

Swan Sundet.

Norra Djurgården 1701

LSA A99-1: 22

Lång Sundet.

IUFRO 2024 Excursion 4

Valuable trees and forests close to people

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Valuable trees and forests close to people

The Djurgården Royal National City Park is the capital's green oasis close to the city center of Stockholm. Here you can experience a unique historic forested landscape interwoven with parkland, beautiful buildings, woods and forests, open land, and waterbodies. It is one of the most-visited recreational areas in Sweden and it is unique to find such an extensive area of outstanding natural, cultural, and recreational beauty and environmental values remaining within a capital city. During this excursion you will visit five points where we will show and discuss the city park, biodiversity and ecosystem services, close-to-nature forest management, recreation, forest history, composting and reuse of materials, and much more.

Welcome!

Program

08.45	Buses arrive at Norra Djurgården, Stora Skuggans väg 22
08.45-09.00	Welcome by King's Palace Bailiff Magnus Andersson, Royal Djurgården Administration.
09.00	Buses depart to the respective starting point.
11.45-12.30	Lunch is served in the field.
15.00-15.30	"Swedish fika" in the field with coffee and cake.

- All participants follow the same bus during the day.
- Five stops with a total of ten reports are presented during the day.
- Toilets will be available at the bus stops.
- There are limited benches at lunch and coffee. To ensure a seat, please bring a sitting stick or similar.
- Clothing according to the prevailing weather and footwear for shorter walks in light terrain are recommended.
- A guide/volunteer accompanies each bus. Their function is to ensure that time and programs are kept. We all help each other to hold the program for the day.

1. The Royal National City Park, urban biodiversity, & ecosystem services

1.1 Almost 30 years have passed since King Carl XVI Gustaf inaugurated Sweden's and the world's first National City Park in Stockholm.

Thus, the large royal parks near the city were protected against ill-conceived exploitation.

- The old hunting park Djurgården
- Haga and other amusement parks around Brunnsviken
- The castle park in Ulriksdal with surrounding old coniferous and deciduous forest

Close to the big city, the biological diversity of the royal parks has been preserved. Here there are over 800 different kinds of flowering plants, more than 1,200 species of beetles, and about 100 nesting bird species. Important for diversity are the many rough oaks, providing habitats for countless small insects, fungi, and other organisms. Djurgården, for example, has Sweden's densest population of barn owls. Protection is not as strict as in a national park. Existing businesses must be able to develop. However, new projects are only allowed if they do not threaten the park's natural and cultural values. It is enough to prevent oaks and owls from being outcompeted by the city's expansion.

Presenter: Henrik Ekman, Swedish Television International



1.2 The Royal National City Park is a mix of both past and present processes shaping the environment.

The most recent ice age (approx. 10,000 yBP) dramatically reshaped the landscape. Under the immense weight of massive ice sheets, the land was compressed, causing extensive regions of Sweden to sink below sea level. As the ice melted, the pressure was released, allowing the land to gradually rise – a process that continues to this day. This ongoing uplift has led to significant changes in the physical landscape (Figure 1). Conversely, higher elevations reveal exposed bedrock and coarser sediments. The variations in soil type determine what natural vegetation occur in different areas, affecting the land-use prerequisites now and historically. As more land is converted into farmland and urban development, the available habitat for wildlife diminishes, making it increasingly difficult for species to thrive and disperse. Therefore, the Royal National City Park today is an important conservation feature in the city. A diverse landscape, rich in different habitats, can support high biological diversity and therefore habitats other than forests are managed as a part of the park. These habitats also contribute to a range of ecosystem services like water purification, heat mitigation, carbon sequestration, and pollination, especially important in an era of intensified land use and climate change.

