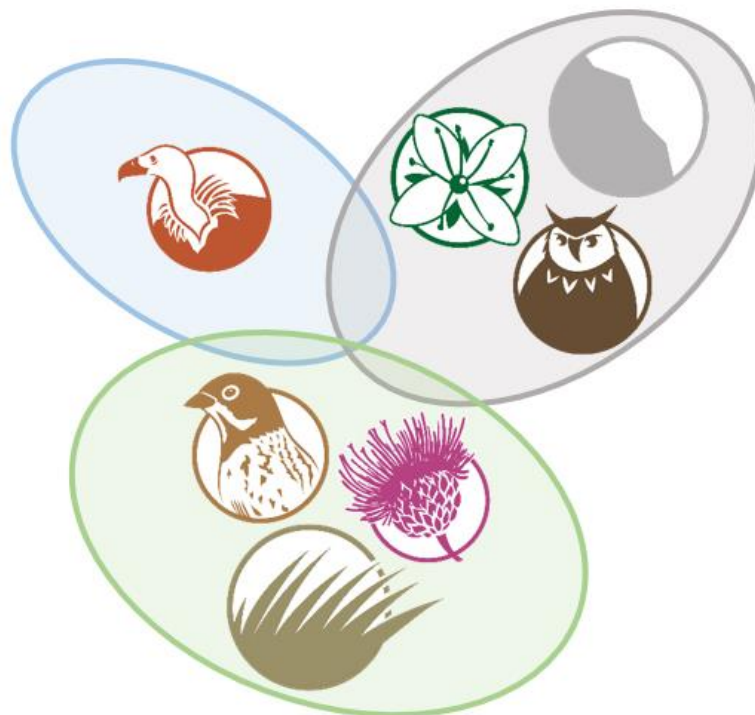


LIKE

Living
on the
Karst
Edge



Educational program

NATURE 2000

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Moehringia tommasinii Marches (*Moehringia tommasinii*)

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Moehringia tommasinii Marches (*Moehringia tommasinii* March., family: Caryophyllaceae, cloves)

General information

Moehringia tommasinii Marches is a small plant from the cloves or carnation family, with linear-subulate leaves and tiny flowers, which have four leaves, petals and sepals placed opposite one another. It belongs to a group of related, mostly highly endemic species of the southern Alps, north-eastern Apennines and western Balkan Peninsula. It usually grows in a form of a cushion, and it can be distinguished by somewhat "meatier" leaves from the related mossy sandwort (*M. muscosa*), which also has four-numbered flowers and nearly always grows in shade. Most specimens of *Moehringia tommasinii* Marches blossoms in April and May, or possibly in June, and certain cushions even during the entire summer. The seeds have an oily structure (elaiosome), and they are spread by ants.

Distribution

Moehringia tommasinii Marches is a highly spread species (narrow endemic, steno-endemic plant), which grows in the karst edge area between Glinščica in the Trieste hinterland and Istarske toplice, in only five locations; in addition to the two previously mentioned locations, it also grows near Osp, Črni kal and Podpeč.

Ecology

Moehringia tommasinii Marches is a semi-cave plant species in the karst edge area. Certain specimens, which grow in rock fissures, are only occasionally reached by water and its dissolved nutrients. Even though it grows in sunny rock complexes, in most cases it dwells in fissures in shaded and wetter parts of rocks. In these edge habitats, where there is not much competition among species, it also grows in the community of *Asplenio lepidi-Moehringietum tommasinii* Martini 1988, where is, in addition to *Sesleria juncifolia*, chimney bellflower (*Campanula pyramidalis*), tender spleenwort (*Asplenium lepidum*), winter savory (*Satureja montana* subsp. *variegata*) and pellitory of the wall (*Parietaria judaica*), accompanied by only c. thirty flowering plant species.

Endangerment causes

Moehringia tommasinii Marches grows in fissures of natural rocks. Since they are unavailable to majority of people, at first it seems that active protection of moehringia and its habitats is not important. However, it seems that human activity has moved from grasslands and pastures to unavailable rocks at the karst edge, in the form of sports climbing which takes place here. There were warnings about the negative effects of climbing on *Moehringia tommasinii* Marches even back in the 1990s since climbers, mostly inadvertently, physically remove cushions of this plant. In the rocks above the Nugla village, where the botanists recorded moehringia in places which are today equipped for climbing routes, nowadays, unfortunately, it can no longer be found.

Protection measures and legal protection

Moehringia tommasinii Marches is a rare and endangered species whose specimens grown only

in five locations in Italy, Slovenia and Croatia. It is included in the list of endangered and protected plant species in all three countries where it grows, and in addition, it is protected by the Habitats Directive (92/43/EEC). Nowadays, *moehringia tommasinii* Marches is not endangered by anyone except the climbers but placing any form of protected trails and the supporting infrastructure in rocks where *moehringia* grows seems unacceptable.

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Eurasian Eagle Owl

(*Bubo bubo*)

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General information

Eurasian eagle owl (*Bubo bubo*)

Order: Strigiformes – owls

Family: Strigidae – owls

Subfamily: Buboninae – typical owls

IUCN Red List: LC (Least Concern) – Europe, Europe 27

Red Book of Birds of Croatia: NT, Red List of Slovenia: NT (base from 2011)

It is listed in the Appendix 1 of the “Birds Directive”, in Croatia it is protected under the Nature Protection Act, and in Slovenia under the Nature Conservation Act and the corresponding ordinances. In special protection areas (SPA) “Kras” (Slovenia) and “Učka and Čičarija” (Croatia), it is a target species, and both states are obliged to conserve its population in a good condition. Despite the estimation that the Eurasian eagle owl population is decreasing globally, mostly due to events in Asia, its endangerment category in Europe is LC (least concern) since its population trend is on the rise. The assessment of European population numbers is 18,500 – 30,300 specimens.

