

Observing oceanic birds in Sri Lanka

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Observing and studying oceanic birds has recently become popular with both professional ornithologists and recreational birders. Nevertheless there are a few observational considerations that serve to differentiate this aspect of ornithology from general birding.

Oceanographic factors that influence seabirds

The study of oceanic birds is best made with due attention to, and in consideration of, oceanographic factors such as, winds, currents, temperature differences in the sea and the seasonal upwelling of nutrients as well as the presence or absence of freshwater influx. In the Sri Lankan context, the two most important oceanic phenomena are the southwest monsoon (c. May–September), and northeast monsoon (c. November–March). Wind and current patterns change with each monsoon and these have their effects on marine life in general and seabirds in particular. A consequence of the southwest monsoon is upwelling of deep nutrient rich water off the west coast of Sri Lanka in May, with the intensity of upwelling increasing progressively off the western and southern coasts as the monsoon progresses. By July the upwelling increases greatly off these coasts, with some upwelling occurring off the south-eastern coast as well (Vinayachandran *et al.* 2004; Shree Ram & Rao 2005). This encourages blooms of plankton, which greatly increase oceanic productivity providing ample nourishment for seabirds and other predators. During the southwest monsoon, winds and ocean currents around Sri Lanka move in a predominantly easterly and north-easterly direction. It is likely that the greatly enriched oceanic productivity and favourable winds during May–September/October influence the high density of seabirds and also facilitate the seabird mass-migration.

The northeast monsoon period brings calm seas to the western and southern coasts. It is during this period that boat-based study is best carried out. Lesser Noddies *Anous tenuirostris*, Black Noddies *A. minutus*, flocks of Wilson's Storm Petrels *Oceanites oceanicus*, and many other species are relatively common in November (see below).

The northeast monsoon period is a rather bleak one for shore-based observations of pelagics on the western and south-western coasts. Due to the prevailing calm weather, boat-based observations will reveal many species of shearwaters, petrels, boobies, and tropicbirds. These species may be observed only a few kilometers out at sea, however, the most visible birds are the various species of terns, which congregate around fishing boats in large numbers.

Methodology

Comments on the observational methodology for the study of

oceanic birds, which follow, are based on my personal experience as observer of *Seabird Watch (Sri Lanka)* since 1981. I broadly categorise the observation of seabirds into two classes. They are (1) land-based observations, and (2) observations at sea. Each method has its advantages and disadvantages.

- (1) Observing from land can be carried out either at sea level or from an elevated site. The advantages of land-based observations include:
 - The ability to carry out observations at almost any time, including during monsoon storms where observations can be made in inclement weather when most small craft would not venture out to sea.
 - As land-based observations can be carried out from either sea level or an elevation it can be the more versatile method of the two. For example observing from sea level is best when it is required to monitor populations and movements of large numbers of birds between shoreline and horizon, as well as for point counts. This method is ideal, for instance, in observing the seabird mass-migration. However, it is sometimes necessary to observe from a height (cliff top or high rise building) for example, when watching birds such as Wilson's Storm-petrels, *etc.*, which stay very close to the surface, as these birds can often be hidden by the waves when observed from sea level.

When using either of the foregoing methods the *Seabird Watch (Sri Lanka)*, whenever possible, uses a three-man team with one observer at a telescope, another using binoculars, and the third acting as timekeeper and recorder. These roles are rotated at intervals.

The main disadvantages of land-based observation are:

In general it requires the birds to come to the observer.

- Birds flying at a distance, and small birds, cannot often be viewed in detail. Birds flying beyond the horizon are obviously not visible.
 - When observing from an elevation only a relatively small elliptical patch of ocean, subtended by the field-of-view of the instrument, can be viewed at any one time and birds occurring outside this ellipse will not be seen.
- (2) Observations from a boat can have advantages over land-based observations as outlined below.
 - The observer can go out to where the birds are. Birds can be observed beyond the horizon visible from land.
 - In general birds can be observed from close up and can therefore be studied in greater detail.

Nevertheless, there are several constraints when observing from a boat. These are outlined below.