Presenters: Regina Lindborg & Jessica Lindgren, Stockholm University

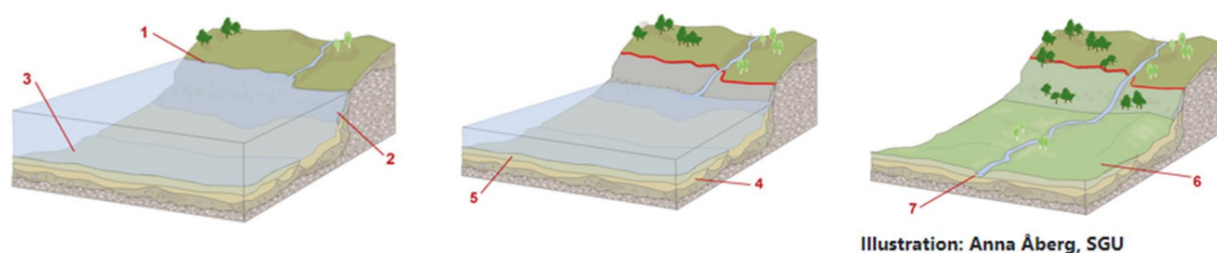


Figure 1. An area transformed from seabed to clay plain. 1) Highest coastline, 2) Sand and gravel washed out from the moraine, 3) Deeply located bottoms. 4) Glacial fine-grained sediments. 5) Postglacial fine-grained sediments. 6) Agricultural land. 7) Water-course. (Source: Landhöjning – från havsbotten till lerslätt, 2020, Geological Survey of Sweden).



2. Close-to-nature forest management, mixed forests and urban forestry for recreation

2.1 Djurgården's forests are very close to large, densely populated areas around Stockholm. Therefore, it is important to use management alternatives that have the ability to balance different interests in order to reduce conflicts around the forest.

To an increased extent, promoting more deciduous forest, and more mixed multi-aged forest and different forms of continuity, i.e., forms of management where clear-cutting is avoided and natural regeneration in mixed stands of different ages is relied upon, are methods that are used. Such forests are better able to withstand various disturbances and are more stable, which is important in a context very close to urban areas. However, there is a great deal of practical uncertainty surrounding the management of such forests in Sweden. At this point, we therefore intend to present how the management at Djurgården deals with these issues and how it carries out forestry. We also intend to present results from our latest research on mixed forest and ecosystem services.

Presenters: Magnus Lof & Adam Felton, Swedish University of Agricultural Sciences



2.2 Managing urban woodlands and trees is not only about managing for a diversity of tree species, but also for a diversity of user groups. This requires transdisciplinary approaches that combine different fields of knowledge and operational scales.

There are five central aspects of urban woodland quality seen from a user perspective: maintenance (the level should relate to desired function and character of the area), accessibility (to and within the area), nature (both for biodiversity and people's experience of nature), provision of facilities (paths, benches, lighting), and structural and species diversity (people like variation in experience). Providing these qualities normally results in high-quality green spaces and woodlands for a typical user, but to meet the needs of multiple user groups, including traditionally marginalized groups, redesign and management adaptations are often required. User participation, and particularly the involvement of marginalized groups, can be a valuable tool for identifying needed adaptations to the urban woodland to ensure that it meets the needs of a particular user group. Starting from the context of Norra Djurgården and based on our research and experience in managing for and with different user groups, we will highlight some key aspects of creating a more diverse urban forest in terms of both use and experience.

Presenters: Björn Wiström & Hanna Fors, Swedish University of Agricultural Sciences



3. Nature conservation in mixed forests with high values

3.1 At this point, we address two types of land use that have been very important in the Swedish landscape: deciduous wood pastures and forest pastures.

Various forms of wood pastures were historically an important part of the agriculture. The deciduous wood pasture was often mixed with arable land. Winter fodder was obtained from the wood pasture in two forms: hay from the ground and leaves from the scattered trees. The form of wood pasture that is best known in Sweden contains pollarded trees. Usually, the trees were cut so that the branches could be reached from the ground or from a small ladder. Over time, the trees took on a characteristic shape with short, rough branches or just a “head”. The combination of tree and hay production in wood pastures can give a higher hay yield compared to completely open hay meadows. Here at Djurgården, wood pastures with pollarded trees has taken up a small area. Another type of wood pasture that appeared in the landscape was with trees cut at the base (coppiced), which then developed several shoots from the stump. In some contexts, these multi-stemmed trees become a source for leaf fodder and in other contexts they were felled for small round wood. The use of wood pastures declined sharply in the second half of the 20th century. Nowadays, all preserved deciduous meadows in Sweden are nature reserves or managed on a non-profit basis.

Presenter: Urban Emanuelsson, Swedish University of Agricultural Sciences



3.2 In pre-industrial agriculture, forest pastures were absolutely essential for the livestock. The pastures were primarily on low-productive, often stony, land, not suitable for agriculture or for meadows.

