



Aerial ATTITUDE

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The size of an albatross; the grace of a tern; the belligerence of a skua; the speed of a swift; the agility of a flycatcher and the attitude of... well, a frigatebird. These amazing seabirds are the undisputed, if somewhat despotic kings of the world's tropical oceans.

Frigatebirds are impressive creatures by whatever yardstick one chooses to measure them. They are highly specialised seabirds, completely in tune with their environment. So well adapted, in fact, that they have pared down to the absolute minimum anything not essential to their mode of living. Those features that are essential they have souped up to the extremes that drag-racing enthusiasts would appreciate.

Their fame is widespread, well deserved, and comes for several reasons. Perhaps the most obvious trait is their well-known habit of attacking other seabirds, which they do ostensibly to get a free lunch. Basically, they are the biggest and meanest kids on the block: they pick on other birds, bullying and harassing them until they cough up lunch money. Seabirds returning to roost generally have a full crop of fish and frigatebirds are wont to

patrol the flyways, picking off hapless victims as they return for the night. Once they have selected a victim, as many as five to 10 frigatebirds will give chase.

They pull on the victim's tail feathers, bite its legs, drag it by a wing-tip and even stick their bills down the other bird's gullet to grab fish. Birds that choose to resist can suffer lethal consequences, such as broken wings or becoming completely exhausted. Often the victim will regurgitate some of its crop contents, and the frigatebirds will then dive and chase the ill-gotten gains. But they must catch it before it hits the water and sinks, for ironically frigatebirds, despite being seabirds, have no waterproofing. If they land in the sea, they drown.

For a seabird not to have waterproof feathers sounds absurd, but frigatebirds have achieved this. It is questionable whether or not the ancestors of frigatebirds ever had waterproofing, but it seems probable that they did. Somewhere along their evolutionary path they became so proficient at catching food in mid-air that they did away with their waterproofing.

It is a popular myth that frigatebirds are obligate klepto-parasites (in other words, that they derive a living from pirating) ▸

Opposite Frigatebirds live hard and play hard, are powerful and aggressive predators, yet so light and manoeuvrable that they can pick a twig off the surface of the ocean.





When a male frigatebird is not displaying, his gular pouch is visible only as a relatively small flap of skin on his throat.

other seabirds' food). This is clearly not the case: if nothing else, simple mathematics tells us so. For example, on Aldabra Atoll in the Indian Ocean there are approximately 10 000 frigatebirds (the second largest colony in the world), and a similar number of Red-footed Boobies. It is inconceivable that the boobies could find enough food to support both themselves and the frigatebirds.

Frigatebirds eat flying fish and flying squid almost exclusively, hawking them out of the air or from just below the water's surface as the flying fish flee predators from below, principally tunas and dolphins. Chasing down birds is perfect practice for the aerial manoeuvring needed to capture the much less agile flying fish. But it is

probably just as important is to be skilled at pilfering nesting material. Another of the frigatebird's extreme adaptations is the reduction of its feet and legs to such a degree that they can only be used for perching (and then only just). The birds cannot walk on land and thus struggle to find material with which to construct their nests. Dispossessing other frigatebirds and boobies of their twigs, especially in the air before the birds can access the relative safety of a nest, is a very valuable skill for breeding birds. Getting free fish is probably an added bonus during training sessions. However, having watched their evening antics for many hours, I firmly believe that frigatebirds simply have 'attitude', and that they enjoy beating up smaller birds.

So what is it that makes the frigatebirds so good at overhauling other seabirds and looting their lunch? For a start, they have a massive wingspan – a Greater Frigatebird's wings stretch to more than two metres, Magnificent Frigatebird's to 2.5

metres. But size is not everything: they also have the lowest wingloading of any bird. For birds the size of frigatebirds to achieve that is truly astronomical engineering. Wingloading is the ratio between the weight of a bird and the surface area of its wings. Clearly, the heavier a bird is, the bigger the surface area needed to achieve lift. Small birds such as sunbirds have very low wingloading ratios, and consequently are highly manoeuvrable. Bigger birds, like ducks and geese, have such high wingloading ratios that they often have to run on the water before taking off, and must flap really fast to stay in the air. There is a fairly neat trend in birds: the bigger they are, the higher their wingloading.

One of the ways frigatebirds achieve their low wingloading is having hollow (pneumatised) bones which, all told, contribute less than five per cent to the birds' weight. In fact, the feathers and flight muscles (arguably the two most critical features for flight) combined account for

half a frigatebird's weight. Frigatebirds are by far the biggest birds that can hover without a headwind. They can also fly more slowly than just about any other bird without falling out of the sky. With a reasonable breeze, they can even achieve take-off without flapping – they simply spread their wings and float away.

Yet another feature that makes frigatebirds so adept at aerobatics is the shape of their wings. Straight, level wings are good surfaces for gliding; angular, curved wings are good for agility. Albatrosses are extreme examples in the straight-winged department, as they have little need for tight cornering or rapid changes in direction. Most birds lie somewhere along the spectrum, with more bowed shapes occurring in birds that need more twisting and turning power. Predictably, frigatebirds have highly bowed wings, making them look the part of a child's depiction of seabirds in the distance – gently-sloping 'M's. Their wings are also more bent at the wrist than other birds', further improv- ▷



Puff daddy... a Magnificent Frigatebird in breeding condition displays his inflated gular pouch.

