

BLOCK 7



WHY DO BIRDS BUILD NESTS?



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Birds are characterized by a great wealth of behaviours resulting from ways of getting food or journey strategies. Without a doubt, the most fascinating in their diversity are to be mating rituals, connected with searching for a partner and then building a nest and raising the offspring. The first stage is finding a partner. The rituals connected with this area are very diverse and fascinating. Usually it is the male that has to attract the attention of a female and to this end uses a whole variety of means, such as: „the stage dance” (<https://www.youtube.com/watch?v=wTcfDCjBqV0>), different sounds – songs and voices (<https://www.youtube.com/watch?v=gGx6yeRZJUg>), visual shows (the bowerbird from Australia - <https://www.youtube.com/watch?v=rBfOS4hJj5U>), offering gifts (a male of a an Arctic tern is encouraging the female with a fish he brought - <https://www.youtube.com/watch?v=AyLUH7NHxes>), acrobatics (peregrine falcon) or the spectacularly coloured plumage of the commonly known and bred peacock.

If in the spring we happen to go to the park or forest, for sure, we will get the chance to listen to bird song. This is not only a male’s attempt to attract the female, but also a sign for all the other males of taking over a certain area for the needs of his family. This area is called a territory, and the male’s song is an acoustic, legible to others, sign of its appropriation. This type of song is typical for passerines (tits, finches, toes, flycatchers, etc.) and characteristic for every species. When we learn to recognize the most commonly met bird voices (e.g. of finches, and chiffchaffs), we will be able to tell which species is present in our neighbourhood.

Why is it the males that have to strive for female favours? The females usually take over most of the duties connected with brooding eggs, so it is better for them to hide their presence from predators in the most neuralgic nesting season. Courtship culminates in copulation. Afterwards birds start preparing the nest. It is built by the female, the male or by both birds. The nest serves as a refuge in the time of nesting and the first days and weeks of the nestlings’ lives. Nest building and hatching, regardless of the place of the nesting, always take place in this season of the year which guarantees an abundance of food for the young chicks and lets them grow up quickly. In our climate this time falls in the spring and summer months.

Nests are less or more complicated constructions, which can be used as a place to sleep or to hide after the nesting period has ended. If their construction is a solid one (e.g. a hollow or nesting box) birds take advantage of them all year long. To birds overwintering in our country (e.g. owls or tits), such safe, winter refuges are extremely important. We can say that they are like a home, to which we can come back and feel relatively safe and comfortable. The level of complexity of the construction of the nest is to a big extent connected to the form of care provided to the offspring by their parents. With species classified as precocials, the time spent in the nest by the nestlings is limited to a short period after the birds have hatched. Afterwards the chicks leave the nest and are able to move and find food on their own fast, although they



still stay under the care of one of both parents. These birds hatch covered in down, which is quickly replaced with feathering. This is typical for most ducks, swans and grebes. In their case, the nests are usually less masterly and durable, yet they can be well hidden.

Hatchlings of nestlings, after hatching stay in the nest until they can move independently – that is they can fly. They are covered in sparse, hatchling fluff and they are not able to maintain the appropriate body temperature. Because of the poorly developed plumage, during the entire time spent in the nest, they are fed and kept warm by the parents. In this group you will find most of our country species: passerines, woodpeckers, owls, herons, etc. Sometimes nests of nestlings are very complicated, and preparing them requires a lot of time and unusual agility. As an example we can mention the nest of the Eurasian penduline tit, which resembles a thickly woven glove with one entrance, which limits the possibility of penetrating the nest by predators. To build the nest, the birds use the „fluff” of a blooming willow or poplar.

Figure 1. An Eurasian penduline tits's nest, drawing by Juan Varela

Sometimes birds build nests close to one another. This is the way of African weavers, which use grass to build huge constructions with nesting chambers for as many as 500 couples. Such nest can weigh up to 1 ton. Without a doubt, in this case, such social nesting means more safety for the nesting birds.

For the same reason, some species, such as the black-backed tern, gather in huge colonies at the Seychelles, where there can be up to several thousand bird couples. Sea birds nesting on rock shelves at the Hebrides and Orcades can build several million nests.

