Hirundo rustica (Barn Swallow)

Family: Hirundinidae (Swallows)
Order: Passeriformes (Perching Birds)
Class: Aves (Birds)

Fig. 1. Barn swallow, *Hirundo rustica*.

[http://www.arkive.org/barn-swallow/hirundo-rustica/image-G88676.html, downloaded 12 October 2015]

TRAITS. Identifiable by their metallic dark slate blue upperparts (crown of head, wings and torso), throat and between eyes are a rusty brown/copper colour and they have a very pale orange or beige breast and belly. Secondaries (bottom wing feathers) are long, pointed and are dark grey brown in colour. They have distinguishably forked beige/grey tail (Fig. 1). The brightness of colours are not seen in chicks and gradually appear to adulthood. They are small birds where males and females have similar features; outer tail streamers are shorter and colour is sometimes less vibrant on females (Moller, 1994). Average length varies between 14.6-19.9cm and wingspan 31.8-34.3cm. Weight ranges between 17-20g (Terres, 1980). Interior of mouth is a bright yellow, easily seen in chick during feeding (Fig. 2) and gets paler upon reaching adulthood. Feet are short, deep brown and toe arrangement are three pointing forward and one pointing towards back (anisodactyl arrangement, a notable feature of Passeriformes) and this helps with perching.

ECOLOGY. There are six generally accepted subspecies and amongst the swallow species, it is the most widely spread. Four of the subspecies are very migratory and spend most winters in the southern hemisphere (or warmer climates such as Lesser Antilles) and breeding in the northern hemisphere. It is found in Asia, Africa, Europe and the Americas (Turner and Rose, 1989). Due

to their wide distribution they are at low risk for being endangered. Found mainly on open air spaces (savanna, harvested sugarcane fields) (Hilty, 2003) and commonly incorporate the use of human made structures for breeding therefore resulting in a close association with humans. Nest construction is in a cup shape comprising of mud, dried grass and feathers (Fig. 2) and normally located on open structures (barns or stables) or exposed areas (tree branches, wires) (Turner and Rose, 1989). Their diet consists of insects (insectivore) which is caught mainly mid-flight (Snow and Perrins, 1998). Known predators include squirrels, domestic cats and gulls. The average life span for a barn swallow is 4 years; apparent increase in longevity is related to length of tail and the symmetry of both wing and tail as well.

SOCIAL ORGANIZATION. Often observed in large social groups on eminent structures such as overhead lines or tall trees (Fig. 3) (Hebblethwaite and Shields, 1990). They nest colonially and colony size was in direct correlation with both wind conditions and local food availability and abundance. Increase in colony size also results in an increase in males mate guarding and guarding of nest (built by both by both sexes) during egg laying. Nest predation, on average, is low at 1-2%. Barn swallows may coexist in a nesting area with ospreys (usually nesting below the ospreys). The advantage to this is that the barn swallow get protection from birds of prey and the ospreys are alerted to the presence of predators from the barn swallow's alarm call (Barker, et al., 1994).

ACTIVITY. Barn swallows are migratory and diurnal. They often sing in a chorus comprised of individual songs. Once the eggs are laid, incubation is done in turns by both sexes (mostly female). Incubation time is 13-17 days and upon hatching and feeding is done by both parents and, on occasion, by the pair's adult offspring (EOL, 1996). After fledging, 2 weeks later, the young leave their parent's nest often travelling to other colonies (EOL, 1996). Mated pairs often preen each other and by mate guarding, there is a reduction in outside male copulation and increasing their own copulation. Nest guarding also ensures females will not lose interest in the nest as reduced egg count resulted in reduced nest attendance (Moller, 1987).

FORAGING BEHAVIOUR. Barn swallows are insectivores; flying insects compose 99% of their diet. From their adaptation for easy air manoeuvrability, both feeding of young and catching and feeding of adult, and drinking is done in the air (Brown and Brown, 1999) (Fig 1 and Fig 4). Their foraging has been observed to be opportunistic, meaning they are often observed following anything that can disturb resting insects such as grass cutting machinery, humans and animals (Perrins, 1989). The amount of prey is increased in vegetated field boundaries so barn swallows population (breeding success) is increased when these are present (Evans et. al., 2010). Prey are selected based on size and availability. Large flies compose approximately 70% of their diet (Hilty, 2003) and prey selection is dependent on the availability of highly preferred prey (larger prey). If in high abundance, smaller prey are still taken (Turner, 1981). They hunt in pairs during egg laying and in large flocks otherwise (Turner and Rose, 1989).

