Istiophorus albicans (Atlantic Sailfish)

Family: Istiophoridae (Billfish)
Order: Perciformes (Perch and Allied Fish)
Class: Actinopterygii (Ray-finned Fish)

Fig. 1. Atlantic sailfish, *Istiophorus albicans*.

[http://www.extremescience.com/sailfish.htm html, downloaded 2 February 2015]

TRAITS. A smaller species of billfish (in the family Istiophoridae), possessing a sharp bill on its upper jaw (Fig. 1). The bill has a circular cross-section, and is approximately three times the length of the lower jaw. The Atlantic sailfish has a tall first dorsal fin, which spans the majority of its body; highest fin peak at the 20th ray. The second dorsal and the anal fins are concave as well as short. Their pelvic fins have one spine and multiple fused rays. Its maximum body size may range between 315-340cm in length, and weigh approximately 100 kg. Female sailfishes are larger than the males. Dorsally, their body colour is dark blue, and ventrally, it is generally white and may have scattered brown spots. The anal fin is white in colour, while all other fins are blackish-blue. Bodily colours however are prone to change based on how excited the fish is (Bond and Diamond, 2011). The Atlantic sailfish is now often considered as being the same species as the Pacific sailfish, populations in these two areas being genetically similar; in that case both are simply known as the sailfish, *Istiophorus platypterus* (Wikipedia, 2015).

DISTRIBUTION. Atlantic sailfish are usually found at 40° North to 40° South in the western regions of the Atlantic, and around 50° North to 32° South in the eastern regions of the Atlantic. Being an extremely migratory species, they may be found off the West African coast, Gulf of Mexico, the Caribbean Sea and off Florida's coast (Fig. 2).

HABITAT AND ACTIVITY. Found in areas above the thermocline; transitional area between surface and deep water layer, during their adult life, and also coastal areas, migrating to near-shore waters. Preferred temperature range is between 21-28°C, preferring tropical climates (Bond and Diamond, 2011). However, they will occasionally move to deeper waters where temperatures may be as low as 8°C, adapting to the temperate habitat region. In the Pacific, sailfish migrate to higher latitudes for the summer, and move back towards the equator during autumn, annually. Larger adults are found generally dispersed across the eastern Atlantic. Being a constantly motile species, *Istiophorus albicans* has been observed to exhibit diurnal, nocturnal and crepuscular activity. This is due to them being opportunistic feeders, so high levels of activity is needed in order to eat whenever possible (Hoolihan, 2006).

FOOD AND FEEDING. Epipelagic (open-water) fish such as anchovies, mackerel and sardines make up the main diet for *Istiophorus,* which is strictly carnivorous and at a high trophic level, being only eaten by whales, sharks and humans. Cephalopods, aquatic crustaceans and molluscs are also predated upon. The sailfish is capable of speeds up to 110 km/hr. They achieve this by folding the dorsal fin back completely, when ready to assault potential prey, however, slower cruising speeds are possible as well by folding the dorsal fin halfway. Once the prey is within range, their pointed bill is tilted quickly, stabbing the prey which may either stun or kill it (Fig. 3). They are also opportunistic feeders, that may prey on neritic (coastal) or benthic (bottom-living) prey should the chance present itself. Experiments have been conducted which revealed remnants of fish and cephalopod mandibles, which would suggest fast digestion of softer muscle, meaning they must eat large quantities of food to survive, given their heightened metabolism (Sun and Yeh, 2004).

POPULATION ECOLOGY. The maximum lifespan of the sailfish is estimated at around 13-15 years. However, specimens from catch and release experiments usually have an average age of 4-5 years. The social organization of the species compels them to swim in dense schools as juveniles; at which point they are highly social. Adults swim in smaller groups and move into sparsely populated zones (Fig. 2). However it is not rare for adults to swim solitary at times. This is particularly exhibited while hunting, as hunting alone is common for adults, however, hunting in small groups have also been observed over time, in maturing adults. They are not known to interact with other fish, keeping to their own kind (Bond and Diamond, 2011).

REPRODUCTION. Breeding takes place year round, in the thermocline. Females attract potential mates by extending their dorsal fin. The sailfish may spawn multiple times in tropical waters because the temperature of the water is suitable. Female fertility is estimated 0.8-1.6 million ova (eggs). Eggs usually hatch within 70 hours, and both male and female sailfish attains sexual maturity within 3-4 years. Adult sailfish do not offer any parental care to their offspring, and as such, are very vulnerable during this time (Hoolihan, 2006).

