hibernation, their body temperature and metabolic rate are low. Hibernating animals must not be disturbed because waking up causes loss of energy.

PIUSA CAVES

The Piusa caves are in fact galleries of a former quartz sand quarry. By construction, this is a system of parallel and crossing passages with sandstone columns left to support the ceiling separating the galleries. This deposit of good quartz stone was discovered by geologist Hendrik Bekker in 1920. Mining of the light sandstone of the Gauja bed of the Sventoji stratum started here in 1922; industrial mining commenced in 1924 starting from Mõrsjamäe. In the beginning, mining was done in adits and the sand was carried out in trolleys. This kind of mining was finished in 1966, when a quarry was opened north of this cave system.

Six abandoned mines – the Big Cave, Good Cave, Museum Cave, Mõrsjamäe (*Bride's Hill*) Cave, Small Cave and Fox's Cave – are located in the protected area. The caves were closed to public in 2006 due to big risk of falling.

HEATH PINE FORESTS

The pine is almost the only tree which is able to grow on the nutrient-poor soil of Piusa. There is nearly no undergrowth and the herbaceous vegetation is also scarce, consisting mainly of the mosses and lichens which stand aridity, and some heather. The pines grow slowly here because of the shortage of moisture and food. There is, however, plenty of light in the forest. The wood is the most picturesque and colourful at the end of summer when the purple heather flowers and the grey lichens make up most unique mosaics.

FOR VISITORS

The visitors who want to learn more about the Piusa Caves are welcome to the Museum Cave with an observation platform. In the Piusa Caves Visitor Centre in its close vicinity you can take a virtual stroll in the caves, and learn about the Piusa sands and how they were mined.

Visitors can take a 1.5-kilometre-long walk on the nature trail which starts and finishes at the car park near the Visitor Centre. The trail introduces a typical heath forest community and gives a good chance to walk in the healthy pine wood air. It will take about an hour to take the walk at a peaceful pace.

DOS AND DON'TS FOR VISITORS

- When moving on hiking trails, do not cross the boundaries because the cave ceilings are at risk of falling and the lichen communities are very fragile.
- You can move about on private land from sunrise to sunset unless you do damage to the landowner. In case the private land is fenced or marked, you will need the landowner's permission.
- Drive your motor vehicle only on the provided roads and park it only in the car park.
- Cycle only on the roads and trails.
- Camping and making a fire is not allowed because of the great wildfire hazard in the local woods.
- Keep your dog on the leash while moving about in the nature.
- You can pick berries, mushrooms and other forest goods.
- Try to act without leaving traces in the nature.

When you see damage done to the nature or visiting objects, inform the Environmental Inspectorate by phone 1313.

