chagos waters. It is present all year round, and should be seen on any sea voyage at any time of the year. There are challenges to accurately monitoring burrow-nesting species on islands that are troublesome to swim on to; it is believed there is a stable population of between 1500–3000 pairs breeding annually. The majority of these birds are found on North Brother on the western side of the Great Chagos Bank. The main breeding season is between October and March, though birds nesting in the urbanised part of Diego Garcia have been found with chicks in other months. To date there have only been two sightings of pale phase birds (Carr 2011a).

Tropical Shearwater *Puffinus bailloni*

A common breeding species [61] presenting the same challenges for accurately monitoring as the previous species. It is thought the breeding population is stable and in the region of 750–1500 pairs and these are centred upon North Brother- and South Brother Islands. The breeding season commences in October and has generally completed by mid-April. The taxonomy of this recently split group remains unresolved; the form breeding in the Chagos being assigned to *P. b. nicolae*. Further research may be required to confirm this.



Photo: Peter Carr

61. Tropical Shearwater

Red-tailed Tropicbird *Phaethon rubricauda*

An uncommon breeding species in the Chagos, only known to breed on Diego Garcia; seldom recorded on any other atoll. The maximum count to date is of 16 breeding pairs in 2002 (Guzman 2003). It breeds on the ground, either in isolation or semi-colonially, and does not have a set breeding period in the Chagos. The subspecies breeding in the Chagos has not been ascertained to date. Despite this species being regarded as the most pelagic of the tropicbirds (Orta *et al.* 2014), due to its minuscule numbers in the Chagos, it is unlikely to be a vagrant to India from the Chagos.

White-tailed Tropicbird *Phaethon lepturus*

Less than 50 pairs breed throughout the Chagos on islands where sufficient forest with mature trees with nesting cavities remain, and provide breeding sites. Of interest, there have been sightings of 'golden-washed' tropicbirds in the Chagos (Carr 2011a), including nest-prospecting birds. These were claimed as the Christmas Island endemic subspecies *P. l. fulvus*, though the Europa Island (South Mozambique Channel) endemic *P. l. europae* was not considered at the time of identification. Whichever subspecies these are sightings of, they will have covered a distance capable of putting them in Indian waters.

Red-footed Booby *Sula sula*

This is the most abundant large seabird in the Chagos with some 12000 pairs breeding annually. The subspecies present is *S. s. rubripes* and the entire population is made up of the white morph (with the exception of a single breeding pair of white-tailed brown morph birds). This species breeds throughout the year with a noticeable spike in breeding numbers in March/April. The population is expanding its breeding range and increasing in numbers (Carr 2011a), contra to populations in the western Indian Ocean (Feare 1978). For example, in April 2015 four new islands had been (re?)colonised in western Peros Banhos, these being the latest in a series of breeding range expansions noted since the first comprehensive seabird census in 1996 (Symens 1999). To date, no research has been conducted in the Chagos to ascertain where this species spends the non-breeding period. It is quite possible it remains in the vicinity of the breeding islands. However, *S. s. rubripes* is the longest winged, and lightest, of the subspecies and is easily capable of

reaching Indian waters.

Brown Booby *Sula leucogaster*

Found throughout the Chagos, similar to the previous species, Brown Booby has been increasing in breeding numbers and expanding its breeding range and there are now in the region of 750–1000 pairs breeding annually. Since the first seabird survey in 1996 (Symens 1999) it has (re?)colonised the Salomon's Islands atoll and Ile Longue in Peros Banhos and has increased by c. 100% since 1996. The subspecies present is *S. l. plotus*. Again similar to Red-footed Booby, it has a protracted breeding season with spikes of breeding activities. How and where it feeds and where it roosts in the non-breeding period is not known though it is believed that adults remain in the vicinity of breeding islands and juveniles and immatures move further afield (Carboneras *et al.* 2014) It is more than capable of the transit required to Indian waters from the Chagos.

Roseate Tern *Sterna dougallii*

A minuscule breeding population (02–20 pairs) exists in the Chagos; the normal breeding period appears to be October–April. The subspecies present has not been determined to date. It is an unlikely candidate for vagrancy north to India from the Chagos.

