

Plants and Animals in Hylte

The current situation and trends in the biological diversity





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Residents of Hylte and Visitors!

In Hylte we have the advantage of living close to nature. All inhabitants of Hylte have woods and countryside within walking distance. We should make sure that we use this wonderful resource!

But how many of us know which species of fish can be found in our lakes? Who knows the story of the last wolf hunt in Femsjö parish? Which areas did Elias Fries and his son Thore prefer for their botanical excursions? Have otters been found in the Nissan? What nature reserves are there in Hylte? What did forests look like in the 17 and 1800s? Have there always been elk and roe deer in our forests?

Would you like answers to these questions? Are you anxious to know more about the nature of Hylte? We hope so!

This little publication is intended to both answer your questions and inspire Hylte residents and visitors to make their way out into the great outdoors, relax and enjoy. This publication is in no way comprehensive. If we were to describe everything in Hylte's nature this would have been a thick book. We hope that we have chosen and succeeded in presenting things that interest most people. We also hope that the booklet will generate curiosity so learning continues beyond what we have covered.

Naturally, we all have to be careful not to disturb animals or to damage the vegetation when we are enjoying outdoor life. In Sweden, we have a unique opportunity for recreation through our customary right known as 'the right of public access'. This right gives us access to nature, but it is also coupled with responsibilities- both in relation to all plants and animals and in relation to the landowners.

I hope that you will find the information contained in this booklet valuable and that it will give inspiration to further studies and discoveries.

I hope to see you out there!



Willy Strömblad



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1. The theme year on biodiversity

In 1999 the theme for Hylte Local Authority's work with Agenda 21 was biodiversity. The goal with this work was to increase the local people's interest and knowledge in this field. During the year facts have been collected and compiled in this description of nature in the Hylte area. In September 1999 five guided nature treks were arranged at different places. The places visited were: Mårås Nature Reserve, Staffansbo and Flora's Kulle, the Femsjö-area and Dullaberget, Bosgårdsfallet and Ivås near Torup, and Ödegårdet at Unnaryd. In all of the places there was opportunity to study the many different mosses and lichen that can only be found where there has been beech forest for generations. We were able to learn that we –the inhabitants of Hylte – are the lucky keepers of several such areas and that they are of great interest in a European perspective.

This compilation of facts does not claim to be complete. To describe everything of biological value in the Local Authority would have been a work too extensive to fit within the framework of our Agenda 21. Apart from some information on plants and animals in our area we have also tried to show some important trends. This applies to the development of game populations and a section on trends in bird life.

The term biodiversity can contain an awful lot. In this work we have chosen not to cover the important biological resources and the genetic mass that can be found in agricultural crops and domestic animals. This is in itself is a large subject that we can perhaps cover another time.

2. General information on the nature in Hylte

The Hylte area is predominantly covered with forest. The forests are greatly influenced by human activity. Much of today's forest land has been cleared for some period in the last hundreds of years. Forests were not always as extensive as they are now.

Hylte is comprised of both the transition zone between the plains of Halland and the plateau of Småland and partly areas that belong to the high-plateau of Småland.

The transition zone between plain and high-plateau in the western part of the Local Authority is quite hilly with high rainfall. This area has ideal conditions for many species of plants and animals. Particularly rich in species are the fertile areas of the Nissan Valley.

The eastern parts of the Local Authority, which belong to the Småland high-plateau are also undulating, but the differences in altitude are less pronounced than in the western parts of our area. There is high rainfall in our part of the high-plateau of Småland too. We can take pride in the wide occurrence of raised-peat-bogs that have evolved here due to the amount of rain and the relatively flat landscape. These West-Swedish bogs can only be found in the hinterland of Halland and in the western parts of Småland and Västergötland. This may not be looked upon as particularly valuable for many of the residents in the area, but even so remains a type of nature fairly unique for our part of the country.

3. A historical retrospective

The forest landscape within the Local Authority of Hylte has undergone great changes throughout thousands of years. Soon after the glacial period, 8,000-9,000 years ago, a tundra landscape dominated. Gradually the tundra became wooded with birch, pine, aspen and hazel.

Some thousands of years later hardwoods had taken over more and more. The landscape was covered with forests dominated by oak, lime, elm and maple. The fertile wetlands were covered with ash and alder forests. The climate, during this period, was warmer than today.

Later, man increasingly affected the forest while the climate became colder. The most fertile land was cultivated or used as pasture. With the colder climate the lime trees were pushed out, and roughly 1,000 years ago the beech made headway in the forest landscape. Later the pine reached our area from the north.

Burn-beating (fire used to be an important tool for management of heather moors that constituted the major grazing areas in this region. Swidden agriculture or slash-and-burn agriculture has also occurred long ago) became more intense, cattle grazing increased and the use of timber for different purposes contributed to the thinning out

of the forests. In many places forest was replaced by an open landscape. During the 19th century the wooded areas were at their least. Most forest land was used for forest grazing, and at the same time heather moors became more extensive, particularly in the western parts of the Local Authority. During the 20th century fast and sweeping change has taken place. Many wetlands have been drained, and much pine and hardwood forest has been harvested and replaced by spruce. In a report from the Government Institute for Forestry Research from 1939 Carl Malmström has presented the state of Halland's forests during the, by then, most recent 300 years. According to Malmström, at the beginning of the 17th century, the natural forest vegetation was still widespread in Halland. The occurrence of forest decreased, however, greatly in the following 200 years. This decline was due to unplanned felling, cattle grazing and the burn-beating of heather moors.

From the 17th a long way up into the 19th century one could easily separate three zones in Halland based on the dominant tree species growing there. These followed the county lengthwise. The western zone, a sparsely forested coast and plain area does not affect the Hylte of today. To the east of this zone, where the land started to rise, beech forests were extensive. Other deciduous trees could also be found. The most westerly parts of Hylte are in this zone.

The most eastern zone includes the borderlands towards Västergötland and Småland and there were pine, spruce and various types of mixed deciduous forest. The larger part of today's Hylte Local Authority falls within this zone. Edvard Wibeck's research on the distribution of the beech forest in Östbo and Västbo (names for earlier administrative areas partly within and partly outside the boundaries of Hylte) gives us interesting information on the history of forests in that part of the Local Authority.

3.1 The situation in the early 1700s

From the maps that are attached to Carl Malmström's report we can clearly see that spruce was only mentioned in a few places within the present Hylte area in the 1729 Land Description of Halland (spruce was only found north of Kinnared and south of Torup). Even if spruce may have been found in a few additional locations there was no way that it dominated in the landscape as it does today. On the other hand, pine and beech were undoubtedly far more usual than now.

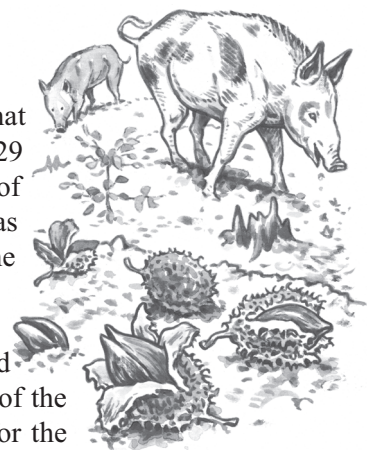
In those parts of the Local Authority belonging to Västbo Edvard Wibeck charted the occurrence of the beech from the middle of the 17th century to the beginning of the 20th century. Wibeck estimated there had been a plentiful occurrence of beech for the whole, or part of the period, on 4,700-5,100 ha in Västbo. At the beginning of the 18th century there were large areas of beech forest, and the beech was protected by legislature concerning nut-bearing trees. The beech forest was highly valued for the beechnuts that were used as pig food. There was even a decree about the planting of beech trees, but despite the stress on preservation from the state the beech forests were already in a state of constant decline.

During the 18th and 19th centuries a lot of felling was carried out which resulted in scarcity of timber in many places. Malmström has presented information from 1685 - 1730 based on geometric maps of homesteads, villages etc from Halland. From the same period and based on the same sources, information can be found on the supplies of wood fuel, fencing posts and building timber for various areas. From this description the following conclusions can be drawn about the condition of the forests around 1700 within the part of the Local Authority that falls within Halland:

- Much deciduous forest
- Wood fuel and fencing materials had to be purchased from Småland due to local shortage in the western areas (Halland)
- From the maps available in the report by Malmström we can see that the forests had decreased between 1650 and 1700. Deforestation had started already 300 years ago.

3.2 Between 1700-1850

During this period the forest was continually being converted for other land use. Land was cleared for cultivation, forest grazing was intensive and areas were burn-beat to improve the pasture. Amongst Malmström's there is a map showing the extent of the forests in 1850. In that map the forest is divided into coniferous and deciduous zones. The deciduous forest was dominant in Halland and widespread in Hylte. But the map also shows that the Torup area was one of the most important coniferous areas in Halland. But it is also a well-known fact that there was a shortage of wood fuel and timber in many places within our area during the latter half of the 19th century.



Wibeck's research into the beech forests in Västbo shows their drastic decrease, especially after the state protection of beech forest was abolished in 1793. Cultivation and grazing were the early causes for the reduction of the areas with beech forests. These factors were later aggravated by the manufacture of potash (1680 – 1880), by the production of barrel staves (mainly during the 19th century) and by the use of beech for wood fuel and as raw material for cottage industry.

3.3 After 1850

The areas of beech forest continued to decrease throughout the 19th century and of the earlier around 5,000 ha of beech forest in Västbo only 340 ha remained at the turn of the century.

Drastic changes in land use at the end of the 19th and the beginning of the 20th century led to a revival of the forest. Even if burning and forest grazing continued well into the 1900s it became less and less common. Towards the end of the 1800s and in the beginning of the 1900s great efforts were made to re-forest the heather moors. Coniferous forest replaced the bare land and deciduous forest. The beech forest has, however, also expanded somewhat in Västbo. Svenningsson (1992), who carried on Wibeck's work, found that around 560 ha of Västbo were covered by beech-dominated forest around 1990. This can be compared with the 340 ha ninety years earlier.

But the spruce has become our most common tree. This trend still continues as small farms cease to be managed. Other factors that influence today's and tomorrow's landscape, flora and fauna, e.g. game populations, are examined below.

3.4 In a European perspective

Further south in Europe the pressure from the human population is greater and the land has been more intensively used during past centuries than in the Hylte area. The beech forests were generally of superior quality in Continental Europe and were more systematically made use of than in our region. This has led to there being very few areas with continual beech forest, over long periods, on the continent. This is in contrast to our area where the flora of mosses and lichen in some locations indicate that the beech forest has grown continually for a very long time. In such areas where the forest, luckily, remained more or less untouched during the 1700s and 1800s rare species, with a history from the time when the beech first entered our region, can still be found. Several of these species are very rare in other parts of Europe and it is our responsibility to look after this valuable inheritance.

4. How well is the nature in Hylte documented?

4.1 The County Administrative Board's inventories

During the 1990's the County Administrative Board has carried out a number of inventories in the Hylte area. These are noted in the reference list to this document.

4.2 The County Forestry Board's key habitat inventory

The Forestry Board has, during the 1990s, made inventories of marsh forests and key habitats in all the forests in Sweden. The most important spots in the forest landscape have been classified as 'Key habitats'. These spots harbour or are expected to harbour species threatened with extinction. Other areas that may not harbour threatened species have still been classified due to their great conservation value. These locations are called 'objects with high conservation value'.

Marsh forests cover large areas in Hylte. Pine-dominated forest on the raised-peat bogs is the most common type. Large areas of marsh forest are, to some degree, affected by drainage.

290 key habitats have been recognised within Hylte Local Authority with a collective area of 530 ha. The number of 'objects with high conservation value' is 325 with an area of 515 ha.

Despite the dominance of spruce in the Local Authority, the inventory of the key areas has shown that the most important natural environments are found in deciduous forests. Particularly beech forest dominates amongst the key habitats. This is because these beech forests have been relatively un-tampered with for a long time and may never have been clear-cut. There has, thus, been beech forest for several generations in the same place and species that depend on forest continuity for their survival can be found in such forests in Hylte.

The coniferous environments of highest value are primarily found in the marsh forests. The spruce tree has been

found in Hylte for at least 3 - 400 years. Due to the fact that marsh forests rarely burn, there is also valuable continuity in many undisturbed spruce-marsh forests. These environments are difficult to locate in the field. Therefore, not so many spruce-marsh forests have so far been registered in the inventory of key habitats. But there are most likely a large number yet to be discovered within the Local Authority. Another environment of high conservation value is the alder-marsh forest, which if unmanaged, often accommodates species dependent on continuity. Again, one of the reasons is that these moist environments are rarely or never exposed to forest fires.

Hylte is abounding with lakes and streams. The vegetation along lakeshores and rivers, especially the deciduous marsh forests, often shows a wealth of biodiversity. These stands are also a prerequisite for rich biodiversity in the watercourses.

4.3 The Flora of Halland/Småland

During the period between 1979-95 an inventory was done of the flora of Halland. Even older documentation of the flora was reviewed. Both new and old findings were compiled and published in a book, "Hallands Flora". This book covers all species that can be found or have been recently found in Halland. 1,278 species are seen as being permanent "residents" in Halland while another 625 species are or have been temporary guests. During the years that the inventory was carried out 1,538 species of flowering plant and fern were found.

A similar work has been carried out in Småland, but "Smålands Flora" is yet to be published.

Many of the 1,500 species that can be found in Halland are located only in the coastal regions and cannot be found within Hylte. Around 700 species of vascular plants have been found in the local inventories of Hylte's flora by e.g. Semir Maslo.

4.4 The work of Elias Fries

The southern parts of Hylte Local Authority have been uniquely documented through the work of Elias Fries (1794-1878). The botanist was the son of the priest Theodor Fries and his wife Sara Lisa. He grew up in Femsjö where his father worked. Elias became a Professor of botany and practical economics at the University of Uppsala and he also became a member of the Swedish Academy. He was one of botany's most important systematists after Linnaeus and had a particular interest in fungi and lichen. His scientific works are well documented and especially well known are his portrayals of the country's economically important mushrooms, published in 1861. Of special interest from Hylte's point-of-view is the documentation Elias carried out of the Femsjö area in his youth, particularly during the 1810s and 1820s.

Flora Femsionensis or 'List of the wild growing vegetation in the parish of Femsjö, Ed. VI Femsjö 4th September 1810'

In this publication 16-year-old Elias Fries had compiled a list of all the plants that he found during his walks in the area. The list is comprised of 612 wild and 59 cultivated species. In the publication a list can also be found of all the villages Elias visited and the biotopes he studied. Already this list gives an idea of the wide variety in the landscape with environments that are no longer common, e.g. cabbage gardens, hazel woods and heather moors. He also reports from visits to burn-beat areas.

Stirpes Agri Femsionensis

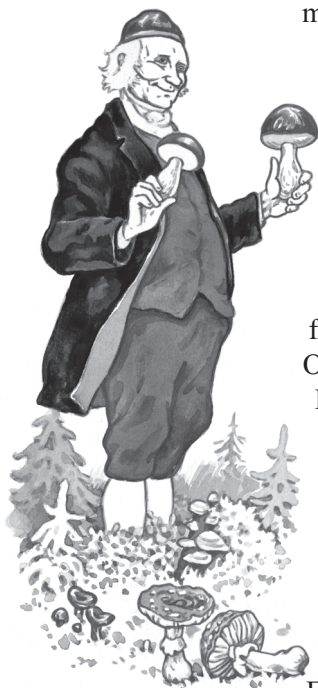
Throughout his time in Lund Elias made new and more complete studies of the plants of the Femsjö area, both flowering plants and fern. Robert Andersson has spent a considerable amount of time going through all the material that is now available in the Elias Fries Museum in Femsjö. While going through *Stirpes Agri Femsionensis* Robert noted some differences between the flora then and now, e.g. that coltsfoot is missing in Fries' notes and dandelion is noted as a species that only occurs in a few places. Both these species are quite frequent nowadays, especially the dandelion.

In this work Elias Fries has also listed the plants cultivated in Femsjö. This is one of the very few accounts of what was commonly grown by people in the Swedish countryside at that time. Amongst the cultivated species Fries mentions: tobacco, balsam, sweet cicely, coriander, flax, garlic, corn cockle, brownish red lily, opium poppy, hyssop, silver mint, summer savory, cress, cabbage, Swedish turnip, turnip, musk mallow, balsam leaves, hemp and hop. The complete list of cultivated plants covers some 55 species, and many of these are no longer grown.

Great opportunities for comparative studies

Elias Fries' son, Thore Fries, published in "Botaniska notiser 1852" an article titled "*Botaniska anteckningar rörande Femsjö socken i Småland*" (Botanical notes concerned with Femsjö in Småland). The opening lines in this article are "Of all the places on the Earth maybe none are from a botanical view point so well documented as Femsjö in Småland". Even if this may seem exaggerated, there is certainly a good basis for comparative studies on how the flora in Femsjö has changed over the last 200 years.

Many other botanists have later on visited Femsjö for follow up of Fries' studies. Amongst these *Seth Lundell* and Professor *Meinhard Moser* deserve a special mention. Seth Lundell was in Femsjö in the 1930s collecting mushrooms. He was mainly collecting for a so-called exsiccata-collection for distribution to varying museums. The idea behind this is that a standard collection of a species, collected in the same area, is placed in different museums to serve as kind of a 'model' for description of a species. Femsjö is particularly well suited to this purpose as Elias Fries scientifically described many fungi from there for the first time. There are still boxes at the Department of Botany at the University of Uppsala with Seth Lundell's notes, amongst them, lists of species from Femsjö and a catalogue of localities around Femsjö where certain mushrooms can (or at least could) be found. Prof. Meinhard Moser has visited Femsjö more than 20 times from 1954 onwards. His collections are found in Innsbrück, Austria, and he has published several articles in scientific journals. Other botanists that have studied the flora in Femsjö are *Lars Romell* (collections at the Riksmuseet, Stockholm) and *John Axel Nannfeldt* (collections in Uppsala). During the summer of 2000 Semir Maslo did a follow-up of Elias Fries inventory on behalf of Agenda 21 in Hylte.



To conclude we can ascertain that there is a unique opportunity for study of changes in the flora in Femsjö as so many prominent botanists have been active there.

The Elias Fries Museum in Femsjö

For anyone that wishes to more closely study the work of Elias Fries there is a small museum in the vicarage in Femsjö where many of his works and diaries are collected. Even some of the later follow-up studies of his works can be seen there.

