

Sula sula (Red-footed Booby)

Family: Sulidae (Boobies and Gannets)

Order: Pelecaniformes (Pelicans and Allied Waterbirds)

Class: Aves (Birds)



Fig. 1. Red-footed booby, *Sula sula*.

[https://en.wikipedia.org/wiki/Red-footed_booby#/media/File:Sula_sula_by_Gregg_Yan_01.jpg, downloaded 6 September 2016]

TRAITS. The red-footed booby is the smallest species of booby, weighing 900-1000g. As its name suggests, this species has short, strong legs and large webbed feet which are red in colour (Fig. 1). The red-footed booby has strong neck muscles and an elongated bill with jagged edges that has a pale blue colour. They have closed external nostrils and secondary nostrils on the bill close to the eyes, which are covered by flaps (Frank, 2002). The covering and closing of the nostrils aid the red-footed booby when diving or plunging into the water. The tail is of a wedge shape and the wings are very long with a wingspan of 91-101cm to help the bird whilst flying in high winds. The red-footed booby has a streamlined, torpedo-shaped body, with a length of 70-71cm, which

gives them the ability to penetrate the water easily and with high speed when plunging. Apart from the colour of their feet the red-footed booby has several colour morphs with different names (Fig. 2). In general, the underparts are white, with darker feathers on the upper parts.

ECOLOGY. The red-footed booby has a wide geographical range covering the majority of the tropics (del Hoyo et al., 1992). They can be found in the Caribbean, the Pacific, the south-west Atlantic and the Indian Ocean (Fig. 3). This species is marine and mainly pelagic, feeding on marine organisms such as flying fish, squid and other smaller fish below the water's surface. They mostly feed on prey with an average length of 8.8cm. The red-footed booby uses boats or rocks as vantage points out at sea (del Hoyo et al., 1992). They do not migrate but travel long distances from where they nest to get food. They are only found inland when nesting or roosting, which they do in tree tops or in low scrub, in very large colonies. The islands or coastal regions that they occupy need to have abundant vegetation.

SOCIAL ORGANIZATION. Red-footed boobies are highly social birds that associate and nest with other large waterbirds, for example the great frigatebird. The red-footed booby has colonial nesting grounds which are very large in size. In January and September breeding takes place in these colonies; breeding in mixed colonies also occur. The largest colony can be found in the Galapagos Islands. The global population estimate is more than 1 million individuals, which are distributed across many islands (Bird Life International, 2012).

ACTIVITY. Red-footed boobies are mostly diurnal, meaning they forage mainly during the day. They can be seen sometimes during the night hunting squid that come to the surface of the water (Frank, 2002). Red-footed boobies fly as far as 150km out to sea for several days where they feed in association with other predators (Arkive, 2016); they are communal hunters so once food is spotted all the birds dive at once.

COMMUNICATION. Red-footed boobies communicate by using calls as well as postures which are displayed more frequently when courting. The calls used differ in male and female due to different structures of the trachea and syrinx (del Hoyo et al., 1992). The calls of the males are plain, soft whistles, whereas the calls of the females are loud and screeching honks/squawks. The juveniles possess the same call as the adult females. However, at sea, the red-footed booby is very silent, the majority of calls are made when in the colony (Bouglovan, 2016).

MAINTENANCE BEHAVIOUR. Red-footed boobies take good care of their feathers, since they are exposed to water and sunlight very often. They do this by coating their feathers with a waterproof secretion (preening) (Fig. 4). The oil is formed by the preen gland, located at the base of the tail. Preening prevents water-logging and helps retain body heat (del Hoyo et al., 1992). Red-footed boobies have also developed heat-regulating behaviours. To gain heat this species spreads its wings away from its body. By spreading its wings, it allows the increase of surface area, therefore more sunlight/heat can be absorbed. To get rid of excessive heat, they excrete on their webbed-feet, this is known as evaporative cooling (del Hoyo et al., 1992).