A very large proportion of the forest pastures were covered with trees, deciduous trees in southern Sweden and mixed coniferous forest in northern Sweden. These forest pastures were open enough for ground vegetation to grow and feed the animals during the summer months. The trees and bushes also provided a range of other necessary products such as firewood, building timber, fencing timber, bark for roofing, crafts and rope, leaves for winter fodder, charcoal, and tar. Prehistoric forest use was thus multi-layered in the soil, shrub, and tree layers. The forest is therefore a cultural landscape where there can be traces of history both in the form of permanent remains and a rich biological cultural heritage. The industrialization of agriculture, cattle breeding, and forestry resulted in a decline of forest grazing. Towards the end of the 19th century, the animals began to graze on arable land while the forest was reserved for forest production. Today, only a very small area of such forest pastures remains.

Presenters: Tommy Lennartsson & Anna Westin, Swedish University of Agricultural Sciences and Swedish Species Information Center



4. Composting and reuse of materials

4.1 The park has 300 stabled horses and the manure they produce is composted and then returned to the soil as a fertilizer. Among other things, manure from the Royal Stable comes here. In order to create a fast and thorough process, an 18m long rotating drum is used, which in the future will also be used for other organic material.

Here also some of the wood (birch) from release cuttings generated by the management is processed into firewood, which is then delivered to the Royal Palace, among other places. If possible, we also try to provide the area's museums, schools, and similar activities with material. The bulk of the not sawed material is chipped onsite and then burned in Värtan's combined heat and power plant, but a small part is also used as ground cover around trees, in flowerbeds, and in Skansen's Animal Husbandry. However, the most biologically valuable material is left in the terrain to promote biodiversity. Sawed timber is largely processed here with a mobile sawmill (band saw). Posts for fences and lighting posts for the area's exercise tracks are sawn and then impregnated locally with linseed oil. Cladding boards for outer panels but also inner panels and floors for our own property maintenance, as well as some rougher constructions such as windbreaks and viewing platforms, are examples of what it can be used for. The wood that is not used locally is sold in the traditional way.

We have an aspiration to phase out old, environmentally-hazardous impregnated wood materials and collaborate with a company that impregnates with linseed oil and gets very good results. The method is relatively new but has been tested and will probably be able to replace today's railway sleepers. Tests show double lifespan and no environmental toxins. Our use is of course very small scale but we are happy to benefit from their presence.

Biodiversity is sometimes negatively affected by lighting, while lighting is often requested for safety or aesthetic reasons. Here we are testing a technical solution that we hope will give visitors an experience of safety without disturbing bats and other creatures at a reasonable price: presence-controlled lighting adapted to the site.