4.5 The work of Semir Maslo

Semir has carried out several inventories of the flora of Hylte. The most comprehensive one is a general inventory of vascular plants found in Hylte. Semir has also described an area, with meadow-like character, between the Nissatigen and the River Nissan just at the southern junction to Hyltebruk. This area is particularly suitable for school classes and other interested visitors. In an area of 100 x 250 m about 300 different species of vascular plants can be found, i.e. nearly half of all the species that can be found in the Local Authority (see Attachment 1, with a map of the area). Semir has also studied a roadside in Nissaryd, where he found 111 species in a section of 600 m along the road (Attachment 2). The flora in the park on Floras Kulle in Hyltebruk has also been documented on behalf of Stora Enso.

As mentioned above, Semir has made a follow-up of the work of Elias Fries by comparing the plants found now with the ones noted by Elias Fries in his *Flora Femsionensis*. Some comparisons have also been made with other work related to Fries, among others, botanical notes by Elias' son Thore. The results of Semir's comparative study can be seen in the Friesmuséet in Femsjö. A summary of the most important findings is presented in chapter 5 below.

5. What plants can be found in Hylte?

5.1 Vascular plants

While carrying out his general inventory of the flora of Hylte, Semir collected and prepared specimens of about 700 different vascular plant species. The results of this work can be seen at the library in Hylte and at the environmental office in the Local Authority. The species found are listed in Attachment 3.

Among the about 700 species Semir collected are 10 that have been listed in the database of species demanding special consideration or under threat of extinction. (Aronsson, M. 1999):

<i>Ajuga reptans</i>	Bugle	rare
<i>Alopecurus mysuroides</i>	Black-grass	vulnerable
<i>Elatine hexandra</i>	Six-stamened waterwort	indeterminate
<i>Eleogiton fluitans</i>	Floating club-rush	rare
<i>Genista pilosa</i>	Hairy greenweed	indeterminate
<i>Leerisa oryzoides</i>	Cut-grass	rare
<i>Lithospermum arvense</i>		
<i>Subsp. Arvense</i>	Gromwell	indeterminate
<i>Misopates orontium</i>	Weasel's-snout	emergency list
<i>Pedicularis sylvatica</i>	Lousewort	indeterminate
<i>Pilularia globulifera</i>	Pillwort	vulnerable
Categories of threat:		
<i>Extinct:</i> species that have either disappeared completely or are regarded as no longer reproducing		
<i>Endangered:</i> species that are at risk of disappearing as reproductive populations in the near future unless the threats are eliminated as soon as possible		
<i>Vulnerable:</i> species whose survival cannot be guaranteed long term		
<i>Rare:</i> species, not at present, seriously threatened or vulnerable but at risk due to small size of population, restricted distribution or low density within its area of distribution.		
<i>Indeterminate:</i> species not in category 1 – 3 but which nevertheless need special consideration		

In addition, Elias Fries has stated that *Lolium temulentum*, darnel, was found in Femsjö. This species is, however, no longer found anywhere in Sweden.

5.2 Changes in the occurrence of vascular plants

During year 2000, some 20 places around Femsjö were visited during June-August in conjunction with Semir's survey of vascular plants in the area. The aim with this inventory was to identify species that are new to the area and species that seem to have disappeared and also to analyse why species had vanished or are threatened.

Even though it was an only 16-year-old Elias Fries that compiled *Flora Femsionensis* the work gives comprehensive information on no less than 671 species then growing in Femsjö. This includes mosses and lichens. Fries noted 482 species of vascular plants that can be compared with the 528 that Semir found during June-August 2000. Another 23 species were noted in the inventories made in Femsjö for *Smålands Flora* and with these we now have 551 species of vascular plant, which are 69 more than 190 years ago.

Does this mean that there has been 'improvement' in the development of the flora? We seem to have more species!

To shed light on this question we need to take a closer look at the species that have been newly discovered and those that have vanished. In total we have 551 species from the 2000 inventory and from *Smålands Flora*. Of these 551 species, 408 were also found in Fries work. 143 species are 'new', not noted by Fries, but on the other hand Fries mentions 74 species that were apparently found then but not now.

The mathematics are as follows:

Species noted by Fries, still definitely to be found	408
Species not found by Fries but found now	+143
Species found by Fries but perhaps disappeared now	-74
Total number of species noted by Semir Maslo or <i>Smålands Flora</i>	551

'New' species

Of the 143 'new' species we can surmise that some were, most likely, present in 1810 but the young Fries had yet more left to learn and discover. However, some of these species are so common and well known now, that it is apparent that Fries would have noted them, were they as readily available then as in the present day. Some of these species are also known as species that have come to Sweden more recently.

Among the well-known species that were not mentioned by Fries are sneezewort, daisy, clustered bellflower, giant bellflower, creeping bellflower, greater celandine, mezereon, foxglove, hawk's-beard, field scabious, garden lupin, compact grape-hyacinth, glaucous dog-rose, northern dock, red-berried elder, elder, devil's-bit scabious, snowberry, alsike clover, coltsfoot, and great mullein or Aaron's rod.

Many of these new arrivals have been introduced for gardening and spread from there. Some others are indigenous but have been favoured by changes in land use or seeds have been spreading along our roads. Certain species are benefiting from deposition of nitrogen and the use of manure and chemical fertilisers. At the time of Elias Fries the ground's nitrogen levels were low in most places as a result of e.g. burn-beating. Furthermore in recent years we have been receiving additional nitrogen due to air pollution, e.g. emission of NO_x from the burning of fossil fuels.

Species that have 'vanished'

For most of the 74 species that can no longer be found, or that have become uncommon, we know that they are not only rare in the Femsjö area but in most parts of Sweden. We also know the reasons why many of the species are disappearing or have vanished.

Most of the depleted species can be split into two groups:

- Species that are disadvantaged by the changed use of today's forest land. Amongst these changes are e.g. that mowing of meadows and wetlands for hay making, burn beating and grazing of forest land have ceased. Further, wetlands have been drained, roads and trails are no longer walked as before and less competitive species have not been able to compete with more competitive ones when the land has been 'fertilised' with nitrogen originating from the air pollution.
- Species that are disadvantaged by changes in agricultural practices, e.g. better sorting of seed (no weeds are accompanying the crop seed) and by changed management of gardens, dung heaps, gravel pits and roadsides.

This is a pretty imprecise divide. It is difficult to make a more exact connection to cause as, most often, several factors co-incide.

Species that are disadvantaged by changes in use of what is today forest land:

<i>Thalictrum simplex</i>	Bog orchid
Dewberry	Nodding bur-marigold
Fragrant orchid	<i>Pyrola umbellata</i>
Quaking-grass	Water-purslane
Alpine Enchanter's-nightshade	Grass-of-Parnassus
Allseed	Cotton deergrass
Field gentian	Solomon's-seal
Angular Solomon's-seal	Common ragwort
Lousewort	Heath pearlwort
Alternate-leaved golden-saxifrage	<i>Carex cespitosa</i>
Oblong woodsia	Common butterwort
Marsh gentian	Fairy flax
Large yellow-sedge	Round-leaved wintergreen
Blinks	Pearlwort spurrey
Marsh lousewort	Early marsh-orchid
<i>Anemone vernalis</i>	One-flowered wintergreen.

Species that are disadvantaged by changes in agricultural practices, e.g. better grading of crop seed, and changed management of gardens, dung heaps, gravel pits and roadsides:

Cornflower	Parsnip
Broad bean	<i>Rosa gallica</i>
Buckwheat	Rye brome
Garden chervil	Swamp meadow-grass
Darnel	Small cudweed
Nettle-leaved goosefoot	Greater burnet-saxifrage
Hemp	Greater burdock
Square-stalked willowherb	Common knapweed
Corncockle	Black mustard
Common poppy	Celery-leaved buttercup
Wetted thistle	Cudweed
Garden cress	White mustard
Flax	Loose silky-bent
Good-King-Henry	Mint.
Wormwood	

Species that seem to be declining for other reasons:

Elm	Creeping willow
Hound's-tongue	Rough horsetail
Autumnal water-starwort	Maidenhair spleenwort
Wood melick	Water mint
Heath dog-violet	Spring speedwell
Bird's-nest orchid	

Some of the species that have disappeared from Femsjö have become rare all over Sweden. Amongst these are dandelion, corncockle, rye brome, lousewort, field gentian and *Pyrola umbellata*.

Conclusion

The landscape in Femsjö has undergone vast change in the 19th and 20th Centuries and we can note that many species have become rarer during the last 200 years. Many of these depend on human activities and have occurred in Femsjö for at least one, perhaps several millenia.

Both farming and forestry have become more and more industrialised and mechanised. Biodiversity and variation have been replaced by depletion and monocultures. In the old fields and meadows you find the new forests growing. By clear-cutting the forest areas an 'inverted landscape' is created where the cut areas make for temporary light openings, while the traditional open land (meadows and arable land) is turned into spruce forest.

The most threatened species are those that grew in pastures and meadows, traditional farmlands. Some of these species have, most likely, a thousand or more years' history in our regions, but are now vanishing, or have already vanished due to the changes in land use. Even plants that were tied to wetlands have disappeared to a great extent while those of the forests seem to have fared better.

Some new species have appeared and become naturalised. The big winners have been man's companions, like weeds and plants that grow well in gardens and on roadsides and naturalise from there. One can also say that by and large plants favoured by nitrogen have increased while those not favoured by nitrogen have decreased. The increased level of nitrogen has, amongst other things, promoted the dense growth of vegetation in areas where grazing and mowing have ceased.

5.3 Mosses and lichens

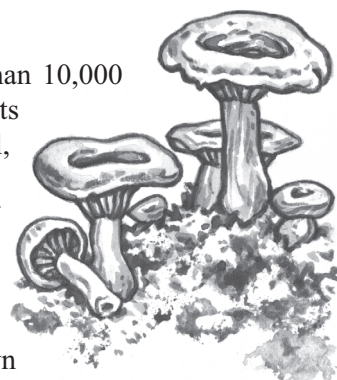
There are an estimated 1,000 species of moss in Sweden and more than 2,000 species of lichen. Lichens are actually not a systematic group but are double organisms established of a fungi and an alga. As far as we know no comprehensive inventory of mosses and lichen has been done in Hylte. But inventories carried out in certain localities have shown that there are a great many valuable mosses and lichens within the Local Authority. Amongst the most important known areas are the nature reserves Ödegårdet, Skubbhult and Mårås.

As we mentioned before (3.4) from a European point of view we are guardians of an important natural inheritance pertaining to e.g. mosses and lichens. Certain environments in our forests have been maintained due to continuity of forests for many hundreds of years in a way that is unusual in other parts of Europe.

For more information refer to the inventory of forest key-habitats within protected nature areas in Halland (Fritz 1995), *Svensk botanisk tidskrift nr 89* (Gustavsson, H-E, 1995) and *Länsstyrelsens meddelande nr 1999:1* (Bengtsson, 1999).

5.4 Fungi

Fungi are a very large group of organisms. It is estimated that there are more than 10,000 species in Sweden. The extensive work that has been carried out by many mycologists in Femsjö, pioneered by Elias Fries, has resulted in a very comprehensive material, now found in many museums. It has not been possible for us to penetrate this material within the framework of this document. This material may be sufficient for years of research for someone who is interested. Below we give just a few examples of how the flora of fungi has developed in one area, the Femsjö Church Reserve (Dullaberget).



In the management plan for the reserve (Holmberg, 1997) a comparison is shown

between fungi in the area during Elias Fries days and now. An inventory that was carried out on behalf of the County Administrative Board (Olofsson, 1992) has been compared to the description Elias Fries made in Femsjö in 1854. Neither of these descriptions are completely comprehensive inventories of the flora of fungi in the area, but they serve as a pointer to how the occurrence of fungi in our area has changed over 150 years.

The comparison shows that the number of species that thrive in open areas has decreased drastically. These are the species that flourish in open environments with plenty of light, i.e. in pastures, meadows, marsh- and wetlands without trees or with a sparse tree cover. Species that grow on grassland are often dependent upon mowing or intense grazing that yield a short but dense grass cover. These environments disappear as soon as the management of such areas ceases. There is reason to believe that these changes within the Church Reserve are representative of what has happened to the flora of fungi in woodland throughout the last hundreds of years.

There may still be fungi in areas with grassland in the Church Reserve, that live in the ground without producing fruiting bodies. The ability to survive when the milieu changes from open cultivated land to more closed forest varies between different species. Thus, some may still be present as resting mycelium. The management measures that are now being carried out in the reserve, with felling trees and the introduction of grazing sheep, may show if some of the species Fries described, but that have not been observed for long, still remain in the ground. If so, they should be able to produce fruiting bodies again when the conditions in the reserve now become more similar to those of 150 years ago.

Fungi growing on trees have generally increased in the Reserve. It seems that species that are tied to deciduous trees have increased more than to those dependant on coniferous trees. This can be explained by the fact that there are old deciduous trees with a rich flora of fungi. This is often not the case in forests that have been managed normally. Nowadays however, the importance of saving old deciduous trees is stressed as they are important hosts for mosses, lichens, fungi, insects, hole-building birds and many other plants and animals that have problems with survival in the managed forests unless the special needs of these organisms are taken into consideration.

6. What animals can be found in Hylte?



6.1 Birds

Västbo Ornithological Society has documented the bird life in Hylte since its formation in 1960. From that time up to now 213 species of bird have been observed within the boundaries of Hylte Local Authority. Of these 106 breed in the area on a regular basis, while 10 nest more sporadically and 8 species can no longer be regarded as breeding in the area. Many of the species, that have been observed but do not breed, are migratory birds from northern Scandinavia and Russia, which pass through the area when migrating. In addition, some more temporary visitors have also been observed. A complete list of the observed species can be found in Attachment 4.

The widest variety of bird life is to be found in biotopes with a broad natural variation and along the birds' migratory routes. Areas that contain water, wetlands, deciduous woods, open fields and grazing land accommodate a rich bird life. Examples of such areas within the Local Authority are Färgån and Sandsjön. Areas with rich bird life along the migratory routes are the large lakes in the eastern part of the Local Authority and the valley of the River Nissan. Also important biotopes for birds are the bog-lands. Species such as the curlew and the lapwing/peewit, which were earlier common in farmland, have now found refuge in the bogs. The widest occurrence of some species of wading birds like the golden plover and the wood sandpiper can also be found in the bogs. Bogs are also important environments for the black grouse and the meadow pipit.

In Hylte, as in other places in Sweden, the bird fauna has been inventoried through a project called the Swedish Inventory of Breeding Birds. These inventories have been ongoing since 1975, and show, through their long-term scale, guaranteed indications of change in the bird fauna. There have been no alarming reports of change in the Hylte area, but the development for some species raises concern. Such species are the cuckoo, wryneck, swallow, house martin, skylark, marsh tit, willow tit, red-backed shrike and the starling. A positive trend has been noted for other species such as the raven, nuthatch, wren, mocking thrush, whitethroat, goldcrest and the siskin. It should be noted that many of the bird species with a negative development are birds occurring in farming areas. Since large scale farming, that has become common in e.g. Skåne and Östergötland, is not featuring in Hylte, birds have not been hit to the same degree here as elsewhere in Sweden. A certain decline has, however, been noted even here.

Another phenomenon that needs monitoring is the survival possibilities of the water-dependant species since our streams and lakes are being used increasingly for tourism and recreation. For the time being no decline has been noticed for sensitive species such as the black-throated diver and the osprey, but the reproduction of the black-throated diver has been very low for some years. This species is extremely sensitive to disturbances from canoes and boats as well as from variation in the water level during nesting time. Some species such as the great-crested grebe, red shank and the lesser merganser, that were nesting birds during the 1970s and the 80s in Lake Bolmen and Lake Unnen, do not nest any more. Most likely their disappearance is due to increased disturbances from boating.

At the same time an increase can be noted for other water-dependant bird species. One of these is the grey goose, which, at the beginning of the 70s could only be found in the southern parts of Femsjö, but is now spread all over the Local Authority. Its expansion has been simultaneous with that of the Canada goose. Another completely new species of bird for the Local Authority, the cormorant, has established itself in the Nature Reserve Tira Islands in Lake Bolmen. There are now some 60 pairs nesting on one of the islands. Cormorants can regularly be seen catching fish in many small lakes in the vicinity.

Some notes should also be made regarding the migratory birds. The birds' migration routes often follow large waterways and for this reason Lake Bolmen has a special attraction for migratory birds. This is, particularly valid for the southerly migration, which takes place between the middle of June to the end of October. In favourable weather conditions lots of flights can be observed from the shores of the Bolmen or the Unnen during that period. In June, July and August it is the Arctic waders and the terns that pass by. The birds of prey and the cranes migrate in September, and at the turn of September-October the skies can be full of chaffinches, bramblings, goldcrests and wood pigeons. At last, at the end of October, it is time for the whooper swans, which after having rested in Matsalu Bay in Hylte's twin town Lihula in Estonia pass our area on their way to Denmark and Holland where they spend the winter. Geese and ducks from northern Scandinavia and the Russian tundra can also be seen on such days.

Of the species of bird that nest or have nested in Hylte there are a few which appear on the so-called 'Red List of Threatened Species in Sweden'. There are five categories of species on that list: RE - Regionally Extinct, CR - Critically Endangered, VU - Vulnerable, NT - Near Threatened (Rare), DD - Data Deficient (Species that may require special consideration). The information below refers to the list as it was in the year 2000. The list is continuously updated, so changes in classification occur.

There are no critically endangered species in Hylte Local Authority.

Among the vulnerable species are the nightjar, the lesser-spotted woodpecker, the red-breasted flycatcher, the wryneck, and the honey buzzard which breed in the Local Authority. The wood pigeon and the garganey were previously breeding birds in the Local Authority but now belong to the species that no longer nest in our area.

Seven of Hylte's breeding birds are regarded as near threatened. These are:

<i>Red-throated diver</i>	Has its southernmost nesting place in Scandinavia in Hylte. Can now only be found in one place.
<i>Shoveler</i>	The only place where it breeds in the Local Authority is Jakob's Lake.
<i>Little-ringed plover</i>	Nests in gravel pits or other open stony ground.
<i>Jack snipe</i>	Only sporadically known in one place in the Local Authority.
<i>Curlew</i>	Has sharply decreased since the 1970s. Can now only be found in marshland.
<i>Blue-headed wagtail</i>	Occasionally nests in open bogs.
<i>Nutcracker</i>	A common bird in Hylte.

