

Nature restoration at Bøjden Nor

- a coastal lagoon with dry grassland



One of nature's pearls

Bøjden Nor is an especially valuable natural habitat in the South Funen Archipelago



^ Inauguration of the project in May 2013 by Grete Justesen, chairwoman of the Committee for Technology and the Environment in the municipality of Faaborg-Midtfyn.

New pond for the natterjack toad. >

FACTS about Bøjden Nor

The Natura 2000 site of Bøjden Nor comprises a total area of around 114 ha. The lagoon itself covers around 36 ha and is bisected by a road embankment leading to the Bøjden ferry harbour.

The area was designated a Natura 2000 site on the basis of the following habitat types: 1150* coastal lagoon, 6210 semi-natural dry grasslands on chalk, 7220* petrifying springs, 1330 Atlantic salt meadows, 1210/1220 beach ridges with annual/perennial vegetation, 1310 annuals colonizing mud and sand.

Bøjden Nor is one of the bird reserves of Fugleværnsfonden (the Danish Bird Protection Foundation). The reserve is managed for the Karen Krieger Foundation. The reserve is especially well known for its occurrence of scaup (*Aythya marila*).

The whole Natura 2000 site has furthermore been conserved since 1968. The site is covered by a Natura 2000 plan dating from 2011 and a Natura 2000 action plan from 2012.



Bøjden Nor was originally a shallow bay, but in the course of time the sea deposited sand and formed beach ridges, barring the entrance. Today the Nor is a coastal lagoon with stretches of shallow water surrounded by salt meadows and low cliffs and cut off from the Little Belt by a long narrow beach ridge.

There are other coastal lagoons dotted around the South Funen Archipelago. Previously there were many more, but embankment and drainage projects carried out 100 - 150 years ago have meant that coastal lagoons are now seldom, not only in Denmark but also in Europe as a whole.

Bøjden Nor is thus part of a European network of exceptionally valuable natural habitats named Natura 2000. This means that we have an obligation to take all possible steps to preserve the coastal lagoon with its special plants and animals and its characteristic landscape.

Bøjden Nor is moreover a very important area for a large number of breeding and staging ducks and waterbirds. In winter large flocks of tufted duck, common pochard and scaup stage here. The area also houses a population of the rare and threatened natterjack toad.

Surveys carried out in the area showed, however, that the natural conditions in Bøjden Nor were far from ideal. The areas with semi-natural dry grassland and salt meadows were too small and too isolated. There were problems with the dry grassland which was becoming overgrown with thicket, and both the dry grassland and the lagoon were generally under pressure from nutrients entering from the surrounding areas. It was necessary to take steps to reverse this development.

A LIFE project was the solution

In 2010, the work already underway to manage and protect Bøjden Nor received a boost when EU LIFE approved a major nature restoration project in the area. The municipality of Faaborg-Midtfyn, in its capacity of local nature management authority, had submitted the project together with Fugleværnsfonden (the Danish Bird Protection Foundation) and the Karen Krieger Foundation. Fugleværnsfonden manages a bird reserve in the area and the Karen Krieger Foundation owns parts of the area. EU LIFE has contributed 50% of the total project budget. The remainder has been covered by the partners involved in the project.

The project aimed to extend and connect the areas with dry chalk grassland and salt meadows. Pollution of the lagoon by nutrients from the catchment area was to be reduced and the conditions for birds and natterjack toad were to be improved.

The project's concrete aims were to:

- Purchase 25 ha of the neighbouring arable land
- Start converting 20 ha of this land into dry grassland and create a mosaic of wetland on the remaining 5 ha to remove nutrients from the surface water flowing into the coastal lagoon.
- Clear bushes and trees from 1.5 ha of the high quality dry grassland.
- Fence in a total of 52 ha new and existing natural habitat and introduce grazing regimes.
- Dig 5 new water ponds and dredge 4 existing ponds to benefit the natterjack toad.
- Establish 2 bird islets in the coastal lagoon to enable waders to breed undisturbed.
- Establish 2 kilometers of new recreational pathways around the area and erect information boards etc.



New paths ensure accessibility for the public.

Grazing cattle help to convert former fields into dry grassland.



Many small natural habitats linked together to form larger areas

The salt meadows and the dry grassland previously formed narrow strips along the lagoon and were limited to relatively small areas that inhibited natural dynamics. Certain plants and the natterjack toad are in danger of becoming locally extinct if the species cannot spread to suitable habitats nearby. The threat of extinction to a natterjack toad with only one suitable breeding pond is greater than if there are 5 suitable ponds in the area.

The small areas also made the coastal breeding birds vulnerable to disturbances from foxes and other predators. The population of breeding birds on the salt meadows and the beach ridges was therefore on a decline.

In many places, the strip of salt meadow was so narrow that it was difficult for the grazing cattle to move around to the different parts of the area. Grazing was therefore not as efficient as it could be.

Thanks to the LIFE project, 25 ha of adjacent arable land have been purchased and now form part of the natural habitat, linking up the original habitats. The dry grassland, which formerly covered less than 0.5 ha in the form of a narrow strip along the edge of the cultivated fields, can now spread over an area of 20 ha. Conversion has started, but the process will take time.

