

Coastal meadows and wetlands of Öland

– experiences of a nature conservancy project





The wetland pastures of Öland have been a distinctive characteristic of its landscape for millennia past.





Half of the project Coastal Meadows and Wetlands in the Agricultural Landscape of Öland was funded by LIFE, the EU fund for environmental and nature conservation projects. LIFE–Nature part–finances projects for the protection and preservation of habitats, flora and fauna of interest within the EU.



Natura 2000 is a network of a representative sample of habitats of Community interest. All sites included in the Coastal Meadows and Wetlands of Öland project are Natura 2000 areas.

The Tjusby coastlands, on the eastern side of central Öland.



Preface

In a long-term, wide-ranging project, it can sometimes be hard to see what results are being achieved. Details tend to blot out the big picture. The LIFE project “Coastal Meadows and Wetlands in the Öland Agricultural Landscape” lasted for 4½ years, with expenditure totalling MSEK 30.5. During the hectic concluding six months, the question was asked: “Have we really done anything? What have we achieved?” The project involved remedial measures of many different kinds, such as clearance, enclosure, reinstatement of water areas, inventories, follow-up and information. Now that the findings have been put together, we can happily record that our lofty objectives were achieved and in some cases exceeded.

Project work in the agrarian landscape is a gratifying enterprise. The results are often supremely tangible and widely appreciated. Both landowners/farmers and the general public have expressed appreciation of the measures accomplished under this project. And appreciation of the results is not confined to human beings. Bird-life has benefited in many areas, and the birds have responded with an increase in numbers and diversity. The flora too, we hope, will appreciate what has been done, but it will probably be some years before those results become visible on the ground.

Many colleagues at the County Administrative Board, as well as researchers and students at Kalmar, Gotland and Lund Universities, and many other people besides, were actively involved in the project. Working with other people who brought new approaches to the problems proved to be a very stimulating and instructive experience. Both the project and everyone concerned with it benefited from the various contacts forged with landowners and farmers through innumerable meetings, evening briefings and courses.

It is to be hoped that the co-operation evolved while the project was underway will survive the project’s conclusion and that the discussion inaugurated concerning the maintenance of sensitive areas will continue unabated.

We hope this brief publication will give you, the reader, a useful insight into what this LIFE project has accomplished.

Annigun Wedin

Project Leader





*Restoration by means of shrub clearance and tree-felling was one of the project's main activities, with nearly 1,000 hectares being opened up.
Picture: clearance in progress at Hjälmsstad.*

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Tjusby coastlands

JOHAN JANSSON

The project in a nutshell

The purpose of the project was to recreate wet and moist, properly grazed habitats in Öland.

During millennia of intensive grazing, the landscape of Öland was dominated by large expanses of open country, copiously dotted with accumulations of water, the size of which varied with the changing seasons. But changing agricultural practices brought a reduction of grazing, the disappearance of the hay

meadows and the draining of wetlands. The landscape was greatly transformed in the 20th century. The diversity of birdlife and plant life diminished, and characteristic Öland species were lost.

The LIFE project Coastal Meadows and Wetlands in the Agrarian Landscape of Öland lasted from 2000 to 2005. The intensive efforts undertaken in close co-operation with farmers and landowners have resulted in open, grazed areas in which, slowly but surely, the flora and fauna can now regain their former abundance.



PETER NILSSON

Blue Moor-grass

The wetlands in the project

The areas included in the project are scattered all over the island. They comprise moist lands and wetlands of various kinds: alvar lakes, temporary pools, coastal meadows and mires.

The eastern coast has a string of waters and wetlands, such as Triberga–Alby

Mosse and Hulterstad. At some point in time, Öland was tilted slightly by movements in the earth's crust, and the whole island now lists 2 degrees eastwards. When it rains, the water runs eastwards until halted by a barrier of sediment deposited by previous Baltic water levels.

Wetlands glossary

Coastlands (sjömarker) are the flat, grazed coastal grasslands along the east, south and southwest coasts. In some places this level ground extends nearly 2 km inland. The coastlands have a copious vegetation. The land is fertilised by seawater whipped up by the autumn storms, and the grass thrives on the moisture. The tradition of putting livestock out to grass in the coastal grasslands dates back at least to the Early Iron Age, which began 2,500 years ago.

A temporary pool (våt) is a shallow pool formed by precipitation in autumn, winter and spring. In summertime these pools dry out. They are found both on the alvar plain and in the coastlands. Öland being so flat, water will accumulate in the slightest declivity. The rainier the weather, the heavier the concentration of temporary pools.

Alvar lakes are the deeper accumulations of water, which, unlike the temporary pools (våtar), are not emptied by the summer drought. In the middle of the lake there is nearly always a small island of sedge or reeds. Öland does not have many alvar lakes: Möckelmossen, Dröstorps Mosse and Stormaren are the ones usually counted.

Mosse is the name popularly given to most other wetlands in the south of Öland, e.g. Frösslundamossen and Södra Utmossen. The corresponding wetlands in the north of Öland are often called **träsk**, e.g. Petgårde Träsk and Djurstad Träsk.

Fen (kärr) is the biologist's name for mosse and träsk on Öland. A mosse (i.e. **bog**) in the botanical sense has to be made up of Sphagnum moss and watered by precipitation only, which is seldom the case on Öland.

Mire is the collective biological term for bog and fen habitats.





The unreclaimed Öland landscape had a far greater number of small pools and waterlogged areas.

TOMAS JÄRNETUN

Moist land important to farmers of yesteryear

For ages past, Öland has had large numbers of grazing livestock. The moist lands were important for both pasture and haymaking. They were lush with grass, and their plant life did not die off so quickly during the summer drought.

Land use on Öland has always been *sui generis* compared with other parts of Sweden.

The climate is dry in summer. The soils are thin and poor in many places and dry out quickly. Water

was a blessing to Öland's earlier inhabitants, and it can hardly be a coincidence, the island's prehistoric forts, such as Triberga and Eketorp, being situated next to wetlands.

To farmers, the wetlands offered an abundance of nourishing grass to be mown as winter-feed for the cattle, even in years of heavy drought. And cattle could be put out to grass on moist lands, which were not used for haymaking. Haymaking was already widespread in the moist lands of Öland 2,000 years ago. The island had many more small areas of water before people started draining the land.



LOTTA ÖSTERBERG

The coastlands were used for grazing, but also for haymaking.



This side of the fence is grazed and kept open. The fen with Great Fen-sedge on the other side has not been grazed for years.

Agricultural modernisation – the landscape drained and overgrown

The draining of wetlands began in the mid-19th century. The remaining moist areas started to get overgrown when winter feed production switched to the arable fields. The entire landscape began to be transformed in the early years of the 20th century.

Öland's population exploded at the end of the 19th century, and more farmland was needed. Wetlands were drained to provide more cultivable land and reduce the problem of flood-prone fields. More than half Öland's wetland acreage disappeared. The arable acreage was correspondingly augmented, but there were new worries in store.

The water table sank and erosion became a problem. The effects on wildlife were clearly apparent. In one of the last reclamation reports we read: "This enterprise will mean the disappearance of one of the last mires on Öland, where infinite numbers of seabirds nest yearly."

Simultaneously with land drainage, ley farming began to catch on. Sowing and

harvesting winter feed for livestock on arable land was more rational than mowing grass growing naturally in the meadows. The wetlands were becoming redundant. Further agricultural change followed the end of the Second World War. Mechanisation increased, artificial fertilisers were introduced, and a farm could now specialise in arable production without any livestock. Such wetlands as now remained were no longer really attractive as pasturage.

The landscape was ceasing to be open. Reed banks obscured the water, moist grasslands became scrublands, and coastlands were invaded by Juniper bushes. The Öland landscape was losing the open, inviting character which millennia of intensive grazing had formerly given it.

In the short term, ditching yielded a great deal of new and productive arable land. Pictured here is the main drain at Hulterstad.





The Lapwing thrives in the coastlands.