BEHAVIOUR. Juveniles usually swim in dense schools, since they are offered no parental care after hatching. This allows for a higher chance at survival against predators, known as shoaling which means it is less likely for any one fish to get eaten by a predator. Further exhibited anti-predatory behaviour in *Istihophorus* involves the utility of their high swimming speeds to escape danger, or the striking of predators with their bills in an attempt to ward it off, should fleeing not be an option. Communication between members of this species are done by the flashing of body colours and dorsal fin movement. Excitement of the fish may also cause a change in body colour. They also have nares (nostrils) on the front of their eyes to detect chemicals in the water, as well as being able to use their lateral line to sense movement and pressure changes, as well as hear underwater. Perceptive communication channels for this species include chemical, visual, acoustic, tactile and vibratory (Sun and Yeh, 2004).

APPLIED ECOLOGY. Due to their tough meat, sailfish has poor value as a commercial fish, in the Atlantic. It is reported to house a total of thirty-four parasitic species, including protozoans, flukes, tissue flukes, roundworms, tapeworms and gill worms which also contribute to it not being a safe source of meat when consumed by humans (Marinebio, 2015). Recreational fishermen, however, hold this fish in high esteem and consider it valuable game. Popular designated hunting locations include Puerto Rico, the Gulf of Mexico, Bermuda and the Windward Islands. Natural predators to *Istiophorus* also include pelagic sharks, killer whales, and the great white shark. The IUCN classes the sailfish as "LC" which is a species of least concern, so there are no serious inherent threats to the species, presently (IUCN, 2015).

REFERENCES

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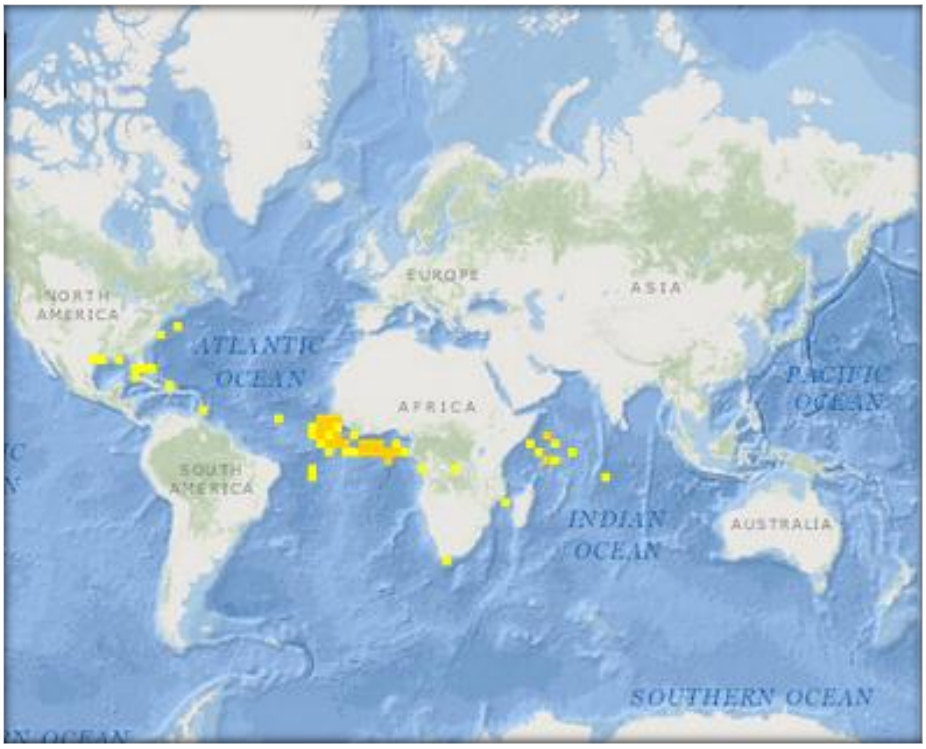

Fig. 2. Atlantic sailfish geographic distribution.

[http://marinebio.org/species.asp?id=146, downloaded 4 February 2015]

Fig. 3. Atlantic sailfish striking prey.

[http://jupiterdivecenter.com/wp-content/uploads/sailfish-2_1575643i-2-300x193.jpg, downloaded 5 February 2015]