COMMUNICATION. They incorporate the use of both vocalizations and body language in order to communicate with one another. They either sing individually or as a group, depending on the call type (predator alarm calls are done in group). They have different calls depending on the situation; predator alarm calls, calls to offspring and mating calls. To help with the call variety, they also produce clicking noises by snapping their upper and lower beaks together

(Brown and Brown, 1999). The health of bird can be determined by the sound quality of the songs made by males (Saino, et. al., 1996) Chicks have their own distinguishable calls when begging.

SEXUAL BEHAVIOUR. Breeding occurs between May and August (dependent on location) and due to them being socially monogamous, the same pairs that mated before will re-mate. The period before the female is fertile, the male will guard against unpaired males and females will hide their fertility by only mating with their partner for an extended period (Moller, 1985). Males with longer tails have a tendency to engage in extrapair (other mate) copulations and thus have a higher paternity (more biological offspring) due to more extrapair broods (Saino, et. al., 1997). Males will try to attract the females by performing for them. This includes spreading of their tails, an aerial chase and singing. Mating occurs usually mid-air (Fig 5). Females base their selection on the symmetry of the male's wings and tail as asymmetry usually resulting from genetic factors (inbreeding for example) or stress due to the environment (lack of food, parasites) (Moller, 1994). Male tail length has been directly related to the longevity and health of offspring. Tail spots, which get large with age, show a positive effect for mate selection (Kose and Moller, 1999). Tail length of females is also significant as it reflects the reproductive potential (Moller, 1993). The frequency of males who don't mate and kill chicks also increases with colony size and so to reduce this frequency males should stay within their colony, as moving colonies lowers mating frequency. (Moller, 1986). Parental certainty is positively correlated to parental care (frequency of feeding) which is determined by males from pair copulation by their mates (Moller, 1987). Clutch size is typically 4-5 eggs which are white with brown spots and females may have two broods per year with the same mate for many years (EOL, 1996).

JUVENILE BEHAVIOUR. Upon hatching, chicks are helpless and require assistance from parents for survival. Recognition between parents and offspring is done by calls (Medvin and Beecher, 1986). Chick begging is directly related to the chick's need for food. Duration of begging calls increases when chick is deprived of food and the brood size determines the latency of these begging calls (Saino et. al., 2001). These begging strategies however varies with the size of the brood (Lotem, 1998). Chicks will remain in the nest for about 20 days before they fledge (wings have developed enough for flight). After fledging, both parents will still care for the chicks for about a week.

ANTIPREDATOR BEHAVIOUR. Some predatory bats and birds prey on barn swallow (for example false vampire bat, African hobby and peregrine falcon). Predator escape is facilitated by the barn swallow's flight agility swiftness along with nest construction in hard to reach places and alarm calls. When a predator is close the colony, mobbing occurs. The size and intensity of the mob was dependent on breeding season stages. They usually contain more active mobbers which produce mobbing calls and sometimes approach the predator, than passive mobbers, remain silent and flew further away from the predator (Shields, 1984). Anti-predator defence of offspring is directly correlated to the males' certainty of parentage. The more extrapair copulation that occurred with the female, the less intense the defence for the offspring (Moller, 1991). To protect against ground predators, barn swallows hunt and drink mid-air and when resting perch on higher ground.

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Posted online: 2015

Fig. 2. Barn swallow chicks, in nest, being fed.

[http://www.arkive.org/barn-swallow/hirundo-rustica/image-G88836.html, downloaded 12 October 2015]

Fig. 3. Large group of barn swallows in a tree.

[http://www.constantinealexander.net/2015/04/dwindling-bird-populations-in-fukushima.html, downloaded 28 October 2015]

Fig. 4. Barn swallow drinking in flight.

[http://www.arkive.org/barn-swallow/hirundo-rustica/image-G9002.html, downloaded 12 October 2015]

Fig. 5. Barn swallows mating.

[http://www.arkive.org/barn-swallow/hirundo-rustica/image-G88243.html, downloaded 12 October 2015]