CHARLOTTA LARSSON

short and moist – vital to endangered species

Well-grazed, moist lands are among the most polyspecific to be found in Sweden and home to many species, which cannot survive in other habitats. Species, which have become rarer as land has been drained and become overgrown.



FrAGRANT Orchid
PETER NILSSON

When vegetation is kept short by haymaking or grazing, just one small space can support many different plant species. No species has a chance of ousting the others. Biodiversity is high as regards both flora and fauna.

Overgrowth decimates

If grazing land is left to run wild, before long a couple of plant species will have gained the upper hand. Buttercups, Cow Parsley and Common Reed are typical overgrowth species, blotting out other and weaker plants.

When plant life becomes uniform, diversity also declines among other organisms, such as birds, insects, fungi, amphibians and reptiles. The environment is less bountiful than before.

Well-used land means more light reaching the ground. Certain plants – such as the Musk Orchid – are very sensitive

indeed to shade and disappear instantly when the surrounding vegetation grows too tall.

Different needs of birds

When vegetation is kept under control, this benefits birds which need open spaces for their foraging, and also birds which, when breeding, want a clear view to guard their eggs and young from enemies. Montagu's Harrier, the Golden Plover and the Avocet are birds with needs of this kind, and all of them are now rare species.

And calcareous

The Öland soil is rich in lime. Open, moist lands with plenty of lime are very unusual, not only in Sweden but in the rest of Europe too. And so our project makes a very important difference to plants requiring that kind of habitat.

MARTIN LAGERLÖF



Endangered, redlisted or just rare?

There are several different terms about species, which are having difficulty in surviving.

Redlisted denotes species listed by the Swedish Species Information Centre (Svenska ArtDatabanken). These are subdivided into: *Regionally Extinct*, *Critically Endangered*, *Endangered*, *Vulnerable*, *Near Threatened* and *Data-Deficient*. This last mentioned category is for species which are suspected to be on the point of extinction but about which we know too little to be able to say for sure.

The critically endangered, endangered and vulnerable species are also termed *endangered*.

In danger of extinction is a term, which biologists think should only be applied to a species on the verge of dying out because of deliberate extinction.

Poor preservation status is a term used in EU nature conservation work. Biotopes and species need good preservation status if they are to survive in the long term.

Rare simply means that a species is uncommon. It ceased to be a Red List category in 2000.

ANITA HEIMDAHL



Grass Snake, Musk Orchid and Bird's Eye Primrose – they all need moist and close-cropped grasslands.

MARTIN LAGERLÖF



BRITA FAHLSTRÖM



PETER NILSSON



Ringed Plover



In the coastlands you can find orchids like Elder-flowered Orchid.

TOMAS JÄRNETUN

Wetland denizens

The wetlands of Öland are not identical. They have different biotopes to offer their inhabitants. Some species prefer temporary pools, others the coastlands.



Little Tern
PETER NILSSON

One thing all the wetlands of Öland have in common is that, one way or another, they present extreme conditions compared with the rest of Sweden, and sometimes with the rest of Europe or even the rest of the world. Their flora and fauna are correspondingly exclusive.

Tough going in the rock pools

Drenched with water one moment and utterly parched the next – not many species can survive in that sort of environment. But Prostrate Rocket, Shoreweed and various *Scorpidium* mosses all flourish there.

The temporary pool biotope has hardly any counterpart elsewhere in Sweden, and so several of the species growing here are not to be found in any other part of the country. Sparse-flowered Plantain, for example, is nowhere to be found between here and the steppes of Central Asia. Lesser Water-plantain, Prostrate Rocket and

the moss *Pseudocalliergon turgescens* have their natural habitat in the Arctic and southwest Europe.

Fish are rarely encountered in the temporary pools – a congenial state of affairs for amphibians like the Great Crested Newt and predatory insects such as various Dragonflies.

The temporary pools are too shallow for swimming birds, but waders like it here.

Öland is not over-endowed with open, permanent freshwater lakes, but where they do exist – at Knisa Mosse or Möckelmossen, for example – they are popular haunt, not least, of dabbling ducks. Öland can boast all the species: Gadwall, Mallard, Pintail, Shoveler, Wigeon and Garganey.

Mixed goodness in the fens

In the Mittland Forest, not least, there are places offering varied, wet habitats all the



The Agile Frog needs a varied habitat with many small pools of water. In the Mittland Forest it finds its Eldorado.

Species benefiting from the project

The project sites include no fewer than 16 of the bird species listed by the EU for the establishment of Special Protection Areas (SPAs), e.g. **Golden Plover**, **Ruff**, **Avocet**, **Little Tern** and **Sandwich Tern**. Vascular plants such as **Fragrant Orchid**, **Fen Orchid**, **Musk Orchid**, **Bird's-eye Primrose** and **Common Butterwort** have been given better chances of surviving and spreading.

Other species benefiting from the reinstatement of moist and close-cropped habitats include the **Agile Frog** and **Marsh Fritillary**, the **Whorl Snail** and the **Great Crested Newt**.

year round. The Agile Frog needs a whole assortment of biotopes for mating, metamorphosis and the rest of the life cycle. Opportunities of this kind abound in the Mittland Forest, which is the prime Swedish habitat of the species.

Fen Orchid is a tiny flower, very hard to spot. It needs an uninterrupted water supply and occurs at only a few sites in Sweden. On Öland it has a number of locales in the Mittland Forest and in the northern part of the island.

The coastland smorgasbord

Many bird species find food and a place to live in close-cropped coastlands. No fewer than 15 redlisted species nest there regularly. Waders are especially fond of this habitat. The Dunlin, which needs the very shortest vegetation, the Redshank, the Black-tailed Godwit, the Avocet, the Ruff and the Curlew find food in plenty at the water's edge.

Exclusive duck species like the Gadwall, Garganey and Pintail also thrive here. Terns and gulls breed here in large numbers.

During the autumn and spring migrations, Arctic waders and geese touch down here in their hundreds of thousands.

Stream transport

The streams play an important part in the reproduction cycle of both Brown Trout and Pike. The Pike needs still, shallow water for mating in. In recent years its reproduction has been very poor indeed in the coastal bays of Kalmar County, south of Oskarshamn, which has made it more important than ever for the Pike to be able to swim upstream and spawn in fresh water.

Brown Trout need flowing water for their courtship, and the benthic material must be suitable, i.e. gravel or small pebbles. The Brown Trout find this sort of bed, for example, in Frösslundabäcken.

Species biding their time

The soil contains a seed bank. When conditions are right, the seeds will germinate. Resumption of grazing can be followed by the sudden reappearance of much the same flora as existed in the old days.

Insects traversing large areas will, if they are reasonably lucky, find their host plants and habitat. But species, which do not move so far, have more difficulty in spreading to areas, which would suit them.

Birds reconnoitre from above the ground which they believe suitable and investigate the food supply there. Öland is traversed by something of an avian superhighway. Every year, millions of migrant birds rest on the island. Fairly soon they will find an area which is once again worth colonising.

Swift recovery of their lost habitats is the best thing for the species, but even several years after the event there are still good chances of persuading a large proportion of lost species to come back again.



Opening up an area that is completely overgrown is a very tough assignment. Juniper forms dense thickets which are difficult, time-consuming and, consequently, expensive for the individual landowner to clear away.



ANITA HEIMDAHL

In 2000 it was clear that many species were hovering between survival and extinction in Öland's increasingly overgrown wetlands. Here the trees are closing in on a Fragrant Orchid.



MARTIN LAGERLÖF

The situation in 2000

The Southern Dunlin needs coastal grasslands with short grass, a biotope that until 2000 had become increasingly rare on Öland.



PETER NILSSON

The species characteristic of moist, open lands were on the point of disappearing. The Öland farmers were willing to put the old moist pastures down to grazing again, but heavy investments were needed.

Water supply has always been a problem on Öland, with its dry summers and thin soils. Farming had been completely transformed as a result of widespread drought and an increasing water shortage on the island. Wells ran dry in hot summers, because of the low water table.