Many of the migrating species rest in the Hylte area during their passage. Some of these are to be found on the Red List. For these birds it is of the utmost importance that there are undisturbed resting-places with plenty of food available during their long flights between their northerly breeding places and where they spend the winters in the south. Amongst these are the pintail, garganey and the dunlin.

Reference is made to Attachment 4 for a complete list of the birds that have been observed in the Local Authority.

6.2 Mammals

Animals that can be found

There are some forty species of mammal that can now be found, or that have been found in Hylte Local Authority in the last 2-300 years. Many of these are small i.e. mice, shrews, bats and voles. Others are large and well known i.e. elk and roe deer.

Amongst the small mammals it is good to know that the dormouse can be found here and there in our area.

Reference is made to Attachment 5 for more information about the mammals that can be found or have been found in the Local Authority.



Animals that have been found earlier

Some animals have been present earlier but have been eradicated by hunting or due to changes in the environment. Amongst these are the bear, wolf, otter and beaver. Bears have not been seen in Hylte at all in the 20th century and were not common in the 19th century either. Neither have wolves been seen in the 20th century but they were common during the first half of the 19th century. See attachment 6 for details of the last wolf hunt in Femsjö. The beaver also disappeared a long time ago and it appears that there are no stories about, or memories of beaver in Hylte. But undoubtedly they used to build their dams in our waters a long time ago. The otter was the last animal to disappear. Otters could be seen in several places 40-50 years ago.

New arrivals

Immigrants can be found amongst the animals too. During very recent years the Raccoon dog has been sighted in Hylte occasionally. If we go further back, the fallow deer, common hare, rat, wild rabbit and mink are all immigrants in our area. In fact none of these species are indigenous in our country.

The variation of the elk (moose) and roe deer populations over time

During the 19th century there was intensive hunting and neither roe deer nor elk could be seen in our region, in certain periods. Elks could not be found south of Östergötland, and as far as is known around 1830 there were only a few hundred roe deers in central Skåne. This was at the same time as the beaver was eradicated in Sweden. Beavers have since been released and established as one of our fauna again, but there are so far no beavers in Hylte.

During the second half of the 19th century elk and roe deer returned to the region. At the turn of the century the roe deer had spread up to Lake Vänern and to the valley of Lake Mälaren. Within the Local Authority some hunting areas have statistical records of all felled elk for longer periods of time. These statistics tell a lot about the variation of the elk population. The area Nissaryd-Mjälleryd-Nyarp-Lindhult-Ekeryd is especially interesting, as they have on record all known elk that have been felled in the 20th century. The first elk to be shot in Långaryd parish, after their return, was in 1907 in Sotaryd and two in 1908 in Lindhult. But statistics show that the re-growth of the elk population was a long and slow process. In the hunting area mentioned above only 40 elk were shot between 1908-1950. 12 of these were felled during the war years 1942-43 and the other 28 were spread out over 40 years. These numbers are for an area of 2,500 ha.

The elk population remained sparse until the end of the 1960s. This can be seen in the statistics for game felled within the 2,500 ha area around Nissaryd. Only 1 – 3 elk were shot per year in the fifties and sixties. Roe deer were also sparse throughout the fifties and the sixties. The severe hurricane that affected Hylte in 1969 resulted in an increased area of cleared forest and as a result of that grazing and browsing for game increased. This, in combination with restrictions in hunting, such as protection of females led to a dramatic rise in the elk population. Increased nitrogen deposits due to air pollution is yet another contributing factor, since the open bogs started to grow pine again. Pine shoots constitute the main winter feed for elk. For example, in the previously mentioned area around Nissaryd, 31 elk were shot in the 1982-83 season only, as compared to the 40 shot during all the years between 1908-50.

Since 1982-83 the numbers of elk have decreased somewhat but they remain high when seen from a historical perspective. The animals have a lower weight and sick animals are more common. The development of the elk population in the Hylte area is a good reflection of the development in Sweden as a whole. It has been calculated that the elk population in Sweden culminated around 1982 with some 500,000 elk before the hunting season. The

size of the roe deer population reached about 1 million animals in Sweden at the beginning of the 90s.

In the Hylte area the roe deer population increased from 1990 onwards. This was mainly due to the occurrence of fox scabies that decimated the fox population. Increased hunting could not compensate the reduced fox predation. During 1999 the fox population has shown signs of revival in most areas, and this is starting to have an impact on the roe deer population.

Wild boar could be found in our region long a time ago but they were eradicated. The last wild ones in Sweden were found on Öland in 1688. In recent years they have been kept in enclosures. Escapees from these enclosures have established a new population of wild boar that has now spread over large parts of southern and middle Sweden. Wild boar can now be occasionally seen in the forests of Hylte.



Our only wild species of cat, the lynx is sometimes seen in the Hylte area. It is so common in some places that its presence affects the roe deer population.

6.3 Frogs and reptiles

There are only about ten species of frog and reptile to be found in Hylte. Everyone recognises the adder, grass snakes and common lizards, but it is better not to kill any snakes! This is so partly because they kill mice but the adder can also be easily confused with the rare smooth snake.

See attachment 7 for more information about frogs and reptiles.

6.4 Fish

There are slightly more than 20 different types of fish in Hylte's lakes and rivers. Previously, fishing provided an important supply of food, but nowadays only fishing in the biggest lakes is of any economical significance. In most other waters, however, fishing is still important as a leisure activity. In many lakes the fish have disappeared as a result of the acid rain due to the air pollution. In those lakes that have been treated with lime, the number of fish has rapidly been regained. The largest lakes, the Bolmen and the Unnen have, so far, not required treatment with lime.

See attachment 8 for more information on what fish there are in the water bodies of Hylte.

6.5 Invertebrates

There are many types of invertebrates. These include the insects, spiders, centipedes and the crustaceans. There are thousands of species, so it is no simple task to keep track of which can or cannot be found in Hylte. If you are interested, it can be a good idea to start with butterfly identification since there are not so many different kinds, no more than about 100 species!

One of the well-known invertebrates is the crayfish. The Swedish river crayfish was previously found in many of our lakes and waterways, but can in most places no longer be found because of a parasitic mould that attacks crayfish. The spread of this disease, and the increased acidity in the water has decimated the crayfish population severely. Apparently there are still some to be found in Lake Unnen.

7. Important areas

7.1 Areas of national interest

At the beginning of the 21st century the National Environment Protection Board made a decision to increase the number of areas of national interest for nature conservation in Sweden. The fact that an area is of national interest does not ensure conservation status, but is instead regarded as a guide for the spatial and development planning of the Local Authorities. Seven areas in Hylte have been declared of national interest for nature conservation:

- Store Mosse-Färgån, 621 ha. Geo-scientific values, wetlands complex, fauna. Långaryd parish.
- Femssjöbygden 2 410 ha. Flora. Femsjö parish.
- Yamossen, 163 ha. Mire complex, forest of conservation value, mire 'mosaic', natural forest. Torup parish.

- Lunnamosen, 132 ha. Mire complex, forest of conservation value mire 'mosaic' marsh forest, fauna. Södra Unnaryd parish.
- Ivås, 2 ha. Ancient agricultural landscape. Torup parish.
- Snokamosen, 330 ha. Mire complex, flora and fauna. Torup parish.

7.2 Nature reserves

In all there are eight nature reserves that are wholly or partly situated in Hylte Local Authority. Management plans and other documentation for these can be studied at the office of the County Administrative Board.

Mårås Nature Reserve

Mårås is situated in Långaryd parish on the property Mårås 1:1, near Lake Jansberg. The Reserve is comprised of 45.5 ha and was declared by the County Administrative Board in December 1978. The Reserve is mainly beech forest and half of the area was declared a Crown Land Reserve (Domänreservat) in 1952. The aim with the Reserve is mainly to maintain and promote one of the larger natural areas of beech forest in the inner parts of Halland. This is of particular interest since the area is at the natural northern boundary for beech. Another aim is to protect an area of great value for recreation.

Lintalund Nature Reserve

Lintalund is in the parish of Torup on the property Lintalund 1:1, which was donated to Torup's local folklore society. The Reserve covers 13.6 ha and was declared by the County Administrative Board in December 1986. The area surrounding Lintalund farm contains well preserved remains of an old-fashioned agricultural landscape. The mounds of stone that have been cleared to make the land arable bear witness to the hard labour of former farmers. Closest to the farm is a wooded meadow that is still mowed in the traditional way, annually by scythe. A wealth of species can be found in this meadow, which is one of the few maintained wooded meadows in the county. The Halland's Trekking Trail runs alongside to the west. The aim of the Reserve is to continue traditional management while retaining the area's cultural, historical and botanical values.

Kloö Nature Reserve

Kloö is in the parish of Femsjö on common land belonging to Ulvanäs Village. The Reserve, which covers an area of 10.1 ha, was declared in August 1988. The area, part of the Kloö marsh, has attracted attention in both the County Administrative Board's inventory in 1977 and in the inventory of wetlands in 1983. The Kloö marsh is described in the wetland inventory in the following way: "The complex contains bogs interspersed with wide stretches of marsh. Both bog and marsh are practically unspoiled, with well-defined structures. The size and the fact that it is untouched gives the area a character of true wilderness. Small ponds and contact with the Lake Halla (Hallasjön) contribute to the diversity". The golden plover can be sighted in the area as well as the capercaillie and the black grouse. The Reserve is situated at the centre of the Kloömossen. Bog asphodel, cotton grass, bottle sedge and bog moss grow on the main part of the bog. Bog-myrtle and a grass, *Molinia caerulea*, grow on the bog periphery. Natural forest with pine, birch and spruce grows on the bog's 'islands'. These islands are areas with mineral soils (moraine) at the land surface. The bog itself consists of peat, often several meters deep, which covers the under-lying mineral soil. On the largest of the islands remains of an old soldier's smallholding can be seen. Foundations of buildings and the cattle track leading from the homestead to the grazing areas are still visible. The smallholding was in use up to about 100 years ago. The aim with the Reserve is to maintain a relatively unspoiled wetland and to protect the natural forest with its flora and fauna. The area should be left to develop freely to let nature recapture what man has taken at one time.

Skubbhult Nature Reserve

Skubbhult is in Femsjö parish on property Skubbhult 2:2. The Reserve is 22.2 ha and was declared by the County Administrative Board in March 1993. The beech forests in Skubbhult have been well known for a long time, because of their scenic location at the shore of Lake Mellan-Färgen. In recent years it has come to light that parts of the area are relatively virgin forest with an interesting flora of lichen. The forest grows on an attractive and undulating gentle slope towards the lake. The bed is of boulder, sandy gravel and moraine with rocky outcrops in some places. The beech forest extends beyond the boundary of the Reserve in the southerly direction into the neighbouring property. There are cairns all over the area. Similar remains of cultivation that can be seen at Unnaryd, have been dated to the period of the older Iron Age to the Middle Ages. The beech forest is divided into four stands with spruce plantations between. The forest can be described as moor-beech forest with few herbs in the under storey. The oldest trees are 100-150 years old, and there are dead and weakened trees as well as hollow trees.

There is rich growth of fungi on some of the old beech trunks, but even more interesting is the epiphyte flora of lichen and mosses on the trunks. In places lichen and mosses are plentiful. Several of the species that occur are rare, for example *Scleophora* sp. There is also an abundance of *Lobaria pulmonaria*. *Thelotrema lepadinum*, *Sphaerophorus globosus*, *Neckera pennata* and *Antitrichia curtispindula* are some other interesting species found in the area. All of these are regarded as indicator species for a generally sensitive and protection-worthy flora and fauna that is dependent upon old beech stands. The common buzzard and the wood pigeon have earlier bred in the area.

The aim with this Reserve is firstly, to maintain the area as unblemished natural forest with its flora and fauna. The main part is to be left to develop freely with only minimal management measures. The Reserve also offers valuable experiences of nature to the public.

Ödegårdet Nature Reserve

Ödegårdet is located in Södra Unnaryd parish on property Unnaryd 4:66. The Reserve is 24.5 ha and was declared by the County Administrative Board in June 1995. The Reserve is of great biological value and important for recreation. A very well preserved area of fossil fields was discovered when the Central Board of National Antiquities carried out an inventory of relics in 1983. In 1988 an abundant flora of lichens was also discovered in Bokhultet. Bokhultet is a remains of a much larger area of beech forest in west Småland. The Reserve is situated in an area of great natural beauty at the shore of Lake Kroksjön, just to the north of Unnaryd. The main part is beech forest. The area is of cultural and historical interest because of its extensive system of old abandoned farming remains, the so-called fossil fields. The botanical interest is partly due to the abundance of lichens in the beech forest. The rare species of bird that can be found here make the area also of zoological interest. The area has a delicate landscape, is of importance for outdoor life and pedagogically, by showing the old farming landscape, with roots in prehistoric times. The aim with the Reserve is to preserve the natural beech forest harbouring an abundant flora and fauna and to safeguard the fossil fields. Furthermore, the Reserve should encourage archaeological research while offering possibilities for outdoor walks on the nature trail.

Tira Islands Nature Reserve

Tira Islands is a large cluster of islands in Lake Bolmen's western part, between Tiraholm and Bolmsö on property Tiraholm1: 12 in Södra Unnaryd parish. The whole Reserve is 735 ha, of which 34 ha are land. The islands are mainly built up of glacial deposits that have created a vast system of boulder ridges. The shores of these islands are mainly made up of gravel, stone and boulders. There are also some patches with sand beaches. The largest island, Storö is located at the centre of the Reserve. The island's highest point is 10 meters above water level. Behind the waterline there are notches, cut out 2 meters above the present water level. These tell tales of the lowering of the water level in Lake Bolmen at the end of the 19th century.

The islands are partly overgrown with natural forest that, in some parts, seems primeval. Most common are pine and spruce, but even deciduous trees can be found. On the island Högaholm, in the southern part of the Reserve, lime trees are the predominant species. The vegetation of the ground cover consists of different berry sprigs, a few herbs, grasses and mosses. A more varied vegetation can be found on Högaholm where, for example, coralroot grows. On Storö, the orchid creeping lady's-tresses is quite common. The remains of a middle-age house can be found on Högaholm.

There is interesting bird life in the Reserve. Amongst the waders, the common sandpiper breeds here. Even some sea birds nest in the Reserve, for example, black-throated diver, red-breasted merganser, goldeneye, mallard and the teal. The heron is a temporary summer guest. Access is prohibited to parts of the area between April 1st – July 15th.

Mogölsmyren's Nature Reserve

This Nature Reserve is only a part of the Mogölsmyre, which in turn constitutes part of a larger complex of mires together with Ringmossen. The Reserve contains land in both Femsjö (Torsaberga 1:6, decision by the County Administrative Board 1976) and Breared parishes. The Reserve covers nearly 33 ha of virgin mire with both sloping areas and raised peat bog. The mire has an undisturbed hydrology and drains into the River Fylleån.

Sjö Conservation Area

A 40 ha area that was originally preserved as a Conservation Area, but with the new environmental legislation this is on par with a Nature Reserve. Sjö is located on the eastern shore of Lake Unnen. It is comprised of an old

agricultural landscape with small patches of formerly tilled land. These patches are partly terraced and with piles of stones in between. The land that is not cultivated, or wood covered, is now grazing land with a rich flora of herbs.

Deciduous forest grows around and between the fields. Oak and hazel dominate but there is also some beech. Characteristic species in the ground cover are the lily of the valley, wood anemone and wood sorrel. The varied landscape at Lake Unnen also harbours a rich fauna of birds. The area is easy to walk through and the view of Lake Unnen is very scenic.

7.3 Natural monuments

There are five natural monuments within Hylte Local Authority:

- An oak in the courtyard of Ynnabo 1:4, Torup parish (Decision made in 1947).
- Three lime trees on Nittebo 1:28, Färgaryd parish (Linnekullen; Decision made in 1948).
- An area with blue anemones on Hylteberg 1:5, Södra Unnaryd parish (Decision made in 1953).
- An oak on Skogsgärde 1:3, Drängsered parish (Decision made in 1964).
- The island Sikö in Lake Jällunden and two rocky islets in the lake about 100 m west of Sikö, Jälluntofta parish (Access prohibited March 1st –August 31st. Decision made in 1957).

7.4 Areas with other forms of protection

There is a general restriction with regard to construction of buildings and other structures in a zone within 100 m from shores of lakes. This is applicable for all lakes with the exception of small pools in fields, woods and marshes. The zone is extended to 200m at Lakes Fjällen, Jansbergssjön, Jällunden, Kroksjön, Mellan-Färgen, Stora Färgen, Södra Färgen and Unnen. It is extended to 300 m at Lake Bolmen.

Kia Islet, Stora and Lilla Slangholmen and Stora and Lilla Förö (all in Lake Unnen) are protected as bird sanctuaries with access prohibited April 1st –July 15th.

7.5 Natura 2000

At the conference in Rio, a decision was made with regard to Agenda 21. Other decisions were also made, for example on common efforts to preserve the Earth's biological diversity. The European Union has responded to this by identifying environments and species that are in need of special protection within the member states. The County of Halland has been given responsibility for certain environments, and the County Administrative Board has been assigned by the EU to suggest areas that should be part of a network. Similar responsibilities have been given to other areas of the Union so that all types of nature and species are preserved for the future.

For the County of Halland certain areas have been approved by the Government, and hence suggested to the European Union in Brussels. No decision has yet been reached in Brussels as to which areas finally become part of the Natura 2000 network.

For Hylte Local Authority the following nine areas have been proposed:

<u>Area</u>	<u>Size</u>	<u>Type of nature</u>
Mogölsmyren	34	Raised peat bog, western taiga etc.
Skubbhult	21	Beech forest of 'woodrush type'
Ödegärdet	26	Beech forest of 'woodrush type'
Lintalund	17	Wooded meadow, old oak forest on acidic sandy soil
Mårås	48	Beech forest of woodrush type and also richer with more herbs
Tira Islands	655	Oligotrophic to mesotrophic lakes, western taiga, lime wood
Store mosse-Färgån	126	Raised peat bog
Dullaberget	19	Western taiga, beech forest of 'woodrush type'
Lunnamossen	90	Open slightly arched bog, western taiga
Moshult	2	Marsh forest with herbs
Lidhult	2	Deciduous hardwood forest with rich biodiversity
Skärshultaberg	18	Old beech forest with rich biodiversity

The fact that an area is part of Natura 2000 means that it shall be protected, preserved and if necessary managed, but not that it necessarily becomes a nature reserve. Most of the areas in Hylte are, however, already nature reserves.

