

R-06-37

Landscape, history and people in a geographical perspective

Studies of land-use, settlement and livelihood in Oskarshamn and Forsmark

Johan Berg, Ulf Jansson, Anders Wästfelt
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June 2006

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ISSN 1402-3091

SKB Rapport R-06-37

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This report concerns a study which was conducted for SKB. The conclusions and viewpoints presented in the report are those of the authors and do not necessarily coincide with those of the client.

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1 Introduction

1.1 Aims of the study

The aim of this study, carried out by researchers from the Department of Human Geography at Stockholm University, is to investigate land-use, settlement, and the way people have used and affected the landscape in the investigated areas. The study revolves around historical land-use, settlement change, and how people have worked and used the landscape over the past five centuries.

This study constitutes a part of the environmental impact assessment work that is being conducted in order to examine potential locations for a deep repository plant for spent nuclear fuel and waste. Both areas are located on the east coast of Sweden. A number of scientific studies have been carried out in this project. Fields that are included for the EIA and the safety assessment include geology, quaternary geology, limnology, biology and other natural sciences that focus on the terrestrial and aquatic environments.

The sources that have been used include historical maps, modern georeferenced information, cadastral material on settlement, population and production, interviews and fieldwork. During the first phase of the study, ending in the summer of 2004, the bulk of the historical material was probed and analysed. Considerable effort was expended in creating GIS-data sets to be used for further analyses. The work that was carried out during the spring of 2004 resulted in a preliminary report that deals with historical land-use, population, settlement from medieval times to the present, and both detailed and general descriptions and investigations of the historical geography of the areas /Jansson et al. 2004/.

Both of the investigated areas are located by the Baltic, but they are very different both physically, especially in terms of land upheaval in the north, and historically with different land-use systems, ownership structures and settlement patterns. Fieldwork was conducted during the autumn of 2004 and this included interviews and field investigations of agricultural remains. This was done to deepen existing levels of knowledge concerning the landscape and population in both regions. The text at hand uses information gathered in the previous phase and includes all of the substantial parts of the previous report.

1.2 The project researchers

This report is a compilation of work carried out by a number of researchers and research assistants at the Department of Human Geography at Stockholm University during the period December 2003 to March 2005. The majority of data capture and the production of the often complex maps was carried out by Anne Philipson and Therese Fast. Annika Björklund has carried out most of the work involving the use of historical records. Ola Hall and Stefan Ene have created the method and written the appendix which elucidates the methods used for the work on the small-scale maps. Ulf Jansson has written the introduction and methodology for cadastral map analysis. Johan Berg is responsible for the sections on settlement history, property and demography. Johan Berg and Ulf Jansson have jointly written the section concerning the detailed overview and the detailed studies in Forsmark and Oskarshamn. Anders Wästfelt has conducted the interviews and written texts concerning the contemporary landscape. The final section entitled "Landscape, history and

people – A conclusion”, which draws from all of the aforementioned chapters, has been collaboratively written by Johan Berg, Ulf Jansson and Anders Wästfelt. The English was revised by Andrew Byerley, Ph.D.

The first phase of the project involved the participation of a number of people for either shorter or longer periods of time. During the second phase the bulk of the work was carried out by Johan Berg, Ulf Jansson and Anders Wästfelt with assistance from Annika Björklund.

Ulf Jansson (Ph.D.) – project leader and responsible for the report

Ola Hall (Ph.D.) – GIS, methods and organisation of data

Stefan Ene (director of Geo Processing Unit) – GIS, methods, support and presentation

Johan Berg (Ph.D.)– Historical geography, responsible for the cadastral material, settlement, and production.

Anders Wästfelt (Ph.D.) – Landscape and people

1.2.1 Research assistants

Therese Fast – GIS and historical landscape

Anne Philipson – GIS and historical landscape

Annika Björklund – Historical geography and GIS

Annett Heerklotz (intern) – GIS

1.3 Structure of the study

The study deals with settlement change, land-use, livelihoods and rural society as a whole. The text begins with an outline of the aim and the scope of the investigations, as well as a brief description of the investigated area. This is followed by a presentation of the perspectives used in historical geography and landscape studies, which form the theoretical base for the investigation. The following chapters deal with the many different methods used during the project. This is a detailed description that covers the full range of methods used in this work, where historical as well as modern sources are used. The methods range from processing digital maps, extracting statistical information and conducting field investigations. The first study deals with *settlement change* over a long period of time. The second study deals with the changing pattern of *land ownership* in the regions. The third study deals with *population* changes in the historical period. The fourth study focuses on *rural production* and changes that have taken place. The fifth study utilises all of the *land-use and landscape changes* that can be observed in maps and other sources to describe both the over-all situation and some examples of local studies of landscape and society. The sixth study deals with *agriculture during the 20th century*, and is based on interviews with land-owners and farmers. The final part consists of a summary and an attempt to create a model of the landscape changes that have taken place in the two areas.

1.4 Areas of investigation

The study incorporates various analytical scales. Some investigations are of an overview character, whereas others focus on details of historical and present landscapes. The two study areas of Forsmark and Oskarshamn are located in the administrative regions (Sw. *landskap*) of Uppland and Småland. The two investigated areas are created from parish boundaries. This is due to the fact that most of the historical sources are organised at the scale of the parish. This scale also enables us to study human activities, e.g. to study the use of forests in the context of a village. By studying a larger area we can also gain a more comprehensive understanding of the society. The parishes in the Forsmark region are smaller than those in Oskarshamn. The Forsmark region comprises Gräsö parish, Börstil parish, Forsmark parish, the town of Öregrund, Hållnäs parish, Valö parish and Österlövsta parish; whereas the Oskarshamn region comprises: Misterhult parish, Döderhult parish, the town of Oskarshamn and Kristdala parish. Both of the regions are approximately 1,000 km². We have conducted detailed investigations in the following settlements in Uppland; Storskäret, Valö, Lund, Vreta, Lundsvedja, Tomta, Kämbo and Dannebo. The towns are not in focus here and are only superficially described. Instead the main focus here concerns the study of the rural landscape. In Småland, the market towns of Figeholm and Döderhultsvik were located within the area. Döderhultsvik was accredited full town status in around 1850 and the name was changed to Oskarshamn. The detailed investigation in this area has been carried out in the parish of Misterhult, and the settlements of Lilla Laxemar and Ekerum have been examined. In this report the regions are called *Forsmark* and *Oskarshamn*. These are not the historical names of these regions; in fact these regions do not exist as entities during the historical period. The name of Forsmark was selected since the area is created with Forsmark as a centre, and the name of Oskarshamn is used because the area under investigation coincides with the modern municipality (Sw. *kommun*) of Oskarshamn.

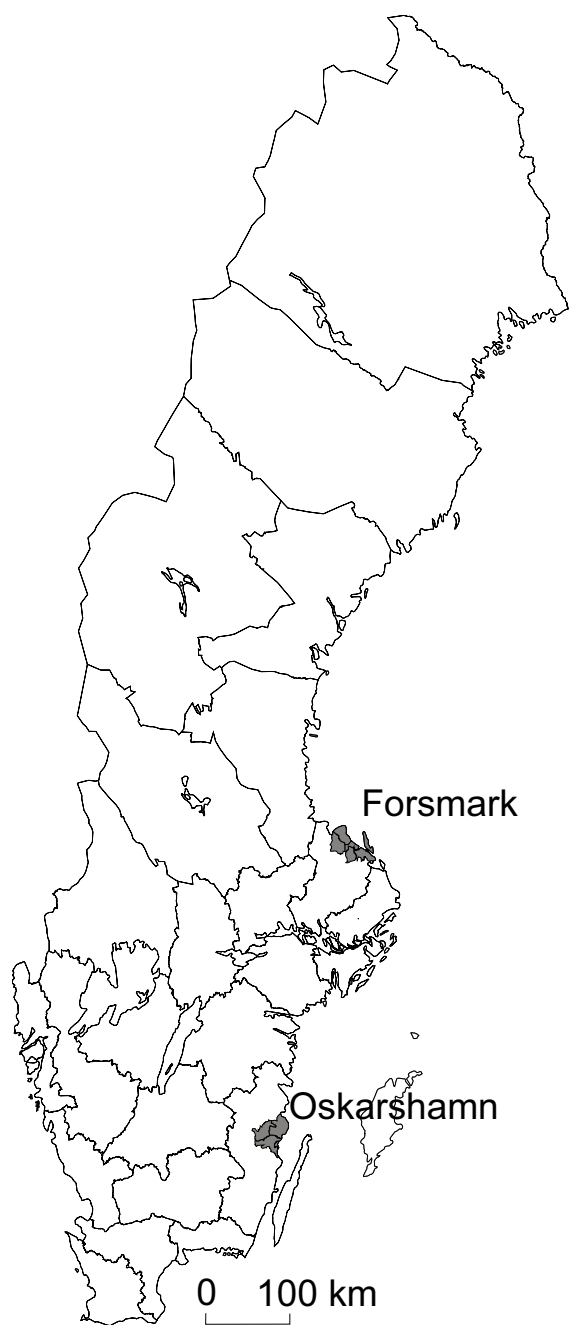


Figure 1-1. The two investigated areas in Sweden.



Figure 1-2. The area of investigation in the Forsmark region. The six parishes cover c 1,000 km².

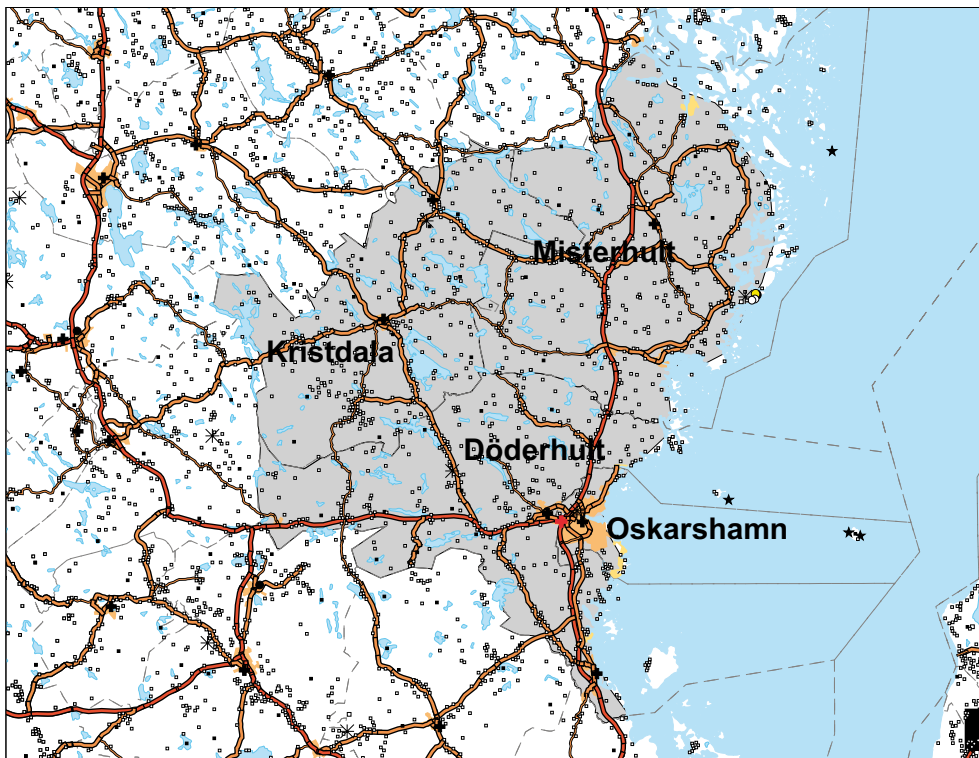


Figure 1-3. The area of investigation in the Oskarshamn region. The three parishes cover c 1,000 km².

2 Studying the landscape

The physical landscape constitutes the foundation for the cultural landscape. The physical setting, at least to some extent, always governs land-use and sets the limits, both historically and today, for human activity. It is therefore of the utmost importance to gain an understanding of aspects including the topography, soils, vegetation and so on. Studies of this character are written and published within the framework of the SKB-investigations and will not be touched upon in this text in any detail, however the physical setting is often essential for our understanding of land-use, settlement, economy and so on throughout history.

The concept of landscape is associated with the work of Carl Sauer who introduced the concepts of cultural landscape and natural landscape to North American geography. He was the founder of the so-called Berkeley School of landscape studies. The concept of natural landscapes is based on a number of factors in the physical environment that over time create a range of forms that cumulatively form the natural landscape. When culture is added to the model, the natural landscape is transformed into a cultural landscape. The notion that cultural landscapes are detached from the natural or physical environment is not supported in the work of Carl Sauer. Instead the natural landscape is seen as a base for the cultural forms.

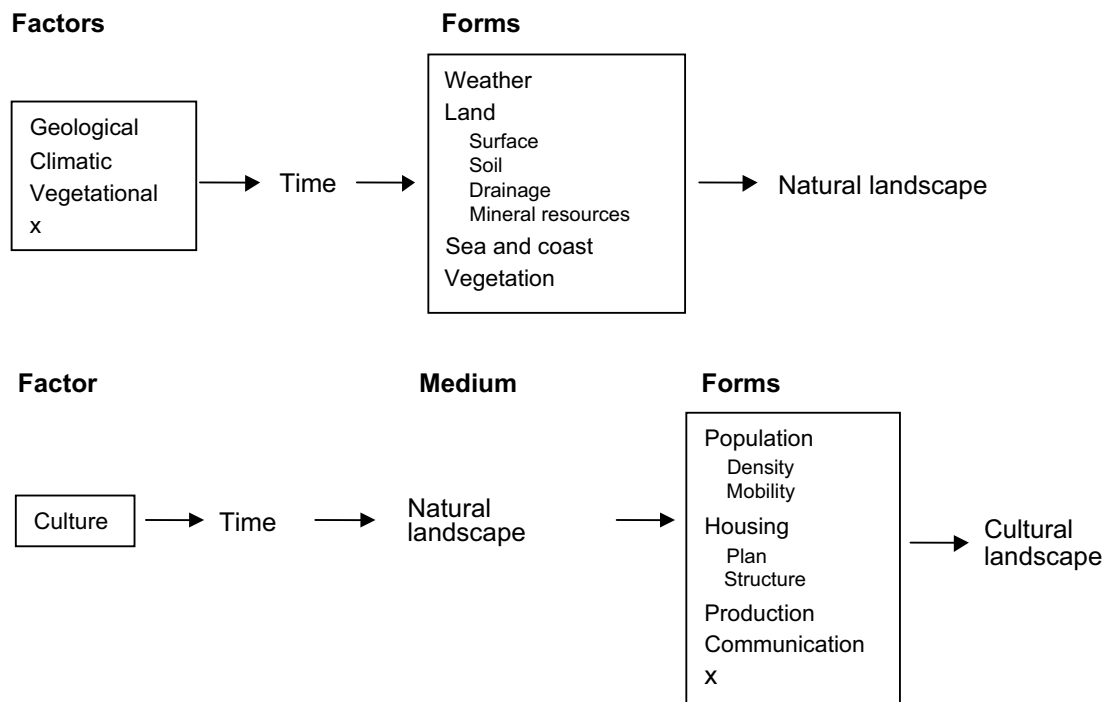


Figure 2-1. The definition of natural and cultural landscapes as formulated by /Sauer 1925/. The basic idea is that the cultural landscape is based on the physical or natural landscape. The cultural landscape is a transformed natural landscape.

Human activity must be understood in relation to both the physical environment and society. Geographers often stress the need to consider both aspects, very much as Sauer did. John Fraser Hart, for example, distinguishes three things that need to be included in a study of the rural landscape: the landscape topography, the vegetation, and the man-made structures /Fraser Hart 1998 p 2/. This is a view that has also been argued for by Ulf Sporrang, one of the leading scholars in the field of landscape studies in Sweden /e.g. Sporrang 1998 p 32/. We can formulate this in a simple matrix where we are able to study agriculture or any human activity in the upper-left box in the diagram illustrated below. This occurs only when a study meets the criteria of incorporating both societal and natural perspectives. A simple illustrative example here would be that a specific crop will only be cultivated if both natural (e.g. climate, soils etc) and social (e.g. demand, taste etc) conditions are conducive. The demarcations between possible and impossible on one hand and acceptable and not acceptable on the other are not static but vary over time.

In a society under pressure, marginal resources that are not sustainable over long periods of time are sometimes used. One example is swidden cultivation (Sw. *svedejbruk*), which is only viable in areas where very large amounts of land are available. Accordingly, if something is to be sustainable it cannot be exploited close to the border of the impossible. On the other hand, new technologies such as land drainage and fertilisers can extend the border of the possible.

Furthermore, in any society it is not possible for different social groups to use the land in the same way. A large landowner and a crofter in medieval Sweden did not have the same resources, knowledge or technology so their options were different.

When studying any given landscape we need to understand its history. We often refer to this as the *diachronic* landscapes. The fact that they are diachronic signifies that they change over time and that in any given landscape remains from different time-periods are to be seen side by side. In the Swedish landscape of today, it is thus common to find a land-ownership structure created in the 19th century, arable fields converted from meadows during the agricultural revolution, a barn built in 1930 and a settlement location with a thousand year-old history. A decision to clear the boulders from a field in 1750 limits the options for later generations. This is referred to as “landesque capital”. If you invest in

		Society	
		Acceptable	Not Acceptable
Nature	Possible		
	Impossible		

Figure 2-2. A matrix illustrating the theoretical relationship between society and nature, and where agriculture or other activities are possible. The activity must be possible from a physical resource perspective – the soils and climate must, for example, be able to support that type of agriculture. Furthermore, the conduct and the choices made by the farmer must be acceptable to society at large. Things that are possible for a large landowner today were not possible for a crofter in the 17th century.

the land, returns will come in the future. Actions in one time-period have effects in later time-periods. This is true not only for physical changes in the landscape but also for unseen social structures such as ownership. It is important to be aware of the many decisions made in the past that have cumulatively shaped the modern landscape. Most of these date from fairly recent history, but some are older than one might expect at first glance. This method of including historical aspects in order to understand the modern landscape has been utilised by Ulf Sporrang in various works on the regional divisions of Swedish landscapes /Sporrang 1995, 1996, see also Jansson 2004/.

Another important focus in this type of research is the spatial aspect. In geography, space, is considered one of the important factors in understanding Society. Uneven distribution over the surface of the earth is often the starting point of analysis. This may be regional differences or differences within a place, so spatial aspects are of paramount importance in studies of landscape and societies over time.

The perspectives discussed above, i.e. incorporating the natural landscape in the study of the cultural landscape while maintaining temporal, social and spatial aspects, are used in this study – a possibilistic approach where space, landscape and society are studied.

3 The methods and sources in the detailed analyses

The following section summarises the process whereby the maps from the 17th, 18th and the 19th centuries were digitised and geo-referenced in such a way that they could be treated and visualised together. The aim has been to make the maps correspond to each other in order to facilitate comparative analyses of various aspects for different periods in time, e.g settlement, land under cultivation, pastures and roads.¹

The method follows a line of work that has been developed at the Department of Human Geography at Stockholm University over the past 30 years /Fogelvik 1973, 1978, 1979, Ene et al. 1991/. The method uses only existing software, is fairly straightforward and follows a general model for handling digital data in a GIS. The work comprises a number of different stages. The first stage is *data capture*, which usually involves scanning a map or a photograph of a map. The second stage is often referred to as pre-processing and this involves working with the scanned image. Here we often want to reduce the image size by adjusting the resolution and reducing the colour depth. The next stage includes geometrically adjusting or *rectifying* the image to fit to a modern co-ordinate system. This also includes adjusting the errors made by the surveyor during the mapping. Generally speaking, geometrical quality progressively decreases with the age of maps. This stage is conducted in a raster based GIS. The next phase, which is necessary to be able to extract information from the image, is to carry out a *vectorisation* of the image. This involves manually drawing the contours of features in the geometrically corrected map. This can be done at many different “levels” ranging from extremely detailed information about each parcel of land and where all kinds of attribute data have been added, to a more superficial selection of features. The selected level must be decided in accordance with the type of analysis one wishes to conduct. The next stage is the *analysis* phase. The types of analyses that can be carried out with digital information are almost endless and must also be guided by the research question at hand. The final stage concerns the *presentation* of the information. This is an important stage because it is important to communicate the analyses. It should be added that a map is not always the best means of representing the information. This may be better represented in a graph or a table.

The maps used in this study were of varying ages and were supplied in different formats and at different scales. The maps that were not originally in digital format were photographed with colour positive film and then scanned.

Image size can be reduced considerably, which makes the work easier but without losing too much colour information. For this reason the images were reduced to tif-files with 256 colours. These tif-files were imported into a raster based GIS, in this case both ENVI and ArcMap were used. The process of rectification involves the selection of points which, in the case of aerial photos, are often known as ground control points. The work consists of trying to identify points on a modern map that correspond with objects in an older map. This transformation can be made more or less “severe”; from a simple **afine** transformation to a polynomial warp of the image, and makes the older map fit to a modern one as well as assigning it a coordinate system. When old maps are geo-referenced, it is important to find as many corresponding points as possible. It is difficult to find points with similar location if the landscape has changed dramatically between the time periods that are to be compared.

¹ The method and analyses are described in Ene et al.: forthcoming.

One way of avoiding this problem is by using a sequence of maps covering the same area that are close in time. This allows for landscape changes to be followed more easily, thus facilitating the identification of corresponding points. Another important consideration is to spread out the points over the map, as the result of the resampling operation depends on the interrelation of the selected points. If the points are agglomerated to one place, the location error is likely to increase with the distance from this cluster (see Appendix 1 for an example of a coordinate-file).

If it is too difficult to stretch or warp the map, it is sometimes easier to divide the map into smaller sections. This was necessary for some of the maps used in this project.

The extent to which the image has been distorted in the process of resampling or rectification is calculated in RMS. Distortions are to be expected when dealing with old maps, but it is important that these errors are not too large. By checking the location of the points with the highest error on the map, it was possible to explain these errors. Only a few control points were used for some of the maps because they were so small. Our benchmark was that positional errors should be less than 20 m. However, because a positive identification of control points was not always possible, it was sometimes difficult to achieve this level of accuracy. This was particularly the case for the coastline. Shorelines are always hard to survey, and this was an even more pronounced problem in the context of the techniques that were at hand prior to the 20th century.

The projection and coordinate system used here is the Swedish national grid – RT90. It has a coordinate precision of 7 digits equivalent to 1 m ground-resolution.

Creating land use vector layers

The next stage was to create vector layers for each type of land-use in the geo-referenced maps. A system with separate files for different types of land-use and other features was used. The main objective of this study was to study the land-use changes. Land ownership was also vectorised.

The vector layers were originally made in ArcMap. The names of the files follow a structure that makes it easy to see the contents and the sources. The file names for the map that covers the greater part of Valö parish can serve as an example here. The first part of the filename corresponds with the name of the map in the archive. The number A13–17:1 tells us that this map is from Stockholm (A), from parish number 113, i.e. Valö, and village number 17, and that this is the first map of that village.

Table 3-1. An example of vector filenames and their contents.

a113_17_1_åker	(Cultivated fields)
a113_17_1_äng	(Meadows)
a113_17_1_byggnad_p	(Building, point)
a113_17_1_byggnad_y	(Building, area)
a113_17_1_bygräns	(Village boundary)
a113_17_1_fastighet	(Real estate, polygon of land ownership)
a113_17_1_hägnad	(Fences)
a113_17_1_odlingsmark	(Cultivated land*)
a113_17_1_tomt	(Toft)
a113_17_1_utmark	(Forest, pasture and misc land)
a113_17_1_väg	(Road)
a113_17_1_våtmark	(Wetland, bogs, marsh)
a113_17_1_vatten	(Water)

* Cultivated land denotes land that could be used as arable and meadows following the landreform.

The attribute data for each map was limited to information about the objects that were drawn. The first two are to enable the identification of geometrical objects. This may be of special interest should the objects be transferred to another file or some sort of SQL is done involving several files. The calculations of area (m²) and perimeter (m) are made in ArcView.

Table 3-2. Name of the attributes used in the files.

Id	An identification number, e.g. 1
Beteckning	The type of object, e.g. meadow
Namn	Name of a feature if it exists
Nr	Number of a feature if it exists
Grad	Quality of a region
Akt	The archival name of the map
Verk_år	The year the map was made
Fast_år	The year the map was accepted as a legal document
Yta	The area of a polygon in metres
Längd	Length of a linear object in metres
Omr	The perimeter of a polygon in metres
Anm	Annotations

3.1 Cadastral maps

Not many maps exist for either of the areas. There are some maps of Forsmark from 1640, but then there is a gap until the end of the 17th century. One abrupt change in the curve can be observed in 1746. This denotes the 46 maps from Österlövsta parish made by the surveyor Olof Gerdes who conducted a survey and regulation of the public roads in that parish. Aside from this example, it is clear that there are relatively few maps for the Oskarshamn region dating from the 18th century.

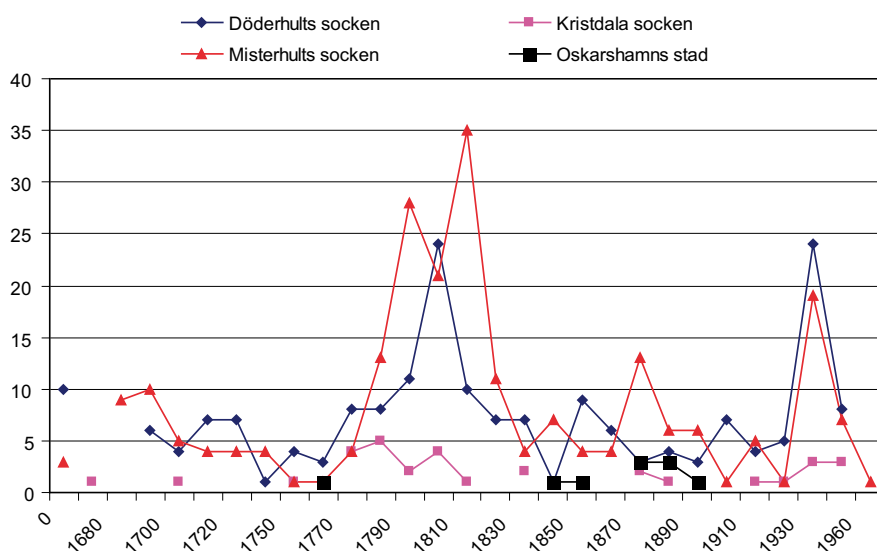


Figure 3-1. Diagram showing the number of maps for each decade for the parishes in the Oskarshamn region.

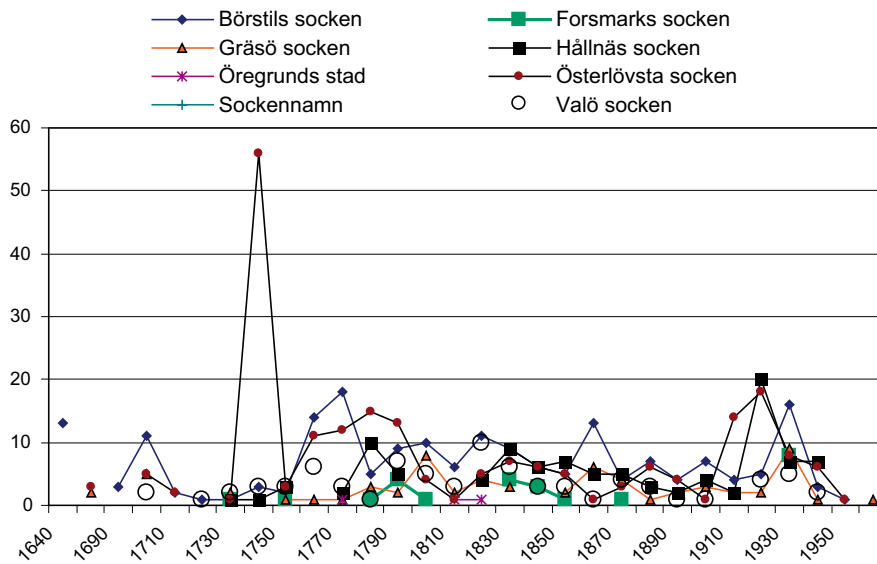


Figure 3-2. Diagram showing the number of cadastral maps for each decade for the Forsmark region.

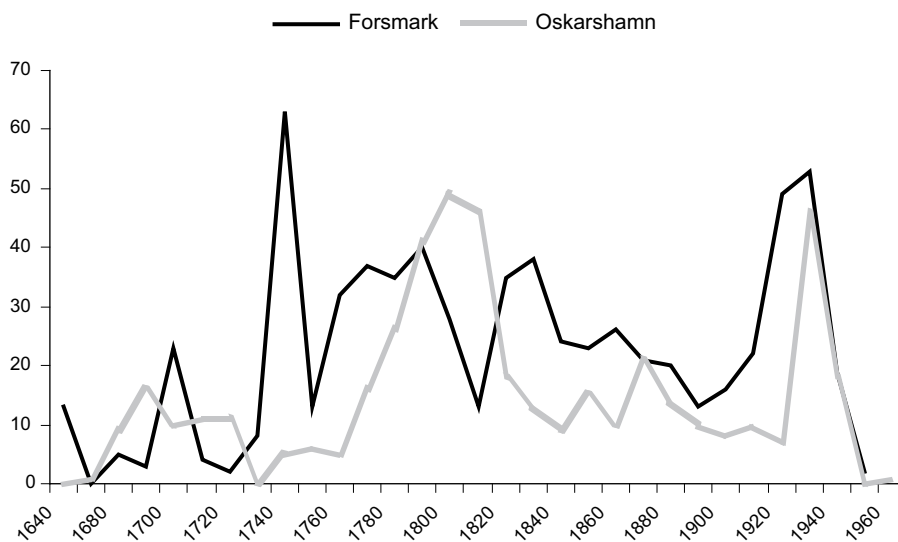


Figure 3-3. Diagram showing the comparison between the two regions. The lines show the total number of maps per decade.

Table 3-3. The number of maps according to the digital register in Lantmäteristyrelsens arkiv (LSA) at the National land survey of Sweden, “socken” means parish and “stad” stands for town.

Parishes in the Forsmark region	Number of maps
Börstils socken	206
Forsmarks socken	26
Gräsö socken	74
Hällnäs socken	112
Öregrunds stad	3
Österlövsta socken	221
Sockennamn	6
Valö socken	84
Total	732

Parishes in the Oskarshamn region	Number of maps
Döderhults socken	191
Kristdala socken	33
Misterhults socken	231
Oskarshamns stad	10
Total	465

4 Method for processing large quantities of raster based information

In this project it has been necessary to digitally resample all of the maps such that they fit into the coordinate system. This was a relatively easy procedure for the maps from the 20th century, although some of these were of a lower quality. It was, however, very difficult to get some of the maps from the 19th century to “conform” to the modern projection.

In this study, large areas were studied as a basis for understanding the land use changes. Approximately 300 economic and older maps were used in total. This was too large a number to handle manually, as was done for the more detailed cadastral maps. Instead, a method for more or less automatically extracting the features in the maps was devised. This work is based on a method proposed by Stefan Ene in 1978 /Ene 1998/.

This method uses the colour information and extracts the land-use types from the maps. Printed maps do, however, have some problems. One is that the colours assigned to certain features are not as straightforward as one might think. Older maps have considerable variations in colour, both due to the manufacturing process and the ageing of paper and print. More modern maps such as the Swedish economic maps have other problems. They use a backdrop of a photo that is overlaid with colours. This means that there is sometimes a blur of colours that has to be dealt with. A scanned map is a convenient way of obtaining digital geographic data. However, maps often contain information that might not always be of spatial relevance, e.g. text and cartographic symbols. As these objects might range in size considerably, conventional filtering is not a very good method for deleting these features. Instead we have found that using ordinary distance operators provides a very smooth and accurate way of solving the problem if two conditions are fulfilled; i) the objects to be removed have a colour that is different from objects that are to be kept, ii) the features to be kept are neither dithered or patterned. (If so filtering might solve the problem at the expense of resolution).

- If necessary use a noise removal filter. If your map is “fuzzy” you might need more filtering of different types in order to get it as “clean” as possible. (If you are scanning a large series of similar maps take your time to test, this will pay off in the long run).
- Thematically classify your map into whatever number of classes you want to extract. Put all of the stuff you want to delete into a separate class (= colour). Let us call this the “superfluous class”.
- Measure the distance from every pixel in the “superfluous class” to any of the other classes.
- Change the value of the pixel in your image to the value of the closest “classified pixel”.

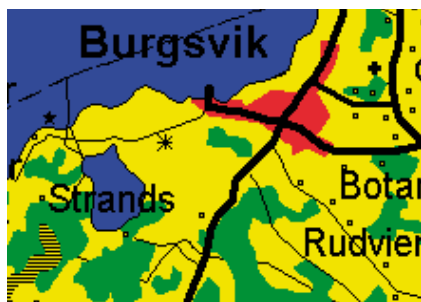
The four steps of this method are described in detail in Appendix 2. The first step was to import the geo-referenced raster map to IDRISI and make a reclassification. The second step entailed the removal of text and cartographic symbols in IDRISI. Removing text and cartographic symbols is a time-consuming process (processing a 10,000×10,000-image takes roughly 45 minutes), and this work is governed by a macro command. Step three consisted of a raster to vector conversion where the binary image files are vectorised. The software used was ArcMap. The fourth step was to convert the vector files to different vector formats and to assign a projection. This was done with MapInfo using the Universal translator.



a) The scanned map



b) Map after noise removal



c) Map classified in 5 classes

- Water (blue)
- Forest (green)
- Open land (yellow)
- Built area (red)
- Superfluous class (black)



d) Distances measured are from all pixels in the "superfluous class" to any "classified pixel" i.e. water, forest etc.



e) Resulting map with text and symbols removed

Figure 4-1. Illustration of the stages of the method, where scanned images are treated digitally in order to capture the colours and thereby the land-use without manually vectorising the information. Method developed by Stefan Ene.

5 Method and sources for population and settlement data

The historical landscape survey is based on settlement information recorded in cadastral books (Sw. *jordböcker*) from 1550–1880. Information on population size derives from *Tabellverket* 1759–1855, registers on harvests (Sw. *tiondelängder*) and livestock (Sw. *boskaplängder*). In the detailed investigations in Valö and Misterhult, Household examinations rolls (Sw. *husförhörslängder*) have been used.

5.1 Cadastral registers

The regional studies of the settlement and land ownership structure are based on cadastral books (Sw. *kronans jordböcker* and *årliga räntan*). Before the beginning of the 20th century, the taxation system in Sweden was based on land. The cadastral books were compiled by the Crown in order to control and manage revenue collection in the country. Aside from the demesnes of the aristocracy, every farm in Sweden was supposed to pay tax, the amount being decided by the size of the farm. The cadastral ledgers were compiled for each parish and show every single farm in each parish. If two or more farms are registered under the same name this denotes a village. It is therefore possible to study the settlement and its structure in these registers and even to identify individual farms in villages. It is also possible to get information about the size of the villages. Levels of taxation were also determined by who owned the land. The aristocracy, for example, paid a lower rate of tax for their tenant farms than the free farmers did. During the medieval period the same was true for land owned by the church. It is therefore possible to follow the land ownership structure in the investigated areas. The cadastral registers were systematically compiled from the mid-16th century during the reign of Gustav Vasa. In order to gain control over the country's resources, the king initiated a system that registered the taxes paid by each farm in Sweden /Dovring 1951/. At that time the medieval land ownership structure was still in operation. This meant that even the land owned by the church was registered, even if Gustav Vasa later confiscated that land. The records give a reliable picture of the settlement and land ownership structure at both the farm and village level. Households and settlement[s?] that were paying land based taxes, for example cottagers, craftsmen and others, are not registered in the registers. For these categories of people, the *Tabellverket* and the *husförhörslängder* are more suitable sources.

Original cadastral ledgers from c 1630, 1680, 1730, 1780, 1825 and 1880 have been used (copied) in the National Archive (Riksarkivet) and the Kammarkollegie Archive (Kammarkollegiets arkiv). DMS²-material has been used to get access to the cadastral register from c 1550.

In the cadastral register from 1680 over Misterhult, one sheet is missing. By comparing the cadastral books from 1680 and 1631 it is clear that some changes have been made. These changes mean that it is not possible to reconstruct the names of one half crown farm (Sw. *kronohemman*), one crown crofter's holding (Sw. *kronotorp*) and one king's heritage farm (Sw. *arv och eget hemman*) in the 1680 cadastral book. However, the missing church

² DMS: Det Medeltida Sverige is a project within the Bureau of national antiquities (Riksantikvarieämbetet).

farms (Sw. *kyrkohemman*) could possibly be reconstructed by using information recorded in the 1631 cadastral book. In 1631 there were two church farms, that were one *mantal* in size, *Späckemåla* and *Klockaregården*. Furthermore, there was one church crofter's holding called *Baggemåla*. In the cadastral book from 1680 there were two church farms of one *mantal* and one 1/4th church farm. This suggests that the one-mantal church farms in the 1680 cadastral book are probably *Späckemåla* and *Klockaregården* and that the 1/4th church farm is likely to be *Baggemåla*.

Furthermore, it is possible to reconstruct the noblemen farms (Sw. *frälsehemman*) that are missing in the 1680 book by using the cadastral book from 1631. The missing noblemen farms are likely to be Tjustgöl 3 fr, Imbramåla 1 fr, Arvidsmåla 1 fr and Grönö 3 fr. The reconstructed units are italicised in the table.

5.2 Tabellverket

The regional population studies are based on statistical material from the Central Statistics Bureau, founded in 1749 as the so-called *Tabellverket* (later *Statistiska Centralbyrån*). The material consists of pre-printed forms, which were filled in by the priests of the parishes every fifth year. These forms contain columns in which the numbers of different kinds of people living in the parish during the period are recorded. The population is differentiated into several classes. These classes change over time, which represents a problem when comparing the population structures of different times from 1749 onwards. To make such a comparison easier, we have grouped classes of people. The statistical material from the *Tabellverket* is often used as a source in historical studies, and it represents a good source of material for the study of population and the social differentiation of the population. The data from *Tabellverket* gives a good quantitative picture of the population and the growth of the population over time. It also provides a good picture of the social structure of the population and the changes in the social structure over time.

The population statistics are based on the *Tabellverket* database (covering the period 1749–1855), which is available on line at: <http://www.ddb.umu.se/tabellverk/Atkomst/tabnet.htm>. From this database, information concerning both the total population size and the social population structure in the six parishes has been collected. Earlier statistics on population size (i.e. 1571–1735) have been gathered from Andersson Palm, and the 20th century population statistics are from the SCB database /Andersson Palm 2000/. For the case of Misterhult, which is not included in the database, the original population documents from the Regional Archive (Sw. *Landsarkivet*) in Vadstena were used. However, only one document on the Misterhult population structure from 1785 is available. The social structure for 1850 has been reconstructed based on information on the whole county of Tunalän.

5.2.1 Methods of selection – the Tabellverket

The pre-printed forms used by *Tabellverket* were changed six times during the 1749–1855 period, and different population categories were used. To allow for a comparative analysis of population change, the statistics have been classified into the following eleven new categories: (See Appendix 9 for detailed information).

- Persons of rank (Sw. *ståndspersoner*).
- Farmers (Sw. *Bönder*). (In some years separated into farmers cultivating their own farms and farmers cultivating others farms.)

- Crofters (Sw. *Torpare*).
- Soldiers (Sw. *Soldater*).
- Metal Works and mine workers (Sw. *Bruks- och gruvarbetare*).
- Others without property (Sw. *Övriga obesuttna/egendomslösa*).
- Craftsmen in the countryside (Sw. *Hantverkare på landet*).
- Seamen and fishermen (Sw. *Skärkarlar och fiskare*).
- Townsmen in the countryside (Sw. *Borgare på landet*).
- Inn keepers (Sw. *Gästgivare*).
- Others (Sw. *Övriga*).

The social population structures in the parishes are based on statistical information for the male population aged above fifteen years. Women and children are not included here because Tabellverket's statistics are difficult to compare in this aspect, since the pre-printed forms changed frequently. During some periods women and children are registered separately, but in many years they are registered together, which means that different social groups can not be identified. So, in order to illustrate the population social structure, this part of the study comprises only the male population aged above fifteen, which is described separately throughout the whole period, i.e. 1749–1855. In order to obtain comparable statistics, unmarried men above the age of fifteen in the categories “farmers” and “crofters” are included in the category “others without property”.

5.3 Tithe Registers (Sw. *Tiondelängder*) and Livestock Registers (Sw. *Boskapslängder*)

The geographer Torsten Lagerstedt's inventories on harvest and stock farming, gathered in the 1940s, have been used as source material /Lagerstedt 1968/. The disadvantages incurred by not using the original source material include the fact that possible errors in Lagerstedt's work, which are now difficult to establish, may be included in this study. There are, however, considerable benefits to be gained by using this material. Lagerstedt's inventories are, for example, clear and easily accessible. His inventories of registers for all of the parishes concerning the 1640 harvest have been used. Deciding exactly what units of measurement were used at this time has been somewhat difficult. This is because the same units were not used in all areas of Sweden. However, according to Lagerstedt's notes, the units that were used in Uppland in 1640 were *tunnor* (barrels), *fjärdingar* (firkins) and *kappor* (gallons), while in Småland the units were *tunnor*, *skäppor* (bushels) and *kannor* (pottles)³.

Torsten Lagerstedt's summaries of livestock registers (Sw. *boskapslängder*) have been used to find out how stock farming varied in the different parishes. Information concerning Österlövsta and Hållnäs is from the year 1627, but for the parishes of Valö, Börstil and Forsmark the year is missing. There are some difficulties in comparing the two areas in Uppland and Småland since Lagerstedt's summaries lack information on specific parishes in Småland. Here the registers on stock farming encompass the whole counties (Sw. *häradar*) of Tunalän and Stranda from the year 1628.

³ The English terms do not fully correspond to the Swedish.

5.4 Registers of Household examinations rolls (Sw. *husförhörslängder*)

The local study areas are partly based on the Household examinations rolls, the so-called *husförhörslängder*. These registers were compiled every five years when the parish priests visited every household in the parish to examine the religious knowledge of the people in the household. The registers are thus a good source for gaining data on all the non-farming households. The register covers craftsmen, sailors, salesmen and other people living in the parish. In the detailed study areas, such registers exist for the period after 1750. In this investigation we have used registers for every 50th year from 1750 up to the end of the 19th century. This material provides reliable and detailed information for different kinds of households at the local level. This material also makes it possible to elicit information about the people and the households in the non-farming categories. It is also possible to elicit information concerning the actual subdivision of farms, which is lacking in the official cadastral books. The *husförhörslängder* represent a very time consuming source material and it has therefore only been possible to use them in the local studies.

Medieval sources and the tax-register of 1312

In the local studies it has been possible to investigate settlement and land ownership structure during the Middle Ages. Sources from the medieval times are very scarce in Sweden, partly because of the fire in the Stockholm castle at the end of the 17th century when a lot of medieval documents were destroyed. For Northern Uppland only a few documents exist. On the other hand, there is an almost unique source for the early 14th century, the so-called *Markgäldsförteckningen*. This is a land register compiled in 1312 in order to collect a supplementary tax from the inhabitants in Sweden. This register is only preserved for the northern part of Uppland. The register records every taxpayer in the area. Some of the people mentioned in the register are farmers, while others were probably not farmers but instead engaged in trades such as fishing and crafts. In Eastern Småland there are commonly more documents preserved. Unfortunately this is not the case for the detailed investigated area in Misterhult.

A commonly used method in gaining an understanding of the areas during the Middle Ages is the combined use of the land taxation register from the mid-16th century and the scarce medieval documents.

Household examinations rolls have been used in the detailed study. This source has made it possible to illustrate household size and household-structure. However, because the task of going through these registers is a very time consuming, only selected parts of the parishes of Misterhult and Valö have been studied. Furthermore, the names of the people living in some of the farmsteads have been noted for a series of years.

6 Identifying landscape transition and values through interviews

This study aims to examine landscape and livelihood transformation during the past half century. The analysis focuses on how the landscape has been maintained and perceived, and employs an insider perspective which prioritises the perspectives of the inhabitants and land users in order to better understand landscape transition. It approaches processes of landscape change by means of a synthesis of aspects that contribute to the livelihoods and meaning for farmers and landowners.

The landscape is transformed by a wide variety of interacting processes that are affected by changes in physical resources, values and intentions. In order to understand the relationship between man's activities and the land, changes in land use and landscape must be understood through people's intentions and valuations of agriculture and landscape. The sources used in this study are interviews with land users in the areas of Forsmark and Simpevarp near Oskarshamn.

It is possible to contextualise an understanding of the attitudes of various individuals, which in turn makes it possible to understand the transformation of ideas and values. This, in turn, makes it possible to understand land use and the resulting changes in the physical landscape. The contextualisation of land users' valuations has made it possible to understand the grounds on which landscape is transformed and the expression this leads to in the physical landscape.

The selection of interviews is based on two criteria. Firstly, on the basis of demographic coverage, whereby both younger and older farmers and landowners are represented. Secondly, on the basis of geographical coverage, whereby different kinds of typical landscape configuration are represented.

This two dimensional procedure for selecting informants has been deployed in order to be able to explore the variations in attitudes to agriculture and landscape. How are historical and current patterns of land use explained by people in the areas and how do their stories differ?

The interviews are semi-structured and are organised around certain themes and several prepared questions. They are, however, conducted as discussions in order to allow different areas of interest initiated by the respondents to be followed up. This gives the interview more the character of a discussion than a questionnaire /Arnstberg 1997/. On many occasions the discussions follow tracks which may initially be understood as unique and trivial. Very often, however, the following interviews elicit similar results or important contrasts in relation to the first interviews. From conversations about memories, places, experiences, land use and all the small banal daily trivialities connected to living in a specific place, it is possible to collect shifting insights from different land owners and land users. These insights say important things about both current and former land use, and also provide important insights about the possibilities of life of and in the studied landscape.

To further understand the opportunities and local conditions for farming and land use, the economic and topographic maps have been used while interviewing. Former and currently used areas are marked directly on the maps /Wästfelt 2004/.

All of the interviews have been conducted at the respective homes of the land users/land-owners in order to ensure their comfort and convenience. One methodological problem associated with the ambition of reaching an inside understanding is avoiding taking a position in which the stories are looked upon from outside. Chaterine Kohleer Riessmann writes, "Informants' stories do not mirror a world out there" /Kohleer Riessmann 1993, s.5, cf Kvale 1999, s. 60/. To avoid this problem, the interviews are conducted while being and walking in the landscape while discussing land use and landscape /Ingold 2000/. Even if it may never be fully possible to capture the inhabitant's perceptions of landscape, seeing landscape together is at least one way of closing in on this goal.

The possibility of capturing the social dimensions of landscape have shown to be wide, too wide in many cases. An hour-long interview is easily able to create material that includes so many memories, valuations, relations and associations of all kinds. In many cases it is the reasoning and not the explicit formulated questions that are most informative. This often becomes evident when the interviews are analysed in relation to each other. It is in these intersections of different stories that the useful interpretation rests.

In sum, the methodological approach is based on the idea of putting together and creating a picture of a whole landscape from the positions of different inhabitants /Wästfelt 2004/. This makes it then possible to say something in general about typical local processes on an aggregate level.

The study has been restricted both by limitations of time for interviewing, and by the fact that SKB insisted on being in contact with all respondents before I was permitted to conduct the interviews. The latter had the consequence that no one allowed me to tape the interviews. In turn, this was a limitation because it isn't possible to note all details when interviewing, especially when the interview method uses discussions as described above.

One specific and important part of this study is to map the organisation of land use. Has this changed over the last decades? If so, how has it changed? What types of production are common in the areas, and are they combined with other ways of earning a living?

What are the main ideas concerning land use in the future? The themes which have been discussed in this study are primarily:

- The type of cultivation, the current landuse, the historical land use.
- Ways of earning a living other than through agriculture.
- Landuse and its changes during the last 50 years
- The possibilities for landuse, today and in the future.

7 Settlement history

The history and geography of settlement in Sweden has been studied for a long time. Research in this field of study has mainly been carried out in the disciplines of archaeology, history and human geography. In the period from the 1960s up to the early 1980s, settlement change and history were debated in all of these disciplines. Important works were published by archaeologists such as /Ambrosiani 1964/ and /Hyenstrand 1984/. The human geographers /Helmfrid 1962/ and /Sporrong 1971, 1985/ made significant contributions to the study of medieval and early modern settlement, historians such as Lars-Olof Larsson carried out a number of important studies on medieval and early modern settlement /i.a. Larsson 1972, 1975, 1981, 1983/, and Gissel carried out a project dealing with abandoned medieval settlements /Gissel et. al 1981/. This legacy constitutes the methodological base for the following study of settlement and population. One of the key discussions in this debate concerned continuity or change in the settlement system. Because of this debate, it became evident that there were not only regional differences but also significant temporal changes in terms of desertion and colonisation.

This section deals with settlement. The information is drawn from a variety of sources: Cadastral books (Sw. *Jordeböcker*), the earliest written documentation (Sw. *tidigaste skriftliga belägg*), tithe registers on harvests (Sw. *tiondelängder*) and livestock registers (Sw. *boskapslängder*).

7.1 The towns

Östhammar was founded in 1368. Öregrund was established in 1491, because the harbour at Östhammar had become too shallow due to land rise in the area. The townsmen in Östhammar complained about this and asked for permission to move the town. However, in 1509 the Danes burnt down Öregrund and many townspeople moved back to Östhammar. King Gustav Vasa decreed that no townspeople be permitted to live in Öregrund, and he placed the town in the charge of a bailiff to ensure that all citizens left the town. However, the bailiff sold pieces of land to fishermen and the town survived. Östhammar grew in size but because of a lack of town land the town's aerial expansion was very limited. This was the cause of many arguments between the townsmen and the farmers from the surrounding villages over the right to use pasture land for the town cattle, and also about fishing rights. These conflicts lead Gustav Vasa to decree that the townspeople had to move back to Öregrund in 1554 and the town was granted new privileges. In the 17th century Öregrund cared for the transportation of iron from the iron works in Uppland to Stockholm. The major source of livelihood for the people in Öregrund was, however, the sea, and many seamen and fishermen lived in the town /Sandelin 1992 p 12 ff/.

In 1646, the small market town (Sw. *lydköping*) of Döderhultsvik was established. Döderhultsvik was granted town rights in 1856 and the name was changed to Oskarshamn /Nilsson 1992 p 105/.

7.2 Landed estates

Throughout the Middle Ages and up to the end of the 17th century, several farms in Misterhult parish belonged to an aristocratic landed estate. One of the manors in the area during the later part of the Middle Ages up until the beginning of the 17th century was Tjustgöl. In the mid-16th century King Gustav I confiscated this manor and the estate. At the beginning of the 17th century, the landed estate was leased to Peder Mikaelsson. He was subsequently knighted and founded the noble dynasty of Hammarsköld. In 1628, he founded the manor of Misterhult, which subsequently became the manor of the Hammarsköld estate in Misterhult parish. During the 17th century, members of Peder Mikaelsson's family founded several new manors in the parish. At the end of the 17th century many farms belonging to the estate were reappropriated by the crown, but Stora Misterhult and Fårbo remained as manors /Almquist 1976 p 1209, p 1321, p 1396 and p 1580/. The farms, which were under the manors during the 17th century, belonged to the crown from the end of the 17th century. Many of those farms were then bought free and became freehold.

During the Middle Ages a landed estate called Bråhult Estate (Sw. *Bråhultsgodset*) existed in Kristdala parish. The centre of the estate was a manor in Bråhult in the so-called Bråbygden. The estate was probably established in the mid-14th century when an aristocratic family called Ruska purchased some land in the area (DMS 4:4 p 51). In 1350 Bråhult is mentioned as the manor of the estate. The estate was sold to Queen Margareta at the beginning of the 15th century and remained under the crown until the end of the 16th century when it was later leased to a noble family called Sabelsköld. At that time Bråhult was still the manor of the estate. During the second half of the 17th century, the estate was taken back by the crown and the manor was divided into four ordinary farms /Almquist 1976 p 1134/.

In Döderhult parish, several farms had belonged to different landed estates since the early Middle Ages. At the beginning of the 14th century there was a manor in the village of Döderhult (DMS 4:2 p 166). Several farms belonged to this manor. During the 14th century a family called Finstaätten (DMS 4:2 p 164–195) owned another landed estate in the parish.

Between the end of the 16th century and the beginning of the 17th century, a landed estate was created around the Forsmark iron-works. The crown owned the estate and the iron-works until 1624. After that it was in private hands /Almquist 1931/. The iron-works was built on the site of the former village of Bolunda and the land became a part of the estate of Forsmark iron-works (DMS 1:1). Kallriga, later called Johannesfors, was also a part of the estate. At the end of the 17th century the whole area north of Forsmark iron-works, including several farms such as Gunnarsbo, Frebbenbo and so on, belonged to the Forsmark estate.

Gustav Vasa formed a state demesne (Sw. *Kungsgård*) on the island of Gräsö by buying almost all of the farms between the years of 1549 and 1552. In 1622, Gustav Vasa gave the state demesne, Risten and Fårön to Nils Bielke and Gräsö state demesne was turned into a manor called Dudregården (= Duderö?) /Sandelin 1992 p 33/. In 1685 the manor, which by then had nineteen subordinate crofter's holdings, was taken back by the Swedish Crown. In 1787 Samuel af Ugglas purchased the manor and the af Ugglas family owned the manor until the mid-19th century /Borgegård 1998 p. 59/.

7.3 Farms and villages

Before urbanisation and the land reforms of the 19th century, the majority of the settlements in Sweden comprised small villages or hamlets. Many of the hamlets comprised three, four or five farms. A further characteristic of the settlement pattern was that single farms were dispersed in the landscape. Indeed, in many of the forested regions, which comprise most of Sweden, this was the most common characteristic during the late medieval and early modern period. In some parts of Sweden there were villages with more than eight or ten farms. This was true for southern Sweden, Skåne and for parts of Västergötland and along the rivers in Norrland in northern Sweden, Norrland. The villages in the north were probably established earlier than those in the south of the country. The hamlets display significant regional differences and had their own characteristic features in terms of village-plans, types of house construction and field layout. Many of the farms within a village belonged to different landowners. Accordingly, some farms could be owned by crown, others by the farmers themselves and yet others by the church or noblemen.

7.4 Crofts

Crofts (Sw. *Torp*) were not very numerous in Sweden during the 16th century, although some were to be found on the larger noble or royal estates. The number of crofts increased during the 17th century. Most of these were to be found on larger and smaller estates, but also to some extent on village lands owned by farmers. During the following centuries the number of crofters increased enormously. They provided workingforce for the farms during the 19th century. They also were involved in industrial production and worked in the forests making charcoal and transports.