Resurgence of grazing

Advisory services and the new agri-environmental measures (AEM) incentives had prompted a growth of interest in grazing the natural pastures during the 1990s, but for many years now the pastures had been running wild and the fencing had fallen into disrepair. Clearance and fencing are costly investments, and this impeded the resumption of grazing over large areas.

Birdlife on the retreat

Bird species requiring moist, open spaces had been steadily declining during the se-

cond half of the 20th century. There was a clear connection between this and the disappearance of the wetlands.

Several species had been put on the Red List as endangered, e.g. the Pochard, Garganey and Black-tailed Godwit. Where grazing was started with the aid of agri-environmental measures, the return of characteristic species was both rapid and noticeable.

Incentives needed

A strategy was needed for keeping the landscape open in the long term, and investments were needed to assist farmers who were willing to go in for grazing livestock. Pastures and water, which were now overgrown, were in need of restoration.

Knowledge needed to be gathered concerning the impact of wetlands on Öland's water supply and concerning the whole ecology of moist pastures. This was where the LIFE project fitted into the picture.



MARTIN LAGERLÖF

Co-operation was the name of the game. Without the goodwill of the farmers, the project would never have achieved its targets. Steers at Hallnäs.

Setting targets

The aim of the project was to achieve, in close co-operation with every conceivable agent, a living, open, well-grazed landscape which displaced species would be able to return to.

The wetlands were to be restored to the appearance they had had for millennia, right down to the present.

Quantifiable targets

Several directly quantifiable targets were defined for the project – for example, the acreage to be cleared, the area of open water to be reinstated, and the bird species, which were to return to their former breeding habitats. The quantifiable targets were important for ascertaining the project's ultimate success.

Necessary co-operation

The project was also to increase the interchange between different interests on the land. The general public, the hunting community, national authorities, ornithologists,

higher education and entrepreneurs often share the same objectives, but contacts between them are not always particularly good. The project was to try to establish a natural co-operation between the different groupings.

Farmer = key player

The work done by the farmers is fundamental to the long-term maintenance of open, close-cropped and moist environments on Öland. Without them the project targets could never be achieved, and so co-operation with the farming community was a top priority.

Knowledge gathering was another vital objective – learning more about restoration techniques and about the connections between moist, actively farmed land and biodiversity.

Four quantifiable targets

The acreage of well-grazed or mown calcareous moist grasslands, alkaline fens and coastlands was to be increased by 1,500 hectares.

Shrubs and trees were to be cleared away from 2,200 hectares of semi-natural grasslands, 952 hectares of which were to be cleared in the course of the project.

Open expanse of water were to be reinstated in various wetlands by cutting reeds, filling in ditches and dredging sediment.

Species such as the Golden Plover, Ruff, Avocet, Little Tern, Sandwich Tern, Southern Dunlin and Montagu's Harrier were to reproduce at the project sites.





TOMAS JÄRNETUN

Börje Ekstam lecturing at the concluding project conference for researchers and conservation workers, May 2005. An opportunity for presenting the results achieved.

Hard work richly rewarded

During the four-and-a-half years of the project, most of the targets initially defined for it were achieved. The acreage of open, moist pastures on Öland has increased, species have returned, co-operative schemes have been started and knowledge of Öland's wetland environment has grown.

Birdwatching platforms were an innovative feature designed as part of the project by Charlotta Larsson.

MALIN MILLER



The County Administrative Board had four, sometimes five, personnel equivalents dedicated to the LIFE project, overseeing the project activities and keeping in touch with farmers, entrepreneurs, students, researchers, inventory workers and excavator drivers. They presented the project at seminars and issued invitations to courses and meetings out in the villages. A brisk pace was kept up from start to finish.

One of the project's great problems was the weather. Even in normal Öland conditions, restoration of wetlands is difficult except during the ground-frost season and before the autumn rains. 2003 and 2004 were unusually rainy years by Öland standards. Machinery damaged the ground or got stuck. Manual clearing operations became impossible when the water level became knee-high. Several jobs contracted could never be completed.

The system of agri-environmental measures was reorganised during the project, and this had a whole string of consequences. Suddenly the grants for grazing in semi-natural grasslands were raised – a powerful

incentive, encouraging many farmers to do their own land clearance in order to cash in as quickly as possible.

This, of course, was all to the good. The farmers were motivated and the project benefited accordingly. Which still left the toughest and most expensive areas to be cleared, with the result that more than twice as much acreage was cleared as had initially been bargained for.

But now came the challenge of getting the European Commission to understand the changed circumstances. That was no easy task, but in the end it was successfully accomplished.

Getting permission for various operations takes time. The Environmental Code requires an environmental impact assessment (EIA) whenever a wetland is to be established. The Heritage Act may stipulate rescue digs. And Water Court judgements may need to be amended.

All three are procedures costing both time and money, as the project team discovered. The necessity of good forward planning was an important lesson learned.



MALIN MILLER



TOMAS BURÉN



ANITA HENRIKSSON



JOHAN JANSSON



BRITA FAHLSTRÖM

Facts – concrete results

2,056 hectares have been reinstated as pasture.

Altogether nearly 4,500 hectares of natural pasture were cleared during the project, 988 of them under project auspices.

19.5 hectares of open water have been reinstated.

One wetland has been dammed and one restored.

3 watercourses have been remedied, enabling fish to migrate upstream to their spawning grounds.

9 new Nature Reserves have been designated, and one enlarged.

2 new bird protection areas have been formed, and another 3 enlarged. 1,384 hectares of land, divided between 8 areas, have been exempted from sea bird hunting during the most sensitive season.

Planted Tench have been removed.

68.2 km of fencing have been put up, enclosing 1,824 hectares of land.

7.6 km of fencing have been restored.

76 gates have been built.

One livestock corral has been built.

37 briefings have been held with landowners and the general public.

9 Öland wetland seminars have been held.

For the general public

72 stiles have been built.

10.5 km of hiking trail have been laid out, complete with duckboarding.

4 birdwatching platforms have been constructed.

14 information spots have been established.

34 information boards have been put up.

3 bridges have been built over watercourses.

6 picnic tables have been put out.

Information material

8 of the project areas have been presented in information sheets.

A website has been built up, supplying comprehensive information about the project: www.h.lst.se/h/amnen/Natur/projekt/life_strandangar

A guide to the wetlands of Öland has been written, entitled "Welcome to the Öland Wetlands", available in Swedish, English and German.

Surveys conducted under the project

The occurrence of parasites in grazing beef cattle has been investigated.

Öland stream biotopes have been mapped.

Shrub growth on Öland has been mapped with satellite data.

Whorl Snail, beetles, breeding birds, Fen Orchid and calcareous moist grasslands have been inventoried.

The breeding bird populations of coastlands have been surveyed.

Biodiversity

10 new Whorl Snail habitats have been found.

Black Tern breeding has increased.

The Black-headed Gull colony has returned to Triborga-Alby.

The Tadpole Shrimp has been found for the first time since 1950 on Öland.



JOHAN JANSSON

Top to bottom: information board at Södsviken/Väsby Fjärd, plot during inventory, duckboard construction at Knisa Mosse, solar-cell-powered electric fencing, official opening of the Vanserum-Bäck Nature Reserve.

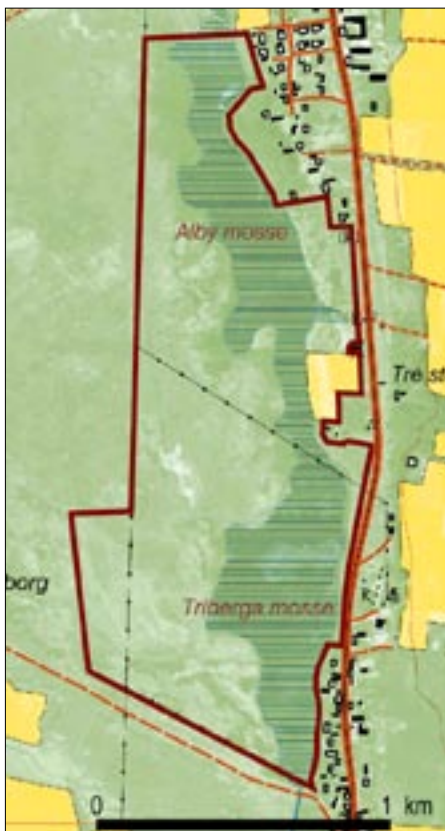
Right: sedge-cutting at Svartvik Fen.