- Observing from a boat can be difficult or impossible in rough weather. This restricts such observations from the western and southern coasts to the northeast monsoon period or to occasional, relatively calm days during the southwest monsoon. This is a great disadvantage in Sri Lanka as the

major seabird activity, namely, the seabird mass-migration occurs during the height of the southwest monsoon when the seas are frequently rough, preventing small craft from venturing out to sea.

- In general, telescopes cannot be used as, even in a calm sea, there is some motion in the vessel which makes it very difficult to hold a telescope steady on the targeted birds; hence, one has to rely mainly on binoculars. It might be argued that using a boat obviates the need for a telescope but actual observation refutes this, as birds sometimes prefer to keep at a distance from a boat.

Ideally, whenever possible, a combination of land and sea-based observation will provide the best results.

Equipment

Equipment considerations will vary somewhat between land and sea-based observing, but one common denominator is usage of good binoculars. For land-based studies binoculars of 10x–12x magnification are best. Whereas, for observing at sea binoculars producing 7mm exit pupils (e.g., 7x50, 9x60, etc.) will be advantageous as a large exit pupil will help to keep the subject in view in an unsteady boat. Of course stabilised binoculars will be even better if their high cost is not a constraint. “Zoom” binoculars generally provide relatively poor images and are best avoided.

When observing from land a good telescope is the *sine qua non* although hand held binoculars could supplement the telescope when birds are flying relatively close to shore. The ideal telescope should provide high resolution (preferably with diffraction-limited optics), high contrast, high throughput, and absence of gross optical aberrations. This would imply a good spotting-scope or (ideally) a small apochromat or semi-apochromat astronomical telescope with an erecting eyepiece. The telescope should always be used on a sturdy and vibration-free tripod. Also useful are sharp-cutoff optical filters (such as Y44, W12, etc.), and polarizers which, when attached to the telescope objective or eyepiece, can be of some use in penetrating haze. A GPS unit, and a sighting or orienteering compass are useful accessories, as are tally counters, maps, and hydrographic charts.

Finally a good field guide is an absolute necessity. Whereas general country and regional guides are useful, I have found Harrison (1983) to be of great use in identification of difficult species.

Comments on selected seabirds

White-headed Petrel *Pterodroma lessonii*. I observed this species on three occasions off the coast of Colombo in September 1990 (De Silva 1992). It is not clear if this was a single bird observed on three separate occasions or different birds. It is difficult to account for this species in tropical waters as it is a resident of sub-Antarctic and Antarctic waters and is seldom seen north of 30° south.

Soft-plumaged Petrel *P. mollis*. I observed this species off the coast of Colombo on four occasions in September 1988 (De Silva 1989a). This species is also a resident of cool temperate and sub-Antarctic waters, and like the White-headed Petrel is seldom seen north of 30° south. As both this and the preceding species were observed in September (although in different years), I speculate, that in September conditions are conducive for these two species to enter the sub-polar low belt and then be carried by westerly high belt winds into the sub-tropical highs



Fig. 1. Soft-plumaged Petrel *Petrel mollis*.

and thence northwards to be picked up by southwest monsoon winds which could bring them to Sri Lanka. Nevertheless, I must emphasise that at present this is conjecture.

Barau's Petrel *P. barau* was first recorded from Sri Lanka by me in September 1991. Since then there have been a few more sightings of the species, mostly in September.

Flesh-footed Shearwater *Puffinus carneipes* leave their breeding grounds in south-western Australia in May to commence a post-breeding dispersal that takes them on an extensive migration northwards into the Indian Ocean. They return to their breeding grounds towards the latter part of the southwest monsoon when they fly southwards along the western coast of Sri Lanka and can be observed from land (De Silva & Perera 1994). Their distinctive form of dynamic soaring is an ornithologist's delight.

Wedge-tailed Shearwater *P. pacificus*. This relatively common species can be seen frequently off the western coast during the southwest monsoon, although there are records at other times of the year, as well as from the eastern coast. In my opinion this and the Flesh-footed Shearwater compete for the title of the 'commonest' shearwater in Sri Lanka.

