Ekolsunds arboretum – a vital 300-yearling.

Ekolsunds arboretum, on the shore of lake Mälaren is situated around the Ekolsund castle in the municipality of Enköping. It is one of the largest arboreta in Sweden and by far the largest in private hands. The origin of Ekolsund dates far back in time and for this reason this text starts with its history.

The estate of Ekolsund was for a long time one of the largest in Sweden and was a royal estate during two periods. King Gustav Vasa owned it in the 1500-hundreds but it was then granted to private hands and during the ownership of Tott during the 1600-hundreds it gradually became the estate we can see today. Around 1650 the first reproductions appear in the famous publication by Dahlberg; Suecia Antiqua et Hodierna (Sweden in ancient and modern times). In this book castles were invariably depicted in a very open, pastoral landscape with intensively managed parks and small groves of deciduous trees. Ekolsund by contrast is shown with a rather brutal and very dense, conifer–dominated forest enclosing the magnificent French park in front of the castle (which in reality are just the twin wings of a main house that never was built because of lack of money). This unusual state of affairs looking almost like a modern production forest, is also depicted in other contemporary pictures of Ekolsund and indicates that the present arboretum probably has roots that go back to the 17:th century.

Ekolsund as pictured in Dahlberg: Suecia –Antiqua et Hodierna

Because of the ambitious building projects Tott went bankrupt. It was then regained by the State and became the favourite castle of Gustav III who further developed the buildings and park during the 1700-hundreds. Due to financial troubles caused by the extensive and unsuccessful Swedish warmongering with Russia it was again sold to private hands. It them went to Seton a Scottish banking family. They ran it as an estate during the 1800-hundreds. They evidently planted some of the present exotic trees – mainly firs - in the arboretum but otherwise their reign is obscure as they burned all documentation following their bankruptcy around 1900. The last owner in this family was PB Seton whose namecipher can be seen at the unique dog house.

After a period of dividing the huge estate (36 big farms were created) a small part of some 1000 ha was purchased 1917 by Carl G. Kempe, who was a leading industrialist in the paper and sawmill industry. Under his reign the castle, which had fallen in disrepair was renovated. He was a collector and had an enormous collection of Chinese monochrome porcelain, gold and trees. For the last lust he imported enormous amounts of tree, shrub and herb seedlings and planted the present arboretum, sometimes using a workforce of 12 men under the supervision of himself and forester Lundström.

A stated reason (besides the collectors) for these intensive plantings was to investigate possible uses of exotic trees with superior growth or characteristics to be used in Swedish forestry. This reson was also behind the Dravle arboretum in Härnösand, N Sweden that was owned by other members of the Kempe family. However all these arboreta were placed in extremely favourable sites with rich soils and mild climate, far from the conditions in the normal forest landscape in Sweden. This
misplacement is by no means unique for Ekolsund, it is more of a rule for arboreta as the managers want to be able to grow as many taxa as possible. In Sweden the arboreta in Garpenberg, Kratte-Masugn, Remningstorp, Borlänge and Ås are really placed in typical situations and conclusions from these have a large applicability. In Finland the famous and well-documented arboretum Mustila is also correctly placed from silvicultural standpoints.

In 1961 the arboretum was at a high peak and received many visitors including the nestor of Swedish dendrology; Tor Nitzelius who described it in Lustgården 1962. The arboretum was then carefully measured, mapped and inventoried by him. Strangely enough, almost no documentation could be presented what had been planted and when and also regarding the provenance of the imported material and such is still missing. The plantings were also done partly in a haphazard manner. This lack of documentation is a big problem even though some of the species today evidently have shown to be very hardy since their offspring has been moved elsewhere.

Carl Kempe died in 1967 and Ekolsund was inherited by his daughters Veronica and Diana. The intensive and expensive management had simply to – as in most other institutional and private arboreta – be minimized. Veronica and her husband Lars Björling lived in the castle until around 1990 with the enormous task of cleaning, weeding, mowing, hedge trimming and on top of this keep the enormous houses, bridges, greenhouses, walls, walks et c in shape. To their help they had a lot of engagement and sheep that kept down the coppice. The plantings continued and for this reason Ekolsund is fairly mixed age.

