**Site 06: Halmø**

**6.1 Change of the site by project activities:**

Before the project started, the small island´s coastal grasslands and former fields had become partially overgrown with dense grass and shrubs (mainly Caucasian blackberry, *Rosa rugosa* and *Crataegus spec*.) since the agricultural use had been abandoned. At the same time plantations with coniferous trees were erected. The overgrowing of the salt and coastal meadows reduced the terrestrial habitat for *Bufo calamita, Bufo viridis* as well as different species of meadow birds. Wading birds had abandoned the island because of the too dense vegetation around all existing water-bodies.

Grazing of the higher lands as well as the meadows was needed to restore and improve habitat conditions. *Bufo calamita* existed in a very small and vulnerable population on the project site in the remaining lagoon on the western half of the island. At the same site, the population of *Bufo viridis* was slightly larger, but the populations of both species were limited by the quality of aquatic and terrestrial habitat and needed the pioneer vegetation that could be provided by the all-year grazing robust cattle.

The site contains several coastal lagoons of which two were chosen for the project. The western lagoon with relatively low salinity was not an optimal habitat for toads nor wading birds anymore, as the edges had been overgrown by *Scirpus maritimus*; inside the lagoon organic material had accumulated over the last 25 years, causing a pessimal trophic stage and muddy water. Salinity had artificially been raised by the means of pumping salt water into it. This was done in order to create a resting place for ducks and sea fowl in order to improve the hunting possibilities. Naturally, the lagoon had been disconnected from the ocean for more than 100 years and the water had become fresh. By raising the salinity, halophilic plants such as *Scirpus maritimus* were able to outcompete less salt tolerant species such as *Agrostis stolonifera* (a preferred egg-laying plant for the natterjack and the green toad). This change had been accelerated by the stopping of the grazing.

Initially, several plots on the island were fenced in and a herd of 16 Scottish highlanders was introduced to the island for robust all-year grazing. Grazing had a positive effect on the lagoons, the natural depression, pond edges and it created a half-open landscape.

The implemented grazing in combination with the restoration of 3 coastal lagoons, 4 natural depressions and 5 cattle ponds had very positive effects:

The western lagoon with the remaining populations of *Bufo viridis* and *Bufo calamita* was partly dredged. The sediment was used to cover a *Rosa rugosa* plantation (planted for hunting reasons 25 years ago) This action had a positive effect on the water quality as well as on the salinity (the natural salinity could be restored). The remaining few spots with *Agrostis stolonifera* were saved. In 2010 exactly at these sites spawn of *Bufo calamita* was found – the species could successfully breed again. The lagoon was fenced off from the cattle in order to give the *Agrostis stolonifera* enough time to recover after the measure to restore the lagoon had been carried out (removal of *Scirpus maritimus*, dredging of mud).

In 2011 *Agrostis stolonifera* had spread further. Along the 300-400m long shoreline of the lagoon, *Bufo calamita* larvae could be observed in high numbers. Further, the natterjack had colonized one restored depression and one shallow cattle pond on the western half of the island with breeding success in 2010 and 2011.

In 2010, *Bufo viridis* did still successfully breed in the western lagoon, but in this year it had also already colonized a cattle pond on the eastern half of the island, breeding there with considerable success. By the year 2011, *Bufo viridis* had colonized the large restored lagoon on the eastern half of the island. This lagoon has a salinity of appr. 5‰. Larvae of *Bufo viridis* could be observed everywhere along the 300m shoreline.
The two toad species had started to separate the coastal lagoons and ponds between them, thus avoiding competition. A similar strategy could be observed on Monnet, where different types of lagoons with a natural hydrology still occur.
In the years 2010 and 2011 the good breeding success of both amphibian species allowed the implementation of supportive rearing and the building up of mirror populations at Urehoved (site 5).
After the lagoons, depressions and ponds were dug or restored, the owner of the island agreed to remove bigger areas of *Crataegus* and the Caucasian blackberry around the western lagoon. A first pair of lapwings was observed breeding there in 2011. The restored water-bodies also had a positive effect on other birds: in 2010 3 pairs of *Anas strepera* and 2 pairs of *Tadorna tadorna* were breeding successfully.
Green frogs have been observed breeding in the freshwater bodies. It is likely that they colonized the island by themselves, managing the distance of a few hundred meters over the open ocean similar to Bufo viridis.

**6.2 Remaining challenges and actions:**
For the future, a further removal of unwanted vegetation around the water-bodies and the lagoons is necessary. Negotiations with the landowner on this topic are going on.

**6.3 Public perception:**
The island is owned by a single person, a former business man from Copenhagen. It is a common and widespread custom among successful entrepreneurs to own islands that can be used for private purposes such as recreation, enjoying the quietness or hunting possibilities with friends. The owner lives on the island in June and July.
During the planning phase, contact with the owner had been established in order to assess if and to what extent a co-operation could be possible. The friendly and open contact between the project team and the owner made it possible to communicate the project´s goals and to overcome doubts and reservations against amphibian protection and restoration of the island´s eco-system as it was foreseen within the scope of the project.
To come to this point and to build up mutual trust many meetings at the coffee table and joint field visits were necessary. Finally, as a first step the owner agreed to initiate a grazing scheme on the island in order to combat the blackberries, the *Crataegus* and the *Rosa rugosa*. Additionally and in order to supplement the cattle with drinking possibilities it was agreed to renovate the lagoons and water-bodies on the island.
The discussions during the planning phase with the land owner were so successful that in 2005 he simply bought 16 Scottish highland cows himself, as he said he didn´t want to wait for the slow EU-money and just wanted to get started. In Scotland he had seen the effects on eco-systems of such animals grazing and he was convinced that it could be a good option for the island of Halmø as well.
It was not before 2009 that he dealt out the permission to restore and dig water-bodies – this permission was only granted because of the friendly and trusting personal relationship with Lars Briggs, as the owner had strong objections against such extensive

changes on his island. But as the owner finally decided that he would take part in the project this opportunity opened up.
In 2010 the owner commented on the result of the digging actions as a good success, now being able to retain such a big amount of freshwater on the island as never before - previously precipitation water had been led very fast to the ocean via pipes and drains. Further, the water quality in the lagoons had considerably improved.
His son-in-law, a member of the Danish ornithological society informed the owner about positive effects on the bird-life on the island: 3 pairs of *Anas strepera* and 2 pairs of *Tadorna tadorna* now successful breeding on the island. The gamekeeper and caretaker of the island from Ærø also spoke with the owner about his observed improvement of the bird life – it is important for local stakeholders to get positive feedback not only from members of the project team.
The land owner mentioned that in spring 2011 he could observe many juvenile toads around his house; he also found 14 *Bufo viridis* and 1 *Bufo calmita* inside his house where they had tried to hibernate but dried out on the kitchen floor. They must have entered the house through the fundament and made their way up to the kitchen. It is likely that many toads hibernate under his house; only juveniles are small enough to find their way up into the kitchen through small cracks.