Audubon's Shearwater *P. lhermierei*. I first recorded it from Sri Lanka in 1982. I suggested that the bird seen by me probably belongs to the race *bailloni*. A further sighting of *bailloni* was made in October 2007 (Pepper & Hettige 2008). Recently there have been a few sightings in April from the north-western coast, of another sub-species *P. l. persicus* which is sometimes treated as a separate species, the Persian Shearwater *P. persicus*.

Streaked Shearwater *Calonectris leucomelas*. This is a rare species in Sri Lankan waters known from two specimens, and a very few sightings. The most recent sighting was of 25+ birds in April from deep water off Kalpitiya (08°17'N 79°35'E) (de Silva Wijeyeratne 2010).

Jouanin's Petrel *Bulweria fallax* was first recorded, based on a specimen, from Sri Lanka in 1978 (Kotagama 1979). Since then there have been several sightings of the species off the south-eastern and south-western coastal regions. A related species, Bulwer's Petrel *B. bulwerii* is known from several sightings, mainly off the western coast of Sri Lanka.

Wilson's Storm-petrel *Oceanites oceanicus*. After breeding in the Antarctic, Wilson's Storm-petrels migrate and disperse widely, with many of the birds spending the southwest monsoon period in our coastal waters. The birds always keep about 2 km or more from land and, although rather plentiful, are very difficult to see from shore, as they are small dark birds that keep close to the

sea surface. Nevertheless, they are easily seen if one ventures a few kilometers out to sea in a boat. However, in November, at the beginning of the northeast monsoon when the sea is very calm, the birds approach close to the shore and can easily be observed using land-based methods, especially if the observation site is at an elevation.

Black-bellied Storm-petrel *Fregatta tropica*. There is a single sighting of this species from the western coast in October 2007 (Pepper & Hettige 2008).

Swinhoe's Storm-petrel *Oceandroma monorhis* appears to be an occasional visitor to our coastal waters during the southwest monsoon. It is occasionally seen in the company of flocks of Wilson's Storm-petrels.

Red-billed Tropicbird *Phaethon aethereus*. This is the commoner of the two species of tropicbirds visiting Sri Lanka. It is a regular visitor to the western and southern coasts during the southwest, and early part of the northeast monsoon. Nevertheless the species has not been seen off the western coast during the seabird migration.

White-tailed Tropicbird *P. lepturus* visits Sri Lanka during the southwest monsoon when they are seen occasionally. Sightings have also been made at other times of the year. The species has not been recorded during the seabird migration. It is less common than the preceding species.

Red-footed Booby *Sula sula*. This is a visitor, in very small numbers, to our western and southern coasts. The *Seabird Watch (Sri Lanka)* has a few records of this species during the southwest monsoon, and I have sighted and been able to closely approach two specimens while diving off the western coast during December/January (northeast monsoon). While scuba diving off the western coast, I once saw a Red-footed Booby plunge in to a depth of c. 12 m to prey on a school of sardines (*Amblygaster* sp.).

Brown Booby *S. leucogaster*. This is probably the commonest

of our boobies and the Seabird Watch has many sightings of the species during the southwest monsoon. I have also observed the species on many occasions while on diving expeditions (De Silva 1995). Like other boobies this species feeds voraciously on flying fish (*Cypselurus* sp., *Exocoetus* sp., *Hirundichthys* sp., etc).

Masked Booby *S. dactylatra*. The Seabird Watch has not observed this species during the seabird mass-migration. There are, however, numerous sightings from both the western and eastern coasts.

Great- *Fregata minor* and Lesser- *F. ariel* Frigatebird. Great- and Lesser- Frigatebirds are occasional visitors to the Sri Lankan coast, mainly during the southwest monsoon. Both species are present as non-breeders in the Maldives (c. 600 km. east of Sri Lanka) and monsoon winds probably assist their passage to Sri Lanka.

A few records exist of the Christmas Frigatebird *F. andrewsi* being sighted on our western coast during the southwest monsoon. Nevertheless the same winds, which assist their congeners from the Maldives to our coast, would severely hinder the Christmas Island species from travelling c. 3,600 km against the strong head- and cross- winds which it would encounter on its journey from Christmas Island to Sri Lanka. Hence, I suspect that most records of this species from our western coast are misidentifications of the Greater- and Lesser- Frigatebirds (De Silva 2011).