7.6 Habitat protection

Valuable areas can be protected with so-called habitat protection through an agreement between the Government (via the Forestry Board) and the landowner. This type of protection is binding for the landowner. There are four such areas in Hylte Local Authority:

- Tornåsen in Drängsered parish, 3.5 ha with old natural beech forest
- Kallar in Torup parish, 1.7 ha natural forest with oak dominance
- Moshult in Torup parish, 2.2 ha old marsh forest with a rich flora of herbs covering the ground (this area harbours many endangered species and is perhaps Halland's finest marsh forest.
- Lidhult in Drängsered parish, 1.6 ha with older natural deciduous hardwood forest with a rich flora of vascular plants.

Furthermore there are two so-called conservation area agreements through which the landowner has committed himself to manage the area in a certain way so as to protect the natural value. These two areas are:

- Gassbo in Långaryd parish, 11.1 ha
- Tannshult in Jälluntofta parish, 4.2 ha

Through the Forestry Board's inventory of key habitats and the associated information to landowners, awareness of the local natural values has been extended and interest in the same has increased. By certification of the forest management, landowners undertake to show consideration to key habitats and other areas of particular value even if these areas are not legally protected. There are also regulations regarding consideration of natural values in forest management that the Silvicultural Act states that landowners are obliged to obey.

7.7 Protected species

Some rare plants are protected in the County of Halland. This means that these species are not to be picked or damaged where they grow naturally:

All orchids	Yellow horned-poppy
<i>Genista germanica</i>	Sea-holly
Petty whin	Yew
Blue anemone	Hart's-tongue
Pesque flower	Black spleenwort
<i>Anemone vernalis</i>	Common sea-lavender
<i>Anemone pratensis</i>	Helichrysum
Cowslip	Slender St John's-wort
Large pink	Issler's clubmoss
Whorled Solomon's-seal	

It is also forbidden to pick or dig up lily of the valley for selling.

8. Planning issues

The Municipal General Spatial Planning shall, as an *environmental-political tool*, contribute to sustainable development, promote an economical building structure, stand up in defence of urban green areas, promote recycling techniques and protect water as a resource. This is done by defining the Local Authority's goals for the environmental-political work, by localising and describing the biodiversity, and by suggesting measures to promote positive development of the established values.

Areas of particular interest are accounted for in the General Spatial Plan. Some of them are *ecologically sensitive areas* and areas of special interest for *environment protection and biological diversity*. Also accounted are *areas with particular environmental problems*, *areas sensitive for disturbance or influence* and *areas of importance for re-cycling of materials*. The municipal standpoint and recommendations are clearly stated concerning the aforementioned fields of interest.

The goals and recommendations that comprise the spatial plan are based on Hylte Local Authority's ambition that the local development should be based on sustainability and re-cycling in the spirit of Agenda 21. This entails care for the unique natural environment and the biological diversity. This is a heavy responsibility for the Local Authority as a big landowner who should be seen to set a good example.

If you are interested in more detailed information please contact the Section for Planning and Building in the office of the Local Authority.

9. The management of land owned by the Local Authority

'Green forest-management plans' have been established for all of Hylte Local Authority's forest land during the last few years. These plans contain a detailed description of the respective land areas and suggest management measures for the next 10 years.

The difference between a green forest-management plan and a more traditional plan is that long-term goals are proposed in the plans, based on the natural values of the area. The goals are based on the following classes:

- PG** Production with general consideration to the natural values. Areas where interest in wood production dominates.
- K** Combined goal: Combined goals with a pronounced interest for wood production but also a specific interest in the natural values which call for consideration of environmental issues that far exceeds the general consideration.
- NS** Nature-conservation areas that need some form of management: The management favours nature conservation without interest in wood production.
- NO** Nature-conservation areas that are left untouched: Nature conservation without interest for production where the area is left without any management.

Hylte Local Authority owns about 1,000 ha of land, out of which 586 ha is productive forest land. According to the Green forest-management plans the 586 ha of forest land is divided into the classes as follows:

PG	58%	338 ha
K	20%	119 ha
NS	15%	87 ha
NO	7%	42 ha

Parts of the forest areas that are suggested for class NS and NO are situated in Skärshultaberg and Bosgården. These areas are also suggested as Nature Reserves to be declared by the Local Authority.

Please contact the Technical Section in the office of the Local Authority for more information on the Green forest-management plans.

10. Schools' work with biodiversity

10.1 Why is it important?

Research and experience about learning has shown that learning is more effective if all of the senses are mobilised. A good way of achieving that is by teaching pupils outdoors. This paves the way for integration of many subjects, and offers chances for the youth to appreciate time spent outdoors. To strengthen the teacher's competence in outdoor pedagogy Hylte Local Authority has arranged courses for those interested. Many of the teachers at Elias Fries School have taken part in these courses during 2000 and new courses are planned for 2001 for staff from Hylte schools and our twin-towns, Piecki, Poland and Lihula, Estonia.

10.2 School playgrounds

The Biological diversity at Elias Fries School

Emphasis on environmental education and use of information technology are prominent features of Elias Fries School. Each classroom has their own garden and there is a greenhouse that is shared by the whole school. Working in and with nature is a common method for the staff and pupils at Elias Fries School. Waste is sorted at source and this activity and composting are integrated parts of the daily work.

Each school building has its own compost where all food waste is composted together with weeds and crop residues from the gardens. Many of the classes also have an indoor compost where the pupils can study how worms work with decomposition.

The school is relatively new. When the first classes moved into the school, each class got three fruit trees and three fruit bushes. The classes chose which kinds they preferred. The trees and bushes were planted close to the classroom of the respective class.

In the greenhouse, seedlings are raised each year for subsequent transplantation to window boxes outside each school building. Tomato and cucumber seedlings are raised for the greenhouse. Each year new crops are tried, for example, squash, artichokes and a variety of herbs. The herbs are later planted out at a specific site, the herb garden. This year we have also tried to raise spruce seedlings.

With help from staff and pupils, we have made a butterfly garden at the school. There, we have planted flowers and plants to attract butterflies. Pupils and staff can relax here while studying the plants and butterflies.

There is a meadow in the school grounds, where we have started to plant typical meadow plants. Despite the fact that the meadow is not yet completed, we have already had a hay-making party. In one corner of the meadow we are creating an “ancient field” where you can play in the labyrinth, have class-council in the stone circle, study the trident or dig in the archaeological pit. We have also planned to plant hazel, ash and other indigenous trees and bushes.

Each class decides what is to be grown in their garden. The pupils and their parents look after the crops and other plants cultivated. Each pupil and his or her parents are responsible for the garden care during one week of the summer vacation. This responsibility rotates such that all gets involved. In the autumn there is usually a “Harvest Festival”.

Sometimes plants are grown according to a set theme. In 1999 the theme was the potato. Seed potatoes were obtained from the Nordic Gene Bank. Many different and exciting varieties were grown. On our ‘Potato Day’ we worked with research, cooking and eating. The blue mashed potatoes were greatly appreciated.

The school pond offers opportunities for the pupils to study aquatic plants and animals. All students of the school have collected specimens from the pond and then struggled to identify them. In and around the pond we have planted different waterplants.

Biodiversity at Torup School

At Torup School there is also a school garden with vegetables, flowers, fruit trees and a herb garden. A rolling timetable for the different classes gives all pupils the opportunity to familiarise themselves with the mystery of how the seed grows to a vegetable or to a flower that attracts butterflies.

The natural part of the school garden encompasses three different biotopes:

- *The copse*, where our most common trees and bushes are found. Typical forest flowers appear in the spring i.e. the wood anemone, lily of the valley and yellow archangel. When there is snow during the winter we can study the tracks of animals that live close by us.
- *The dry meadow*: Not so many years ago sheep grazed here. It is now possible to study typical flowers and plants of such environment, e.g. the mullein, common toadflax, St John’s wort and yarrow.
- *The Marsh*: A so far unexplored environment in the proximity of the school.

Development of pedagogical approaches aimed at maximum use of the natural resources close to the school is going on continuously with involvement of both teachers and pupils.

10.3 The school forest

Through good contacts with Stora Enso Ltd, Elias Fries School has been offered a chance to use a forest area close to the school as a school forest. Classes can come here to experience and enjoy the forest or to carry out activities that need more space or a different environment that can be found at school.

11. Some important reasons for change in plant and animal life

11.1 Human population pressure

The increase in the human population combined with more intensive land use and uncontrolled hunting during the 18th and 19th Centuries resulted in the disappearance of several species in our region. The countryside changed

considerably due to the clearing of forests, slash and burn techniques, extended cultivation and drainage. In spite of these drastic changes plant species that depended on continued management of meadows and grazing areas still survived. The existence of these species was, in some instances, a result of more than a thousand years of continual management of meadows and pastures. Examples are grass-of-parnassus and the globeflower that were found at the time of Thore Fries' walks in Femsjö (ca. 1850). Now both these two species seem to have vanished. Amongst the animals that disappeared long ago are the beaver, the bear and the wolf, in mentioned order. Both the elk and the roe deer were eradicated in our region, but are now common. In recent years the human population in the countryside has again decreased and is now at the same level as in the 17th century. In many places there are barely a quarter of the maximum human population remaining. But even if there are no longer so many people permanently living outside the urban areas, mans influence is noticeable and perhaps more radical than ever before.

11.2 Acidification/over-fertilisation

Acidification of rainfall, water bodies and ground as a result of air pollution has had great effects on the environment. The most noticeable effects are in our lakes and rivers, and without the addition of crushed lime stone, many water bodies would have lost most of their fish. Due to this added lime our fish have fared better, but still, practically all our lakes are affected by acidification to some degree. The fresh water fauna has been seriously affected, especially those species sensitive to acidity (e.g. salmon, crayfish and roach). Changes in the fish population influence the occurrence of certain birds, e.g. the black-throated diver and the osprey.

Another result of air pollution is an increase in nutrient deposits. Of greatest importance is the increase in the deposits of nitrogen. Many changes in the vegetation can be directly related to the excess of nitrogen. Grasses are more favoured than herbs and this is most noticeable on clear-cut areas where the dominance of grass can be clearly noted. The decline of the cloud berry is most likely due to the fact that trees have taken over the open areas preferred by the cloud berry as a result of the 'fertilisation' from air pollution. Arnica, mountain everlasting, sticky catchfly and other plants that flourish on poor soil are also disadvantaged. Cow-parsley, nettles, tufted hairgrass and *Deschampsia flexuosa* are amongst the species clearly favoured by increased levels of nitrogen. On clear-cut areas *D. flexuosa* competes very successfully with berry sprigs resulting in reduced production of blueberries and lingon berries. Conditions have changed considerably since the time when the production of the lingon berry was of economical importance in this region. Collection of lingon berries used to be a base for trade and industry in e.g. Lidhult.

It is no easy task to define the effects of acidification and over-fertilisation in relation to other factors affecting plant and animal life, but the influence is certainly great. Unless serious measures are taken we are going to notice that some species vanish while a few others become more common.

11.3 Changes in farming and forestry practices

Farming and forestry have undergone evident changes throughout the centuries. During the last 100-150 years forest grazing and burn beating has ceased and natural forests have widely been replaced by spruce plantations. Land that was cleared for cultivation during the 19th and 20th Centuries remained farmland only for a short period of time. Now forests grow again on many of these areas, but not of the same type that once grew there. Much of the arable and pastureland with a long history of cultivation and management has also been abandoned. During the last centuries vast areas of deciduous forest, mainly beech, have been replaced by spruce. Most of the grazing land is fertilised with chemical fertilisers, which promote the growth of grass over herbs.

All of these changes have led to the disappearance of species. It is said that the ermine has been badly affected by denser vegetation on and around stonewalls and boulder piles. Species that depend on the tread of livestock, hay making and fires have become less and less common.

11.4 Heavy browsing by game

During the last thirty years or so, the populations of elk and roe deer have been dense and the browsing-pressure has been intense. Forests that are now reaching maturity for final felling were established at the beginning of the century when the population density of game was considerably less. From being extinct, in our region, during the first half of the 19th century, both elk and roe deer have made a comeback. The increase went slowly until the beginning of the 70's when a rapid increase took place. Our countryside has not seen such intense browsing-pressure from wild animals for at least 200 years as in the last 20 years. This constitutes a threat to the biological diversity in the forest landscape.

Species that are preferred by elk and roe deer are eaten to the extent that they can no longer be regarded as part of

the normal flora though previously very common. Examples are rose bay, blueberry and lingon sprigs, wild raspberry, juniper and even fungi. Some tree species, such as the rowan and the aspen, are also intensively browsed. Nowadays, seedlings of these species rarely manage to reach a size where they become part of the new forest. Even the pine is intensively browsed. The roe deer have changed their choice of feed and started to consume emergency feed e.g. young shoots of spruce. In some places landowners have fenced off forest plantations. This rapidly results in a marked difference of the vegetation inside versus outside of the enclosure.

The species that are attractive for browsing are hardly running risk of extinction. The new forest stands are, however, greatly affected by game browsing. This was not the case when the forest stands that are now old were established. As the rotation period is so long in Scandinavian forestry it is important to be observant. Factors influencing the establishment of new forests determine the composition of vegetation for a long time. It is thus essential that forest owners apply a forestry-historical perspective on their activities. It is difficult for us to judge the significance of the changed characteristics of the young forest stands, but it may well be a threat to our biodiversity.

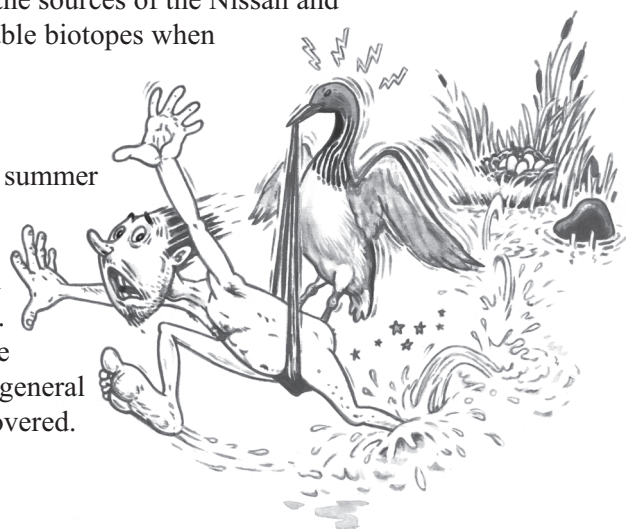
For the individual forest owner there seems to be little point in planting pine as the elk always damage pine plantations. The reaction from forest owners has been to stop planting pine. It is true that the roe deer eat spruce shoots, but rarely to the extent that the seedlings die. The spruce browsing results in lower quality forest because of double tops and stunted growth. But results of planting spruce are anyhow better than with plantation of pine. It is difficult for the individual forest owner to successfully establish pine when most others do not. Planting pine becomes unique and can be compared to laying a succulent table for the elk. Damages are guaranteed. But if the majority of forest owners had seriously gone for diversity and variety by planting pine on suitable sites the result would be that many succulent tables were laid and the damage on each one would thus be less. Simultaneously, there would be more feed for the elks, which idea is attractive to all that like to enjoy the sight of elks. Generally, this is an issue in the region, but particularly pronounced in the easterly parts of Hylte Local Authority. Through the monoculture of spruce, forests are being created with a deficiency of undergrowth, few deciduous trees and, in the long run, a shortage of feed for game. Because of this we run the risk of creating a vicious circle that will ultimately affect the game population. From forestry point-of-view problems like root-rot, storm-felling, shortened rotation times and few alternatives in the management of older forest could all be mitigated if pine was more extensively planted. This is negative from both an economical and an environmental position. With more pine we get a more pleasant forest to spend time in, more berries to pick and, in the long run, better grazing for game, hence a sustained population of game and other fauna.

11.5 Hydroelectric power expansion

Both small rapids and rapids and waterfalls in bigger rivers have been harnessed for hydroelectric power. This has been going on for a long time, and these activities have disadvantaged some species and favoured others. Natterer's bat, *Myotis nattereri*, is a species that likes stone constructions by old water mills, and is disadvantaged when these are no longer taken care of. More noticeably disadvantaged by hydroelectric power buildings are the salmon and trout, which can no longer migrate up from the sea to the sources of the Nissan and the Fylleån. The grey wagtail is one bird that has lost suitable biotopes when the rapids disappeared.

11.6 Disturbances from outdoor activities

Even if most parts of Hylte are sparsely populated during the summer when the countryside is a maternity ward for birds and other animals, visitors can cause serious disturbance of some species during nesting time. For example the black-throated diver and the osprey are very sensitive to such disturbance. These birds often nest on islands and longer visits by people during the most sensitive time can ruin their nesting. A general rule is to immediately leave an area if a bird's nest is discovered.



12. What can we do now?

12.1 Increase awareness and interest

An interest for nature that is shared by many people is a necessity. Without such interest from the population at large there will be no widespread concern regarding e.g. trends or threats to our biodiversity. The schools have a

great possibility to inject ideas and arouse interest among the youth by teaching about the nature that we have in Hylte. The bold venture of the teachers to work with outdoor pedagogy and the environment is important. If this is properly arranged it can lead to both emotional links to and interest in the nature that we are all ultimately and completely dependent upon.

Possibilities exist to improve the information about our nature. Such information can be targeted both to us, the residents in Hylte, and to our visitors. We have many valuable areas both within and outside of the reserves that could become appreciated outings, if people knew about them.

The Nissan Trail in Hyltebruk was put in order a few years ago, but now needs improvement.

The Yellow Trail in Femsjö is of great importance to visitors from near and far. It has been maintained by Femsjö folklore society.

Educational tourism is a way of changing attitudes and values. Knowledge on the wealth of nature and outdoor experiences are a prerequisite for all of us to care about what happens with the environment! Knowledge is also necessary for both the present and future generations to use the outdoors without causing damage. Disturbances from outdoor activities can be destructive for some species. Learning about the demands of these species needs to be combined with supervised protection of certain places.