7.5 The Medieval period

In the Forsmark area the tax register (Sw. *markgäld*) from 1312 includes the parishes of Hållnäs, Valö and Österlövsta. This tax register makes it possible to show the settlement changes between 1312 and c 1550. This is especially so for the cases of Hållnäs and Österlövsta for the reason that the actual farmstead of each taxable person is registered. In Valö, only a few farms are mentioned by name in the tax register, which makes detailed analyses of settlement expansion more difficult. The tax register from 1312 is unique in its kind and it covers a large part of northern Uppland /Dahlbäck 1974/. This kind of source material does not exist for the Oskarshamn area.

We do not know if the 1312 tax register (Sw. *markgäld*) really mentions all settlement units in the parishes at this time, the farms belonging to the church and the nobility are for example probably not included (DMS 1:1 p. 44). However, the majority of the farmsteads that existed in c 1550 belonged to freeholders. Only a few farms belonged to the church and the nobility in the investigated area around Forsmark. A comparison of the tax register from 1312 and the cadastral book from c 1550 indicates a substantial decrease in the number of settlement units. For the case of Valö, the decrease in settlement units is from 122 in 1312 to 65 units in 1540. In Hållnäs, the number of settlement units reduced from 135 in 1312 to 57 in 1546. In Österlövsta, the number of settlement units reduced from 166 in 1312 to 82 in 1554. It is interesting to notice that 24 cadastral units without settlement (Sw. *utjordar*) are registered in the 1554 cadastral book for Österlövsta, something that usually indicates deserted settlement units.

As the number of settlement units decreased between 1312 and the mid-16th century, the number of settlement names more than doubled in Hållnäs. In 1312 there were 11 registered names while in 1546 25 settlement units were mentioned, i.e. 13 new names were registered. The source material indicates a similar development in Österlövsta where the number of names increased from 14 in the tax register from 1312 to 53 in the register from 1554, i.e. an increase of 39 units. It is particularly interesting to note that the vast majority of the “new” settlements in both Hållnäs and Österlövsta consist of settlement names with the suffix –bo and –boda. The circumstances concerning the larger numbers of settlement names and the smaller number of taxpaying farms can probably be explained by the emancipation of the settlement units that had been colonised during the early Middle ages /Windelhed 1995, Dahlbäck 1974/. These colonised units were built in the forests of the existing settlement units and were formerly recorded under the names of the existing units in 1312. In the mid-16th century the colonised units were emancipated and were recorded under their own names in the land registers.

Since the 1312 tax register is based on persons liable to taxation, the register may also be used to estimate the population size at this time. However, the various ways in which scholars have variously interpreted the 1312 register has been a cause for dispute. /Broberg 1990 p. 92/, for example, interprets the 1312 register as representing all adult men and not households. The population development according to his figures is less probable since there was no decrease in population during the late Middle ages. /Dahlbäck 1974/ interpreted the register as representing one household. If the numbers of persons paying taxes are each assumed to represent one single household then a total of 166 people living in Österlövsta, 135 in Hållnäs and 122 persons in Valö were liable to taxation. If the average household is estimated at c 6–8 persons, i.e. 4–5 adults and several children, the population size in Österlövsta would be c 996–1328 individuals. The estimated population size in Hållnäs would be c 810–1080 persons, and in Valö c 732–976 individuals (see Table 7-2). This can be compared to the estimated population sizes in 1571 (based on “Älvsborgs lösen”⁴), which indicate that Österlövsta had c 604 inhabitants, Hållnäs c 513 inhabitants, and Valö c 264 persons /Andersson Palm 2000/.

As we can see in Table 7-1, the figures indicate a remarkable decline in population between 1312 and 1571. In Österlövsta and Hållnäs the approximate population size in 1312 could have been as much as double the estimated population size in 1571. In Valö the estimated population size in 1312 was almost three times larger than in 1571. The estimated figures in 1312 correspond more to the population sizes in 1620, than in 1571.

Table 7-1. Estimated population in three parishes. Sources: DMS 1:1, /Andersson Palm 2000/.

Village	Estimated population 1312	Approximated population 1571	Population 1620
Österlövsta	996–1,328	604	953
Hållnäs	810–1,080	513	628
Valö	732–976	264	455

⁴ A specific tax that was collected for the payment of Älvsborgs castle that had been captured by the Danes in September 1563 and in May 1612.

The decline in population then caused a decrease in the number of farms. This process is explained by the late medieval crises. The population decrease can more directly be explained by the recurrent plague epidemics after 1349. More generally, these epidemics are known to have occurred throughout northern Europe and it is commonly accepted that the decrease in the population during the late Middle Ages also caused farm desertions. These desertions were probably more extensive in marginal areas and in areas characterised by early medieval colonisation /Gissel et. al. 1981 p. 66 ff, especially p 105/. According to the figures in Table 7-1, the population decrease in the Forsmark area suggests an extensive

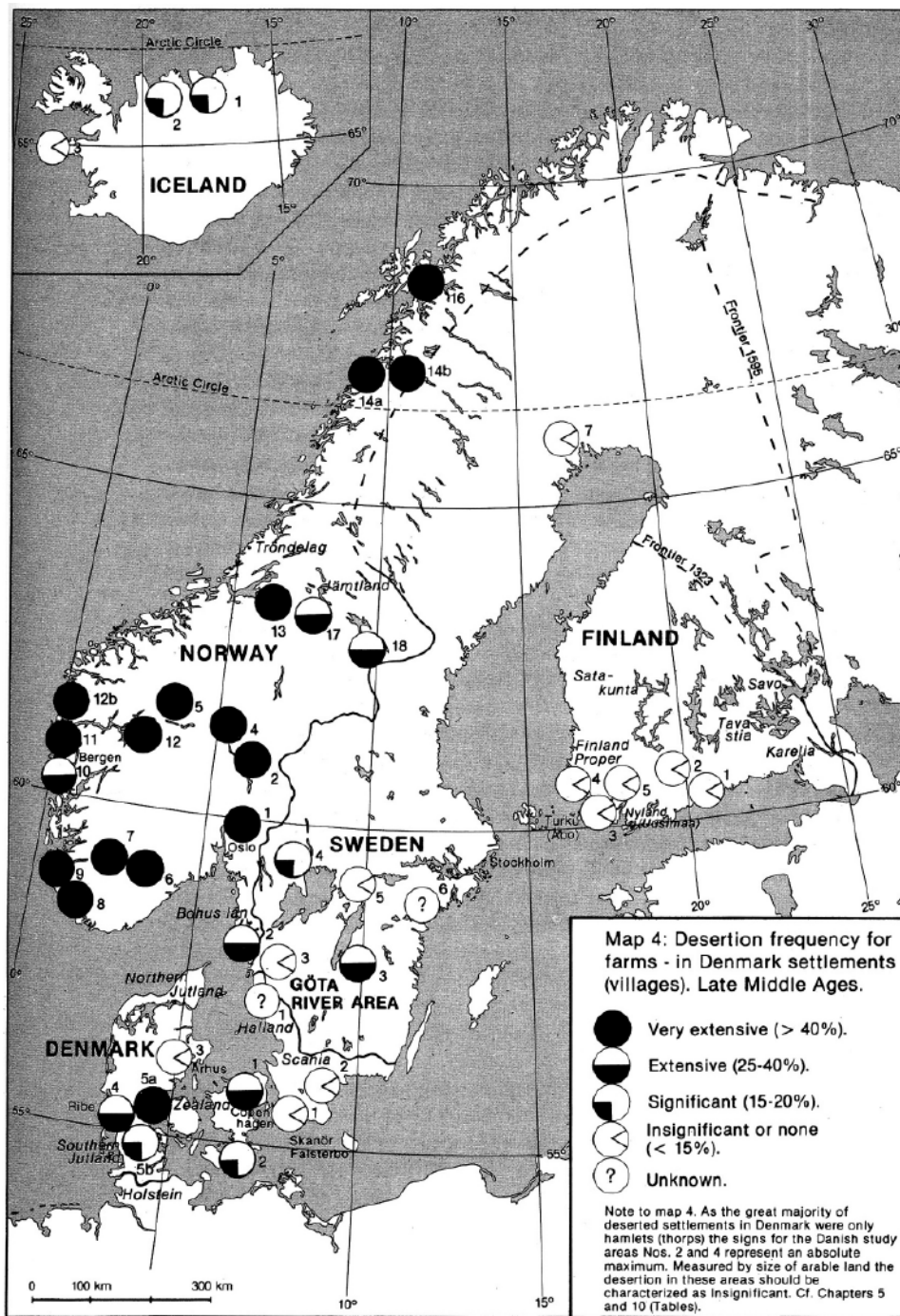


Figure 7-1. Map showing the frequency of farm desertion in the Nordic countries. /Gissel et al. 1981/ p 103.

desertion of farms. In Hällnäs parish for example, the number of farms was probably at least 94 in 1312 and 63 in the 1540s /Broberg 1990 p 95/. At least about 33% of the farms in the area seem to have been deserted in the late Middle Ages. This corresponds with the scale of farm desertion in Norra Vedbo hundred in the inner part of Småland during the Middle Ages /Bååth 1983/. In Norra Vedbo about 36% of the farms were deserted. For the Oskarshamn area, there are no reliable sources to enable a reconstruction of the number of farms before the 16th century.

7.6 The early modern period until today

As is shown in 1, the number of settlement units increased in all parishes from the middle of the 16th century to the end of the 19th century. However the increases are generally rather small, which means that the number of settlement units has been quite stable during the period. The greatest increase occurred in Döderhult, where number of settlement units increased by c 51%.

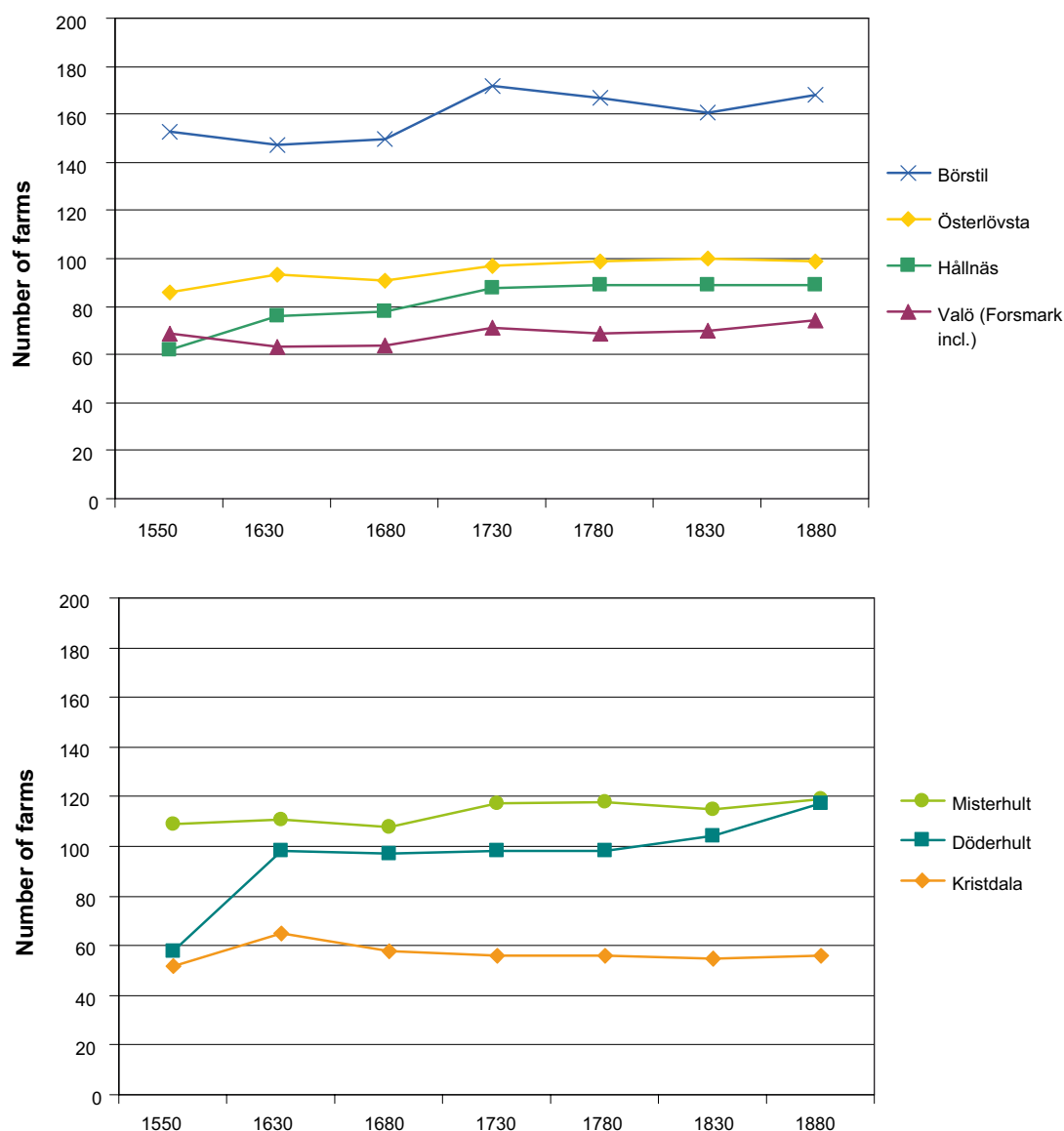


Figure 7-2. Number of settlement units (farms) in the Forsmark and Oskarshamn regions. Source: Cadastral books in Österlövsta, Valö, Hällnäs, Börstil, Misterhult, Kristdala and Döderhult.

A general characteristic of the settlement history is that there was a transition from predominantly full size (Sw. *hela*) farms in the 16th and 17th century to smaller farms in the 18th and 19th centuries, i.e. 1/2, 1/4, 3/4 and 3/8 farms became common. Examples from Österlövsta parish are provided in Table 7-2. This transition corresponds with the common settlement development in Sweden during this period. It is important to notice that farm subdivisions, which are described in Section 7.7 below, were not recorded in the cadastral books. The process towards smaller farms was caused by the increase in population as well as tax reductions. The latter was rather common since many of the farms came to be co-inhabited by several families and were therefore granted tax reductions.

Table 7-2. Österlövsta parish illustrates the settlement history in the area. Source: Cadastral registers, Österlövsta.

Härad	Oland	Oland	Oland	Oland	Oland	Oland	Oland
Socken	Lövsta	Lövsta	Lövsta	Lövsta	Lövsta	Lövsta	Lövsta
År	1550	1630	1680	1730	1780	1830	1875
Skatte (Freehold)							
Hela	82	49	47	18	18	18	18
Halva		28	27	6	6	6	7
1/4dels		1					
1/8dels					2	2	2
Utjordar	24					1	1
Summa skattehemman	82	78	74	24	26	26	27
Krono (Crown) (Kyrko inkl.)							
2 mantal		5	5	1	1	1	1
Halva		3	3	1	1	1	1
1/4dels		1	3				
1/8dels				2			
Klockarbol				1	1	1	1
Torp				2	1	1	
Lägenhet							1
Utjordar				1	1		
Ängar					1	1	
Vret			1				
Summa kronohemman	4	9	11	5	3	3	3
Kyrko (Church)							
Hela	4						
Summa kyrkohemman	4						
Frälse (Noble) Säteri and rå och rör inkl.)							
Hela		5	5	31	32	33	31
Halva		1	1	23	30	22	23
1/4dels				5	6	5	5
1/8dels				2	2	2	2
Torp					8	2	2
Utjordar					1		1
Vret							1
Summa frälsehemman	0	6	6	68	70	71	69

Härad	Oland	Oland	Oland	Oland	Oland	Oland	Oland
Frälsesäterier							
2 mtl			1	2	1	1	
Hela			2		3	2	
Uppodling					1		
Summa frälsesäterier			3	2	4	3	
Rå och rörshemman							
1 ½			1			1	
Hela			1		1	1	
Halva			1		3	2	
2/3dels			1		1	1	
Vret					1		
Utjordar					1		
Summa rå och rörshemman			4		5	5	
Total without crofts, utjord, etc	86	93	91	97	99	100	99

According to the cadastral books, the numbers of crofter's holdings were generally small in Kristdala, Misterhult and Döderhult parishes and no increase in the number of crofters occurred during the 18th and 19th centuries. In Döderhult the number of crofter's holdings was in fact larger in the 16th century – c 30 crofter's holdings – than in the 18th and 19th centuries. However, it is important to note that not all crofters' holdings were registered in the cadastral books, since these settlements were not taxed. Hence, the number of crofter's holdings in the 18th and 19th centuries is likely to have been higher.

According to the social population structure, which is confirmed by the cadastral books, the number of crofters increased between 1750 and 1850. In Uppland there was a general increase in crofter's holdings during the 18th and 19th centuries. In Österlövsta, Hållnäs and Valö however, the increase was rather modest, as there were c 2–8 crofters' holdings in each parish during this period. In Börstil, on the other hand, there was a sizeable increase in the number of crofters, as there were between 20–32 crofters' holdings from c 1730 to the end of the 19th century.

Concerning the cadastral units without settlement (Sw. *utjordar*), the general picture in the investigated areas is that the *utjordar* were more frequent in the Uppland parishes than in the Småland region. In Kristdala, the number of *utjord* was low during the investigated period. In Misterhult the number of *utjord* was even lower, since the only two that are mentioned are found in the 1730 cadastral book. In Döderhult, the number of cadastral units without settlement was slightly higher than in the other two Småland parishes. Here we can also see a clear change in the number of *utjord*, as they were quite common in the 16th and 17th centuries (c 7–10), and reduced in the 18th and 19th centuries, when only one *utjord* was registered. This reduction in the amount of *utjord* in the 18th and 19th centuries is quite similar to the development in Hållnäs, Valö and Österlövsta and corresponds with the national Swedish pattern. In Österlövsta however, as many as 24 of these units were registered in the oldest cadastral book. In Börstil a somewhat different pattern is found, as the occurrence of *utjord* was much more frequent and actually quite stable during the investigated period. In the middle of the 16th century there were as many as 47 in Börstil. A hundred years later the number of *utjord* was 11, but in the following investigated period the number of *utjord* increased and remained stable at around 25.

The term *utjord* is often used to denote former settlement units that were deserted during the late medieval crises. They are often quite common in the oldest cadastral books from the 16th century, but as the colonisation of land continued during early modern time, they were often re-colonised /Helmfrid 1962/.

In the investigated area in Småland, a vast number of deserted farms are registered in the 1631 cadastral book. Some of these farms were not abandoned, but their inhabitants received a reduction of taxes for a number of reasons including famine and war. In 1631, nearly 50% of the settlement units in Döderhult were partially or wholly deserted. In Kristdala 17% of farms were deserted and in Misterhult c 22% of the farmsteads were deserted at this time. Why were these farms deserted? A possible explanation can perhaps be found in the expansive Swedish wars during the first half of the 17th century which had a considerable impact on the population and on the ability of the farms to pay taxes /Lindegren 1980/.

7.7 The subdivision of farms (Sw. *Hemmansklyvningen*)

A common development, but with regionally specific characteristics, concerns the subsequent partitioning of farms in the 19th century. This can be observed in the series of maps presented here, and can also be studied in a number of different sources.

This table gives us a good idea of the difficulties involved in using this kind of source material. The cadastral units do not always correspond with the number of households in a village. The general trend is however clear in the table. There were also people owning land in villages where they did not reside. Accordingly, a farm might be divided into three parts, but one of the parts is not the base for a farm, but rather an additional piece of land for a landowner living either near or far from the place.

Table 7-3. Number of units (Sw. *mantalssatta enheter*) in Misterhult and Valö. Figures for 1550, 1630, 1680, 1730 and 1871 are based on cadastral records whereas those for 1750, 1800, 1850 and 1895 are based on the household examination rolls (Sw. *husförhörslängder*). Accordingly, the information from the later mentioned records relates to households moreso than to cadastral units.

	1550	1630	1680	1730	1750	1800	1850	1871	1895
Misterhult									
Basthult, Stora	2	1	1	1			11	1	7
Ekerum							18		9
Laxemar, Lilla	3	3	2	2			12	2	8
Simpevarp	1	1	1	1			8	1	7
Valö									
Botarsbo					2	10	9		12
Lund	4	4	4	4	8	22	11	4	11
Vreta				1	1	2	1	1	1
Lundsvedja	4	4	4	4	7	12	10	4	20
Tomta	1	1	1	1	3	3	3	1	1
Kämbo							1 (croft)		2 (croft)
Dannebo	1	1	1	1	5	7	2	1 (croft)	4

One example that illustrates the complex situation can be drawn from Lilla Laxemar in the investigated area in Oskarshamn. There were seven small plots in 1831. Bengt Adamsson, who lived in Lilla Basthult, owned 1/8, 1/16 was owned by Sven Olsson, and Didrik Nilsson owned another 1/16. The latter two both apparently lived in the village. The rest of the owners were not living or using the lands: one pilot called Alexander Persson. In Langö (1/16), Peter Olsson in “Westerbo” (1/16), the widow Lisa Magnidotter in Äverö (1/16) and the children of Lage Olsson (1/16)

7.8 The modern settlement

While the modern settlement situation is not a focus of this study, a few comments can nevertheless be made. Firstly, it is often the case in rural areas that most features are linked to 19th century settlement. The physical layout of settlement after the last land reform (Sw. *Laga skifte*) is often the feature that we can detect in the present landscape. Also evident are the significant additions from the late 19th century and even moreso from the 20th century. It is also possible to see that some of the settlements from c 1900 have been abandoned in Forsmark. In Oskarshamn it is also possible to observe some degree of abandonment between 1900 and 1950.

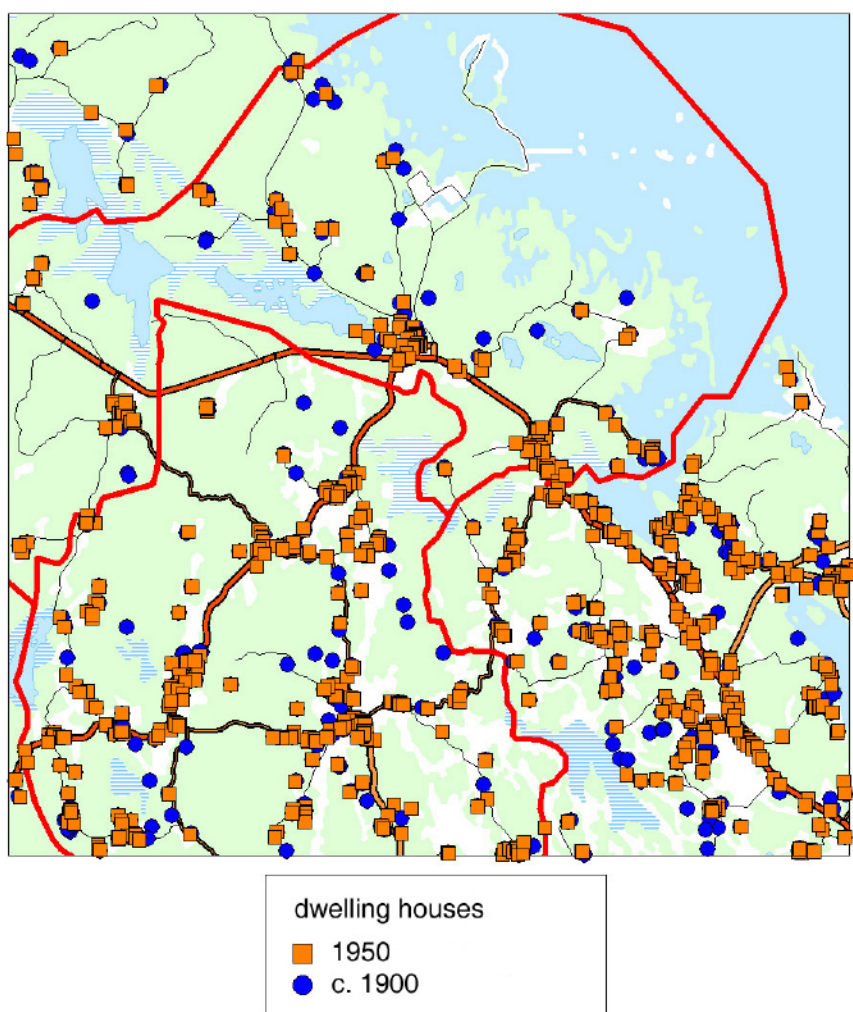


Figure 7-3. In this map it is possible to see the changes in inhabited houses from 1900 to 1950. Some settlements have been abandoned during the period.

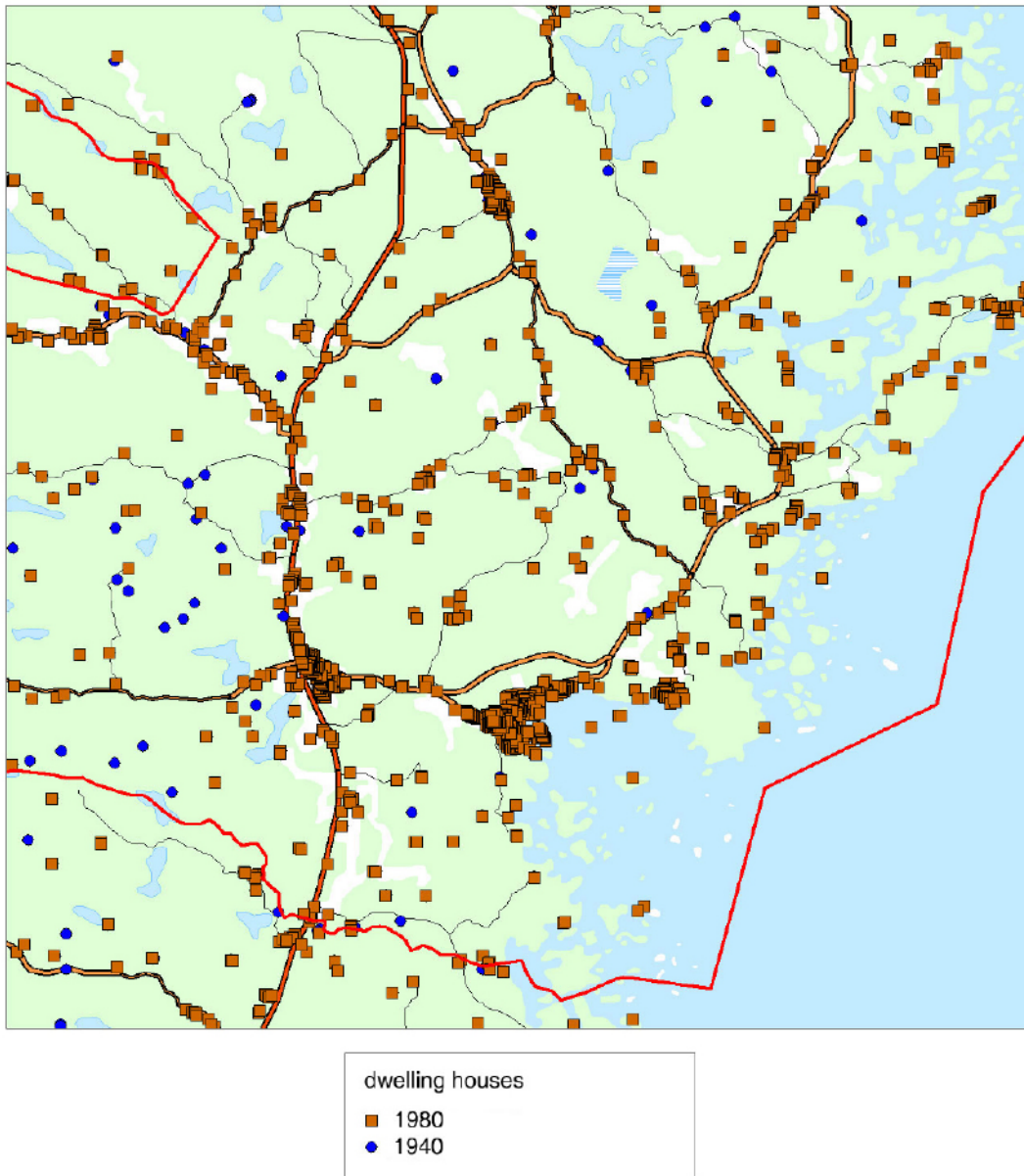


Figure 7-4. In the area close to Simpevarp, it is clear that there are quite a few houses in the rural areas. But in some regions especially in the inland, to the west they have been abandoned.

8 Landed property categories (Sw. *Jordnatur*)

Before the 20th century, landed property in Sweden comprised a number of different categories. The category called *skattejord* was owned and farmed by freeholder farmers who paid taxes directly to the state. Another category was land that was owned by the crown (Sw. *kronojord*), which was farmed by tenant farmers who paid land rent to the crown. The third category was land owned by the aristocracy (Sw. *frälsejord*), also farmed by tenants, but who paid rent to their respective landowners. During the Middle ages there were several other categories of landed property. The church, the bishops and the different monasteries had their own respective category of land. For example, the land that belonged to the monastery of Vadstena was called “farms of the monastery of Vadstena” (Sw. *Vadstena klosterhemman*). During the reformation in the 16th century, King Gustav I confiscated all land belonging to the ecclesiastical institutions and the land was transferred to the crown. However, in the cadastral registers, which cover the period from the mid-16th century onwards and which have been preserved for all areas of Sweden, land continued to be registered according to the medieval categories of landed property. The cadastral registers thus show the late medieval situation. It was not until the beginning of the 18th century that the cadastral registers were revised. From that time onwards only three categories of landed property are used in the cadastral registers; freehold land, crown land, and land belonging to the aristocracy.

In the following sections we use the mid-16th century registers as a base-line from which to look both backwards and forward in time. When looking backwards the land property categories from the late Middle ages are used. When looking forward, the land recorded in the registers as belonging to the church and other categories has been counted as belonging to the crown, which was in fact the case from the mid 16th century onwards (see above).

At least from the late Middle Ages onwards, family farms (Sw. *familjejordbruk*) cultivated most of the land in Sweden. The tenant farms were also small-scale family based farms. The tenants worked their farms and paid a part of the surplus in land rent to the landowners. Large-scale agriculture was only practiced on the demesnes of the crown and the aristocracy.

8.1 The Medieval situation

As has been mentioned above, the land registers from the mid-16th century show the situation for the late medieval period. The cadastral books from the mid-16th century show that none of the farms in any of the parishes in Uppland originally belonged to the crown. Instead, the share of crown land mostly comprises farms belonging to the church. It can also be noted that in Börstil, only a few farms belonged to the royal dynasty (Sw. *Arv och eget*). The freehold farmers constituted the dominant category in the area, something that is true for many regions in Sweden.

Table 8-1. Uppland in the late Middle ages.

	Valö	Börstil	Österlövsta	Hållnäs
Freehold	90.3	85.0	91.1	93.5
Noble	5.6	10.5	–	–
Crown	–	–	–	–
Aoe*	–	0.7	–	–
Church	4.2	3.9	4.4	6.5

* Aoe (Sw. *Arv och eget*) are farms belonging to the dynasty of the king.

The situation in the parishes in Småland in the mid-16th century was somewhat different. In all of the investigated areas there were farms belonging to the crown. In Döderhult, the share of old crown land was rather low, i.e. only c 5%. Instead, most of the crown land consisted of farms belonging to the royal dynasty (Sw. *Arv och eget*). In Misterhult and Kristdala sizeable proportions of farms belonged to the crown. This was especially pronounced in Misterhult where the share of original crown land almost reached a remarkable 80%. Only less than 1% of the crown land in Misterhult consisted of farms belonging to the royal dynasty (Sw. *Arv och eget*). In Kristdala the share of crown land consisted of unity farms (Sw. *Sämjehemman*) and farms that belonged to the church.

Table 8-2. Småland in the late Middle ages.

	Kristdala	Döderhult	Misterhult
Freehold	13.5	10.3	–
Noble	5.8	46.6	20.2
Crown	53.8	5.2	78.9
Aoe1	–	37.9	0.9
Sämje*	17.3	–	–
Church	9.6	–	–

* Sämje (Sw. *Sämjehemman*) can be translated “unity farms” are often associated with new settlement in the forest commons.

8.2 Uppland from the 16th century onwards

The freeholder farms were almost completely dominant in the parishes in Uppland throughout the 16th and 17th centuries. Only a small number of farms belonged to the aristocracy and the crown. In the 18th century, this changed and during the 18th and 19th centuries the aristocracy owned the majority of farms. Once again, the pattern in Börstil was somewhat different in that freeholder farms were still quite common, together with an increase in the number of farms belonging to the nobility. Noble estates were established in the 18th century in Börstil and Österlövsta, but not in Valö or Hållnäs. However, the representation of noblemen was considerably widespread also in Hållnäs. In 1646, Mr Louis de Geer, the owner of Lövsta iron-works (Sw. *Lövsta bruk*), purchased almost all of the farmsteads in the parishes of Österlövsta and Hållnäs. The Swedish crown also granted him the right to collect taxes from freeholders. These farmers became “noblemen’s freeholders” (Sw. *frälsekattebönder*) and the farms were considered as noblemen farms. An illustrative example here concerns Hållnäs where, in 1645, c 90% of all farms were freeholder farms

and c 10% were farms belonging to the crown. In 1700 Lövsta iron-works owned c 70% of the farms /Renting 1996 p 61/. The farmers under Lövsta iron-works were required to pay their taxes in charcoal. The establishment of Lövsta iron-works and the demand for charcoal provided a new source of provisioning for the country people. At the same time however this also meant that farmers could no longer be fully self-supporting. This opened the way for the establishment of shop at Lövsta iron-works /Renting 1996 p 8/. According to the cadastral books, in 1680 Louis De Geer owned almost all farms in Hållnäs and Valö. He also owned the vast majority of the farms in Österlövsta and Börstil, even though they were registered as freeholder farms in the cadastral books. The most productive period for Lövsta iron-works was during the middle of the 18th century, when 1200 tons of bar iron were produced per year /Renting 1996 p 10/.

Table 8-3. Farms by category of landed property in Hållnäs parish. Sources: DMS for 1550 and cadastral records (“Jordeböcker”).

	Freehold	Crown	Noble
1550	93.5	6.5	–
1630	85.5	14.5	–
1680	83.3	16.7	–
1730	21.6	17.0	61.4
1780	34.8	4.5	60.7
1825	34.8	4.5	60.7
1880	36.0	3.4	60.7

Table 8-4. Farms by category of landed property in Valö parish. Sources: DMS for 1550 and cadastral records (“Jordeböcker”).

	Freehold	Crown	Noble
1550	90.3	4.2	5.6
1630	88.9	9.5	1.6
1680	80.9	13.2	5.9
1730	28.2	2.8	69.0
1780	29.0	2.9	68.1
1825	27.1	1.4	71.4
1880	25.7	2.7	71.6

Table 8-5. Farms by category of landed property in Österlövsta parish. Sources: DMS for 1550 and cadastral records (“Jordeböcker”).

	Freehold	Crown	Noble
1550	91.1	4.4	–
1630	83.9	9.7	6.5
1680	81.3	12.1	6.6
1730	24.7	5.2	70.1
1780	26.3	3.0	70.7
1825	26.0	3.0	71.0
1880	27.3	3.0	69.7

In Österlövsta, Valö and Hällnäs the share of freeholders dominated in the 16th and 17th centuries and the share of farms belonging to the nobility dominated in the 18th and 19th centuries.

Table 8-6. Farms by category of landed property in Börstil parish. Sources: DMS for 1550 and cadastral records (“Jordeböcker”).

	Freehold	Crown	Noble
1550	85.0	4.6	10.5
1630	83.7	4.8	11.6
1680	71.3	17.7	11.0
1730	46.5	29.7	23.8
1780	62.9	15.0	22.2
1825	65.8	11.8	22.4
1880	65.5	10.1	24.4

In Börstil, the share of farms belonging to the nobility did not increase to the same extent as in the other investigated parishes in Uppland. Here the share of farms belonging to the crown in the 18th and 19th centuries was slightly larger than in the other investigated parishes. The share of freeholder farms was considerable in the 19th century, and much larger than the share of farms belonging to the nobility.

Table 8-7. Farms by category of landed property in Forsmark*.

	Freehold	Crown	Noble
1825	56.3	–	43.8
1871	56.3	–	43.8

* The farms in Forsmark parish were before the beginning of 19th century parts of Valö and Börstil parishes.

In Forsmark, the share of freeholders and the share of farms belonging to the nobility were almost equal and changes very little between 1825 and 1871. Accordingly, it can be concluded that for all of the investigated parishes in Uppland, there was a very significant decrease in the number of freeholder farms and a considerable increase in the number of farms belonging to the nobility. In the 16th and 17th centuries, the share of freeholders was generally large while the share of farms belonging to the nobility was generally small. After 1680, however, the share of farms belonging to the aristocracy increased significantly and at the same time the share of freeholders decreased. The share of farms belonging to the crown was generally quite small throughout the entire period.

In Hällnäs, Valö and Österlövsta we see the same pattern, as the number of freeholder farms, which was rather high in the 16th and 17th centuries, diminished quite substantially in the late 17th century, and was rather low in the 18th and 19th centuries. At the same time the number of farms belonging to the nobility, which was very low in the 16th and 17th centuries, has increased substantially over time. The number of farms belonging to the crown was, on the other hand, quite stable over the period.

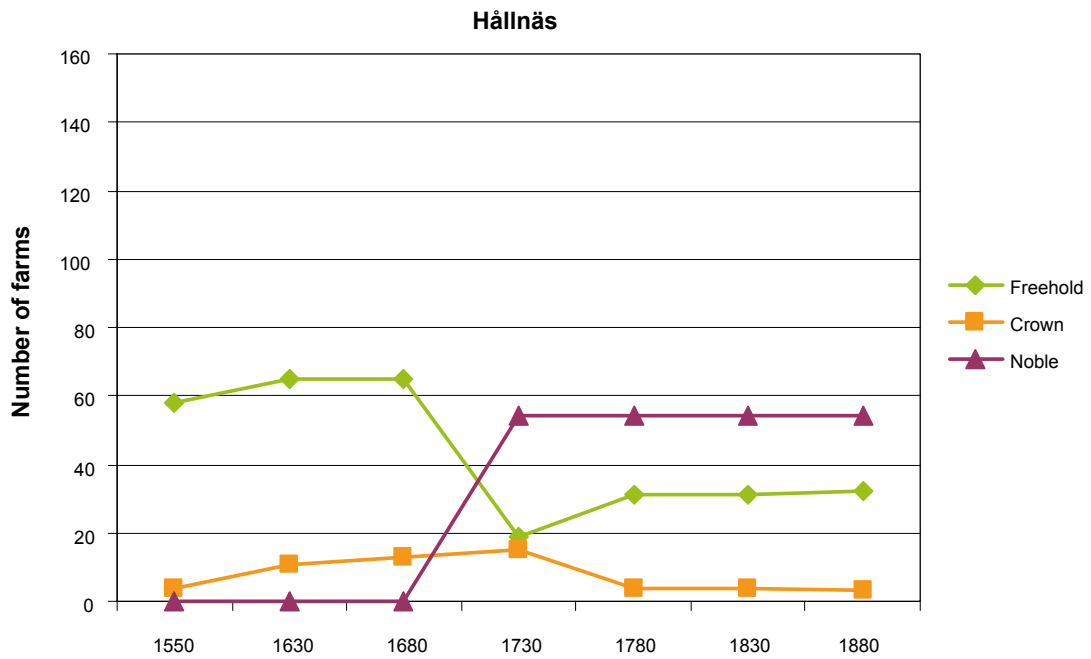


Figure 8-1. Diagram of the changes in landed property in Hållnäs parish. Sources: DMS for 1550 and cadastral records (“Jordeböcker”).

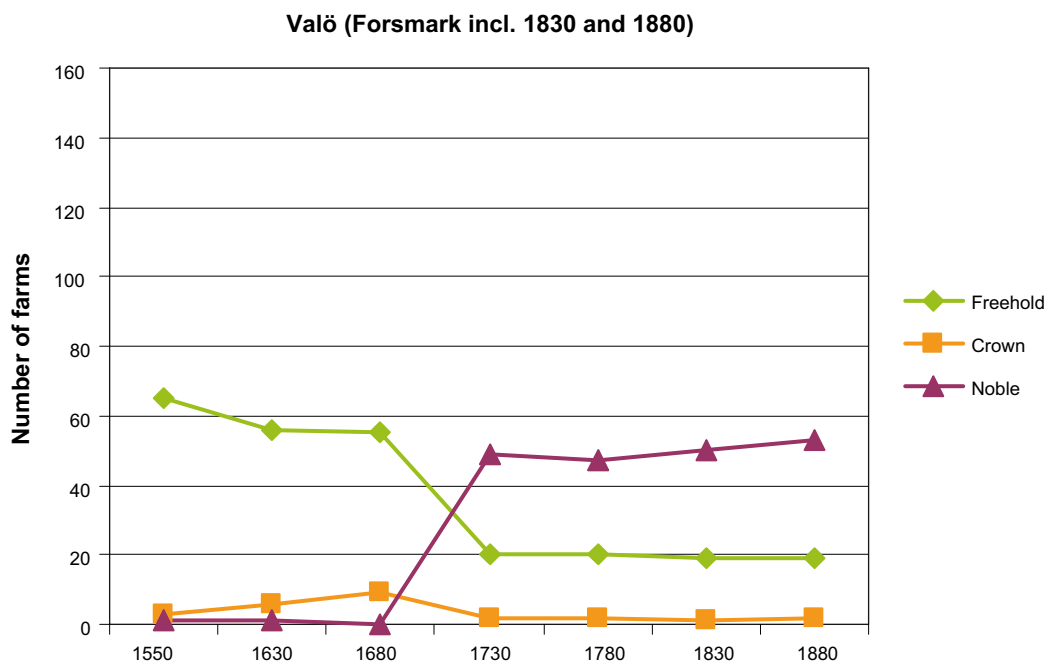


Figure 8-2. Diagram of the changes in landed property in Valö parish. Sources: DMS for 1550 and cadastral records (“Jordeböcker”).

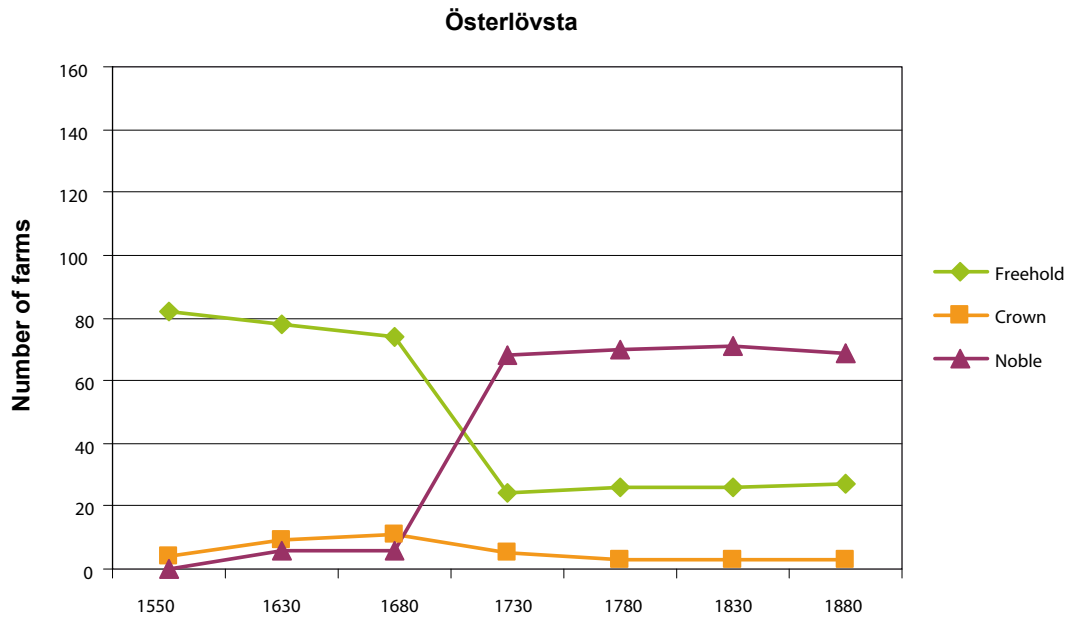


Figure 8-3. Diagram of the changes in landed property in Österlövsta parish. Sources: DMS for 1550 and cadastral records (“Jordeböcker”).

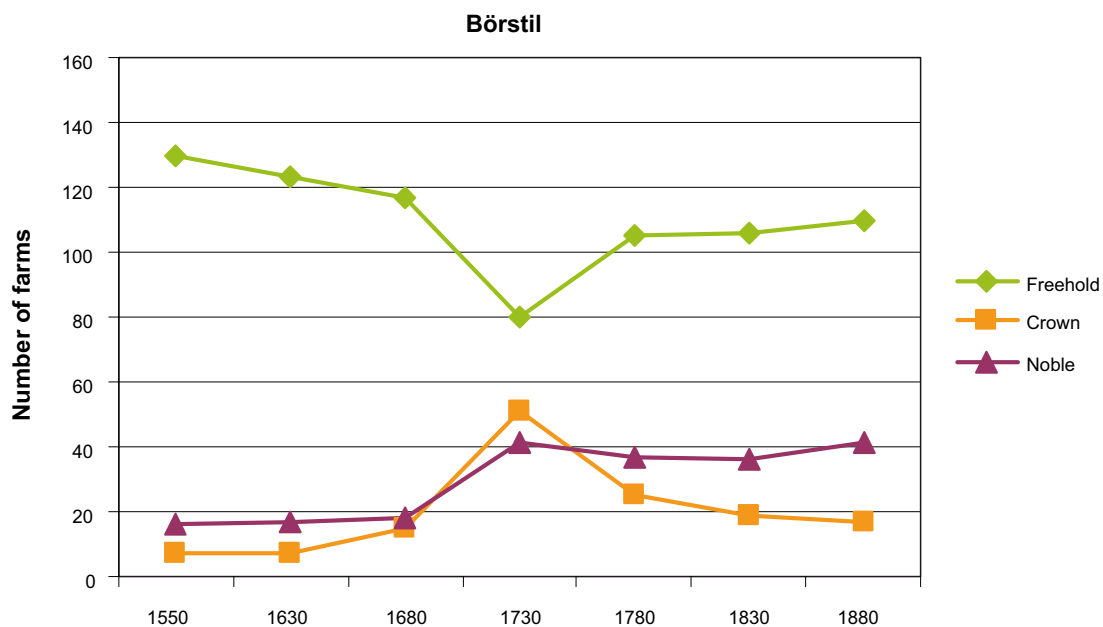


Figure 8-4. Diagram of the changes in landed property in Börstil parish. Sources: DMS for 1550 and cadastral records “Jordeböcker”.

In Börstil we see a different pattern, as the number of freehold farms was quite high throughout the entire period. However, by the end of the 17th century the number of freeholder farms had diminished, and at the same time the number of farms belonging both to the crown and the nobility had increased. By the end of the 18th century, the number of freeholder farms increased again and the number of farms belonging to the crown decreased.

8.3 Småland from the 16th century onwards

In the mid-16th century, the majority of farms in Misterhult and Kristdala belonged to the crown. This clearly indicates that the crown owned the majority of the land also during the Middle Ages. In 1543, the crown owned nearly 80% of the farms in Misterhult while the aristocracy owned 20%. In the same year, the crown also owned around 80% of the farms in Kristdala, and the landed property categories (Sw. *jordnaturer*) were rather scattered. Here about 13% were freeholder farms, c 10% were farms belonging to the church, and c 17% were unity farms (Sw. *sämjehemman*). Likewise, in Döderhult, the landed property categories were quite divided, but also somewhat different, since about 38% of the farms were owned by the royal dynasty (Sw. *arv och eget hemman*). These farms are thus counted as belonging to the crown. The aristocracy owned about 47% of the farms, c 10% were freeholder farms. As is illustrated in the table below, c 43% of the farms belonged to the crown. However, this figure includes not only farms owned by the crown, but also unity farms (Sw. *Sämjehemman*), Bråhultshemman, Arv och eget-hemman, St Erikshemman and farms belonging to churches and monasteries.

By the end of the 19th century great changes in the land ownership structure had taken place in the Oskarshamn area. About 56% of the farms in Misterhult at that time were freeholder farms and 23% belonged to the nobility. Furthermore, c 11% were noble demesnes and around 6% were subordinated farms directly under the demesnes (Sw. *rå- och rörshemman*). This implies that the noblemen owned considerable amounts of land in Misterhult in the late 19th century, around 40%, and that the former domination of the crown had completely disappeared. In Döderhult, c 47% of farms belonged to the freehold category, while about 38% belonged to the nobility. Here the proportion of the farms owned by the crown had decreased from around 43% in the middle of the 16th century to c 14% in the 1880s. However, in the late 17th century the share of farms belonging to the crown reached 70%. This was a result of the considerable decrease in the amount of land owned by the nobility at this time. In Kristdala, freeholder farms constituted the vast majority of farms throughout the 18th and 19th centuries, i.e. around 76%. Of the remaining farms, c 11% were owned by the crown and about 12% by the nobility. For an explanation of the dominant position of the nobility in Misterhult in terms of farm ownership, see the discussion above concerning the Hammarskjöld estate.

Table 8-8. Farms by category of landed property in Döderhult parish. Sources: DMS for 1550 and cadastral records (“Jordeböcker”).

	Freehold	Crown	Noble
1550	10.3	43.1	46.6
1630	11.3	58.8	29.9
1680	9.3	70.1	20.6
1730	26.5	32.7	40.8
1780	44.9	15.3	39.8
1825	50.0	11.5	38.5
1880	47.0	14.5	38.5

In Döderhult there was no single category of landed property that dominated. The share of freeholders increased over time while the share of farms belonging to the nobility decreased somewhat. Concerning farms belonging to the crown, there was an increase in the 17th century, probably due to the reduction of land belonging to the nobility. The decrease in the number of farms belonging to the crown after 1730 was a result of farmers purchasing crown land (Sw. *skatteköp*) and turning the farms into freehold.

Table 8-9. Farms by category of landed property in Kristdala parish. Sources: DMS for 1550 and cadastral records “Jordeböcker”.

	Freehold	Crown	Noble
1550	13.5	80.8	5.8
1630	29.2	66.2	4.6
1680	34.5	60.3	5.2
1730	58.9	26.8	14.3
1780	75.0	10.7	14.3
1825	76.4	10.9	12.7
1880	76.8	10.7	12.5

In Kristdala the share of freeholders increased over time, partly as a result of the purchase of crown land (Sw. *skatteköp*), and this category dominated throughout the 18th and 19th centuries. Behind the large share of farms belonging to the crown in 1550 are about 20% *sämjehemman*. The share of farms belonging to the crown decreased over time and the share of farms belonging to the nobility increased slightly.

Table 8-10. Farms by category of landed property in Misterhult parish. Sources: DMS for 1550 and cadastral records “Jordeböcker”.

	Freehold	Crown	Noble
1550	0	79.8	20.2
1630	0	80.4	19.6
1680	0	80.6	19.4
1730	32.5	26.5	41.0
1780	43.2	16.1	40.7
1825	47.8	11.3	40.9
1880	56.3	4.2	49.5

In Misterhult, crown farms dominated (c 80%) throughout the 16th and 17th centuries. The share of noblemen farms was c 20%, and there were no freeholders. After 1680, however, the share of crown farms decreased and farms belonging both to the nobility and to freeholders increased. The reason for the increase in the share of land owned by the nobility relates to the transactions from the crown to the nobility. The former crown land was controlled by the Hammarskjöld family during the first half of the 17th century. Faced with the threat of losing all their land in Misterhult parish in the late 17th century because of the reduction of noble land, members of the Hammarskjöld family exchanged noble land in other part of Sweden in order to be permitted to retain the land in Misterhult parish. The Hammarskjöld family was settled in the Misterhult area (see above). The purchase of crown land by freeholders caused the increase in the share of the freehold farms.

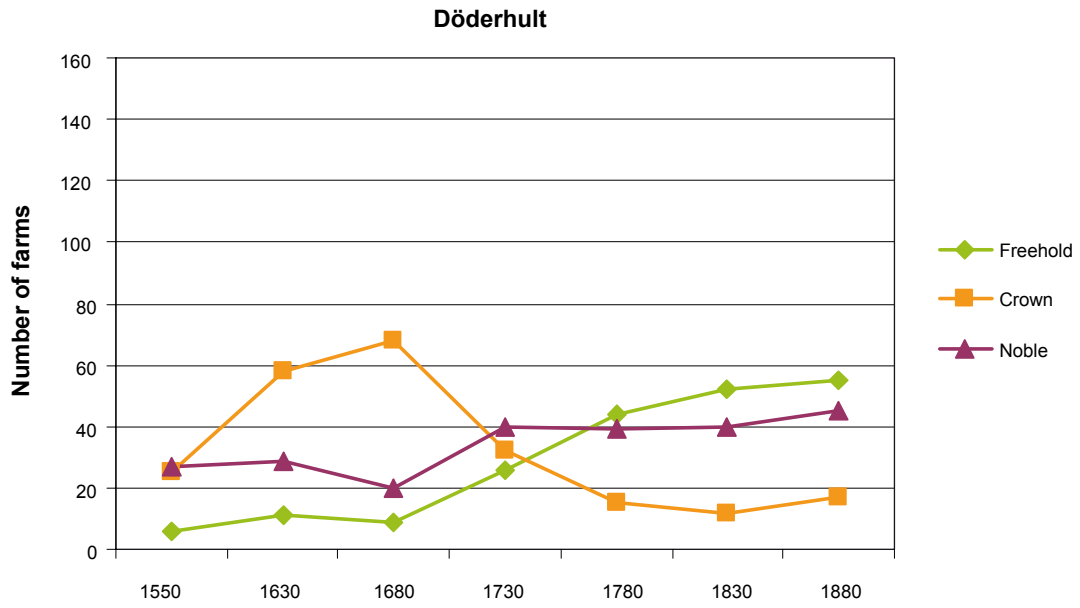


Figure 8-5. Diagram of the changes in landed property in Döderhult parish. Sources: /Ferm and Brunius 1990/ for 1550 and cadastral records (“Jordeböcker”).

