

# EUROPEAN

*Merops apiaster*

# BEE-EATER





## European Bee-Eater (*Merops apiaster*)

The European bee-eater, the kingfisher and the roller are the birds with the most beautiful colouring to be found in our nature. Often, the bee-eater's presence is revealed by an unmistakable, bubbly call "purr-purr" heard even from far away.

## Identification

Its size is similar to the thrush, beak is longer and narrow. Elongated central tail feathers show particularly during the flight. It is characterized by striking colours. The front part is chestnut-coloured, back part shines with golden-yellow tones. Belly and chest are blue-green, while the throat is in intense yellow. A black stripe runs through the red eyes. Sexes are alike, they only differ in the colour intensity, as female and young individuals are more mottled.





Bee-eaters fly similarly to swallows. However, they glide more often and lunge sharply when hunting the flying insects.



## Geographical Distribution

The bee-eater is a thermophilic bird. They live in warm and dry zones of Europe, Africa and Asia. It is a strictly migratory species. They spend the winters in tropical and south Africa.

In Slovakia, the bee-eaters can be found in warmer southern areas. They prefer open country with solitary trees or orchards and sandy dunes, eroded walls or old extraction sites with steep sandy or earthy walls, or even abandoned sand quarries.



## Behaviour and Ecology

Bee-eaters are social birds, they live in flocks (colonies). They can be found wherever there is enough food –large insects are crucial to their survival. They choose their nesting sites based on the food accessibility. If there is enough food and suitable material to dig the nesting holes, they are able to nest even in low grooves on field roads or small pits. They can nest also on grazed river dunes with low vegetation. Bee-eaters hunting in larger numbers can be seen nearby rivers, on blooming meadows or clover fields.

The birds like to sit on elevated spots –e.g. on dry branches, electric lines and poles. Sometimes, they sit on tall grass, and hunt the flying insects from there.

Since they specialize in certain type of food, they depend on suitable source all year long. Therefore, they spend the winters in wintering sites. Our bee-eaters fly to African savannas. In August, they form larger flocks. In the beginning of September, they travel along larger rivers down south. Next year, in April and May, they return to their nesting sites.



## Feeding

Bee-eaters feed exclusively on insects, and are very well adapted to this diet. They are fast aviators with great vision, and hunt even the most agile insects without any difficulties. They hunt mostly during the flight, but if the weather is bad (rain, wind, cold, etc.) or an extensive grazing is ongoing, they can pick the insects from the ground. They feed mostly on hymenopterans (wasps, bumblebees, bees), dragonflies, flies, butterflies, Orthoptera (grasshoppers and bush crickets) and beetles.

Before eating the prey, the bee-eater first prepares the meal by smashing it against a branch, thus removing inedible parts, e.g. a bee sting. Later on, they spew out the undigested rests (hard chitin exoskeletons of invertebrates, legs, hard elytra, etc.) in forms of pellets.

## The Family Life of Bee-eaters

### ■ Nesting Habitat

Bee-eaters nest in steep sandy, earthy or loessial walls. In the past, they used to nest in river banks and natural landslides. These biotopes ceased to exist or overgrew with vegetation due to river regulations and lack of floods. Nowadays, the bee-eater doesn't have another choice then look for substitute spots, often nearby humans. They nest in aboveground pits, sandpits, road grooves, etc. In Slovakia, a nesting colony contains 10 – 20 pairs, exceptionally several hundreds of nesting pairs.



Bee-eater spewing out the undigested rests of Insects in forms of pellets



## ■ Mating

A characteristic courting ceremony precedes the mating. It starts with clapping the wings next to the mating partner, followed by jerky movements of the head and wings. Both partners make throaty sounds. Every now and then, one bird makes a move towards the other one's belly. It is neither a warning nor an attempt to intimidate, it is simply a ritual move. This type of behaviour helps release the tension (aggression) before the actual mating. The display can take hours. Afterwards, the exhausted birds rest pressed against each other.