Natterjack toads have already spread to the five new ponds and a basis has therefore been established for a large and sustainable population of this species.

Spreading hay from neighbouring dry grasslands to ensure development of new dry grassland.



FACTS about the Natterjack Toad (*Bufo calamita*)

The natterjack toad is easiest to find when it is croaking at the ponds on a warm afternoon or evening in May–July. The males give a loud and continuous croaking to attract females to the shallow ponds where the eggs are to be laid. A good breeding pond should be shallow and have sparse vegetation, ensuring that the sun's rays can warm up the water to such an extent that hatching of the toads' eggs is furthered. Many of the toads hibernate in the long stone walls and earthen banks bordering the area.

Creating ideal living and breeding conditions for the natterjack toad also results in improved habitats for many other plants and animals living in the ponds.



Bird islet taking shape.

Cleaner water in the lagoon

The waters of the lagoon are very shallow, being less than one metre deep in most places. This means that the lagoon is exceptionally vulnerable with regard to nutrients from the catchment area transported by, for example, drainage water. Too many nutrients pollute the water in the lagoon and make it turbid. Nutrients are also a threat to the special species of vegetation growing on the dry grassland, which are typically low plants adapted to a nutrient-poor habitat. Excessive nutrition causes the low plants to be ousted by species that are taller and faster growing.

Even if agricultural practices in the catchment area comply with the existing general regulations for the use of fertilizers, there was need for a special effort to reduce the amount of nutrients reaching the natural habitats. It was estimated that the



New information boards have been put up in the hides.

shallow waters of the lagoon, covering a little less than 36 ha, received around 4,000 kg of nitrogen per year.

One way of reducing the amount of nutrients reaching the lagoon is to retain larger quantities in the catchment area. In practice, this is done by stopping cultivation of adjoining arable land and using it as a buffer zone between the cultivated areas and the natural habitat. In addition, a number of small wetlands established in the buffer zone ensure that the nitrogen is held back and decomposed.

Analyses carried out up to now show that this measure has reduced the amount of nitrogen entering the lagoon by 30%.

The buffer zone will also combat the impacts of future rises in sea level due to climate change, by making it possible for the natural habitats to spread further inland.

Cattle as managers

The dry grassland and the salt meadows are to be grazed by large animals such as cattle or horses. Otherwise the areas would become overgrown by tall plants such as reeds, hawthorn, willow and alder, which would compete with the many low plant species which are naturally at home here. The area would then lose a great deal of its biological diversity and its significance for birds and amphibians.

The whole area has therefore been fenced in and facilities established for cattle grazing in the form of e.g. pens, gates, watering places, etc. A small area of the slopes has been cleared of bushes etc.

A herd of cattle has been put out and will in future be instrumental in managing the salt meadows, the dry grassland and the "new" grassland.

Planning in progress winter 2011.



Bøjden Nor.

Birdlife will also benefit. The cattle will keep the grass and reeds down, so that the birds can move around here with their young. At the same time the cattle's trampling will form small pools: a habitat for a variety of small animals which in turn are food for wading birds. To ensure breeding birds are undisturbed by predators - for example foxes - two breeding islets have been established in the eastern section of the lagoon as part of the project.

Bird islet where waterbirds can breed in peace.



The birds are happy too

The shallow waters of Bøjden Nor and the surrounding salt meadows house many birds. Around 45 species breed here and others arrive on migration and in winter. All year round, ducks and other waterbirds find a rich larder in the lagoon where they can forage in peace. Waders nest and forage on the wet salt meadows or on the two breeding islets. Terns nest on the meadows and catch fish in the shallow waters of the lagoon. The meadows also serve as a nesting site for gulls, which use the whole area - water, land and air - for foraging. Passerines can be observed on the meadows and in the woodland both during the breeding season and on passage.

Practical information



The public are welcome inside the grazing enclosures. But please show consideration for the birds.

The project has been carried out by the municipality of Faaborg-Midtfyn in cooperation with Fugle-værnsfonden (the Bird Protection Foundation) and the Karen Krieger Foundation.

- The municipality of Faaborg-Midtfyn is the local authority for nature management with the responsibility of implementing Natura 2000 action plans. Project manager: Claus Paludan.
- Fugleværnsfonden has a bird reserve in the area and is responsible for the future management of the area. A management plan has been drawn up as part of the project. This plan can be found as an annex to the municipality's Natura 2000 action plan for Bøjden Nor on: www.faaborgmidtfyn.dk/fileadmin/user_upload/Plan_og_Kultur/Natur/Endelig_Natura_2000-planer/B%C3%B8jden_Nor_LAV_2.pdf
- The Karen Krieger Foundation owns in all 40 ha of the land areas after the completion of the project.

All three parties have contributed to the project with professional expertise and financing.

Further information about the project can be found on:
www.fuglevaernsfonden.dk/fuglevaernsfonden/projekter/life-bojden

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Karen Krieger-Fonden