Distribution

The Eurasian Eagle owl is distributed nearly across the entire Europe. It is only absent on Mediterranean island, in Great Britain, in Iceland and western France, and it is extremely rare in certain lowlands in central and northern Europe (Hagemeijer & Blair 1997). In Slovenia it is distributed across the entire territory, with the exception of the south-eastern and north-western part of the country. Kras with the karst edge is known as one of the most important nesting grounds for this species. In 2019 in the KRAS SPA area in Slovenia, as many as 9 eagle owl territories were recorded. The distribution of this species continues in the Učka and Čičarija SPA area, and the species is further distributed in Croatia along the entire seaside: in Istria, on Kvarner and in Dalmatia with its corresponding islands.

The eagle owl is mostly a species with lowland distribution. Its distribution nowadays in Slovenia and in Croatia indicates that this is a mostly lowland bird species. Thus, the highest nesting ground of this species in the Alps was recorded at the height of somewhat over 1000 m above sea level, whereas over 90% of the population lives below 800 m above sea level. We primarily attribute these occurrences at higher positions to sexually immature specimens. This species also avoids large forested areas.

Ecology

The Eurasian eagle owl primarily inhabits area where suitable rocky nesting grounds are surrounded by open surfaces.

It mostly nests in rocks, so the availability of nesting grounds is strongly conditioned with the terrain orography. A small part of the population (<10 %) nests in other places as well, e.g. on the ground, in the forest i.e. on trees, branches or in tree hollows. It is not particularly picky when it comes to choosing rocks for nesting, and it mostly opts for high, dry and well fragmented rocks. The fragmentation enables its nesting since it does not build its own nests but can rather nest exclusively on appropriate shelves or cavities in rocks. We will primarily find it in south-oriented rocks and semi-caves. In addition, it nests in quarries, mostly abandoned ones, and it

can tolerate the presence of humans and mechanisation in parts of the quarries. It is interesting that it more easily adapts to permanent presence of construction machinery, cars or trains, than to the presence of walkers near the nest, so we can still say that the nesting grounds of this species must be remote and quiet. A pair of eagle owls is present in the nesting ground throughout the entire year.

Nest-related activities often begin as early as December, even though laying eggs in our conditions starts at the end of February or beginning of March. The eaglets leave the nest in June and become independent in October. The eagle owl is known as a food generalist and opportunist. The composition of its diet here shows that it mostly hunts in open areas, and the thickness of its nest primarily depends on the area structure and prey availability. The highest local nesting density in Slovenia was recorded at the Kras edge, where 3 pairs nested in the area smaller than 10 km², whereby the smallest distance between the two nests was 1.9 km, which can be compared with certain densities recorded in Europe. Similar densities were also recorded on the Dugi otok in Croatia.

The data from the program for monitoring the state of this species, conducted in the period from 2004 to 2019, indicate that the population of the eagle owl in the Natura 2000 areas Kras and Vipavski rob in Slovenia is stable, but with a lower nesting success in comparison with similar areas in Europe.

Endangerment causes

The Eurasian eagle owl is a larger bird. Electric shocks often occur on medium-voltage overhead power lines, and they are known to be the most common cause of death of the eagle owl. The impact of medium-voltage power lines was recognized as the reason for decreasing the density of the population, missing out on nesting opportunity or even completely abandoning traditional nesting grounds. The most problematic are open areas, and since power lines in open areas are excellent hunting opportunities, the eagle owl often uses them as a hunting blind. Such areas often prove to be seemingly stable habitats since the population stability is only ostensible there. Another issue in death cases caused by power lines is the fact that the largest number of killed specimens are adult, territorial birds.

The species is also endangered by nest disturbances, whereby sports rock climbing is the main factor. What is dangerous here is the fact that both climbers and eagle owls choose similar rocks, and the similarity in their choice can be explained with the eagle owls' ecological requirements and the climbers' sports needs. They both purposely look for high, steep rocks; the eagle owl for the nest safety, and the climbers for climbing challenges. The sunlight exposure of rocks is another reason why they choose the same rocks since sunny rocks are appealing in early spring when the eagle owls nest. The rock position in the landscape is also important as the rocks located above the cultural landscape mean that the eagle owls can bring the prey to the nest more easily, and on the other hand, they facilitate the access to the climbing sites for the climbers. We are talking about the phenomenon of selecting the same rocks, therefore, it is not surprising that climbing sites are set up in the very locations where the eagle owls nest. Thus, nowadays we have a larger number of climbing sites from which the eagle owl completely disappeared with the onset of climbing, as witnessed by empty remains of nests in rock shelves.

Protection measures

One of the most significant protection measures is to repair dangerous medium-voltage power lines (insulating wires next to poles) or the replacement of unsafe poles or insulators with safe ones.

It is also important to have as accurate judgement as possible on the acceptability of introducing sports activities into rocky areas. The most important thing here is to properly manage sports climbing, as well as cycling, hiking and paragliding. An extremely important protection measure is individual nesting ground protection. A large number of eagle owls does not nest in protected areas, so daily monitoring of nesting and determining and solving reasons for the absence of nesting has proved to be an extremely efficient measure. This action is called Eagle Owl Guardians.

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