## ■ Building a Nesting Hole

Building a nest is an exceptionally demanding task. The nest is placed inside a hole that can be 1 – 2 m deep. Both partners participate in digging, using their feet and beaks. Depending on the conditions (type of soil, weather), it takes up to two weeks. During this time, the birds mate repeatedly.

Length and quality of a nesting hole depends on hardness of the soil on the nesting site. The longest holes are dug in looser soils, e.g. sandy soils. Shorter holes are dug in harder materials, e.g. loessial walls. At the end of the nesting corridor, they build a little hollow, about 17 – 30 cm wide and about 12 cm high. Bee-eaters never bring any material to cosy up the place, nor they weave a real nest. They lay their eggs on the bare bed of the hollow. The rests of food, dung and pellets accumulate there, too. In most cases, the nest is used only once (due to accumulation of dung, parasites, and decomposition of food rests). Rarely, the same nest is used more than once.





During the digging, the male brings "a present" – an insect snack – to the female several times a day. After giving the present, they mate.

### ■ Caring for the Offspring

In Slovakia, the bee-eaters nest once a year. On average, the female lays 5 – 7 eggs. Less often, she may lay only four, rarely eight eggs. The eggs are laid one-by-one, and the female incubates them from the very first one. The embryos start evolving immediately and the siblings have different age and size. It takes about 20 days for the eggs to hatch, young birds are naked and completely helpless. Both parents care for their offspring for about 20 days. Different sizes of bird siblings play a vital role in adverse weather (rain, cold). If the food is scarce, the largest siblings – being the stronger ones – usually survive. On the other hand, the younger ones are oppressed and often die. The reduction seems drastic; however, it is nature's way to deal with times when the parents cannot properly feed all of their youngs. After leaving the nest, the young birds return to spend several more nights. The parents give them complementary food for about 12 more days. Then the family falls apart. Sometimes, there is a third bird, so called "helper", which helps with caring for the youngs. Usually, it is a parent's relative. The helper is usually a young individual, yet not in a couple, and without its own family. Most often it is a sibling, not an offspring, of one of the parents – usually a brother. Bee-eater males, like other bird species, are tied to their birthplace stronger than females, and they often return from the wintering sites together.



## Threat

Suitable conditions for successful breeding are crucial to the survival of entire populations and for the species itself. The same goes for the European bee-eater. While the species is well adjusted to negative impacts of natural environmental factors – after all, they spent generations adapting – the birds are often helpless when facing sudden changes caused by human activities.

The European bee-eater, too, is threatened the most by human activities. The main factor is human induced lack of food due to overuse of chemicals in farming, reduced size of wetlands and decreasing diversity of the country. Besides that, the bee-eater suffers from degradation or a complete loss of natural nesting opportunities – steep river banks and naturally eroded loessial or sandy walls. Moreover, the lack of grazing along the rivers or on nearby sandy or loessial dunes adds to the problem. Many nesting sites overgrew with vegetation due to lack of grazing.



An exhausted bee-eater after spending long time in a hole clogged by PURfoam

**What is that river had in the past, but now it's missing? Why there are no bee-eaters nesting in river banks and their numbers generally decline?**

- The most palpable reason is **the loss of river dynamics** in alluvial ecosystems – 19th and 20th century was characterized by massive river regulations. Straightening the main stream, cutting off the meanders and entire river branch systems, building the dams and diverting the water to artificial channels – All that affected the Danube and majority of Slovak rivers and streams. For more than 30 years, all larger side branches of Danube were being cut off of the main stream. Progressively, fine sediments filled the side arms and overall degradation started. As a result, there are dying rests of arms and branches, mostly overgrown and filled with deposits. Steep and eroded walls are missing.
- Another nail in the coffin for the birds nesting in steep river banks were **quarry stone embankments**. During the river regulations in 19th and 20th century, the majority of Danube banks was fortified with quarry stone even in zones, where it was not necessary, including beaches and islands. Bird species that require steep and eroded banks and walls cannot nest in these embankments at all.