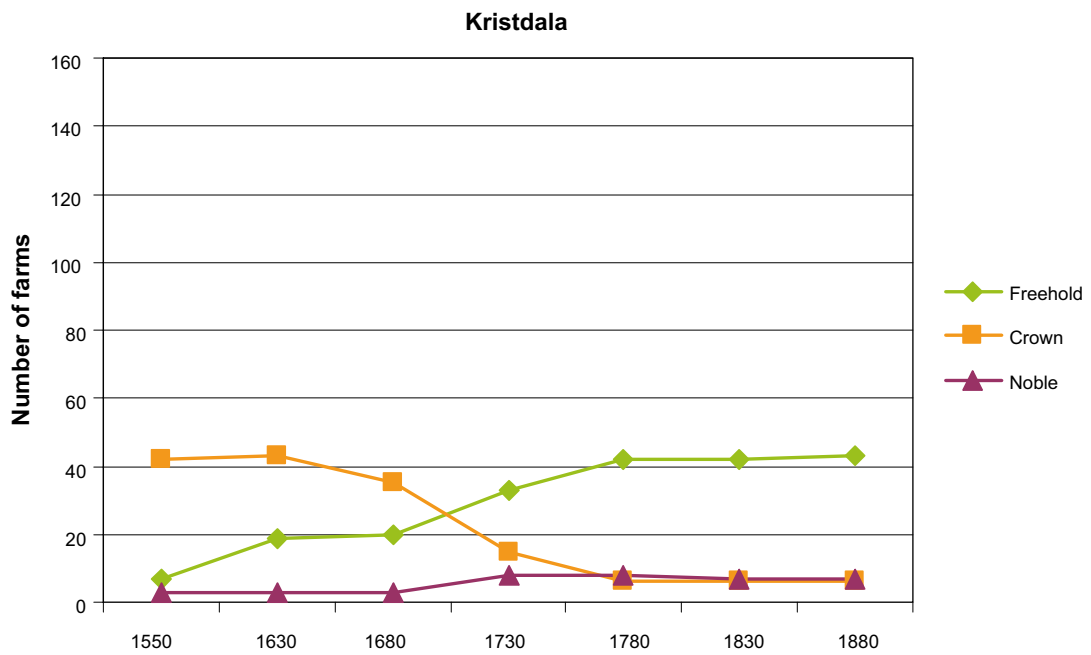


Figure 8-6. Diagram of the changes in landed property in Kristdala parish. Sources: DMS for 1550 and cadastral records “Jordeböcker”.

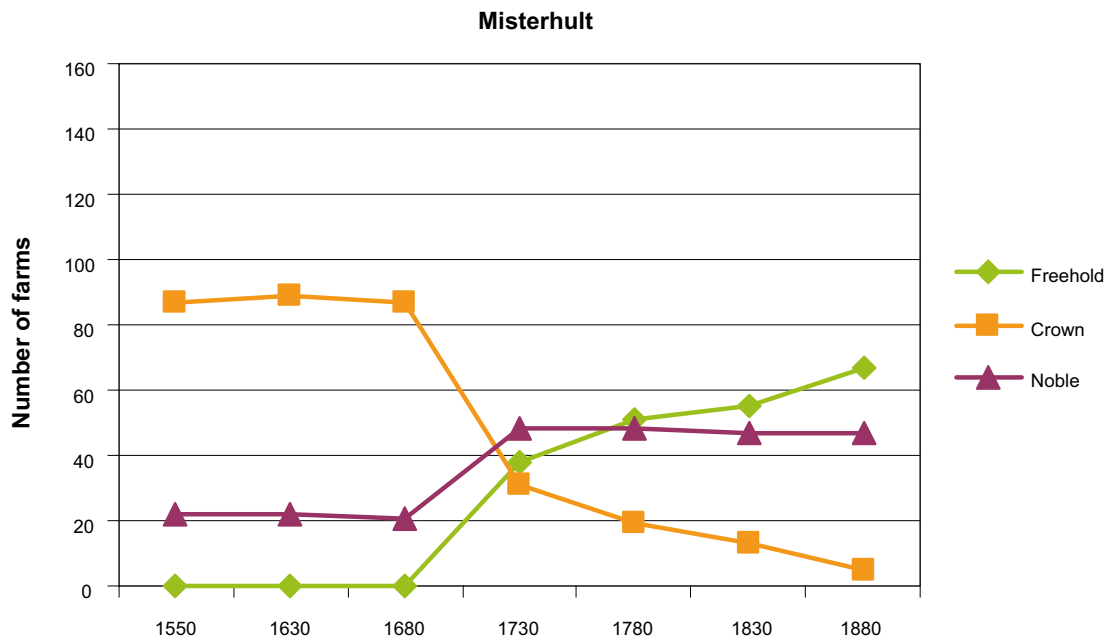


Figure 8-7. Diagram of the changes in landed property in Misterhult parish. Sources: DMS for 1550 and cadastral records “Jordeböcker”.

Essentially the same pattern is discernible for all three of the investigated parishes in Småland. By the middle of the 17th century, the number of farms belonging to the crown was dominant and the number of farms belonging to the nobility and freeholders was relatively small. For the case of Döderhult however, the number of farms belonging to the crown in the mid-16th century was not as dominant as in Misterhult and Kristdala. The number of freeholder farms increased during the 18th and 19th centuries. In Kristdala and Misterhult the number of farms belonging to the crown decreased, while the number of farms belonging to the nobility remained relatively stable. In Döderhult, the number of farms belonging to both the crown and the nobility increased somewhat.

8.4 A comparison

The situation in Uppland in the mid-16th century concerning categories of landed property is representative of the situation in Sweden more generally. In Småland, however, the share of farms belonging to the nobility was slightly larger than the Swedish average, while the share of freeholders was smaller.

Table 8-11. Table showing the amount of farms belonging to different ownership categories in the 1540s.

	Freehold	Crown	Noble and Church
Småland	33	10	57
Uppland	45	3	52
Sverige	46	6	48

Source: Early 1540s, from /Larsson 1985/ p 67, Table 3.

The investigated parishes in the Forsmark area evidence a rather different land owning structure than that which generally characterised Uppland as a whole. The freehold farm category was dominant in the mid-16th century while the share of farms belonging to the nobility was small.

In Kristdala and Misterhult, the share of farms belonging to the crown was unusually large and the share of freeholders was very small. In Döderhult the share of farms belonging to the nobility was completely dominant in c 1540.

In terms of developments after the 16th century, the freeholder land generally increased from the beginning of the 18th century in the investigated parishes in the Oskarshamn area. While the nobility continued to own a large amount of land, land owned by freeholders was the dominant land category in the area as a whole at the end of the 19th century. The increasing number of freeholder farms resulted from a process whereby former tenants purchased their farms from the crown (Sw. *skatteköp*). These farms were then turned into freeholder farms and the tenants became freeholders. This process occurred throughout Sweden during the 18th and 19th centuries /Gadd 2000 p 198 ff/. From the second half of the 19th century the tenants who farmed the noble land were also able to buy their farms. The extent to which this took place in the investigated parishes has not been studied in this project. It seems likely that most of the new freeholders were formerly tenants on crown land.

The investigated parishes in the Forsmark area evidence a very different pattern than the Oskarshamn area concerning the changes in the land ownership structure after the 16th century. In the Forsmark area, the nobility increased their possession of farms from 1680 and onwards. This expansion of the noble land took place at the expense of freeholder land. Former freeholders sold their land to the nobility, often because of debts owed to the nobility who owned the iron-works in the area, and they accordingly became tenants and their farms became tenant farms /Renting 1996/. This process is unique for areas with many iron-works. In other parts of Sweden, the noble estates could not expand following the considerable reductions of noble land at the end of the 17th century. The state did not permit the nobility to increase their holdings. However, this was not the case in areas with many iron-works. The owners of these iron-works were privileged by the state and were therefore permitted to expand at the cost of the freeholders. This is probably the most significant explanation for the differences between the Forsmark area and the Oskarshamn area.

9 Demography

This chapter deals with the reconstruction of the population in the investigated areas over a long time period. The first section of the analysis comprises a general investigation of population development and change. The next section is an investigation of social structure and change between the middle of the 18th and the middle of the 19th centuries. The main sources are *Tabellverket* and *SCB*.

In general there was a slow increase in population for Sweden as a whole from the 16th century onwards. However, there were regional differences in population development, and these differences are reflected in the two investigated areas around Forsmark and Oskarshamn respectively.

Due to the detailed and comprehensive nature of the source material concerning mobility, it has not been possible to go through all of the necessary statistics in this project. One important general trend in Swedish demography concerns the emigration that took place during the latter part of the 19th century. During the period of emigration, Sweden lost

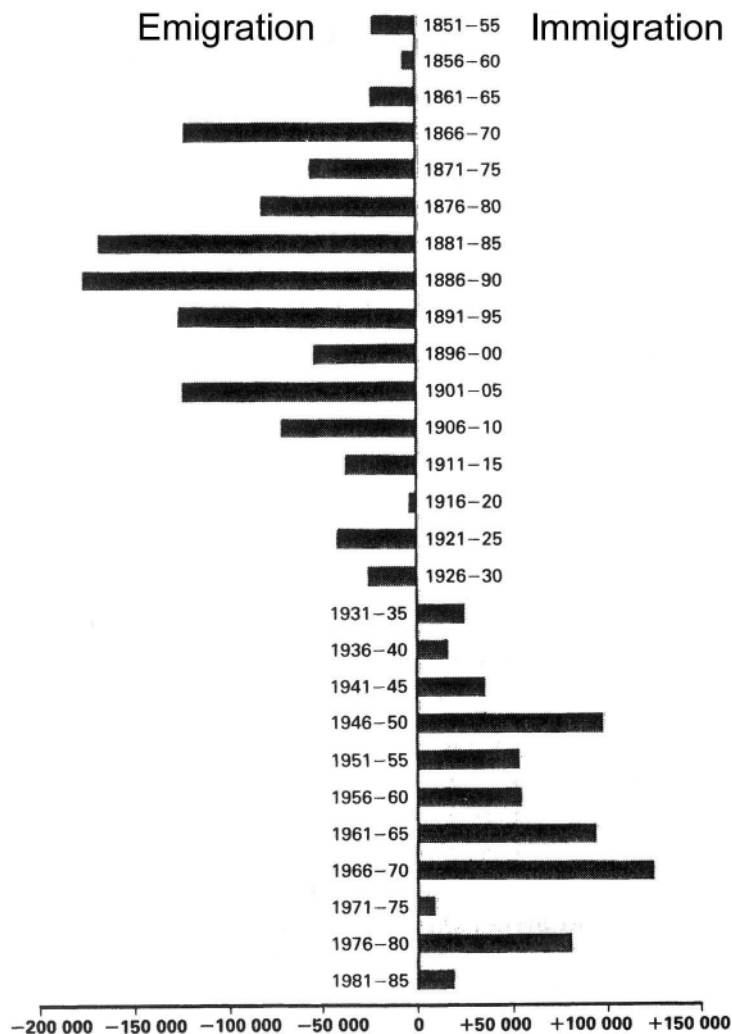


Figure 9-1. Diagram showing changes in emigration and immigration for Sweden 1851–1985 /Hofsten 1986 p 76/.

between 20 to 25% of her inhabitants. About 1.1 million people emigrated in the period between the mid-19th century and the beginning of the First World War /Hofsten 1986 pp 74–76/. After the 1920s there was a more positive trend in migration flows. Rates of emigration varied from region to region, but generally one can say that the forested areas in southern and western Sweden, including the investigated area in Oskarshamn, accounted for a substantial part of the emigration.

9.1 Population change in the area surrounding Forsmark

An estimation of the population size in the investigated parishes in Uppland shows that 2,856 people lived in the area in 1571. However, it must be remembered that this figure is an approximation, since there are no comprehensive sources on Swedish population size before c 1750. Figure 9-2 shows a strong population increase in several parishes during the 18th and at the beginning of the 19th centuries. The question is if there really were such large population increases, or if this instead indicates that population figures had been under estimated in 1571.

Population growth was significant in all of the investigated parishes up to the year 1900. The figures in Table 18 show that there were two periods of intensive population growth. The first period was between 1620 and 1699 and the second period was between 1800 and 1850.

However, the population increase was not linear, but was characterised by periods of growth and periods of temporary regression. In 1900, 15,882 people lived in the investigated area. The smallest population size during the investigated period is found in Forsmark. Österlövsta had the largest population size, except for a brief period around 1571 and again between 1880 and 1900, when the population of Börstil was larger. In the second half of the 20th century (1952–1990), there has been a negative population trend in all parishes except for Börstil. In Börstil there was a considerable increase in population from slightly less than 2,200 persons in 1960 to c 4,000 inhabitants in 1990. The population growth in Börstil has probably been caused by the fact that many people moved to the Östhammar area during this period. Town expansion during the 20th century usually took place on town land, i.e. the former arable land that had been granted to the towns in medieval and early modern times. However, Östhammar had one of the smallest areas of town land among all Swedish towns, and as the town expanded new settlement had to be located outside the town, i.e. in Börstil. In 1990, a total of 10,252 persons lived in the investigated area.

Table 9-1. The total population in the investigated area around Forsmark for some years between 1571 and 1990.

Year	Number of people
1571	2,856
1620	3,748
1699	8,764
1750	10,453
1800	11,378
1850	14,288
1900	15,882
1990	10,252

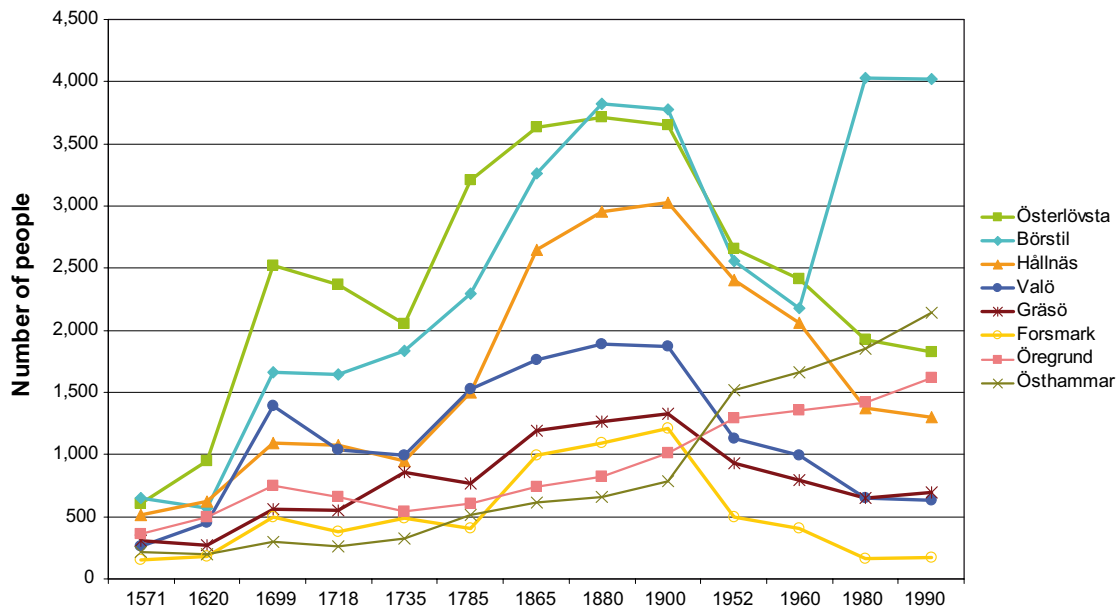


Figure 9-2. Graph showing the population changes in the parishes surrounding Forsmark 1571–1990. Source: /Tabellverket, and Andersson Palm 2000/.

9.2 Population change in the area surrounding Oskarshamn

The estimated total population size for all three investigated parishes in Småland in 1571 was c 1,266 persons. Concerning Uppland, it is important to point out that this figure is an approximation. Population growth was quite even during the period and almost doubled every 50 years. After c 1800, there was a strong population growth, especially in Döderhult. A similar population trend is observable for Kristdala and Misterhult, although Misterhult's population size was generally larger. The population development for Döderhult follows the same trend as for Kristdala and Misterhult, until c 1865, when a very large population growth began in Döderhult which lasted until c 1900. This peak can probably be explained by the fact that the town of Oskarshamn was established in 1856. Between 1856 and 1900 Oskarshamn and Döderhult were shown together in the statistics. After 1900 however, Oskarshamn was separated from Döderhult and hence the population size in Döderhult decreased. During the 20th century there was a negative population trend in the three investigated parishes. After 1960, there was a positive population trend in Döderhult, and the same thing happened in Misterhult after 1980. In 1990, the total population of Misterhult, Döderhult and Kristdala was calculated at 10,640 persons.

Table 9-2. The total population of the investigated area around Oskarshamn for some years between 1571 and 1990.

Year	Number of people
1571	1,266
1620	1,287
1699	3,535
1750	4,889
1800	8,544
1850	15,248
1900	21,886 (including the town Oskarshamn)
1990	10,640 (excluding the town Oskarshamn)

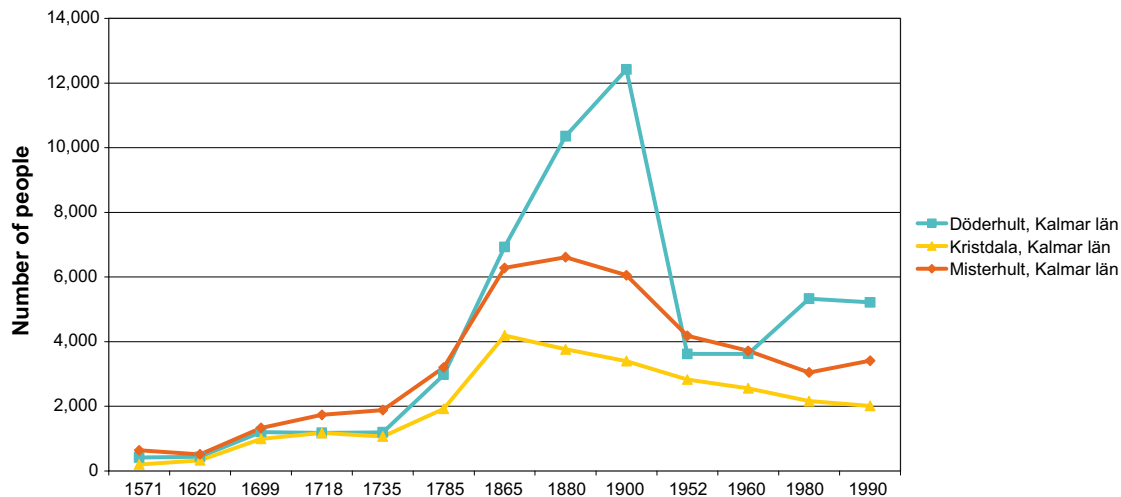


Figure 9-3. The population changes in the Oskarshamn area. Note that the municipality of Oskarshamn is not represented in this graph. Source: /Tabellverket, and Andersson Palm 2000/.

9.3 Social stratification

In order to illustrate social population changes over time, the population structures in the investigated parts of Uppland and Småland in 1750 have been compared with the population structure in 1850. Furthermore, the area surrounding Forsmark in Uppland is compared with the Småland area around Oskarshamn to demonstrate any regional variations. Finally, the changes in each parish are presented.

The previous investigations were based on the total number of people living in the investigated parishes. The investigations in this section are based on the male population over 15 years of age. Since no recorded information exists showing the numbers of women and children in the different social categories, the following investigation cannot elicit the total number of people belonging to the different groups. A comparison of the situation in 1750 and 1850 can, however, tell us something about changes in the social stratification.

As is shown in Figure 9-4, a number of general changes that transpired between 1750 and 1850 can be emphasised. In the six investigated parishes in Uppland, the share of farmers (Sw. *bönder*) has decreased, while the share of crofters has increased. Furthermore, the share of works- and mine workers has substantially reduced while the share of rural landless people has increased considerably. In addition, the share of craftsmen in the countryside has increased. Cumulatively, the social structure development shows an increase in the number of poor people without landed property and a slight increase in the number of noblemen.

The changes in the investigated parishes in Småland are somewhat different from those in the Forsmark area. In the Oskarshamn area, the share of farmers decreased only a little, and was roughly the same in 1850 as it had been in 1750. The most significant difference between Småland and Uppland is that the share of crofters did not increase in the Småland parishes between 1750 and 1850. Instead, there was a rather substantial decrease in the number of crofters. Furthermore, the share of works- and mine workers was considerably smaller in Småland than in Uppland. As in Uppland, the share of rural landless people and craftsmen increased, and a general increase in the number of poor people without landed property is also evident.

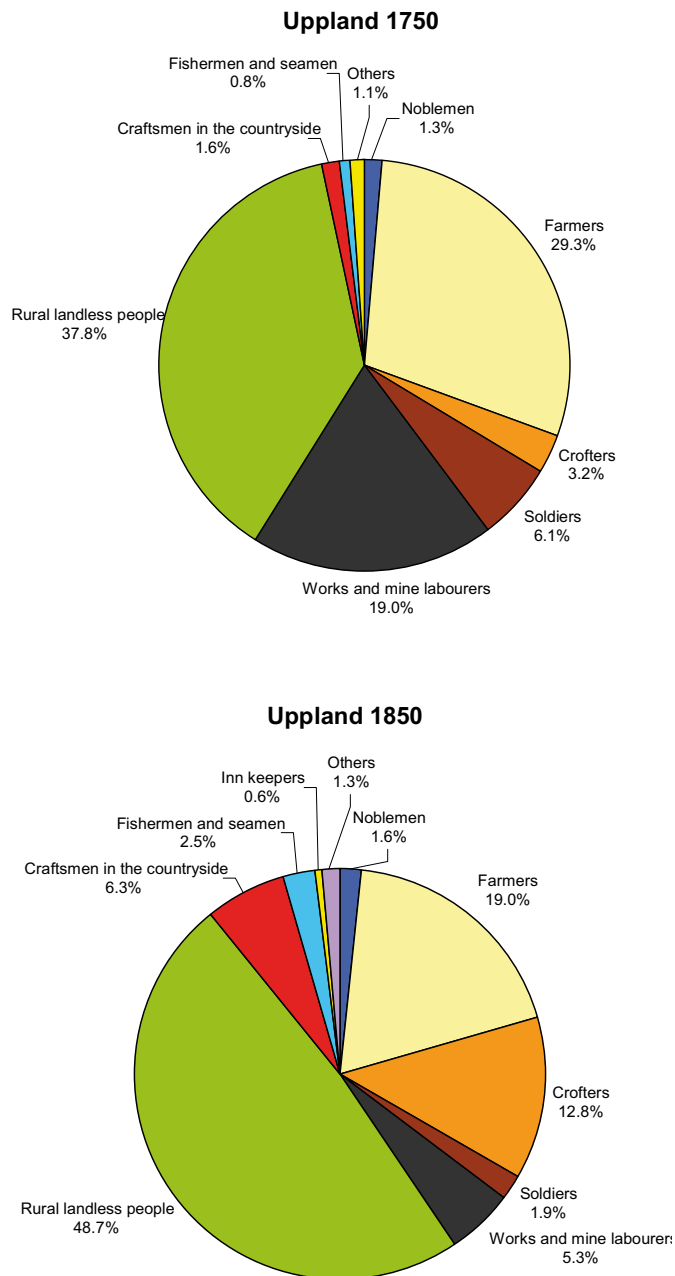


Figure 9-4. Social population structure in 1750 and 1850 in the investigated parishes in Uppland.
 Source: Tabellverket.

The general changes in social structure, i.e. an increase in the share of people without landed property, are evident for both Småland and Uppland. It is likely that these changes reflect the general Swedish development at this time period. However, the local variations in each parish do reflect local differences, which have affected the local social population structures.

The pattern described above was based on percentages. If we instead use the absolute numbers the pattern is even more stressed. Table 9-3 shows the changes in the social population structure in absolute numbers.

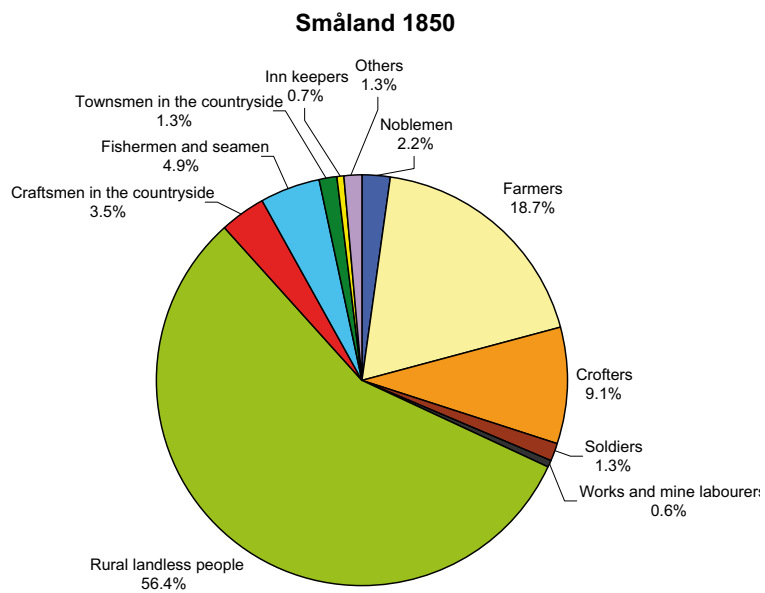
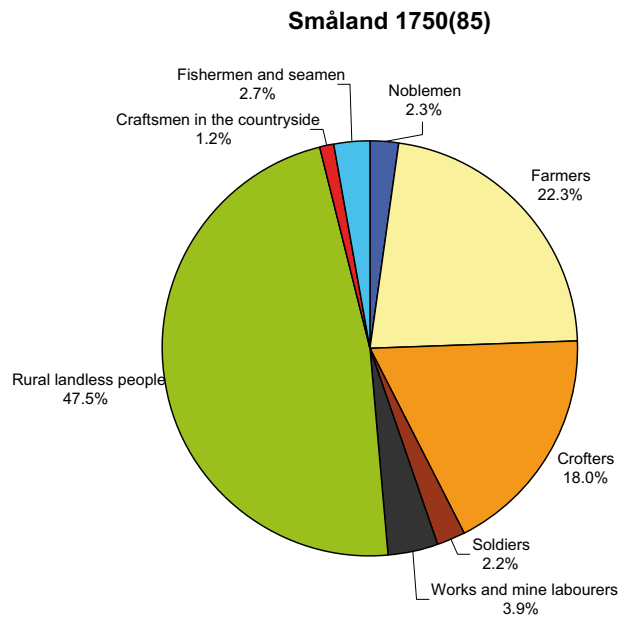


Figure 9-5. Social population structure in 1750 and 1850 in the investigated parishes in Småland.
Source: Tabellverket.

Table 9-3. The absolute numbers for different categories in the investigated parishes in the Forsmark area and in the Oskarshamn area based on the male population aged over 15 years. Source: Tabellverket.

	Forsmark area 1750	Forsmark area 1850	Oskarshamn area 1750	Oskarshamn area 1850
Noblemen	30	58	50	105
Farmers	701	702	495	901
Crofters	77	474	399	436
Soldiers	145	70	48	64
Works and mine labour	456	194	86	31
Rural landless people	905	1,801	1,054	2,714
Craftsmen in the countryside	38	232	26	166
Fishermen and seamen	18	92	60	235
Townsmen in the countryside	–	–	–	62
Inn keepers	–	24	–	34
Others	26	48	–	62
Total	26	72	3,968	6,660

Note: what does 'total' indicate?

In the Forsmark area, the number of farmers remained almost the same throughout the investigated period, while the number of crofters increased by more than six times. The group of rural landless people also increased considerably. In general, the groups of landless people in the countryside had increased in large numbers. In the Oskarshamn area, the numbers of farmers increased during the period. However, the increase in the number of crofters was only modest. On the other hand, there was a larger increase in the size of the rural landless category than was the case in the Forsmark area.

These regional differences correspond with the general picture concerning social and demographic change in the period between 1750 and 1850. In general, the number of farmers in eastern central Sweden decreased during this period, i.e. the Mälars Valley area. In southern and south-eastern Sweden, however, the number of farmers increased during the same period. Two explanations have been put forward to account for this discrepancy. Firstly, in southern Sweden a process of farm subdivision took place, mainly as result of the divisions of inheritance. Secondly, in east central Sweden, farms were amalgamated as result of the purchase of farms and marriage alliances /Gadd 2000 p 205 f./. Concerning the crofters, their numbers increased in areas dominated by large landed estates and iron-works /Gadd 2000 p 227 ff/. Almost all of the crofters were sons of farmer families. This process is characterised by downward social movement, and is typical for the 1750–1850 period of large population growth /Winberg 1977/. The crofters emerged as a result of the need for agricultural labour, the transportation of goods, and for charcoal production. In the Oskarshamn area, where there was only a modest increase in the number of crofters, the sons of the farmers were able to become farmers themselves as a result of the subdivision of existing farms and because some crofters' places were upgraded to taxpaying farms. This caused an increase in the number of small farms during the period (see above).

9.3.1 The rural landless population

In all of the investigated parishes, the share of “rural landless people” was quite substantial in both 1750 and 1850. A closer delineation of the categories within this group is of interest. As is shown in the table below, the number of “rural landless people” was rather large in 1750 as well as in 1850.

The following graphs show the different categories within the “rural landless people” category. As is shown in the graphs, the largest share of “rural landless people” are “sons of farmers and crofters /sons of country people”. Another quite substantial category in most parishes is the one comprising “old discharged soldiers”. The other groups consist of different categories of poor people.

In most of the investigated parishes, the share of “sons of farmers and crofters/sons of country people” diminished quite substantially from c 73–80% in 1750 to c 56–67% in 1850. In Hållnäs and Börstil however, this reduction was rather small, and the share of “sons of farmers and crofters/sons of country people” was around 70% in both 1750 and 1850. In Österlövsta, on the other hand, the share of “sons of farmers and crofters/sons of country people” increased from c 52% in 1750 to almost 75% in 1850. It is obvious that the share of different categories of poor people has increased over time.

Table 9-4 shows that there was an increase in the absolute numbers of sons aged above 15 years. The other group that experienced a considerable increase in size was the one comprising poor people.

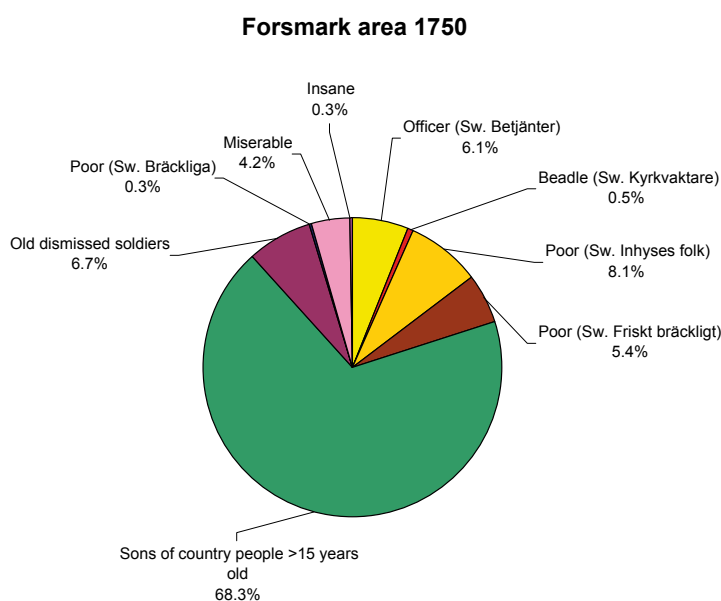


Figure 9-6. Social stratification in the Forsmark area in 1750.

Forsmark area 1850

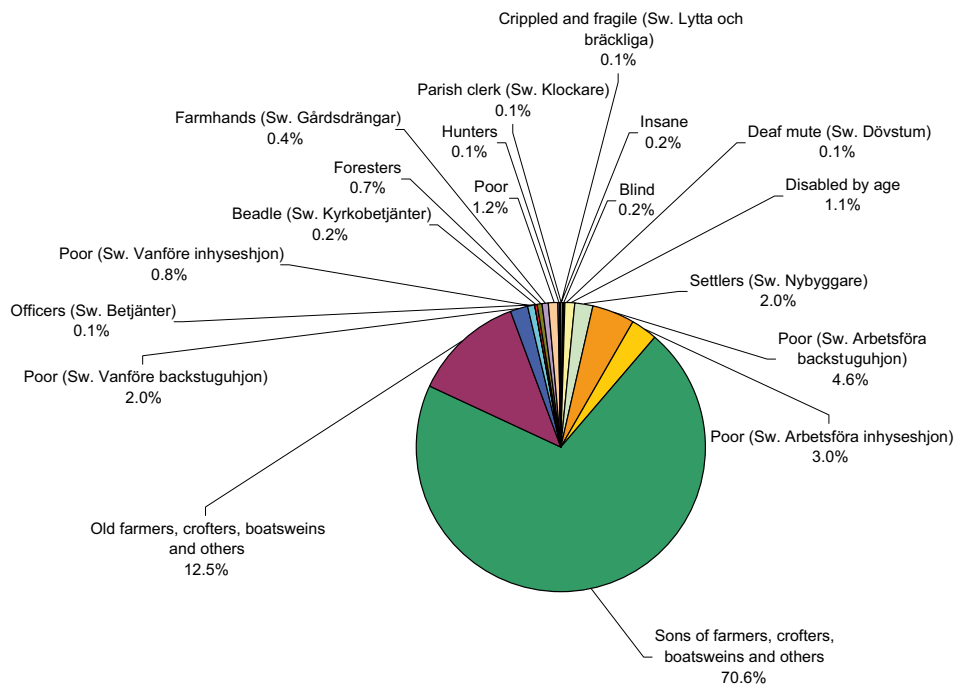


Figure 9-7. Social stratification in the Forsmark area in 1850.

Oskarshamn area 1750

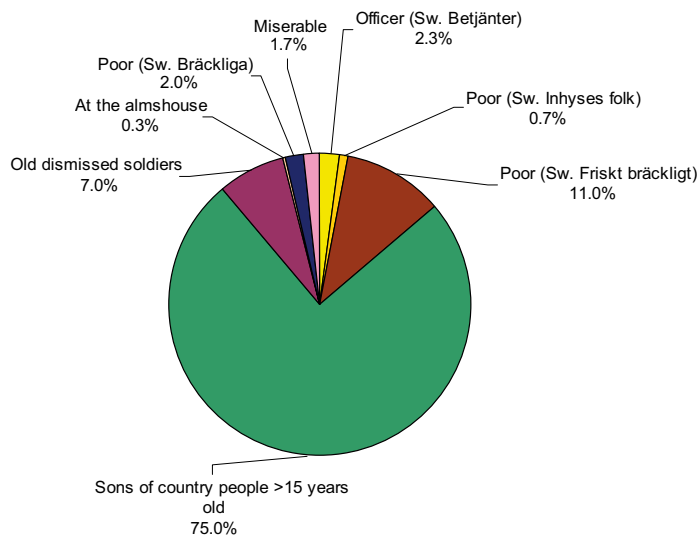


Figure 9-8. Social stratification in the Oskarshamn area in 1750.

Oskarshamn area 1850

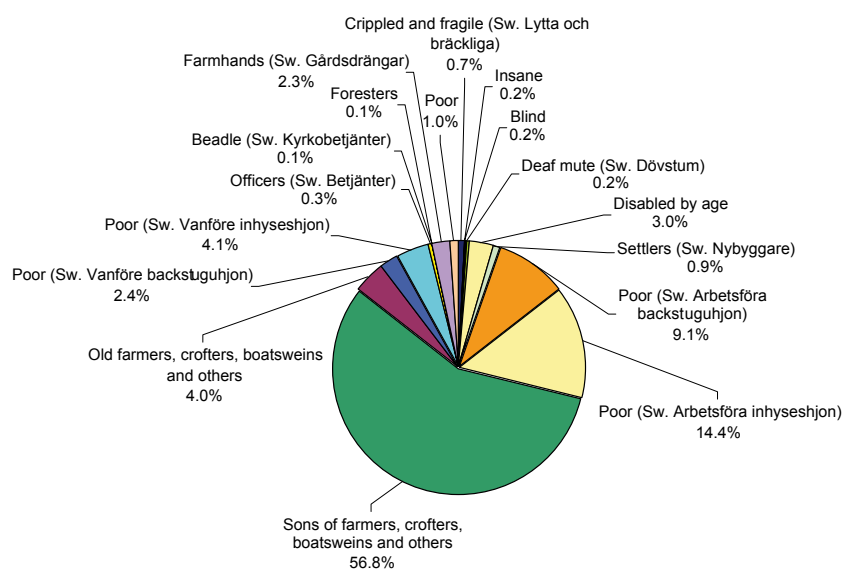


Figure 9-9. Social stratification in the Oskarshamn area in 1850.

Table 9-4. The “Rural landless people” group in the Oskarshamn and Forsmark areas. Note: Misterhult and Gräsö parishes are not included.

	Forsmark area 1750	Forsmark area 1850	Oskarshamn area 1750	Oskarshamn area 1850
Sons of farmers, crofters, boatswains etc	648	1,189	225	933
Crippled and fragile (Sw. <i>Lytta och bräckliga</i>)		2		12
Insane	3	4		3
Blind		3		4
Deaf mute (Sw. <i>Dövstum</i>)		2		4
Disabled by age		18		50
Settlers (Sw. <i>Nybyggare</i>)		33		14
Poor (Sw. <i>Arbetsföra backstuguhjon</i>)	51	78	33	150
Poor (Sw. <i>Arbetsföra inhysesjon</i>)	77	50	2	237
Old farmers, crofters, boatswains and others	64	211	21	66
Poor (Sw. <i>Vanföre backstuguhjon</i>)		34		39
Poor (Sw. <i>Vanföre inhysesjon</i>)	3	13	6	68
Officers (Sw. <i>Betjänter</i>)	58	2	7	5
Church wardens/janitors, ringers etc (Sw. <i>Kyrkobetjänter</i>)	5	3	0	2
Foresters		11		2
Farmhands (Sw. <i>Gårdsdrängar</i>)		7		37
Poor	40	21	6	16
Hunters		2		
Ringer (Sw. <i>Klockare</i>)		1		
Summa:	949	1,681	300	1,642

9.3.2 Misterhult

In Misterhult, the social structure was relatively similar in both 1785 and 1850 (see Figure 9-10). The major difference is that the share of works- and mine workers disappeared between 1785 and 1850. Instead, a small share of soldiers is registered in 1850. Furthermore, the share of crofters decreased a little.

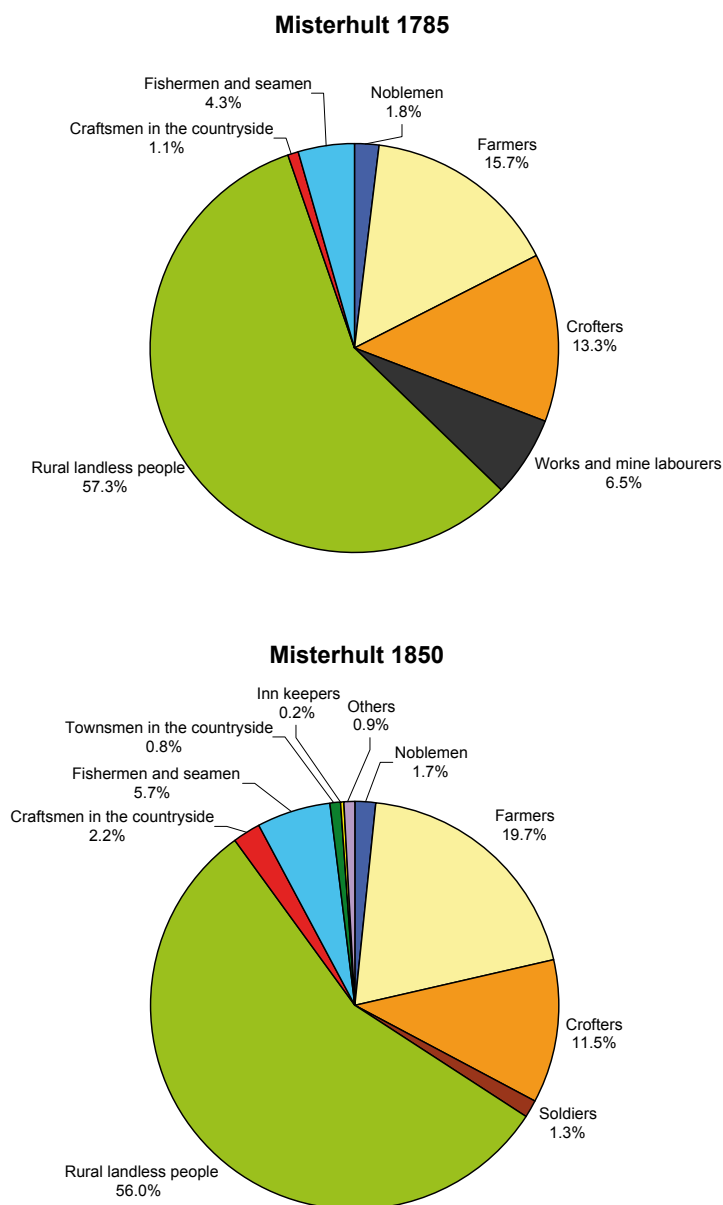


Figure 9-10. Social population structure in Misterhult 1785 and 1850. Source: Tabellverket

9.3.3 Döderhult

In Döderhult there were substantial changes in the social population structure. As is shown in Figure 9-11, the share of farmers, crofters and soldiers decreased significantly, while the share of rural landless people increased considerably. Furthermore, there was a significant increase in the numbers of fishermen and seamen, and a slight increase in the number of noblemen. It is interesting to notice that in the investigated area, the highest share of noblemen is found in Döderhult.

Why did the share of farmers and crofters decrease so drastically? This was not due to a population decrease among farmers and crofters. The actual numbers of farmers and crofters increased between 1750 and 1850, but at the same time the number of people without property has increased significantly.

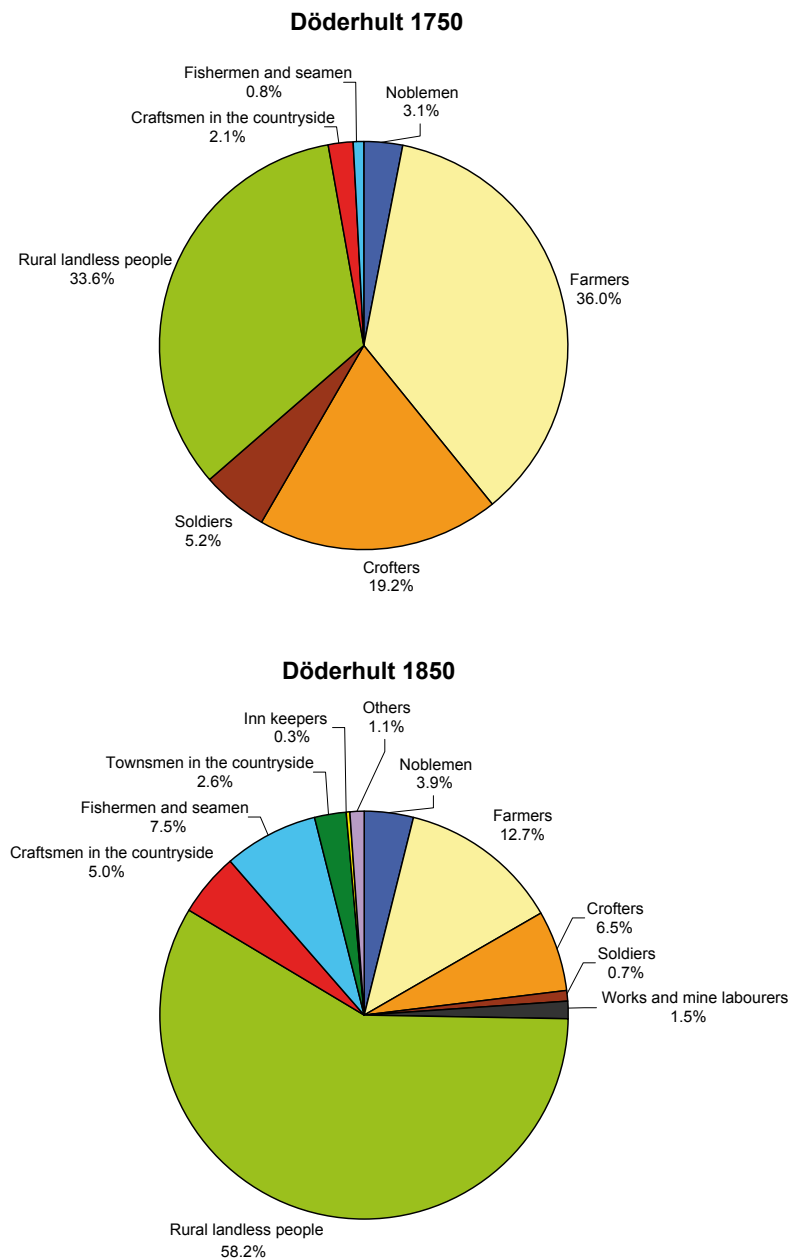
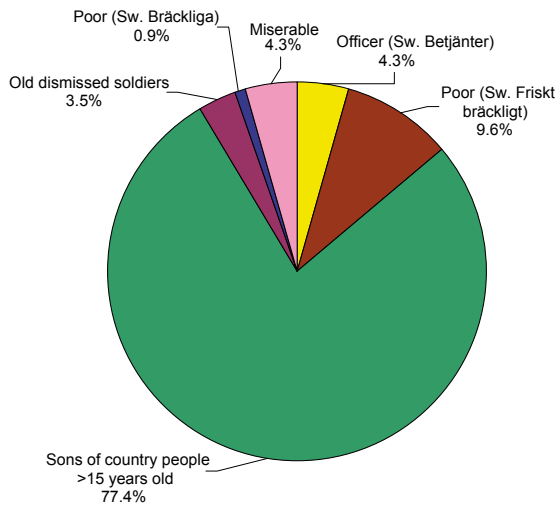


Figure 9-11. Social population structure in Döderhult 1750 and 1850. Source: Tabellverket.

Döderhult 1750



Döderhult 1850

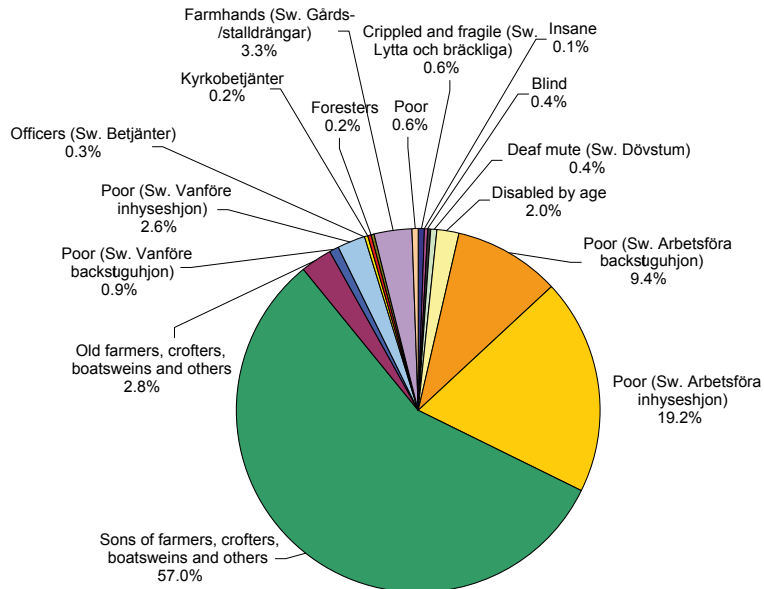


Figure 9-12. The different types of rural landless in Döderhult parish in 1750 and 1850.

9.3.4 Kristdala

As was the case in Döderhult, the share of rural landless people in Kristdala increased quite substantially between 1750 and 1850 (see Figure 8-6), and in a similar manner to the other two investigated parishes in Småland, the share of crofters decreased in Kristdala. Furthermore, there was a decrease in the numbers of soldiers and noblemen.

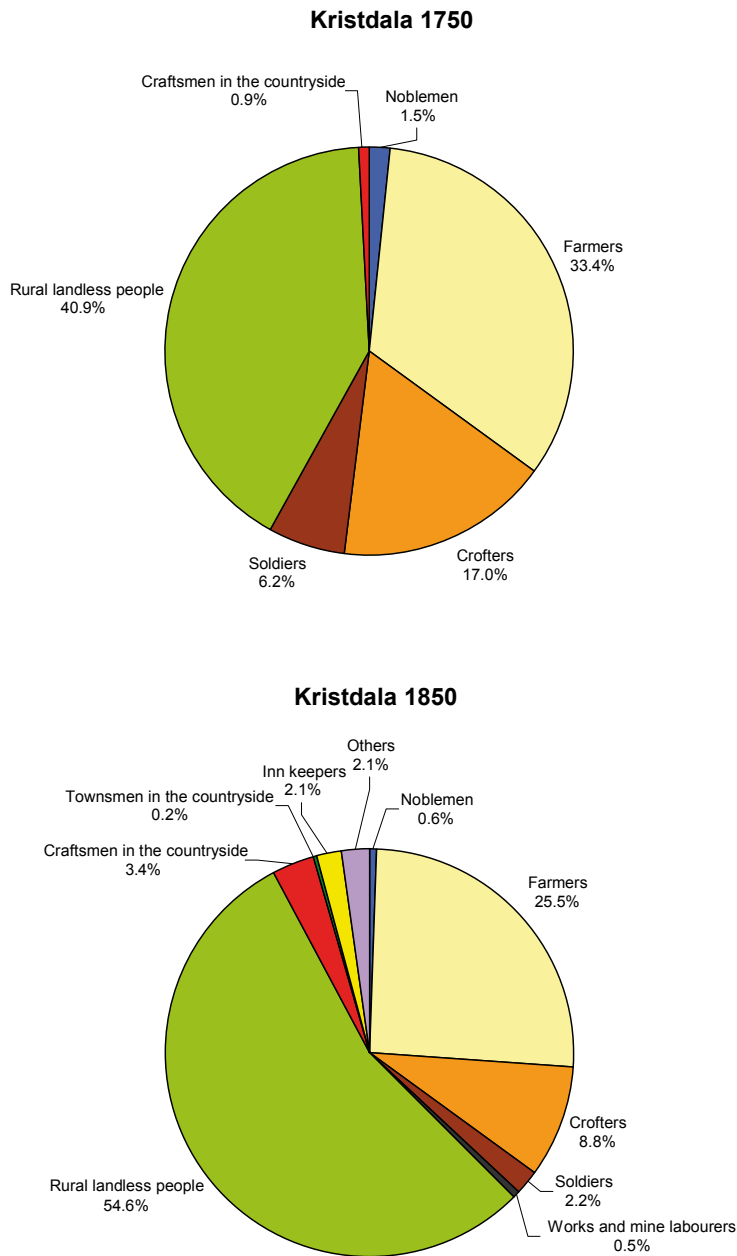
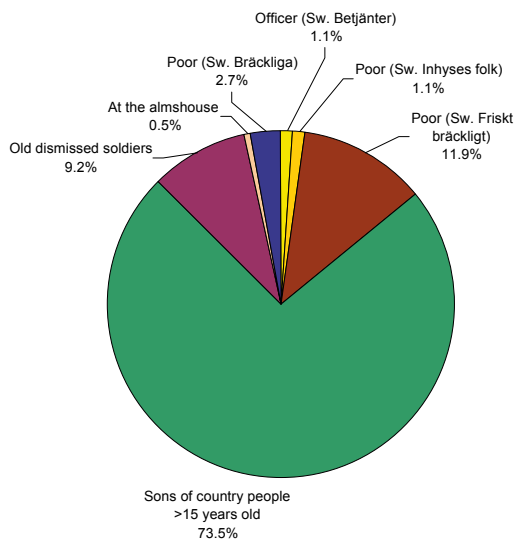


Figure 9-13. Social population structure in Kristdala in 1750 and 1850. Source: Tabellverket.

Kristdala 1750



Kristdala 1850

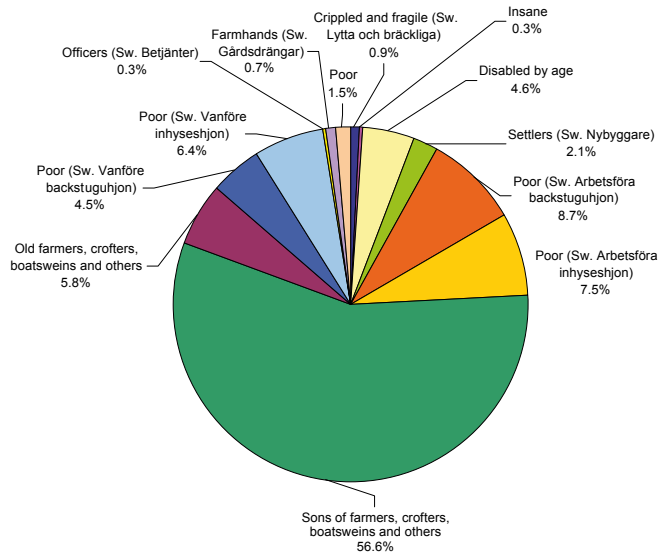


Figure 9-14. The different types of rural landless people in Kristdala parish.

9.3.5 Börstil

Figure 9-15 illustrates the decrease in the number of farmers and the increase in the number of crofters in Börstil between 1750 and 1850. Conforming to the general pattern of social structure development, the share of rural landless people has increased in Börstil, and this conforms to the more general development of social structure in Sweden during this period. Furthermore the share of craftsmen and fishermen has increased a little.

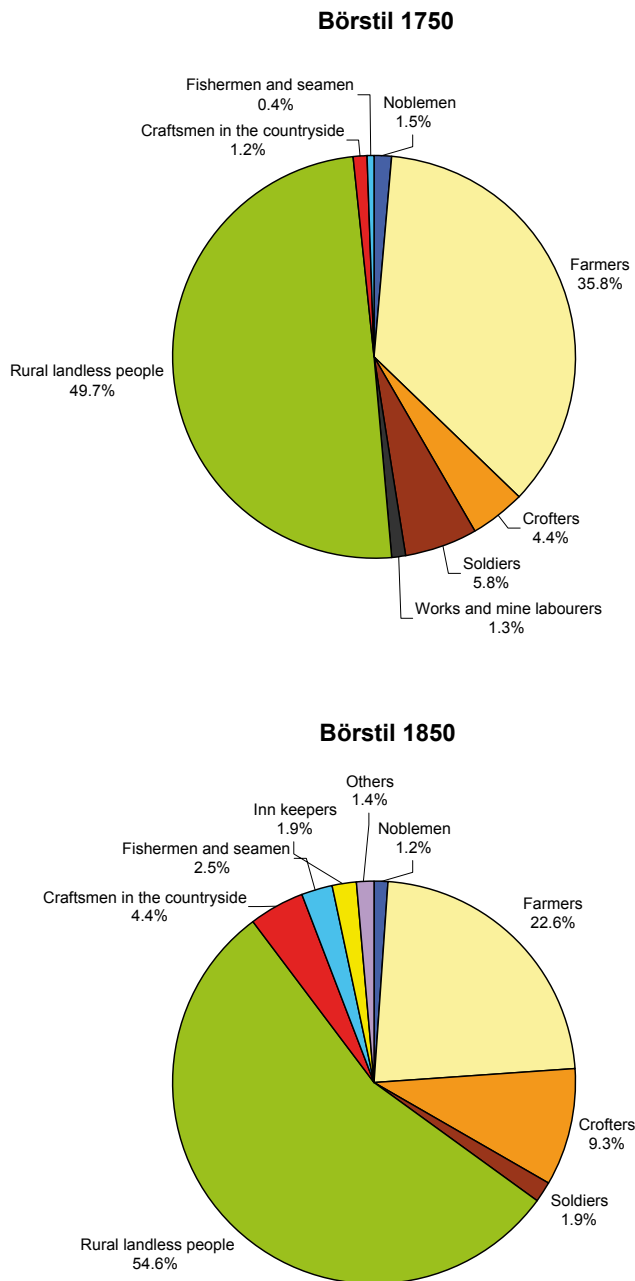


Figure 9-15. Social population structure in Börstil in 1750 and 1850. Source: Tabellverket.