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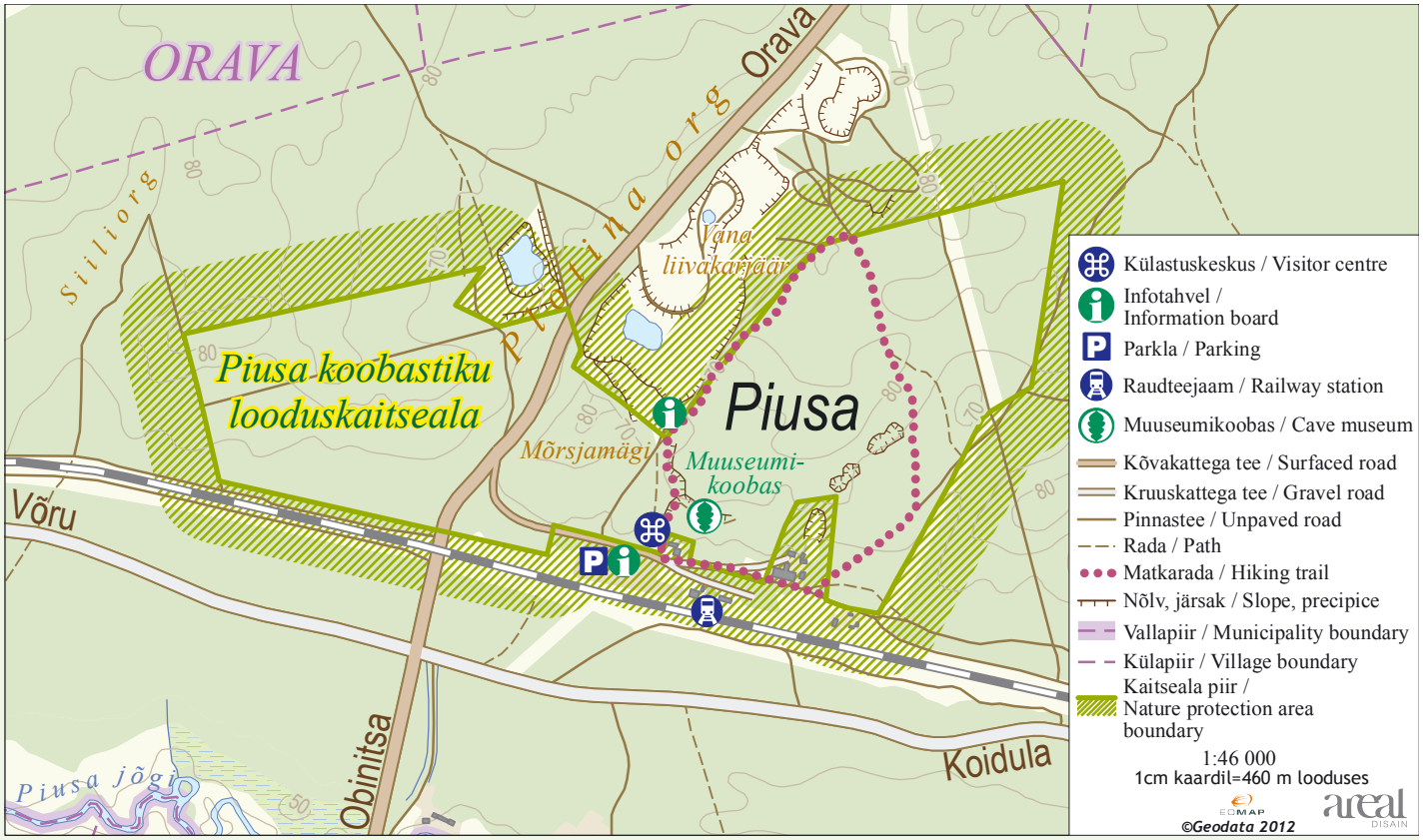
PIUSA
Cave System Nature Reserve

Photo: Nests of bank martins in sandstone, Environmental Board



PIUSA CAVE SYSTEM NATURE RESERVE

The Piusa Cave System Nature Reserve with its area of 47.4 hectares is located in the vicinity of the Piusa Railway Station on the Valga-Petseri railway in Orava Rural Municipality. The nature reserve was formed in order to protect the sandstone caves in Piusa, which are the largest hibernating area for bats not only in Estonia, but also anywhere in the Baltics. The caves became a protected area in 1981, and the nature reserve was established in 1999. In addition to bats, this territory contains habitats suitable also for other protected species, such as the great crested newt (*Triturus cristatus*), Eastern pasqueflower (*Pulsatilla patens*), small pasqueflower (*Pulsatilla pratensis*) and creeping lady's tresses (*Goodyera repens*).

BIGGEST BAT HIBERNATION HABITAT IN ESTONIA

The former mines at Piusa have become a hibernating place for bats because of their suitable conditions, such as the stable thermal and humidity environment, silence, darkness, appropriate measurements of the caves and their openings, existence of cracks, and the characteristics of the landscape around the caves.

The favourable conditions in the Piusa caves have enabled the formation of a big hibernating colony – bats come to hibernate here from within the distance of 100 kilometres. After the cave openings were closed for people and the temperature stopped fluctuating, the number of hibernating bats has increased. While in 1949 the total of 22 bats was counted in all the caves, the latest research in 2008 confirmed the number of approximately 4,000 hibernating bats. This makes the cave system the biggest bat hibernation habitat in Estonia and one of the biggest habitats in North-East Europe.

Seven different species of bats have been found in the Piusa caves: the pond bat, Daubenton's bat, Brandt's bat, whiskered bat, Natterer's bat, brown long-eared bat, and Northern bat. All in all, eleven species of bats have been discovered in Estonia.

Bats belong to the order *Chiroptera*, who are the only mammals capable of flying. The bats living in Estonia feed on insects, whom they find at night with the help of ultrasonic echolocation. Their daylight hours are spent motionless in tree hollows and cracks or in attics. While some species of bats (e.g. the common noctule) fly to warmer territories for winter, the others, mostly the Myotis, gather in caves and cellars and hibernate from October to April. Bats survive the period thanks to the reserves of body fat. During

Photo: Pond Bat, T. Tõrv