- Last but not least, the lack of traditional meadow management negatively affects steep and eroded river banks or loessial and sandy walls. Absence of traditional grazing by horses and cattle along the rivers and further away significantly contributed to the bare segments being overgrown with vegetation. Due to lack of grazing, the vegetation could grow stronger, even grow over the high and otherwise inhospitable steep banks and walls, as well as dunes.

Due to these human alterations, the birds have to find alternative nesting spots (above-ground pits, road grooves), where the walls are, unfortunately, often directly destroyed. Walls located in e.g. an active sand quarry are threatened by direct open cast, or even landslides. Destroyed or fallen walls are not suitable for nesting.

On the top of that, people often go after the bee-eaters directly, e.g. by blocking the nesting holes or even by killing them, due to unjustified fear for bees. Moreover, human activities —e.g. overuse of insecticides in farming— cause severe decrease in amounts and diversity of food available for this interesting bird.



## Conservation

In European Union, the European bee-eater is protected under NATURA2000 network. Out of 41 Special Protection Areas in Slovakia, the European bee-eater is listed as a protected species in four areas, and one area is a nesting site to a significant part of the population (over 1% of the nesting population in Slovakia).

### What is NATURA2000?

NATURA2000 covers two types of protected areas:

- Special Protection Areas (SPA, Special Protection Areas) – declared by the Birds Directive,
- Special Areas of Conservation (SAC, Special Areas of Conservation) – declared by the Habitats Directive. Birds are not counted here among the species of plants and animals, since in their case the procedure is according to the older directive.

**A target species** – a key species for which the Special Protection Area (SPA) is declared in order to assure their protection and proper management of their habitats. Target species are mostly those endangered within the entire European Union, plus some species of national importance and groups of migratory bird species.

**1% species** – an endangered species not considered target in the respective SPA, however, their numbers represent more than 1% of national population and they are subject to protection in these areas. This provides more efficient protection within the existing SPA network.