9.3.6 Hållnäs

The changes in Hållnäs to a large extent match those in Börstil. The share of farmers has decreased considerably while the share of crofters has increased significantly. Furthermore, the respective shares of rural landless people and fishermen/seamen have increased in size.

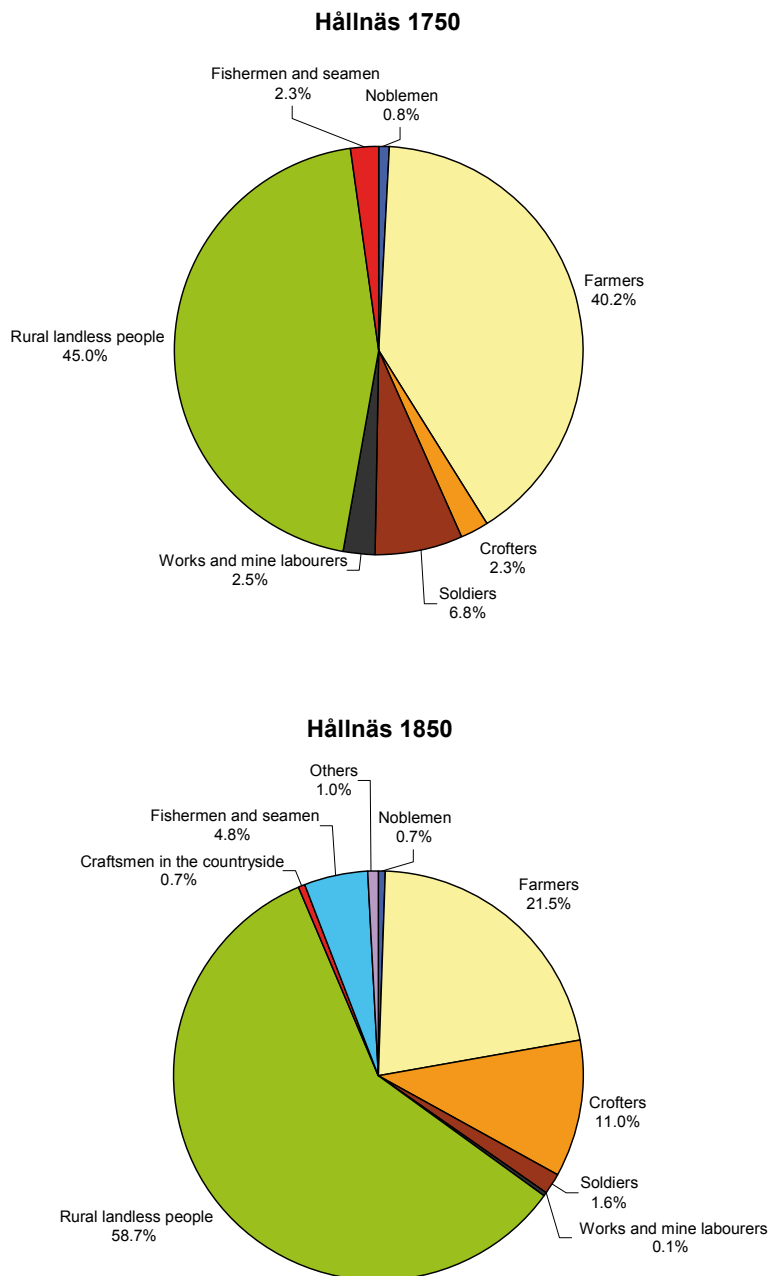


Figure 9-16. Social population structure in Hållnäs in 1750 and 1850. Source: Tabellverket

9.3.7 Valö

In Valö the social population structure was largely stable between 1750 and 1850. The most significant changes were the decreases in the numbers of soldiers and works- and mine workers respectively. There were also marginal increases in the numbers of farmers and crofters, but the share of rural landless people has remained stable.

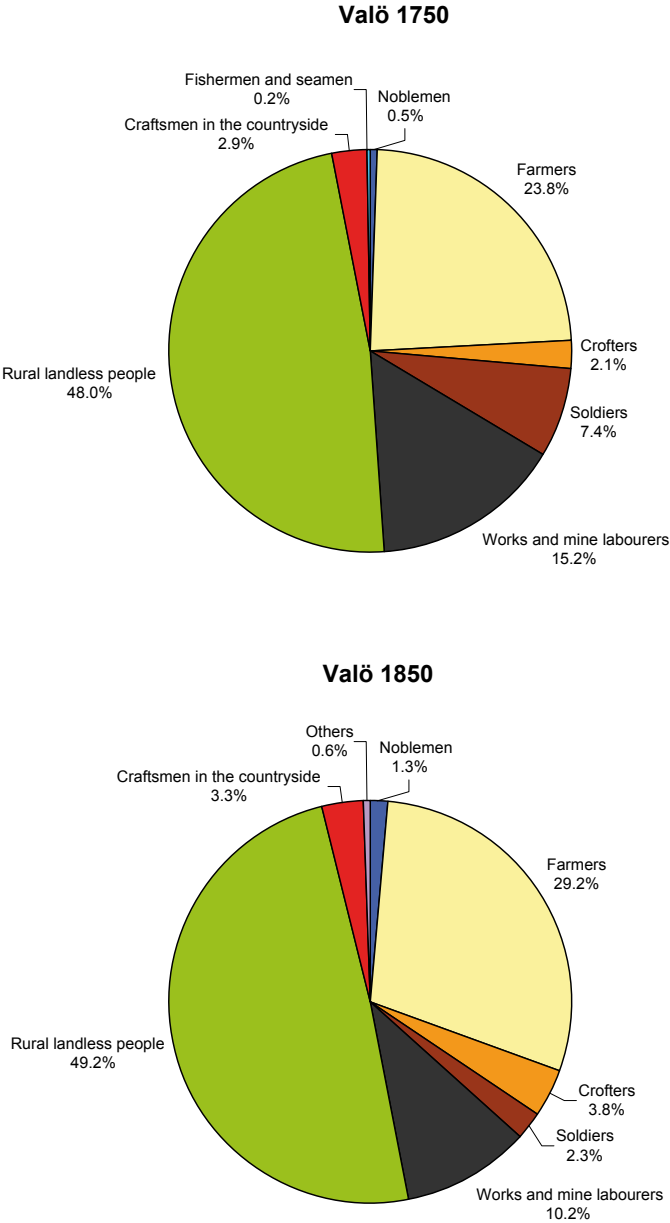
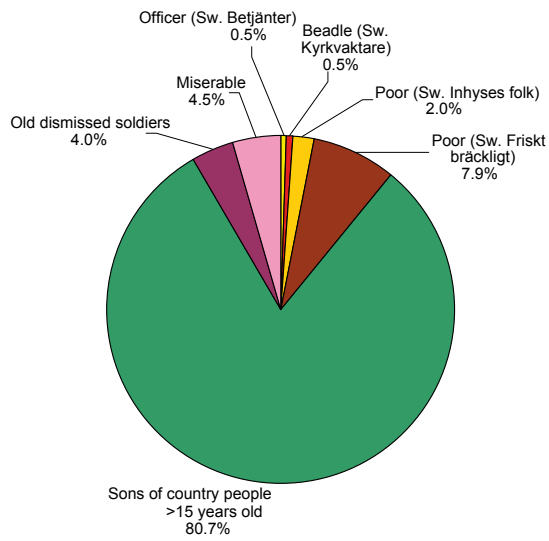


Figure 9-17. Social population structure in Valö in 1750 and 1850. Source: Tabellverket

Valö 1750



Valö 1850

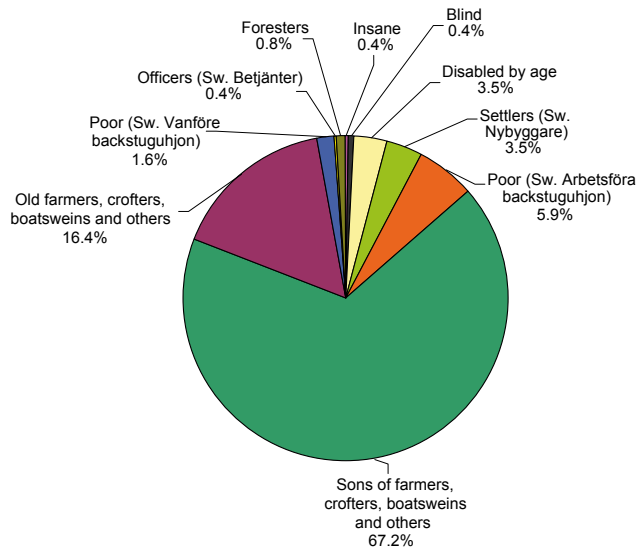


Figure 9-18. The different types of rural landless in Valö parish in 1750 and 1850.

9.3.8 Forsmark

In Forsmark the social population structure was very different from the other investigated parishes. The share of works- and mine workers was particularly dominant in 1750. Furthermore, there were no farmers, but there was a fairly large share of rural landless people. By 1850 this structure had changed rather drastically. The share of works- and mine workers had decreased significantly and the share of craftsmen had increased extensively. At the same time, the share of crofters increased and there was now a small share of farmers. Furthermore, the share of noblemen decreased a little between 1750 and 1850.

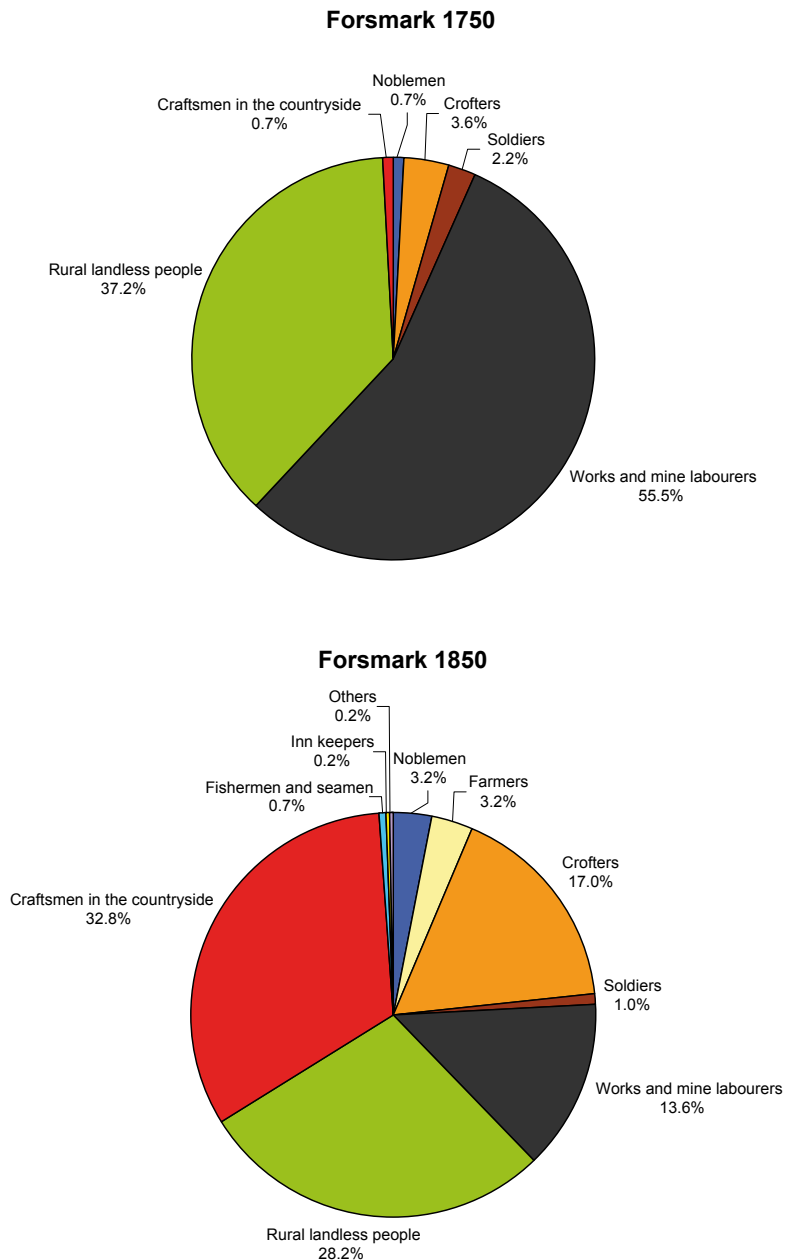


Figure 9-19. Social population structure in Forsmark. Source: Tabellverket

9.3.9 Österlövsta

In Österlövsta the social population structure resembles the pattern in Forsmark, as the share of works- and mine workers was very substantial in 1750. This large share had diminished quite considerably by 1850. The share of farmers and soldiers had decreased, but the share of crofters had increased significantly. Furthermore, there was an increase in the share of rural landless people.

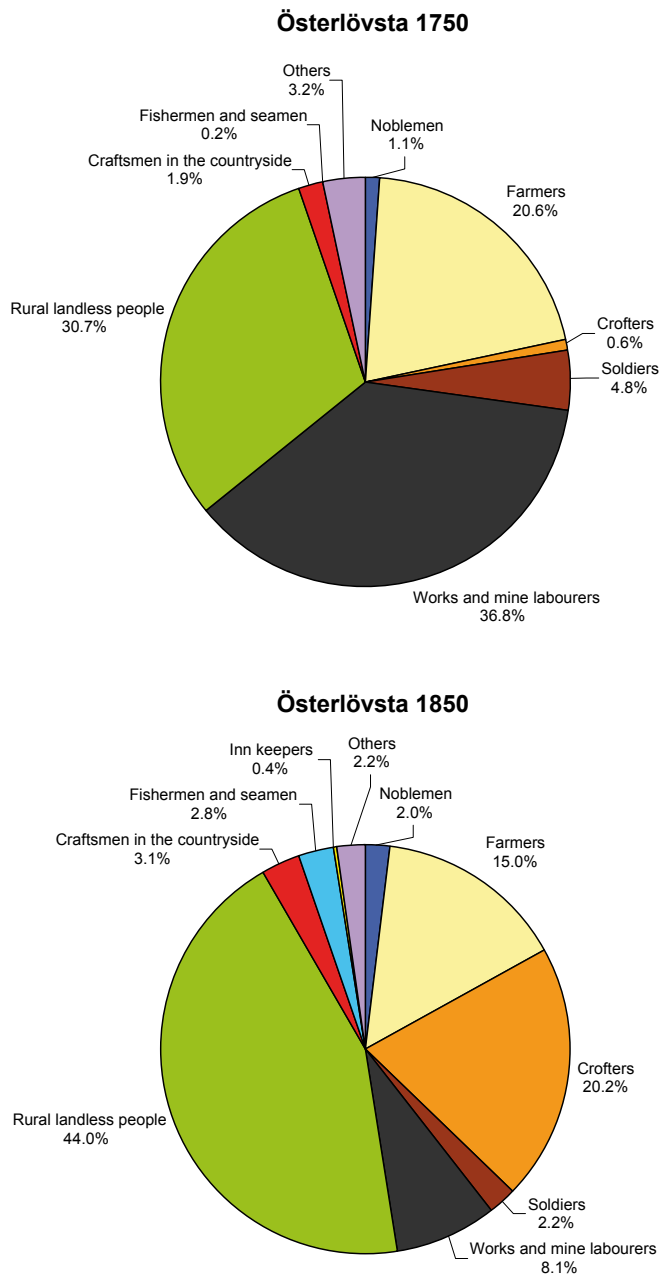
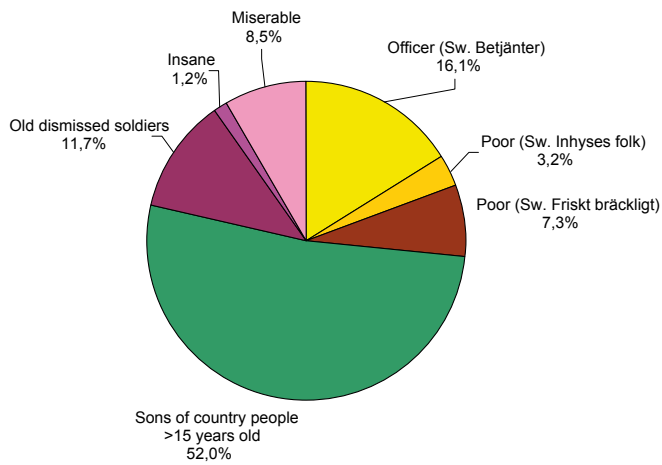


Figure 9-20. Social population structure in Österlövsta. Source: Tabellverket.

Österlövsta 1750



Österlövsta 1850

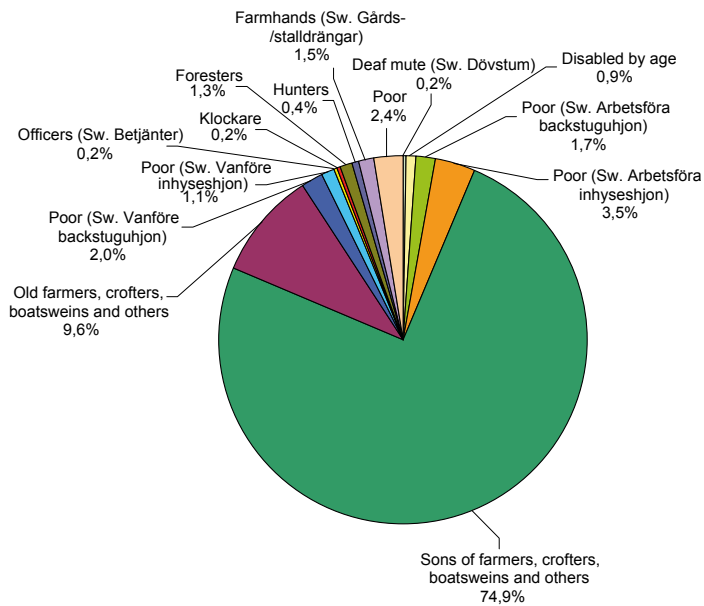


Figure 9-21. The different types of rural landless in Österlövsta parish in 1750 and 1850.

9.3.10 Gräsö

Because Tabellverket's statistics for Gräsö are missing for the period after 1795, the comparison covers a shorter period than for the other investigated parishes. However, it is still evident that quite a large change in social population structure occurred. The share of noblemen was relatively large in 1750, but this had diminished by 1795. The shares of farmers, crofters and soldiers have all decreased quite substantially. In contrast to the other investigated parishes, the share of rural landless people has diminished considerably. However, the most significant change here is the considerable increase in fishermen and seamen.

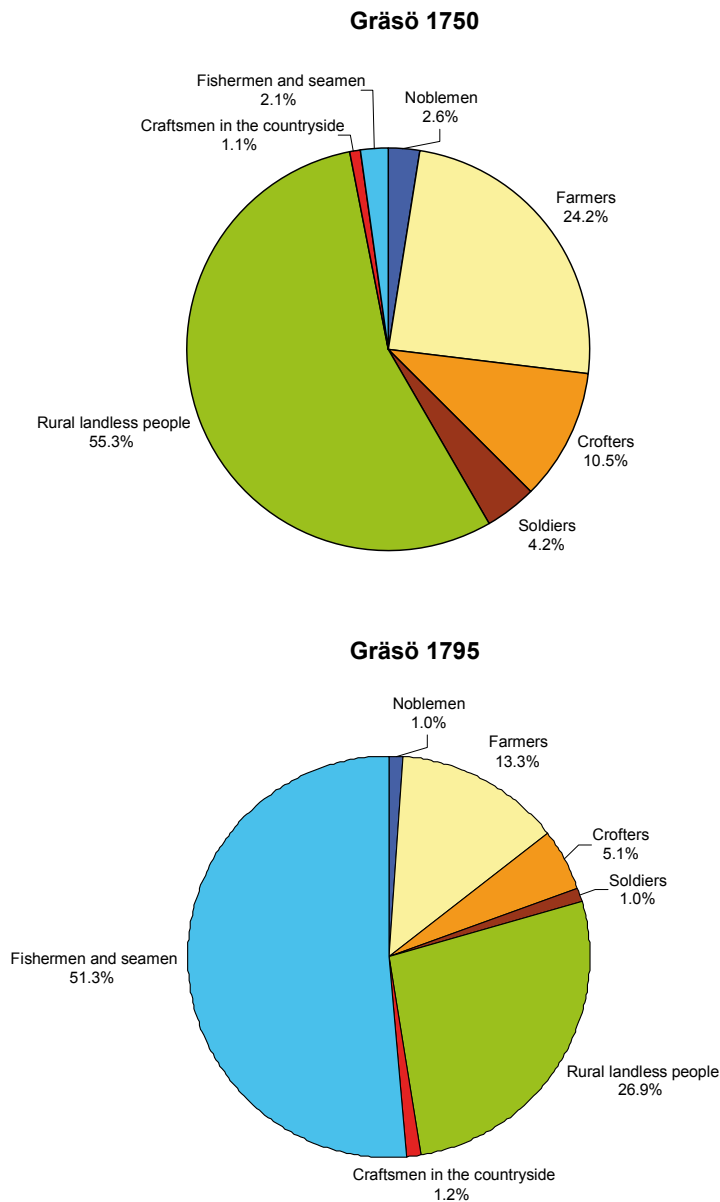


Figure 9-22. Social population structure in Gräsö. Source: Tabellverket.

9.4 Summary

The investigation clearly shows a large increase in population in the period from 1571 up to the present day in both investigated areas. Particularly high population growth is evident for both of the investigated areas during both the 17th century and the first half of the 19th century. The population increase in the first half of the 19th century was larger in the Oskarshamn area than in the Forsmark area. In the 20th century there has been a decrease in population in both areas.

Concerning the changing pattern of social stratification between 1750 and 1850, there were differences between the two investigated areas. In the Oskarshamn area, the number of farmers almost doubled during the period while the number of crofters increased only slightly. In the Forsmark area, however, the number of farmers remained unchanged but there was a considerable increase in the number of crofters. These regional variations between the south of Sweden and eastern central Sweden have been well documented in earlier research.

Another group that increased in large numbers in both areas was the groups of landless people. Sons over the age of 15 years accounted for a large part of this increase. Other subgroups in this category were poor people. It is very evident that there was an increase in the number of poor people in both areas.

9.5 Household population size

In Misterhult the household examination rolls have been used as source material for two periods: 1851–60 and 1893–99 respectively. There are no such registers for Misterhult for the period before 1812. In Valö however, priest's interrogations from 1751–62, 1800–06, 1850–54 and 1891–95 have been used. The registers show an increase in the number of crofter's holdings and other new establishments in the 19th century, as well as an increase in population (see Table 8-2). The average household size in Valö generally decreased from almost 10 persons per household in 1751–62 to c 6 persons per household in 1891–95. The average size of farm households decreased from over 12 in 1751–62 to 7,5 in 1891–95, while for crofter households the decrease was from an average of almost 9 in 1751–62 to 5.7 people per household in 1891–95.

In Misterhult the changes between 1851 and 1893 indicate a similar pattern. During this 42-year period, the average household size decreased from almost 7 persons per household in 1851–60 to c 5,5 persons per household in 1893–99. If farms are separated from crofter's holdings some differences can be seen. In 1851–60 the average farm household comprised approximately 8 persons, while the average crofter household comprised just over 5 persons. At the end of the 19th century, however, average farm household size had increased to a little more than 6 persons while the average crofter household remained stable at c 5 persons per household.

Table 9-5. Average household size (number of persons per household) in Misterhult and Valö. Farms and crofters holdings are shown separately. Source: Parish catechetical meeting registers for Misterhult 1850¹ and 1895² and Valö 1750³ and 1895⁴.

	c 1750	c 1850	c 1895
Misterhult (all households)		6.7	5.5
Farms in Misterhult		7.9	6.7
Crofter's holdings in Misterhult		5.2	5.1
Valö (all households)	9.8	6.3	6.1
Farms in Valö	12.6	7.7	7.5
Crofter's holdings in Valö	8.9	5.4	5.7

¹ Riksarkivet Arninge, Husförhörslängder, Kalmar län, Misterhult socken, AI:6A. År 1851-1860

² Riksarkivet Arninge, Husförhörslängder, Kalmar län, Misterhult socken, AI:17B. År 1893-1899

³ Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:1. År 1751-1762

⁴ Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:20. År 1891-1894

As we can see, the general average household size has decreased over time and farm households appear to have been larger than the crofter households. This is probably due to the number of farm hands and maids in farm households. Crofter households in Valö generally had more members than those in Misterhult. In 1895, farm households in Valö appear to have been larger than those in Misterhult. In 1850, however, average farm household size was slightly larger in Misterhult than in Valö.

In one respect, the population changes in the two regions are very similar, i.e. the increase during the 16th and the 17th centuries. The increase is more pronounced in Uppland than in Småland, and this is partly caused by the increase in the number of employees in the early industry in the Forsmark-region. At the turn of the century, the decrease in population in all rural areas is visible in both areas with the notable exception of the towns.

10 Rural production and its changes

10.1 Arable production and livestock

This section deals with production in the rural areas that have been studied in this investigation. There were significant regional differences in Sweden during the medieval period. Some regions were oriented towards cattle and dairy production, while others were more adapted for cereal production. The majority of the products were, however, consumed by the local farming population. It is very difficult to get information from the medieval period concerning actual production. From the 16th century and onwards, however, the availability of source material is much better. One method that can be used to study production during the early modern period is to use the available source material concerning tithe and livestock. These sources have been used extensively in historical studies /Lagerstedt 1968, Myrdal and Söderberg 1991, Andersson Palm 1993/.

Concerning stock keeping, Table 8-4 illustrates some regional variations. In the four parishes of Österlövsta, Hållnäs, Valö and Börstil, the distribution pattern is quite similar. The distribution in Forsmark is different however, since the share of horses, oxen/bullocks/bulls and goats/sheep is lower here. In Forsmark, the share of cows is much higher than in the other parishes in Uppland. In the Oskarshamn area, the pattern of distribution is different from the areas in Uppland. In this area of Småland the share of horses is much lower than in the investigated area in Uppland. Instead the share of oxen/bullocks/bulls is far greater. The share of goats/sheep and pigs in the Oskarshamn area resembles the pattern in the parishes in Uppland.

Table 10-1. The percentages of animals in different areas in the early 17th century. Source: Torsten Lagerstedt's summaries for the years 1627–1628.

	Horses	Cows/heifers	Oxen/bullocks/ bulls	Goats/sheep	Pigs
Österlövsta Hållnäs	23.9	51	7.4	15.1	2.7
Valö	22.8	50.3	10	14.8	2.1
Börstil	20.7	56.6	5.7	14.7	2.3
Forsmark	16.1	73.1	1.5	7.3	2
Tunaläns härad	10.6	45.8	26	15.5	2.1
Stranda härad	12.2	43	28.9	13.4	2.5

Table 10-2. Arable production in 1640 (råg: rye, korn: barley, havre: oats, vete: wheat). The measures vary regionally. A tunna is equal to one barrel and the other measures are subdivisions thereof. Source: Torsten Lagerstedt's summaries.

Härad	Parish	Year	Crop	Tunna	Fjärding	Kappor	Fat
Olands	Österlövsta	1640	Råg	65	2	3	
Olands	Österlövsta	1640	Korn	78	6	3	
Olands	Österlövsta	1640	Vete	1	7	1	
Olands	Österlövsta	1640	Havre				
Olands	Hällnäs	1640	Råg	50	1	1,75	
Olands	Hällnäs	1640	Korn	21	6	2	
Olands	Hällnäs	1640	Vete				
Olands	Hällnäs	1640	Havre				
Frösåker	Valö	1640	Råg	39	2	0	
Frösåker	Valö	1640	Korn	23	2	0	
Frösåker	Valö	1640	Vete				
Frösåker	Valö	1640	Havre				
Frösåker	Börstil	1640	Råg	57	6	3,2	
Frösåker	Börstil	1640	Korn	64	6	3,2	
Frösåker	Börstil	1640	Vete				
Frösåker	Börstil	1640	Havre				
Tuna län	Misterhult	1640	Råg	11	3	1	
Tuna län	Misterhult	1640	Korn	21	3	0	
Tuna län	Misterhult	1640	Vete				
Tuna län	Misterhult	1640	Havre				
Tuna län	Kristdala	1640	Råg	8	0		6
Tuna län	Kristdala	1640	Korn	31	1		6
Tuna län	Kristdala	1640	Vete				
Tuna län	Kristdala	1640	Havre				
Stranda	Döderhult	1640	Råg	14	2,25	0	
Stranda	Döderhult	1640	Korn	28	3,19	0	
Stranda	Döderhult	1640	Vete				
Stranda	Döderhult	1640	Havre				

As we can see in the table below, there are some regional changes between the investigated parishes in Uppland and Småland. Barley (Sw. *korn*) was the major crop in all of the investigated parishes in Småland. In Uppland, however, the distribution pattern is different since rye (Sw. *råg*) was the most commonly cultivated cereal in Hällnäs and Valö. While barley was the major crop in Österlövsta and Börstil, the production of barley and rye was much more equal than was the case in the parishes in Småland.

According to the figures, arable production seems to have been larger in the parishes in Uppland than in Småland. However, it is important to point out that the figures are not comparable as different sizes of barrels (Sw. *tunnor*) were used in different parts of Sweden.

The conditions for cattle raising were particularly good in Gräsö. Extensive lowlands that were used as meadows were common in the landscape, due to the land upheaval that constantly created new lands /Borgegård 1998 p 9/. During the 16th century, measures of taxation indicate that fishing was more important than farming. The arable lands were quite small, with extensive pastures.⁵ Furthermore, the production of charcoal and its transportation to the iron-works in Forsmark was important /Borgegård 1998 s. 28/, and there were a number of iron mines located on the islands in Norrboda (18th century) and in Söderboda (end of 19th and beginning of 20th century) /Borgegård 1998 p 28, 41, 44/.

⁵ Borgegård 1998 p 21. This is described in a quotation from the 18th century but without references.

It is clear that these areas were dependent on the surrounding regions in various ways. Further study of this aspect is required if we are to be able to fully understand why, for example, land-use changed over the years. The iron-works at Forsmark and Österlövsta have of course been very important for the development of the region. Indeed, there were already four blast furnaces and six hammers in production at Forsmark in 1604 /Nisser 1984, p 12/. Charcoal production became increasingly important in Hållnäs during the 17th century and this led to a reduction in the earlier importance of fishing and sailing. It is also conceivable that charcoal production may have led to a decrease in corn and root vegetable production /Stridsberg 1992 p 64 f./.

Historically speaking, rural production in Småland was focused on cattle and especially oxen, which were sold to Denmark during the medieval period. This trade was prohibited in the 16th century and many oxen were instead transported to Central Sweden for sale, often to the iron producing areas in Dalarna and Västmanland. This livestock production reflects the medieval system of taxation as well as the organisation of the landscape. The transport of the oxen was organised both by the state and private traders, and each year hundreds of animals were moved from Småland to the north. In Uppland, corn was the principal farm product. In Småland the amount of oxen increased and became more important as working animals during the 16th century /Myrdal and Söderberg 1991 p 136/.

This medieval division of production altered during the early modern period, but some general regional divisions can still be observed in the 19th century, even though significant changes had occurred in the rural production.

One of the most important transformations in the rural regions of Sweden was the subsequent abandonment of meadows in favour of producing winter fodder on arable land. This process, which began in the early 1800s, was more or less completed by the turn of the century (c 1900). By that time most farmers in Sweden had abandoned the old meadow system and had adopted modern rotations of different crops and newly introduced species such as lucern (*Medicago sativa*) for fodder and the American potato.

The other great change was the increase in wheat production. Wheat was not a major crop during the 18th century, but it subsequently became one of the leading crops in the country. The same can be said for the production of potatoes. This had been a relatively unimportant crop during the 19th century, but subsequently came to be an important staple, not least among poorer social groups such as crofters and landless groups. Potatoes were also important for alcohol production. It has been estimated that the production of liquor stood at 40 litres per inhabitant in the 1820s /Ingers 1956 p 148/. In the Oskarshamn area, wheat production was fairly limited and the yields were also relatively low /Lägnert 1949/.

The aforementioned changes largely coincided with the introduction of land reforms, and some scholars argue that these reforms were instrumental in bringing about these changes. While this is open to debate, it is clear that the changes in crops, farming methods and the distribution of property, did cumulatively bring about a “modernisation” of rural production. This modernisation, or agricultural revolution, included increased trade and a dependency on cash crops /see Gadd 2000/. The foodstuffs produced on the farms were, to a large extent, still consumed by the inhabitants. But buying new machinery and other commodities required finances. This coincided with a rapid process of urbanisation in Sweden, and factory workers and other urban inhabitants required a supply of food. Accordingly, an important market for agricultural products emerged.

One important change during this period of agricultural modernisation was a change in crops. Apart from the growing importance of the American potato, wheat production also increased during the transformations that took place between the late 19th century and the early 20th century /Lägnert 1949/. The production of oats also increased in parts of Sweden, and oat exports were considerable during the late 19th century, especially to Great Britain.

During the 1840s, some changes in land-use took place in southern Sweden. The older field systems had been altered on the mansions. During the latter part of the 19th century, the method of growing winter crops in the fields had been introduced in most regions /Lägnert 1955 p 95–97/.

An important factor behind the transformation of rural areas between the late 19th century and the early 20th century was that the increase in cereal production during the late 1800s was complemented by an increase in dairy production. Milk production rose during this period. Furthermore, the consumption of dairy products increased between the 1870s to the 1930s /Morell 1997 p 225/. New co-operative organisations for producing milk, cream and cheese were created in many regions (Sw. *andelsmejerier*). These co-ops were often owned by a group of farmers, a village or a larger region, and created a more regular source of income for the farmers. Previously, farm incomes were usually earned in the autumn when animals were sold and slaughtered and when the corn was harvested. But with a steady flow of milk, farms could now also earn a steady flow of income.

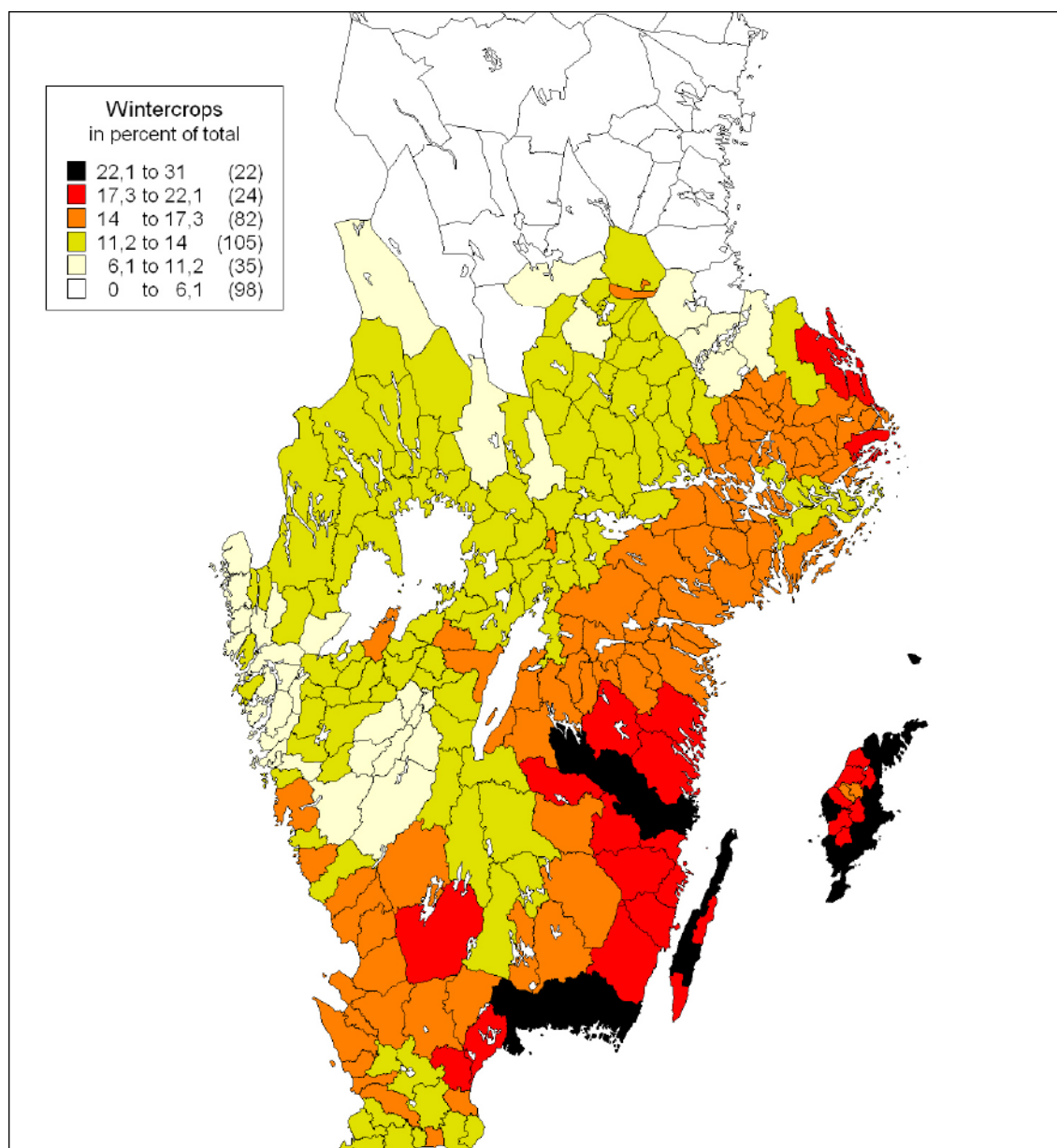


Figure 10-1. Winter crops (i.e. crops sown in the autumn) in Sweden in 1900. Note that percentages are highest in eastern and southern Sweden. Source: Atlas 1900.

Cereal production in the two counties has not altered significantly over the last twenty years. The main products were, and still are, barley and wheat. These figures cover the two counties in their entirety, which means that they do not show the detailed information from the investigated areas. However, they do show the general trends. There has not been a significant change in arable production or types of crops. It is apparent, however, that the yields in Kalmar have gradually dropped over the last twenty years, whereas in Uppsala county there has been an increase.

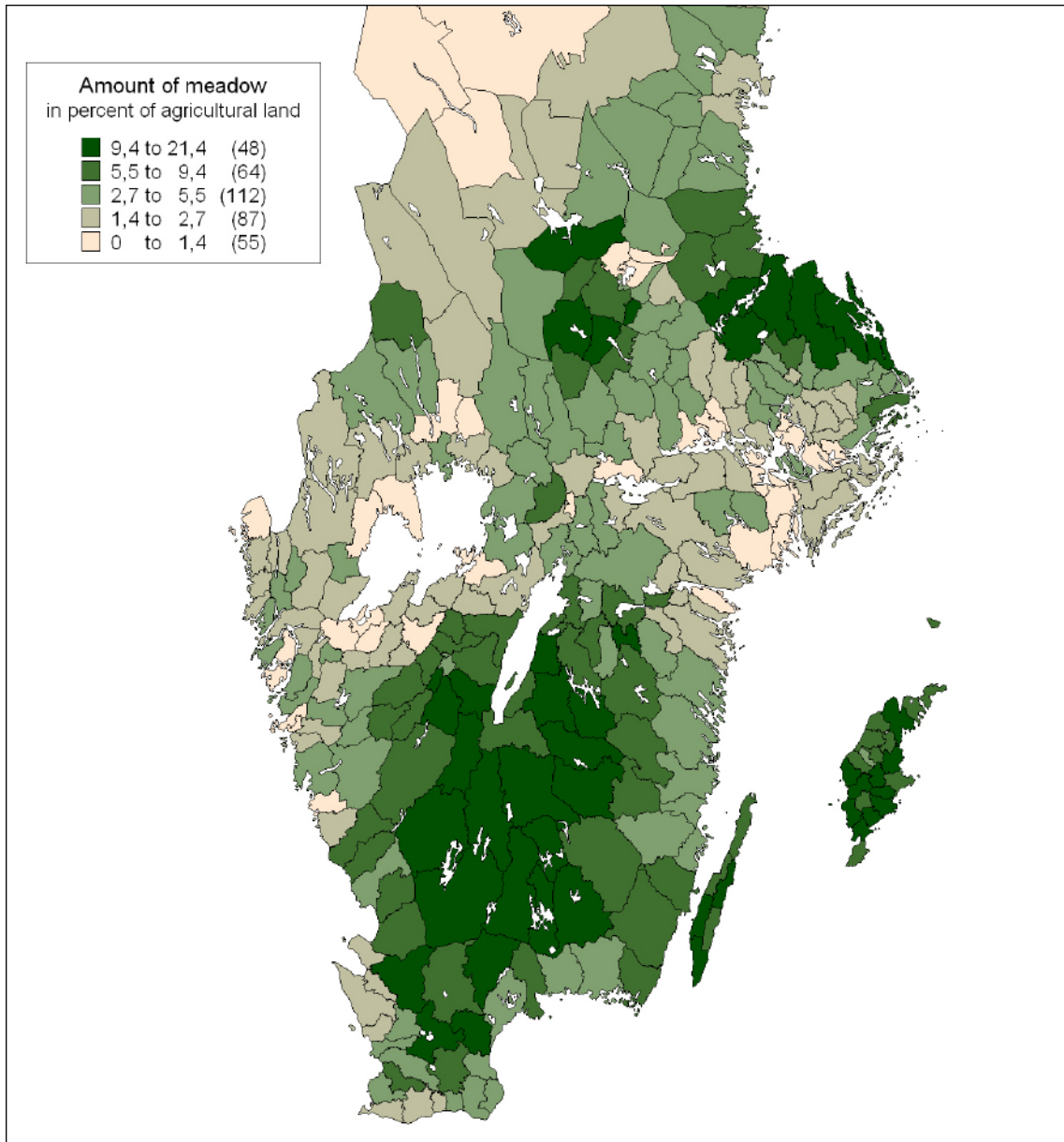


Figure 10-2. The amount of meadow in use in 1900. Central southern Sweden has large proportion of meadows, as does the Forsmark area. Source: Atlas 1900.

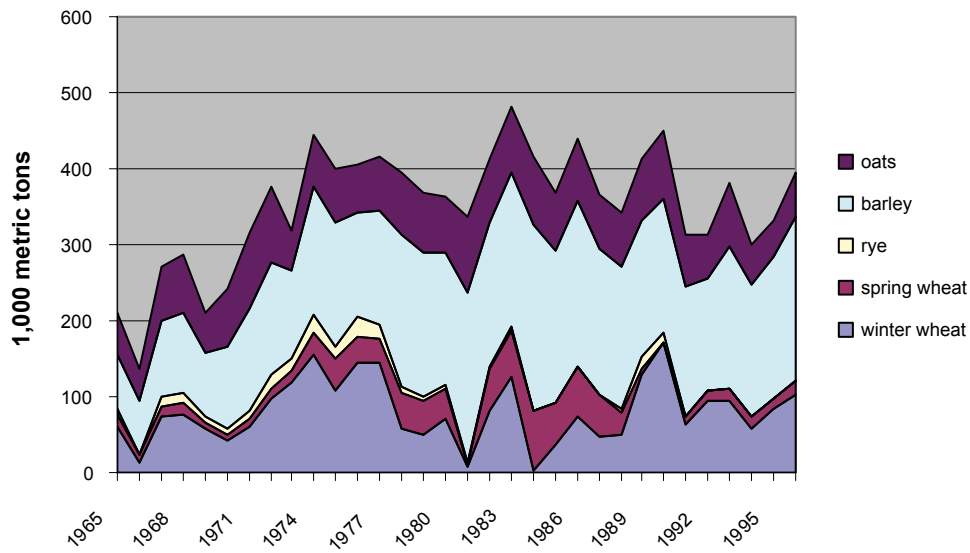


Figure 10-3. Yields in 1,000 metric tons in Uppsala county 1965–1997. Source: SOS, SCB.

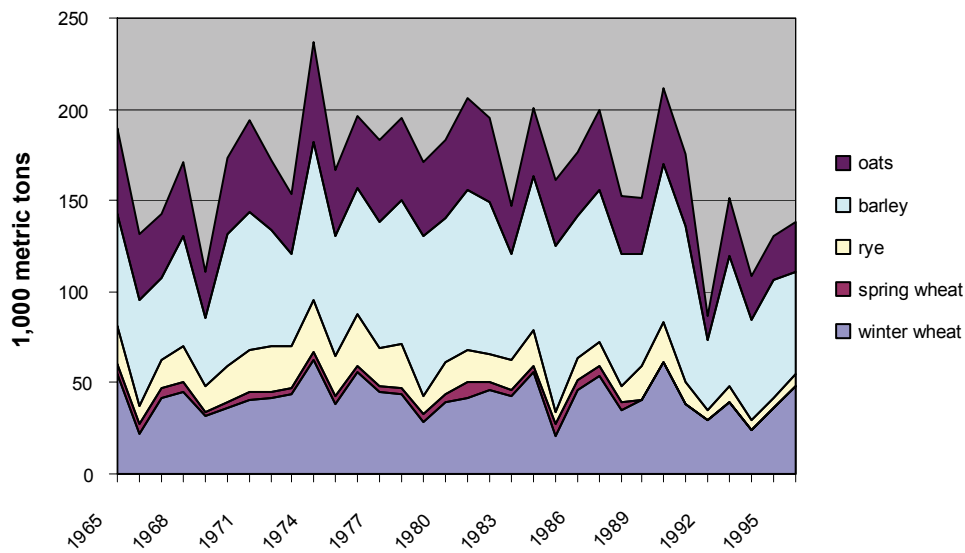


Figure 10-4. Yields in 1,000 metric tons in Kalmar county 1965–1997. Source: SOS, SCB.

11 The landscape in Oskarshamn

The agricultural landscape in the Oskarshamn region is shaped by the physical setting, i.e. the topography and the soils. The areas that are possible to cultivate are limited and the creation of large areas of arable land is difficult. The amount of forest was and is substantial in the area. As has been shown in previous chapters, the settlement pattern was characterised by single farms with a relatively high proportion of subdivision during the later periods. The increase in population during the 19th century was substantial as well. The social stratification was also an important factor. These factors, combined with the limited availability of resources, resulted in considerable pressure on the landscape. With the decline in population at the turn of the century, this pressure diminished.

This chapter seeks to examine the physical layout of the landscape, especially concerning the types of land-use and land-use change over the last four centuries. The source material comes from cadastral maps or other types of maps that depict the landscape, but it is supplemented by field investigations.

By looking at detailed maps of the area of investigation, we can see that most farms were in fact small, and that the arable fields principally consisted of patches of land which were often filled with clearance cairns. In the early maps from the 17th and 18th centuries many meadows can also be observed. These are often located in the same fields as the arable land. In some cases this land also includes forests or stands of trees. While the maps are not very good at depicting the forests, this seems to be a pattern that reoccurs in many maps. Perhaps this can be explained by the physical landscape, where not everything could be used as a meadow because of boulders and rock outcrops, instead small wooded areas or single trees could grow in the meadow without preventing the production of winter fodder. The leaves and twigs from the trees were probably also used as fodder for smaller animals such as goats or sheep.

Another important characteristic of the area is the location of farms by the coast or in the archipelago. These, such as the farms on Ävrö, show us that arable production was not always the most important form of livelihood in the (local) economy. Indeed, the location of such settlement, where the arable land was sometime located relatively far away, is closely connected to the importance of fishing.

The agrarian revolution and the changes that took place during the 19th century also affected the farms and people in the Oskarshamn area. New roads were created and new ownership structures became apparent in the landscape. New stone walls were built in straight lines and divided the landscape into separate domains. The meadows were to some degree abandoned and wetlands were reclaimed as arable land in many areas of the region.

Landscape change was dramatic during the period encompassed in this study, i.e. between 1940 and 1980. About 74 million square metres of arable land were abandoned between 1940 and 1980. According to the calculations, only 3.8 million new square metres were ploughed in 1980. Of the original 114 million square metres of arable land in 1940, only 41 million were still in production in 1980.



Figure 11-1. The farms in Småland are often associated with small arable fields with many clearance cairns and boulders. These represented obstacles when the land was to be ploughed or when general work tasks were to be carried out on the arable land. This situation is very apparent for the case of Djurskult in Döderhult parish. Also discernible in the map from 1712 is the occurrence of large numbers of trees in the meadows.



Figure 11-2. In a much later map from 1804, only half of the area is mapped. The other part, which is denoted as “Frälsehemmannens No 2 Djurhults ägor”, is not mapped (LSA G12-9: 4).



Figure 11-3. The map from 1654 shows that there were several small estates in the area. One example was Bråhult in Kristdala parish, which can be seen in the north of the map situated next to the unnamed lake. There were, however, several small farms that belonged to the estate, thus making it relatively large in size. The farm located to the south of Bråhult is called Saxtorp and another map shows that this farm was situated on the manor's premises. At this time the estate was owned by /Sabelskjöld 1590–1663/. King Johan III originally gave Bråhult to Carl's father-in-law, Hans Strang, as payment of a debt owed to Mr. Strang in 1577.



Figure 11-4. A more detailed map from 1701 (LSA G49-9: 2). We can see that the manor is not particularly large. The amount of arable was limited and over time it developed into a small hamlet. What had originally been the single farm of Saxtorp, indicated as no. 33 in the map, was now subdivided.

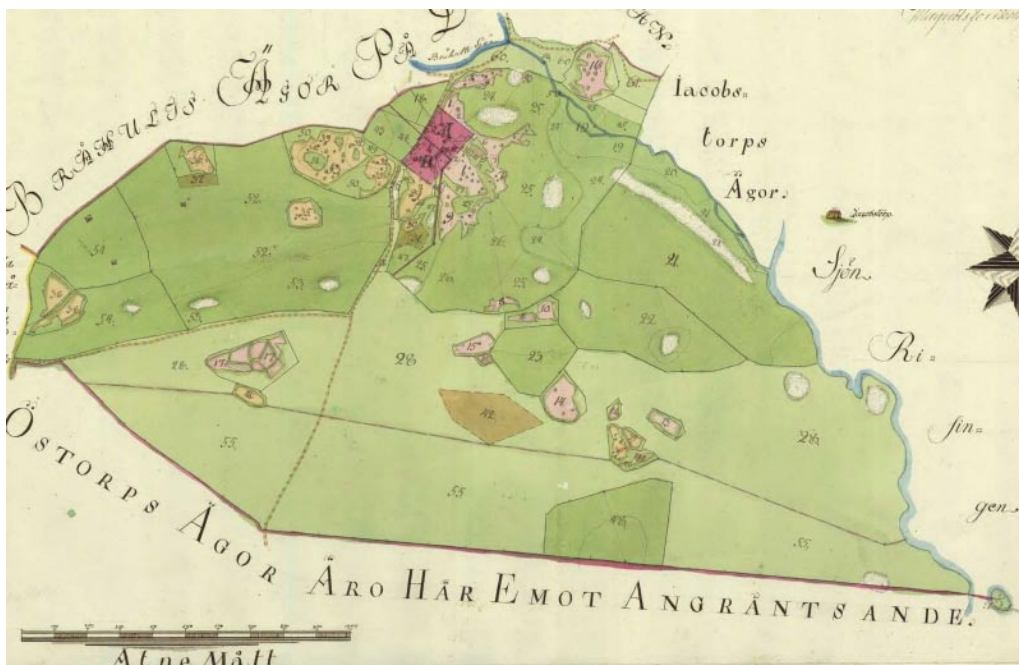


Figure 11-5. In 1786, the 'storskifte' land reform was carried out in Saxtorp. At that time the small settlement consisted of two farms that were separated fairly easily. New quadratic tofts were created, and, aside from the new arable land that had been created in the forested area, a simple line was drawn to divide the arable land; farm A being apportioned the pink areas and farm B the orange areas represented in the map. Even the forest was divided into two main blocks. Also of note is that the surveyor marked many impediments such as rock outcrops in the meadows (marked in green), and other non-productive areas (LSA G49-9: 5).