Brown Skua *Catharacta (antarctica) lonnbergi*. Brown Skuas are regular visitors to Sri Lanka's western coastal waters during the southwest monsoon (De Silva 1989b, 2003). This species, which is a visitor from the Southern Ocean, is particularly common when the seabird migration is at its peak. Skuas, being kleptoparasites, chase migrating Bridled Terns *Sterna anaethetus* and other seabirds forcing them to relinquish their catch. They will often grab a tern's wing, thereby unbalancing and, forcing it to drop its catch, which is then picked off the sea surface by



Fig. 2. Flesh-footed Shearwater *Puffinus carneipes*, and juvenile Masked Booby *Sula dactylatra*, September 2010.

the skua. I showed (De Silva 1994) that Brown Skuas occurring in Sri Lanka (and the northern Indian Ocean) originate from New Zealand and the sub-polar islands of Amsterdam, Crozet, Heard, Prince Edward, etc. The Brown Skua, and its congener the South Polar Skua *C. macconnicki* regularly visit Sri Lankan waters in small numbers (De Silva 1989; Simpson & De Silva 1990) although they appear to be grossly under-observed by Sri Lankan ornithologists.

Pomarine Jaeger *Stercorarius pomarinus* is another kleptoparasite that visits the western coast of Sri Lanka during the southwest monsoon (De Silva 1986). Unlike the Brown Skua, the Pomarine comes to Sri Lanka from the far north. It too parasitizes migrating seabirds but unlike its congener, the larger and less maneuverable Brown Skua, on forcing a tern to relinquish its catch, the more agile Pomarine will often seize the falling prey in midair. Pomarine Jaegers breed in the far north during summer (which coincides with the southwest monsoon in the tropics). However there is a presence of the species in the Indian Ocean throughout the year (Harrison 1983). It is possibly these individuals that are seen during the seabird migration. The birds are probably more visible during this period as they concentrate along the migratory route in order to prey on terns. I suspect that during the northeast monsoon they disperse widely since food is not easily obtainable, hence, they are not seen as frequently. (A note on identification: Pomarine Jaegers are best identified by the elongated, twisted spoon-shaped middle tail streamers. Unfortunately many of the birds seen in Sri Lanka have their "spoons" broken off.)

Brown Noddy *Anous stolidus*. This is the commonest of our noddies. It is primarily a pelagic species, which is moderately abundant during the southwest monsoon. The birds are often forced close to land, by storms and squalls, when they can be observed from shore. Brown Noddies occur in the entire Bay of Bengal and also the Indonesian region. However, as most sightings are during the southwest monsoon, I suspect that our birds arrive wind-assisted from the Maldivian Islands.

Black Noddy *A. minutus*. The Black Noddy (De Silva 1992) is probably more common than records suggest. The birds are commonest during the early part of the northeast monsoon, but there are also a few sightings during the southwest monsoon.

Juvenile Lesser Noddies are sometimes confused with this species (see below). Black Noddies are species of the tropical Atlantic- and Pacific- Oceans. The closest populations to Sri Lanka occur in the area around the Philippine Islands. As the first sighting was in November, I speculate that it could be a bird from the Philippine population, which was assisted in its passage to Sri Lanka by northeast monsoon winds.

Lesser Noddy *A. tenuirostris*. The Lesser Noddy was first recorded from Sri Lanka in November 1978 (De Silva 1979, 1998). There have been many sightings of the species subsequently. There has been some confusion in Sri Lanka regarding this species as some juvenile Lesser Noddies have dark lores, which are sharply demarcated from the white cap. This has, on occasion, misled some birders into erroneously identifying the birds as 'Black Noddies.' However, there is really no cause for confusion as on close inspection it may be seen that the lores, while dark, are lighter than those of the Black Noddies enabling one to clearly see the black triangular markings in front of and behind the eyes, which are characteristic of these variant juvenile Lesser Noddies, but are not visible in the Black Noddy (De Silva 1998). Lesser Noddies breed in the Maldives from where the birds seen in Sri Lanka probably come.