12.2 Local Authority Reserves

It has long been suggested that the areas around Bosgårdsfallet in Torup and Skärshultaberg become nature reserves. Since a few years back it has been possible for the Local Authority to make decisions about reserves, and preparatory work is in progress for the establishment of these two areas as Nature Reserves.

12.3 The responsibilities of the landowners

The achievement of a sustainable balance between elk, roe deer and the vegetation is primarily the responsibility of the landowner. There are two main issues that need to be addressed; the hunting intensity and the species selection in reforestation. The combined hunting by man and by predatory animals ought to keep the population of cloven-footed animals less dense than at present. In reforestation it would be desirable with an element of pine in all less fertile soils, on gravel ridges and where root-rot is worst, either naturally or by planting pine. Later in the rotation time the tree mix can be steered towards pine by clearing and thinning-out. In order not to risk complete failure of reforestation activities, planting of pure pine stands can not be recommended as long as the browsing intensity is as high as at present. Information and discussions involving both hunters and forest owners are necessary to improve the situation.

It is essential that the percentage of hardwoods increase, at the cost of the spruce to secure the survival of rare species found in key-habitats in deciduous forests in the longer time perspective. To achieve this it is necessary that we carry on protecting key-habitats but there is also need for voluntary initiatives from landowners.

The Forestry Board has a plan of action for biodiversity in Hylte Local Authority. The approach is based on a combination of advice, information, education and jurisdiction.

12.4 Management of the land belonging to the Local Authority

The Green forest management plans are the most important tools for the Local Authority for planning of forest operations in its forest land. These plans are intended to define the balance between economical and conservation gain with consideration to recreation and the natural environment. The interest for recreation is particularly pronounced in forests close to built-up areas.

The Local Authority intends to follow the Green plans in the future, and all the forests owned by the Authority have been certified with the assistance of the Forest Owners Association. The certification implies that:

- Key habitats are protected
- Solitary trees of specific environmental value are left when forest stands are cut
- The proportion broad-leaved species will increase
- Dead trees and dead wood are left in all forestry operations
- No forestry operations will be undertaken in marsh forests or other wetlands.

All areas that the Authority has bought for developmental purposes, like industrial expansion, are to be well managed.

12.5 Fries' favourite meadows in Södra Bökeberg

Elias Fries has mentioned that many plants, and particularly rare plants, can be found in Södra Bökeberg. Elias' son, Thore, also a botanist, has given an explanation as to why so much botanical investigation has been done in Bökeberg. The following quote is taken from *'Botaniska anteckningar rörande Femsjö socken i Småland'* by Thore Magnus Fries, from *'Nya botaniska notiser No 4 april 1852'* (English plant names have been added in parenthesis):

“...I am sure that most people, like myself, enjoy spending time while searching through the beautiful meadows that can be found here and are the only refuge within Femsjö for many species of plant such as *Anemone hepatica* (blue anemone), *Paris* (herb-paris), *Trollius* (globeflower), *Pyrola rotundifolia* (round-leaved wintergreen), *Parnassia* (grass-of-Parnassus), *Salix nigricans* (Black willow) and others. Without any particular reason one is always rewarded whilst wandering through this place that is to be regarded as the pearl of the parish”.

This place is still a worthwhile visit now, 150 years later. The anemones are still plenty, and many other species, found by father and son Fries, can still be found.

Continued mowing is beneficial for this area so as to keep the spruce from taking over. The mowing that has been carried out in this area has left signs that can be seen in the vegetation.

In the County Administrative Board's inventory of meadows and pastures (Håkansson and Sjögren, 1992) Bökeberg gets a mention, but only the drier part, on higher ground where there are some ancient remains. The special flora, described by Fries, seems to have been overlooked. The entire slope from dry to marshy land is of botanical interest. It would be helpful to reintroduce the ancient management practices in this area, especially the mowing of some parts.

12.6 Lake Roten

Roten is an area of special ornithological importance on the outskirts of Unnaryd. The Roten-area is a lake that has been lowered and is well known for the abundant bird life found there such as a rest and nesting place for whooper swans and cranes. Roten is the best place in the Local Authority to hear the Jack snipe in springtime. After the lake was lowered the wetlands are turning into a raised-peat-bog, and there is a risk of decreased natural value. Restoration would be valuable.

12.7 Financing special measures

It is essential that we maintain our inheritance of the biological diversity as an integral part of forestry and farming. Other threats to the survival of species should as far as possible be eliminated, for example, over-fertilisation must be reduced so that less competitive plants are not completely suppressed by nitrogen-favoured species.

Some areas need more than just everyday consideration so as not to jeopardise the biodiversity. Some of these are already protected as nature reserves and conservation areas, others not at all. The Government contributes to the management of nature reserves, but the resources have always been scarce.

All the inhabitants of Halland make a yearly contribution, 2 SEK per person, to the Väst kuststiftelsen (The Foundation for Nature Conservation in Western Sweden), a Foundation that helps with the creation of new reserves and facilities for outdoor life and also manages many wonderful nature areas. The Foundation can also help with joint-action projects between Local Authorities and local interest groups for smaller projects of regional or local importance. The Foundation has existed since 1962. Only very limited resources have reached Hylte, if any at all. If the suitable projects were initiated in the Local Authority, either of national interest or more local joint-action projects, they could perhaps be supported from the foundation.

For example, the Local Authority could apply for assistance with funding of the maintenance of the Femsjö area. This might be considered positively as it is of local, regional, national and international interest. There are many visitors to Femsjö from all over.

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Collections at the Fries' Museum, Femsjö
The key habitat inventory (The Regional Forestry Board, unpublished)

Dialogue with

Sture Wahlström, Femsjö
Robert Andersson, Borås
Rune Gerell, Lund
Peter Norell, The County Administrative Board of Halland
Göran Nilsson, Department of Zoology, University of Gothenburg
Jeanette Erlandsson, The County Administrative Board of Halland
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Karin Hernborg, The County Administrative Board of Halland
Egon Nennesson, Hyltebruk
Hans Jonsson, Femsjö
Lasse Strandberg, Västkuststiftelsen

Contributions to the text from

Rune Christiansson: Wildlife
Bertil Holmén: Wildlife, a historical retrospective
Gunnar Lindkvist: Schools' work with biodiversity, Elias Fries' School
Olle Hallborg: Elias Fries
Semir Maslo: Plants in Hylte, attachment 1 and 3
Stefan Andersson: A historical retrospective, the key habitat inventory
Ewelyn Nilsson: Schools' work with biodiversity, Torup's School
Birgitta Holmén: Attachment 2
Willy Strömblad: Birds, attachment 4
Kjell Pihl: Planning issues
Bitte Rosén Nilsson: Editorial work and contributions to all sections
Bo Tengnäs: Editorial work and contributions to all sections, attachments 5, 7 and 8.
Karl-Erik Jonsson: Attachment 6

Attachment 1: Semir Maslo's documentation of the area between the Nissastigen and the south entrance to Hyltebruk.

At the southern entrance from the Nissastigen to Hyltebruk there lies an area with a wealth of flowers and species worthy of some special attention. This area (100 x 250 m) lies between the River Nissan and the Nissastigen, just north of the entrance to Hyltebruk. The vegetation has a meadow like character with a great diversity of species. About 300 vascular plants can be found here, roughly half of all the species that can be found in Hylte.

Particularly noticeable is the element of grass (*Calamagrostis* spp), ostrich fern and bracken, which gives the area a special character. As the soil moisture conditions vary in the area, species that need plenty of water as well as species that tolerate dry conditions prosper here.

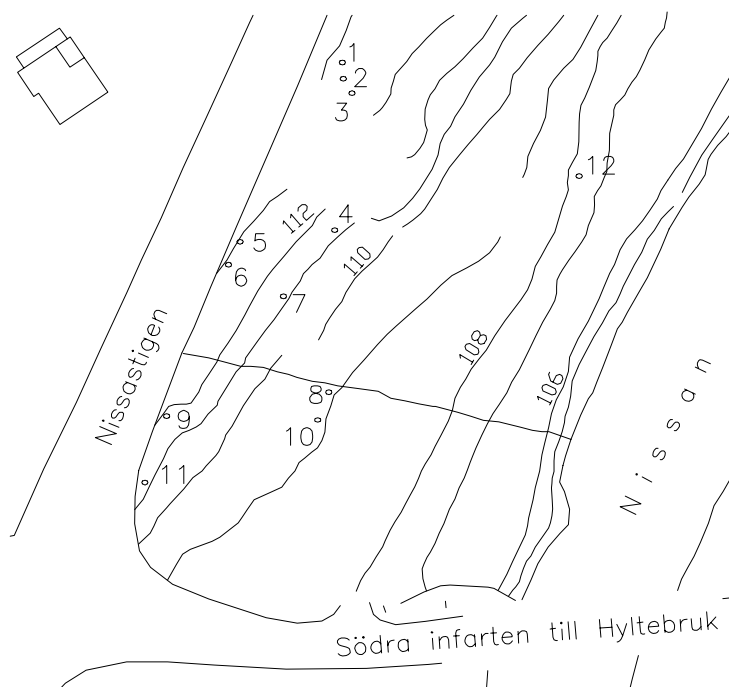
Dominant species in the eastern parts are purple small-reed (*Calamagrostis canescens*), reed (*Calamagrostis arundinaceae*), rare spring-sedge, (*Carex ericetorum*) and sheathed sedge, (*Carex vaginata*).

Stone bramble (*Rubus saxatilis*) dominates the ground vegetation on drier ground in the western part. Thread rush (*Juncus filiformis*), jointed rush (*Juncus articulatus*) and deergrass (*Triglochin palustre*) cover the soil on wetter ground. In the northern part the vegetation has been more influenced by human activity. Mugwort (*Artemisia vulgaris*), melancholy thistle (*Cirsium heterophyllum*), creeping thistle (*Cirsium arvense*), scented mayweed (*Matricaria inodora*), viper's-bugloss (*Echium vulgare*) and bugloss (*Anchusa arvensis*) can be found here.

The vegetation was inventoried during August and September 1997. A complete list of species has been prepared.

Semir Maslo

October, 1997



Some rare and interesting plant found in the area:

- | | |
|--|---|
| 1. <i>Daphne mezereum</i> | 12. <i>Dactylorhiza maculata</i> ssp. <i>maculata</i> |
| 2. <i>Astrantia major</i> | 13. <i>Platanthera chlorantha</i> |
| 3. <i>Prunus tenella</i> | 14. <i>Matteuccia struthiopteris</i> |
| 4. <i>Echium vulgare</i> | 15. <i>Calamagrostis canescens</i> |
| 5. <i>Rosa pimpinellifolia</i> | 16. <i>Triglochin palustre</i> |
| 6. <i>Pimpinella saxifraga</i> ssp. <i>saxifraga</i> | 17. <i>Cardamine amara</i> |
| 7. <i>Polygonatum multiflorum</i> | 18. <i>Calamagrostis arundinaceae</i> |
| 8. <i>Ranunculus auricomus</i> (coll.) | 19. <i>Carex vaginata</i> |
| 9. <i>Armeria maritima</i> ssp. <i>maritima</i> | 20. <i>Carex ericetorum</i> |
| 10. <i>Cirsium heterophyllum</i> | 21. <i>Calamagrostis epigejos</i> |
| 11. <i>Plantago maritima</i> | 22. <i>Elymus caninus</i> |

Attachment 2: Biological diversity along an old road

When travelling along the old Nissastigen, through the village of Nissaryd, on a beautiful summer day one can experience the wealth of flowers on the roadsides. The road administrators have noticed this and set aside a 600 m length of road, that is managed in a traditional way. The herbs are cut with a scythe, and left on the ground for about a week or so before removal.

In July 1998 the biologist Semir Maslo carried out an inventory of the flora along this stretch of road. He found 111 different species. A contributory factor to this abundance of flora is most likely the fact of ecological management. No chemical fertilizer or insecticides have been used in the fields here for the last 15 years, but there may also be other reasons behind the wealth of flora.

The old Nissastigen is one of the oldest roads in southern Sweden. It has been busy for many hundreds of years. In the old days there were horse trails on both sides of the river. The so-called “Vekavägen”, that can still be found in places, between Färgaryds church and Gassl Junga village, is most likely a remnant of a “Nissastigen” on the eastern side of the river. This theory is supported by the fact that most churches are found on the eastern side of River Nissan. Tradition says that a wading place across the river was located near Färgaryd’s church. During all the wars and conflicts, especially in the 16th and 17th Centuries army movement back and forth through the area was common. The road was improved and eventually the Nissastigen ran solely on the western side of the river.

In the village of Nissaryd there was an inn, where travellers on their way “up to Småland “ or “down to Halland” could rest.

Danish and Swedish armies alternately marched back and forth, the post carriages changed horses, gentry, royalty, priests and others travelled through the region. Monks walked between monasteries, as well as the so-called “normal” people on their varying errands along the old road. It seems perfectly reasonable to suppose that seeds fastened on wagon wheels, horse hooves or the wanderer’s footwear and eventually ended up at the side of the road. It could well be traces of this that can still be seen in today’s roadsides.

Imagine if the old road could talk! What a tale it would tell.

Birgitta Holmen
Nissaryd Gallagård



Attachment 3: A complete list of vascular plants found by Semir Maslo in Hylte

<i>Abies alba</i>	temporary	<i>Avenula pubescens</i>	fairly common
<i>Acer campestre</i>	temporary	<i>Barbarea stricta</i>	very rare
<i>Acer ginnala</i>	temporary	<i>Barbarea vulgaris</i> ssp. <i>arcuata</i>	common
<i>Acer platanoides</i>	common	<i>Bellis perennis</i>	temporary
<i>Acer pseudoplatanus</i>	fairly common	<i>Berberis thunbergii</i>	temporary
<i>Acer tataricum</i>	temporary	<i>Berteroa incana</i>	very rare
<i>Achillea millefolium</i> ssp. <i>millefolium</i>	common	<i>Betula pendula</i>	common
<i>Achillea ptarmica</i>	common	<i>Betula pubescens</i> ssp. <i>pubescens</i>	common
<i>Aconitum x. storkianum</i>	temporary	<i>Bidens tripartita</i>	rare
<i>Actaea spicata</i>	very rare	<i>Bistorta major</i>	temporary
<i>Adoxa moschatellina</i>	very rare	<i>Blechum spicant</i>	fairly common
<i>Aegopodium podagraria</i>	common	<i>Borago officinalis</i>	temporary
<i>Aesculus hippocastanum</i>	temporary	<i>Brassica napus</i> ssp. <i>napus</i>	temporary
<i>Agrostis canina</i>	fairly common	<i>Brassica rapa</i> ssp. <i>sylvestris</i>	common
<i>Agrostis capillaris</i>	common	<i>Briza maxima</i>	temporary
<i>Agrostis gigantea</i>	common	<i>Briza media</i>	rare
<i>Agrostis stolonifera</i>	common	<i>Briza minor</i>	temporary
<i>Agrostis vinealis</i>	rare	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	common
<i>Ajuga pyramidalis</i>	fairly common	<i>Bromus inermis</i>	rare
<i>Ajuga reptans</i>	temporary	<i>Bromus tectorum</i>	very rare
<i>Alchemilla filicaulis</i> ssp. <i>filicaulis</i>	common	<i>Bupleurum rotundifolium</i>	temporary
<i>Alchemilla subglobosa</i>	very rare	<i>Calamagrostis arundinacea</i>	fairly common
<i>Alchemilla acutiloba</i>	fairly common	<i>Calamagrostis canescens</i>	common
<i>Alchemilla glabra</i>	fairly common	<i>Calamagrostis epigejos</i>	common
<i>Alchemilla glaucescens</i>	common	<i>Calamagrostis purpurea</i>	rare
<i>Alchemilla plicata</i>	very rare	<i>Calitriche hamulata</i>	fairly common
<i>Alchemilla subcrenata</i>	common	<i>Calla palustris</i>	fairly common
<i>Alisma plantago-aquatica</i>	common	<i>Callitriche cophocarpa</i>	very rare
<i>Allium schoenoprasum</i>	temporary	<i>Callitriche palustris</i>	rare
<i>Alnus glutinosa</i>	common	<i>Callitriche stagnalis</i>	common
<i>Alnus incana</i> ssp. <i>incana</i>	temporary	<i>Calluna vulgaris</i>	common
<i>Alopecurus geniculatus</i>	common	<i>Caltha palustris</i> ssp. <i>palustris</i>	common
<i>Alopecurus pratensis</i>	fairly common	<i>Calystegia sepium</i> ssp. <i>sepium</i>	fairly rare
<i>Amaranthus retroflexus</i>	temporary	<i>Calystegia sepium</i> ssp. <i>spectabilis</i>	temporary
<i>Amelanchier lamarckii</i>	temporary	<i>Campanula glomerata</i>	temporary
<i>Amelanchier spicata</i>	rare	<i>Campanula persicifolia</i>	temporary
<i>Anchusa arvensis</i>	common	<i>Campanula rapunculoides</i>	fairly common
<i>Anchusa officinalis</i>	very rare	<i>Campanula rotundifolia</i> ssp. <i>rotundifolia</i>	common
<i>Andromeda polifolia</i>	fairly common	<i>Cannabis sativa</i>	temporary
<i>Anemone apennina</i>	temporary	<i>Capsella bursa-pastoris</i>	common
<i>Anemone blanda</i>	temporary	<i>Caragana arborescens</i>	temporary
<i>Anemone nemorosa</i>	common	<i>Cardamine amara</i>	fairly common
<i>Anemone ranunculoides</i>	temporary	<i>Cardamine hirsuta</i>	rare
<i>Anemone sylvestris</i>	temporary	<i>Cardamine pratensis</i>	common
<i>Anethum graveolens</i>	temporary	<i>Cardaminopsis arenosa</i>	fairly common
<i>Angelica sylvestris</i>	common	<i>Carduus crispus</i>	rare
<i>Antennaria dioica</i>	very rare	<i>Carex acuta</i>	common
<i>Anthemis arvensis</i>	rare	<i>Carex canescens</i>	common
<i>Anthemis tinctoria</i>	very rare	<i>Carex caryophyllea</i>	rare
<i>Anthoxanthum odoratum</i> ssp. <i>odoratum</i>	common	<i>Carex demissa</i>	common
<i>Anthriscus sylvestris</i>	common	<i>Carex digitata</i>	rare
<i>Anthyllis vulneraria</i>	fairly common	<i>Carex dioica</i>	fairly common
<i>Apera spica-venti</i>	rare-temporary	<i>Carex echinata</i>	common
<i>Aphanes arvensis</i>	very rare	<i>Carex elongata</i>	fairly common
<i>Aquilegia vulgaris</i>	temporary	<i>Carex ericetorum</i>	rare
<i>Arabidopsis thaliana</i>	common	<i>Carex hirta</i>	rare
<i>Arabis glabra</i>	rare	<i>Carex lasiocarpa</i>	fairly common
<i>Arctium lappa</i>	very rare	<i>Carex limosa</i>	fairly common
<i>Arctium minus</i>	rare	<i>Carex nigra</i> var. <i>nigra</i>	common
<i>Arctium tomentosum</i>	rare	<i>Carex ovalis</i> var. <i>ovalis</i>	common
<i>Arctostaphylos uva-ursi</i>	rare	<i>Carex pallescens</i>	common
<i>Arenaria serpyllifolia</i> ssp. <i>serpyllifolia</i>	common	<i>Carex panicea</i>	common
<i>Armeria maritima</i> ssp. <i>maritima</i>	rare	<i>Carex pilulifera</i>	common
<i>Armoracia rusticana</i>	temporary	<i>Carex remota</i>	very rare
<i>Arnica montana</i>	fairly common	<i>Carex rostrata</i>	common
<i>Arrhenatherum elatius</i>	fairly common	<i>Carex spicata</i>	rare
<i>Artemisia campestris</i> ssp. <i>campestris</i>	rare	<i>Carex vaginata</i>	rare
<i>Artemisia vulgaris</i> var. <i>vulgaris</i>	common	<i>Carex vesicaria</i>	fairly common
<i>Aruncus dioicus</i>	temporary	<i>Carex viridula</i> var. <i>viridula</i>	rare
<i>Asplenium trichomanes</i> ssp. <i>trichomanes</i>	very rare	<i>Carpinus betulus</i>	temporary
<i>Aster novi-belgii</i>	temporary	<i>Carum carvi</i>	rare
<i>Astrantia major</i>	temporary	<i>Centaurea cyanus</i>	temporary
<i>Athyrium filix-femina</i>	common	<i>Centaurea dealbata</i>	temporary
<i>Atriplex patula</i>	rare	<i>Centaurea jacea</i>	fairly rare
<i>Avena sativa</i>	temporary	<i>Centaurea montana</i>	temporary
<i>Avenula pratensis</i>	rare	<i>Cerastium arvense</i>	common
		<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	common