MARKUS FORSLUND

Restoration has paid off. Birds are returning already, like this visiting White Stork.

The wetland lies between the villages of Triberga and Alby in the southeast of Öland and forms part of the Natura 2000 site Stora Alvaret. The red line indicates the bird protection area.



Birdlife and bandy at Triberga–Alby Mosse

In 2003 a large part of Triberga–Alby Mosse became open water again. The local reinstatement association had been campaigning for several years to make the restoration come true, and the LIFE project was one of several agencies contributing expertise and finance.

Triberga–Alby Mosse is the kind of wetland typical of Stora Alvaret. Oligotrophic and governed by seasonal fluctuations of drought and precipitation. Invaluable to the species – both flora and fauna – round about.

The water became increasingly overgrown from the 1950s onwards, following the decline of livestock grazing – the same trend as in other such Öland wetlands. The Ruff, Pintail and Yellow Wagtail stopped coming there.

Black-headed Gull defence force

Finally the Black-headed Gull colony disappeared. This was a deathblow to the wetland's birdlife, because Black-headed Gull put up fierce and effective resistance to raptors and other assailants, a fact which many other bird species make use of. Gull colony boom years have also been peak years for duck breeding.

In the end the vestiges of the wetland

seemed to be only inhabited by the Grey-lag Goose, which, on the other hand, adapted well and increased its numbers.

Local crusade for restoration

In the nearby villages of Triberga and Alby, a reinstatement association was started in a bid to restore the wetland to its pristine condition. The initiative came from Inga-Lill Andersson.

"I was born here," she says, "and have returned every summer since moving away. Year by year I've watched the lake getting overgrown." Formerly it was a central location for Triberga and Alby, with people from all over southern Öland coming there to play in bandy tournaments. But by the end of the 1990s the open waters had vanished.

"We got the village farmers together and asked if they had any objections to our campaigning for the lakes to be restored," Inga-Lill Andersson continues. "They



Water-level gauges were lowered into the alvarlake for monitoring fluctuations.

Facts and figures

7 hectares of open water have been created by dredging and removing sediment and reed peat. This work was completed in 2003.

The restored wetland was officially opened in the presence of the County Governor and 150 visitors.

A 41.3-hectare bird protection area has been formed at Triberga–Alby Mosse.



MARTIN LAGERLÖF

As part of the restoration, sediment and peat were removed by an excavator and dumper trucks

hadn't. On the contrary, several of them had already been thinking that something ought to be done."

Finance the stumbling block

The big problem was how to raise money for the preliminary work and restoration. Before the big sponsors came on the scene, the association had raised SEK 85,000. That went to finance an archaeological dig.

"We nearly gave up," Inga-Lill Andersson recalls.

But companies, foundations and private individuals rallied to the cause, contributing money, a little later on the wetland was affiliated to the LIFE project and the work of the WWF, and now at last restoration became possible.

"But," says Inga-Lill Andersson, "we wanted it done our way, so we had to dig our heels in."

Today she is pleased with the outcome. The reinstatement association has been dissolved after eleven years, its mission accomplished. Co-operation with both the County Administrative Board and the

WWF ran smoothly, and once more people are skating on the alvarlake in wintertime.

Future looking good

Both before and after the restoration, inventories were compiled to see how bird-life in the area responded to the restoration. Only two years have passed, but the figures show a growth of *anseriformes* in the area. Several of the vanished birds are breeding in the immediate surroundings of Triberga–Alby and can be expected to return. In particular, the Black-headed Gull colony has returned, which, the inventory compilers predict, is likely to be very good for birdlife security and survival.

Börje Ekstam, who lectures at Kalmar University, drew up the restoration plan. He has observed the progress of restoration over a long period.

"Triberga–Alby Mosse," he says, "is a really inspiring instance of what can be achieved when local residents and people immediately affected take up a cause like this. Their commitment ensures that the small alvar lakes will be kept open and their surroundings close-cropped."



TRIBERGA–ALBY MOSSE
REINSTATEMENT ASSOCIATION



Restoration of Gillsby Mosse has enabled Montagu's Harrier and many other birds to continue breeding in the area.

PETER LARSSON

Paradise Regained for Montagu's Harrier

Gillsby Mosse, well known for its birdlife, was slowly clogging up. So the place was cleared, Willows were torn up by the roots and a drastic method creating blue borders was tested.

Gillsby Mosse lies on northern Öland, a little way north of Alböke, to the east of the main road.



Gillsby Mosse is a big wetland by Öland standards, and it has never been drained. There are three interconnected fens: oligotrophic Bärsmossen, where Great Fen-sedge reigns supreme; tiny Stenkärret, with its Tufted-sedge, and then Norra Mossen, the biggest and most variegated.

Wetland welter

The wetland diversity of Norra Mossen is unique to Öland. The water is dotted with islets, polyspecific and well grazed. Here you will find Blue Moor-grass, Fly Orchid, Common Butterwort, Fairy Flax, Early Marsh Orchid (yellow form) and Musk Orchid. More than half the area consists of Tufted-sedge.

Gillsby Mosse is known for its birdlife. Breeding species include the Marsh Harrier, Greylag Goose, Barred Warbler, Snipe, Lapwing and Crane. More recently the Ruff, Golden Plover and Horned Grebe have also found their way here. But Montagu's Harrier remains the bird with

which Gillsby is above all associated. This wetland hosts one of its stable populations in Sweden, and it has remained firmly ensconced here even since the wetland started getting overgrown.

A rigorous existence

Montagu's Harrier is very particular about habitats. Open spaces are absolutely essential. The nest is simple and built straight on the ground. Voles, mice, the young of small birds and other prey are hunted over large areas.

It is above all the shortage of good breeding places that has made Montagu's Harrier a rarity. Instead it is forced to lay its eggs on ploughland, where they are very liable to be crushed by harvesters.

Stemming the overgrowth

Gillsby Mosse was slowly clogging up. In the long term this would threaten the existence of Montagu's Harrier and of many

Montagu's Harrier

Circus Pygargus

Montagu's Harrier is a very uncommon raptor in Sweden. Öland is the only part where it is widespread. Here between 30 and 35 pairs nest annually, as against 5–10 in the rest of Sweden.

The male is bluish-white, the female brownish-grey, with a white streak across the rump.

Montagu's Harrier arrives in Sweden in May, returning to the African savannas in August or September.

The nest is simple and built straight on the ground. 4 or 5 eggs are laid and take a month to hatch. This usually happens after Midsummer, after which the female guards the nest, receiving prey brought home by the male.

Overgrowth is the biggest threat facing the bird in Sweden. It needs wide open spaces both for foraging and for breeding.



PETER NILSSON

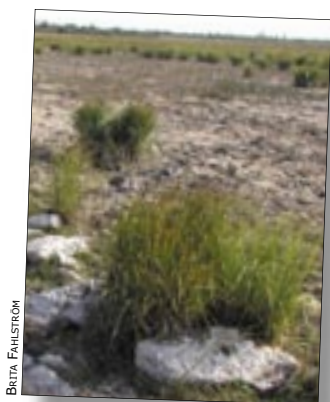
Facts and figures

About 30 hectares of land were reinstated by clearance.

0.5 hectare of open water was created by means of a new excavator method.

200 metres of fencing were put up.

A preservation plan was drawn up, describing how the area is to be managed in future for optimum preservation of its natural qualities.



BRITA FAHLSTRÖM

Tufted-sedge forms dense tussocks, which can easily take over a wetland if there are not enough grazing livestock about. This is what happened at Gillsby.