The diversity of nests that are built is connected with the wealth of building material. This can include: sticks, twigs, grass stems, leaves, stones, clay, spider web or shells. Some birds, such as the house martin and swallow, use clods of mud to build nests.

Asian salagans, relatives of our swifts, use their own saliva to build nests (these nests are edible and are used in the preparation in a famous and valued soup). Some bird names bear the information about the birds' building skills, as the already mentioned sociable weaver and the rusty potter, inhabiting South America, or tailorbird from India.

Bird nests can be located on sand (terns) in the grass (lapwings, pheasants, harriers), in the branches of bushes and trees (warblers, thrushes, orioles), on rock benches (scissors, puffins), in burrows in the ground (sandbank swallow, kingfisher), in excrescences (wren), floating leaves (black tern), between reed stems (reed-bunting), and of course in hollows, as many of our forest birds do (flytraps, woodpeckers, tits) or in anthropogenic openings (swift).

Figure 2. A House Martin next to its nest. Drawing by Juan Varela

Smaller birds build new nests every season, the bigger ones (e.g. predators and storks) use their first nest many times, adding new elements every year. Sometimes birds have several nests in the area (goshawks), which they use year after year. The construction time of such nest can





FIG. 1. THE NEST OF PENDULINE TIT.

Autor: Juan Varela.

differ significantly. Small birds build simple nests in 4-5 days, the Remiz needs around 5 weeks to build its complicated bag-like nest, while eagles build their nest in as much as 2 months. So we can say that the time needed to build a nest depends on its size and on how laborious it is to build it, given its construction.

The nest during the time of sitting the eggs and raising the nestlings is bedded with plant material (grass, leaves, small twigs) and animal material (cobwebs, fur, feathers) for the protection against damage and low temperatures. Hair and feathers have better insulating properties, but when wet, they lose them faster than plant material. This is why water birds prefer plant bedding. In spring we can often spot birds pecking on rugs hanging on the balcony or pulling out hair of animals that are changing their fur. They will use this material in the nests. Not all birds build nests – some use constructions created by other species (e.g. eared owls inhabit nests built by corvids) or lay eggs in nests of birds of other species, which then not only have to incubate the eggs, but also take care of the young (nesting parasites). Among such species we will find the European cuckoo bird, Asian honeyguide and American wren. Mound birds, relatives of our pheasants represent a very interesting way of nesting. Their nest is actually a heap of decomposing plants – something that we could call a compost prisme. During the fermenting processes a very high temperature is generated in the prisme. Mound birds make a hole in such prisme and put in their eggs, which are heated with the fermentation heat. The role of the bird (only males take care of this) is to control the temperature inside of the prisme and watch the eggs. Depending on the situation, the planting material is spread apart or tossed on top of the eggs to keep the right level of warmth.

In the nesting season, not all birds have the chance of finding a safe place to build a nest. Many look for a more unconventional location, which can be easily observed in the anthropogenic environment such as the city. Instead of natural elements, birds take advantage of the infrastructure. They build nests in crevices of buildings, under the roofs, in ventilation openings on street lamps, cranes and roofs. Hole-nesting birds (birds laying eggs in hollows) are in a particularly hard situation. Only woodpeckers are able to make a hollow by themselves, in





FIG 2. HOUSE MARTINS BESIDE NEST. Autor: Juan Varela.

a tree trunk. Other species, especially the small ones, like redstarts or tits have to use ready-made hollows. We can help them by hanging specially prepared nesting boxes, in our gardens, parks and forests. Such actions are not only bird friendly and help to protect them, but are also indirectly advantageous to people. Most of the hole-nesting birds are insectivores in the spring and summer season. Both adult birds and nestlings consume enormous amounts of insects, which are considered pests of gardens and forests by people. By hanging nesting boxes, we encourage the birds to come live in our neighbourhood and this way protect our gardens and forests. In the forest we should hang the nesting boxes with the permission of foresters and always under the supervision of an adult. Ready-made nesting boxes can be bought in gardening markets, online shops or in forest districts.