Black-naped Tern *Sterna sumatrana*

This species is found in the lagoons of all of the atolls of the Chagos and all four atolls hold small nomadic breeding populations. There are 20–100 breeding pairs in the archipelago and the normal breeding period is October–April, though breeding has been recorded outside this period. It is another unlikely candidate as a vagrant from the Chagos to India.

Lesser Noddy *Anous tenuirostris*

A species with a very complicated breeding strategy in the Chagos. It breeds throughout the Chagos with three epicentres holding the bulk of the population that nest at differing times. Approximately 40000 pairs of the nominate subspecies nest annually. When feeding and foraging in the Chagos it is very much an inner lagoon species and is seldom seen more than a kilometre from land. Where it spends the non-breeding period is unknown. It is more than capable of reaching Indian waters.

White Tern *Gygis alba*

A common species throughout the Chagos though not particularly numerous. There are perhaps 250–650 breeding pairs nesting on most islands in all atolls. It does not form single species flocks though is often seen far out at sea at prey balls with mixed species flocks, especially Red-footed Booby and Common Noddy *Anous stolidus*. Due to its pelagic feeding habits, it could be a potential vagrant north from the Chagos.

Discussion

It is unlikely that there are any new breeding species left to discover, though new colonists are always a possibility. Yellow Bittern *Ixobrychus sinensis*, Indian Pond-heron *Ardeola grayii* and Little Egret *Egretta garzetta* are probably the strongest candidates. Further detailed research in to the taxonomic status

of the Madagascar Turtle-dove could lead to a new subspecies. It is believed that the 18 breeding species of seabirds reflects what currently breeds in the Chagos. An examination of the taxonomic status of Tropical Shearwater may lead to at least an endemic subspecies and the golden-washed White-tailed Tropicbird, if found breeding, would prove exceedingly interesting and either a range extension or, less likely, a new subspecies.

Being the final termini for north / south migrants, the Chagos is highly unlikely to provide potential landbird vagrants or colonists north. Perhaps it is better used as an indicator of what species may occur as vagrants to the north from the east and to a lesser extent from the west. Diego Garcia with its freshwater wetlands is a magnet to overshooting vagrants or those pushed of course from western and eastern migration flyways. Due to the island's small size and concentrated birding spots, when birders are present on Diego Garcia, particularly through September to December, finding vagrants is nowhere as difficult as locating them on the mainland. The discovery of over 25 species new to the Territory between 2007 and 2013 may be testimony to this. The only land bird thought of, as a possible vagrant/colonist north, is Madagascar Red Fody, based upon the fact it has colonised every island in the Chagos, mainly unassisted.

It is the seabirds of the Chagos that may provide interesting records to the north. Pelagic foragers and feeders such as Red-footed Booby, Wedge-tailed, and Tropical Shearwater, and White Tern are probably the strongest candidates. It is presumed that if they were to appear as vagrants north, it is more likely to occur during the south-eastern trades after the peak breeding period, and involve inexperienced juvenile birds.

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Appendix

Table 1: A checklist of the birds of the British Indian Ocean Territory

[Reproduced with permission from the author from Birds of the British Indian Ocean Territory (Carr 2011a) and updated to July 2015.]

Legend

? = Status or date of occurrence uncertain; ○ = Occurs very exceptionally (< 10 birds ever) or involves long-staying individual birds; ● = Occurs annually in very low numbers (generally < ten birds/year); □ = Occurs annually or resident (generally <100 birds); ■ = Occurs annually or resident (generally >100 birds).

¹. Recorded from Diego Garcia only; ². Recorded only at sea; ³. Recorded from northern atolls only; ⁴. Recorded in all appropriate habitat throughout the Territory.