STAFFAN RÖDERBERG

The blue border; a stretch of open water between mainland and wetland, was created with the aid of an excavator.

other resident bird, insect and plant species. Up until the mid-1990s, Gillsby was one of the favourite Öland resorts of the Black Tern, but the species vanished. Clearance was needed to prevent Montagu's Harrier following suit. A total of more than 30 hectares of land were reinstated by clearing away trees and bushes.

Birdlife benefits from the existence of a "blue border" – a stretch of open water – between the mainland and the wetlands. Borders of this kind are formed along shorelines, which have been subjected to prolonged grazing, with livestock treading and walking along the water's edge. Gillsby had a blue border before overgrowth set in. To hasten the process and quickly create a new expanse of water, the drastic expedient was tried of dredging away sediment from the area nearest dry land by means of an excavator. A rational, cost-effective method, it was hoped.

After the first season, the venture looks to have succeeded. The water is there and birds are foraging along the shoreline.

STAFFAN RÖDERBERG



Willow bushes were pulled up by the roots, to give Montagu's Harrier the open spaces it needs.



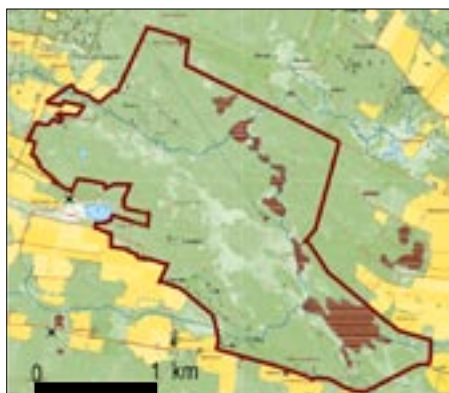
CHARLOTTA LARSSON

The five livestock farmers now have animals out to grass again in the area. Icelandic horses and beef cattle ruminant together.

Vanserum–Bäck *– unique diversity rescued by hand*

Vanserum–Bäck is one of the most variegated and biologically interesting places in the Mittland Forest. More than a hundred redlisted species have their habitats here. Restoration of the sensitive, wet terrain called for great delicacy of touch.

Vanserum–Bäck is in the middle of the Mittland Forest, in the centre of Öland, and is not easy going for visitors. It has meandering streams, springs and fens both large and small.



The fascinating thing about Vanserum–Bäck is its fantastic mosaic of different biotopes. All through history, man has used these lands for settlement, for grazing, for haymaking and as a source of timber and firewood. Man's footprints are everywhere to be seen.

The fens here are fed by spring water. This gushes out of several springs. A stream connects them. To either side of the stream is calcareous moist grassland. The drier spots have rare broadleaf woods and alvar soil with temporary pools. Oak woods and grasslands also hobnob together.

Careful does it!

It was clear from the start that this area needed careful, “customised” clearance. Certain drier parts could be cleared mechanically, but the greater part had to be restored manually, using brush saw and chainsaw.

Tommy Johansson contracted for the

task of removing the overgrowth vegetation.

“The clearance itself wasn’t really all that difficult – most of what had to be removed was only small stuff. But it was very wet and tussocky,” he says.

Tommy Johansson spent all autumn, winter and spring clearly the moist areas.

“You had to take care not to get up to your neck in water, and adapt the clearance to the wetness of different parts.”

Polyspecificity the first priority

With such a variety of biotopes, the area can of course provide homes for an unusual number of species. More than a hundred of them are on the Swedish Red List, which means that, one way or another, they are in danger of disappearing in the longer term. Catering to the interests of so many different species would have been difficult using more large-scale, rational restoration methods.



The area contains many different biotopes, from small moist patches surrounded by broadleaf trees to flat, barren places with shallow accumulations of water.



LRF (the Federation of Swedish Farmers), the WWF and the County Administrative Board jointly hosted the official opening of the Vanserum-Bäck Nature Reserve.

One of the most exclusive species, the butterfly Marsh Fritillary, needs maximum exposure to sunlight and a high level of air humidity in order to survive. Because it does not travel long distances, it has difficulty in expanding into new areas.

The area has important spawning waters for the Agile Frog, a species whose Swedish heartland is in fact Öland's Mittland Forest. For mating purposes it needs small, shallow areas of water, which do not dry out, preferably close to broadleaf woodland. At other times it needs woodland areas with plenty of broadleaf trees, swamp and fen. Which is exactly what Vanserum-Bäck has to offer.

There are a host of different orchids in this area, such as Early Marsh Orchids (yellow form and Leopard Orchid), Musk Orchid, Marsh Helleborine and Fly Orchid.

All these exclusive residents would eventually have disappeared if overgrowth had been allowed to continue.

Facts and figures

The Vanserum-Bäck Nature Reserve, totalling 415.0 hectares, was formed in 2004.

207 hectares of land were enclosed with 7 km of fencing.

45 hectares of land were restored by clearance.

By May 2003 the area had been fully enclosed and Icelandic horses and beef cattle had been put out to grass there.

A corral was built for the grazing livestock.

Visitor information boards were put up and hiking trails laid out, complete with stiles and duckboarding.

Several surveys have been made of the area, plus an inventory of drainage ditches, biotope mapping of Pelnabrobäcken (the stream traversing the wetland), inventories of the beetle fauna, of molluscs and the Marsh Fritillary, and satellite-image mapping of the degree of overgrowth.



Roland Rosengren, livestock farmer and landowner at Södra Bäck

"Grazing pressure was already low ten years ago. We had grazed the land in common, with several herds, but then the diseases came. First EBL and then BVD, which meant we could not longer graze the area together. Our herds had different health status." And so communal grazing had to end.

As time went on, grazing pressure kept diminishing, until five years ago it became non-existent. The area quickly became overgrown. When planning started for making Vanserum-Bäck into a nature reserve, this brought Roland Rosengren and the other landowners into contact with the LIFE project, which presented an opportunity of getting enclosure and also clearance paid for.

"Heavenly," says Roland Rosengren. "Without that initiative it's uncertain whether we'd have started grazing that area again. Now that the area has been cleared and fenced in, we're entitled to agri-environmental measures. That's our only chance of being able to keep livestock here. Animals don't grow so fast on this land, and the grants are a necessary top-up for our grazing operations here to break even."



JOHAN JANSSON

Since the check dam was constructed in 2004, Hulterstad has recovered its wide-open water spaces.

To dam or not to dam – the Hulterstad inquiry

There was hardly any doubt that birdlife would benefit from the damming-up of the Hulterstad coastland. But in what way, how was it to be done and at what price? Large-scale wetland construction projects have to be preceded by an inquiry, an environmental impact assessment (EIA).

The Hulterstad coastlands lie between the main road and the Baltic Sea in the southeast of Öland, forming part of the Natura 2000 site Coastlands of Southeast Öland. The dammed-up area is arrowed.



Several times between 1840 and 1947, deep dikes were excavated from the Hulterstad wetland out towards the Baltic Sea. Birdlife remained abundant after this drainage enterprise, but, here as in many other places, diversity shrank as the wetland became overgrown. Between 1980 and 1996 the wetland was dammed up in summer to secure the supply of water for the surrounding arable land.

This changed the birdlife. The Öland Ornithological Society noted a far greater abundance of birds when the land was dammed up. Farmer Göran Olsson discontinued the practice when new rules were introduced after Sweden joined the EU, but he had seen what the wetlands could do for birdlife and he set about campaigning for a restoration.

Permanent damming can have complex implications for the landscape. Will the water submerge important economic, biological or cultural interests? How can

the dam be built to last? How can the risk of heavy flooding be reduced?

Ecologist Åsa Wågman was commissioned to draw up an environmental impact assessment, EIA, for the restoration of the Hulterstad wetland. A challenging assignment she found it: “An EIA has such a wide span. Fish, birds and farming – everything has to be included.”