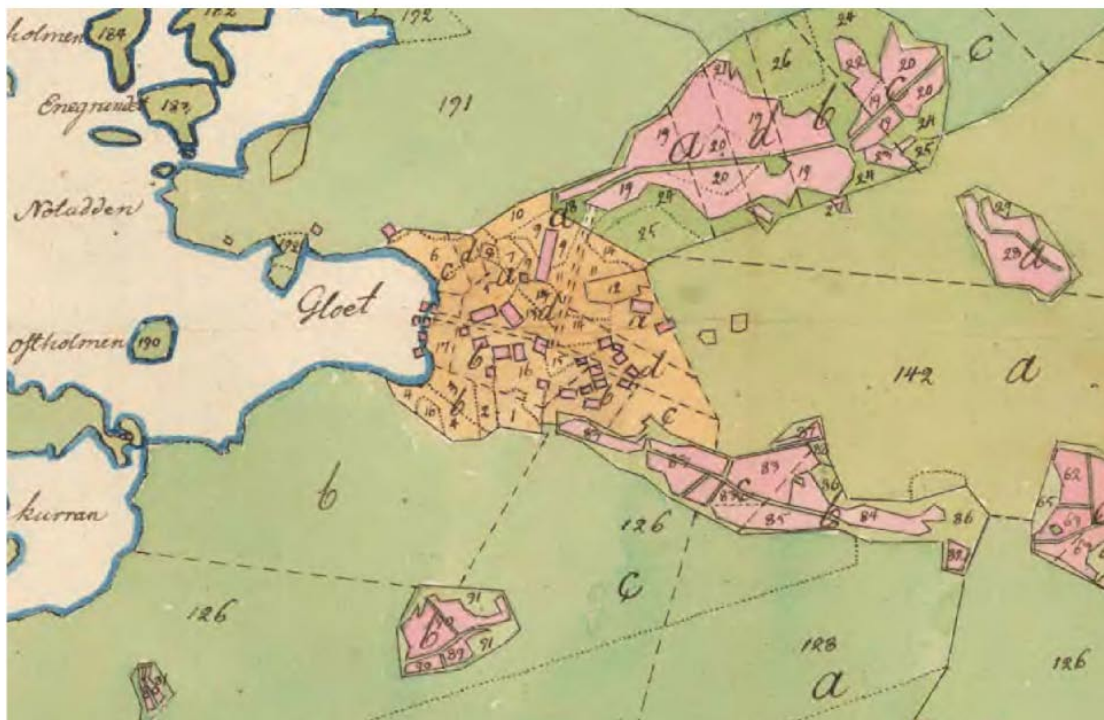
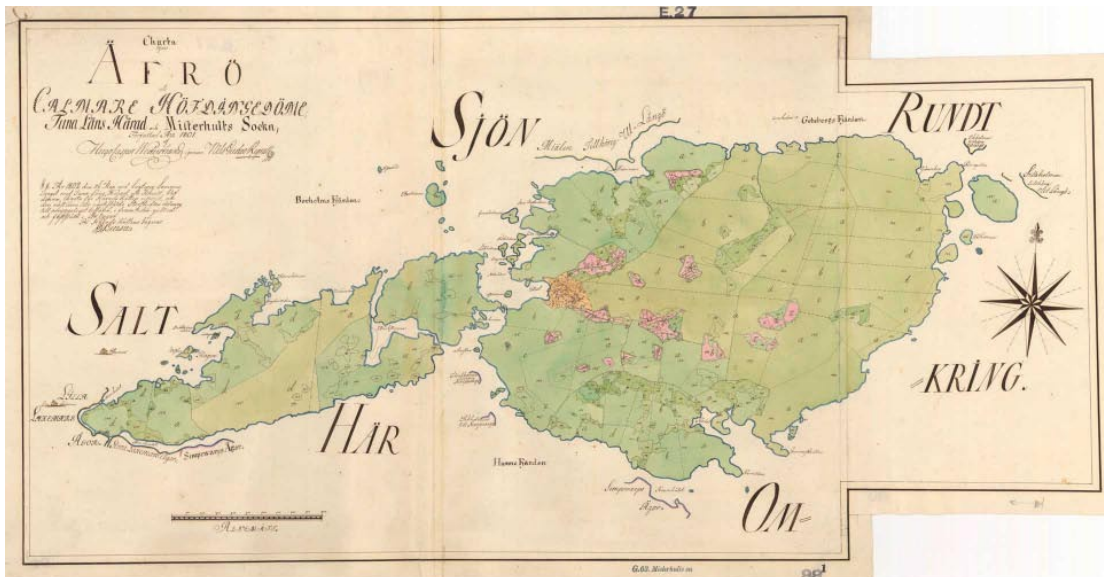


Figure 11-6. This map of Ävrö in Misterhult parish, located a short distance from the mainland, was made in 1801. Depicted above is an overview of the whole hamlet and depicted below is an enlargement from the same map of the settlement. This shows that the settlement is located close to the water and that the arable fields (marked in pink) are located at considerable distances from the buildings. The location, which is typical for archipelagos, indicates that fishing and close proximity to the sea were of more importance than close proximity to the arable fields. The latter would have been essential in the context of farms on the mainland.

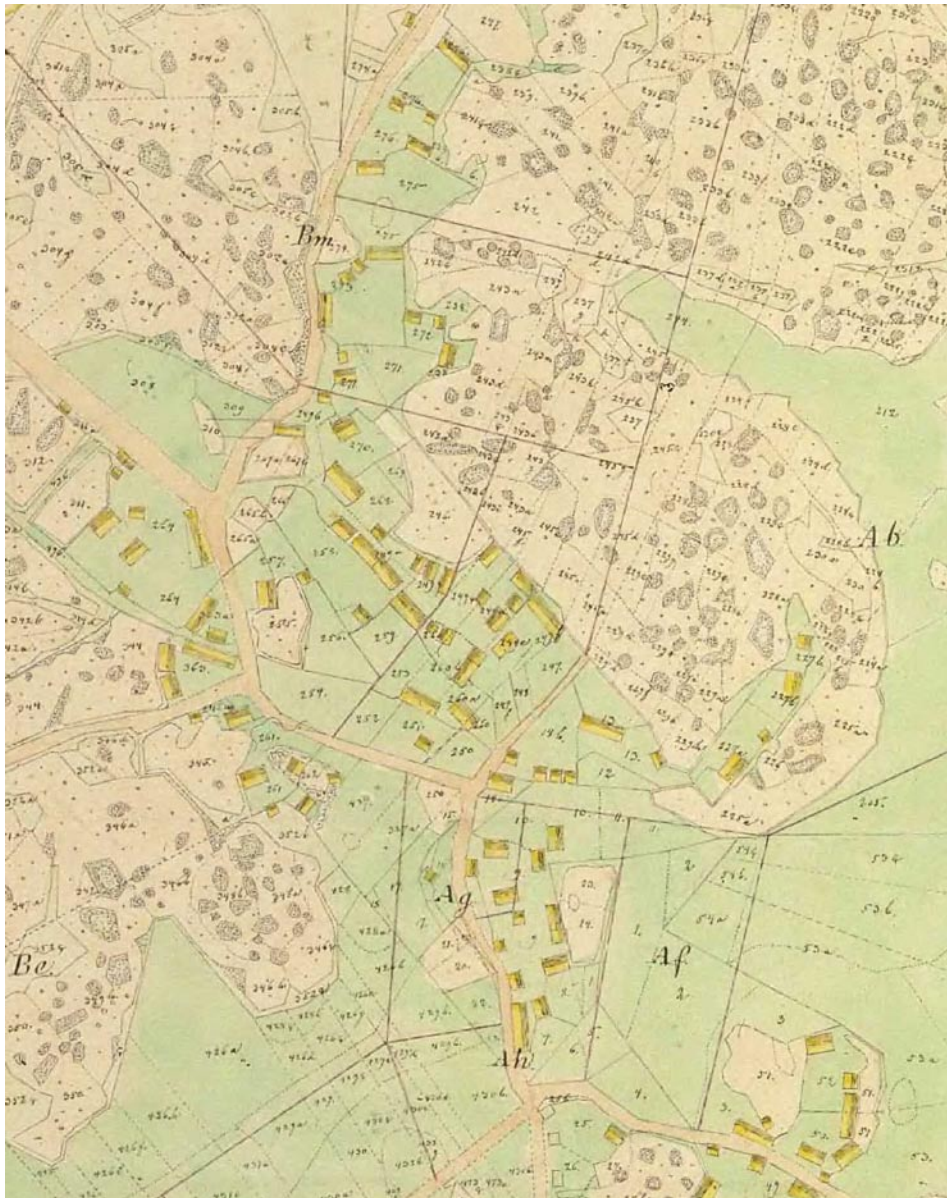


Figure 11-7. The amount of clearance cairns in the fields can easily be seen in this map from 1856 of Fallebo in Kristdala parish. A substantial proportion of arable fields in this small part of the village comprise obstacles to land tillage in the form of literally hundreds of cairns and boulders. The size of the individual cairns is also evident when they are compared to the size of the houses.

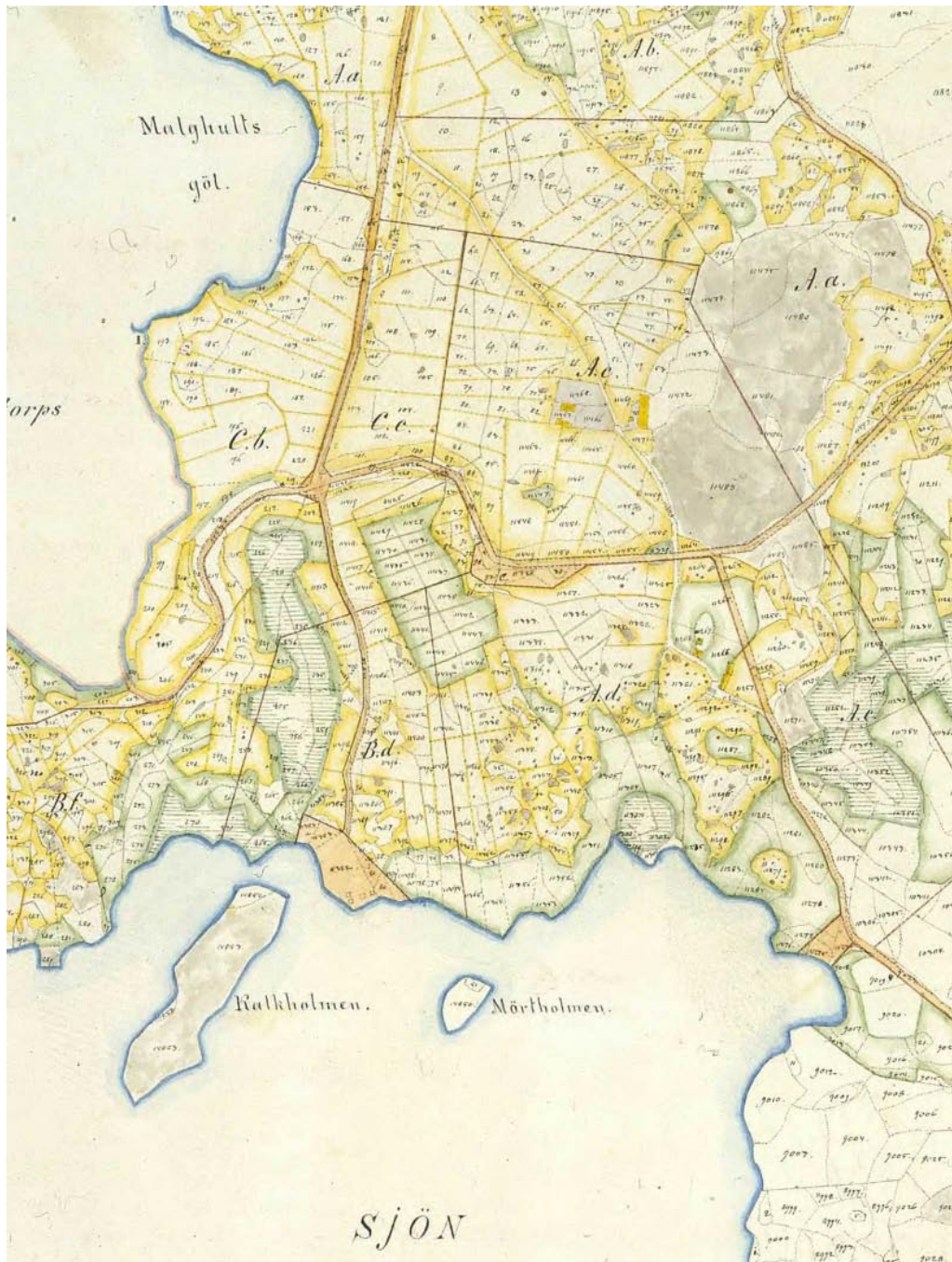


Figure 11-8. Malghult in Kristdala parish 1881–1889. Malghult is located between Lake Hummeln and the present day community of Kristdala. We can see the new planned roads that were created as an effect of the ‘laga skifte’ land reform. They are often constructed in straight lines as opposed to the older winding roads that connect settlements in the landscape, as can be seen at “Ac” in the map. We can also see that there are a number of ditches in straight lines at the centre of the image. The ditches that were dug in order to drain the wet meadows to create new arable land, meant that only minor areas of meadows remained (marked in green in the map). Lowering the levels of lakes also allowed the area of arable land to expand. The small lake to the north, Malghultsgöl, has drastically decreased in size today, and the islands Kalkholmen and Mörtholmen are now peninsulas.

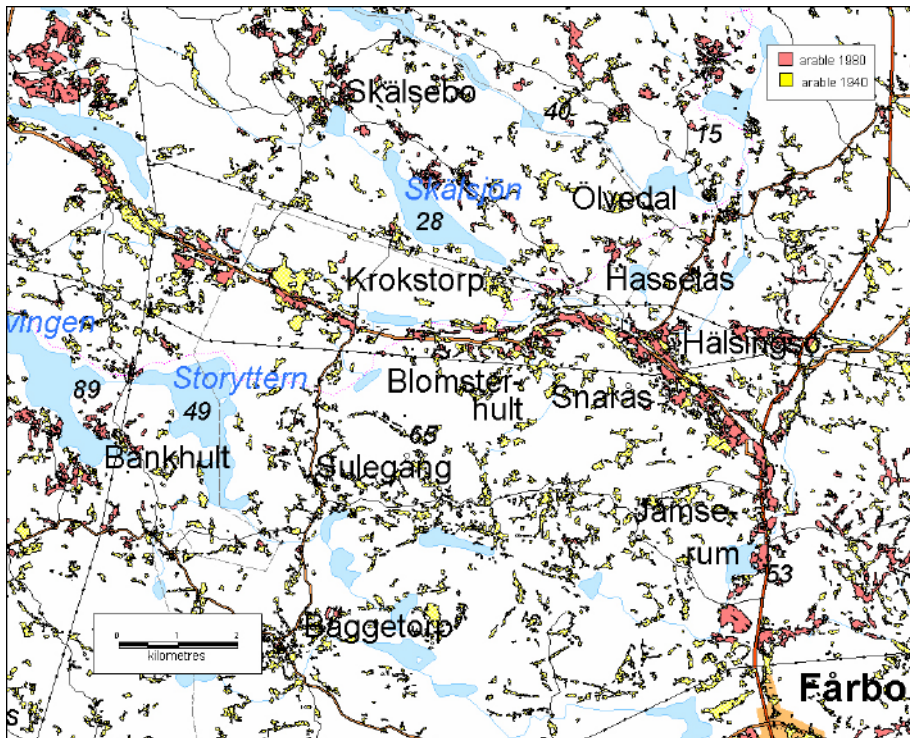


Figure 11-9. This map shows the changes in the extent of arable land in the period between 1940 and 1980. Some areas of arable land have been abandoned.

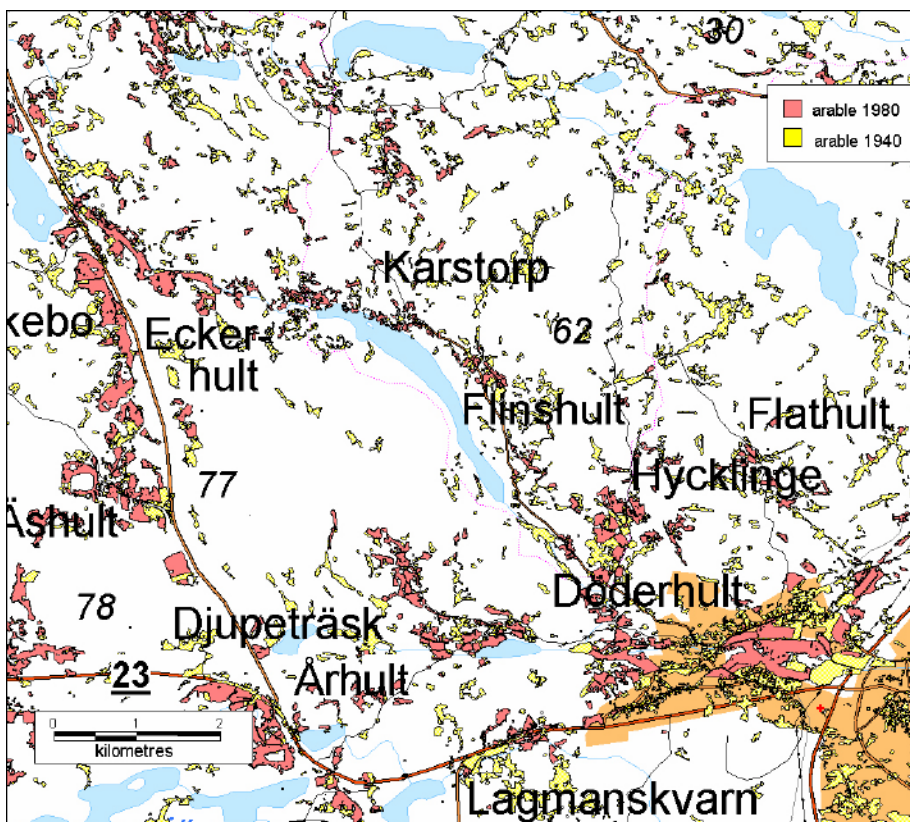


Figure 11-10. This map shows the changes in the extent of arable land in the period between 1940 and 1980. Some areas of arable land have been abandoned.

Table 10-3. Amounts of abandoned, new, and continuously used arable land in the Oskarshamn area for 1940 and 1980.

Arable 1940 and abandoned later	73,699,500 m ²
Arable in 1980	3,848,600 m ²
Arable both in 1940 and 1980	41,609,600 m ²

The forms of the arable fields can also be analysed in relation to the changes. It is not uncommon that field configurations have become simplified over time, i.e. that the irregular shapes and forms have been simplified into simple rectangular forms. This can be calculated by comparing the perimeter and the area of a specific arable field. In this case the raster files were used. The method was to analyse this in a raster format with a resolution of 10 m. This eliminates some smaller changes in the extent of arable land, but the quality of the input data is not higher than a 10-metre resolution. These values, or indexes, are dependent on the resolution used, which means that these figures can only be compared to other calculations using a 10 m resolution.

If we compare the curves in the graph, it is evident that the arable fields, or pixels belonging to the low index category dominated in 1940. In the 1980, however, they have decreased dramatically.

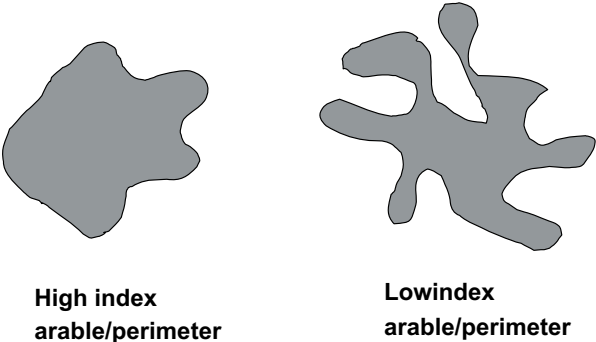


Figure 11-11. Explanation of the index used in the analysis of the field forms.

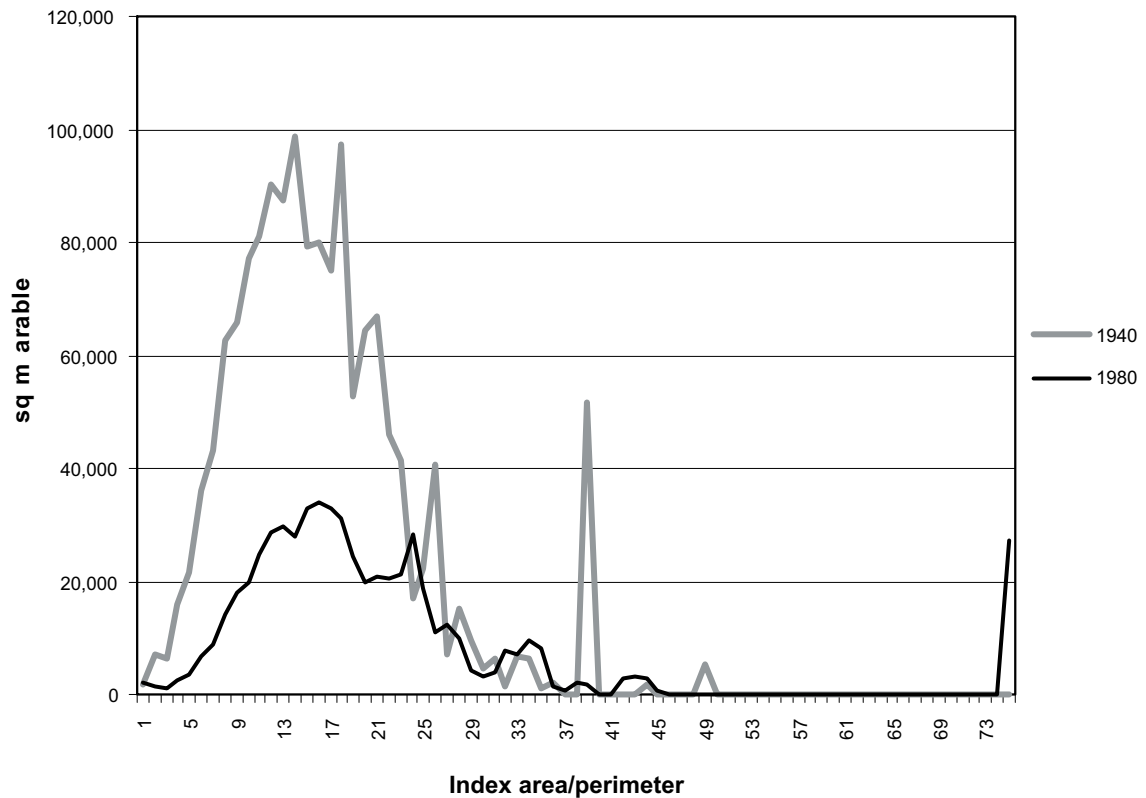


Figure 11-12. Index of the proportion of area and perimeter. The lowest index value has the most complex form with a relatively small area and a long perimeter. Arable fields with low index numbers dominate in 1940, but in 1980 the aerial extent of this category has fallen dramatically.

11.1 The changes in arable land according to “aspect”

By calculating the aspect, i.e. directions of a slope, of a digital elevation model (DEM), it is possible to see in what directions the arable fields are located in the terrain. In this case, this has been done by using a DEM with a 50 m-resolution and the same land-use files as above. The aspects are classified according to cardinal directions, i.e. into 8 classes N, NE, E, etc, each of which covers a 45 degree sector. This classification allows us to see if arable fields are more commonly aligned in certain directions than others.

It is evident that in 1940 most of the arable fields were located on south-facing slopes and that few were located on north-facing slopes. This can be explained by the factor concerning microclimatic conditions. The southern slopes get more sunshine and are perhaps not so heavily affected by frost. The overall conditions are the same in 1980, but the arable fields have “slid” more towards the south. This can be seen in the graph where the changes in percentages are displaced. The polar diagrams show the changes in percentages for arable fields in 1940 and 1980 respectively. It is evident that arable land located on north-facing slopes has been abandoned to a larger extent in favour of south- or southwest-facing slopes.

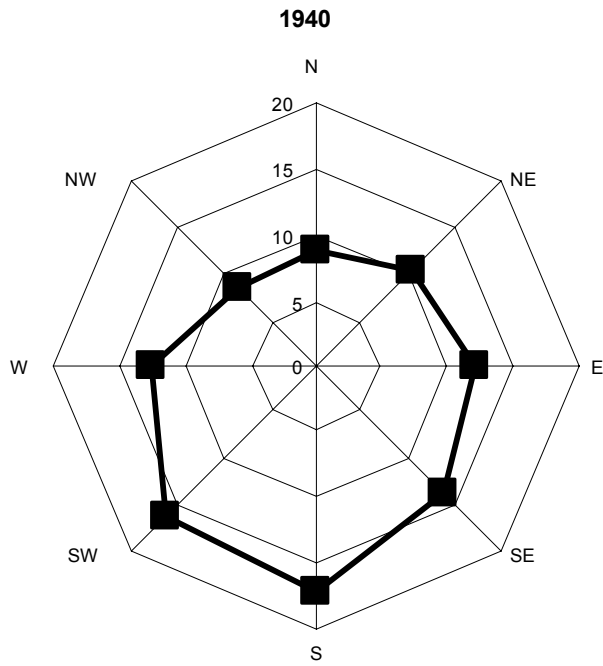


Figure 11-13. Polar diagram showing the distribution of arable land according to slope direction in Oskarshamn in 1940.

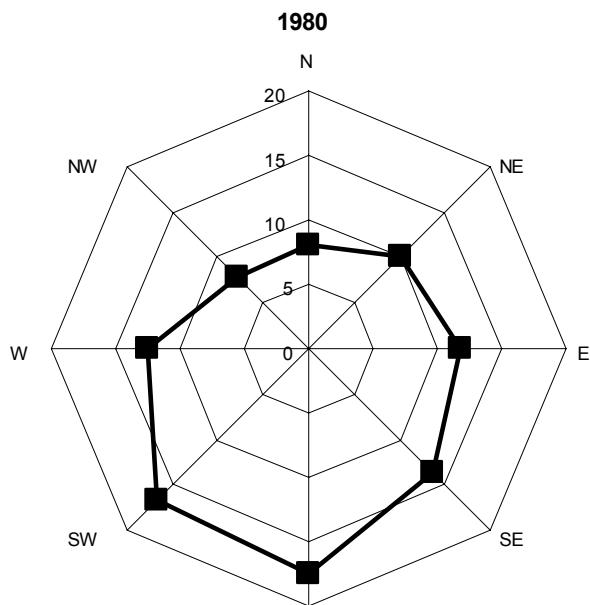


Figure 11-14. Polar diagram showing the distribution of arable land according to slope direction in Oskarshamn in 1980.

Changes in percent 1940 to 1980

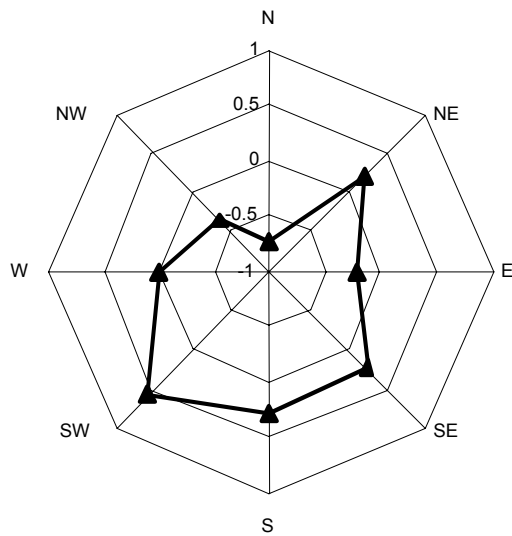


Figure 11-15. This diagram shows the changing aspect of arable land between 1940 and 1980 in percentage values. The value of zero indicates that there is no change in the relative values whereas negative values of one would indicate a change from, i.a. 8 to 7%. It is evident from this diagram that arable land located on north-facing slopes has been abandoned to a larger extent in favour of south- or southwest-facing slopes.

11.2 Lilla Laxemar, Misterhult

Lilla Laxemar, together with the farms of Ström and Ekerum, are situated on the coastline in Misterhult parish, just north of Simpevarp. The three farms were mapped together at the end of the 17th century. The reason for mapping them together was that the farms shared the woodlands. They constituted a so-called *skogelag*. The map shows that the three farms were situated as single farms in fairly close proximity of each other. Each farm had its own arable land but they shared large parts of the meadowlands and the woodlands. The map from 1689 was originally made so that the farm boundaries could be separated even in the woodlands.

The physical landscape in Lilla Laxemar is characterised, on the one hand, by rock outcrops and areas with many boulders in the higher part of the terrain, and, on the other hand, by smaller or bigger pockets of sedimentary soils in the lower part of the terrain. It is only possible to till the sedimentary soils. Around the settlements of Lilla Laxemar, Ström and Ärnhult, there are larger areas of land that can be tilled. The rougher parts of the terrain are largely wooded. Some areas of the unproductive land are covered only with low bushes and these parts thus form a semi-open landscape.

11.2.1 Landscape history in Lilla Laxemar

The three farms are mentioned in land taxation register for Misterhult from the mid-16th century. At that time Lilla Laxemar comprised two farms, while Ström was a single farm owned by the crown. Considering that Lilla Laxemar is represented as only a single farm in the map from 1689, it seems probable that the other farm in the mid-16th century was Ekerum. In c 1530 a fishery was reportedly located in Lilla Laxemar (DMS 4: 4 p 219 and p 223).

According to the map from 1689, the three farms had very little arable land. In spite of this, the farms were registered as full tax paying units (Sw. *hemman*). These circumstances indicate that the main income sources for the farmers in the area were non-agricultural. For people living in the coastal area of Misterhult, the fishery and other fishing-based income earning activities were of most importance /see also Moström 2004/.

The fishery in Misterhult is well documented in the written sources from at least the mid-16th century. At that time, Gustav Vasa established a crown fishery at Simpevarp. Simpevarp was also the centre for the whole area and fishery in the area took place with Simpevarp as a centre. There was a fishery bailiff at Simpevarp during the later part of the 16th century. According to records from the Simpevarp fishery for 1557, the fishing catch largely comprised small fish (such as perch, bream, pike, roach, eel), but also seal, the latter being caught during the summertime at *Simpevarps skär* (DMS 4:4 p 221). No documents from the Middle Ages have been preserved for Lilla Laxemar or for the other farms in the detailed studied area. The ancient monuments from the late Iron Age at Simpevarp indicate that Lilla Laxemar and Simpevarp were important places for fishing during the whole period from the late Iron Age to the mid-16th century /Norman 1993 p 110/. The field evidence from the early and high Middle Ages of remains of seasonal fishing (so-called *tomtningar*) on the islands in the outer part of the archipelago in the Misterhult area, also indicates that fishing was the main source of income for the people in the coastal area /Norman 1995 p 44/. It is likely that the people living in the area used agriculture as a sideline activity during the entire period from at least the late Iron Age to at least the 19th century.

Two crofts, Ärnhult and Sandsböle, are also represented on the map from 1689. Sandsböle was transformed to a tax-paying farm in 1689, but Ärnhult remained a croft until the mid-19th century. Neither Sandsböle nor Ärnhult are mentioned in the land register from the mid-16th century. This suggests that these crofts were established after that time but before 1689. It is also possible that Sandsböle and Ärnhult were crofts in the Middle Ages. Crofts were not registered in the official land registers.

In the area situated a few hundred metres north west of Ekerum, there is a small plot of arable land called Torpet. The name of the plot clearly indicates a deserted settlement, probably a croft. The fieldwork in the area confirmed that this was in fact the case. At a place in the northern part of the plot there were indications of a deserted settlement. The place was cleared and formed a terrace. No concrete evidence of the settlement was found. It is not possible to determine whether the croft was deserted during the medieval crises after the mid-14th century, or if it was colonised and deserted between the mid-16th century and 1689. This indicates that the area of Ekerum and Lilla Laxemar was more densely settled before 1689.

The areal extent of arable land and even more so of meadows increased throughout the 18th and 19th centuries. The wetlands in the wooded areas were then also being used as meadows. At the same time, the old meadows located near the settlements were transformed into arable land. The increase in population and the increasing number of farms during the period may partly explain this situation. Another possible explanation is that fishing and fishing related incomes decreased in relation to other incomes and that agriculture increased in importance as a source of income at the same time. This does not mean that fishing related incomes disappeared, but that agriculture became relatively more important.



Figure 11-16. The location of the deserted croft is simply called “torpet” in this map from 1689. The location of the settlement was probably just below the T in Torpet.



Figure 11-17. The field at Torpet in the woodlands west of Lilla Laxemar today.

In the mid-19th century, the enclosure (Sw. *laga skifte*) took place in Ekerum and Lilla Laxemar. At that time the number of farms in the area had increased. Ekerum and Lilla Laxemar each consisted of seven farms (see below). This increase in the numbers of farms in the villages was the effect of the farm subdivisions that took place during the 18th and 19th centuries. These subdivisions were, in turn, caused by the increase in population. At that time of the enclosure the areal extent of arable land had further increased. A consequence of the enclosure in Ekerum and Lilla Laxemar was that some farms were forced to move from the former toft of the villages. In this area, two farms at Ekerum moved to the crofters place Ärnhult. This forced the crofter at Ärnhult to move away. Another direct consequence of the enclosure was the creation of property boundaries. From that time onwards, all of the farms in the area were single farms which individually managed their own land.

A considerable amount of the arable land in the woodlands remains open to this day. This is now used for the production of hay. Only a few of the arable areas from the period of expansion during the 19th century are now deserted. These areas are now either wooded or are covered with bushes and small trees.



Figure 11-18. Abandoned arable land that has reverted to woodland. Here, the fossil fields are identified as cleared plots, often with negative lynchets on the outer boundaries of the plots and with small ditches crossing them. This picture is from a plot at Ström that was used as arable land at the end of the 19th century, but which was turned into grazing land in the 1940s and after that to woodland.



Figure 11-19. In an area situated immediately to the east of Ström, there are traces indicating that the land was formerly open and dotted with small plots of arable land. This pollard is one of the remaining features from that time.



Figure 11-20. *In the area called Nyhägnaerna at Lilla Laxemar, the arable land has only recently been abandoned. Trees and bushes from the surrounding woodland have started to grow on the outer part of the plot.*

One of the clear changes that can be observed in the maps spanning the period from 1689 to 1872, is an increase in the amount of meadowland located in the central part of the village. In the 17th century, the meadows were concentrated in the eastern part, close to the settlement. Most of the meadows were in the same fenced-in area as the arable land. The picture has changed dramatically one hundred years later, and many of the former wetlands and peats were now being used as meadows. The maps from 1793 show this in great detail. This can be interpreted as a result of the increase in population and hence a greater pressure on the landscape, but also probably a change in production with larger numbers of animals requiring winter fodder.

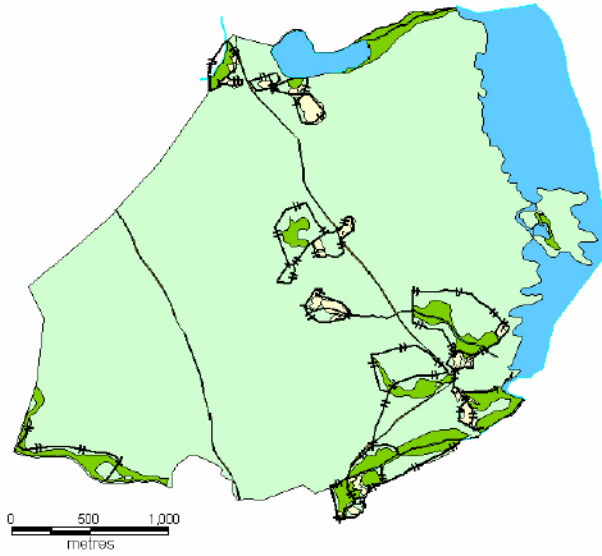


Figure 11-21. This is the earliest map of the area of Ekerum and Lilla Laxemar. LSA G63-51:1, 1689.

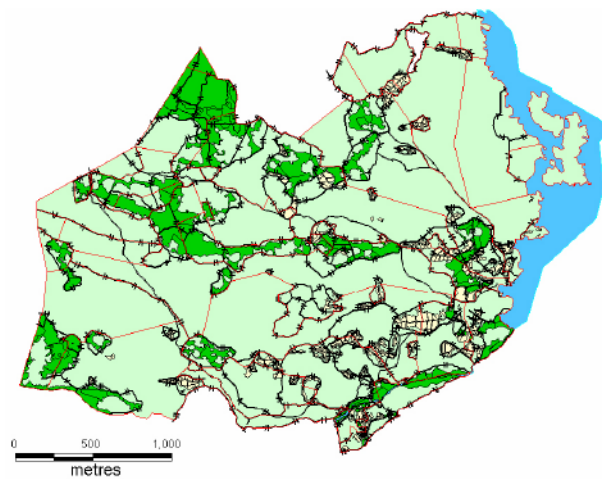


Figure 11-22. This map illustrates the effects of creating fences in the forest. This is often referred to as “förhugning” and is related to an increase in the number of livestock, LSA G63-51: 2, 1793.

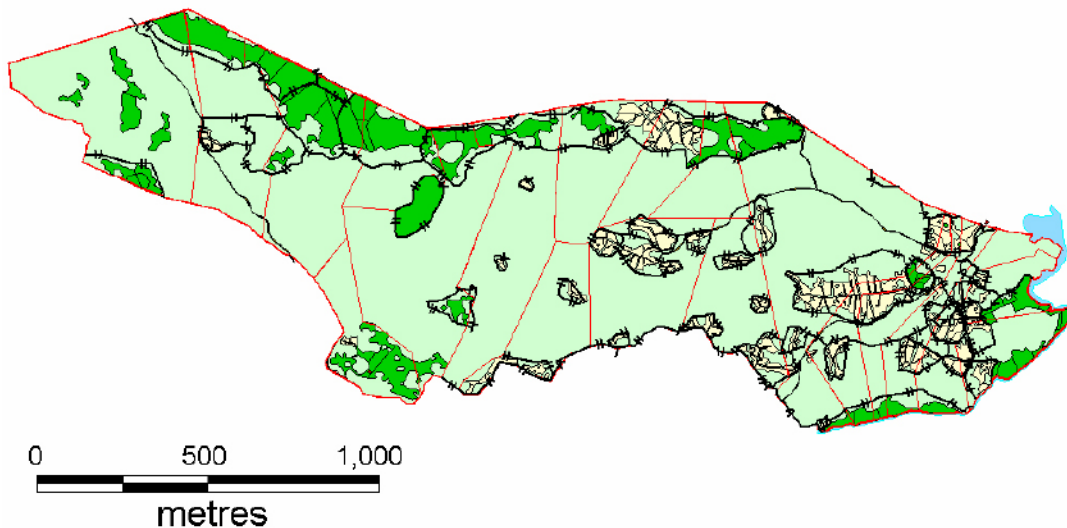


Figure 11-23. This map shows the southern part of the areas shown in the previous maps. It is very apparent that the amount of arable land has increased LSA G63-51: 4, 1831

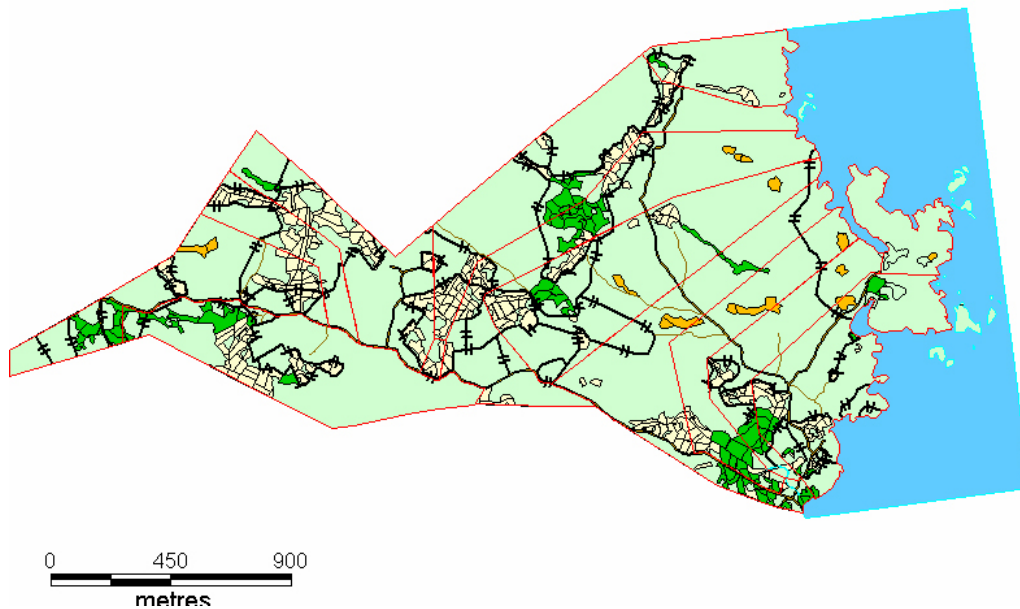


Figure 11-24. This map of the northern part of the area shows the subdivision of farms that occurred during the period. LSA G63-51: 5, 1872.

Another effect of the increase in population was the emergence of crofts. In the Lilla Laxemar area, a number of crofts appeared during the 18th and 19th centuries. Some of them are still in existence today as summerhouses, one example being “Båtsmanstorpet”. Other crofts had been deserted by the end of the 19th century and the beginning of the 20th century. One example of a deserted croft is Sandbo in the northern part of Lilla Laxemar, which was deserted before the 1940s. Around the crofts were also small plots of arable land, and at Sandbo the arable land was still being cultivated during the 1940s. Today, all of the arable land has reverted to woodland.



Figure 11-25. *Abandoned small fields at the croft at Sandbo. The settlement was deserted at the beginning of the 20th century. The fields were still in use in the 1940s. Today the area has been reverted to woodland.*

Another example of a deserted croft is Norra Horva near Ekerum. The remains of a collapsed chimney mark the site of the deserted settlement.

Other examples of remains of historical structures are the roads. Many of the old roads in the area are still in use, one example being the road from Ström to Mederhult in the woodlands of Ström. Some of the old roads are, however, no longer in use. One example is the old road between the northern part of Lilla Laxemar and the central part of the village. The road can be traced through the woods and, at certain places where the road crosses property boundaries, there are some remains of wooden gates.

Another example of the remains of a wooden gate is to be found at the intersection of the road from the former crofter's place of Sandbo and the village boundary of Medelhult. An old and partly destroyed wooden fence with a gate marks the village boundary.



Figure 11-26. The remains of the cottage at Norra Horva north of Ekerum.



Figure 11-27. The old road north of Lilla Laxemar and Ekerum. Where the road crossed property boundaries there would have been wooden gates. These no longer exist and today only the gatepost and the gap in the fence remain.



Figure 11-28. A wooden fence marks the boundary between Lilla Laxemar and Mederhult. A wooden gate is located at the point where the old road to Mederhult passes the boundary.

11.2.2 The contemporary landscape in a historical perspective

The landscape today has many vestiges from previous periods, from as far back in time as the ancient monuments of prehistoric times, to the more recent remains of land-use practices in the 19th and 20th centuries. The landscape has been used and reorganized in order to suit the needs and capacities of the time period. The present agricultural landscape is characterized by the agricultural expansion that took place in the 18th and 19th centuries, a period when many of the niches in the landscape that could be exploited came to be used for agricultural production. Another very visible trait in the landscape is the decrease in the amount of arable land during the last century. It is possible to detect abandoned fields and other physical evidence of agricultural labour literally everywhere in the landscape. Many of the open fields of today have also undergone change, and many areas that were formerly of vital importance for the sustenance of the population have been turned over to other uses.

The remains of many abandoned crofters' houses are the physical legacy of the period of population growth during the 18th and 19th centuries, and they bare witness to the relatively high density of population that pertained until the beginning of the 20th century. Furthermore, the evidence of a former settlement at "Torpet", which was probably deserted during the late medieval crisis, indicates that there was a higher density of settlement during the Middle ages than was the case during the 17th century.

11.3 Agriculture and modern landscape transition processes in the Oskarshamn area

The understanding of contemporary agriculture and the modernisation of agriculture in the Oskarshamn area presented in the report, has been gained from interviews with two younger farmers, one foreman, three retired farmers, and two landowners. All the interviewees have grown up in the area and live in small hamlets in the vicinity of the Oskarshamn power plant. The physical landscape is characterised by the relatively large amount of bedrock and the relatively small and scattered distribution of areas suitable for cultivation.

The themes discussed in all of the interviews have been:

- Land use during the last 50-year period and typical changes in land use over the last decades.
- Earning a living in cases where agriculture is not practiced.
- The direction of production in the context of current land use practice.
- The possibilities for land use, today and in the future.

11.3.1 Historical land use and characteristic changes after the second world war

After the Second World War, farming in this area was conducted by a large number of small non-mechanised family farms with a relatively diversified production. In the study area there were also a couple “forest estates”. Two brothers tell me about life on one of these small family farms in the old days. Their farm is situated close to the coast. They talk about farming and fishing in the old days and explain many details of the changing processes that have occurred since then. After the war, production was geared towards self-sufficiency, and combined fishing, grassing and cultivation. This had been augmented by collecting lingonberries and rosehips, and hunting seabirds. The only things that they had needed to purchase from outside were coffee, sugar, hulled grain (Sw. *gryn*) and clothes, everything else they produced themselves. Some families also carried out some commercial fishing, especially during the summer season. Their working days were rather intensive during the summer season and they fished all night long. In the mornings, they arrived back home in time to milk the cows and the rest of the days were spent working in the fields. As they themselves related, there was not much time for rest during the summer months. The fish was sold to the fishing association (Sw. *fiskeförening*) in Oskarshamn, so accordingly they had to go by boat during late night and early morning. Their farm consisted of approximately three hectares of cultivated land and they had between three and five cows and a horse. With the start of the period of mechanisation following the war, they became the owners of a small threshing machine and a small sawmill. The first tractor in the hamlet was purchased collectively by the neighbours in 1950. They explained, however, that the tractor did not have had any significant impact on the way in which they used the land, but that it had made their work somewhat easier. The most important change was that all of the horses were gone after a couple of years, and that all of the old meadows were converted into arable fields.

The coastal fishing waters belonging to each hamlet were very important for people living near the sea as this provided them with exclusive fishing rights within 180 m of the shoreline. This type of fishing was divided into sectors, each of which was circulated among the farms in the village. This meant that in a hamlet with four farms, each farm would fish the same sector every fourth year. This had the result that different types of fish were landed by each member in each year. Fishing beyond 180 m from the shoreline was open to all, and as was discussed earlier, many of the farmers in the area did this to at least some extent in order to augment their incomes.

The two brothers give a good picture of farming and livelihoods in the area before mechanisation and modernisation started; it was founded on a diverse and multifunctional use of land and sea.

But what has happened in the village since the 1950s? One farmer continued to earn his living here until the 1992. Elderly retired male farmers, in two cases without families, occupied the other farmhouses. The latter situation was common during the discussed period and for the type of landscape studied here, i.e. where farms were inherited by eldest sons who were not usually married and who did not have families /Wästfelt 2004/. This inheritance system often meant that farms continued to be farmed in the traditional manner for much longer than would have been the case if they had been handed over to the younger generation.

The last farmer to earn his income mainly from farming in the hamlet was active in the period from 1950 to 1992. In the period from 1970 to 1980, he cultivated all of the land in the hamlet. He had purchased one more farm during the period and added leasehold land as and when it became free. Most of his production derived from milking cows (14–15) and the use of the forest during the winter. This farmer argued that the tractor was an important reason and innovation, which made it possible for him to become the only land user in the whole hamlet. Today he is rather disillusioned about the long-term viability of farming in the area. He says that it is not possible to have 50–60 milking cows in such a small hamlet because the distances to the fields are too long and the only production possible is grassing. At the same time, however, his considered opinion is that production must remain in focus, rather than the production of landscape values for entertainment or other reasons. He is very sceptical about subsidies from the European Union and the EU's preference for large areas. In his opinion, the conditions in the study area are not favorable for full-time farming. He finishes by telling me that all of his neighbours in the hamlet have stopped growing potatoes because it is now cheaper to buy them in the local shop. I find this information symbolically important in understanding that the idea of self-sufficiency has gone.

In 1992, his son took over the farm and he began by building a new pigsty. The land, both owned and leased, amounted to c 50 hectares of arable land and 80 hectares of forest. An important point is that landowners never lease out forests. This is because of their economic value and also for the reason that only low levels of inputs in terms of work are necessary. Throughout the period that he has run the farm, he has had a non-farm job. The price of pork halved in the period between 1992–2002, and in 2003 he abandoned the “real” farming activities totally. Today, he produces silage for sale during his free time. In terms of the future possibilities, he argues that the forest is what makes the hamlet go round economically. His 80 hectares of productive forest provides a good extra income.

In addition to the other small family farms, some of which still produce milk, there is also another type of farm in the area, i.e. the large forest estates that have a rather different history than the family farms. Firstly, they are ten times as large as normal family farms, around 800 hectares compared to 50–90 hectares. Before the war, there were 31 crofts on this estate and 12 still exist today. Most of the abandoned buildings were torn down and used as firewood during W.W.II when it was not possible to import oil and coal. The former cultivated areas around these abandoned crofts are now either overgrown or have been converted to so-called “game fields” (Sw. *viltåker*) for wildlife and game. The forest manager of the estate who was interviewed, had himself grown up on the farm as a son of a lease-holder farmer. At most, the cultivated area had encompassed around 100 hectares of land, and nowadays it encompasses around 50 ha of open grassed land. The arable fields are leased out to a neighbouring land user, and the game fields are leased out to professional hunter who specialises in raising ducks and selling hunting experiences to foreigners.

Formerly, this had been a more traditionally run farm, but following the sale of the estate to the current owner ten years ago, the focus has become forest production and hunting. Several projects have been carried out to make the environment more suitable for game. For example, many of the small old arable fields are today ploughed and sown with special seeds good for the animals. Furthermore, some of the old ditched areas have been flooded to make them suitable for ducks. Approximately 3,000 ducks and pheasant are reared each year as game for hunters.

The estate owner, who lives in Stockholm, visits the place several times each year and is himself a hunter. Accordingly, the basis of the estate is a combination of recreation and farm and two people are employed on a full-time basis to manage the forest and game.

The examples presented here illustrate how farming has been abandoned and replaced with other forms of extensive land use. It is important to remember that there is an important economic incentive for retaining and managing forests, and also that the extensive use of former arable fields gives subsidies.

11.3.2 Creating suitable conditions for farming

Only in the case of one young farmer, has it been possible to develop farming activities in a way which make it possible to make a living from land use. Conforming to the inheritance system discussed above, he inherited the farm from his father, in his case in 1994. The family farm has an arable area of approximately 10 hectares. Since 1994, he has also been the leaseholder of 25 fields of other farms in an area with a 20km radius on which he primarily produces fodder and silage for sale and for use for his own animals. He runs meat production and a few other animals as calves (Sw. *amkor*). He also grazes his 14 highland cattle in an area for which he receives subsidies for preserving meadows. Over the past few years he has increased his holdings by between 2 and 5 farms per year, and has now reached the point where it is necessary to have an employed assistant. During the interview, he explained to me that the most important quality nowadays is to be flexible to changes in agricultural policy and particularly those relating to available subsidies. He also related that the local geographical conditions in the area make it impossible to manage a large milking farm because of the relatively high cost of fodder. He added that the necessary number of cows (around 60) to be able to run such a milking farm, would mean that the necessary number of fields would be spread over such a large area that it would make transport costs too expensive. He has also developed a system whereby he uses machinery belonging to other farmers in the area, and when he is out doing this works often passing his own leased fields that makes it possible to reduce transportation costs.

The described process of spatial reorganisation has resulted in a spatial concentration of land use to a few land users who employ different approaches to land use. At the same time, the concentration to a handful of land users has led to a situation where the fields used by these land users are more dispersed.

One of the interviewed farmers argued that when the law was changed to allow anyone to buy a farm (and for any use), it became evident that more farms were being sold as summer holiday cottages, and that this has hindered a suitable redistribution of farms to suitable sizes. On the other hand, one of the farmers who was interviewed mentioned that it is not possible anyway to have 50–60 cows in the area, because of the long distances and the small and scattered fields.

11.3.3 Conclusions

The first and most important conclusion to be drawn from this study of Oskarshamn is that farming and cultivation as a livelihood and for earning one's living as a traditional farmer not exist as an idea in the area. Farming is continuously abandoned in favour of managing natural and cultural values. This has resulted in a situation where a few landusers have a lot of small tenancy contracts

It is important to notice that even when modernisation has altered the production and there has been a concentration to one single farmer in each hamlet, this process seems not to be enough for conserving the idea of farming in a traditional way. One explanation for the current situation is probably to do with of the small-scale physical structure in the area. Too many small fields spread out in a relatively large area make modern cultivation uneconomical. The owners of old family farms do not sell the whole farm.

There has not been any great rearrangement of land, which has made it possible to live off forest production. The only place where forest production is of such an amount that it is possible to live off, is at the former landed estate, where the production has shifted to raising ducks for hunting.

During the interviews in the study area it became clear that two small milk farms had been abandoned this autumn (2004). I found this significant for an ongoing process; their land use is converted from productive land to production of ensilage in order to receive subsidies.

12 The landscape in Forsmark

The settlement situation in Forsmark in the early-modern period was heavily dependent on the establishment of *Forsmarks bruk* ironworks. In the 17th century, a large number of ironworks were established around Dannemora. Most of these are known as *Vallonbruk* due to the fact that people from southern and south-eastern Belgium, i.e. Walloons, established them or ran them during the 17th and the 18th centuries. These ironworks often comprised a manor, various types of houses for employees, and a church. They were essentially self-contained communities that were separate from the surrounding agricultural society. These estates were also architecturally different from the local Swedish rural settlement. They were thus more than a workplace or a production plant. There is a medieval history of the production of iron in the area, but it has not been fully investigated. There are archaeological remains in the region that can be dated to the medieval period and scholars believe that iron production can have started in the 14th or the early 15th century /Nisser 1987 p 24/. It is however an unclear period that is not completely easy to investigate. From the 16th century we find numerous accounts of *Dannemora bergslag*. Dannemora mine was the main source of ore in the region even though there were other smaller mines in history. In the north of Uppland, the crown acquired a number of ironworks in the late 1500s. There were five different ironworks owned by the crown in region Dannemora bergslag that were acquired or established over a 35 year period: Forsmark and Österby bruk in 1580, Ortala bruk in 1590, a hammer in Leufsta bruk in 1596, Wesslands bruk in 1612 and Gimo bruk in 1615. Cumulatively, this represented a remarkable concentration of ironworks controlled by the crown /Nisser 1987 p 27/.

The influence of the Dutch, and more particularly the French-speaking Walloons, was to gain in importance over time, but already during the early phase Johan III had recruited Welam de Wijk to organise the establishment of the ironworks belonging to the crown. The first of the capitalist Walloons to establish himself in Sweden was Willem de Besche, who arrived in the country in 1595 at the age of twenty-four /Isaksson 1995 p 114/. de Besche's father and brothers also came to Sweden, and from the early 17th century they played an important role in metallurgical developments in Sweden, more especially in the context of their collaboration with Louis De Geer.

Forsmark ironworks is situated close to the coastline and on the border between Valö and Börstil parishes. The name Forsmark is first mentioned in the written sources in 1558. At that time Forsmark was a fishery in a lake at Simundö, south of the later Forsmark ironworks. Forsmark attained a more organised form following the incorporation of three hundreds and eight additional parishes under Forsmark and Österby bruk. These three hundreds were Närding, Oland, and Frösåker, and the parishes were Tensta, Viksta, half of Lena, Tegelsmora, Hållnäs, Valö, Lövsta (Leufsta), Dannemora and Film /Nisser 1987 p 28/. The farmers in these areas were obliged to supply the ironworks with charcoal and to transport both the ore and the finished products, the latter of which mostly comprised weapons of various kinds. The ironworks, which was probably founded at about that time, was built on the land of the former village of Bolunda. The land belonging to the ironworks also consisted of the village of Norrby and a number of single farms – Gunnarsbo, Dannebo and Frebbenbo – in the northern part of Valö parish, and the estate of Kallriga, the single farm Länsö and the woodlands of Simundö in Börstil parish. Forsmark parish was created in 1612 and comprised land from the northern parts of Valö and Börstil parishes. As was mentioned above, Forsmark was initially owned by the crown, but in 1624 it was

leased out to a private company owned by Gerhard de Besche, Peter Rochet, Ewert Hoes and Welam Vervier. de Besche and his brothers owned substantial parts of the canon manufacturing industry in Sweden. Gerhard and Hubert de Besche also collaborated with Louis De Geer. De Geer was a powerful industrialist and he lent money to de Besche and Roget which gave him some control over Forsmark /Nisser 1987 p 37/.

Gerard de Besche and Peter Rochet established Vigelsbo blast furnace in 1641. Later on, in 1688, ore was found in the vicinity and Vigelsboda mine was started /Isaksson 1995 p 250/.