IBR = Introduced breeding resident, BR = Breeding resident, NBR = Non-breeding resident, NWV = Northern winter visitor, SWV = Southern winter visitor, PM = Passage migrant, V = Vagrant, ? = Status uncertain

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Species	Status	J	F	M	A	M	J	J	A	S	O	N	D
White-cheeked Tern <i>Sterna repressa</i> ¹	V	○	○	○	○	○				○	○	○	○
Bridled Tern <i>Sterna anaethetus</i> ⁴	BR	■			■		■	■	■	■	■	■	■
Sooty Tern <i>Sterna fuscata</i> ⁴	BR	■	■	■	■	■	■	■	■	■	■	■	■
White-winged Tern <i>Chlidonias leucopterus</i> ¹	V	○	○	○	○	○				○	○	○	○
Black Tern <i>Chlidonias niger</i> ³	V												
Brown Noddy <i>Anous stolidus</i> ⁴	BR	■	■	■	■	■	■	■	■	■	■	■	■
Lesser Noddy <i>Anous tenuirostris</i> ⁴	BR	■	■	■	■	■	■	■	■	■	■	■	■
White Tern <i>Cygis alba</i> ⁴	BR	■	■	■	■	■	■	■	■	■	■	■	■
Pomarine Jaeger <i>Stercorarius pomarinus</i> ³	V									○			
Parasitic Jaeger <i>Stercorarius parasiticus</i> ¹	V										○		
Rock Pigeon (Feral Pigeon) <i>Columba livia</i> ¹	V									○	○		
Madagascar Turtle-dove <i>Nesoenas picturata</i> ¹	IBR	■	■	■	■	■	■	■	■	■	■	■	■
Zebra Dove <i>Geopelia striata</i> ¹	IBR	■	■	■	■	■	■	■	■	■	■	■	■
White-throated Needletail <i>Hirundapus caudacutus</i> ¹	V									○			
Common Swift <i>Apus apus</i> ⁴	V										○	○	
Fork-tailed Swift <i>Apus pacificus</i> ¹	V										○	○	
European Roller <i>Coracias garrulus</i> ¹	V											○	
Blue-cheeked Bee-eater <i>Merops persicus</i> ⁴	V	○			○								
Eurasian Hoopoe <i>Upupa epops</i> ¹	V			○									
House Crow <i>Corvus splendens</i> ¹	NBR	○	○	○	○	○	○	○	○	○	○	○	○
Sand Martin <i>Riparia riparia</i> ¹	V										○		
Barn Swallow <i>Hirundo rustica</i> ¹	V	○	○							○	○	○	
Common Myna <i>Acridotheres tristis</i> ¹	IBR	■	■	■	■	■	■	■	■	■	■	■	■
Rosy Starling <i>Sturnus roseus</i> ¹	V										○	○	
House Sparrow <i>Passer domesticus</i> ³	?	?	?	?	?	?	?	?	?	?	?	?	?
Madagascar Red Fody <i>Foudia madagascariensis</i> ⁴	IBR	■	■	■	■	■	■	■	■	■	■	■	■
Yellow Wagtail <i>Motacilla flava</i> ¹	V					○				○	○	○	
Grey Wagtail <i>Motacilla cinerea</i> ¹	V				○	○							

Table 2: A checklist of the birds that have historic records but are not accepted as having occurred "beyond reasonable doubt" or, did occur but have died out from the British Indian Ocean Territory. A brief discussion of these records follows the table.

Species	Comment
Guineafowl species Numididae	A failed introduction
Grey Francolin <i>Francolinus pondicerianus</i>	A failed introduction
Common Teal <i>Anas crecca</i>	Erroneously named in original paper - should be "Garganey Teal"
Giant Petrel species <i>Macronectes</i>	Specimen not identifiable to species level
Persian Shearwater <i>Puffinus persicus</i>	Record under consideration
Southern Fulmar <i>Fulmarus glacialisoides</i>	Insufficient evidence to support record
Broad-billed Prion <i>Pachyptila vittata</i>	Insufficient evidence to support record
Gadfly petrels <i>Pterodroma</i> species	Identification not made to species level
White-bellied Storm-petrel <i>Fregetta grallaria</i>	Insufficient evidence to support records
Western Reef-egret <i>Egretta gularis</i>	Insufficient evidence to support record - record withdrawn
Christmas Frigatebird <i>Fregata andrewsi</i>	Records under consideration
Abbott's Booby <i>Papasula abbotti</i>	Insufficient evidence to support records
Pelican species <i>Pelecanidae</i>	Identification not made to species level
Sparrowhawk species <i>Accipitridae</i>	Identification not made to species level
Great Snipe <i>Gallinago media</i>	Author acknowledged identification uncertain
Asian Dowitcher <i>Limnodromus semipalmatus</i>	Insufficient evidence to support record
Nordmann's Greenshank <i>Tringa guttifer</i>	Insufficient evidence to support record
Wandering Tattler <i>Heteroscelus incanus</i>	Insufficient evidence to support record
Lesser Black-backed Gull <i>Larus fuscus</i> species	Identification not made to species level due to taxonomic problems
Arctic Tern <i>Sterna paradisea</i>	Several claims but insufficient evidence and some birds proven to be misidentified by photographs
Whiskered Tern <i>Chlidonias hybrida</i>	Insufficient evidence to support record
Great Skua <i>Catharacta skua</i>	Insufficient evidence to support record
Long-billed Corella <i>Cocatua tenuirostris</i>	Unconfirmed failed introduction
Pigeon species <i>Columbidae</i>	Identification not made to species level
Little Swift <i>Apus affinis</i>	Insufficient evidence to support record
Pied Crow <i>Corvus albus</i>	Insufficient evidence to support record
Northern House-martin <i>Delichon urbicum</i>	Insufficient evidence to support record
Bulbul species <i>Pycnonotidae</i>	Insufficient evidence to support record
Golden-crested Myna <i>Ampeliceps coronatus</i>	Record withdrawn