Number crunching

Prediction of consequences involves a number of assumptions and calculations concerning the effects of different scenarios. Åsa Wågman found the potential height of the water level and the magnitude of flows and floods hardest to predict.

“They are hard to calculate because the flow of water in the canal is much greater in spring and autumn than in summer and winter. It’s also hard to predict the water-retaining capacity of the ground. The water



JOHAN JANSSON

The canal is now held back by a check dam where there used to be a deep dike leading to the Baltic.

Facts and figures

The drained wetland was reinstated by damming in the summer of 2004, resulting in 8 hectares of open water.

An EIA was prepared before restoration began.

The Hulterstad coastland has become a bird protection area, 37.1 hectares in extent, and seabird hunting has been put off until after the nesting season.



CHARLOTTA LARSSON

Rough weather wasn't allowed to spoil the party at the restoration kick-off.



JOHAN JANSSON

The EIA showed that a levee would be a good safety precaution. If for some reason the banks should burst, the water will be led off into the Baltic instead of inundating the surrounding farmland.

can trickle through fissures in the bedrock here," she explains.

In her EIA Åsa Wågman came to the conclusion that enlargement of the wetland to 8.6 hectares of open water would affect something like 17 hectares of land round about. The water would be 1.1 metres deep and nitrogen leakage into the Baltic would decline by something between 1500 and 1800 kg annually. The volume of water must be sufficient to keep the wetland from drying out in summer. Birdlife and fish stocks must benefit. Heritage qualities must be left unimpaired.

A complete scheme

The EIA recommended damming up the dike leading into the Baltic. Banks were to be reinforced on the east and south sides to keep the water from flooding arable land. To guard against the bank bursting, it was proposed that a levee be dug on the other side of it, so that the floodwater would be led off.

An excavator driver and Göran Olsson himself did the work during the summer of 2004, and getting it finished before the winter rains was quite a race against time. A lot of the instructions for the restoration work were contained in the EIA, but certain ingredients had been left open, pending the progress of excavation work.

Birdlife has already responded

A year after the damming-up took place, Åsa Wågman says that the restoration outcome is fairly well on target compared to the EIA. True, the area is somewhat larger than estimated, but it will probably settle at a lower figure later on.

The birds have returned as it was hoped they would. The Black Tern came back during the spring, and now all Sweden's duck species can be seen breeding near Hulterstad. The Ruff went through their courtship ritual in the moist grasslands next to the wetland. Good going for a wetland newly restored.



ÅSA WÅGMAN



MATTIAS PERSSON

The County Administrative Board's little plastic rowing boat under the weight – half a ton – of all the Tench hauled in by Tobias Borger (picture) and Mattias Persson.

Knisa Mosse – the battle of fish and fowl

Knisa Mosse is in the northwest of Öland and easily accessible to visitors.



Surveys by Kalmar University had shown Knisa Mosse to be inhabited by large numbers of Tench that had been planted there. Nearly half a ton of them were caught and removed to augment the food supply for visiting and breeding birds.

Knisa Mosse has been widely known for its abundant birdlife. But in recent years species like the Horned Grebe, Garganey and Gadwall had stopped breeding there.

As part of the LIFE project, Kalmar University made several surveys of the wetland to see what had made it less attractive as a bird lake, and whether there were other causes besides the overgrowth due to there being so little livestock grazing in the area. Surprisingly, the lake was found to contain large numbers of very big Tench. In addition, there were only sparse stocks of Stonewort and very few molluscs and benthic small-scale creatures. All because of the Tench.

Birdlife assailed on two fronts

The many Tench in Knista Mosse have presumably impacted on birdlife in two ways, both adverse. Firstly there is the direct competition between them, due to fish and birds eating more or less the same tiny

creatures.

Secondly, large numbers of tench grubbing in the benthic sediment for food set off a chain reaction. Plant life has difficulty taking root and the sludge stirred up clouds the water, reducing the amount of light admitted and making life more difficult for the *Characeae algae*. These algae and the benthic vegetation are an important biotope for the small creatures on which Tench and birds both feed.

Half a ton of Tench landed

Tench are not native to Knisa Mosse. They were planted there at the beginning of the 20th century, when they ranked as a real delicacy. In the LIFE project it was decided to empty the lake of its Tench population. The attempt occupied one whole week in June 2005, with nearly 436 kg landed.

“The extinction fishing undertaken at Knisa has few counterparts,” says Börje Ekstam, a lecturer at Kalmar University,

Tench, *Tinca tinca*

Culinary status: In Sweden the Tench has lost its delicacy status. In Eastern Europe and north Germany it remains popular and is fished in great quantities commercially.

Geographic distribution: Tench occur spontaneously from the western fringe of Europe to the River Lena in Russia and from central Sweden down as far as the Mediterranean, Turkey, Iran and Kazakhstan. They have been planted in many parts of Europe. They thrive best in a eutrophic freshwater lake.

Character: The colour varies from black to green with touches of yellow. There is also a completely golden variety, known as golden Tench. A distinct lateral line running the full length of the body is a sensory organ enabling the fish to sense movements in the water. The Tench has a barbell at each corner of its mouth. Its scales are quite small and the skin is stout and very slimy.

Food: The Tench lives on worms, molluscs, mussels, crustaceans, mosquito larvae, insects and other things found in the benthic sediment. It fills its mouth with mud from the lakebed, separates off the edible matter and spits the silt back.

Breeding: The Tench is sexually mature at 2 or 3 years. It mates during several periods in summer, but not until the water is really warm. A fully-grown female lays something like 600,000 eggs.



The Black-tailed Godwit used always to nest at Knisa Mosse, but not any more. The clearance operations in the wetland's surroundings might induce it to return.

Facts and figures

The lake was emptied of Tench in June 2005, when 436 kg were netted.

8.5 km of fencing has been put up.

Grazing has been resumed on 45 hectares of land.

New methods of reducing sedge and reeds by burning have been tested.

The Knista Mosse Nature Reserve has been enlarged during the project, a new management plan has been drawn up, as well as a preservation plan. Stiles and duckboards have been constructed to make the reserve more accessible to visitors.

Kalmar University, acting in association with the LIFE project, has made several surveys of the wetland, including test fishing and benthic fauna sampling.



Stoneworts mean a lot to underwater life. The shelter and varied biotopes in between them make for a great diversity of small creatures.

“and it is hard to say how quickly the ecosystem will be reinstated.” But he expects the birdlife to show immediately when the food supply has returned.

“There are certain to be more duck species resting there already this spring.”

A new chance for the beef sirloin of the Tench

Börje Ekstam is hoping that the carpets of bluish-green algae will vanish and the benthic sediments will lie still in future. But this will depend on how quickly the rooted plants expand their territory, which may take a couple of years, because the benthic supply of dormant seeds and other diaspores is depleted. Many species will have to spread to Knisa from other wetlands. Knisa can teach us something about the length of time it takes for populations of underwater plants and molluscs to recover.

“At present,” Börje Ekstam explains,

“the molluscs are uncommon in the open expanses of water, because of course to the tench they are beef sirloin.”

Exciting future

The next few years will be an interesting time to follow at Knisa Mosse. The management plan for the Knisa Mosse Nature Reserve has been rewritten and the reserve itself enlarged. In future the water will be test-fished at regular intervals to see if the Tench are coming back. There are always some survivors after extinction fishing, but the question is how effectively numbers are kept in check by predator species such as Pike.

But the restoration of Knisa also includes extensive clearing and reinstatement of pasture. The work of opening up the coastal meadows and creating a blue border of open water between mainland and wetland will continue in the years to come.



PETER NILSSON

The Avocet is one of the wader species, which appear steady in number, judging from the inventories taken on Öland since 1988.

Bird trends under the magnifying glass

Geese and ducks are increasing. Waders are decreasing. The trends are stable. The opening-up of land is essential for the preservation of birdlife, but other factors too have a decisive bearing on the survival of species.



PETER NILSSON

The Oystercatcher has an uncertain future.