Relatively speaking...

Frigatebirds have the remnants of webs joining all four toes on their somewhat atrophied feet. This single character has been used to place them along with pelicans, cormorants, gannets and boobies in the order Pelecaniformes. However, recent molecular evidence strongly suggests that this classification is incorrect, and that frigatebirds are more closely related to albatrosses, petrels, divers and penguins.

Worldwide there are five species of frigatebirds in a single genus, *Fregata*:

Ascension Frigatebird *F. aquila* Breeds only on Boatswainbird Island off Ascension Island, central Atlantic Ocean. Conservation status: Vulnerable

Christmas Frigatebird *F. andrewsi* Breeds only on Christmas Island, an Australian island south-east of Sumatra. Conservation status: Critically Endangered

Magnificent Frigatebird *F. magnificens* Breeds on tropical islands off the Americas, with a very small population, relict on the Cape Verde Islands, off West Africa

Greater Frigatebird *F. minor* Breeds widely on islands throughout tropical oceans

Lesser Frigatebird *F. ariel* Breeds widely on

islands throughout tropical oceans.

Off Africa, both the Ascension and a few Magnificent frigatebirds occur off the west coast, whereas Greater and Lesser frigatebirds occur off the east coast, with vagrants reaching the southern tip of the continent. There have been claims of Christmas Frigatebirds from the Kenya coast, but these remain unsubstantiated. Given their great powers of flight, vagrancy is fairly common. However, the correct identification of single, out-of-range birds requires careful observation.



An immature Magnificent Frigatebird.



The atrophied feet, showing the vestiges of webbing between the toes, are shown clearly in this female Greater Frigatebird.

Frigatebirds are unusual among seabirds in being sexually dimorphic, with males being mostly or entirely black, and females having varying amounts of white on the breast or belly. Differences between the species are rather subtle, especially among adult males. Their identification is further complicated by each species having a series of juvenile and immature plumages. Young birds typically have pale heads and breasts, and take several years to acquire adult plumage.

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Immature frigatebirds typically show a pale head and breast.

ing their agility. Added to this is a deeply forked tail which makes a highly effective rudder. This is one of the longest non-ornamental tail feathers in the bird world. They are also the only species to have a fused pectoral girdle that allows their bodies to cope with rapid, high-speed turns. All in all, frigatebirds are delicately tuned flying machines. They are

cap-able of sleeping on the wing over sea, flying vast distances, producing bursts of unbelievable speed and catching and relieving almost any other seabird of its meal.

Another well-known character of this charismatic family is the male's breeding display. Male frigatebirds have a large flap

of skin on the throat, called a gular pouch, that they use in a dramatic visual display to attract a mate. When the bird is in breeding condition, the gular pouch is bright crimson, and the male inflates it to many times its original size. It looks like a massive red balloon strapped to the throat: quite extravagant for seabirds, which usually go in for rather demure colorations. Males which are ready to mate will inflate the pouch, then droop their wings over the nest, raise their heads and produce a variety of often very peculiar, howling calls. Prospecting females are welcome, but rival males that come too close are chased off. Fighting among males for nests can get quite intense, and not infrequently the inflated gular pouch is targeted by protagonists. Once his pouch is punctured, a male cannot attract a mate and thus cannot breed again until it heals.

Once a mate has been selected and a nest secured, an elaborate courtship follows; this can last up to two weeks in the

case of the Greater Frigatebird. Frigatebirds are monogamous, but probably find a new mate at each attempt. The female lays a single, large, white egg, which is incubated for around three months; chicks fledge after about six months. Frigatebirds are unusual in having extremely protracted periods of post-fledging parental care, with young birds being fed by their parents for up to 18 months after leaving the nest. This is presumed to be a result of the long learning period required to master their highly-skilled aerial feeding techniques. A single breeding attempt can take as long as two years from the start of nesting to the young becoming independent. Breeding is colonial, and the resultant mêlée of several thousand birds squabbling, fighting, displaying, mating and raising young, is one of nature's great biological spectacles.

With their massive wings, frigatebirds can soar effortlessly for hours on end. The tradewinds of the tropics generate thermals, rather unusually in that they are over the ocean. Frigatebirds have learned to ride the thermals to incredible heights, gliding so high that one needs binoculars and a steady hand to see them. This allows them to travel vast distances away from their roosting sites. In this respect they are much like African vultures; another similarity is the speed with which they descend to a point where food is, seemingly conjuring themselves out of thin air. Frigatebirds are very gregarious, and besides communal roosting and breeding, will often commute, hunt and feed in large groups.

Despite being so atypical in many respects, frigatebirds have one critical aspect in common with the vast majority of seabirds: their *naïveté*. Seabirds typically breed on islands, usually remote and inaccessible, and away from predators. This has led, over aeons, to them losing fear of predators, including humans. Some frigatebirds remain disarmingly 'tame' and approachable, such as those on the Galapagos. This trust in people has been their undoing at many colonies, where humans have pillaged them to local extinction. Frigatebirds have undergone some breeding-range contraction as a result of colonies being deserted. With one exception, they now breed only on protected or very isolated islands. The highly range-restricted spe-



Top Frigatebirds of all ages crowd a communal breeding tree on Aldabra Island.

Above Cute as it seems as a chick, this frigatebird will soon develop the bully-boy habits of its elders.



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