If we decide to make a nesting box by ourselves, we have to remember about several rules:

1. The entrance of the house has to have the right size – one which will let through the right bird species but at the same time keep away the predators. The entrance should additionally be secured against the activity of woodpeckers, which can try to reach the eggs and nestlings (e.g. with a piece of metal). We should not put beams next to the entrance (which used to be quite common), because it can help predators to get inside of the box.
2. The house cannot be too shallow, otherwise the predator will easily reach the nest situated at the bottom of the box.
3. The box cannot be too deep either, because it will turn into a trap for the nestlings, which will have problems with getting out of it.
4. The house should be built with materials which won't get destroyed easily and which were not impregnated with chemical substances emitting harmful fumes (the best material is wood or a mix of concrete with scobs). For this same reason we don't paint the bird houses.
5. The box should have a removable front wall, which enables postseason cleaning, usually between the end of October and February. Remember, this work, for safety reasons (a ladder must be used), should always be supervised by adults.

Taking into account the size of the entrance and the preferences of the birds, 4 basic types of



boxes can be distinguished:

- Type A1 – with the smallest entrance (28mm in diameter). Blue tits nest in such boxes.
- Type A – with the entrance of 33mm in diameter, a bit bigger than in A1, great tits, tree sparrows, common sparrows, flycatchers, blue tits and redstarts nest in them.
- B type – the entrance of 45 mm in diameter, mainly starlings nest in it, but also smaller birds will be happy to move in – tits, redstarts and tree sparrows.
- P type (half open) – wagtails and black redstarts build nests in it, more rarely also common redstarts.
- Apart from the already mentioned ones, there are also less commonly used boxes:
- Type D – with the entrance diameter of 8,5 cm, for the jackdaw, stock dove, golden-eye, boreal owl, nuthatch, redstart, hoopoe, European roller and starling.
- Type E – with an entrance of 15,0 cm in diameter, for the tawny owl, mallard duck, golden-eye, jackdaw and stock dove.

How and where do we hang the boxes?

1. The box should be situated more than 2 meters above the ground.
2. The box shouldn't attract attention.
3. The entrance shouldn't face West nor South-West. This will protect the birds from the wind and slanting rain – these are the directions from which the wind usually blows in Poland.
4. The entrance shouldn't face up, to protect the birds from the rain and predators. The box should hang straight, yet, if it is not possible, it is better to position the entrance downwards than upwards. An entrance facing up makes it easier for nesting thieves to achieve their goal and exposes the inside of the box to the rain.
5. The box can be attached to the tree with nails or screws and if we don't want to hurt the tree – with a piece of rope.
6. We should put the boxes up in autumn or early spring – before the start of the nesting season.

Taking into account the needs of individual species, we should remember that:

- The starling inhabits boxes situated at almost any height and any location, yet it is important to hang the box in early spring – so that the starling can spot it on time. Boxes for starlings can hang close to one another, these birds are quite agreeable.
- Boxes for common redstarts, wagtails and black redstarts should hang in calm, even secluded places and quite low – at a height of 2-3 m. They can be hung on buildings or arbour. It is important that they are as little visible as possible and that, in the feeding period, nobody disturbs the birds, because they can abandon their nestlings.
- Tits, great tits and blue tits are territorial, they hate the close neighbourhood of their relatives, this is why their boxes should be separated by at least several dozen meters. They prefer refuges hung up on trees, both on the single ones and those in bigger woodlots. They often take over bigger boxes, e.g. those of starlings, or evict tree sparrows from their nests.
- Sparrows and tree sparrows, just like starlings tolerate ones company. Their boxes can hang on trees, stalks or buildings, yet they avoid boxes hanging very high. For a common sparrow and tree sparrow it makes no difference if the box hangs among trees or on an open space.