“In conservation contexts, the saying often goes: ‘the better grazed, the more waders’,” says Richard Ottvall of Lund University, who has studied the occurrence and extent of breeding birds in the coastlands. But, he continues, this is an oversimplification.

Even though the Öland coastlands have been opened up a great deal in recent years, the wader population keeps on declining. The Oystercatcher and Ruff are the biggest worries where Öland’s breeding waders are concerned. Between the 1988 and 2004 inventories, the Ruff population fell by an incredible 80%. Richard Ottvall is afraid the Ruff as a breeding species will disappear completely from the Baltic Sea region within 10 or 15 years. During the same 16-year period the Oystercatcher population declined by 60%, and Richard Ottvall believes the Oystercatcher may already become a rare species on Öland within 15 or 20 years.

But there is good news too. Southern Dunlin numbers are declining everywhere

else in Sweden, but on Öland the species appears to be doing relatively well, with something like 110 breeding pairs.

Predation, i.e. the fact of birds and eggs becoming food for other animals, is an important reason for the decline in the wader population, though Richard Ottvall adds that the connection is hard to explain.

In the Oystercatcher’s case the decline is presumably connected with problems in wintering areas and during migration. But no one can be certain on this point either. More research is needed.

Dabbling duck numbers peaked in 2004, presumably because it rained heavily and the water accumulated in temporary pools in the coastlands. The inventory compilers also spotted large numbers of Redshank fledglings near the moist areas.

There is much to suggest that the temporary accumulations of water in coastal grasslands are important for birdlife. More studies are needed to confirm the connection.

Species	1988	1998	2003	2004	Trend
Barnacle goose	0	9	68	110	Increasing
Canada goose	6	18	12	17	Steady
Eider	392	298	616	460	Fluctuating
Gadwall	52	32	74	80	Increasing
Garganey	11	44	25	32	Fluctuating
Goosander	0	0	4	15	Increasing
Greylag goose	9	92	147	214	Increasing
Mallard	138	46	211	217	Increasing
Mute swan	66	64	107	113	Increasing
Pintail	30	9	22	20	Decreasing
Pochard	4	3	2	3	Steady
Red-breasted merganser	54	36	76	90	Increasing
Shelduck	221	220	366	430	Increasing
Shoveller	95	59	85	93	Steady
Teal	19	27	55	80	Increasing
Tufted duck	16	18	43	100	Increasing
Velvet scoter	75	55	54	69	Steady
Wigeon	3	9	35	38	Increasing
Swans, geese and ducks, total	1211	1139	2012	2180	Increasing
Avocet	225	214	263	245	Steady
Black-tailed godwit	86	72	81	84	Steady
Common sandpiper	0	4	11	17	Increasing
Curlew	190	175	149	155	Decreasing
Golden plover	57	58	31	31	Decreasing
Lapwing	858	756	790	963	Steady
Oystercatcher	1166	632	439	473	Decreasing
Redshank	625	576	595	722	Steady
Ringed plover	230	231	301	274	Steady
Ruff	239	121	37	49	Decreasing
Snipe	256	107	127	182	Decreasing
Southern dunlin	91	87	108	94	Steady
Turnstone	70	31	33	45	Decreasing
Waders, total	4093	3064	2965	3334	Decreasing
Arctic tern	115	65	157	190	Increasing
Black-headed gull	230	48	37	48	Decreasing
Caspian tern	1	1	1	1	Steady
Common gull	164	166	254	293	Increasing
Common tern	4	1	4	0	Decreasing
Great black-backed gull	31	33	50	45	Steady
Herring gull	254	130	214	221	Fluctuating
Lesser black-backed gull	39	6	7	4	Decreasing
Little tern	25	26	34	60	Increasing
Sandwich tern	7	1	5	2	Decreasing
Gulls and terns, total	870	477	763	880	Fluctuating
Total	6174	4680	5740	6394	Fluctuating

Total numbers of breeding pairs in the 47 inventory areas, plus a subjective appraisal of population trends.

The coastal grasslands at Eckelsudde are important for migrant birds following the west coast of Öland.

CHARLOTTA LARSSON





CHARLOTTA LARSSON

Västerstads Träsk. Although situated in the middle of Stora Alvaret, given plenty of water this wetland offers a passage through streams to the Baltic Sea.

Clearway from the Baltic to the Alvar

The Pike needs unobstructed watercourses, so that it can move upstream to the quiet pools for mating – all the more vital in view of the reproduction difficulties occurring in recent years in the Baltic.

Pike in the Baltic Sea are having a hard time of it. Their mating in its waters seldom results nowadays in reproduction, and so mating in fresh water has become increasingly important for the survival of the species.

Stora Alvaret has many pools both large and small. During spring these are linked to the Baltic by streams, enabling fish to move upstream and mate in the fresh water.

Pike reproduction in the Baltic Sea has been beset with increasing difficulties in recent years. Mating takes place in shallow bays and is successful, but hardly any of the roe develops afterwards into fry. Pike numbers have fallen off disastrously.

The Pike, being really a freshwater fish, readily moves upstream to quiet waters for breeding. There its reproduction is far more successful. This may be the salvation of its continuance in the Baltic, but only if the streams are unobstructed so that the Pike can get to their spawning grounds.

To ascertain the state of things along a number of important watercourses on Öland, the LIFE project decide to carry out biotope mapping. This means walking alongside the watercourse and writing down one's observations. The vegetation near the water, bridges, inflows from ditches, the condition of the streambed, cur-

rents, and, most important of all, obstacles. Everything is noted down and conclusions then drawn concerning the prospects of the fish being able to make it upstream.

Mattias Persson, a biologist at the Kalmar County Administrative Board, has studied more than 60 km of watercourses on Stora Alvaret.

"Compared with watercourses on the mainland, Öland's are very shallow indeed, more cleared and straightened. They are flanked by arable land or pasture and there are only small quantities of dead wood in the water."

But even though the human impact on streams is negative, there are exceptions.

"The streams Frösslundabäcken and Penåsabäcken are both fantastic," Mattias declares, "with such a beautiful and varied environment along them."

He has recommended ways of facilitating the progress upstream for fishes like Pike and Brown Trout. Easily removable obstacles to this migration have already been dealt with.



ANITA HEIMDAHL



MATTIAS PERSSON



Montagu's Harrier hunts open spaces.



BRITA FAHLSTRÖM

The land in this project was cleared by seven firms of contractors, all of them represented in this picture, taken during clearance operations at Södviken.

sharp medicine for Södviken thickets

The coastlands at Södviken and Vässby Fjärd were as fantastically extensive as they were overgrown. This is the project area where the biggest area of coastland has been cleared of juniper bushes and thickets. Several lessons have been learned here which will benefit the whole project.

Södviken and Vässby Fjärd occupy a large part of northeastern Öland, comprising extensive coastlands, shallow waters and flat islands. The land is often flooded, which gives life to flora and fauna.

Machinery first preference

Just as with clearance operations on other land covered by the project, machinery was used at Södviken whenever possible. This is undoubtedly the most cost-effective arrangement. The contractors specialise in different methods, and it was the nature of the land and the character of the overgrowth vegetation that decided which method was to be used in which place, always assuming the firm was available and not occupied elsewhere when clearance was due to begin.

A small harvester works admirably with mature bushes and trees, felling trees just the same way as in forestry.

“Chains are a good way of dealing with small, scattered bushes,” says Brita Fahlström, a biologist who has put a lot of work into planning the project’s clearance operations.

A machine with rotating chains splits the bushes apart, scattering the chips on the ground.

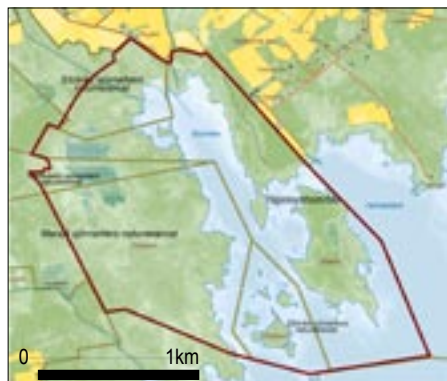
“But,” Brita Fahlström continues, “we don’t feel larger shrubs ought to be removed that way, because then you get too much wood residue left on the ground.”