The French-speaking and religiously reformed capitalists also had an impact on the architecture during the 18th century. John Jennings, the son of Frans Jennings of Irish reformed origin, built the mansion at Forsmarks bruk between 1768–1776. According to Bedoir, these estates, (Sw. *vallonbruk*), were constructed as a representation of the ideal Huguenot society /Bedoire 1995 p 147–149/.

At the mansion, a park was created in the so-called English style. In fact it is one of the best preserved parks in this style in Sweden /Vahlne 1984/. In addition to the planted trees (parks?), there were, and still remain, a number of earthworks and small buildings such as pavilions, temples, and aviaries. Small bridges were also built over the canals and small ponds. One special feature was the hermitage, complete with a wax and wooden statue of a hermit, which was reminiscent of the antique grotto often found in 17th century parks /Bauer 1984/.

12.1 Charcoal

A basic precondition for iron production is a large and reliable supply of charcoal. Lövstabruk was permitted to forge 6,500 *skeppund*⁶, (c 1,105 tons) of bar iron which required 10,000 *läster* (c 20,000 m³) of charcoal. Producing this amount of charcoal required an estimated 30,000 days of work /Renting 1996 p 8/. If we add to this the fact that most of the charcoal had to be produced close to the production site, this lead to a considerable impact on the local forest resources /Karlsson 1990/. These figures indicate that the supply of charcoal was as crucial as the ore for production to be able to function on a regular basis. The preservation of the forests and maintaining production meant that forestry in the modern sense was introduced relatively early on in these areas. Because this iron was an important product for the country, the crown tried to restrict the use of the forests by spatially separating the mines, the blast furnaces and hammers from one another, i.e. that certain areas were dedicated solely to either mines, blast furnaces or hammers /Kardell 2003 p 199/.

The single most important resource in the forests in the Forsmark region was charcoal, but the wood was also needed for building material and for fuel.

The owners of iron production facilities in Sweden organised the supply of charcoal in two ways. One was to recruit workers and locate them on the premises and they were often allowed to settle in areas close to the workplace, i.e. in the forests. The other way was to use the right to buy all charcoal from the surrounding farming communities. This was granted to a specific ironworks so that no other competing company could intrude /Renting 1996 p 239/.

⁶ One *skeppund* is c 170 kg and one *läst* is c 2 m³ charcoal.

Table 12-1. The amount of ore the different ironworks were allowed to take from Dan-nemora mine in 1749 /Nisser 1987 p 49/.

Ironworks	"Lass" ore
Lövsta	6,200
Forsmark	4,500
Österby	4,000
Strömbergsverken	4,000
Älvkarleby	2,300
Gimo	2,200
Harg	1,500
Vattholma	1,400
Akerby	1,300
Söderfors	1,200
Skebo	1,200
Gysinge	1,200
Ortala	900
Iggesund	800
Ljusne	600
Total	33,300

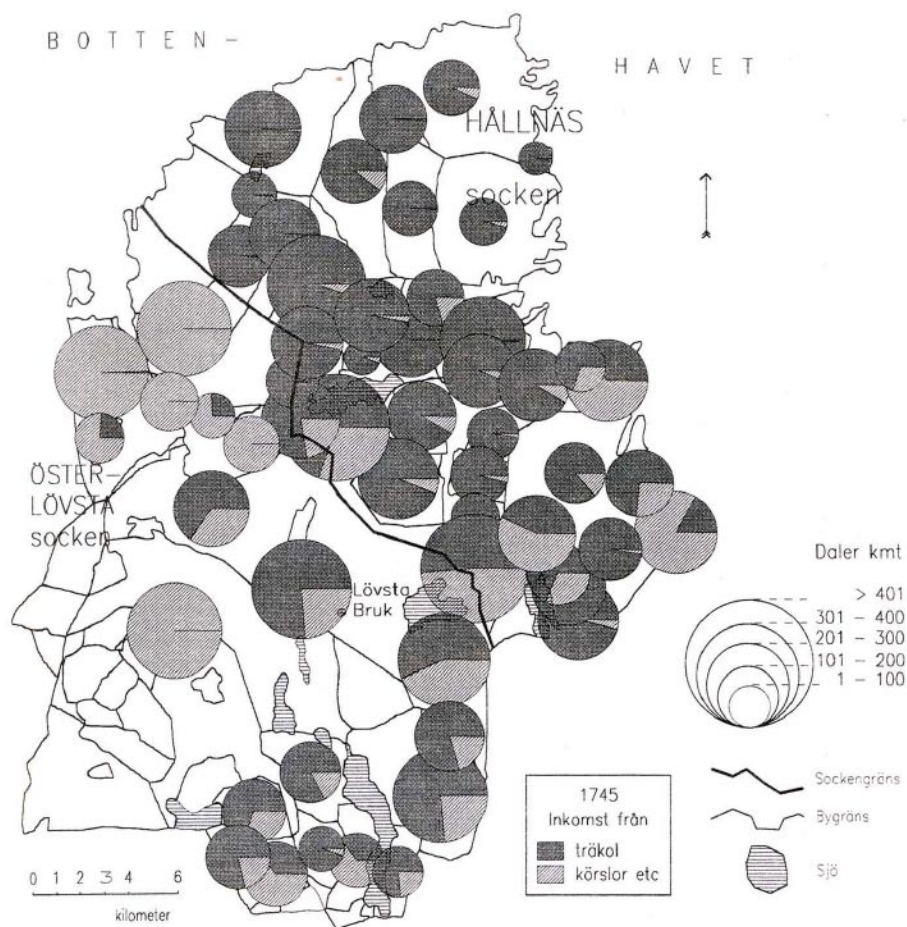


Figure 12-1. One of the important incomes for farmers was charcoal, but transports of ore and finished products were also of importance for the local economy. This map shows the relative importance of the two types of income in the region around Lövsta bruk in 1745 /Renting 1996 p 131/.

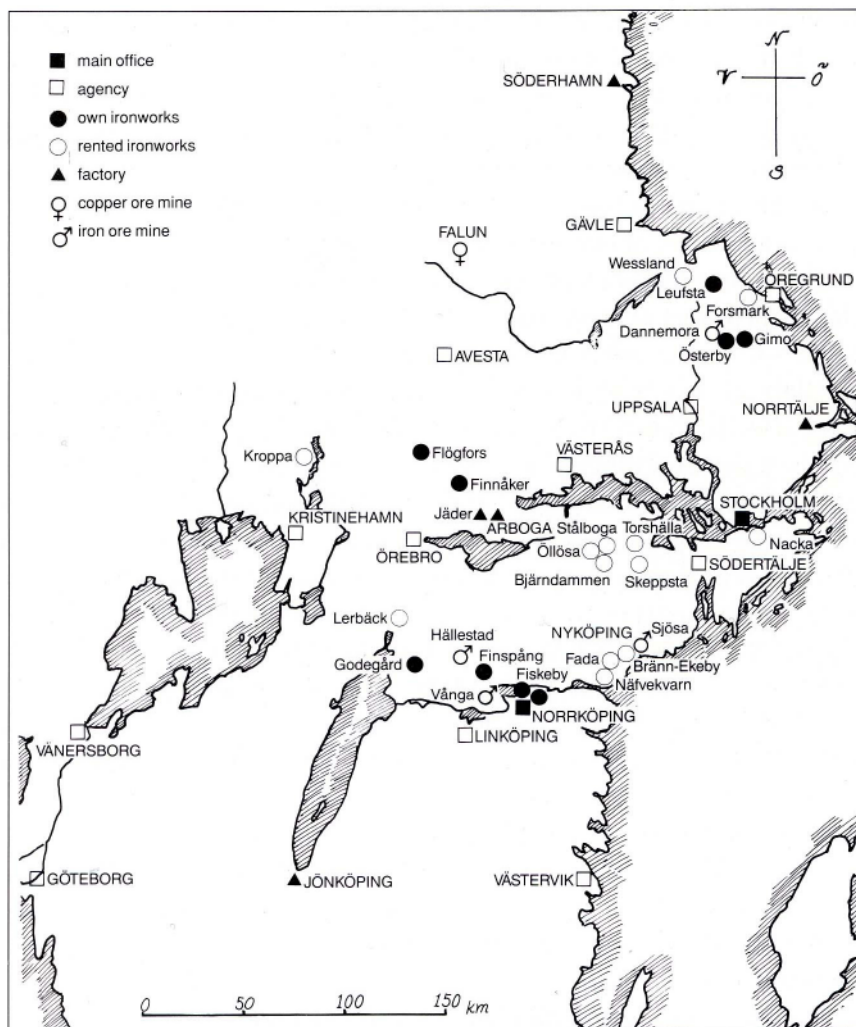


Figure 12-2. Forsmark made up one part of the vast industrial empire of Louis De Geer in the early 17th century. He either owned the iron-works or rented them /Hildebrand 1992 p 145/.

Forsmark bruk was not only an ironworks but was also an agricultural enterprise. In 1749 there were lands taxed as 12 $\frac{1}{6}$ mantal, 3 $\frac{3}{4}$ fr (noble), 7 $\frac{1}{6}$ krsk (crown-freehold), 1 $\frac{1}{4}$ frsk (noble-freehold) directly under the estate, and an additional 13 $\frac{25}{48}$ mantal tilled by the farmsteads owned by the estate (3 $\frac{1}{4}$ fr, 6 $\frac{5}{16}$ krsk and 4 $\frac{1}{6}$ frsk) /Essemyr 1988 p 28/.

The plots used by the workers during the 1750s were approximately $\frac{1}{2}$ tunnland in size, but this varied somewhat depending on the status of the worker /Essemyr 1988 p 80–81/.

In the Forsmark area, the central part of Valö parish and Forsmark parish have been studied at a local level. The landscape in both Forsmark and Valö is characterised by a flat terrain with only small changes in elevation. The cultivated land is situated between 3 and 15 m above sea-level. The more elevated part of the terrain is characterised by bare rocks or washed till. The cultivatable land is situated in the lower parts of the terrain, often in small irregular pockets in the surrounding boulder-rich terrain. This meant that the arable fields were, in many cases, small with irregular geometric forms. It is only in the area around the central part of Valö and in the area in the immediate proximity of the Forsmark ironworks that we find larger open areas dominated by arable land. Until the middle of the 19th century there were large wetland areas in the woodlands. These areas were subsequently drained and then cultivated as arable land. Some of these areas are still cultivated while others are now deserted and, in some cases, these have been turned into woodlands.

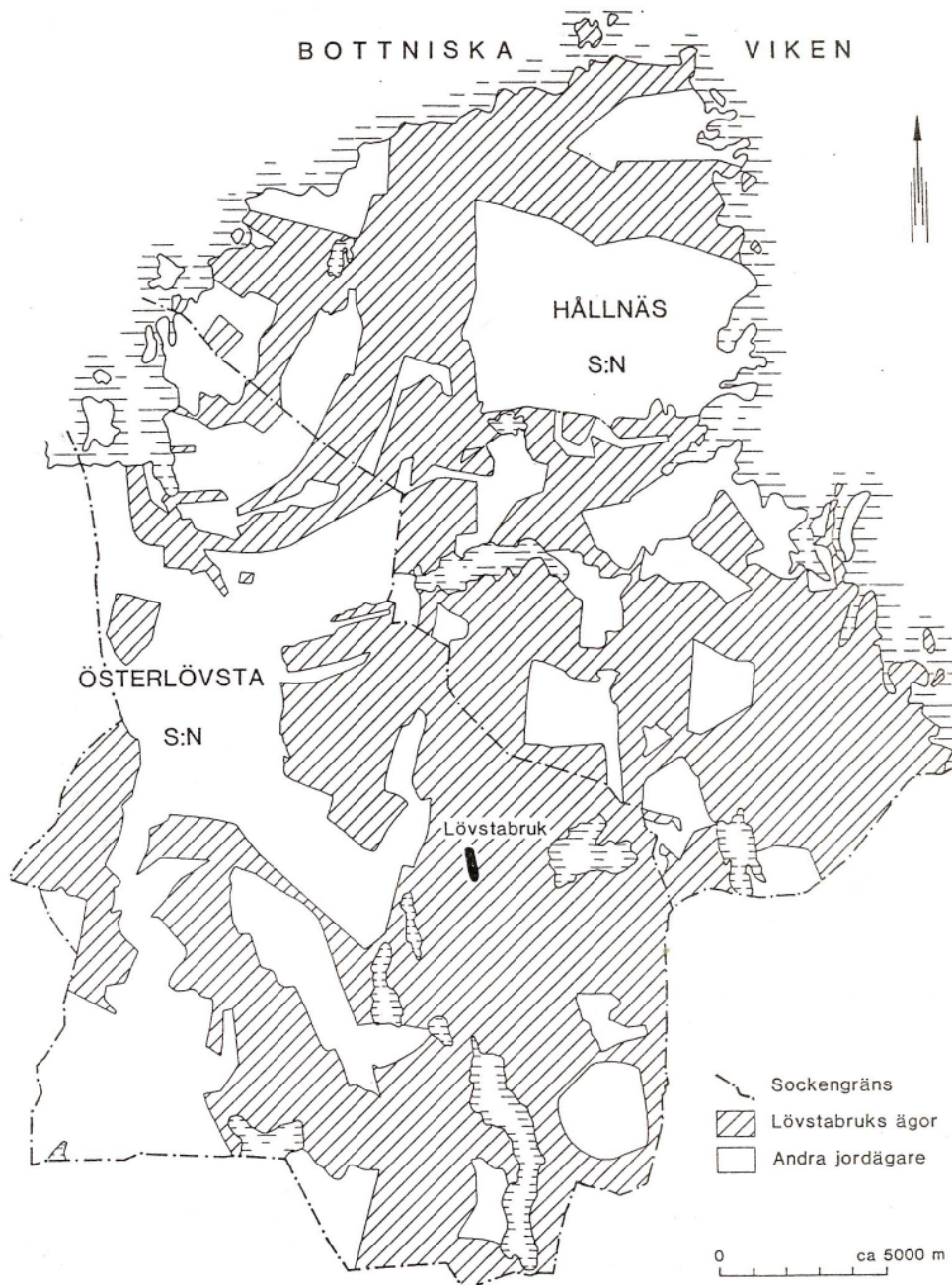


Figure 12-3. The ironworks often bought up many of the surrounding villages and farms, in part to ensure charcoal production. This had a considerable impact on the development of the area. This map shows the holdings owned by Lövstabruk in 1910 within the parishes of Österlövsta and Hällnäs. Lövstabruk also owned property in other parts of the region /Renting 1996 p 274/.

The areas around Forsmark and the central part of Valö parish are representative for the coastal area in Northern Uppland, where settlement and land use were characterised by land upheaval and shore displacement during the Iron Age and the Middle Ages. In the flat landscape the land upheaval caused dramatic effects in the form of shore displacement, which then had effects of the settlement structure and land use. The ironworks are another typical feature in the northern part of Uppland. Many of these were founded during the 16th and 17th centuries and a large number remained in operation until the beginning of the 20th century. Two ironworks were located in the area of Valö and Forsmark; Forsmark in a physical sense and Österbybruk in the more abstract sense of being a major landowner in Valö parish during the 18th century and onwards.

The shore displacement in Northern Uppland and its effect on the settlements and the people living in the area has been examined in earlier research. One result from this research is that the shore displacement and the land elevation facilitated an increasing population and the colonisation of former wetlands and woodlands /Dahlbäck 1974/. A further result from this research is that the shore displacement lead to a dramatic effect on the economy /Broberg 1990/. Farms, which in the late Iron Age were situated on the coast and had drawn a large part of their incomes from the sea (fishing and hunting birds and seal), were just some hundred years later situated inland and no longer had contact with the coast. This, in turn, forced farms to change from an economy based on incomes from the sea to an economy based on agricultural. The major part of the newly elevated land was initially wetland and was not suitable for agriculture. This situation, in combination with an increasing population and the establishment of new settlements on the new land,



Figure 12-4. It is apparent from the island of Rävsten in present day Gräsö parish that the farms in the archipelago had diverse activities. The yellow arable land is relatively small as seen in the map to the left, which is twice as large as the map of the whole island to the right. In the Baltic to the north, it is possible to see the fishing areas with permanent fishing tools in the map called “strömmings varp”, as well as small fishing cabins on the nearby small island of Björkskär.

caused a crisis in the area during the 13th and 14th centuries. This crisis is very apparent in the archaeological material, where the health of people who died in the period was poor in comparison with earlier periods /Broberg 1990/.

This section deals with the study of the economic maps and the map of hundreds (Häradskartan) in the Forsmark region. The maps covering the Forsmark region were originally of two separate types; one from Uppsala County covering Lövsta from 1863–64 and one covering Frösåker from 1905. The Frösåker area covers the parishes of Forsmark, Valö, Börstil, Gräsö and Öregrund. These maps were based on a number of more detailed base-maps that have been used in this project (see Appendix 5). This enables us to see the land-use and general landscape characteristics in great detail.

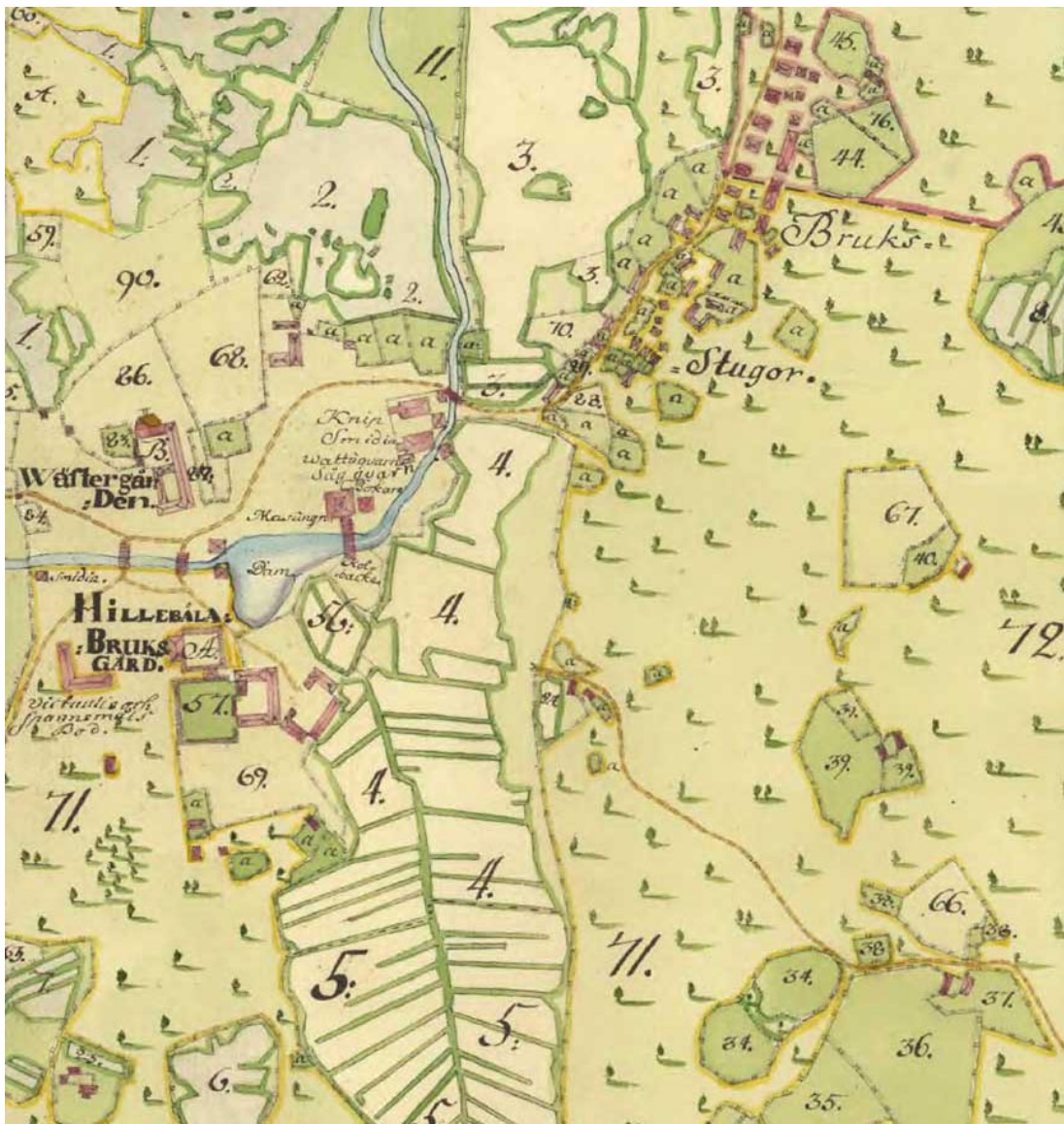


Figure 12-5. A number of smaller and larger industrial enterprises were established in the region. This map shows the layout of Hillebola estate (Sw. Bruk?) in Österlövstad parish in 1742. It was established in 1640 and was incorporated by De Geer in 1734. We can see the blast furnace and other enterprises located on the banks of the streams and also the dam that ensured the supply of water. The older farms, which predated the blast-furnace, are situated to the west and the newly erected dwellings for the workers are laid out in a line to the north marked as “Bruksstugor” in the map. In the forests we can also see some of the crofts that were crucial for the production of charcoal.

The land-use in Forsmark in the late 19th century can be seen in the very detailed map of hundreds (häradskartan). The map used here is not the original map but is a draft (konceptkarta). The scale is 1:20,000 and this reveals more information than the printed maps which have a scale of 1:50,000 /Jansson 1993/. It is possible to discern arable land, meadows, settlement and other information in the map. In this project, arable land and meadow have been vectorised by using the above-mentioned automatic method. The rest of the information can be viewed in the raster maps that can be displayed in a GIS.

The economic map was produced after the map of hundreds and utilises an aerial photo as a backdrop and was published in many different versions. Some early versions produced during W.W.II are very detailed but often have poor geometrical quality. There are also some maps with relatively poor thematic information from the Forsmark region. This is because they are simplified versions.

The vector layers from the early economic map (häradskartan) and the information from later economic maps from 1940, 1950 and 1980 are used so that a simple comparison can be carried out. This is done by converting the vector layers to raster in order to facilitate further analysis.

It is clear that there is an increase in arable land in Forsmark. In Forsmark, most of the arable land is unchanged between the early 20th century and the 1950s. Some of the fields have been abandoned in the period, about 26 million square metres. Almost 65 million new square metres of arable fields were created. The total amount of arable land in the Forsmark region in 1950 was 148 million square meters.

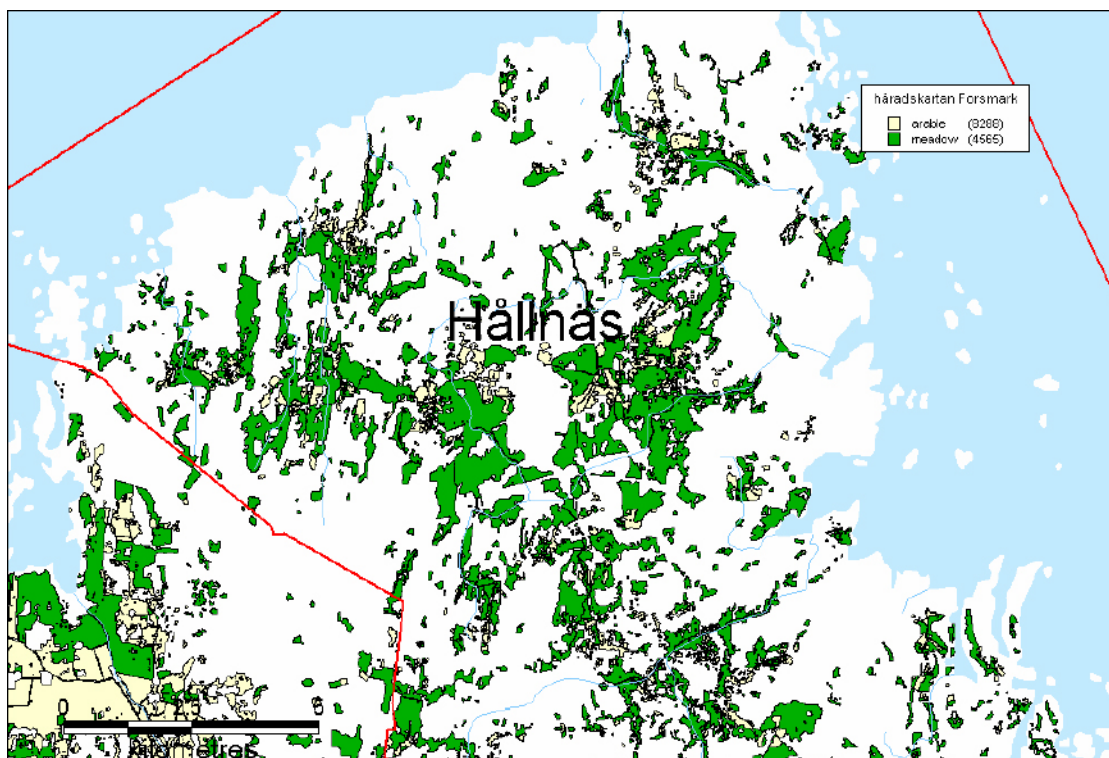


Figure 12-6. Extent of arable land and meadows from the map of hundreds (häradskartan) in the 1860s. In the northern part of the investigated area (Hällnäs Parish) meadows dominate.

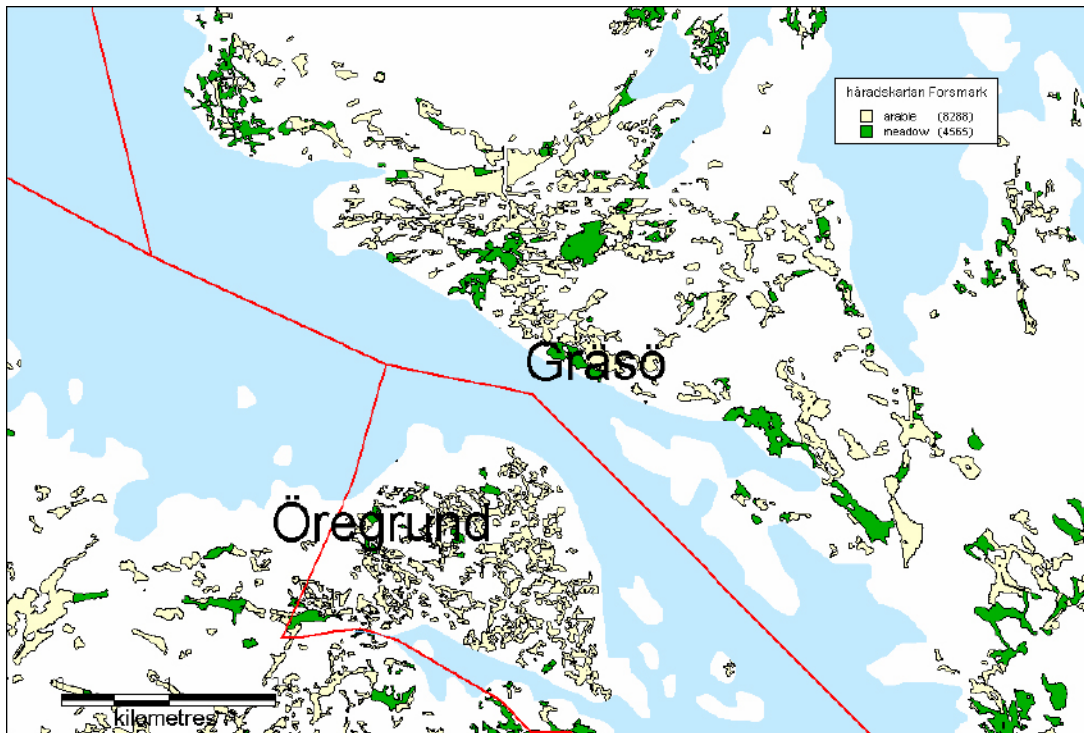


Figure 12-7. Extent of arable land and meadows from the map of hundreds (häradskartan), 1905. In the archipelago, arable and meadow land use are largely of a small-scale nature. The many small fields dominate the landscape.

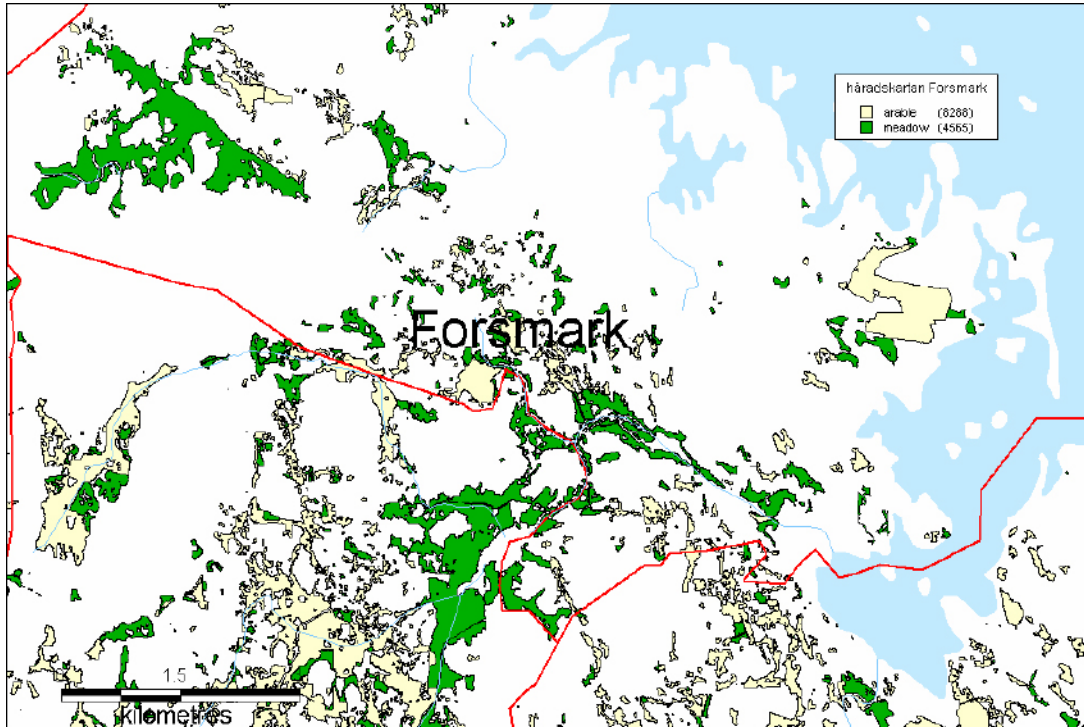


Figure 12-8. Extent of arable land and meadows from the map of hundreds (häradskartan), 1905. In the Forsmark area large areas of meadow covered the lower elevated parts of the landscape.

Table 12-2. The extent of arable fields during different periods and their changes, i.e. continuously used, abandoned or new (1860–1900 = häradskartan).

Arable in 1860–1900 abandoned later	26,150,400 m ²
Arable only in 1950	64,972,500 m ²
Arable both in 1860–1900 and 1950	82,766,400 m ²

In these areas, other options have to be considered if we are to be able to understand the land use changes. We have to incorporate the modern arable land and ask critical questions about the sources used. There are significant changes in the landscape and considerable regional and local differences. This requires greater attention and the careful study of other factors such as the leasing of arable land and demographic structures. Further analyses including soil types, topography and sizes and spatial structure of the holdings would reveal more information about the history of land use in the area.

12.2 The changes in arable according to “aspect”

By calculating the aspect of a digital elevation model (DEM) it is possible to see in what directions the arable fields are located. In this case, this is done by using a DEM with a 50 m-resolution and the same land-use files as above. The aspects are classified according to cardinal directions, i.e. into 8 classes N, NE, E, etc, that cover sectors of 45 degrees. By studying this it is possible to deduce if certain directions are more prone to arable use.

Based on the “map of hundreds”, arable land in Forsmark in 1900 was very evenly distributed in terms of localisation in different directions. The directions SW and W both represent more than 15% of the arable land. The north-facing slopes account for slightly less than 10%. This distribution is very similar in 1950. One of the possible reasons for this is that the land is relatively flat and even north-facing slopes are relatively good for arable use.

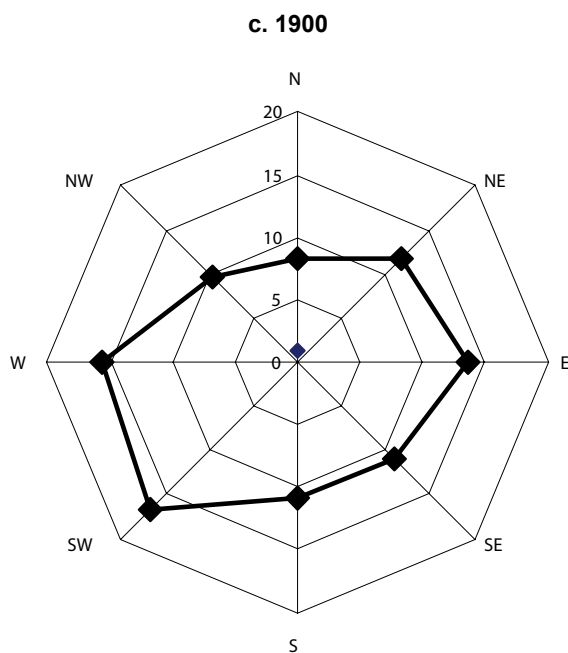


Figure 12-9. Polar diagram showing the distribution of arable according to the directions of the slopes in Forsmark c 1900.

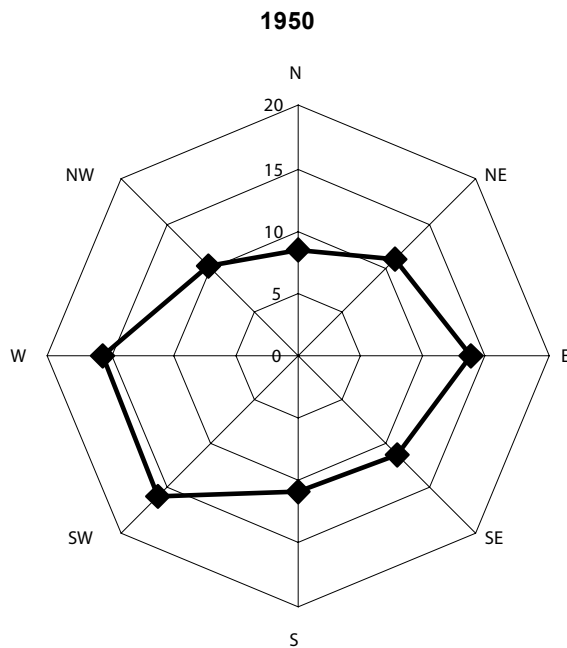


Figure 12-10. Polar diagram showing the distribution of arable according to the directions of the slopes in Forsmark in 1950.

12.3 The Forsmark ironworks, land and settlements

Forsmark ironworks is situated by the coast, between Valö and Börstil parishes. The name Forsmark is first mentioned in the written sources in 1558. At that time Forsmark was a fishery in a lake at Simundö, south of the later Forsmark ironworks. In 1583, the name Forsmark was associated with a ironworks. The ironworks was probably founded at about that time. The ironworks was built on the site of the former village of Bolunda. At the beginning Forsmark ironwork was owned by the crown, but in 1624 it was leased out to a private owned company. In addition to the land of the former village of Bolunda, the land that belonged to the ironworks consisted of the village of Norrby and a couple of single farms – Gunnarsbo, Dannebo and Frebbenbo – in the northern part of Valö parish, the estate of Kallriga, the single farm of Länsö, and the woodlands of Simundö in Börstil parish. The Forsmark parish was created in 1612 and consisted of the northern parts of Valö and Börstil parishes.

During the 19th century, agricultural land was established at Storskäret situated to the west of Forsmark. Judging from the map of Storskäret, in 1840 the land was used by the workers at the ironworks (LSA A27-6:4.). According to archive documents, Storskäret was purchased by Forsmark in the 1640s from the village of Simundö. Subsequently, the place was used as meadow land where people living at the ironworks could get hay for their livestock.

There are no maps in the official archives of the part of the ironworks that was situated in Börstil parish. For this reason it has not been possible to study land use and settlement in detail in that part of Forsmark ironworks or the estate of Kallriga.

The oldest map of the other portion of land that belonged to the ironworks, the northern part of Valö parish, is from 1699. This map shows the village of Norrby and the single farms in the northern woodland area. From this map it is also possible to conclude that a major part of the land that belonged to ironworks consisted of the village of Norrby and its woodlands. In the mid 16th century, Norrby was a large village and consisted of 7 farms. All of the farms

were at that time owned by freeholders. The fact that the ironworks later incorporated the whole village means that all of the freeholders' farms must have been purchased by the ironworks sometime before the end of the 17th century. At Norrby there are also ancient monuments from the late Iron Age, indicating that the village was established at that time. As the name Norrby means a settlement situated north of something else, it indicates that the village was a secondary settlement in the area. The primary settlements in the area, situated to the south of Norrby, are probably Vamsta or Lund in the central part of Valö parish. In Lund there are also ancient monuments from the Iron Age.

Judging from the map, the village of Norrby was formerly very extensive. The three single farms in the Norrby forest, Gunnarsbo, Dannebo and Frebbenbo, all have place names ending with *-bo*. In earlier research about northern Uppland, the *-bo* suffix has been related to the colonisation that took place during the early Middle Ages /Dahlbäck 1974, Windelhed 1995/. This colonisation took place in the woodlands of the existing villages. During the late medieval period and in the 16th century, these places with names ending in *-bo* became holdings with their own borders (Sw. *Avgårdning*) /Windelhed 1995/. The fact that these holdings were surrounded by the woodlands of Norrby in 1699 shows that they were colonised on land belonging to the village of Norrby. To conclude, in the late Iron Age, Norrby extended over the entire area lying north of the village. During the early Middle Ages, from around 1100 to 1300, the area lying north of the village was colonised by settlers. In the beginning these new farms belonged to the village of Norrby. In the late Middle Ages and the 16th century these farms were separated from the mother village.

These settlements in the former Norrby woodlands belonged to the ironworks from the 17th century onwards. Many of them, for example Frebbenbo and Björnbo, still exist as farms, while others have been deserted or turned into settlements without agriculture. One example



Figure 12-11. Former arable land at the former farm of Ön. The farm was abandoned after the 1950s.



Figure 12-12. *A clearance cairn and fossil arable land at the former farm of Labbo. The farm was deserted some time between the end of the 17th century and the middle of 19th century. The only remains from that time that could be recognised during the field work are fossil arable land.*

of a recently deserted farm is Ön, which was abandoned after the 1950s. The former agricultural land can still be discerned. One example of a settlement without agriculture today is Gunnarsbo. Here the buildings still remain but most of the surrounding agricultural land is no longer used for agriculture.

A special case of a deserted farm in the woodlands north of the ironworks is Labbo. This farm is known from the maps from the end of the 17th century. According to later maps the farm was subsequently deserted since no settlement is mapped in the area. The name Labbo is nowadays the name of a wetland called Labbokärret. In the area of the former settlement of Labbo, fossil arable land can be recognised in the form of for example clearance cairns and negative lynchets. No remains from the houses of the settlement could be found during the field work. The reason for the desertion of the settlement and the arable fields could not be ascertained from the sources used in this study.

In the early 18th century there were also a large number of crofters in the forest situated to the north of the Forsmark ironworks. A map from 1734 shows that there were 19 crofters spread throughout this area. The crofters had small areas of arable land and meadows were situated close to their houses. These crofts were probably established during the 17th century as a consequence of the labour demand from the ironworks. The crofts were localised in the woodlands, often in small valleys which have fertile soil. At the beginning of 20th century, the number of crofters had increased to 120. The crofts represent a new wave of colonisation in the area, which took place from the 17th century onwards. The crofts also represent the physical manifestation of the labour requirements of the Forsmark ironworks. At the beginning of the 20th century, then, the area was quite densely settled.

Many of these crofters' places are still used today, but not for agriculture. Instead they are used as summerhouses or as permanent residences, but without any connection to agriculture. One example is Stora Rångsön, earlier called Kopparslagars.

Other places were deserted in the late 19th century and at the beginning of the 20th century. One example is Tranbo croft in the northern part of Forsmark. Tranbo is marked as a croft on the map over Forsmark from 1699 and it was still in existence at the end of 19th century. The croft was deserted some time before the 1950s. Today the remains of both the buildings and the small plots of former arable land are still discernable.

Other examples of historical features in today's landscape are old roads. Many of the small roads in the woodlands today existed during in the 19th century. In some cases new roads have been built. One example is the highway RV76, which is built for heavy traffic. The old road can still be seen running alongside the new highway. The old road was more adjusted to the topography and land-use. To the south of Forsmark ironworks, the old road runs along a large stone wall.

Many of the small roads connected the croft and wet meadows in the woodlands with the ironworks. Some of those roads are still in use today but others are not. One example of a road that is no longer in use is the road to the above mentioned croft of Tranbo.



Figure 12-13. *Kopparslagars croft in the northern part of the Forsmark and Norrby woodlands. This typical croft was probably established during the 17th century and had small plots of arable land and meadows surrounded by woodland. The place is today called Rångsön.*



Figure 12-14. The remains of the chimney of the deserted cottage at Tranbo.



Figure 12-15. The old road from Lövsta bruk to Öregrund and Stockholm. The photograph is taken just south of Forsmarks bruk where an impressive stone wall lines the road.



Figure 12-16. The old road to Tranbo croft in the northern part of the Forsmark area. The road is now overgrown with grass.

12.4 The central part of Valö parish

The central part of Valö parish is situated in the inland area south of Forsmark ironworks. The natural landscape is characterised by valleys with arable land and wetlands in the lower part of the terrain and till and woodlands in the more elevated parts. During the period from the early Iron Age to the early Middle Ages, the land upheaval transformed the area from an inner archipelago to an inland area situated several kilometres from the sea (or coast). From the late Iron Age and the early Middle ages, the settlements in the central part of Valö lost their contact with the sea.

The old cadastral maps from the Valö area are from 1709 and 1741–42. At that time, and already in the Middle Ages, the entire central part comprised one settlement unit, i.e. farm. This large settlement unit included several named villages and farms. All of these villages and farms shared arable land, meadows and woodlands. The villages were Lund and Lundsvedja and the farms were Sunnanäng, Prästgården, Tomta, Dannebo, Juvansbo, Vreta and Östmora. The fact that these settlements shared the land indicates that they had developed from one large village. See /Tollin 1999/ for examples from the southern part of Sweden. Lund, Lundsvedja and Tomta are situated in the central part of the large settlement unit. A burial ground dating from the late Iron Age and a medieval church are situated in this area. The name of Lundsvedja indicates that this village was secondary to Lund. It is not possible to chronologically interpret the name of Tomta in relation to Lund and Lundsvedja. Most of the other farms in the large settlement unit are situated in the surrounding woodlands. The names of these farms indicate that they were established during the early Middle Ages. The settlements were the result of a period of colonisation by settlers as the population increased and as new land became available for agriculture as a result of the land upheaval.

The interpretation of the settlement development in the Valö area from the late Iron Age (and?) during the Middle Ages is that the whole area comprised one large settlement unit during the late Iron Age. According to the grave field, the settled area during the Iron Age was at Lund. The landscape was an inner archipelago. During the late Iron Age and the early Middle Ages, however, the land upheaval caused shore displacement and the transformation of former wetlands into dryer land. This, in turn, opened up for colonisation and a concentration of the settlements during the early Middle Ages. Lundsvedja and the other farms were settled during this period as crofts or small farms on the land at Lund. A comparison of the land taxation register from 1312 and the land taxation registers from the 16th century indicates that the number of settlements in this area decreased during the late Middle Ages. During the 16th and 17th centuries the number of settlements increased again, and by around 1700 all the settlements in the Valö area were settled again. In the 18th century the settlements in the Valö area still shared arable land, meadows and woodlands.

During the 17th century there was a new phase of settlement expansion. From this period onwards, crofters colonised the woodlands in the Valö area. In 1709 there were 31 crofters in the Valö area and some 200 years later, in 1905, there were 114 crofters. It is likely that most of the crofters worked at the ironworks in Forsmark and Österbybruk. Another important function of the crofters was to provide these ironworks and the blast furnace in Vigelsbo with charcoal and transportation services. In the 18th century, Österbybruk purchased most of the farms in the Valö area, including the crofts. The Valö area, as well as the Forsmark area, was quite densely settled about 100 years ago.

Some of the crofts at Valö have also been deserted since the beginning of the 20th century. One example is the croft called Strandbergen. Today, only a barn and some remnants of the cottage remain.



Figure 12-17. Remains of the cottage at Stranbergen croft in Valö parish.

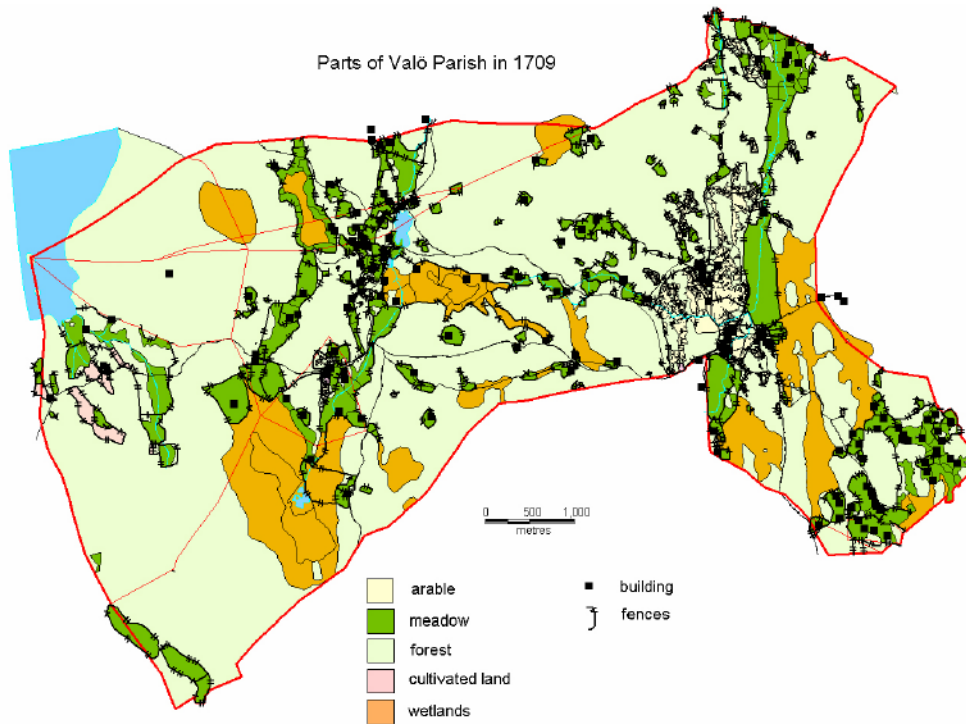


Figure 12-18. The central part of Valö in 1709.

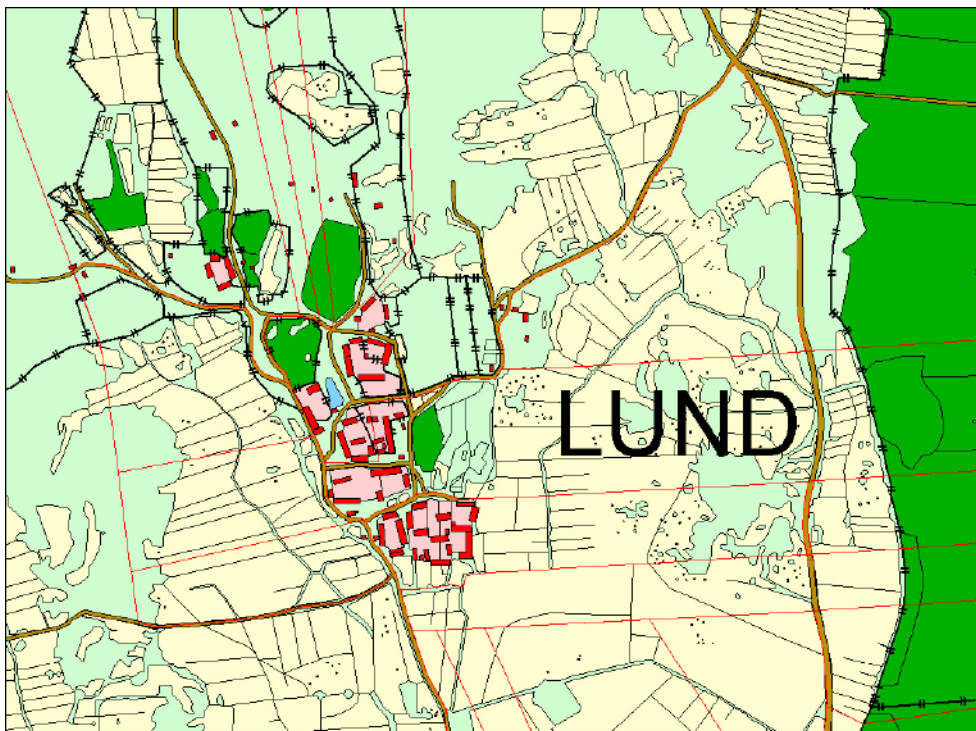


Figure 12-19. In the maps it is possible to study details and, in the more modern maps from the 19th century, also the actual layout of the buildings. Note the amount of clearance cairns to the east of the village.

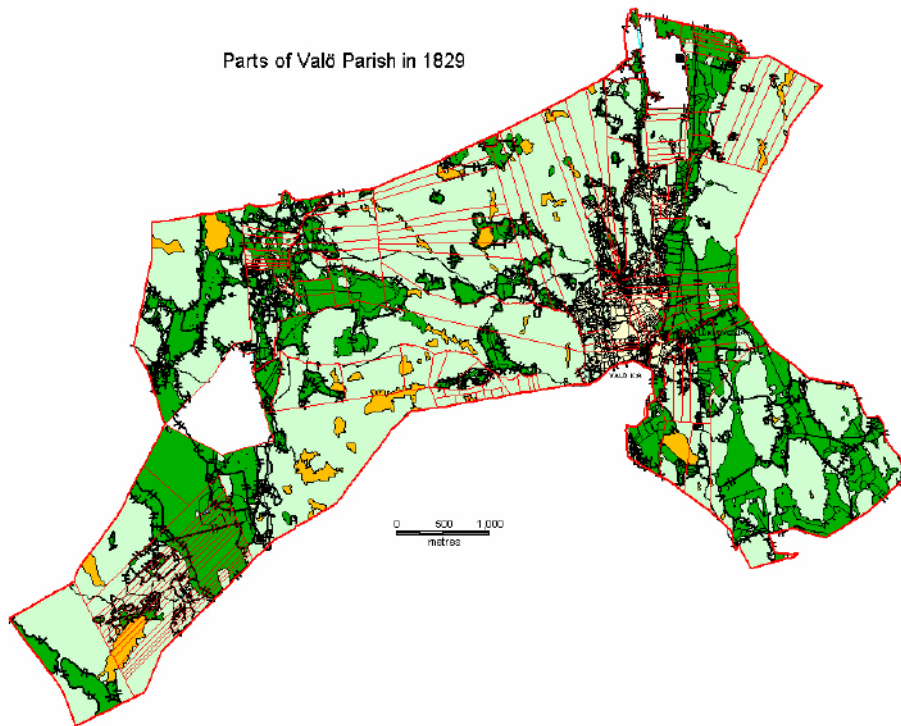


Figure 12-20. The vectorised version of the map from 1829 over a large area of Valö parish.

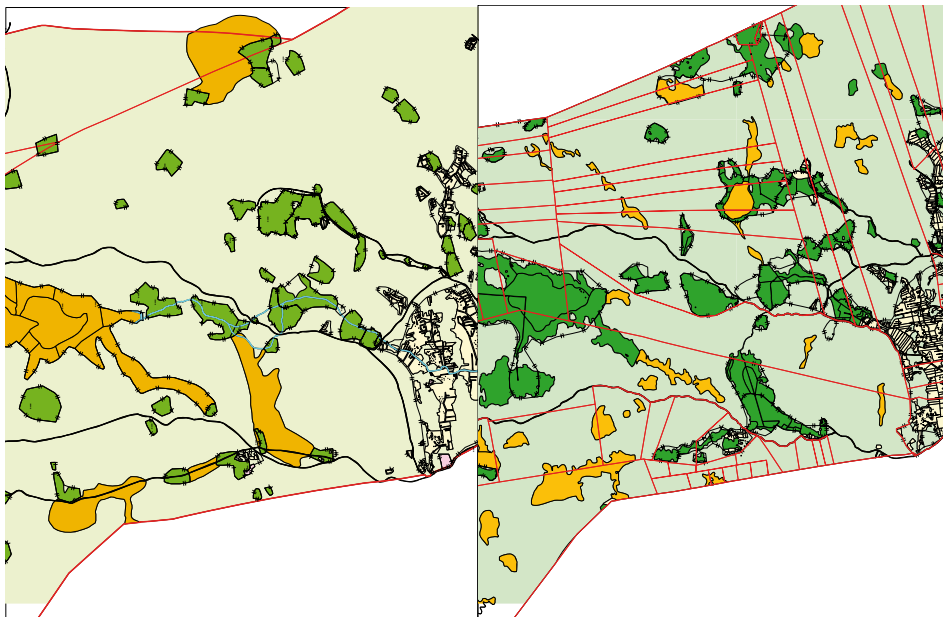


Figure 12-21. The same area in Valö in 1709 and 1829. It is possible to see that the meadows have expanded into the wetlands and the forests.

Table 12-3. The areal extent of arable land in the mapped areas in Valö in square metres. Observe that the areas differ somewhat over time. The older map from 1709 covers a larger area. It is clear however, that the extent of arable land and meadows have increased.

	1709		1829	
Arable	890,597	(2.15%)	1,400,276	(4.75%)
Meadow	5,919,645	(14.30%)	8,031,235	(27.23%)
Wetlands	5,232,176	(12.64%)	990,382	(3.36%)
Water	1,651,885	(3.99%)	51,335	(0.17%)
Total	41,387,890	(100.00%)	29,489,330	(100.00%)

12.4.1 The landscape today in an historical perspective

There are several different things that can be observed in the landscape in the Forsmark region today. One being that it is very much a landscape with working farms and a living agricultural society. There are areas where arable land and farms have reduced in size or been abandoned, most notably close to the power plant. Like most areas in Sweden, there has been a reduction in the number of farms over the years. The most striking feature concerns the large-scale demesnes, e.g. Forsmarks bruk that dominated the central region. One landowner controlled a large estate and could influence the settlement and the economy. This has led to large-scale changes imposed by only a few decision makers. This can be contrasted with the history of the large villages in the region. There, land partition and the buying and selling of land resulted in the restructuring of both the settlement system and land-use over the past 150 years. Without understanding the effects of the iron industry, the land-owners and, the landscape can not be fully understood. Even the landscape in the archipelago and the surrounding areas should be viewed in the context that the mines, the blast furnaces, and the hammers were central places of employment in the region.