Presenter: Royal Djurgården Administration

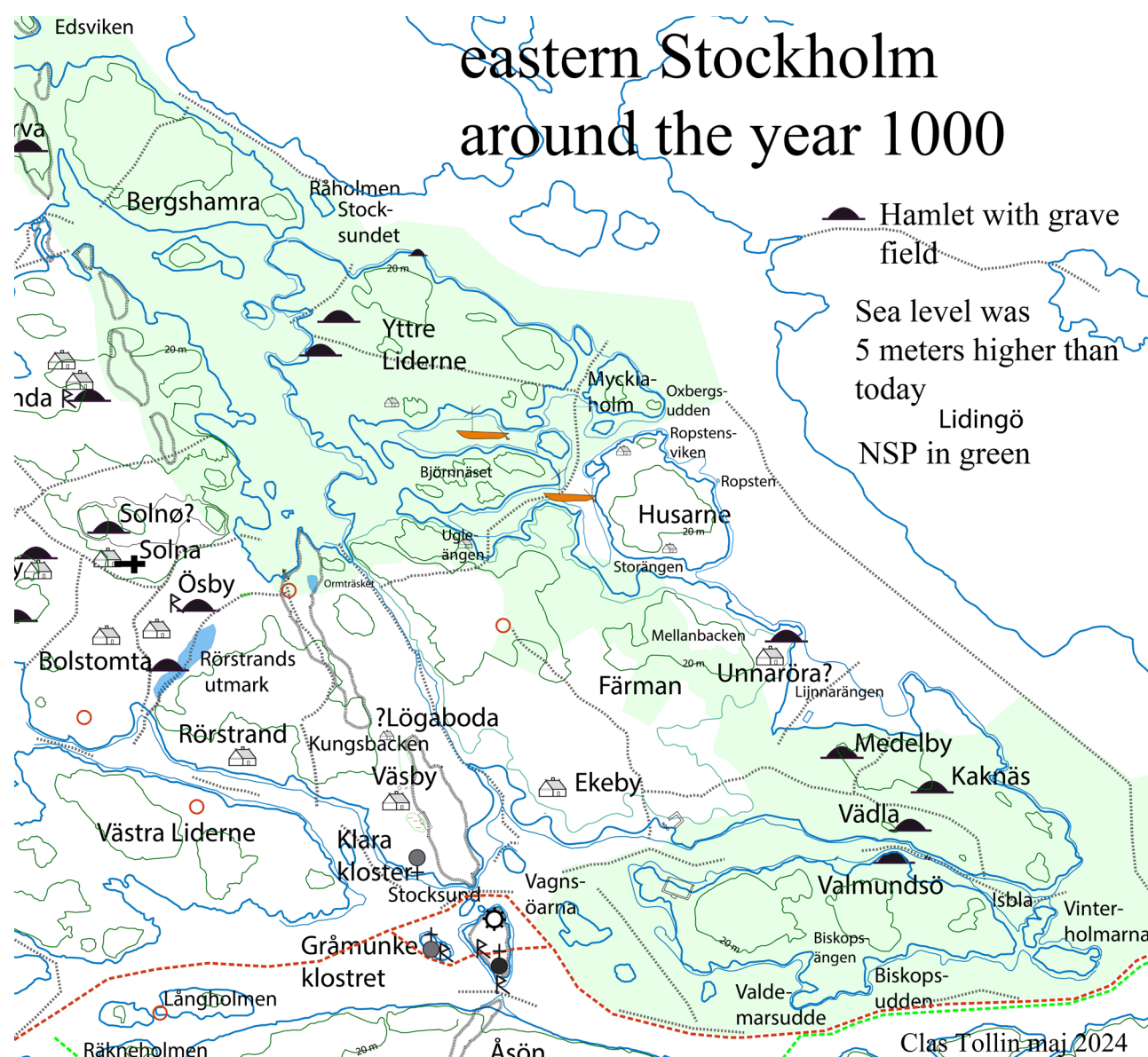