<i>Cerastium glomeratum</i>	rare	<i>Epilobium ciliatum</i>	rare
<i>Cerastium semidecandrum</i>	common	<i>Epilobium collinum</i>	rare
<i>Cerastium tomentosum</i>	temporary	<i>Epilobium hirsutum</i>	rare
<i>Cercidiphyllum japonicum</i>	temporary	<i>Epilobium montanum</i>	common
<i>Chaenorhinum minus</i>	fairly common	<i>Epilobium palustre</i>	common
<i>Chaerophyllum temulum</i>	very rare; temporary	<i>Equisetum arvense</i>	common
<i>Chamomilla recutita</i>	temporary	<i>Equisetum fluviatile</i>	common
<i>Chamomilla suaveolens</i>	common	<i>Equisetum pratense</i>	rare
<i>Chelidonium majus</i>	rare	<i>Equisetum sylvaticum</i>	common
<i>Chenopodium album</i>	common	<i>Eranthis hyemalis</i>	temporary
<i>Chenopodium polyspermum</i>	fairly common	<i>Erica tetralix</i>	common
<i>Chenopodium rubrum</i>	fairly rare	<i>Erigeron acer</i> ssp. <i>acer</i>	fairly common
<i>Chinodoxa gigantea</i>	temporary	<i>Erigeron annuus</i>	temporary
<i>Chrysanthemum segetum</i>	rare	<i>Eriophorum angustifolium</i>	fairly common
<i>Chrysosplenium alternifolium</i>	very rare	<i>Eriophorum gracile</i>	very rare
<i>Cicuta virosa</i> var. <i>virosa</i>	fairly common	<i>Eriophorum vaginatum</i>	common
<i>Cirsium arvense</i>	common	<i>Erodium cicutarium</i>	fairly common
<i>Cirsium helenioides</i>	temporary	<i>Erophila verna</i>	common
<i>Cirsium palustre</i>	common	<i>Erysimum cheiranthoides</i>	common
<i>Cirsium vulgare</i>	fairly common	<i>Eschscholtzia californica</i>	temporary
<i>Colchicum autumnale</i>	temporary	<i>Euphorbia cyparissias</i>	temporary
<i>Consolida regalis</i>	temporary	<i>Euphorbia helioscopia</i>	common
<i>Convallaria majalis</i>	common	<i>Euphorbia peplus</i>	rare
<i>Convolvulus arvensis</i>	very rare	<i>Euphrasia stricta</i> var. <i>stricta</i>	fairly common
<i>Conyza canadensis</i>	temporary	<i>Evonymus europaeus</i>	temporary
<i>Cornus alba</i> ssp. <i>alba</i>	temporary	<i>Fagopyrum esculentum</i>	temporary
<i>Cornus alba</i> ssp. <i>stolonifera</i>	temporary	<i>Fagus sylvatica</i>	common
<i>Cornus mas</i>	temporary	<i>Fallopia convolvulus</i>	common
<i>Cornus sanguinea</i>	temporary	<i>Fallopia japonica</i>	temporary
<i>Cornus suecica</i>	common	<i>Fallopia sachalinensis</i>	temporary
<i>Corydalis solida</i>	temporary	<i>Festuca ovina</i>	common
<i>Corylus avellana</i>	common	<i>Festuca pratensis</i>	common
<i>Cotoneaster bullatus</i>	temporary	<i>Festuca rubra</i> ssp. <i>rubra</i>	common
<i>Cotoneaster lucidus</i>	temporary	<i>Filago arvensis</i>	rare
<i>Crataegus grayana</i>	temporary	<i>Filipendula ulmaria</i>	common
<i>Crataegus monogyna</i>	rare	<i>Fragaria vesca</i>	common
<i>Crepis paludosa</i>	rare	<i>Frangula alnus</i>	common
<i>Crepis tectorum</i> ssp. <i>tectorum</i>	rare	<i>Fraxinus excelsior</i>	common
<i>Crocus luteus</i>	temporary	<i>Fumaria officinalis</i>	fairly common
<i>Crocus vernus</i>	temporary	<i>Gagea lutea</i>	rare
<i>Cymbalaria muralis</i>	temporary	<i>Galanthus nivalis</i>	temporary
<i>Cynosurus cristatus</i>	rare	<i>Galeopsis bifida</i>	common
<i>Cystopteris fragilis</i> ssp. <i>fragilis</i>	rare	<i>Galeopsis ladanum</i>	rare
<i>Cytisus scoparius</i>	temporary	<i>Galeopsis speciosa</i>	common
<i>Cytisus x praecox</i>	temporary	<i>Galeopsis tetrahit</i>	common
<i>Dactylis glomerata</i> ssp. <i>glomerata</i>	common	<i>Galinsoga ciliata</i>	temporary
<i>Dactylorhiza maculata</i> ssp. <i>maculata</i>	common	<i>Galium album</i>	common
<i>Danthonia decumbens</i>	fairly common	<i>Galium aparine</i>	fairly common
<i>Daphne mezereum</i>	temporary	<i>Galium boreale</i>	common
<i>Datura stramonium</i> var. <i>stramonium</i>	temporary	<i>Galium palustre</i> ssp. <i>palustre</i>	common
<i>Dentaria bulbifera</i>	very rare	<i>Galium saxatile</i>	common
<i>Deschampsia cespitosa</i> ssp. <i>cespitosa</i>	common	<i>Galium uliginosum</i>	rare
<i>Deschampsia flexuosa</i>	common	<i>Galium verum</i> ssp. <i>verum</i>	common
<i>Descurainia sophia</i>	rare	<i>Genista pilosa</i>	rare
<i>Dianthus barbatus</i>	temporary	<i>Gentiana pneumonanthe</i>	rare
<i>Dianthus deltoides</i>	fairly common	<i>Geranium columbinum</i>	rare
<i>Digitalis purpurea</i>	temporary	<i>Geranium molle</i>	rare
<i>Doronicum columnae</i>	temporary	<i>Geranium pusillum</i>	fairly common
<i>Drosera anglica</i>	rare	<i>Geranium pyrenaicum</i>	very rare
<i>Drosera intermedia</i>	fairly common	<i>Geranium robertianum</i>	rare
<i>Drosera rotundifolia</i>	common	<i>Geranium sanguineum</i>	temporary
<i>Dryopteris carthusiana</i>	fairly common	<i>Geranium sylvaticum</i>	fairly common
<i>Dryopteris dilatata</i>	common	<i>Geum coccineum</i>	temporary
<i>Dryopteris expansa</i>	fairly common	<i>Geum rivale</i>	common
<i>Dryopteris filix-mas</i>	common	<i>Geum urbanum</i>	common
<i>Echinops bannaticus</i>	temporary	<i>Glechoma hederacea</i>	common
<i>Echium vulgare</i>	rare	<i>Glyceria fluitans</i>	common
<i>Elaeagnus commutata</i>	temporary	<i>Glyceria maxima</i>	rare
<i>Elatine hexandra</i>	very rare	<i>Gnaphalium sylvaticum</i>	common
<i>Eleocharis mamillata</i>	fairly common	<i>Gnaphalium uliginosum</i>	common
<i>Eleocharis palustris</i>	common	<i>Gymnocarpium dryopteris</i>	common
<i>Eleocharis quinqueflora</i>	rare	<i>Hedera helix</i>	temporary
<i>Eleocharis uniglumis</i>	rare	<i>Hepatica nobilis</i>	rare
<i>Eleogiton fluitans</i>	fairly common	<i>Herniaria glabra</i>	very rare
<i>Elodea canadensis</i>	temporary	<i>Hesperis matronalis</i>	temporary
<i>Elytrigia repens</i> ssp. <i>repens</i>	common	<i>Hieracium aurantiacum</i>	fairly common
<i>Empetrum nigrum</i> ssp. <i>nigrum</i>	common	<i>Hieracium</i> group <i>Silvaticiformia</i>	fairly common
<i>Epilobium adenocaulon</i>	common	<i>Hieracium</i> group <i>Tridentata</i>	common
<i>Epilobium angustifolium</i>	common	<i>Hieracium</i> group <i>Vulgatiformia</i>	common

<i>Hieracium lactucella</i>	common	<i>Lycopodium clavatum</i> ssp. <i>clavatum</i>	fairly common
<i>Hieracium pilosella</i>	common	<i>Lycopus europaeus</i>	common
<i>Hieracium umbellatum</i>	common	<i>Lysichiton americanus</i>	temporary
<i>Hippophae rhamnoides</i>	temporary	<i>Lysimachia nummularia</i>	temporary
<i>Hippuris vulgaris</i>	fairly common	<i>Lysimachia punctata</i>	temporary
<i>Holcus lanatus</i>	common	<i>Lysimachia thyrsoiflora</i>	common
<i>Holcus mollis</i>	common	<i>Lysimachia vulgaris</i>	common
<i>Hordeum vulgare</i> var. <i>distichum</i>	temporary	<i>Lythrum salicaria</i>	fairly common
<i>Hottonia palustris</i>	rare	<i>Mahonia aquifolium</i>	temporary
<i>Humulus lupulus</i>	temporary	<i>Maianthemum bifolium</i>	common
<i>Huperzia selago</i> ssp. <i>selago</i>	fairly common	<i>Malus sylvestris</i>	common
<i>Hydrocharis morsus-ranae</i>	rare	<i>Malva moschata</i>	temporary
<i>Hydrocotyle vulgaris</i>	fairly common	<i>Matricaria perforata</i>	common
<i>Hypericum maculatum</i>	common	<i>Matteuccia struthiopteris</i>	temporary
<i>Hypericum perforatum</i>	common	<i>Medicago lupulina</i>	rare
<i>Hypochoeris radicata</i>	common	<i>Melampyrum pratense</i>	common
<i>Hyssopus officinalis</i>	temporary	<i>Melampyrum sylvaticum</i>	common
<i>Ilex aquifolium</i>	temporary	<i>Melica nutans</i>	common
<i>Impatiens glandulifera</i>	temporary	<i>Melilotus albus</i>	rare
<i>Impatiens parviflora</i>	temporary	<i>Melilotus officinalis</i>	very rare
<i>Iris pseudocorus</i>	fairly common	<i>Mentha arvensis</i>	common
<i>Iris sibirica</i>	temporary	<i>Mentha spicata</i>	temporary
<i>Isoetes lacustris</i>	fairly common	<i>Mentha suaveolens</i>	temporary
<i>Jasione montana</i>	common	<i>Mentha x. verticillata</i>	fairly common
<i>Juncus alpinoarticulatus</i> ssp. <i>nedulosus</i>	rare	<i>Menyanthes trifoliata</i>	common
<i>Juncus articulatus</i>	common	<i>Milium effusum</i>	very rare
<i>Juncus bufonius</i>	common	<i>Misopates oronitum</i>	temporary
<i>Juncus bulbosus</i>	common	<i>Moehringia trinervia</i>	common
<i>Juncus conglomeratus</i>	common	<i>Molinia caerulea</i>	common
<i>Juncus effusus</i>	common	<i>Monotropa hypopitys</i> var. <i>hypopitys</i>	rare
<i>Juncus filiformis</i>	common	<i>Muscari botryoides</i>	temporary
<i>Juncus squarrosus</i>	fairly common	<i>Mycelis muralis</i>	fairly common
<i>Juncus stygius</i>	very rare	<i>Myosotis arvensis</i>	common
<i>Juncus tenuis</i>	temporary	<i>Myosotis discolor</i> ssp. <i>discolor</i>	rare
<i>Juniperus communis</i> ssp. <i>communis</i>	common	<i>Myosotis laxa</i> ssp. <i>caespitosa</i>	fairly common
<i>Knautia arvensis</i>	common	<i>Myosotis ramosissima</i>	rare
<i>Laburnum anagyroides</i>	temporary	<i>Myosotis scorpioides</i>	fairly common
<i>Lamiastrum galeobdolon</i> ssp. <i>argentatum</i>	temporary	<i>Myosotis stricta</i>	fairly common
<i>Lamium album</i>	rare	<i>Myosotis sylvatica</i>	temporary
<i>Lamium amplexicaule</i>	fairly common	<i>Myrica gale</i>	common
<i>Lamium hybridum</i>	rare	<i>Myriophyllum alterniflorum</i>	common
<i>Lamium maculatum</i>	temporary	<i>Myriophyllum verticillatum</i>	rare
<i>Lamium purpureum</i>	common	<i>Myrrhis odorata</i>	temporary
<i>Lapsana communis</i>	common	<i>Narcissus poeticus</i>	temporary
<i>Larix decidua</i>	temporary	<i>Narcissus pseudonarcissus</i>	temporary
<i>Lathraea squamaria</i>	very rare	<i>Nardus stricta</i>	common
<i>Lathyrus latifolius</i>	temporary	<i>Narthecium ossifragum</i>	common
<i>Lathyrus linifolius</i>	common	<i>Nuphar lutea</i>	common
<i>Lathyrus pratensis</i>	fairly common	<i>Nymphaea alba</i>	common
<i>Leersia oryzoides</i>	very rare	<i>Oenothera biennis</i>	temporary
<i>Leontodon autumnalis</i> var. <i>autumnalis</i>	common	<i>Origanum vulgare</i>	temporary
<i>Leontodon hispidus</i>	rare	<i>Ornithogalum angustifolium</i>	temporary
<i>Lepidium heterophyllum</i>	very rare	<i>Orthilia secunda</i>	rare
<i>Leucanthemum vulgare</i>	common	<i>Osmunda regalis</i>	rare
<i>Leucojum vernum</i>	temporary	<i>Oxalis acetosella</i>	common
<i>Ligustrum vulgare</i>	temporary	<i>Oxalis corniculata</i>	temporary
<i>Linaria repens x vulgaris</i>	very rare	<i>Oxalis fontana</i>	temporary
<i>Linaria repens</i>	rare	<i>Papaver dubium</i> ssp. <i>dubium</i>	rare
<i>Linaria vulgaris</i>	common	<i>Papaver nudicaule</i>	temporary
<i>Linnaea borealis</i>	rare	<i>Papaver pseudoorientale</i>	temporary
<i>Linum usitatissimum</i>	temporary	<i>Papaver rhoeas</i>	rare
<i>Lithospermum arvense</i> ssp. <i>arvense</i>	very rare	<i>Papaver somniferum</i>	temporary
<i>Littorella uniflora</i>	fairly common	<i>Parietaria officinalis</i>	temporary
<i>Lobelia dortmanna</i>	fairly common	<i>Paris quadrifolia</i>	very rare
<i>Lolium perenne</i>	common	<i>Parthenocissus quinquefolia</i>	temporary
<i>Lonicera caprifolium</i>	temporary	<i>Parthenocissus tricuspidata</i>	temporary
<i>Lonicera periclymenum</i>	fairly common	<i>Pastinacia sativa</i>	temporary
<i>Lonicera tatarica</i>	temporary	<i>Pedicularis sylvatica</i> ssp. <i>sylvatica</i>	rare
<i>Lonicera xylosteum</i>	very rare	<i>Peplis portula</i>	very rare
<i>Lotus corniculatus</i>	common	<i>Persicaria amphibia</i>	rare
<i>Lupinus polyphyllos</i>	temporary	<i>Persicaria hydropiper</i>	common
<i>Luzula campestris</i>	common	<i>Persicaria lapathifolium</i> ssp. <i>pallida</i>	common
<i>Luzula luzuloides</i>	temporary	<i>Persicaria maculosa</i>	common
<i>Luzula multiflora</i> ssp. <i>multiflora</i>	common	<i>Peucedanum ostruthium</i>	temporary
<i>Luzula pilosa</i>	common	<i>Peucedanum palustre</i>	common
<i>Lychnis flos-cuculi</i>	rare	<i>Phacelia tanacetifolia</i>	temporary
<i>Lychnis viscaria</i>	fairly common	<i>Phalaris arundinacea</i> var. <i>arundinacea</i>	common
<i>Lycopodium annotinum</i> ssp. <i>annotinum</i>	common	<i>Phalaris arundinacea</i> var. <i>picta</i>	temporary