During the 1980:ies and 1990:ies the arboretum was used in the education of dendrology to foresters from Garpenberg under the tutorship of the undersigned. As a way to compensate the owners – who had no support whatsoever from anywhere – we arranged a team of 8 students every 3:rd year with clearing saws for a day – a day of massive dendrocide of ash, maple, oak, silver fir, spruce, hazel and lime. The management of Ekolsund had at this time - and still has - a leading idea that there was to be no fussing, trees had to fight their own way and watering was never done. This has kept Ekolsund as a rather unique arboretum – multi-age, mixed composition, internal competition and a large degree of being a forest arboretum rather than a botanic garden, just as Carl Kempe intended. The Björlings gradually moved from Ekolsund around 1990 and when the forest faculty closed the campus at Garpenberg in 1995 – thereby moving the forestry education from the forest to the town of Umeå. Ekolsund then entered a period of free development to the pleasure of ash, silver fir, maple, beech, lime and hazel. Buildings, walls and other things also fell into more disrepair.

*The arboretum around the dog’s house (before the renovation) is rather open and among other trees Brewers Weeping Spruce (Picea breweriana) and behind it Mountain hemlock (Tsuga mertensiana) can be seen.*

*The mixture of species is intensive and trees stand close. On the picture Nikko Fir (Abies homolepis) to the very right, the high conifer on right is Nordmann Fir (Abies nordmanniana) and on the left are two smaller specimens of Pacific Silver Fir (Abies amabilis).*
In 2002 Ekolsund was purchased by Raija Ohlin and will now face a new future as a living castle open for different activities as health promotion, festivities, conferences and film making. In this context the arboretum will be developed and expanded. Her son Nils Lidbaum is now managing the arboretum and park together with some aid from the undersigned. Extensive plantings have been done with thematic layout and presently the arboretum houses some 300 species of trees and large shrubs. During the first 8 years all work was directed towards enormous thinnings of oak and silver fir, pre-commercial cleanings, building new bridges of larch from the arboretum, inventories, plantings, mapping and labelling. One target for the arboretum is to use it for its educational and research values with specialized groups of dendrologists, botanists, foresters, hortonomists and landscape architects together with other interested groups. The other target is to use if for a larger public, supplying unique experiences and raising interest.

A large effort has been to restore the alleys, 1400 trees in 10 separate alleys. This has commenced in 2014 after a looooooong planning period with support from the province government using EU funds. Elements of the former baroque park is slowly restored using historical evidence. Ekolsund has a unique water park and this is integrated in the alley system.

Large parts of the arboretum consist of more or less closed, 70-year old Silver Fir (*Abies alba*) forest with an inmix of other trees like Serbian and Turkish spruce (*Picea omorica, P. orientalis*), Red cedar (*Thuja plicata*), Pine (*Pinus sylvestris*), Macedonian Pine (*Pinus peuce*) and many others. These were planted from the beginning as “production forests” and will so remain. In 2004 and 2006 large thinnings were made with the aim of gradual regeneration and enrichment planting in some areas. The measured extracted volumes (350 m$^3$ from app 3 ha) with a residual, standing volume of some 450 m$^3$/ha and non-existence of heart-rot in the silver fir shows an impressive silvicultural potential. Another even more impressive growth is shown by Grand Fir (*Abies grandis*) where 60 year old trees may be 35 metres with an estimated volume of 10 m$^3$. This excellent species regenerates freely, is not browsed upon – unlike most other trees - and will be used extensively in the future.

The National Union of Roedeers very much appreciates the enormous amounts of seedlings of Silver Fir on Ekolsund. This regrowth is a problem in management of the more open parts of Ekolsund but a big advantage in the forest parts of the arboretum. The picture on right shows the Silver Fir forest before thinning in 2003.

On the following page there is a map of Ekolsund (based on the map from Nitzelius) but only showing a selection of what can be seen of the different tree and shrub species that are present now. Labelling is partly done with the old, wonderful porcelain labels from the Kempe period, some of those bear incorrect names but all are correct on at least genus level. Presently the labelling is complemented with more prosaic aluminium labels.

Börje Drakenberg and Nils Lidbaum May 2014      www.ekolsundslott.se
Some comments on certain species and their natural regeneration at Ekolsund.