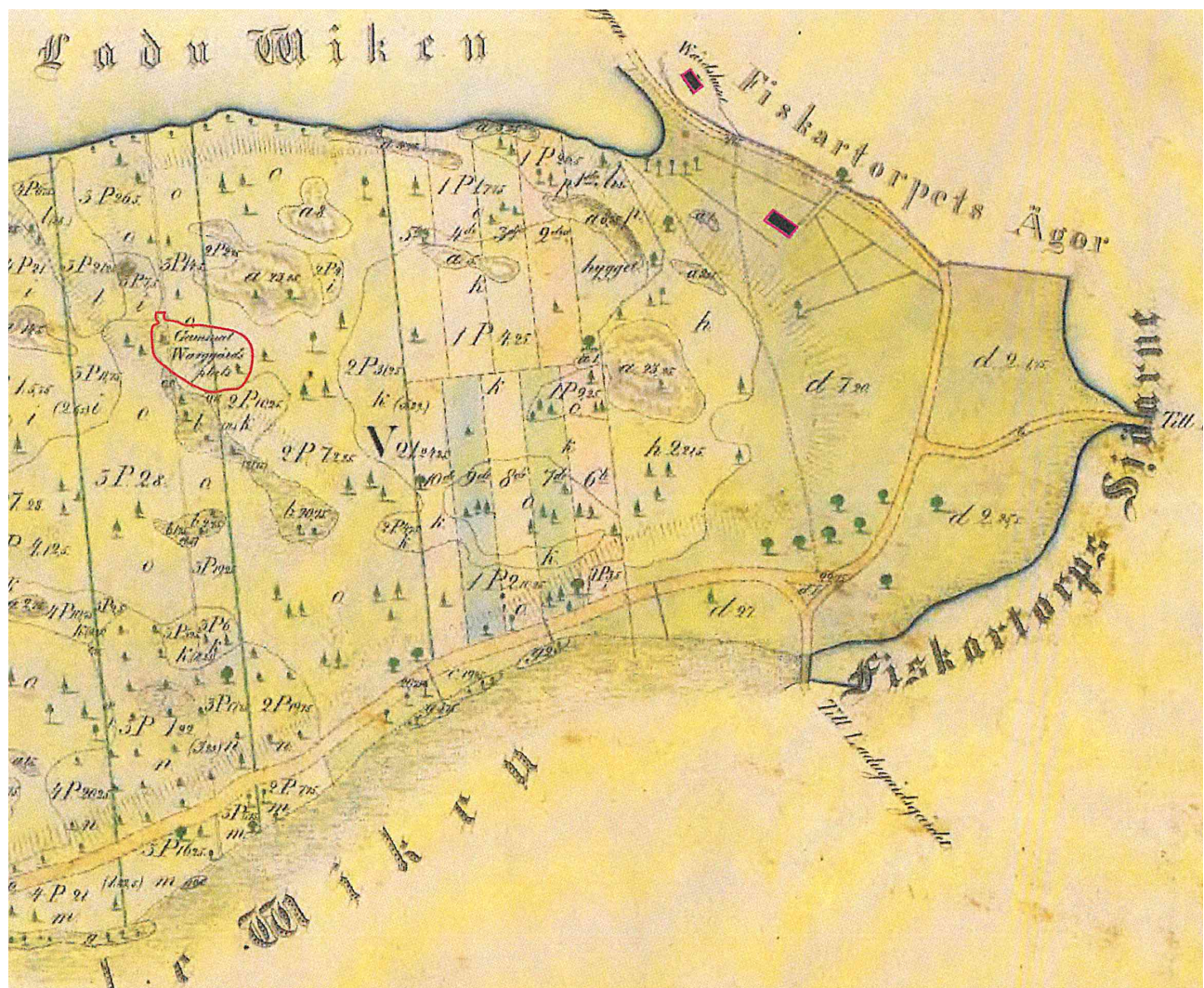
5. From forest history to recreational value for public health