12.5 Agriculture and processes of modern landscape transition in the Forsmark area

The understanding of current agriculture and the modernisation of agriculture in the Forsmark area presented in the report has been drawn from interviews with five active farmers and two retired farmers. The farms are located in the area surrounding Forsmarks Bruk.

The themes discussed in all of the interviews have been:

- The mode of production, current land use, historical land use.
- Earning a living in the absence of agriculture.
- Land use during the last 50 years and changes in land use during the last decades.
- The possibilities for land use, today and in the future.

12.5.1 Historical landuse in the post-W.W.II era

One of the interviewed farmers explained how his farm had expanded during the course of the past few centuries. This is a characteristic example of the modernisation of Swedish agriculture in general, and it corresponds well with the literature /Flygare and Isacson 2003/.

The farmer told me that before the Second World War they had 6–7 milking cows and that after the war they increased the number to 12–13 cows and a couple of horses. After their stable burned down in 1965, they built a new classic two-floor stable for approximately 40 cows. Today they have 36 milking cows and some younger animals. To make it possible to expand the farm, they have purchased some land and have also leased some additional land.

At the same time, however, the number of active farmers in the area has decreased by approximately four-fifths over the past 50 years. This means that in villages that had consisted of five family farms immediately following W.W.II, today there is only one farmer still earning his living from agriculture. While the volume of production is approximately the same today as it has been over the last 20–30 years, the big difference is that the work is now carried out by a smaller number of farmers using machines. Discussing further expansion, they all point to the physical configuration of the fields as an aspect that will hinder a more effective production in the future.

The two older men who were interviewed both pointed to a lot of small fields on the map that I showed them. They had harvested from these fields in the old days but today the fields are all totally overgrown with shrubs and trees. It can thus be concluded that there have also been local transitions where a lot of smaller fields have been abandoned, become overgrown and closed; fields which they remember as having been cultivated in the past.

After the war a couple of large estates were running farms with employed workers. In the 1950s and 1960s, however, these all abandoned farming and focused on forestry instead. This transition can be connected to the large increases in the costs of employing people to cultivate and run large farms /Flygare and Isacson 2003/. These large estates were converted to or sold out to large forest companies who, in turn, retained the forests but often sold off the arable land to smaller family farmers. All presently existing farms in the area are former family farms.

One result from this study is that there is an ongoing separation between forests and arable land. This is probably also enforcing the polarisation of landscape expression which can be seen in the area.

12.5.2 Creating suitable conditions for farming

All of the interviewed farmers inherited their respective farms, and in two cases their fathers are still active in production. In order to create sustainable farms, all of the interviewed farmers have purchased arable land to expand their farms. The incorporated land is often located in another village, and in one case the farmer owned land in three different villages. It is important to note that this expansion concerns arable land and does not normally include forests.

The studied farms range in size between 80 and 200 hectares (this includes both arable land and forest) and the cultivated area is normally between 80 and 100 hectares, including lease-hold areas. The described expansion and redistribution process has resulted in an outward spatial spread of the fields used by the current farmers. In turn, this has counteracted co-operation in the use of machines for cultivation, as one of the farmers explained. The distances that the machinery has to be driven between the fields are too long to facilitate co-operation, primarily because the time left for other potential users is too short. This can be seen as an extra cost for farming in the studied area. One of the interviewed farmers also mentioned that the soil in the area is not as good as the soil in the central parts of Uppland, and added that the annual yield is only 50%.

The outward spatial spread of the currently used fields is primarily a consequence of the spatial properties of the physical landscape. All the interviewed farmers point to the inconvenience of this condition, but at the same time we must remember that the fields and the amount of arable land is large enough to serve relatively large family farms with land.

12.5.3 Changes in production

Farm production in the area focuses primarily on growing seeds, producing milk and some meat. Three of the interviewed farmers currently have milking cows, and one of them is only involved in meat production. The number of animals ranges from 40–80, and the largest milk farm has recently invested in a milking robot, advanced milking machines.

The farmer with the largest tenancy contract tells me that he sees no future for cultivation in the area. He argues that the conditions for farming were much better in the 1960s than is the case today /Flygare and Isacson 2003/. Today's problems can be divided into an economic part and a functional part. Economically, the returns from production were better in terms of absolute prices, which mean that it is impossible to make a living from a small family farm. Indeed, all of the studied farmers have expanded their land holdings to approximately 100 hectares over the last 30 years. The functional dimension stems from the fact that the spatial spread of the new fields makes it impossible to co-operate in the use of expensive machinery.

Bad soils and the practice of ditching in order to win new land, have had the consequence that some of the land, especially the organogenic soils, have been compressed, and according to the interviewees, today these areas are often flooded in the springtime.

One of the interviewed farmers has recently invested in a milking robot and has automated the handling of manure in a new farmstead. The explicit reason is that he sells his milk to the dairy in Gävle which gives him around 1 SEK more per kilo of delivered milk than his neighbours. His fields are, as is the case with the fields of the other interviewees, located in three different villages.

The younger farmer (in his forties or fifties) formerly had milking cows but is today running meat production in combination with the preservation of grazing areas with high biological values. This resulted in large investments in a new farmstead. He says himself that it is not possible to have milking cows and preserve nature at the same time; it is not possible to have the cows grazing in that kind of landscape and have effective milk production at the same time. The income is also better and safer from preservation than from the production of meat or milk. Looking into the future, this reasoning will probably become more common.

The latter farmer has adopted a strategy that can be seen as a response to a change in direction in agricultural policy whereby there is no longer a primary focus on the production of food and fibre. Instead, other values such as securing food production and natural and cultural landscape qualities have moved into focus /cf Myrdal 2001/. This is probably a process that will continue.

12.5.4 Conclusions

The first and most important conclusion of this study is that farming and cultivation as a livelihood and a way of earning one's living still exist. The idea of farming still lives on in the area around Forsmark. This is expressed in such small things as newly built stable houses, changing direction of production, and continuous expansion by buying new land.

It is interesting to note the connection made by the farmers that they associate their way of living as being an Uppland farmer, rather than being a person living by the coast and being involved in many activities such as fishing and diverse land use. All the interviewed land users focus on traditional farming. A possible explanation for this is that the Forsmark estate (Sw. *bruk*) has been an effective border that has hindered the land users in the studied areas from developing any substantial amount of fishing. A further plausible explanation is the relatively large amount of arable land and availability of good soils. Another possibility is that the delivery of charcoal to the iron industry was formerly an important source of extra income.

The rearrangement of land has resulted in a separation of woodland and arable land. Old family farms have expanded their total area by buying arable land from wood companies, which earlier had bought farms. This has resulted in relatively large farms in the area. There are a couple of examples of ongoing transformation and adaptation to new and effective production technologies and extensive land use forms.

13 Landscape, history and people – conclusions and comparisons

The inhabitants – the users of the landscape – must be seen in combination with the landscape, topography, soils, vegetation, climate and so on. It is also important to view the landscape and the inhabitants in a broader temporal perspective, to simply put the landscape in an historical perspective. This final section will draw upon the various studies and analyses that have been carried out in connection with this work. The methods used and the results from the two different regions are briefly described. To some extent these results will also be contrasted and described. Simplified models of the two regions are constructed as a synthesis of the settlement changes and changes in land-use.

The aim of this project, carried out by the Department of Human Geography at Stockholm University, has been to investigate the land-use in the investigated area by examining the settlement structure and the way people have used and affected the landscape. The study revolves around the historical land-use, the changes in settlement, and how people have worked and used the landscape over the last centuries. The sources used include historical maps, cadastral material, interviews and fieldwork. In doing so, a number of different methods had to be applied.

13.1 Methods for capturing and analysing cartographic information

One of the greatest challenges for this project was capturing data from small-scale and large-scale historical and modern cadastral maps. The study has been carried out at various scales. Some investigations are of an overview character (while others are more detailed in focus). The investigated areas consist of parishes. This is due to the fact that most of the sources for historical periods are organised at the scale of the parishes. It is also a scale that enables us to study the human activities, e.g. to follow the use of forests in the context of a particular village. By studying a larger area we can also gain a more comprehensive understanding of the society.

The methods enabled us to digitise and geo-reference maps from the 17th, 18th and the 19th centuries so that they could be treated and visualised together. The aim was to make the maps correspond to each other, so as to enable a comparison between different periods in time, e.g. settlement, land under cultivation, pastures and roads.

The method follows a line of work that has been developed at the Department of Human Geography at Stockholm University over the last decade. The method uses only existing software, is fairly straightforward, and follows a general model of how to handle digital data in a GIS. The work comprises a number of different stages. The first stage is *data capture*, which often involves scanning a map or the photograph of a map. In this case, the maps were of varying ages and supplied in different formats and at different scales. The maps that were not in a digital format from the beginning were photographed with positive colour film and then scanned. The second phase is often referred to as pre-processing, which includes working with the scanned image. We often want to reduce the image size by adjusting the resolution and reducing the colour depth. The next stage is to geometrically adjust or *rectify* the image to fit to a modern co-ordinate system. This also includes adjusting any errors

made by the surveyor during the mapping. Generally speaking, the older the maps are the worse the geometrical quality is. These images were imported into a raster based GIS, in this case both ENVI and ArcMap were used. The process of rectification consists of the selection of points, often known as ground control points when we deal with aerial photos. The work consists of trying to find points in a modern map that correspond with objects in an older map. This transformation can be more or less “severe”; from a simple affine transformation to a polynomial warp of the image. This makes the older map fit with a modern map and also assigns it a coordinate system. When geo-referencing old maps, it is important to find as many corresponding points as possible. It is difficult to find points corresponding to a similar location if the landscape has changed dramatically between the time periods that are to be compared. The next phase, assuming that we wish to extract information from the image, is to *vectorize* the image. This includes manually drawing the contours of features in the geometrically corrected map. This can be carried out at many different “levels”; from extremely detailed information of each parcel of land where many kinds of attribute data have been added, to a more superficial selection of features. The level must be decided by the analysis we want to conduct. The *analysis* phase is the next stage. The types of analyses that can be done with digital information are almost endless and must also be guided by the research question at hand. The last phase is the *presentation* of the information. It is important not to neglect this phase because it is important to communicate the analyses. Maps are not always the most suitable way of representing the information. It may be the case that a graph or a table serves this purpose more profitably.

The method used for the detailed maps is time-consuming and our goal of analysing a larger area required another technique. The maps firstly had to be digitally resampled to fit to the coordinate system. This was relatively easy for the maps from the 20th century, but some of these were also of lesser quality. Some of the maps from the 19th century were, however, very hard to “conform” to the modern projection.

This innovative method uses the colour information and extracts the land-use from the maps. Printed maps have some problems however. One is that the colours assigned to a certain feature are not as straightforward as one might think. Older maps have considerable variations in colour, both due to the manufacturing process and the ageing of paper and print. More modern maps, such as the Swedish economic maps, have other problems. They use a backdrop of a photo that is overlaid with colours. This means that there is sometimes a blur of colours that has to be dealt with. A scanned map is a convenient way of obtaining digital geographic data. However, maps often contain information that might not always be of spatial relevance, e.g. text and cartographic symbols. As these objects might range considerably in size, conventional filtering is not a very suitable approach when we want to delete these features. Instead we have found that using ordinary distance operators provides a very smooth and accurate way of solving the problem if two conditions are fulfilled; i) the objects to be removed have a colour that is different from objects that are to be retained, ii) the features to be kept are neither dithered nor patterned.

13.2 Methods and sources for dealing with population and settlement data

Methods for obtaining information from historical records employs the critical stance to source material as traditionally used by historians, human geographers and others that have investigated agrarian history and rural landscapes. The methods are not technically challenging but require a careful selection of sources since the written material for certain periods is vast.

The historical landscape study is based on medieval information, settlement information from cadastral books (Sw. *jordböcker*) 1550–1880, information on population size from *Tabellverket* 1759–1855, harvest registers (Sw. *tiondelängder*) and livestock registers (Sw. *boskaplängder*). In the detailed investigations, registers of priests' interrogations (Sw. *husförhörslängder*) have been used.

The medieval sources are the most problematic form of historical material concerning Swedish history. In the local studies it has been possible to investigate the settlement and land owning structure during the medieval period. Sources from the medieval times are very scarce in Sweden, partly as a result of the fire in the Stockholm castle at the end of the 17th century that destroyed a lot of medieval documents. A commonly used method to gain a picture of the areas during the Middle Ages it is to combine the land taxation register from the mid 16th century with the scarce medieval documents.

The regional studies of the settlement and land owning structure are based on cadastral books, *kronans jordböcker* and *årliga räntan*. Before the beginning of the 20th century, the taxes in Sweden were based on land. The cadastral books were compiled by the Crown in order to control and manage the revenue in the country. With the exception of the demesnes of the aristocracy, every farm in Sweden was supposed to pay taxes. The amount of the taxes was decided by the size of the farm. The cadastral ledgers were compiled for each parish and show every single farm in the parish. If two or more farms are registered under the same name, this denotes a village. It is therefore possible to study the settlement and its structure in these registers, and even to pick out individual farms from farms in villages. The cadastral registers were systematically compiled in the middle of the 16th century during the reign of Gustav Vasa. In order to gain control over the resources of the country he initiated a system to register the taxes paid by each farm in Sweden /Dovring 1951/. At that time the medieval land owning structure was still in function. That meant that even the land owned by the church was registered, even if Gustav Vasa later confiscated this land. The records provide a reliable picture of the settlement and land-ownership structure at the level of both the farm and the village. Households and settlements that were paying taxes based on land holdings, for example cottagers, craftsmen and others, are not registered in the registers. For these categories of people the *Tabellverket* and the *husförhörslängder* are more suitable.

Original cadastral ledgers from c 1630, 1680, 1730, 1780, 1825 and 1880 have been used (copied) in the National Archive (*Riksarkivet*) and the Chamber Archive (*Kammarkollegiets arkiv*). DMS-material has been used to get access to the cadastral register from c 1550. DMS, standing for *Det Medeltida Sverige*, was a project carried out by the Bureau of National Antiquities (*Riksantikvarieämbetet*).

The regional studies of the population are based on statistical material from the Central Board of Statistics (*Statistiska centralbyrån*), which was founded in 1749 as the so-called *Tabellverket*. The material consists of pre-printed forms, which were filled in by the priests of the parishes every fifth year. These forms include columns for the numbers of different categories of people living in the parish during the period. The population is differentiated into several classes. These classes change over time, which is a problem when comparing the population structures at different times from 1749 onwards. In order to make such a comparison easier, we have grouped classes of people. The statistical data from the *Tabellverket* are often used as a source in historical studies and this provides a valuable and reliable source for the study of population and social differentiation of the population. The data from *Tabellverket* gives a good quantitative picture of the population and the growth of the population over time. It also provides a good picture of the social structure of the population and changes of the social structure over time /Andersson Palm 2000/.

The geographer Torsten Lagerstedt's summaries on harvest and stock farming, gathered in the 1940s, have been used as source material /Lagerstedt 1968/. One disadvantage associated with not using the original source material is that there may be mistakes made by Lagerstedt that are difficult to discover. However, there are considerable benefits to be gained by using this material, as Lagerstedt's summaries are clear and easy to get access to. Lagerstedt's summaries of harvest registers from the year 1640 have been used for all parishes investigated in this study. There have been some difficulties in deciding what kind of units were used at this time, as different units were used in different areas of Sweden.

Registers of interrogations by priests have been used in the detailed study. These registers make it possible to illustrate household size and household structure. However, because going through these registers is a very time consuming activity, only selected parts of the parishes have been studied. These registers were compiled every fifth year when the parish priests visited every single household in the parish with the aim of controlling the religious knowledge of the people in all households. Accordingly, the registers represent a good source for capturing non-farming households. The registers cover craftsmen, sailors, salesmen and other people living in the parish. This material provides reliable and detailed information about different kinds of households at the local level.

13.3 Models of settlement and landscape change

The methods and sources used in this project have resulted in a number of conclusions concerning landscape, landscape change, and the people living and working in the rural areas in both Oskarshamn and Forsmark. In this concluding chapter we have made some models of the landscape changes that draw upon the information from the previous parts. One obvious change in Sweden concerns the changes in the number of farms over time, but also the changes in structure and local land-use. These simplified models attempt to capture the major trends in the two areas.

The attempt is to construct a model based on both the local studies and the general investigations in the two areas. It is important to note that these models are not meant to depict a specific landscape or a thoroughly investigated area; instead they are assembled to represent general and observed trends in the areas of investigation.

13.3.1 Oskarshamn

The prehistoric material for Oskarshamn is not very easy to interpret. This is not a part of our study, but it would be interesting to know something about the landscape and settlement in prehistoric times. It is clear that the area was inhabited, but the exact distribution of the settlement or the land-use is hard to interpret. Most place-names are probably medieval and this could be an indication that the area was colonized during the medieval period. During the late Iron Age and the early medieval period there was a considerable colonisation of the country, including Småland. During the 14th century there was a decrease in population and settlement in Europe that also affected areas of Sweden. This may have occurred in the investigated area a decrease has been identified in nearby regions /Bååth 1983/. Without a prehistoric baseline it is hard to draw any firm conclusions. There are indications of abandoned settlement in the area. The so-called "Torpet" in Lilla Laxemar can be interpreted in this way.

From the early-modern period onwards, the sources and the interpretations stand on firmer ground. The large forested areas, which were jointly owned by many farms and small hamlets, were divided between the different land-owners. This is an important change in the management of forests. The creation of different holdings with clear boundaries created the type of forestry that we are used to seeing today; a forest with often similar vegetational characteristics within rectangular demarcated areas. We can observe a partitioning of the farms from the 17th century onwards. This further changed the land ownership structure in that land holdings became smaller.

The extent of arable and especially meadow land increased during the 18th and the 19th centuries. During the early phase most of the intensively used lands were located close to settlements, but this subsequently changed and many parts of the landscape were included in the agricultural production. The emergence of crofts can also be seen in the material. They were not particularly numerous, but existed in most hamlets. We can also see that the population increased rapidly in the area. At the time of the land reforms in the 19th century, some farms were moved from their original locations and relocated to the areas with “new” arable lands. This often affected the crofts, which sometimes had to be moved even further away from the old hamlets to agriculturally less advantageous locations. Eventually the crofts were abandoned or converted into houses by people not working in agriculture.

During the 20th century the extent of arable land began to decrease. The changes were most pronounced in the latter half of the century. This coincides with the introduction of tractors, modern machinery and an adjustment in the size of a viable farm. Following the Second World War the number of farms decreased, and in many small hamlets in the region there was only one or no active farm at all. To some extent this has led to the amalgamation of farms, but the general trend is that most old farms remain as property even though farming is no longer carried out by the present owners. This has led to a complex system of leaseholds, where one farm can lease many farms or parts of former farms. The need for large areas of arable land and the small sizes of the farms also increases the number of leaseholds needed for a farm to survive. The specialisation in agriculture has also been instrumental in the changes. Some farmers have focused on milk production while others focus on meat, cereal production, etc. This has had the effect that many arable fields are nowadays only used for fodder or for silage production. Before this change, fodder production was incorporated into a system of rotation between crops and fodder.

13.3.2 Forsmark

In the more open areas with relatively large villages there seems to be a discernable chronology. A village such as Lund is an old settlement and newer settlements were established as the shore displacement changed the landscape. New settlements, often with place-names ending in *-boda* or *-bo*, were established in the forests in the outer areas of the territory during the medieval period.

The shore displacement and the subsequent drainage of the lands also made it possible for the villages to be dispersed, i.e. farms were established outside the village *toft*. The majority of the arable fields today are made up of these old wetlands, which later became meadows. The old arable fields with a continuity of several hundred years have today become pasturelands or have been forested.

A common trait for the area is that there are a number of large villages (Valö, Vamsta-Norrby, Karö etc). These villages have expanded over time. Accordingly, aside from the establishment of new farms in the outer parts of the village, new farms were also established at the centre, thus creating these large villages of today.

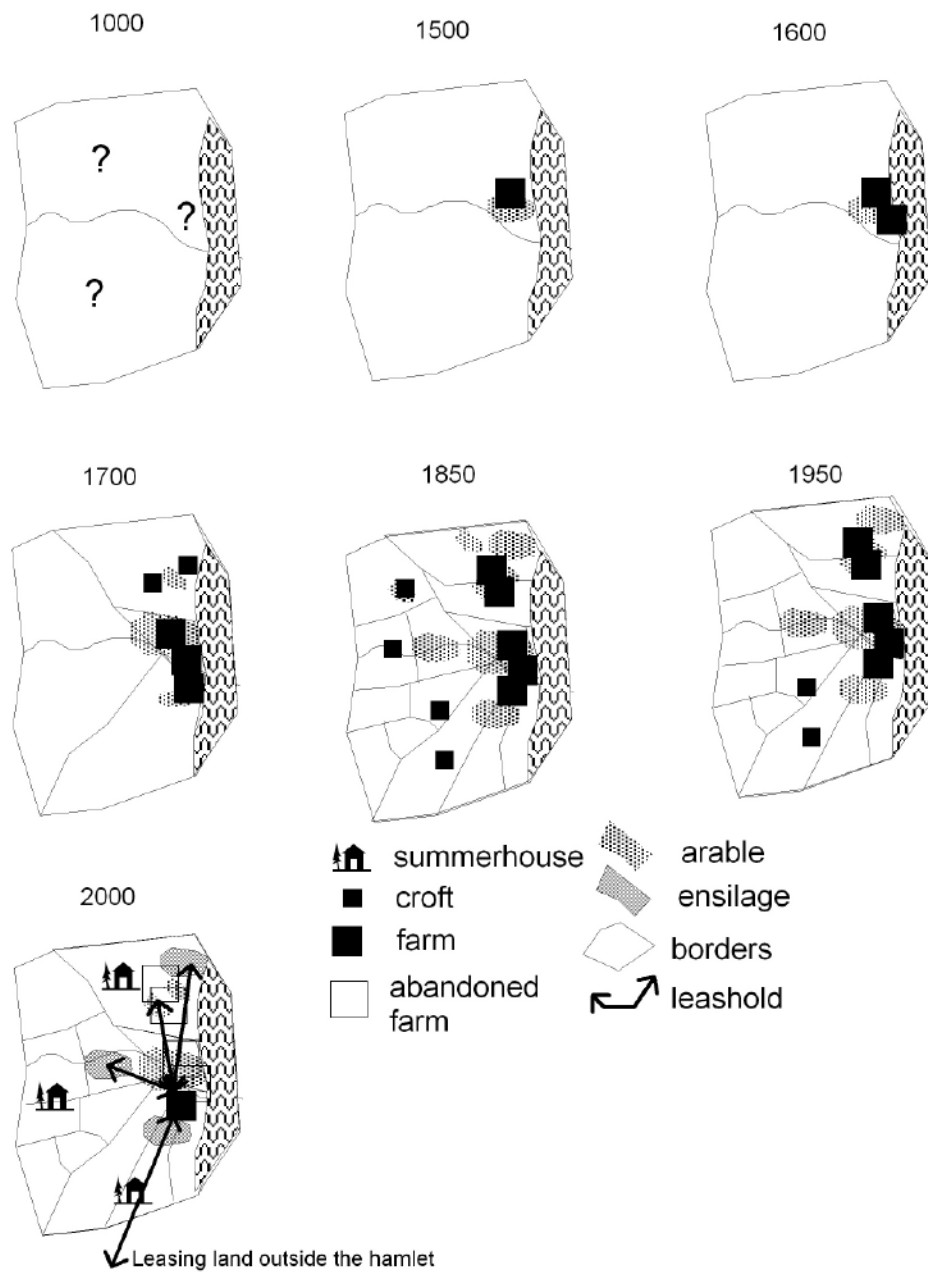


Figure 13-1. A model that represents the settlement changes in the region of Oskarshamn in the period 1000–2000.

One of the major changes in the region was the establishment of various types of ironworks. Some of these ironworks were created in the outer parts of the old villages and some in the central areas. Even though the estates associated with iron production were not established in existing villages, these were quickly to become the dominant land owners in many villages in the region. As iron production increased and became a major industry in the region, the landscape and settlement was adjusted to that activity. The estates became larger and more elaborately built. Charcoal production became better organised with the help of the establishment of crofts between the 17th century and the end of the 19th century. These crofts were usually established on less favourable land outside both the *-boda* settlements and the villages, often in areas with many boulders. Many of these crofts have subsequently been abandoned and many of them were not used as locations for new farms during the land-reforms. Most of the farms in the area that changed location moved to areas in the vicinity of the old arable fields.

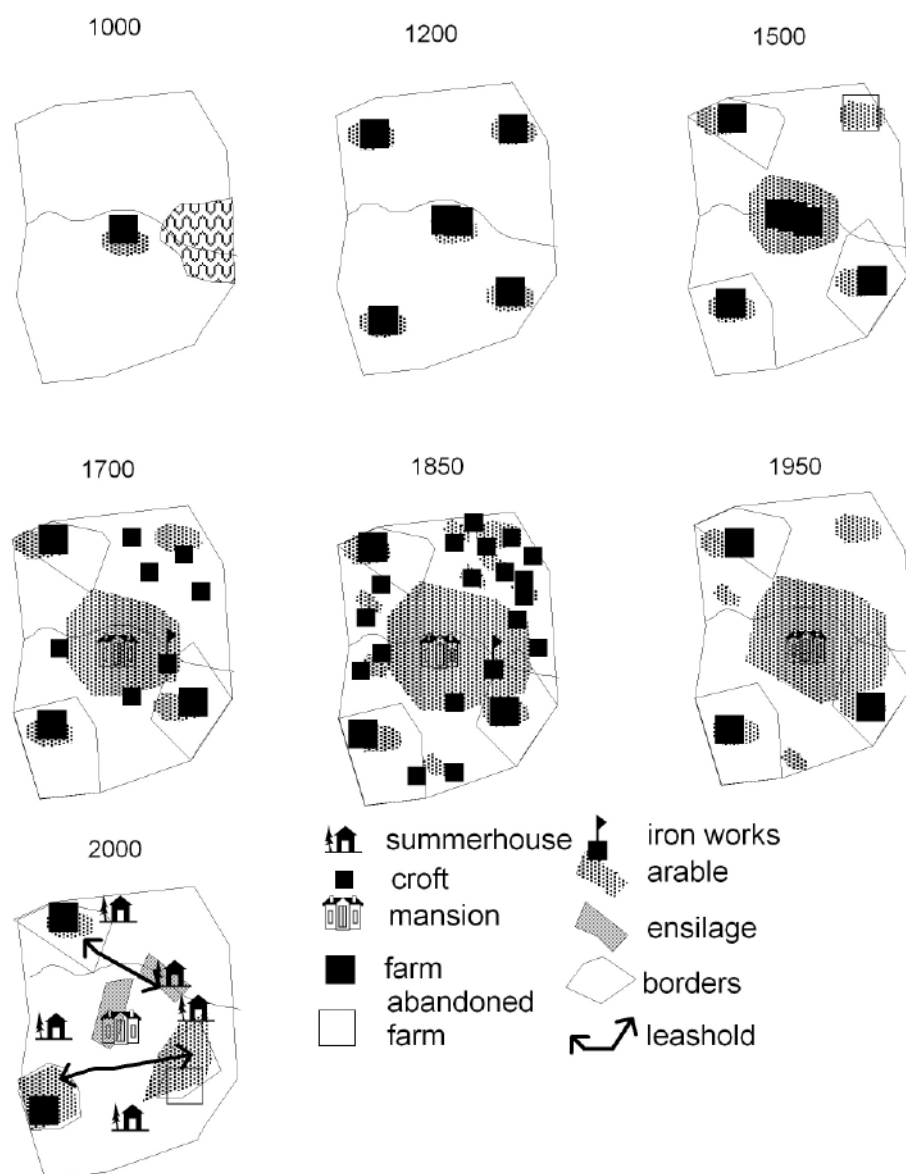


Figure 13-2. A model illustrating the settlement changes in the region of Forsmark during the period 1000–2000.

Many of the large estates abandoned agriculture during the 20th century and the land was leased out. The decrease in the number of farms is also discernable in the region. Many of the farms belonging both to the old nobility and to the freeholders were converted to dwelling houses of different types. The large areas of forest that were needed for the production of charcoal were in many cases purchased by large timber companies. The surviving farms often bought the arable lands in order to amalgamate larger holdings. Another possibility was to lease land from the land owners not involved in farming. To some extent, this arable land was then used solely for the production of plants for silage and fodder production, and not as arable.

13.4 A comparison

We have studied two areas in Sweden that are located by the Baltic. They exhibit many differences in terms of development and history. This is partly due to their different physical settings, but also to the fact that their societies and economies have developed differently. One area has experienced land rise while the other has remained more or less stable throughout the investigated thousand-year period. In one area many smallholders own land, while in the other area large land owners exist.

13.4.1 Prehistory –1050

This study only deals with prehistory as a backdrop, and it has not been fully investigated. It is clear however, that there have been significant changes. The patterns of prehistoric settlement and land use are very unclear for the Oskarshamn area. The situation in Forsmark is somewhat clearer. In the investigated area, the settlement dating from the late Iron Age is fairly clearly observable as burial grounds, at least in the inland areas. Closer to the sea, however, the land upheaval has meant that these areas were not settled permanently until the end of the prehistoric period.

13.4.2 Medieval period 1050–1550

The medieval period shows us the differences between the regions in more detail. One difference between the regions is that in Forsmark there existed small hamlets during the medieval period. In Oskarshamn there was a dominating settlement structure of single farms.

Another difference concerns the phase of expansion in Forsmark whereby new settlements were created in the peripheral areas of the older ones. This expansion cannot be easily observed in Oskarshamn. The recession during the middle of the medieval period, which is often attributed to the plague, has not been confirmed in this study but there are indications that this occurred in Oskarshamn.

The investigated parishes in the Forsmark area show that the freeholders were dominant at the end of the medieval period and that the share of farms belonging to the nobility was small. In Kristdala and Misterhult, the share of farms belonging to the crown was unusually large and the share of freeholders was correspondingly very small. In Döderhult, the share of farms belonging to the nobility was completely dominant in c 1540.

13.4.3 Early modern period 1550–1750

During the early modern period, 1550–1750, the establishment of the iron industry dramatically affected the surrounding landscape. Production was geared towards the needs of the industry; charcoal production, mining, and the production of fodder for animals used in the industry. The ownership structure also changed abruptly with the establishment of large estates. In both areas there was an expansion that was common in many places. In Forsmark, this meant that many crofts were established in the forested areas, that were inhabited by people involved in the charcoal production. In many parishes in Forsmark, the population doubled or increased at an even faster rate between the 1570s and the 1780s. In Oskarshamn there was also an increase, but a more moderate one during later periods. We can see that the settlement in Oskarshamn increased, in part due to the partitioning of farms.

The land ownership changes after the 16th century meant that the freeholders land increased from the beginning of the 18th century in the investigated parishes in the Oskarshamn area. In the area as a whole, the land held by freeholders was the dominant category of land at the end of the 19th century, even though the nobility still owned a large share of the land. This increase in the number of freehold farms was caused by a process whereby former tenants purchased their farms from the crown (Sw. *skatteköp*). These farms were then turned into freehold farms and the tenants duly became freeholders. This process is more generally found throughout Sweden during the 18th and 19th centuries /Gadd 2000 p 198/. From the second half of the 19th century the tenants of the noble land were also able to buy their farms. It seems as though most of the new freeholders were settled on farms that had previously belonged to the crown.

13.4.4 Era of modernisation 1750–1950

The number of freehold farmers increased in Oskarshamn during this period. This was both a result of partitioning and that farmers purchased old farms belonging to the nobility. The reverse can be said to be the case in many of the investigated areas in Forsmark. The large estates, e.g. Forsmarks bruk, expanded and since they belonged to the nobility the number of farms under seigniorial power increased during the period. The privileges of the nobility diminished over time and the difference between the types of farms was only of historical importance during the 20th century.

The population increased dramatically from the 1780s up to the late-19th century. This was halted at the turn of the century and the rural population decreased during the latter part of the 20th century. The population of Sweden increased between 1870 and 1945, but the number of people involved in agriculture decreased. Instead, the numbers of people employed in industry and crafts increased /Morell 2001 p 14–15/.

The land reforms that took place in the 18th and the 19th centuries caused profound changes in the spatial organization of settlement and land use. In some cases, settlements were forced to move away from the old villages and to relocate to previously uncultivated areas. However, this was not the general pattern in the two regions. Instead, the changes that occurred in Oskarshamn were very small; many of the farms were still located to the old toft (building plot) where the hamlets had been for centuries. The farms that actually moved were located to areas where the land was already tilled. In Forsmark, this was also generally the case and many of the larger villages are still visible today. This does not mean that there were no changes. In the areas that belonged to the estates the changes were of a different nature. This instead involved an increase in the number of crofts and other settlements that cannot be described as independent farms.

As the technology changed, the old agricultural system of arable land and meadows was abandoned. This model, in short, meant that a farm needed the meadows for winter fodder. The winter fodder was necessary for keeping cattle that were important not only for providing power and meat, but also for fertilizing the arable land. This local agro-ecological cycle was broken, and at first this meant that the fodder was grown in the arable fields creating a rotation of crops involving cereal production, fallow and fodder in one field. These new rotations improved not only the amount of fodder but also the yields of barley and other crops. These changes in technology coincided more or less with the land reforms. So, from the earlier part of the period, we could find hamlets and villages that cooperated in the use of arable land, forest and meadows. At the end of the period, however, most farmers had direct control of their holdings and without the involvement of their neighbours. The forest had been divided and the pattern of the land reforms can easily be seen in today's landscape. Many new fences were erected to separate the different parts of the arable land. These fences were erected both to separate land belonging to different land owners and as a part of the new rotation systems that were introduced.

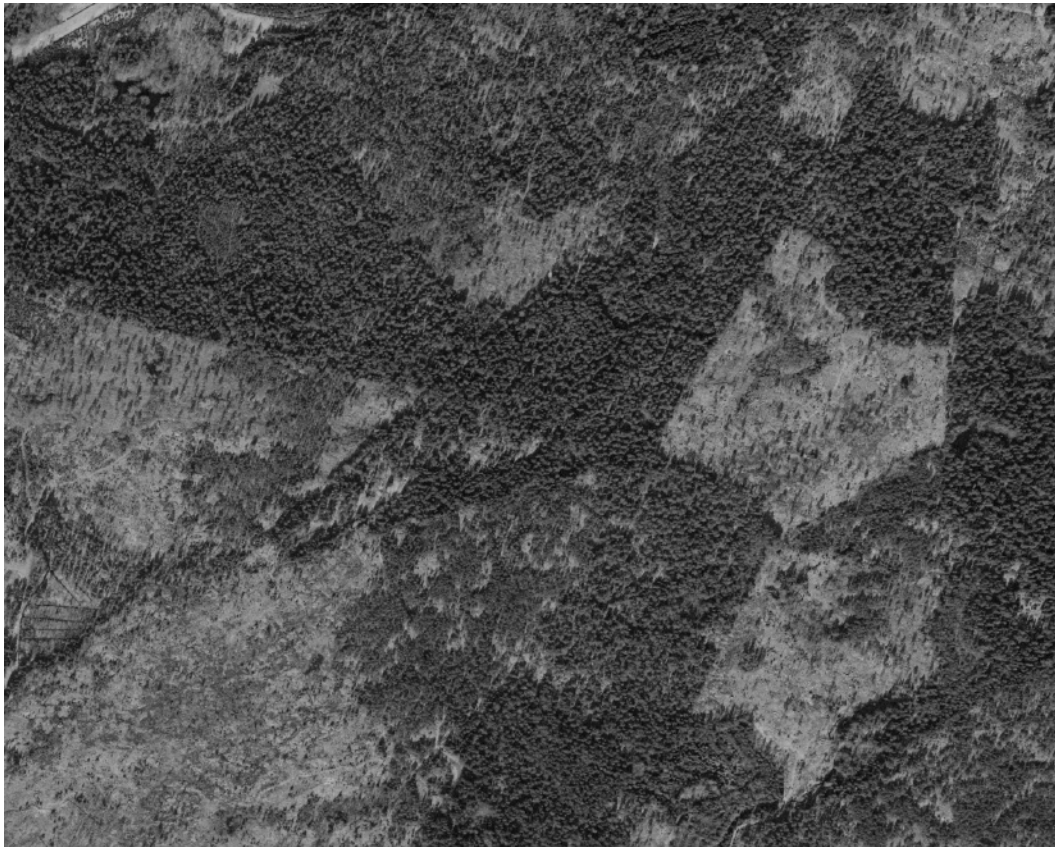


Figure 13-3. *The rectangular pattern in the forests can be observed in many parts of the investigated area. This pattern is often attributed to the new division of the forests that took place as a result of the land reforms during the 17th and the 18th centuries. This aerial photograph from 2001 of the forests between Finnshult and Fallegärde, north-west of Oskarshamn, exemplifies this well.*

The average household size in Valö generally decreased between c 1750 and c 1895 from almost 10 persons per household in 1751–62 to c 6 individuals per household in 1891–95. When the farm households are separated from the crofters' holdings in Valö, the average number of persons per household in 1751–62 is over 12. This is more than the average household size among the crofters' holdings, which comprises almost 9 persons per household at the same time. In 1891–95, the average farm household size was 7.5 persons, and at the same time the crofters' holdings comprised c 5.7 persons per household on average.

The changes in Misterhult between 1851 and 1893–99 indicate a similar pattern. During this roughly fifty-year period, the average household size decreased from almost 7 persons per household in 1851–60 to c 5.5 persons per household in 1893–99. If farms are separated from crofters' holdings some differences can be seen. In 1851–60, the average farm household size can be estimated to almost 8 persons per household. Crofters' holdings however, have an average household size of just over 5 persons. At the end of the 19th century the farm household size has increased to a little more than 6 persons and the crofters' holdings remain at c 5 persons per household.

13.4.5 The Postwar period 1950–2000

The aim of Swedish agriculture policy after the Second World War was to rationalise the sector. This goal had substantial effects on landscapes in all parts of Sweden. Before the war, cultivation was carried out either by relatively small family farms or by large estates with employees. Three different goals were formulated by the state; the income goal, the efficiency goal, and the self-sufficiency goal in case of war. The income goal meant that farmers' standard of living should be comparable/equal to an employed industrial worker. The efficiency goal aimed for a rationalised and efficient production. Today the goals have changed and the agricultural politics is a part of the EU policy. The EU gives subsidies to farmers for different types of land use /Flygare and Isacson 2003/. This means that production of non-agricultural values has come into focus to a much larger extent than was earlier the case. Preservation of old meadows and grazing land can provide better returns than agricultural production can.

Table 13-1. The number of farms according to farm-size and year in Sweden.
Source: SCB.

Farms according to size in hectares	1980	1985	1990	1995	1996	1997	1998	1999	2000
2.1–5.0	19,248	17,865	14,957	12,828	14,730	14,273	13,563	11,344	11,784
5.1–10.0	25,474	22,110	19,020	16,710	17,816	17,179	16,442	15,229	14,110
10.1–20.0	28,123	24,660	20,832	18,458	18,701	18,066	17,451	16,656	15,453
20.1–30.0	15,876	14,423	12,177	10,633	10,607	10,127	9,827	9,295	8,717
30.1–50.0	15,875	15,536	14,223	12,834	12,587	12,249	11,845	11,445	10,624
50.1–100.0	10,061	10,923	11,348	11,339	11,350	11,268	11,188	10,969	10,652
100.1 –	3,225	3,512	4,003	4,503	4,697	4,864	4,991	5,181	5,458
Total	117,882	109,029	96,560	87,305	90,488	88,026	85,307	80,119	76,978

The policies and the changes in economy after the war have substantially altered the landscape and the conditions for farming in different areas. These changes are especially visible in the areas where conditions for cultivation are good. As a consequence of rationalisation and mechanisation, a smaller number of farmers were now able to cultivate larger areas, which was also a necessity for the urbanisation and industrialisation of society. From the ethnographic study in this project, some general conclusions about land use in the two study areas can be drawn. It is further possible to place these two case studies in a more general Swedish context.

Current land use is in some respects typical for the forested rural areas in Sweden: small-scale family based farming with grazing animals dominates in both areas. However, there are some subtle but important differences. First, a difference in the traditional land use can be recognised. It seems that there has been a more diverse land use in the Oskarshamn area, focusing more on fishing, hunting and collecting berries. In the Forsmark area, however, land use has been more focused on the traditional practice of growing seeds. Secondly, the reorganisation of properties has gone one step further to build sufficiently sized farms in the Forsmark area than in Oskarshamn. In the Oskarshamn area most farms are still intact from the time of the land reforms, and the current land users are instead lease-holding many tracts of land from other farms, up to 25 contracts in some cases. In the Forsmark area large forest companies bought whole farms in the post-war period and sold off the arable land to family farmers. In the Oskarshamn area most farms are still owned by the same families as in the early twenties. Thirdly, the spatial dimensions are different in terms of field size and distribution. Today it is necessary to have somewhere in the region of 50 to 60 cows to have a solid economic base for milk production. In the Oskarshamn region, however, there is not enough grazing land close to the hamlets and not enough fodder producing areas in the proximity of farms. According to those who were interviewed, this makes the establishment of a dairy farm in the region increasingly difficult. But in Forsmark it is still possible, which has resulted in modernisation and investments in milking machines and new stables.

The oldest interviewed land users in both areas expressed the importance of real production and relative independence from the state. The youngest land users, on the other hand, represent an attitude that views real farming as having been replaced by extensive land use and the adoption of a pragmatic and flexible approach towards EU subsidies. They explicitly argue that it is now necessary to direct production in such a manner that it conforms to the system of subsidies. In both areas these men have new modern machines, which they hire out as and when time allows.

In summarizing the two case studies, it can be said that the land use in both areas can to a large scale be seen as agriculturally marginal. In both areas land use is to some extent dependent on subsidies. But the two studies have uncovered an important difference between the two. In the Oskarshamn area many landowners do not see much future for farming. For the inhabitants in the Forsmark area, however, the idea of farming as a source of revenue and a livelihood is still alive and thus incorporated in the perception of everyday life. This is an example of a subtle immaterial border, which will probably have effects on how land will be used in future.

Sources

Archives:

Riksarkivet (the National Swedish Archive) Marieberg:

Kammararkivet, Jordeböcker, Stockholms län, 1640
Kammararkivet, Jordeböcker, Stockholms län, 1653
Kammararkivet, Jordeböcker, Stockholms län, 1730
Kammararkivet, Jordeböcker, Stockholms län, 1777:1–2
Kammararkivet, Jordeböcker, Stockholms län, 1825:1–5

Kammararkivet, Jordeböcker, Uppsala län, 1632:23
Kammararkivet, Jordeböcker, Uppsala län, 1636
Kammararkivet, Jordeböcker, Uppsala län, 1680
Kammararkivet, Jordeböcker, Uppsala län, 1730
Kammararkivet, Jordeböcker, Uppsala län, 1780
Kammararkivet, Jordeböcker, Uppsala län, 1825:3
Kammararkivet, Jordeböcker, Kalmar län, 1631:9
Kammararkivet, Jordeböcker, Kalmar län, 1631:7
Kammararkivet, Jordeböcker, Kalmar län, 1680:1–3
Kammararkivet, Jordeböcker, Kalmar län, 1730
Kammararkivet, Jordeböcker, Kalmar län, 1780

Kammararkivet, Jordeböcker, Kalmar län, 1825:1–4

Kammarkollegiets arkiv (the Kammarkollegie Archive) Riddarholmen, Stockholm

Jordeböcker, Stockholms län, 1871:1–12
Jordeböcker, Uppsala län, 1875:1–5
Jordeböcker, Kalmar län, 1880:1–5

Landsarkivet, Vadstena

Tuna läns och Sevede kontrakt, H 4, Folkmängdsstatistik (om Misterhults totala folkmängd 1860–63, 1866, 1869–1906).

Tuna läns och Sevede kontrakt, prostarkiv: G 2, Befolkningsstatistiska tabeller 1776, 1785, 1788, Folkmängdstabell 1785. (Om Misterhults sociala befolkningsstruktur 1785).

Tuna läns och Sevede kontrakt, Statistiska tabeller 1802–1808, 1810–1859, H 3. (1850 använt för att beräkna den sociala befolkningsstrukturen i Misterhult 1850).

Riksarkivet Arninge: Husförhörslängder,

Kalmar län, Misterhult socken, AI:6A–B. År 1851–1860
Kalmar län, Misterhult socken, AI:17A–B. År 1893–1899
Uppsala län, Valö socken, AI:1. År 1751–1762
Uppsala län, Valö socken, AI:4a–b, 1800–1806
Uppsala län, Valö socken, AI:12, 1850–54
Uppsala län, Valö socken, AI:20. År 1891–1894

Atlas 1900: Digital version av Atlasen Sveriges jordbruk vid 1900-talets början: statistiskt kartverk 1, som trycktes år 1909 <http://www.ksla.se/atlas1900/>.

Se även: Jansson, Ulf (2004): *Atlas 1900 –Handledning till en digital atlas över jordbruket kring år 1900*. Kungl. Skogs- och lantbruksakademiens enhet för de areella näringarnas historia, Småskrifter 5. Kungl. Skogs- och lantbruksakademien, Stockholm.

Kulturgeografiska institutionen, Stockholms universitet

Torsten Lagerstedt's excerpts, of information from the 17th century on tithe and cattle.

Maps

Lantmäteristyrelsens arkiv. Lantmäteriverkets forskningsarkiv, Gävle.

A number of large scale cadastral maps from the investigated areas. See separate appendix.

Printed maps

Most of the printed maps covering the areas were used.

Old economic map from the late 19th and early 20th century (häradskarta).

Economic maps from the mid 20th century.

Modern economic maps.

Interviews

Forsmark area

The interviews are anonymous in order to protect the respondents.

2004-10-06 Interviews

2004-11-02 Interviews

2004-12-01 Interviews

Oskarshamn area

2004-10-20 Interviews

2004-11-09 Interviews

2004-11-10 Interviews

Information on cadastral units c 1550,:

Ferm, Olle and Brunius, Jan (ed) (1990) *Det Medeltida Sverige Småland, Handbörd, Stranda, 4:2*. Riksantikvarieämbetet, Stockholm.

Rahmqvist, Sigurd (ed) (1999) *Det Medeltida Sverige, Småland, Aspeland, Sevede, Tuna län, 4:4*, Riksantikvarieämbetet, Stockholm.

References

- Almquist J A, 1931.** Frälsegodsen i Sverige under storhetstiden: med särskild hänsyn till proveniens och säteribildning, D. 1, Stockholms och Uppsala län, Bd 1, Inledning och tabeller, LiberFörlag/Allmänna förl., Stockholm.
- Almquist J A, 1976.** Frälsegodsen i Sverige under storhetstiden : med särskild hänsyn till proveniens och säteribildning, D. 4, Småland, Bd 3, LiberFörlag/Allmänna förl., Stockholm.
- Anderson Palm L, 1993.** Människor och skördar. Studier kring agrarhistoriska meod-problem 1540–1770. Institutet för lokalthistorisk forskning, skriftserie nr 4. Avhandlingar från Historiska institutionen i Göteborg, 6. Göteborg.
- Andersson Palm L, 2000.** Folkmängden i Sveriges socknar och kommuner 1571–1997: med särskild hänsyn till perioden 1571–1751, L.A. Palm, Göteborg, Visby.
- Ambrosiani B, 1964.** Fornlämningar och bebyggelse. Studier i Attundalands och Södertörns förhistoria. Uppsala.
- Arnstberg K-O, 1997.** Fältetnologi. Carlsson. Stockholm.
- Bauer W, 1984.** ”Engelska parken” p 93–98 i red Jansson, Sverker & Janson, Bengt Forsmarks bruk, en uppländsk herrgårdsmiljö. LT:s förlag, Stockholm.
- Bedoire F, 1995.** ”Kyrka, herrgård och bruk: den fransk-reformerte kapitalisten som bygg-herre och kulturförmedlare i det svenska 1700-talet”, p 147–162 i Konsthistorisk tidskrift. 1995 (64:3).
- Borgegård S-O, 1998.** Upplev Gräsön. En vandring i tid och rum genom ett levande kulturlandskap, Gräsöfondens natur- och kulturguide, Gräsöfonden.
- Broberg A, 1990.** Bönder och samhälle i statsbildningstid : en bebyggelsearkeologisk studie av agrarsamhället i Norra Roden 700–1350, Upplands fornminnesförening. Uppsala.
- Bååth K, 1983.** Öde sedan stora döden var – bebyggelse och befolkning i Norra Vedbo under senmedeltid och 1500-tal, Det nordiske ødegårdsprosjekt 12, Bibliotheca historica Lundensis 51, Liber/Gleerup, Lund.
- Dahlbäck G, 1974.** ”Landhöjning och bebyggelse i nordligaste Uppland” p 121–131 in Fornvännen 1974/3.
- Dovring F, 1951.** De stående skatterna på jord 1400–1600. Lund.
- Ene S, 1998.** Removal of text and cartographic symbols in scanned maps <http://www.humangeo.su.se/gpu2/scanfilter/scanfilter.htm> (Jan 1998).
- Ene S, Persson C, Widgren M, 1991.** Markdatabas Gotland. Läns museet Gotlands Fornsal. – Presentation av datorbaserad markdatabas i vilken data om fasta fornlämningar kompletterats med data om landskapets ekologiska förutsättningar och markanvändningen i äldre tid. 51 sid. Pris 50:-.

Ene S, Hall O, Jansson U, (forthcoming). ”Geografisk informationsbehandling och landskapsanalys” i Jansson, Ulf (red.) Kartlagd land: Kartor som källa till de areella näringarnas geografi och historia. Skogs- och lantbrukshistoriska meddelanden. Kungl. Skogs- och lantbruksakademien. Stockholm.

Essemyr M, 1988. Bruksarbetarnas livsmedelskonsumtion: Forsmarks bruk 1730–1880, Uppsala.

Flygare I, Isacson M, 2003. ”Jordbruket i välfärdssamhället 1945–2000”. I Det svenska Jordbrukets historia band 5. Natur och kultur/LTs förlag. Örebro.

Fogelvik S, 1973. Kulturlandskap i omvandling : en kvantitativ studie av dynamiken och det rumsliga förloppet i de senaste decenniernas kulturlandskapsomvandling baserad på material omfattande Östergötland jämte delar av angränsande län. Rapporter från Forskningsprojektet Agrar kulturlandskapsmiljö 8. Kulturgeografiska institutionen, Stockholms universitet, Stockholm.

Fogelvik S, 1978. Det föränderliga kulturlandskapet. Kulturgeografiskt seminarium 78:9 Stockholm.

Fogelvik S, 1979. Kvantitativ landskapsanalys : att beskriva landskap med siffror : en manual med tillämpningsexempel. Kulturgeografiskt seminarium 79:1 Kulturgeografiska institutionen, Stockholms universitet, Stockholm.

Fraser Hart J, 1998. The Rural Landscape. Johns Hopkins university press.

Gadd C-J, 2000. Den agrara revolutionen 1700–1870, Det svenska jordbrukets historia, band 3, Natur och Kultur/LTs förlag, Stockholm.

Gissel S et al. 1981. Desertion and land colonization in the Nordic countries c 1300–1600. comparative report from the Scandinavian research project on deserted farms and villages, Almqvist & Wiksell international, Stockholm.

Helmfrid S, 1962. Östergötland „Västanstång” Studien über die Ältere Agrarlandschaft und ihre Genese. Geografiska annaler 44, 1962.

Hofsten E, 1986. Svensk befolkningshistoria. Några grunddrag i utvecklingen från 1750, Prisma, Göteborg.

Hyenstrand Å, 1984. Fasta fornlämningar och arkeologiska regioner. RAÄ rapport 1984:7.

Ingers E, 1956. Bonden i svensk historia, Del 3, av Sten Carlsson med bidrag av Albert Eskeröd Lantbruksförbundets tidskriftsaktiebolag, Stockholm.

Ingold T, 2000. The Perception of the Environment. Essays in Livelihood, Dwelling and Skill. Routledge. London.

Isaksson O, 1995. Vallonbruk i Uppland : människor och miljöer, Bonnier i samarbete med Upplandsmuseet, Stockholm.

Jansson U, 1993. Ekonomiska kartor 1800–1934. En studie av småskaliga kartor med information om markanvändning. Riksantikvarieämbetet. Stockholm.

Jansson U, 2004. Örebro län. Ett län med många landskap, Program för Kulturmiljövård i Örebro län, del 2. Publikationsnummer: 2002:22, Länsstyrelsen, Örebro län, Örebro. ISSN 0349-4454. även digitalt <http://www.t.lst.se/VISInformWebsite/kulturmiljo/landskap/del2.htm>

- Jansson U, Berg J, Björklund A, 2004.** A study on landscape and the historical geography of two areas – Oskarshamn and Forsmark, June 2004. SKB R-04-67, Svensk Kärnbränslehantering AB.
- Kardell L, 2003.** Svenskarna och skogen. D. 1, Från ved till linjeskepp, Skogsstyrelsens förlag, Jönköping.
- Karlsson P-A, 1990.** Järnbruken och ståndssamhället. Institutionell och attitydmässig konflikt under Sveriges tidiga industrialisering. Jernkontorets bergshistoriska skriftserie 25. Stockholm.
- Kohler Reismann C, 1993.** Narrative Analysis. Qualitative Research Methods volume 30. Sage Publications: London.
- Kvale S, 1999.** Intervjun som kunskapskonstruktion, p 57–75 in Carl Anders Säfström, Leif Östman (eds) Textanalys, Studentlitteratur, Lund.
- Lagerstedt T, 1968.** Sädesodling och boskapsstock under 1600-talet. Ymer 1968.
- Larsson L-O, 1972.** Kolonisation och befolkningsutveckling i det svenska agrara samhället 1500–1640. Lund.
- Larsson L-O, 1975.** Det medeltida Varend. Studier i det småländska landskapets historia fram till 1500-talets mitt (2. uppl.). Kronobergsboken 1974–75. Växjö.
- Larsson L-O, 1981.** Småländsk bebyggelsehistoria. I Från vikingatid till Vasatid. 1:4 Norrvidinge och Uppvidinge härad. Acta wexionensia serie 1 History & Geography 1:4. Växjö.
- Larsson L-O, 1983.** Bönder och gårdar i stormaktspolitikens skugga. Acta Wexionensia. Serie 1. History & Geography 3. Växjö.
- Larsson L-O, 1985.** Jordägofördelningen i Sverige under Gustav Vasas regering, i Scandia 51 pp 61–90.
- Lindegren J, 1980.** Utskrivning och utsugning: produktion och reproduktion i Bygdeå 1620–1640, Studia historica Upsaliensia 117, Uppsala universitet, Almqvist & Wiksell international (distr.), Stockholm.
- Lägnert F, 1949.** Veteodlingen i södra och mellersta Sverige. Meddelanden från Lunds universitets geografiska institution. Avhandlingar 17. Lund.
- Lägnert F, 1955.** Syd- och mellansvenska växtföljder 1. Meddelanden från Lunds universitets geografiska institution, avhandlingar 29. Lund.
- Morell M, 1997.** ”Kosthållets utveckling”, s. 211–228 i Bengt M. P. Larsson, Mats Morell, Janken Myrdal (red) Agrarhistoria, LT, Stockholm.
- Morell M, 2001.** Det svenska jordbrukets historia, Bd 4, Jordbruket i industrisamhället: 1870–1945, Natur och kultur/LT i samarbete med Nordiska museet och Stift. Lagersberg, Stockholm.
- Moström J, 2004.** Skärgårdsmönster : en historisk-geografisk studie av ägande, nyttjande och landskap i Kalmar läns urbergsskärgård, Meddelande 2004:1, Länsstyrelsen Kalmar län, Kalmar.