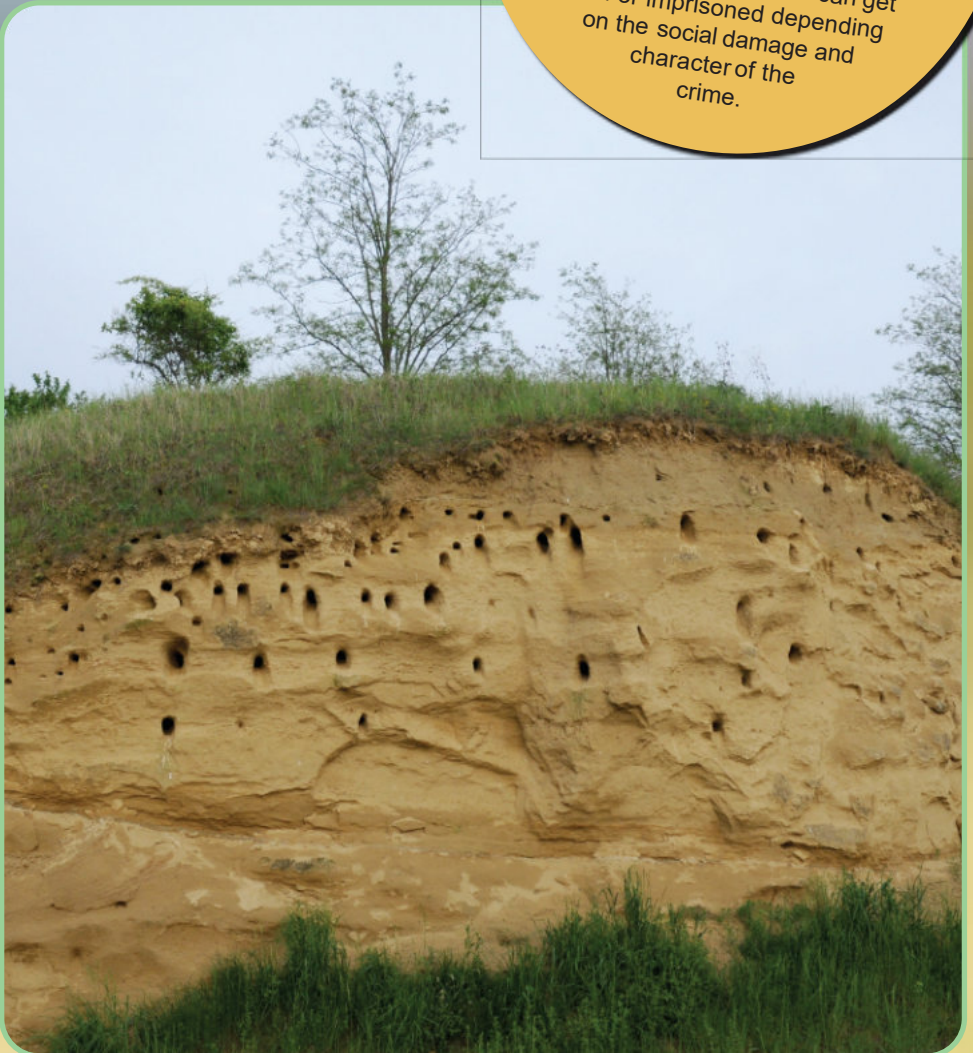




## Conservation in the Slovak Legislation

Conservation of the European bee-eater in Slovakia falls under the Act No. 543/2002 Coll. on Nature and Landscape Protection that treats legal aspects of animal conservation, including the birds. The Nature and Landscape Protection in Slovakia covers protection of species and areas. The protection of species covers protected animal species. The protection of areas is indirect, via the Landscape Protection.

All wild birds, with exception of feral pigeons, are protected under the Nature and Landscape Protection Act. They cannot be disturbed, touched or otherwise harmed. Their breeding sites, including the nests and nesting habitats, and different stages of development (e.g. eggs) are also protected. If the law is violated, the perpetrator can get fined or imprisoned depending on the social damage and character of the crime.







*Restored sand-loessial walls near Bátorove Kosihy village, maintained in collaboration with local volunteers. European bee-eaters, sand martins and Eurasian tree sparrows nest in there.*

## **What Needs to be Done to Create Suitable Nesting Conditions for the European Bee-Eater?**

There are several ways to help bee-eaters return to their natural nesting sites—river banks, open loessial or sandy walls. Long-term measures are the most efficient for the species and the entire ecosystems—Measures that allow natural processes to restore steep river banks on one shore, and create beautiful natural gravel or sandy beaches on the other one, while keeping them without vegetation.

- That means letting the water flow wherever needed—open the side branches that were cut off, reconnect them to the main stream, restore the meanders and let the water raise and drop naturally. In restored branches, or even better, in entire river stretches, the water only needs a few years to restore the habitats that have been degrading for decades. Steep river banks form spontaneously and quickly. Sand martins and other species are quick to find them and use them for nesting.



*A former nesting site of European bee-eaters located on sandy-loessial dunes. Due to lack of grazing, the location has completely overgrown with invasive plants.*

- **Removing the embankments** wherever not necessary. Removing the longest stretches of the paving or stone fortification possible is imperative for improvement of the conditions for the birds that nest in steep banks and walls.
- From a long-term perspective, it is beneficial to restore **the traditional extensive grazing**, especially by horses, along the rivers, in river bank vegetation, on loessial and sandy dunes, in order to keep the banks and nesting walls in suitable condition. Bee-eaters are particularly fond of grazed sandy dunes—they can dig their nesting holes in the sand, even in horizontal terrain.