5.1 The landscape of Djurgården was shaped by the ice age and the subsequent uplift of the land mass, which continues today. Above the 5-meter level, there were around a dozen fixed settlements in the 11th century, which existed until the early Middle Ages, when various monasteries and church institutions came to dominate land ownership.

The church's land was taken over by the Crown around 1530 and around 1680 agriculture was replaced by a Djurgård (hunting park) of 1500 ha surrounded by a 20 km long and 3 m high fence. Up to 1,500 deer were kept (mainly fallow deer). Royal Djurgården takes its name from this Djurgården, even though the last deer disappeared more than 125 years ago.

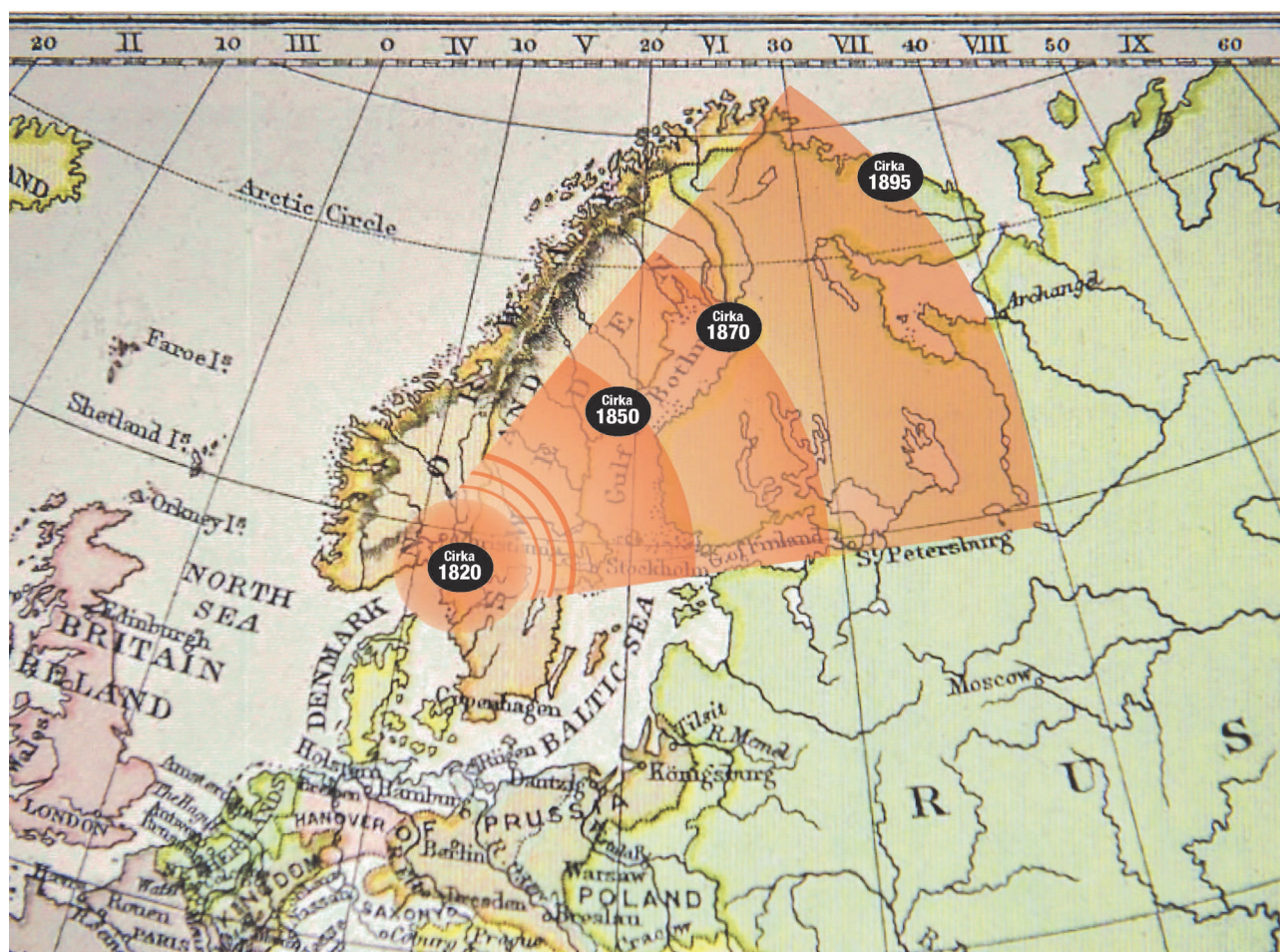


Israel Adolf af Ström came to be of great importance for the creation of Sweden's first higher forestry education. The Forestry Institute was founded in 1828 and Djurgården was then used to a large extent by the students as a practice school area. Forest seedlings were planted locally, but as long as the deer remained, the young forest had to be protected. To deal with this conflict, the deer park was established in 1827, a smaller enclosure of 75 ha with 130-140 fallow deer. Traces of the students' activities have been found by connecting their division maps with traces in the terrain. Thereby, for example, the location of a permanent wolf trapping facility (used in the teaching) is identified and confirmed through excavation. A pair of Djurgården oaks, contemporary with the 1830s large oak-cultivation project on Visingsö (southern Sweden, to which Djurgården supplied oak seedlings) seem to have been managed as a parallel project at Djurgården. In addition to forest management, the early forestry training also included game management, where the wolf problem of that time was a priority national interest, and forest managers were expected to deal with it and solve it.



During the early 19th century, long-term sustainable production of ship timber was the most prioritized task for forest management, but at the same time the foundation was laid for the more modern same-aged conifer-dominated forestry.

Presenters: Henrik Niklasson, Clas Tollin and Lars Klingström from the Royal National City Park, Swedish University of Agricultural Sciences and the Society for forest history, respectively.



5.2 Research shows that access to forests reduces the risk of premature death, especially due to heart and vascular diseases, and that the number of healthy years of life increases. The connection is strongest for people in the lowest socio-economic group.

The World Health Organization therefore advises authorities around the world to make it easier for people to spend more time outside in nature. The health benefits are many. Staying in nature automatically leads to people being exposed to natural daylight, which is health-promoting. Proximity to urban forests has also been shown to increase the physical activity of the population. It leads to a longer active life, fewer cardiovascular diseases, and less risk of stress-related mental illness and type two diabetes. It is important that the areas are close and accessible which increases the number of visits. The areas should also be well maintained, clean, and tidy. It is important that they are perceived as safe. There should also be clean and tidy toilets, barbecue areas, and preferably also some catering. All of these are good investments for public health. The roads should be easy to navigate and find, but there should be more demanding detours for those who wish. In general, it is important that there is a range of experiential values. Research has made it clear that exposure to certain natural values leads to rapid and long-term stress reduction and recovery of concentration. The most important thing is the experience of calmness, silence, and stillness. It is also important that the recreational area has a cohesive character, so that you can walk long distances without having to think about ending up outside the forest area. Parts of the area can be experienced as more wild and original, while other parts can have a more open and cultivated character. While some parts may be species-rich and varied, other parts may be more uniform and less varied.

Presenter: Patrik Grahn, Swedish University of Agricultural Sciences



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