Bridled Tern *Sterna anaethetus*. The exact status of this species in Sri Lanka is enigmatic. Henry (1955) considered it to be a winter visitor. I consider it to be primarily a passage migrant (De Silva 1990) and there is some evidence that the species may breed in small numbers on islets off the north-western coast. Perhaps it is all of these: winter visitor, passage migrant, and occasional breeder. The Bridled Tern is the main component of the southward mass migration of seabirds, which takes place each year off the western coast of Sri Lanka during the southwest monsoon. The birds migrate over a broad front parallel to the coastline. When migrating they usually fly at low altitude and in stormy weather may actually fly in the troughs between waves. In the early stages of migration the birds are mostly adults but, as the migration intensifies, the number of juveniles progressively increases. (De Silva 1987, 2003). I devised a simple method for estimating the flight-speeds of migrating Bridled Terns and found these to vary between 13 and 26 kmph with a mean of



Fig. 3. Bridled Tern *Sterna anaethetus*, April 2011.

approximately 19 kmph. These figures are tentative and should be confirmed or modified in the light of new studies. It is estimated that in peak years as many as 400,000 Bridled Terns fly within sight of land during daytime. It is important to note that recent taxonomic revisions have assigned the dark brown-backed terns to the genus *Onychoprion*. Hence the Bridled Tern now becomes *Onychoprion anaethetus* (Australian Government 2011; Gill & Wright 2008), and the birds visiting the western Indian Ocean, India, and Sri Lanka are reassigned to the sub-species *O. a. fuligula* (Australian Government 2011).

In addition to Bridled Terns other species also participate in smaller numbers in the seabird migration. Hence, during my thirteen-year study of the phenomenon, in addition to the normal methods of identification, I used a simple technique for rapid recognition of Bridled Terns. In still air, and mild breezes, Bridled Terns flap their wings twice per second. Among Sri Lankan terns, this wing-beat frequency is unique to Bridled Terns; hence, I used this as a supplementary guide to identification. After some practice, it becomes a rather effective technique for separating Bridled Terns from their congeners, especially in difficult conditions. However a caveat; it is only useful in poor light if the birds are within 300 m from the observer. In conditions of good visibility the technique can be extended to identify Bridled Terns flying up to a kilometer or so away. The technique is, of course, not infallible and is totally ineffective in strong winds when Bridled, Sooty, and other terns tend to glide.

Sooty Terns *S. fuscata*. Sooty Terns form a small proportion of the seabird migration being largely outnumbered by Bridled Terns. Sooty-, and Bridled- Terns often fly together in mixed flocks. Whereas the juveniles of both species are distinctive and easily separated in the field, in less-than-ideal conditions, it is sometimes difficult to differentiate the adults of the two species from each other. In some years many Sooty Terns are found dead inland. The reason for this mortality remains a mystery. As already mentioned the dark brown-backed terns are now assigned to the genus *Onychoprion* hence, the Sooty Tern becomes *O. fuscata* (Australian Government 2011; Gill & Wright 2008).

A mass-migration of marine species?

It is interesting to note that concurrent with the seabird migration, I also observed, during the southwest monsoon, what appears to be, a southward movement of scalloped hammerhead sharks *Sphyrna lewini*, and also a possible southward migration of humpback whales *Megaptera novaeangliae* (De Silva 2000). Whether this indicates that a mass-migration of several groups of marine animals including sharks, seabirds, whales, and possibly other species, occurs during the southwest monsoon, I leave for other researchers to determine.

Concluding remarks

Despite an increased interest in seabirds in recent years, Sri Lanka's marine avifauna continues to be under-observed. A majority of observations are from the southern and south-western coastal waters, hence, there is great need for more information from the eastern and northern seas. There is wide scope for more intensive studies of pelagic species and the oceanographic factors that influence them. Many questions remain unanswered about seabird migration; e.g., what is the ultimate destination of the migrating terns, and what return route do they use? What factors influence birds from the south temperate- and sub-polar- regions

to visit Sri Lanka? Properly equipped and prepared observers can seek answers to some of these mysteries and add greatly to the knowledge of our marine avifauna.

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