<i>Phalaris canariensis</i>	temporary	<i>Ribes nigrum</i>	temporary
<i>Phegopteris connectilis</i>	common	<i>Ribes rubrum</i>	temporary
<i>Phleum pratense</i> ssp. <i>bertolonii</i>	rare	<i>Ribes sanguineum</i>	temporary
<i>Phleum pratense</i> ssp. <i>pratense</i>	common	<i>Ribes uva-crispa</i>	fairly common
<i>Phragmites australis</i>	common	<i>Ribes x pallidum</i>	temporary
<i>Physocarpus opulifolius</i>	temporary	<i>Roegneria canina</i>	fairly common
<i>Picea abies</i> ssp. <i>abies</i>	common	<i>Rorippa palustris</i>	fairly common
<i>Pilularia globulifera</i>	very rare	<i>Rorippa sylvestris</i>	rare
<i>Pimpinella major</i>	temporary	<i>Rosa canina</i>	rare
<i>Pimpinella saxifraga</i> ssp. <i>saxifraga</i>	fairly common	<i>Rosa dumalis</i>	rare
<i>Pinus mugo</i>	temporary	<i>Rosa glauca</i>	temporary
<i>Pinus sylvestris</i>	common	<i>Rosa kamschatica</i>	temporary
<i>Pisum sativum</i> ssp. <i>arvense</i>	temporary	<i>Rosa majalis</i> var. <i>majalis</i>	temporary
<i>Plantago lanceolata</i>	common	<i>Rosa pimpinelifolia</i>	temporary
<i>Plantago major</i> ssp. <i>major</i>	common	<i>Rosa rugosa</i>	temporary
<i>Plantago maritima</i>	very rare	<i>Rosa villosa</i> ssp. <i>villosa</i>	rare
<i>Plantago media</i>	very rare	<i>Rubus chamaemorus</i>	common
<i>Platanthera bifolia</i> ssp. <i>bifolia</i>	fairly common	<i>Rubus idaeus</i>	common
<i>Platanthera chlorantha</i>	common	<i>Rubus nessensis</i>	common
<i>Poa annua</i>	common	<i>Rubus odoratus</i>	temporary
<i>Poa compressa</i>	rare	<i>Rubus saxatilis</i>	common
<i>Poa nemoralis</i>	common	<i>Rumex acetosa</i> ssp. <i>acetosa</i>	common
<i>Poa palustris</i>	rare	<i>Rumex acetosella</i> var. <i>acetosella</i>	common
<i>Poa pratensis</i> ssp. <i>angustifolia</i>	rare	<i>Rumex crispus</i>	common
<i>Poa pratensis</i> ssp. <i>pratensis</i>	common	<i>Rumex longifolius</i>	common
<i>Poa supina</i>	rare	<i>Rumex obtusifolius</i>	common
<i>Poa trivialis</i>	common	<i>Sagina procumbens</i>	common
<i>Polemonium caeruleum</i>	temporary	<i>Salix aurita</i>	common
<i>Polygala vulgaris</i>	fairly rare	<i>Salix caprea</i> var. <i>caprea</i>	common
<i>Polygonatum multiflorum</i>	temporary	<i>Salix cinerea</i>	fairly common
<i>Polygonatum odoratum</i>	rare	<i>Salix fragilis</i>	temporary
<i>Polygonatum verticillatum</i>	rare	<i>Salix pentandra</i>	fairly common
<i>Polygonum aviculare</i>	common	<i>Salix repens</i> ssp. <i>repens</i>	common
<i>Polypodium vulgare</i>	common	<i>Salix viminalis</i>	temporary
<i>Populus balsamifera</i> var. <i>hortensis</i>	temporary	<i>Sambucus nigra</i>	temporary
<i>Populus tremula</i>	common	<i>Sambucus racemosa</i>	common
<i>Potamogeton alpinus</i>	fairly common	<i>Sanguisorba minor</i> ssp. <i>minor</i>	very rare
<i>Potamogeton natans</i>	common	<i>Saponaria officinalis</i>	temporary
<i>Potamogeton perfoliatus</i>	rare	<i>Satureja acinos</i>	mycet rare
<i>Potamogeton polygonifolius</i>	rare	<i>Saxifraga granulata</i>	very rare
<i>Potentilla anserina</i> ssp. <i>anserina</i>	rare	<i>Scheuchzeria palustris</i>	rare
<i>Potentilla argentea</i> ssp. <i>argentea</i>	common	<i>Schoenoplectus lacustris</i>	common
<i>Potentilla argentea</i> ssp. <i>impolita</i>	fairly common	<i>Schoenoplectus tabernaemontani</i>	rare
<i>Potentilla erecta</i>	common	<i>Scilla siberica</i>	temporary
<i>Potentilla fruticosa</i>	temporary	<i>Scirpus sylvaticus</i>	fairly common
<i>Potentilla intermedia</i>	very rare	<i>Scleranthus annuus</i> ssp. <i>annuus</i>	common
<i>Potentilla norvegica</i>	common	<i>Scleranthus perennis</i>	rare
<i>Potentilla palustris</i>	common	<i>Scorzonera humilis</i>	fairly common
<i>Primula veris</i>	rare	<i>Scrophularia nodosa</i>	common
<i>Prunella vulgaris</i>	common	<i>Scutellaria galericulata</i>	common
<i>Prunus avium</i>	temporary	<i>Sedum acre</i>	fairly common
<i>Prunus padus</i> ssp. <i>padus</i>	common	<i>Sedum telephium</i> ssp. <i>maximum</i>	common
<i>Prunus spinosa</i>	temporary	<i>Selinum carvifolia</i>	very rare
<i>Prunus tenella</i>	temporary	<i>Senecio jacobaea</i>	very rare
<i>Pseudofumaria lutea</i>	temporary	<i>Senecio nemorensis</i>	temporary
<i>Pteridium aquilinum</i>	common	<i>Senecio sylvaticus</i>	common
<i>Pulmonaria obscura</i>	temporary	<i>Senecio vernalis</i>	very rare
<i>Pulmonaria officinalis</i>	temporary	<i>Senecio viscosus</i>	common
<i>Pulsatilla vulgaris</i>	very rare	<i>Senecio vulgaris</i>	common
<i>Pyrola chlorantha</i>	very rare	<i>Silene armeria</i>	temporary
<i>Pyrola media</i>	rare	<i>Silene dioica</i>	rare
<i>Pyrola minor</i>	common	<i>Silene latifolia</i> ssp. <i>alba</i>	rare
<i>Quercus petraea</i>	fairly common	<i>Silene vulgaris</i> var. <i>vulgaris</i>	rare
<i>Quercus robur</i>	common	<i>Sinapis arvensis</i>	fairly common
<i>Quercus rubra</i>	temporary	<i>Sisymbrium altissimum</i>	rare
<i>Ranunculus acris</i> ssp. <i>acris</i>	common	<i>Sisymbrium officinale</i>	rare
<i>Ranunculus auricomus</i> (coll.)	rare	<i>Solanum dulcamara</i>	fairly common
<i>Ranunculus bulbosus</i>	rare	<i>Solanum nigrum</i> ssp. <i>nigrum</i>	rare
<i>Ranunculus ficaria</i> ssp. <i>bulbilifer</i>	rare	<i>Solidago virgaurea</i> ssp. <i>virgaurea</i>	common
<i>Ranunculus flammula</i> ssp. <i>flammula</i>	common	<i>Solidago canadensis</i>	temporary
<i>Ranunculus repens</i>	common	<i>Sonchus arvensis</i> var. <i>arvensis</i>	fairly common
<i>Ranunculus reptans</i>	rare	<i>Sonchus asper</i>	fairly common
<i>Raphanus raphanistrum</i>	common	<i>Sonchus oleraceus</i>	rare
<i>Reseda lutea</i>	temporary	<i>Sorbus aucuparia</i> ssp. <i>aucuparia</i>	common
<i>Rheum x rhabarbarum</i>	temporary	<i>Sorbus hybrida</i>	temporary
<i>Rhinanthus minor</i>	fairly common	<i>Sorbus intermedia</i>	temporary
<i>Rhynchospora alba</i>	fairly common	<i>Sparganium angustifolium</i>	rare
<i>Rhynchospora fusca</i>	rare	<i>Sparganium emersum</i>	fairly common
<i>Ribes aureum</i>	temporary	<i>Sparganium erectum</i>	common

<i>Sparganium natans</i>	fairly common	<i>Trifolium repens</i>	common
<i>Spergula arvensis</i>	common	<i>Triglochin palustre</i>	fairly common
<i>Spergularia rubra</i>	common	<i>Trollius europaeus</i>	very rare
<i>Spirea chamaedryfolia</i>	temporary	<i>Tussilago farfara</i>	common
<i>Spirea x arguta</i>	temporary	<i>Typha latifolia</i>	common
<i>Spirea x billardii</i>	temporary	<i>Ulmus glabra ssp. glabra</i>	rare
<i>Stachys palustris</i>	common	<i>Urtica dioica ssp. dioica</i>	common
<i>Stachys sylvatica</i>	very rare	<i>Urtica urens</i>	rare
<i>Stellaria alsine</i>	fairly common	<i>Utricularia intermedia</i>	fairly common
<i>Stellaria graminea</i>	common	<i>Utricularia minor</i>	fairly common
<i>Stellaria holostea</i>	very rare	<i>Utricularia vulgaris</i>	fairly common
<i>Stellaria longifolia</i>	rare	<i>Vaccinium myrtillus</i>	common
<i>Stellaria media</i>	common	<i>Vaccinium oxycoccos</i>	common
<i>Stellaria nemorum ssp. glochidisperma</i>	very rare	<i>Vaccinium uliginosum ssp. uliginosum</i>	common
<i>Stellaria palustris</i>	rare	<i>Vaccinium vitis-idaea</i>	common
<i>Subularia aquatica</i>	rare	<i>Valeriana officinalis</i>	very rare
<i>Succisa pratensis</i>	common	<i>Valeriana sambucifolia ssp. sambucifolia</i>	fairly common
<i>Symphitum officinale</i>	temporary	<i>Verbascum nigrum</i>	fairly common
<i>Symphoricarpos rivularis</i>	temporary	<i>Verbascum thapsus</i>	temporary
<i>Symphytum x uplandicum</i>	temporary	<i>Veronica agrestis</i>	fairly common
<i>Syringa josikaea</i>	temporary	<i>Veronica arvensis</i>	fairly common
<i>Syringa vulgaris</i>	temporary	<i>Veronica chamaedrys</i>	common
<i>Tanacetum parthenium</i>	temporary	<i>Veronica filiformis</i>	temporary
<i>Tanacetum vulgare f. vulgare</i>	common	<i>Veronica hederifolia ssp. hederifolia</i>	very rare
<i>Taraxacum section Ruderalia</i>	common	<i>Veronica longifolia</i>	temporary
<i>Taxus bacata</i>	temporary	<i>Veronica officinalis</i>	common
<i>Teesdalia nudicaulis</i>	rare	<i>Veronica persica</i>	rare
<i>Thalictrum flavum</i>	fairly common	<i>Veronica scutellata</i>	common
<i>Thalictrum minus</i>	temporary	<i>Veronica serpyllifolia ssp. serpyllifolia</i>	common
<i>Thermopsis montana</i>	temporary	<i>Viburnum lantana</i>	temporary
<i>Thlaspi arvense</i>	common	<i>Viburnum opulus</i>	fairly common
<i>Thlaspi caerulescens ssp. caerulescens</i>	common	<i>Vicia angustifolia var. angustifolia</i>	rare
<i>Thymus serpyllum</i>	rare	<i>Vicia angustifolia var. segetalis</i>	rare
<i>Tilia cordata</i>	fairly common	<i>Vicia cracca</i>	common
<i>Tilia x vulgaris</i>	temporary	<i>Vicia hirsuta</i>	fairly common
<i>Torilis japonica</i>	very rare	<i>Vicia lathyroides</i>	very rare
<i>Tragopogon pratensis ssp. pratensis</i>	rare	<i>Vicia sepium</i>	rare
<i>Trichophorum cespitosum ssp. germanicum</i>	fairly common	<i>Vinca minor</i>	temporary
<i>Trientalis europaea</i>	common	<i>Viola arvensis</i>	common
<i>Trifolium arvense</i>	fairly common	<i>Viola canina ssp. canina</i>	common
<i>Trifolium aureum</i>	rare	<i>Viola odorata</i>	temporary
<i>Trifolium dubium</i>	rare	<i>Viola palustris</i>	common
<i>Trifolium hybridum ssp. hybridum</i>	fairly common	<i>Viola riviniana</i>	common
<i>Trifolium medium</i>	fairly common	<i>Viola tricolor ssp. tricolor</i>	common
<i>Trifolium pratense</i>	common	<i>Woodsia ilvensis</i>	very rare

The inventory was carried out between 1994-99. During the inventory I have registered 715 species of vascular plant, wild and domesticated species that, at least temporarily, have become naturalised. A compendium with pictures of the plants can be seen at the library in Hylte.

The scientific names follow *Den nordiska floran* (Mossberg m fl, 1992).

The plants are split into five categories of frequency:

- Common
- Fairly common
- Rare
- Very rare (only found in one place)
- Temporary (domesticated species that have been temporarily naturalised)

November 24th, 1999

Semir Maslo



Attachment 4: Bird species observed in Hylte



B=Regularly breeding

b=Occasionally breeding

(b)=Has bred earlier

Black-throated Diver	B	Little Ringed Plover	b	Rook	
Red-throated Diver	B	Grey Plover		Jackdaw	B
Great Crested Grebe	B	Golden Plover	B	Magpie	B
Red-necked Grebe		Turnstone		Nut-cracker	B
Horned Grebe		Snipe	B	Jay	B
Little Grebe		Great Snipe		Great Tit	B
Gannet		Jack Snipe	b	Blue Tit	B
Cormorant	B	Woodcock	B	Coal Tit	B
Heron	B	Curlew	B	Crested Tit	B
Mallard	B	Whimbrel		Marsh Tit	B
Teal	B	Bar-tailed Godwit		Willow Tit	B
Garganey	(b)	Green Sandpiper	B	Long-tailed Tit	B
Gadwall		Wood Sandpiper	B	Nuthatch	B
Wigeon	b	Common Sandpiper	B	Tree Creeper	B
Pintail		Redshank	b	Dipper	b
Shoveler	B	Spotted Redshank		Wren	B
Scaup		Greenshank		Mistle Thrush	B
Tufted Duck	B	Knot		Fieldfare	B
Pochard		Little Stint		Song Thrush	B
Goldeneye	B	Temminck's Stint		Redwing	
Long-tailed Duck		Dunlin		Ring Ouzel	
Velvet Scoter		Curlew Sandpiper		Blackbird	B
Common Scoter		Pectoral Sandpiper		Wheatear	B
Eider		Ruff, Reeve		Goldfinch	
Red-breasted Merganser	B	Avocet		Siskin	B
Goosander	B	Arctic Skua		Linnet	(b)
Smew		Long-tailed Skua		Twite	
Shelduck		Great Black-backed Gull	B	Redpoll	
Grey Lag Goose	B	Herring Gull	B	Arctic Redpoll	
White-fronted Goose		Common Gull	B	Bullfinch	B
Bean Goose		Little Gull		Scarlet Grosbeak	
Pink-footed Goose		Black-headed Gull	b	Pine Grosbeak	
Brent Goose		Black Tern		Crossbill	B
Barnacle Goose		Common Tern	B	Parrot Crossbill	b
Canada Goose	B	Arctic Tern	(b)	Chaffinch	B
Mute Swan	(b)	Little Tern		Brambling	
Whooper Swan	B	Sandwich Tern		Yellowhammer	B
Bewick's Swan		Domestic Pigeon	B	Ortolan Bunting	
Golden Eagle		Stock Dove	(b)	Reed Bunting	B
Buzzard		Wood Pigeon	B	Lapland Bunting	
Rough-legged Buzzard		Collared Turtle Dove			
Sparrow hawk	B	Cuckoo	B		
Goshawk	B	Eagle Owl			
Kite	(b)	Hawk Owl			
White-tailed Eagle		Pygmy Owl	B		
Honey Buzzard	B	Tawny Owl	B		
Marsh Harrier		Long-eared Owl	B		
Hen Harrier		Short-eared Owl			
Osprey	B	Tengmalm's Owl	B		
Hobby	b	Nightjar	(b)		
Peregrine		Swift	B		
Merlin		Kingfisher			
Kestrel		Hoopoe			
Black Grouse	B	Green Woodpecker	B		
Capercaillie	B	Great Spotted Woodpecker	B		
Hazel Hen		Lesser Spotted Woodpecker	B		
Partridge		Black Woodpecker	B		
Pheasant	B	Wryneck	b		
Crane	B	Wood Lark	B		
Water Rail		Sky Lark	B		
Spotted Crake		Swallow	B		
Moorhen	(b)	House Martin	B		
Coot		Sand Martin	B		
Oystercatcher		Golden Oriole			
Lapwing	B	Raven	B		
Ringed Plover	B	Hooded Crow	B		

Attachment 5: Note on mammals that occur or have occurred in Hylte

Categorised after Bjärvall A. Ullström, S.: Mammals, All of Europe's species in text and picture (Däggdjur; alla Europas arter i text och bild)

Insectivores

Hedgehog

The hedgehog is found in built-up areas, but have been less common in recent years, due to traffic mortalities.

Pygmy shrew

Fairly common in Hylte

Common shrew

Common in Hylte

Northern water shrew

The northern water shrew can probably be found in Hylte's stream ecosystems, but the population has not been researched.

Mole

Moles annoy house owners in Hylte by burrowing in the gardens.

Bats

Whiskered bat (*Myotis mystacinus*)

Uncertain if it is found in Hylte. The species is generally rare, normally found in city-like dwellings with mature deciduous trees. This species has become increasingly rare in Sweden.

Brandt's bat (*Myotis brandtii*)

May occur in Hylte's deciduous woods but this species is rarely noticed.