Notes on a checklist: Birds that have historic records of, but are not accepted as, having occurred "beyond reasonable doubt" or did occur but have died out in BIOT

Guineafowl species Numididae

A guineafowl, likely to have been Helmeted Guineafowl *Numida meleagris* was found in the Solomon Islands in 1905 by the Percy Sladen Expedition: it has never been reported since.

Grey Francolin *Francolinus pondicerianus*

This species was recorded on Diego Garcia in 1960 and was possibly still there in 1964. The possible 1964 record was the last potential sighting and it has certainly died out in BIOT.

Common Teal *Anas crecca*

There is a record of three female and a drake "Garganey Teal (*Anas crecca*)" in March 1995. It is certain that these records refer to Garganey *Anas querquedula* and not *Anas crecca*.

Giant Petrel *Macronectes* species

A record exists of a Giant Petrel species being bought on Diego Garcia in July 1970. The specimen is now in the Ministry of Agriculture in the Seychelles and has not been identified to species level to date.

Persian Shearwater *Puffinus persicus*

See main text. [62]

Southern Fulmar *Fulmarus glacialisoides*

A single record exists of this species being provisionally identified at sea in July 1958 at 10°S 69°E.

Broad-billed Prion *Pachyptila vittata*

There are records from pre-1971 and a recent claim of five Broad-billed Prions at sea at 7:0:0S, 78:12:0E on 19 Feb 2001. These



62. Persian Shearwater

records have been treated with caution due to the absence of substantiating evidence and the difficulty of identifying this genus at sea and also the potential vagrancy of several prion species in the Indian Ocean.

Gadfly petrels *Pterodroma* species

There are numerous possible sightings of this genus from BIOT waters, though with the exception of the Tahiti Petrel referred to in the main text, no other conclusive report has been published to date.

White-bellied Storm-petrel *Fregetta grallaria*

There are details of possible sightings of this species in BIOT waters, though no conclusive report has been published to date.

Western Reef-egret *Egretta gularis*

A claim exists of a sighting on Diego Garcia in March 1996 that was attributed to either this species or dark phase Little Egret *Egretta garzetta*. This record has been withdrawn.

Pelican species Pelecanidae

Information of a pelican in Peros Banhos lagoon in January 2009 were passed to the author by two yachts that were there at the time, there is insufficient detail to claim a positive record to species level.

Abbott's Booby *Papasula abbotti*

There have been at least two claims of this Christmas Island breeding endemic in the Chagos, sadly neither record has any supporting documentation or photographs. As such, it remains in the hypothetical list.

Christmas Frigatebird *Fregata andrewsi*

See main text.

Sparrowhawk species Accipitridae

A "sparrowhawk" was seen hunting through the Downtown area of Diego Garcia on 26 December 2008; it was not identified beyond genus.

Great Snipe *Gallinago media*

A record exists of "Eight snipe, almost certainly this species...." on Diego Garcia on 03 April 1971. As no supporting information exists and the author of the record admits uncertainty, this record has been placed in the non-verified category.