FLIGHT BEHAVIOUR. Red-footed boobies are graceful while flying at high speed. They often glide a mile and more without flapping. They usually fly alone or in small groups when going out to sea. If flying in a group, the flock patterns that are commonly seen are lines and wedges. They

greatly depend on the wind for flying. Without strong winds it can be difficult for the red-footed booby to leave the ground or the water's surface. Before being able to fly fully, there is a long warm up of a few metres of half running and flying. But if wind is present then the boobies can take off with ease from the ground or by launching into the wind from a high structure. When taking off from the water, they jump forward into the wind, by simultaneously thrusting backwards with both feet (Verner, 1965). A study in Belize showed a soaring behaviour that would take place in the late evening when there were very high winds. A large group of red-footed boobies would soar for a long period of time and then come back to rest (Verner, 1965).

FORAGING BEHAVIOUR. The red-footed booby forages mainly during the day, but at night as well if it has to. The duration of foraging can vary depending on the stage of breeding. During the period of brooding, foraging periods are very short, since the females are getting ready to lay their eggs, whereas during incubation it is intermediate (both male and female take turns incubating the egg) and during the fledging period foraging for food is very long (Mendez et al., 2016). The red-footed booby forages for food by gliding over the surface of the waves, scanning for prey. Once a fish or squid is spotted, they plunge-dive head first at very high speeds into the water. They can dive up to 4-10m and even deeper by using their wings to swim (Bouglouan, 2016). Before they breach the surface their food is swallowed to prevent other birds from stealing it (Frank, 2002). Red-footed boobies can be seen working together with other marine organisms such as tuna and dolphins (Arkive, 2016). When these large predators chase fish, for example flying fish, the flying fish comes out of the water where the red-footed booby will capture them.

SEXUAL BEHAVIOUR. Red-footed boobies form monogamous pairs during mating season (Fig. 5), where they utilize the same location every time. The male collects the twigs/sticks to build the nest. This species breeds about once every 15 months, depending on food availability. When finding a mate, red-footed booby courtship involves a number of rituals/displays using their wings and feet. Males do most of the displays, where they posture with their tails, wings, beaks and also call. One of the common displays is called sky-pointing (Fig. 6); where the male throws its head back until its bill points directly upwards. To inhibit aggression there is the facing-away or bill-tucking posture (Alten, 1998). One egg is laid, and both parents take turns in incubating it, by standing on the egg. After incubation of the egg (41-45 days) and the chick hatches, it broods on the feet of the parents for the first few days. The chick will reach maturity in 2-3 years, until then it depends on the parents for its food. It feeds by eating food from the parents' mouth. When food is scarce the parents will abandon the chick and ensure their own survival (del Hoyo et al., 1992).

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Fig. 2. Colour morphs of the red-footed booby. Clockwise from top left: a) white morph; b) white-tailed brown morph; c) white-head white-tailed morph; d) golden morph.

[a) <http://ianfrasertalkingnaturally.blogspot.com/2013/12/genovesa-tower-of-galapagos.html>
b) http://www.sophiewebb.com/2011/02/26/301/img_0013/ c) <http://onvoyage.net/wordpress/?p=789>
d) <http://www.pelagicodyssey.ca/page14/page22/>, downloaded 6 September 2016]



Fig. 3. Geographical range of the red-footed booby.

[<http://www.hbw.com/species/red-footed-booby-sula-sula>, downloaded 6 September 2016]



Fig. 4. Red-footed booby preening.

[<http://www.hbw.com/ibc/photo/red-footed-booby-sula-sula/adult-preening-tree>, downloaded 6 September 2016]



Fig. 5. Red-footed boobies mating.

[<http://wesharepics.info/imagergkl-red-footed-booby-bird.asp>, downloaded 6 September 2016]



Fig. 6. Sky-pointing display.

[<http://animalyou.blogspot.com/2012/12/red-footed-booby.html>, downloaded 6 September 2016]