At Ekolsund there is a large amount of mature trees, this in combination with the mild and favourable site conditions has resulted in a very massive regrowth. The real occurrence of seedlings and saplings is difficult to estimate because the extreme browsing and grazing pressure which kills most seedlings before they are old enough to be noted. When Nitzelius visited Ekolsund in 1961 the pressure was considerably lower if at all since the arboretum was fenced and his inventory shows many more taxa in regeneration. Then as now seedlings are tagged, moved to a nursery and finally planted at Ekolsund or other arboreta. Below is a summary what has been noted in the years 1979-2000. The extreme, and troublesome, regrowth with coppice and seedlings of ash, lime, oak, maple, beech, sycamore maple and hazel is not commented below

**Abies alba** – The silver spruce regenerates very intensively – to the happiness of the roedeers – under semi-closed canopy. The browsing pressure is however extreme and many seedlings fall prey to the clearing saw. Its productive capacity in a closed stand is high and since heart-rot almost never is encountered, it is a very useful forest species – semi-native since it existed naturally in Sweden before the Ice-age

**Abies grandis** – By far the most rapidly growing conifer at Ekolsund, A tree that fell in 1991 was planted in 1928 and became 35 m high with a girth of 2,6 metre. Younger but massive trees appear in many places and the regrowth is dense in semi-open conditions. Many such seedlings have been moved else in much more harsh conditions (eg Garpenberg) and proved fully hardy. The browsing at Ekolsund is very limited since the roedeers know their dendrology well and know what is nice to eat and not.

**Abies nordmanniana** – In spite of many fully grown speciemens, seedlings are very rare and some of those may be hybrids. The browsing pressure is even greater than on Silver Fir.

**Abies procera** – There are only 5 large trees with regular setting of cones (gigantic), all pretty close to each other. In their vicinity seedlings are found but all are heavily browsed upon until they are fenced. Some have been replanted and show quite vigorous growth even as far north as Garpenberg.

**Abies sibirica** – This interesting species grows at Ekolsund with just a few speciemens. Most are in bad condition due to the inherent behaviour of this very continental species to start growing as soon as there are a few mild days – that normally are followed by harsh frosts that destroy the emerging shoots. Seedlings are very rare but some of the trees show the typical behaviour of regeneration with layering branches that in soil contact produce roots and gradually bend up to form a new, secondary stem.

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**Pinus peuce** – Macedonian Pine grows quite rapidly out to a broad-crowned tree at Ekolsund, seedlings are encountered here and there but most are damaged by browsing. Many seedlings have been moved and grow successfully.

**Pinus ponderosa** – A small grove of some 6 trees grows at the northern border. A single seedling has been noted but later died of drought.

**Pseudotsuga menziesii** – The famous Douglas Fir is not common at Ekolsund – which would be expected as this was one of the main trial species in Sweden for forestry. Large trees produce ripe cones but seedlings – unlike what is the case in most other Swedish arboreta – are rare (and browsed upon). Recent plantings have been made with material from Remningstorps arboretum

**Thuja plicata** – Red Cedar is commonly encountered at Ekolsund in almost all dimensions and it is a favoured species which we are developing small stands of it mixed with Douglas. Seedlings are rare except on some stumps and it has to be rapidly fenced to survive the sapling stage.

**Tsuga spp.** – No regeneration of these have ever been seen at Ekolsund and much of the same goes for Sweden in general.

**Magnolia** – The plants of Magnolia spp. that earlier grew at the “Parabole” has died out but are replaced.

**Ginkgo** – There were earlier some small trees of this unique tree but these have vanished. A small 20-year old tree can be seen at the pond and one has been planted at the parabole.

Except from those noted above the following species have been planted the later years: Abies amabilis, Abies balsamea, Abies cephalonica , Cryptomeria japonica, Cedrus atlantica, Pinus parviflora, Pterocarya fraxinifolia, Cercis siliquastrum, Gleditsia triacanthos, Robinia pseudoacacia, Acer negundo, Acer palmatum, Acer griseum, Zelkova serrrata, Ostrya carpinifolia, Celtis occidentalis and Juglans cineria.