Natterer's bat (*Myotis nattereri*)

May occur in Hylte. Usually found in stone foundations of old mills in small streams with abundant vegetation along the banks. This species has been poorly researched but is generally thought to be in decline due to the development of hydroelectric power, which has destroyed or submerged old stone construction.

Bechstein's bat (*Myotis bechsteinii*)

Very rare, nothing is known of its presence in Hylte

Daubenton's bat (*Myotis daubentoni*)

This is the bat most commonly seen flying over lake surfaces and slow flowing rivers.

Pond bat (*Myotis dasycneme*)

Extremely rare, nothing is known of its presence in Hylte. Has an easterly distribution in Sweden and it is less likely that it is found in Hylte.

Pippistrelle (*Pipistrellus pipistrellus*)

Can be found in Hylte around built-up areas.

Noctule (*Nyctalus noctula*)

Uncommon in Halland. This species is mainly found in the plain regions, therefore can be found in the valley areas in the west of Hylte, in hollow trees.

Northern bat (*Eptesicus nilssoni*)

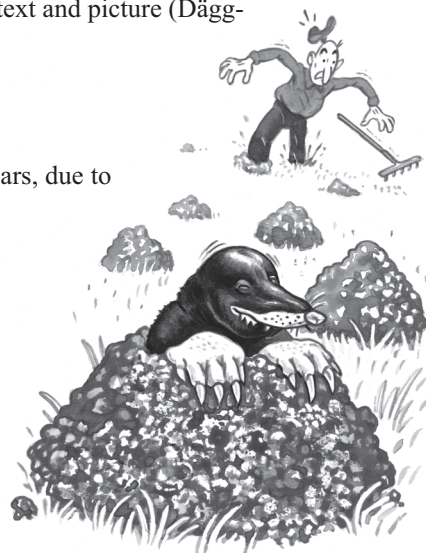
Common in Hylte, often seen flying around street lights.

Parti-coloured bat (*Vespertilio murinus*)

May occur in Hylte. During the summertime this bat is found in open areas but moves into built-up areas during the autumn. Has a ticking sound, and are often found close to tall buildings.

Brown long-eared bat (*Plecotus auritus*)

Occurs in Hylte. Often found in churches and in hollow trees.



Barbastelle (*Barbastella barbastellus*)

This bat winters in Varberg's fortress. Uncertain if it can be found in Hylte. This species is generally not well researched. They need old hollow trees.

Rabbits and hares

Brown hare

Not an indigenous animal in Sweden but is common now after being introduced in the 19th Century. Brown hares are commonly found in Hylte.

Arctic hare

The arctic hare belongs to the indigenous fauna and is common in our forests.

Rabbit

During the 19th Century fruitless attempts were made to introduce rabbits in many regions of Sweden. After new attempts at the beginning of the 20th Century a population has been established, first on the island of Gotland and later in Skåne. Rabbits can from time to time be found in sandy areas around Hylte e.g. at Håknaböke and near Lake Frillen. It is, however, not a permanent population.

Rodents

Red squirrel

The red squirrel is common in all wooded areas and it is one of our most common mammals.

Beaver

The beaver was previously common in all regions of Sweden, but was hunted to extinction. The last indigenous beavers in Småland were shot between 1800 and 1810, and the beaver was already extinct when it was protected in 1873. From 1920 beavers have been reintroduced and a population can be found in eastern Småland. So far there are none in the Hylte region and none in living memory.

Bank-vole

Common in Hylte.

Water-vole

Common in Hylte.

Field-vole

Common in Hylte.

Greater wood-mouse

Common in Hylte.

Lesser wood-mouse

Common in Hylte.

Black rat

No longer found in Sweden. The black rat could be found in Småland until the 1800s but has been replaced by the brown rat.

Brown rat

Came to Sweden from southern Asia and Iran at the end of the 1700s. By the middle of the 1800s the brown rat had spread to all harbour towns and surrounding areas. Common in Hylte but not welcome!

House mouse

Also common, similarly unwelcome in our homes.

Dormouse

The dormouse can, at least, be found in the western parts of Hylte, perhaps spread throughout. Has been definitely seen in the Skärshult area.

Carnivores

Wolf

According to Linnaeus the wolf was a rare animal in the 1700s, but during the first half of the 1800s the population increased and wolves could be found throughout the



country. The wolf was seen as a menace and was therefore always hunted. There were plenty of tales of wolf hunts in our area but many of these have now been forgotten. There have been no definite sightings of wolf in Hylte for the last hundred years but lone wolves have visited southern Sweden in recent years. We have many place names to remind us of the wolf, look on the map for “ulv” and “varg” in place names.

Arctic fox

There are stories of arctic foxes wandering throughout Sweden in the 1800s but it seems unlikely that they visited Hylte.

Fox

Fox is the most common of the larger carnivores. The fox population has, however, been hit hard in the last 10-15 years by fox scabies. More healthy foxes can be seen now again.

Raccoon dog

The racoon dog is originally from East Asia and Japan. It has been introduced to European Russia and hence spread west via Finland to Sweden. They were first seen in Sweden in the 1940s and since then have spread as far down as Götaland. A few observations have been made in Hylte in recent years.

Brown bear

Brown bear was common in all parts of Sweden years ago but at the beginning of the 1800s was no longer resident in Götaland. Only very few bears have been shot in Småland in the 1800s and they were deemed as “wanderers” lost in the south. In the 1990s there have also been reports of wandering bears from the north that have been sighted in the south, but no definite sightings in Hylte. We still have many reminders of bears and bear hunts in place names here as we have with wolf, look for “björn” in place names.



Stoat

Stoat is a species that has become rare due to lack of suitable habitat.

Stoats are rare, like dry-stone walling in arable areas and may have been reduced. Little is known about their occurrence.

Weasel

Weasel is common in Hylte, favours clear-felled areas.

Mink

Mink is originally from North America but was introduced to Sweden for fur farming in the 1920s. Escapees from these fur farms have established a permanent population in Sweden. Minks are frequently seen around lakes and streams in Hylte.

Ferret

Ferret is not common in Hylte even though they seem to have increased in southern Sweden.

Marten

The marten or the pine marten is common in the forests of Hylte and has increased in recent years.

The elk is common in our forests, as everyone knows, but this has not always been the case. In the middle of the 1800s no elk could be found south of Östergötland, and they took a long time to spread and become common in our region.

Roe deer

In the middle of the 1800s roe deer could only be found in Skåne, Halland and Blekinge. During the 1990s the roe deer population has been very dense, partly due to the scarcity of foxes.

Badger

The badger is common but rarely seen because they are mainly active at night.



Otter

In the 1950s the otter was so common in Hylte that they were regularly hunted. Otters were found in the River Nissan at Nissaryd and Hyltebruk until the end of the 1940s.

There was even a population in the Frillen lakes. The last otter was shot in the Femsjö area at Nedre Dova Lake in 1960. Environmental poisons, development of hydroelectric power, hunting and net fishing have been contributing factors to the decline of the otter in Sweden. A resident otter population no longer exists in Hylte, but can be found in other places around southern Sweden.

Lynx

Our only wild cat, the lynx can sometimes be found in the woods of Hylte. The lynx was once common in most parts of Europe but was forced back. There were few remaining when the lynx was protected in Sweden in 1927. The lynx population recovered, and hunting was allowed in Sweden from 1940 until 1991 when it once again was protected due to limited numbers.

Even-toed Ungulates

Wild boar

The wild boar is another indigenous animal here in Sweden that was wiped out. The last wild boars were in Öland in 1688. In recent years they have been kept in enclosures, and from 1970 escapees have established a wild population in various regions in Sweden. Occasionally seen in Hylte.

Fallow deer

The fallow deer were once found wild throughout Europe, but today's fallow deer are descended from deer that have been brought in from Asia. They can be found in several places in southern and middle Sweden (Götaland and Svealand) but the most of the population is in Skåne. They can even be found in Hylte.

Red deer

The red deer has always been found in Sweden but was nearly wiped out in the middle of the 1800s. They were only found in a few areas (Skåne and Västergötland). Nowadays there is a strong population in southern Sweden and wandering red deer visit Hylte.

Elk

The elk is common in our forests, as everyone knows, but this has not always been the case. In the middle of the 1800s no elk could be found south of Östergötland, and they took a long time to spread and become common in our region.

Roe deer

In the middle of the 1800s roe deer could only be found in Skåne, Halland and Blekinge. During the 1990s the roe deer population has been very dense, partly due to the scarcity of foxes.



Attachment 6: Notes from the last wolf hunt in Femsjö parish 1863

One frosty autumn morning in 1863 Johan Larsson, from Stora Tranhult accompanied by his dog Hejdi, went out into the forest. He did not know that this would be the last time he went hunting with Hejdi. They paced towards Bäck's ground because they had heard that two wolves had passed the village of Hjälmskult the previous afternoon. By the cottage at Runhult in Bäck hejdi started to bark – she was onto something – it ended up with the dog being bitten to death by the two wolves. Johan fired at the closest wolf, death was instantaneous because it was a head-shot.

To get the bounty, the wolf had to be skinned and that took place in the “great hall” at Stora Tranhult. Johan donated the bounty to help with the renovation of Femsjö church. My grandmother, Charlotta, verifies that the hunt took place in 1863. She was born in 1858, as a five-year-old she remembers her father coming home with the wolf.



What kind of weapon did Johan Larsson have?

The shotgun was homemade by Johan Larsson. The calibre was something in between 12 and 20 mm, maybe 16. According to uncle Albert the barrel came from an army rifle. Johan drilled out the rifling with a special drill, then he polished the barrel with rags and lake sand. The cylinder, cock and entire firing mechanism were Johan's own construction. The mainspring was made in Tranhult. Sheep suet was used in the hardening process, it helped to show when the correct temperature had been reached. When the mainspring was dipped in the suet after heating and the suet melt without smoking, it was the right temperature. I have got this information from Johan Elmén, Vallshult. The bullet used in the hunt was cast in Johan's smithy. The drill that was used to bore the rifle was also used to drill the casting form for the bullet. This ensured a good fit in the barrel. This was, without doubt Femsjö's first “slug”.

How has this information been saved?

Tage Danielsson has spoken about verbal tradition in his Electricity song (Elektricitetsvisa). This is how this information has been passed down. I have heard this information from my father Gottfrid Jonsson, my father's brothers Albert and Bernhard and their sisters Gerda, Emma and Maja. The Jonsson siblings were Johan Larsson's grandchildren. Albert Larsson (son of Johan, uncle to the Jonsson siblings) has assisted with information about the gun and its origins.

How did the gun find its way back into the family?

When Johan Larsson's effects were sold at auction Bengt Eliasson, Skubbhult bought the gun for 2 SEK. Gottfrid Jonsson, blacksmith was shoeing a horse for Carl Bengtsson (Bengt Eliasson's son) and received the gun as payment. It was immediately recognised, by Albert Larsson, as Johan Larsson's wolf gun.

When the gun came back into the bosom of the family it was loaded with a rather special load. The entire load was about 12 cm long made up of; black powder, 20 No 9 shot and topped with 3 large buckshot. The charge was wrapped in a sheet from a church paper (Sv. Missionstidning) from 1914. The rifle was most likely loaded for roe deer or fox. The gun is now kept in Johan Larsson's old home, Stora Tranhult, now lived in by Anders Carlsson.

Written in Femsjö 21st November 1992

Karl-Erik Jonsson

Attachment 7: Notes on frogs and reptiles that are found or were earlier found in Hylte

Reference: Cedhagen, T. and Nilsson, G.: Frogs and reptiles in the Nordic countries (*Grod och kräldjur i Norden*).

Reptiles

Sand lizard

No sightings in our area but might exist in Hylte, as they can be found not only along the coast in sandy environments, but also in the hinterland, for example on Taberg, where they live amongst the rocks. Keep your eyes open!

Common lizard

Common in Hylte.

Slow worm

Common in Hylte.

Smooth snake

No sightings in Hylte but might be found here as they have been seen in both Bjärehalvön and in northern Halland. They prefer moorland with old heather, sunny southerly slopes and rocks. Keep your eyes open!

Grass snake

Common in Hylte, especially close to water.

Frogs and toads

Lesser newt

Common in Hylte, but is rarely seen except during spawning period. They spawn in water but can wander far from water at other times. Can also be found in coniferous forest and they tolerate ground and water with low pH. If you want newts you must have fish-free ponds or other water since fish eat the spawn.

Greater newt

Can most likely be found in Hylte but has become rare in large parts of Europe, they need an open environment or deciduous forest and water with a high pH. Acidification has probably contributed to their decline. Spawn in fish free water.

Common toad

A species that is common in Hylte. It can reproduce in water containing fish, as their spawn is slightly poisonous for fish.

Natterjack toad (*Bufo calamita*)

Uncertain if they can be found in Hylte, but found around Halmstad. Spawn in shallows on sandy bottom.

Moor frog (*Rana arvalis*)

The moor frog is common in Hylte. They spawn in water without fish.

Common frog

The common frog is also frequent in Hylte. They spawn in water without fish.



Attachment 8: Notes about fish found or most likely found in Hylte

Lamprey

Found in the rivers Nissan and Fylleån and probably in both in Hylte.

Salmon fish

Salmon

Salmon can be found in both the water systems of the Nissan and the Fylleån, but they are hindered in their migration by the hydroelectric damns, cutting off the upper regions of the water systems. Salmon can no longer reach Hylte, although they previously migrated all the way to Jönköping.

Salmon trout, sea trout, freshwater trout, brook trout

These are all of the same species, but size and ecology vary. The salmon trout migrate up both the Nissan and the Fylleån but they are hindered from reaching Hylte by the hydroelectric damns. Populations of salmon trout (brook trout and trout) can still be found in some streams and rivers in Hylte but are scarce due to increased acidification. At the outlet of the Lake Frillen, freshwater mussels can still be found. These are dependent on salmon trout. As salmon trout is no longer common in these waters, the freshwater mussels may in time also disappear. Salmon trout can also be found in Lake Unnen. There used to be an indigenous variety of salmon trout in the River Nissan that was different from the introduced salmon trout. This has, however, not been seen since the 1980s.

Rainbow trout

Rainbow trout are farmed in Lake Bolmen and have been released in some waters. There is no reproductive population but fish that have escaped from farms and been stocked for sport fishing. The species originally comes from North America.

American brook trout

The species comes from North America and has been introduced in Sweden. It can reproduce in the wild and a population is said to have existed in Lake Skärsjön by Skärshult. It is not clear, whether these fish still can be found in Hylte waters. The American brook trout can live in water with higher acidity than other salmon fish.

Lavaret

There are different forms of lavaret and it is an unclear line between forms and varieties of the same species. Around Lake Bolmen the local people differ between two types, locally known as lövsik and gråsik. Both these can also be found in Lake Unnen. Lavaret have also been caught in Lakes Färgen, Fjällen and Yasjön when the County Administrative Board organised test fishing in 1994 and in Stora Allgunnen in 1995.

Vendace

Vendace were caught when the County Administrative Board organised test fishing in Lake Jällunden in 1992 and in Stora Slätten and in Färgen in 1994. They are also found in the Unnen and the Bolmen. The vendace seems to be in decline throughout the Nordic countries and we can locally note that trend too.

Pike fish

Pike

The pike is one of our most common fish and can be found in many lakes in Hylte.

Carp fish

Carp

The carp originates from Asia but was introduced to Europe many years ago and most likely came to Sweden in the 1500s. The common goldfish is a variety of carp. Carp may be found in ponds in Hylte.

Crucian

Crucian have been caught in Lake Bolmen but are not common. May be found in ponds too.

Tench

Tench can be found in, for example, the water system of the Fylleån in Nedre Dovasjön and many other lakes, even in Lakes Bolmen and Unnen. Fairly common in Hylte.

Minnow

Minnows are found in the River Nissan in Hylte.

Rudd

Odd rudds have been caught in the Bolmen, probable in other lakes.

Roach

The roach was once a very common fish but has vanished from many water bodies due to the acidification of the water. However roach may still be found in lakes that have been treated with lime and some other less acid waters.

Chubb (*Leuciscus cephalus*)

Found in the Nissan downstream from Hylte.

White bream

Caught in Lake Höghultasjön in the Ätran water system when the County Administrative Board organised test fishing in 1995. The white bream was only found in two lakes of fifty-five that were test fished between 1993-95, so it is a rare fish in our waters.

Ide

Found in the River Nissan

Common bream

Found in many lakes, for example, in Jällunden, Hagasjön, Mjålasjön, Nordsjön, Risasjön and Djursjön.

Bleak

The bleak can be found in lakes in the Nissan's water system, for example in Färgensjön, Bolmen and Unnen.

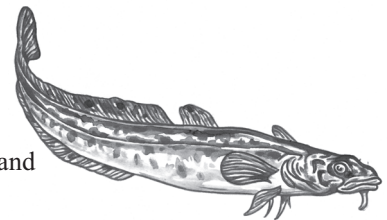
Eels

Eels are found in most waters, even smaller streams and ditches.

Cod fish

Burbot

The burbot is the only freshwater codfish. It can be found in the Bolmen and the Unnen and even in the Höghultasjön.



Perch fish

Pike-perch

The pike-perch was introduced in the Unnen in 1997 and in the Färgensjöarna in 1949. It has always been found in Lake Bolmen.

Ruffe (*Gymnocephalus cernuus*)

The ruffe is a fish similar to the perch. Found in the Unnen and the Bolmen and in other lakes in the area.

Perch

Found in most lakes in Hylte.

Scorpaeniformes

Bullhead (*Cottus gobio*)

This fish is found in Lake Bolmen and Lake Unnen and also in River Nissan. It is, however, uncertain if it is found in the Nissan as far upstream as within Hylte.

Sticklebacks

9-spined stickleback (*Pungitius pungitius*)

Distribution uncertain.

15-spined stickleback (*Gasterosteus aculeatus*)

Distribution uncertain.



Would you like to find out more about the environment in Hylte?

The work on Agenda 21 in Hylte is based on an approach with theme years where we try to describe current trends. These descriptions are followed up and hopefully we will see trends in the right direction.

The themes so far have been:

Solid waste	Water and sewage
Acidification, acid rain	Traffic
Energy	Biological diversity

You can find all the descriptions of the current situation on Hylte's homepage, www.hylte.se/agenda_21.htm. You can also get them if you call the municipal office in Hylte, 0345-18000. They are also collected in folders in all schools and libraries in Hylte Local Authority.