The Trimcut is a blade, which saws into the thicket. The brushwood is then gathered together in a grab. This is a precision job, but it can work very well on densely thicketed ground.

Manual safest

Manual clearance has been resorted to where the ground has been too moist, too sensitive or too stony. This has been the

The Södviken area is in northeast Öland, immediately north of Föra.





Manual clearance played a very important part in the project. Often the wet, sensitive land cannot be reinstated with heavy machinery.

case with a good deal of the land included in the LIFE project.

Mechanical clearance nearly always has to be supplemented by brush saw, so as to tidy up the often scruffy result produced by the machine.

Plenty of clearance work

Sven Pettersson of Mantorps Linjeröjning has been running his own business for 14 years, and since 1998 has been operating exclusively on Öland.

“Our machines haven’t been idle for one single day,” he says. “There’s plenty of clearance work on Öland.”

Something like 50% of the firm’s total working time has been devoted to LIFE project clearance operations. Sven Pettersson does not feel these clearances have been so very different from other assignments he takes on, but they’re certainly wetter.

The machine Sven Pettersson works with has a Trimcut head which rivals manual clearance – a flexible machine that an experienced driver can operate with great precision.

“We used a lot of manual labour at Södsviken,” Brita Fahlström recalls, “but it’s a question of striking the right balance. We enlisted Sven in some places because that way is faster. On the other hand, the ground is very stony, which is tough on the equipment.”

All in the same thicket

Skäret, an island in the area, needed to be cleared quickly, Brita Fahlström continues. “So we called in all the manual workers at once to come and clear the island together.”

Stig Eriksson was one of them:

“It was very interesting, because there you could see how different firms operate. The conditions were the same for all of us. Very different stump heights, for example.”

Brita Fahlström wants trees and shrubs to be cut off as close to the ground as possible.

“That way the livestock can get at the grazing, and shrub clearance is much easier if there are no stumps in the way.”

Facts and figures

The Marsjö Coastlands, Hjälmstad Coastlands and Södsviken Coastlands Nature Reserves were formed in 2001.

131 hectares of grazing land have been cleared.

To welcome and assist visitors to the area, information boards have been put up, as well as stiles and a birdwatching platform.



Some of the livestock now grazing the opened-up coastlands of Vässby Fjärd.

Tractor fitted with Trimcut head and a grab for piling up brushwood.



Harvester removing timber and brushwood



Before...



...and after clearance measures at Själgrund, Södviken. Coastlands where Juniper had formed impenetrable thickets.

Birds

Common name	Scientific name
Arctic Tern	<i>Sterna paradisea</i>
Avocet	<i>Recurvirostra avocetta</i>
Barnacle Goose	<i>Branta leucopsis</i>
Barred Warbler	<i>Sylvia nisoria</i>
Black Tern	<i>Chlidonias niger</i>
Black-headed Gull	<i>Larus ridibundus</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Canada Goose	<i>Branta canadensis</i>
Caspian Tern	<i>Sterna caspia</i>
Common Gull	<i>Larus canus</i>
Common Sandpiper	<i>Actitis hypoleucos</i>
Common Tern	<i>Sterna hirundo</i>
Crane	<i>Grus grus</i>
Curlew	<i>Numenius arquata</i>
Eider	<i>Somateria mollissima</i>
Gadwall	<i>Anas strepera</i>
Garganey	<i>Anas querquedula</i>
Golden Plover	<i>Pluvialis apricaria</i>
Goosander	<i>Mergus merganser</i>
Great Black-backed Gull	<i>Larus marinus</i>
Greylag Goose	<i>Anser anser</i>
Herring Gull	<i>Larus argentatus</i>
Horned Grebe	<i>Podiceps auritus</i>
Lapwing	<i>Vanellus vanellus</i>
Lesser Black-backed Gull	<i>Larus fuscus</i>
Little Tern	<i>Sterna albifrons</i>
Mallard	<i>Anas platyrhynchos</i>
Marsh Harrier	<i>Circus aeruginosus</i>
Montagu's Harrier	<i>Circus pygargus</i>
Mute Swan	<i>Cygnus olor</i>
Oystercatcher	<i>Haematopus ostralegus</i>
Pintail	<i>Anas acuta</i>
Pochard	<i>Aythya ferina</i>
Red-breasted Merganser	<i>Mergus serrator</i>
Redshank	<i>Tringa totanus</i>
Ringed Plover	<i>Charadrius hiaticula</i>
Ruff	<i>Philomachus pugnax</i>
Sandwich Tern	<i>Sterna sandvicensis</i>
Shelduck	<i>Tadorna tadorna</i>
Shoveler	<i>Anas clypeata</i>
Snipe	<i>Gallinago gallinago</i>
Southern Dunlin	<i>Calidris alpina schinzii</i>
Teal	<i>Anas crecca</i>
Tufted Duck	<i>Aythya fuligula</i>
Turnstone	<i>Arenaria interpres</i>
Velvet Scoter	<i>Melanitta fusca</i>
White Stork	<i>Ciconia ciconia</i>
Wigeon	<i>Anas penelope</i>
Yellow Wagtail	<i>Motacilla flava</i>

Plants

Common name	Scientific name
Bird's-eye Primrose	<i>Primula farinosa</i>
Blue Moor-grass	<i>Sesleria caerulea</i>
Buttercups	<i>Ranunculus</i> sp.
Common Butterwort	<i>Pinguicula vulgaris</i>
Common Reed	<i>Phragmites australis</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Early Marsh Orchid, yellow form	<i>Dactylorhiza incarnata</i> var. <i>ochroleuca</i>
Elder-flowered Orchid	<i>Dactylorhiza sambucina</i>
Fairy Flax	<i>Linum catarticum</i>
Fen Orchid	<i>Liparis loeselii</i>
Fly Orchid	<i>Ophrys insectifera</i>
Fragrant Orchid	<i>Gymnadenia conopsea</i>
Juniper	<i>Juniperus communis</i>
Leopard Orchid	<i>Dactylorhiza incarnata</i> var. <i>cruenta</i>
Lesser Water-plantain	<i>Baldellia ranunculoides</i>
Marsh Helleborine	<i>Epipactis palustris</i>
Musk Orchid	<i>Hemerocallis monorchis</i>
Prostrate Rocket	<i>Sisymbrium supinum</i>
Shoreweed	<i>Plantago uniflora</i>
Sparse-flowered plantain	<i>Plantago tenuiflora</i>
Stoneworts	<i>Chara</i> spp.
Tufted-sedge	<i>Carex elata</i>
Willows	<i>Salix</i> sp.

Other species

Common name	Scientific name
Agile Frog	<i>Rana dalmatina</i>
Brown Trout	<i>Salmo trutta trutta</i>
Grass snake	<i>Natrix natrix</i>
Great Crested Newt	<i>Triturus cristatus</i>
Marsh Fritillary	<i>Euphydryas aurinia</i>
Mayflies	<i>Ephemeroptera</i>
Pike	<i>Esox lucius</i>
Tadpole Shrimp	<i>Triops cancriformis</i>
Tench	<i>Tinca tinca</i>
Whorl Snail	<i>Vertigo geyeri</i>

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Further reading

This publication is based on many of the reports and publications produced on behalf of or in association with the project. Here are some of them:

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- Igenväxningens effekter på förekomsten av kransalger (*Characeae*) öländska våtmarker. Karlsson, Kalmar University.
- Inplanterad fisk i Knisa mosse — en orsak till ett fattigt fågelliv? Gage/Hülswitt/Niesel/Paulsson, Kalmar University.
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- Welland P – Life Histories and Distributional Patterns. Bertilius/Boberg, Kalmar University.



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Spårskattens Öland



Heading for the future across the Lilla Vickleby Alvar

Coastal meadows and wetlands of Öland

- experiences of a nature conservancy project

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