Moreover, the areas will become **more attractive for tourism**, which is an added value of these measures. A river without ugly and impassable embankments is more attractive and much safer place not only for animals, but also for canoeists and people who wish take a walk along the picturesque shore to recharge their batteries. Such river bank is safer and more attractive to the children, too. They like to look for pebbles, shells or build sandy or stony structures. An extensive grazing nearby the river makes the place more appealing just by simple presence of the animals. At the same time, a grazed meadow makes for easier access to the river and attracts many interesting animals. Grazing is an exceptionally powerful tool to **contain spreading of invasive plants** that spread quickly. It can be beneficial to the land owners that are obliged by law to remove these invasive plant species.

All these measures are considered suitable solutions to **improve flooding capacity of rivers**. What is it good for? It means the area between the dykes will be able to absorb more water. That is a great help during a flood – it will slow down and flatten the flood wave, thus mitigating its negative impacts.



*Restoration of extensive grazing on sandy dunes near Virt village. Thanks to an amazing local farmer, grazing takes place right next to a bee-eaters nesting wall and is managed in a close-to-nature fashion—numbers of animals and duration of grazing are in proportion to on the size of the pasture. As a result, the sandy dunes are popular amongst the bee-eaters, as they can nest in the ground, right on the pasture. Horses are the ideal animals for such place, since they notice the nesting holes and go around, thus avoiding their damage.*





## How Can You Help?

The most efficient way the general public can support bee-eaters, is preserving the existing and newly formed nesting walls. Therefore, it is necessary to inform the conservationists about existing nesting holes – include the description of the location, the habitat, provide coordinates or photographs.

It is of great help to let the nature conservancy authorities, or the Slovak environmental police, know about any interventions to the nesting walls, disturbances or illegal dumping nearby the nesting site.





## Restoration of nesting and feeding habitats of Sand Martin, Kingfisher and European Bee-eater in Danube-Morava region

EULIFE Programme under European Commission is there to improve the status of endangered species and habitats. LIFE Projects implement restoration measures in Natura 2000 locations.

The BeeSandFish is one of these projects. As the name suggests, it aims to protect and restore nesting sites and hunting habitats of three interesting bird species—the sand martin (*Riparia riparia*), the common kingfisher (*Alcedo atthis*) and the European bee-eater (*Merops apiaster*). What do they have in common? A specific way of nesting in steep river banks or walls.

Four organizations collaborated closely on the project: BROZ—the Regional Association for Nature Conservation and Sustainable Development as the main partner and coordinator, while experts from Water Research Institute prepared the studies on restoration of water regime in Danube branches, wetlands, and restoration of steep river banks. Project documentation and necessary engineering works were carried out by experts from VODOHOSPODÁRSKAVÝSTAVBA, š.p. Throughout the project, the specialists from The Faculty of Natural Sciences of Comenius University, Bratislava (PRIFUK) monitored the target species and fish, as well as socio-economic impacts of the project.

The achieved results—in particular, restored steep river banks, restored nesting walls, reconnected river branches with restored water regime, return of autochthonous tree species to river banks and return of grazing and mowing to the alluvial meadows can all be seen on the project:

**[www.broz.sk/BeeSandFish](http://www.broz.sk/BeeSandFish)**



### Bibliography

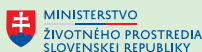
Hudec, K. a Šťastný, K. (2005). *Merops apiaster* – Vlha pestrá. In: Ptáci – Aves. Fauna ČR, díl 2/II. Academia, Praha.

Karaska, D., Trnka, A., Krištín, A., Ridzoň, J. (2015). *Chránené vtáčie územia Slovenska*. ŠOPSR, Banská Bystrica, 380 pp.

[http://www.sazp.sk/slovak/periodika/enviromagazin/enviro3\\_2/duha12.html](http://www.sazp.sk/slovak/periodika/enviromagazin/enviro3_2/duha12.html)

<http://spolocnebrehy.vtaky.sk/vcelarik-zlaty>

<http://ziva.avcr.cz/files/ziva/pdf/vlha-pestra-skvost-nasi-prirody.pdf>



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