Asian Dowitcher *Limnodromus semipalmatus*

There is a single claim for this species in that of a lone bird on Diego Garcia on 17 March 1995. There is not enough supporting evidence to place this IUCN categorised "Near Threatened" species (with a decreasing world population of 23,000 birds) in the confirmed category.

Nordmann's Greenshank *Tringa guttifer*

There is a claim of this species on Diego Garcia on 21 March 1995. There is not enough supporting evidence to warrant

placing this IUCN categorised "globally endangered" species (with an estimated world population of 500 - 1,000 birds) in the confirmed sightings category.

Wandering Tattler *Heteroscelus incanus*

This species appears as a captioned illustration in David Bellamy's book "Half of Paradise," which covered the Joint Service Expeditions to BIOT in the early 1970's. It is also mentioned in an unpublished ornithological report of the 1972 / 73 Joint Service Expedition to the Egmont Islands, presumably the source of the "Half of Paradise" illustration. There is insufficient evidence in either of the records mentioned to differentiate this species when in non-breeding plumage from the virtually identical Grey-tailed Tattler *Heteroscelus brevipes*. Therefore, the records are placed in the non-verified category.

Lesser Black-backed Gull species *Larus fuscus*

Lesser Black-backed Gull taxonomy is in a state of flux and the level of detail in the record of a single adult that over flew the accommodation area of Diego Garcia on 26 May 2005 is not sufficient to confirm identification to species level, other than saying it was a *Larus fuscus*-type.

Arctic Tern *Sterna paradisaea*

There have been several claims by Carr and RNBWS expeditions (Carr 2011a) dating back to at least 1996. Following a review of some of the available photographs pertaining to these records, which were subsequently identified as Common Tern, all records of Arctic Tern are under review.

Whiskered Tern *Chlidonias hybrida*

A single adult in non-breeding plumage was claimed to be seen on Diego Garcia on 21 March 1995. Non-breeding and immature plumaged *Chlidonias* terns are not so straight forward to identify. It has been proven that the marsh tern that regularly winters in BIOT is White-winged Tern *Chlidonias leucopterus*. As there is no supporting photograph or description to substantiate the record, it is possible that the record refers to White-winged Tern and this record is therefore placed in the non-verified category.

Great Skua *Catharacta skua*

Records exist of three sightings of possible Great Skuas at sea up until 1971. As there is no supporting information or photographs and the possibility of confusion with other skuas, which occur in

the area, these records are treated with caution and placed in the non-verified category.

Long-billed Corella *Cacatua tenuirostris*

Unconfirmed reports (Wikipedia) state that this species was unsuccessfully introduced to the Chagos Archipelago. Further details are lacking.

Pigeon species Columbidae

There are unconfirmed reports in the Nineteenth Century of pigeons occurring in BIOT. Some credence is lent to these reports with the occurrence of a Rock Pigeon (Feral Pigeon) in 2009.

Little Swift *Apus affinis*

An illustration captioned "Little Swift" appears in Davis Bellamy's book "Half of Paradise", which detailed the activities of the Joint Services Expeditions to BIOT in the 1970's. As there are no supporting details for this bird and, because of the possible confusion with other white-rumped swifts that can occur in BIOT, this record is placed in the not conclusive category.

Pied Crow *Corvus albus*

There is a single claim of this species: a lone bird on Ile du Coin, Peros Banhos on 08 October 1974. There is no supporting information and every possibility that House Crow was involved. Therefore, this record has been placed in the non-verified category.

Northern House-martin *Delichon urbicum*

Two hirundine species were seen by the Percy Sladen Trust Expedition of 1905. Further details are lacking.

Bulbul species Pycnonotidae

Records exist that a bulbul species was introduced to Diego Garcia that, "...became common by about 1953, but at this time it suddenly died out and was not reintroduced." It has been speculated that this species was Olivaceous Bulbul *Hypsipetes borbonicus*. If the species was ever introduced, it certainly no longer occurs in BIOT.

Golden-crested Myna *Ampeliceps coronatus*

This species was claimed to be seen on Diego Garcia in 1996. This record is incorrect and has been withdrawn.