Bird eggs

Birds are the only group of vertebrates, all representatives of which lay eggs in order to have offspring. Why is that? The reason is an extremely important one. Birds, as animals that can fly, have to minimise their body weight, this is why female birds get rid of the eggs from their bodies as soon as it is possible. An egg is nothing else than a very big cell, in which a young individual is formed after insemination. During incubation it is not possible to provide it with nutrients and this is why it has to have all the resources necessary for the young nestling to develop. The water is provided by a protein sheath known colloquially as the egg white, and the nutrients contain a yolk ball called yolk. On the surface of the yolk ball, in a fixed position, lies the so-called germplug, from which the embryo develops, thanks to the heat supplied by the brooding parents (sometimes only one of them). The yolk ball maintains a fixed position (embryo disk facing up), thanks to the twisted strands of thick protein extending from its sides. The developing chick requires also the supply of an appropriate amount of oxygen for the metabolic processes and the removal of accumulated carbon dioxide through these processes, which is ensured by a properly developed calcareous shell, (the outer shell of the egg). It is equipped with a system of small openings, so-called pores, that allow gas to circulate. The shell also acts as a mechanical shield for the developing embryo. Thanks to appropriate pigmentation, it can take on various colors and drawings, which in the case of eggs laid in open nests play a camouflage function, protecting against attacks of predators. Eggs in hollows are usually white, because colors and spotting do not have much use in a dark nest.

The shapes and colour of eggs are very diverse and depend on the customs of individual species. Bird eggs laid on rock shelves have a conical shape, which protects them from rolling away from the rock and ensures that, in the event of a possible movement, they will only roll around a small surface. On the other hand, species that build nests in hollows lay eggs which are almost completely round, because this shape allows them to be conveniently placed on the bottom of the hollow.

Figure 4. Protective coloring of eggs in a lapwing's nest. Author. Cezary Korkosz

The number of eggs laid is generally the greater the more the nest or the offspring is endangered. This is the case with nestlings, where the chicks quickly move on to living independently (e.g. ducks).

The period of mating, nesting and breeding offspring is an important, seasonally repeatable part of the entire life cycle of birds. To what extent is this time related to the total lifespan of birds? Precise data on this subject has been provided by ringing, and despite the availability of various modern techniques, it is the best method for learning about the birds' lifespan so far. It turned out that there is a large dispersion in the age of birds and even for the same species we can get very different information. Small birds usually live shorter, on average 2-3 years (e.g the robin). However, there was a representative of this species, ringed as a chick that lived for 8 years.

The following are other examples of birds' maximum lifespan, deviating from the average for small birds:



- finch - 17 years,
- barn swallow - 15 years,
- great tit - 15 years,
- sparrow - 10 years,
- swift - 21 years,
- skylark - 10 years (this bird lives 3 years on average).

For larger birds, the maximum life expectancy can be:

- crow - about 13 years,
- gray heron - the oldest confirmed age is 25 years,
- mute swan - a swan found in Denmark broke the life record for these birds by reaching 40 years of age (on average it is 18 years),
- mallard duck - the oldest, confirmed age is 29 years,
- white stork - the oldest known wild white stork lived for 39 years after ringing, in Switzerland, while in captivity, storks live for 35 years,
- eagle owl - in nature it usually lives up to 20 years,
- golden eagle - in the wild it can survive for over 20 years, and the oldest ringed bird was 32; in captivity these birds live much longer - even 40 years,
- white-tailed eagle - in the wild it is 30 years, in captivity - even 40 years.

Frequently given examples of long-lived crows or parrots refer to breeding birds that, while staying in favourable conditions, without aggression from predators, can achieve higher life expectancy than the ones mentioned above.





FIG.2. PROTECTIVE COLORING OF EGGS IN THE LAPWING'S NEST
Autor: Cezary Korkosz.

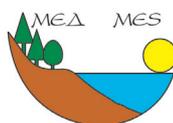






This material was prepared as part of the project „We live in harmony with nature. The educational program for teachers of pre-school and primary education”. The project involved selected non-governmental organizations involved in the protection of birds associated as part of the international BirdLife International federation. In addition to the National Society for Bird Protection, which ran the project, the Spanish Ornithological Society (SEO), the Slovak Ornithological Society (SOS), the Macedonian Ecological Society (MES), the Czech Ornithological Society (CSO) and BirdWatch Ireland (BWI) were involved. The University of Gdańsk became the substantive partner of the project responsible for creating materials for teachers.

BirdWatch Ireland is a non-governmental organization with a public benefit status, dealing with the protection of wild birds and the places where they live. The aim of the Society is to preserve the natural heritage for the benefit of present and future generations. BirdWatch Ireland is the Irish partner of the global federation of bird protection societies - BirdLife International.



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