- Myrdal J, Söderberg J, 1991.** Kontinuitetens dynamik. Agrar ekonomi i 1500-talets Sverige. Acta universitatis Stockholmiensis. Stockholm studies in economic history 15. Stockholm.
- Myrdal J, 2001.** Den nya produkten – det nya uppdraget. Jordbrukets framtid i ett historiskt perspektiv. Ds 2001:68, Jordbruksdepartementet.
- Nilsson L, 1992.** Historisk tätortsstatistik. Del 1: Folkmängden i administrativa tätorter 1800–1970, Stads- och kommunhistoriska institutet, Stockholm.
- Nisser M, 1984.** ”Forsmarks bruks historia” i Janson, Sverker & Janson, Bengt (red) 1984 Forsmarks bruk – en uppländsk herrgårdsmiljö, LTs förlag, Stockholm
- Nisser M, 1987.** ”Forsmark – ett av vallonbruken kring Dannemora gruvor” p 14–69 in Artur Attman et al. Forsmark och vallonjärnet, Forsmarks kraftgrupp, Stockholm.
- Norman P, 1993.** Medeltida utskärsfiske. En studie av fornlämningar i kustmiljö. Nordiska museets handlingar 16. Stockholm.
- Norman P, 1995.** Sjöfart och fiske. Fornlämningar i Sverige 3. Riksantikvarieämbetet, Stockholm.
- Renting A, 1996.** I skuggan av Lövsta bruk. Järnbruksrörelsens inverkan på agrarsamhället i norra Uppland 1630–1930, Rapporter från Barknåreprojektet nr 6, Meddelanden nr 96, Kulturgeografiska institutionen, Stockholms universitet
- Sandelin S, 1992.** Öregrund, Roslagens pärla, Streiffert Stockholm.
- Sauer C O, 1925.** The morphology of landscape. Reprinted in Leighley, J. (1974): Land and life: a selection of writings of Carl Ortwin Sauer. Berkeley. Univeristy of California Press.
- Sporrong U, 1971.** Kolonisation, bebyggelseutveckling och administration. Studier i agrar kulturlandskapsutveckling under vikingatid och tidig medeltid med exempel från Uppland och Närke. Meddelanden från Kulturgeografiska institutionen vid Stockholms universitet Nr B 23. Stockholm.
- Sporrong U, 1985.** Mälarbygd. Agrar bebyggelse och odling ur ett historiskt-geografiskt perspektiv. Kulturgeografiska inst. Sthlm. Univ. Meddel. Ser. B61. Stockholm.
- Sporrong U, 1995.** Svenska landskap, Naturvårdsverket, Solna.
- Sporrong U, 1996.** Odlingslandskap och landskapsbild, Studier till Kulturmiljöprogram för Sverige, Riksantikvarieämbetet, Stockholm.
- Sporrong U, 1998.** ”Landskapet, format av natur och samhälle – geografins möjlighet till forskningsintegration,” p 29–43 Martin Gren & P O Hallin red Svensk kulturgeografi. En exkursion inför 2000-talet. Lund.
- Stridsberg E, 1992.** Hållnäsbygden under kolskogsepoken 1626–1926, Meddelanden serie B 77, Kulturgeografiska Institutionen, Stockholms universitet
- Tollin C, 1999.** Rågångar, gränshallar och ägoområden: rekonstruktion av fastighetsstruktur och bebyggelseutveckling i mellersta Småland under äldre medeltid, Meddelanden från Kulturgeografiska institutionen vid Stockholms universitet 101, Stockholm.

Vahlne B, 1984. ”Vem anlade Engelska parken?” p 99–113 i red Jansson, Sverker & Janson, Bengt Forsmarks bruk, en uppländsk herrgårdsmiljö. LT:s förlag, Stockholm.

Wästfelt A, 2004. “Landskapets förvandlingsförlopp: Studier av byn Sötåsa i Småland utifrån en rumslig, tidlig och meningsskapande aspekt.” I Continuous landscapes in finite space; making sense of satellite images in social science. Hugo förlag. Uppsala.

Winberg C, 1977. Folkökning och proletarisering, Bo Cavefors Bokförlag

Windelhed B, 1995. Barknåre by. Markanvändning och bebyggelse i en uppländsk by under tusen år. Meddelanden serie B92. Kulturgeografiska institutionen Stockholms universitet. Stockholm.

The structure of a point file

Old X	Old Y	New X (E)	New Y (N)
3.451847	12.112421	1627806.998588	6691302.402958
3.733345	15.880487	1627831.548386	6691782.990499
17.014823	5.895802	1629593.375500	6690578.183210
15.349245	12.058441	1629342.475364	6691337.420479
1.587436	10.528911	1627567.890987	6691081.240014
19.853882	9.191247	1629928.529106	6690998.334930
5.373528	9.282047	1628067.254314	6690938.138520
17.821897	10.491121	1629658.627537	6691152.518535
12.120329	5.204835	1628964.892280	6690441.330819
11.566181	3.064578	1628901.627115	6690161.000691
11.150701	7.427539	1628824.292286	6690720.490085
3.947500	11.557300	1627872.728122	6691217.958166
1.705455	5.646120	1627597.475969	6690440.245719
4.061727	2.693147	1627921.272592	6690069.406000
2.849873	0.696530	1627773.637347	6689799.658890
1.269427	1.076144	1627563.945252	6689851.206112
6.575012	3.226398	1628253.214229	6690155.050723
7.946685	13.721874	1628388.588680	6691516.605300
5.925843	15.375954	1628114.715752	6691727.477041
6.756266	13.702848	1628238.635442	6691517.646642
8.535816	10.071491	1628477.623415	6691055.290824
8.490065	9.267550	1628472.416706	6690951.156630
4.989868	4.481483	1628038.448538	6690306.060663
8.126085	12.693506	1628414.860610	6691388.407564
8.471970	7.833748	1628473.245280	6690766.365933

Structure of the point file: (A113_17_7_a). This is one of 10 parts of this map; all of them consist of about the same number of points. The first two columns, old x and old y, show the coordinates of the points in the unrectified image. The next two columns show the location of these points in a georegistered image, i.e. in a modern map. With the help of these points the image has been resampled (warped). As a result of this resampling the old maps have been stretched in various directions to fit the modern coordinate system.

Manual on the extraction of thematic information from scanned paper maps using ENVI, IDRISI and ADOBE PHOTOSHOP

Stefan Ene och Ola Hall 2004-01-15

This manual deals with the pre-processing steps, registration, subsetting, and mosaicking of scanned paper maps. It also deals with the classification and extraction of thematic map information.

In this working example we assume the presence of scanned versions of the Cadastral map of Sweden, 1: 10,000 (Ekonomiska kartan).

Map orientation

Before you start it is necessary to check the orientation of the maps in Photoshop. Orientate maps so that north points to the top of your monitor. Use ROTATE CANVAS under the menu IMAGE. Save the file in the same filename. This is now your original data.

Registration of maps with acceptable geodetic quality (e.g. from the 70's and onward)

Use ENVI and the function IMAGE-TO-MAP under the menu MAP/Registration. Choose the registration projection SWEDEN and 1 m pixel size. Use the cursor to identify coordinate crosses in the image and type the corresponding coordinate pair in the empty field marked as N and E. If correct, add the point to the coordinate list. Repeat the same procedure for all corners. Check RMS, this should be zero or close to zero. Go to the OPTIONS menu and select WARP FILE. In the next dialog window, select RST as the transformation algorithm and Nearest Neighbour as the resampling algorithm. The syntax for the output filename is: `*\bladkod_year_rek.*`.

Check the result visually! Use CURSOR LOCATION under TOOLS in your image window.

Meta data: Note the number of points used for the transformation, algorithm name, and save the transformation points file to: syntax: `\bladkod_year_rek.*`

Subsetting of registered maps

Open the menu BASIC TOOLS, select RESIZE DATA. Select your input file and select SUBSET by MAP. Type the top-left and bottom-right coordinate pairs for use in subsetting the file. Note: due to certain conventions in ENVI you need to add respectively subtract 1 meter from the original coordinates to avoid adding columns and lines to the file. The way around this is to select a coordinate located 1 meter within the actual frame. For example, top-left 1620000/6750000 translates to 1620001/6749999. Select OK where appropriate and give the output file the name `\bladkod_year_rek_sub.*`.

Check the result with the cursor and use the function LINK DISPLAYS under the TOOLS menu. The file should be 5,000×5,000 pixels.

Registration of maps with low geodetic quality (e.g. cadastral map from the 50's)

Open the file that contains the base map (e.g. the one with best geodetic quality) and the file that you want to register (WARP). Use ENVI and the function IMAGE-TO-IMAGE under the menu MAP/Registration. Select the image that contains the base image and the warp image. Use the cursor to visually locate similar (but geometrically different) points. Start with map corners and then add points in the image centre. Check RMS during the registration and de-select points when RMS becomes too high. Go to the OPTIONS menu and select WARP FILE. Use RST and Nearest Neighbour as algorithms. The syntax for the output file name is: `*\bladkod_year_rek.*`.

Check the result with the cursor and use the function LINK DISPLAYS under the TOOLS menu.

Meta data: Note the number of points used for the transformation, algorithm name, and save the transformation points file to: syntax: `\bladkod_year_rek.*`

Subset the file according to the conventions for subsetting registered maps.

Mosaicking of registered maps

Open the files to be mosaicked. Go to the MAP menu, select MOSAICKING and GEOREFERENCED. Import files under the IMPORT menu. Check the result. If the maps are incorrectly placed, then go back and check the registration. Go to APPLY under the FILE menu. Select pixel size 1 m and Nearest Neighbour. If, for example, the input maps are: 12I 9e, 12I 9f, 13I 0e and 13I 0f, then the output filename should have the syntax: `12I9ef_13I0ef_temp.*`

Go to FILE MENU and EDIT ENVI HEADER. Check that the number of samples and lines are 10,000×10,000 pixels. If not, open RESIZE DATA under the main menu BASIC TOOLS. Select input file (`*_temp.*`). Set lines = 10,000 and samples = 10,000 and make sure that the resampling algorithm is set to nearest neighbour. Save the file in the same filename but WITHOUT the `_temp` part. Thereafter, go back to EDIT ENVI HEADER and select EDIT ATTRIBUTES. Register the upper-left corner by choosing pixel size 1.00000 for X and Y, and then register the corner to corresponding RT 90 coordinate. ENVI will automatically define the other 3 corners.

Export mosaic as TIFF/GeoTIFF

Open the image and select SAVE IMAGE AS and IMAGE under the FILE MENU in the image window. Set the parameters Resolution = 8-bit (colour table), Output file type = TIFF/GeoTIFF, and output filename to the same as the original image. This file is now readable in IDRISI by first using the IMPORT command.

Semi-automatic extraction of thematic land-cover from mosaic images with ENVI

Load your image file into ENVI. In the image window menu select OVERLAY and REGION OF INTEREST. The task here is to define representative regions that can be used in supervised classification. Click with the cursor to delimit a region, right-click to close the polygon. Note that the number of pixels within the region is displayed in the dialog window. Use the EDIT function to select a meaningful name for the region. Save the regions of interest (ROI) file by selecting Save ROIs, select all ROIs from the list and use the syntax: `12I9ef_13I0ef_ROI.*`.

We suggest that you define regions in the following order and with the following names and number of pixels:

Name	Content	Number of pixels
Åker1	Bright yellow fields	25,000–30,000
Åker2	Normal yellow fields	=
Åker3	Dark yellow to dark green fields	=
Skog1	Bright to almost white areas	=
Skog2	Mixed	=
Skog3	Very dark green areas	=
Text	All the black in the image with emphasis on text within arable fields	~ 1,000

Go to the CLASSIFICATION menu in the ENVI main menu and select supervised classification and MAXIMUM LIKELIHOOD. Select the image that is to be used in the classification. In the MAXIMUM LIKELIHOOD PARAMETERS dialogue, select all classes to be used in the classification. Enter an output classification filename, use the form 12I9ef_13I0ef_tempklass.*. Select No at the Output rule images. Select OK to start the classification. Load the classification output to another window. Select POST-CLASSIFICATION and MAJORITY/MINORITY ANALYSIS. Select the classification output as input and select OK. Select Åker1, Åker2, and Åker3 as classes to be used in the analysis. The analysis method should be MAJORITY and the kernel size set to 7×7. Select an output filename with the syntax 12I9ef_13I0ef_tempmaj.*. Press OK. Note that these files are only steps to the final classification image.

Select POST CLASSIFICATION once more, and COMBINE CLASSES. Select the output file from the majority analysis. Select input class åker2 and output class åker1, press ADD COMBINATION. Select input class åker3 and output class åker3, press ADD COMBINATION. Repeat for Skog but not for text. Select an output filename with the syntax: 12I9ef_13I0ef_klass. Press OK.

Check the result. There should be one class indicating all of the arable land, one class indicating the text, and one class indicating the remainder of the image. Use LINK DISPLAYS to see if this is correct.

Export to Idrisi

Go to FILE and SAVE IMAGE AS. SELECT TIFF/GeoTIFF. Select the classification file and check that the file information is correct. Select a filename with the syntax: 12I9ef_13I0ef_klass_exp. Press OK.

Text and cartographic symbol removal and vectorizing- Manual on post-processing scanned maps

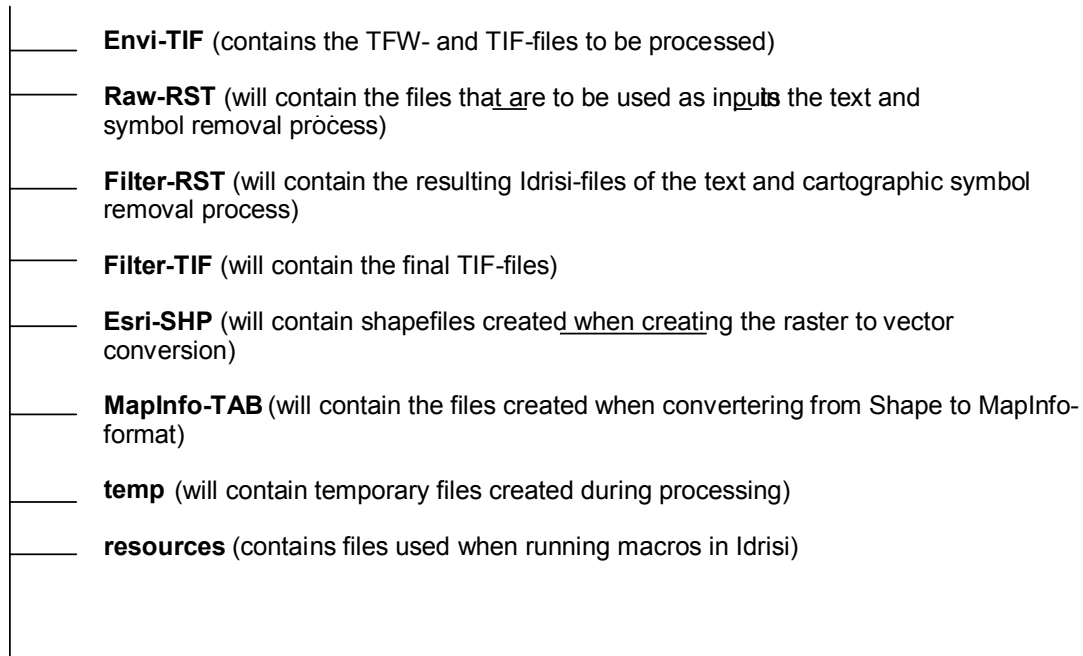
This part of the manual deals with the post-processing of scanned maps. Before the below steps are performed, be sure that the input file has been processed according to the steps described above.

The results of that process are assumed to have resulted in TIFF/GeoTIFF-images (TFW/TIF pairs). The coordinate system should be the Swedish National System (RT90) with a coordinate precision of 7 digits (equivalent to 1 m ground-resolution). It is also assumed that the image resides in an indexed colour 8-bit format with no compression.

Folder-structure

Before starting, put all the files to be processed in the folder c:\SKB-work\Envi-TIF. Check that all tif-files have a corresponding tfw.

SKB-work(should not be used)



Step 1

Import to IDRISI and reclassification.
Software used IDRISI.

Start IDRISI and select Data Paths/Project Environment. The Main working folder should be set to c:\SKB-work\Raw-RST\ and the Resource folders to c:\SKB-work\Envi-TIF\

Import the TIF-image with TIFIDRIS and check “Output reference parameters”. If necessary, make any appropriate corrections. Change the reference system to RT90. The resulting output file should be given the same name as the TIF-image that is to be imported.

Reclass the image so that the arable land will receive the value 1, all other land use the value 255, and the class containing the text etc that is to be removed should receive the value 0. Give the resulting file the same name as the input file but add _CLASS to the end of the name. When the reclassification is finished check the result.

Repeat this procedure for all of the files that you want to apply the text removal procedure on.

Step 2

Removal of text and cartographic symbols in Idrisi.

Software used IDRISI, Notepad.

Copy the file textfilter.iml from the folder c:\SKB-work\resources and place it in c:\SKB-work\temp.

Open the file c:\SKB-work\temp\textfilter.iml in Notepad.

It should contain the following rows:

```
COPY x c:\SKB-work\Raw-RST\INFILE_class.rst*class.rst
```

```
COPY x c:\SKB-work\Raw-RST\INFILE_class.rdc*class.rdc
```

```
DISTANCE x c:\SKB-work\temp\class.rst* x c:\SKB-work\temp\distance.rst
```

```
ALLOCATE x c:\SKB-work\temp\distance.rst* c:\SKB-work\resources\class.rst* c:\SKB-work\Filter-RST\OUTFILE.rst
```

Exchange INFILE with the name of the file created in Step 1 above (e.g. 12i0ef_12i9ef_class). Exchange OUTFILE with the name that you gave the file that was imported by TIFIDRIS above (e.g. 12i0ef_12i9ef).

Now copy the four rows and change INFILE and OUTFILE to the name of the next file that you want to process and export respectively.

Repeat this with all of the files that are to be processed in one single macro-execution in IDRISI and save the textfiler.iml file.

Start IDRISI and select Data Paths/Project Environment. The main working folder should be set to c:\SKB-work\temp\

Choose I Modelling and select Run Macro. Select textfilter.iml as the macro that should be run and start the processing.

Removing text and cartographic symbols is a time-consuming process (processing a 10,000×10,000 image takes approximately 45 minutes and this is macro described:

- COPY x c:\SKB-work\Raw-RST\INFILE_class.rst*c:\SKB_work\temp\class.rst
Renames the indata-file and places it in the temp-folder
- COPY x c:\SKB-work\Raw-RST\INFILE_class.rdc*c:\SKB_work\temp\class.rdc
Renames the rasterdocumentation-file and places it in the temp-folder.
- DISTANCE x c:\SKB-work\temp\class.rst* x c:\SKB-work\temp\distance.rst
Calculates the distance from all pixels with a value of 0 to the closest pixel with a non-0 value. DISTANCE uses c:\SKB-work\Raw-RST\class.rst as indata and the result is saved as distance.rst.
- ALLOCATE x c:\SKB-work\temp\distance.rst* c:\SKB-work\resources\class.rst* c:\SKB-work\Filter-RST\OUTFILE.rst
Each pixel with a value of 0 in the file c:\SKB-work\temp\distance.rst receives the value of the closest non-0 pixel and the result is saved as OUTFILE.rst.

Step 3

Export to TIF and TFW.
Software used IDRISI.

Start IDRISI and select Data Paths/Project Environment. The Main working folder should be set to c:\SKB-work\Filter-TIF\ and the Resource folders to c:\SKB-work\Filter-RST\ and c:\SKB-work\resources\

Use the Idrisi export-module TIFIDRIS to export the files in c:\SKB-work\Filter-RST\.

Use the same filename for output as for input (the files created will have the extensions tif and tfw). Enter binary as Idrisi palette (found in c:\SKB-work\resources\).

Step 4

Vectorizing and editing the binary image files.
Software used ArcMap.

First check that all tif-files in c:\SKB-work\FILTER-TIF have a corresponding tfw-file.

Start ArcMap and open the files to be vectorized (these should reside in the folder c:\SKB-work\FILTER-TIF). Select Convert from the 3D Analyst-menu Select the file that you wish to vectorize at Input raster, check that Output geometry type reads Polygon.

Also check that the radio-button Generalize lines is selected and write the same filename at Output features as you used when specifying Input raster, but select c:\SKB-work\Escri-SHP\ as the folder where the resulting shape-file is to be saved. Click OK to start the vectorization.

Now select Editor in the Editor Toolbar and click Start Editing.

Use Selection – Select by Attribute and choose the background polygons (with a value of 255) by executing the SQL-query GRIDCODE = 255 and delete these polygons by simply pressing the delete-button on the keyboard. Save the file by clicking Save Edits in the Editor menu.

Repeat this with the other images that you want to vectorize.

Step 5

Convert to MapInfo format.

Software used MapInfo.

Start MapInfo and select Universal Translator from the Tools-menu.

At Source – Format select ESRI Shape. Then select the files that you would like to convert at Source – File(s). You should find these in the folder c:\SKB\work\Escri-SHP\. Click Projection and select Swedish coordinate systems under Category and then Swedish National System (RT90) under Category members.

At Destination – Format select MapInfo TAB and at Directory select c:\SKP-work\Mapinfo.TAB\.

At Log you select where the conversion messages are to be saved (this should be c:\SKB-work\temp\).

Start the conversion.

Metadata, economic maps, Forsmark

Note: do you want the column headings translated? (Sheet code; Sheet Name; Newer Economic Maps; Older Economic Maps).

Bladkod	Bladnamn	Yngre ekonomisk karta	Äldre ekonomisk karta
12l 5e	Bummelmora	4 rekt. pts, RMS 1,2, rekt:RST/närmaste granne. 12i5e_79_rek, 12i5e_79_rek_sub	15 rekt. pts, RMS 6,8, rekt:RST/närmaste granne. 12i5e_53_rek, 12i5e_53_rek_sub. Kartan ingår i mosaiken 12i5e_12i6ef.
12l 6e	Östmora	4 rekt. pts, RMS 1,05, rekt:RST/närmaste granne. 12i6e_79_rek, 12i6e_79_rek_sub	14 rekt. pts, RMS 7,2, rekt:RST/närmaste granne. 12i6e_53_rek, 12i6e_53_rek_sub. Kartan ingår i mosaiken 12i5e_12i6ef.
12l 6f	Hackbol	4 rekt. pts, RMS 0,4, rekt:RST/närmaste granne. 12i6f_79_rek, 12i6f_79_rek_sub	20 rekt. pts, RMS 7,1, rekt:RST/närmaste granne. 12i6f_53_rek, 12i6f_53_rek_sub. Kartan ingår i mosaiken 12i5e_12i6ef.
12l 6g	Hanunda	RST, närmaste granne. 4pts RMS 0.9	RST, närmaste granne. 17pts RMS 8.92. 12i6g_53_rek_sub
12l 6h	Uppskedika	4 rekt. pts, RMS 0,8, rekt:RST/närmaste granne. 12i6h_79_rek, 12i6h_79_rek_sub	22 rekt. pts, RMS 6,8, rekt:RST/närmaste granne. 12i6h_53_rek, 12i6h_53_rek_sub.
12l 7c	Vikasjön	RST, närmaste granne. 4pts RMS 1,4	RST, närmaste granne. 21pts RMS 10.0. 12i7c_53_rek_sub
12l 7d	Andersbo	RST, närmaste granne. 4pts RMS 1.3	RST, närmaste granne. 16pts RMS 9.7
12l 7e	Vigelsbo	4 rekt. pts, RMS 1,0, rekt:RST/närmaste granne. 12i7e_79_rek, 12i7e_79_rek_sub	19 rekt. pts, RMS 6,9, rekt:RST/närmaste granne. 12i7e_53_rek, 12i7e_53_rek_sub.
12l 7f	Valö	4 rekt. pts, RMS 1,0, rekt:RST/närmaste granne. 12i7f_79_rek, 12i7f_79_rek_sub	20 rekt. pts, RMS 5,8, rekt:RST/närmaste granne. 12i7f_53_rek, 12i7f_53_rek_sub.
12l 7g	Stummelbo	4 rekt. pts, RMS 1,0, rekt:RST/närmaste granne. 12i7g_79_rek, 12i7g_79_rek_sub	18 rekt. pts, RMS 5,1, rekt:RST/närmaste granne. 12i7g_53_rek, 12i7g_53_rek_sub. Kartan ingår i mosaiken 12i7gh_12i8gh. En del fel i mosaikens passning mellan de två nedre bladen /12i7g–12i7h.
12l 7h	Norrskedika	RST, närmaste granne. 4pts RMS 0.5	RST, närmaste granne. 17pts RMS 5.7
12l 7j	Långalma	RST, närmaste granne. 4pts RMS 0.6	
12l 8b	Fälaren	RST, närmaste granne. 4pts RMS 0.5	
12l 8d	Finnsjön	RST, närmaste granne. 4pts RMS 1.2	RST, närmaste granne. 20pts RMS 12.0 12i8d_53_rek_sub
12l 8e	Gålarhora	RST, närmaste granne. 4pts RMS 1.2	RST, närmaste granne. 22pts RMS 8.5 12i8e_53_rek_sub
12l 8g	Simundö	RST, närmaste granne. 4pts RMS 1.0	RST, närmaste granne. 14pts RMS 5.1 12i8g_53_rek_sub
12l 8h	Snesslinge	4 rekt. pts, RMS 0,8, rekt:RST/närmaste granne. 12i8h_79_rek, 12i8h_79_rek_sub	21 rekt. pts, RMS 6,0, rekt:RST/närmaste granne. 12i8h_53_rek, 12i8h_53_rek_sub. Kartan ingår i mosaiken 12i7gh_12i8gh. En del fel i mosaikens passning mellan de två nedre bladen /12i7g–12i7h.
12l 8i	Bolka	RST, närmaste granne. 4pts RMS 0.8	RST, närmaste granne. 20pts RMS 7.0 12i8i_53_rek_sub
12l 8j	Öregrund	4 rekt. pts, RMS 0,9, rekt:RST/närmaste granne. 12i8j_79_rek, 12i8j_79_rek_sub	21 rekt. pts, RMS 5,2, rekt:RST/närmaste granne. 12i8j_53_rek, 12i8j_53_rek_sub. Kartan trasig i vänstra hörnet. Kartan ingår i mosaiken 12i8ij_12i9ij. En del fel i mosaikens passning mellan de två nedre bladen 128i_128j.
12l 9a	Skallbo	RST, närmaste granne. 4pts RMS	

Bladkod	Bladnamn	Yngre ekonomisk karta	Äldre ekonomisk karta
12I 9b	Elinge	4 rekt. pts, RMS 1,0, rekt:RST/närmaste granne. 12i9b_79_rek, 12i9b_79_rek_sub	19 rekt. pts, RMS 6,9, rekt:RST/närmaste granne. 12i9b_52_rek, 12i9b_52_rek_sub. Kartan ingår i mosaiken 12i8ab_12i9ab.
12I 9c	Åkerbysjön	4 rekt. pts, RMS 1,6, rekt:RST/närmaste granne. 12i9c_79_rek, 12i9c_79_rek_sub	22 rekt. pts, RMS 6,8, rekt:RST/närmaste granne. 12i9c_52_rek, 12i9c_52_rek_sub. Kartan ingår i mosaiken 12i9cd_13i0cd.
12I 9d	Giboda	4 rekt. pts, RMS 1,4, rekt:RST/närmaste granne. 12i9d_79_rek, 12i9d_79_rek_sub	20 rekt. pts, RMS 6,1, rekt:RST/närmaste granne. 12i9d_53_rek, 12i9d_53_rek_sub. Kartan ingår i mosaiken 12i9cd_13i0cd.
12I 9g	Habbalsbo	rekt:RST närmastegranne 4pts RMS 0	rekt: RST närmaste granne. 9pts RMS 5.6
12I 9h	Glupudden	rekt: RST närmaste granne. 4pts RMS 1.9. Kartan har varit vikt.	rekt:RST närmaste granne. 23 pts RMS 11,8. Svårrektifierad karta. Många små öar som inte gick att få rätt trots många pts. 12I9h_53_rek_sub
12I 9i	Djursten	RST, närmaste granne. 4pts RMS 1.9	RST, närmaste granne. 15pts RMS 6.3 12I9i_53_rek_sub
12I 9j	Gräsö	RST, närmaste granne. 4pts RMS 0.9	RST, närmaste granne. 14pts RMS 5.9 12I9j_53_rek_sub
12J 5a	Östra Tvärnö	RST, närmaste granne. 4pts RMS 1.1	RST, närmaste granne. 22pts RMS 5.9. 12J5a_53_rek_sub. Ingår i mosaiken 12J5ab_12J6ab
12J 5b	Slätön	RST, närmaste granne. 4pts RMS 0.7	RST, närmaste granne. 14pts RMS 4.3. 12J5b_53_rek_sub Ingår i mosaiken 12J5ab_12J6ab
12J 6a	Yttersby	RST, närmaste granne. 4pts RMS 1.2	RST, närmaste granne. 22pts RMS 6.8. 12J6a_53_rek_sub. Ingår i mosaiken 12J5ab_12J6ab
12J 6b	Fälön	4 rekt. pts, RMS 2,9, rekt:RST/närmaste granne. 12j6b_78_rek, 12j6b_78_rek_sub. Kartan förefaller ha felplacerade koordinatkors.	21 rekt. pts, RMS 6,9, rekt:RST/närmaste granne. 12j6b_53_rek, 12j6b_53_rek_sub. Förändringar i strandlinjen mellan kartskikten.
12J 6c	Ellan	RST, närmaste granne. 4pts RMS 0.8	RST, närmaste granne. 13pts RMS 6.8. 12J6c_53_rek_sub.
12J 7a	Alnön	RST, närmaste granne. 4pts RMS 1.1	RST, närmaste granne. 16pts RMS 7.2. 12J6c_53_rek_sub
12J 7b	Ormön	RST, närmaste granne. 4pts RMS 1.1	RST, närmaste granne. 20pts RMS 9.4. 12J 7b_53_rek_sub
12J 7c	Garpen	RST, närmaste granne. 4pts RMS 0.9	RST, närmaste granne. 11pts RMS 5.7. 12J7c_53_rek_sub
12J 8a	Bjurön	RST, närmaste granne. 4pts RMS 1.1	RST, närmaste granne. 27pts RMS 10.8. 12J8a_53_rek_sub
12J 8b	Högsten	RST, närmaste granne. 4pts RMS 0.5	RST, närmaste granne. 17pts RMS 11.9
12J 8d	Norrsten		
12J 9a	Höglyke	RST, närmaste granne. 4pts RMS 0.7	RST, närmaste granne. 14pts RMS 9.4 12J 9a_53_rek_sub
12J 9c	Västerbådan		Ingår i mosaiken 13I0cd_12I9cd
12J 9d	Storgrunden		Ingår i mosaiken 13I0cd_12I9cd
13I 0a	Ingarsbo	4 rekt. pts, RMS 1,0, rekt:RST/närmaste granne. 13i0a_79_rek, 13i0a_79_rek_sub	13 rekt pts, RMS 5.1, rekt: RST/närmaste granne. 13i0a_52_rek, 13i0a_52_rek_sub
13I 0b	Österlövsta	RST, närmaste granne. 4pts RMS 0.4. 13i0b_79_rek_sub	RST, närmaste granne. 22pts RMS 11.8. 13i0b_52_rek_sub
13I 0c	Lövstabruk	4 rekt. pts, RMS 1,8, rekt:RST/närmaste granne. 13i0c_79_rek, 13i0c_79_rek_sub	14 rekt pts, RMS 5.5, rekt: RST/närmaste granne. 13i0c_52_rek, 13i0c_52_rek_sub
13I 0d	Skälsjön	RST, närmaste granne. 4pts RMS 1.4	RST, närmaste granne. 16 pts RMS 12.5. 13i1b_52_rek_sub. Ingår i mosaiken 13I0cd_12I9cd

Bladkod	Bladnamn	Yngre ekonomisk karta	Äldre ekonomisk karta
13I 0g	Höggrunden	4 rekt. pts, RMS 0, rekt:RST/närmaste granne. 13i0g_79_rek, 13i0g_79_rek_sub	19 rekt pts, RMS 9.1, rekt: RST/närmaste granne. 13i0g_53_rek, 13i0g_53_rek_sub, kommentar: kartbladet innehåller kuststräcka med öar. Sämre överensstämmelser mellan kartsikten vad gäller öar i kartans högra del.
13I 0i	Mårtensboda	RST, närmaste granne. 4pts RMS 0.9	RST, närmaste granne. 10pts RMS 5.8 13I 0i_53_rek_sub. Ingår i mosaiken 13i1ij_13i0ij
13I 0j	Kallboda	RST, närmaste granne. 4pts RMS 0.9	RST, närmaste granne. 10pts RMS 7.8 Ingår i mosaiken 13i1ij_13i0ij
13I 1a	Gällbo	4 rekt. pts, RMS 2,0, rekt:RST/närmaste granne. 13i1a_79_rek, 13i1a_79_rek_sub	15 rekt pts, RMS 3.7, rekt: RST/närmaste granne. 13i1a_52_rek, 13i1a_52_rek_sub
13I 1b	Skärplinge	RST, närmaste granne. 4pts RMS 0.3. 13i1b_79_rek_sub	RST, närmaste granne. 17pts RMS 5.6 13i1b_52_rek_sub
13I 1c	Griggebo	4 rekt. pts, RMS 1,0, rekt:RST/närmaste granne. 13i1c_79_rek, 13i1c_79_rek_sub	15 rekt. pts, RMS 5,8, rekt:RST/närmaste granne. 13i1c_52_rek, 13i1c_52_rek_sub
13I 1d	Vavd	RST, närmaste granne. 4pts RMS 1.1. 13i1d_79_rek_sub	RST, närmaste granne. 18pts RMS 8.9. 13i1d_52_rek_sub
13I 1e	Göksnäre	4 rekt. pts, RMS 1,0, rekt:RST/närmaste granne. 13i1e_79_rek, 13i1e_79_rek_sub	14rekt. pts, RMS 7,0, rekt:RST/närmaste granne. 13i1e_52_rek, 13i1e_52_rek_sub. Kartan ingår i mosaiken 13i1ef_13i2e
13I 1f	Bredbådan	RST, närmaste granne. 4pts RMS 0.7. 13i1f_79_rek_sub	RST, närmaste granne. pts RMS
13I 1g	Länsman		Ingår i mosaiken 13i1ij_13i0ij
13I 1i	Norrboda	4 rekt. pts, RMS 0,8, rekt:RST/närmaste granne. 13i1i_79_rek, 13i1i_79_rek_sub	18 rekt. pts, RMS 6.0, rekt:RST/närmaste granne. 13i1i_53_rek, 13i1i_53_rek_sub
13I 1j	Malbådan	RST, närmaste granne. 4pts RMS. 0.5. 13i1j_79_rek_sub	RST, närmaste granne. 13 pts RMS 9.0. 13i1j_53_rek_sub
13I 2a	Karlholm	RST, närmaste granne. 4pts RMS 1.5. 13i2a_79_rek_sub	RST, närmaste granne. 18pts RMS 8.0. 13i2a_rek_sub
13I 2b	Grönö	RST, närmaste granne. 4pts RMS 0.9	RST, närmaste granne. 22pts RMS 5.3
13I 2c	Hällnäs	RST, närmaste granne. 4pts RMS 2.2	RST, närmaste granne. 11pts RMS 6.4. 13i2c_52_rek_sub
13I 2d	Barknäre	4 rekt. pts, RMS 1,3, rekt:RST/närmaste granne. 13i2d_79_rek, 13i2d_79_rek_sub	16 rekt. pts, RMS 5,0 rekt:RST/närmaste granne. 13i2d_52_rek, 13i2d_52_rek_sub.
13I 2e	Gudinge	RST, närmaste granne. 4pts RMS 1.6. 13i2e_79_rek_sub	RST, närmaste granne. 17pts RMS 9.0. 13i2e_52_rek_sub
13I 2f	Mickelsgrund		
13I 2i	Örskär	4 rekt. pts, RMS 0,9, rekt:RST/närmaste granne. 13i2i_79_rek, 13i2i_79_rek_sub	16 rekt. pts, RMS 6,9 rekt:RST/närmaste granne. 13i2i_53_rek, 13i2i_53_rek_sub.
13I 2j	Utterbådan		
13I 3a	Flatgrund	RST, närmaste granne. 4pts RMS 0.9	RST, närmaste granne. 9pts RMS 9.5
13I 3b	Edsättra	4 rekt. pts, RMS 0,2, rekt:RST/närmaste granne. 13i3b_79_rek, 13i3b_79_rek_sub	21 rekt. pts, RMS 6,6, rekt:RST/närmaste granne. 13i3b_52_rek, 13i3b_52_rek_sub, dålig överensstämmelse mellan kartsikten. Ingår i mosaiken 13i2ab_13i3ab
13I 3c	Sikhjälma	RST närmaste granne. 4pts. RMS 1.2.	RST, närmaste granne. 11pts RMS 6.8. 13i3c_rek_sub. Kartan ingår i mosaiken 13i4c_13i3c
13I 3d	Slada	4 rekt. pts, RMS 1,1, rekt:RST/närmaste granne. 13i3d_79_rek, 13i3d_79_rek_sub.	22 rekt. pts, RMS 5,1 rekt:RST/närmaste granne. 13i3d_52_rek, 13i3d_52_rek_sub. Kartbladet ingår i mosaikbilden 13i3de_13i4de.
13I 3e	Killskär	RST, närmaste granne. 4pts RMS 0.6. 13i3e_79_rek_sub	RST, närmaste granne. 21pts RMS 8.5. 13i3e_53_rek_sub
13I 3i	Skvatudden	RST, närmaste granne. 4pts RMS 0.6. 13i3i_79_rek_sub	RST, närmaste granne. 9 RMS 22.1. 13i3i_52_rek_sub. Kartan består till ca 95 % av vatten. Svårrektifierad.

Bladkod	Bladnamn	Yngre ekonomisk karta	Äldre ekonomisk karta
13I 4c	Rossholm	RST, närmaste granne. 4pts RMS 0.77 13i4c_rek_sub	RST, närmaste granne. 11pts RMS 7.0. Svårrektifierad, då det endast finns land i kartans nedre högra hörn. 13i4c_rek_sub. Kartan ingår i mosaiken 13i4c_13i3c
13I 4d	Fågelsundet	4 rekt. pts, RMS 1,2, rekt:RST/närmaste granne. 13i4d_79_rek, 13i4d_79_rek_sub	14 rekt. pts, RMS 4,6, rekt:RST/närmaste granne. 13i4d_52_rek, 13i4d_52_rek_sub. Kartbladet ingår i mosaikbilden 13i3de_ 13i4de. Kartan är riven i det vänstra hörn. Skogsmarken är inte karterad.
13I 4e	Måsörarna	4 rekt. pts, RMS 1,2, rekt:RST/närmaste granne. 13i4e_79_rek, 13i4e_79_rek_sub	6 rekt. pts, RMS 3,4, rekt:RST/närmaste granne. 13i4e_52_rek, 13i4e_52_rek_sub. Kartbladet ingår i mosaikbilden 13i3de_ 13i4de. Kartan är riven i det vänstra hörn.
13J 0a	Gället	RST, närmaste granne. 4pts RMS 0.7	RST, närmaste granne. 15pts RMS 5.6, warp2

Metadata, economic maps, Oskarshamn

Bladkod	Bladnamn	Yngre ekonomiska kartan	Äldre ekonomiska kartan
5G 6i	Em	RST, närmaste granne. 4pts RMS 0.3.	RST, närmaste granne. 32pts RMS 11.9
5G 7h	Påskallavik	RST, närmaste granne. 4pts RMS 0.6	RST, närmaste granne. 31pts RMS. 11.1
5G 7i	Runnö	RST, närmaste granne. 4pts RMS 1.1. 5G7i_81_rek_sub	Polynomial, närmaste granne. 38pts RMS 7.9, warp 2. 5G7i_41_rek_sub
5G 8g	Boda	4 rekt. pts, RMS 1,4 rekt:RST/närmaste granne. 5g8g_82_rek, 5g8g_82_rek_sub. Kartan ingår i mosaiken 5g8gh_5g9gh_82.	41 rekt. pts, RMS 6,2 rekt:RST/närmaste granne. Warp grad 3. 5g8g_42_rek, 5g8g_42_rek_sub Kartan ingår i mosaikens 5g8gh_5g9gh_42.
5G 8h	Skorpetorp	4 rekt. pts, RMS 0,8 rekt:RST/närmaste granne. 5g8h_82_rek, 5g8h_82_rek_sub. Kartan ingår i mosaiken 5g8gh_5g9gh_82.	25 rekt. pts, RMS 6,3 rekt:RST/närmaste granne. Warp grad 2. 5g8h_42_rek, 5g8h_42_rek_sub Kartan ingår i mosaikens 5g8gh_5g9gh_42.
5G 8i	Storö	RST, närmaste granne. 4pts RMS 0.7. Ingår i mosaiken 5G8i_5G9I_81	Polynomial, närmaste granne. 30pts RMS 8.5. Warp 2. Ingår i mosaiken 5G8i_5G9I_41
5G 9c	Gösebo	4 rekt. pts, RMS 0,7 rekt:RST/närmaste granne. 5g9c_81_rek, 5g9c_81_rek_sub. Kartan ingår i mosaiken 5g9c_5g9d_81.	36 rekt. pts, RMS 7,7 rekt:polynomial/ närmaste granne. Warp grad 2. 5g9c_ 42_rek, 5g9c_42_rek_sub Kartan ingår i mosaikens 5g9c_5g9d_42.
5G 9d	Bockara	4 rekt. pts, RMS 0,5 rekt:RST/närmaste granne. 5g9d_82_rek, 5g9d_82_rek_sub. Kartan ingår i mosaiken 5g9c_5g9d_82.	42 rekt. pts, RMS 10,0 rekt:polynomial/ närmaste granne. Warp grad 2. 5g9d_ 42_rek, 5g9d_42_rek_sub Kartan ingår i mosaikens 5g9c_5g9d_42.
5G 9e	Bohult	RST, närmaste granne. 4pts RMS 0.7. 5G9e_82_rek_sub. Ingår i mosaiken 5G9ef_81	RST, närmaste granne. 45pts RMS 7.9. Warp3. 5G9e_42_rek_sub
5G 9f	Möckhult	RST, närmaste granne. 4pts RMS 0.06. 5G9f_82_rek_sub. Ingår i mosaiken 5G9ef_81	RST, närmaste granne. 4pts RMS. Warp3. Ingår i mosaiken 5G9ef_81
5G 9g	Forshult	4 rekt. pts, RMS 0,6 rekt:RST/närmaste granne. 5g9g_82_rek, 5g9g_82_rek_sub. Kartan ingår i mosaiken 5g8gh_5g9gh_82.	45 rekt. pts, RMS 5,4 rekt:polynomial/ närmaste granne. Warp grad 4. 5g9g_ 42_rek, 5g9g_42_rek_sub. Kartan ingår i mosaikens 5g8gh_5g9gh_42.
5G 9h	Oskarshamn	4 rekt. pts, RMS 0,5 rekt:RST/närmaste granne. 5g9h_82_rek, 5g9h_82_rek_sub. Kartan ingår i mosaiken 5g8gh_5g9gh_82.	24 rekt. pts, RMS 8,2 rekt:RST/närmaste granne. Warp grad 2. 5g9h_42_rek, 5g9h_42_rek_sub Kartan ingår i mosaikens 5g8gh_5g9gh_42.
5G 9i	Ärnemar	RST, närmaste granne. 4pts RMS 0.4. 5G9i_81_rek_sub. Ingår i mosaiken 5G8i_5G9I_81	RST, närmaste granne. 40pts RMS 8.1. 5G9i_41_rek_sub. Ingår i mosaiken 5G8i_5G9I_41
6G 0c	Lönnekulla	4 rekt. pts, RMS 1,3 rekt:RMT/närmaste granne. 6g0c_1981_rek, 6g0c_1981_rek_ sub.	35 rekt. pts, RMS 8,08 rekt:RMT/ närmaste granne. 6g0c_1942_rek, 6g0c_ 1942_rek_sub Kartan ingår i mosaiken 6g0c_6g1d_1940
6G 0d	Ingebo	4 rekt. pts, RMS 1,05 rekt:RMT/närmaste granne. 6g0d_1981_rek, 6g0d_1981_rek_ sub	19 rekt. pts, RMS 2,44 rekt:RMT/ närmaste granne. 6g0d_1942_rek, 6g0d_ 1942_rek_sub Kartan ingår i mosaiken 6g0c_6g1d_1940
6G 0e	Libbershult	RST, närmaste granne. 4pts RMS 0.3. 6G0e_81_rek_sub. Ingår i mosaiken 6G0ef_6G1ef_81.	Polynomial, närmaste granne. 30 pts RMS 95.7 warp 3. 6G0e_42_rek_sub. Ingår i mosaiken 6G0ef_6G1ef_42
6G 0f	Lockebo	RST, närmaste granne. 4pts, RMS 0.1. 6G0f_81_rek_sub. Ingår i mosaiken 6G0ef_6G1ef_81.	Polynomial, närmaste granne. 32 pts, RST 45.2, warp 3. 6G0f_42_rek_sub. Ingår i mosaiken 6G0ef_6G1ef_42

Bladkod	Bladnamn	Yngre ekonomiska kartan	Äldre ekonomiska kartan
6G 0g	Flinshult	4 rekt.pts, RMS 0,7 rekt:RSt/närmaste granne. 6g0g_81_rek, 6g0g_81_rek_sub. Kartan ingår i mosaiken 6g0gh_6g1gh_81.	55 rekt.pts, RMS 8,4 rekt:polynomial/närmaste granne. Warp grad 3. 6g0g_41_rek, 6g0g_41_rek_sub. Dålig överensstämmelse mellan kartskikten. Kartan ingår i mosaiken 6g0gh_6g1gh_41.
6G 0h	Flathult	4 rekt.pts, RMS 0,5 rekt:RST/närmaste granne. 6g0h_81_rek, 6g0h_81_rek_sub. Kartan ingår i mosaiken 6g0gh_6g1gh_81.	35 rekt.pts, RMS 8,8 rekt:RST/närmaste granne. Warp grad 3. 6g0h_41_rek, 6g0h_41_rek_sub. Kartan ingår i mosaiken 6g0gh_6g1gh_41.
6G 0i	Saltvik	RST, närmaste granne. 4pts RMS 0.4. 6g0i_81_rek_sub. Ingår i mosaiken 6G0ij_6G1ij_81.	RST, närmaste granne. 22 pts. RMS 9.8. 6g0i_42_rek_sub. Ingår i mosaiken 6G0ij_6G1ij_42.
6G 0j	Furö	RST, närmaste granne. 4pts RMS 0.1. 6G0j_81_rek_sub. Ingår i mosaiken 6G0ij_6G1ij_81.	Ingår i mosaiken 6G0ij_6G1ij_42.
6G 1c	Mossebo	4 rekt. pts, RMS 1,85 rekt:RMT/närmaste granne. 6g1c_1981_rek, 6g1c_1981_rek_sub	28 rekt. pts, RMS 3,1 rekt:RMT/närmaste granne. 6g1c_1942_rek, 6g1c_1942_rek_sub Kartan ingår i mosaiken 6g0c_6g1d_1940
6G 1d	Fallebo	4 rekt. pts, RMS 1,06 rekt:RMT/närmaste granne. 6g1d_1981_rek, 6g1d_1981_rek_sub	19 rekt. pts, RMS 2,48 rekt:RMT/närmaste granne. 6g1d_1942_rek, 6g1d_1942_rek_sub Kartan ingår i mosaiken 6g0c_6g1d_1940
6G 1e	Bråbo	RST, närmaste granne. 4pts RMS 1.4. 6G1e_81_rek_sub. Ingår i mosaiken 6G0ef_6G1ef_81.	Polynomial, närmaste granne. 31 pts, RMS 5.7, warp 3. 6G1e_rek_sub. Ingår i mosaiken 6G0ef_6G1ef_42
6G 1f	Lämmedal	RST, närmaste granne. 4pts RMS 0.2. 6G1f_81_rek_sub. Ingår i mosaiken 6G0ef_6G1ef_81.	Polynomial, närmaste granne. 35 pts, RMS 6.2, warp 3. 6G1f_42_rek_sub. Ingår i mosaiken 6G0ef_6G1ef_42.
6G 1g	Skrikebo	4 rekt.pts, RMS 0,3 rekt:RST/närmaste granne. 6g1g_81_rek, 6g1g_81_rek_sub. Kartan ingår i mosaiken 6g0gh_6g1gh_81.	31 rekt.pts, RMS 4,5 rekt:RST/närmaste granne. Warp grad 3. 6g1g_41_rek, 6g1g_41_rek_sub. Kartan ingår i mosaiken 6g0gh_6g1gh_41.
6G 1h	Stensjö	4 rekt.pts, RMS 0,2 rekt:RST/närmaste granne. 6g1h_81_rek, 6g1h_81_rek_sub. Kartan ingår i mosaiken 6g0gh_6g1gh_81.	32 rekt.pts, RMS 6,7 rekt:RST/närmaste granne. Warp grad 3. 6g1g_41_rek, 6g1g_41_rek_sub. Kartan ingår i mosaiken 6g0gh_6g1gh_41.
6G 1i	Virkvarn	RST, närmaste granne. 4pts RMS 0.1. 6G1i_81_rek_sub. Ingår i mosaiken 6G0ij_6G1ij_81.	RST, närmaste granne. 30pts RMS 6.4, warp 3. Ingår i mosaiken 6G0ij_6G1ij_42.
6G 1j	Ekö	RST, närmaste granne. 4pts RMS 0.4. 6g1j_81_rek_sub. Ingår i mosaiken 6G0ij_6G1ij_81.	RST, närmaste granne. 31pts RMS 7.7, warp2. 6G1j_42_rek_sub. Ingår i mosaiken 6G0ij_6G1ij_42.
6G 2e	Kristdala	4 rekt. pts, RMS 0,72 rekt:RMT/närmaste granne. 6g2e_1981_rek, 6g2e_1981_rek_sub	25 rekt. pts, RMS 4,8 rekt:RMT/närmaste granne. 6g2e_1943_rek, 6g2e_1943_rek_sub Kartan ingår i mosaiken 6g2e_6g3f_1940
6G 2f	Hummeln	4 rekt. pts, RMS 0,64 rekt:RMT/närmaste granne. 6g2f_1981_rek, 6g2f_1981_rek_sub	34 rekt. pts, RMS 5,67 rekt:RMT/närmaste granne. 6g2f_1943_rek, 6g2f_1943_rek_sub Kartan ingår i mosaiken 6g2e_6g3f_1940
6G 3e	Skinshult	4 rekt. pts, RMS 0,64 rekt:RMT/närmaste granne. 6g3e_1981_rek, 6g3e_1981_rek_sub	35 rekt. pts, RMS 6,38 rekt:RMT/närmaste granne. 6g3e_1943_rek, 6g3e_1943_rek_sub Kartan ingår i mosaiken 6g2e_6g3f_1940
6G 3f	Bankhult	4 rekt. pts, RMS 0,71 rekt:RMT/närmaste granne. 6g3f_1981_rek, 6g3f_1981_rek_sub	31 rekt. pts, RMS 5,91 rekt:RMT/närmaste granne. 6g3f_1943_rek, 6g3f_1943_rek_sub. Kartan ingår i mosaiken 6g2e_6g3f_1940
6G 3i	Plittorp	RST, närmaste granne 4pts. RMS:0.6.6g3i_rek_sub. Ingår i mosaiken	

Bladkod	Bladnamn	Yngre ekonomiska kartan	Äldre ekonomiska kartan
6G 3j	Mederhult	RST, närmaste granne 4pts. RMS: 0.3. 6G3j_rek_sub.	
6G 4e	Dalsebo	4 rekt.pts, RMS 0,9 rekt:RST/närmaste granne. 6g4e_80_rek, 6g4e_80_rek_sub. Kartan ingår i mosaiken 6g4ef_6g5f_80.	31 rekt.pts, RMS 6,9 rekt:RST/närmaste granne. Warp grad 2. 6g4e_43_rek, 6g4e_43_rek_sub. Kartan ingår i mosaiken 6g4ef_6g5f_43.
6G 4f	Ishult	4 rekt.pts, RMS 0,6 rekt:RST/närmaste granne. 6g4f_80_rek, 6g4f_80_rek_sub. Kartan ingår i mosaiken 6g4ef_6g5f_80.	30 rekt.pts, RMS 6,2 rekt:polynomial/närmaste granne. Warp grad 2. 6g4f_43_rek, 6g4f_43_rek_sub. Kartan ingår i mosaiken 6g4ef_6g5f_43.
6G 4g	Skälsebo	RST, närmaste granne. 4pts RMS 0.6. 6G4g_80_rek_sub. Ingår i mosaiken 6G4gh_6G5gh_80	Polynomial, närmaste granne. 35pts RMS 7.9. 6G4g_43_rek_sub
6G 4h	Ölvedal	RST, närmaste granne. 4pts RMS 1.0. 6G4h_80_rek_sub. Ingår i mosaiken 6G4gh_6G5gh_80	Polynomial, närmaste granne. 35pts RMS 7.0. Warp 2. 6G4h_43_rek_sub
6G 4i	Misterhult	4 rekt.pts, RMS 0,5 rekt:RST/närmaste granne. 6g4i_80_rek, 6g4i_80_rek_sub. Kartan ingår i mosaiken 6g4ij_6g5ij_80.	28 rekt.pts, RMS 4,7 rekt:RST/närmaste granne. Warp grad 2. 6g4i_42_rek, 6g4i_42_rek_sub. Kartan ingår i mosaiken 6g4ij_6g5ij_42.
6G 4j	Götemar	4 rekt.pts, RMS 0,9 rekt:RST/närmaste granne. 6g4j_80_rek, 6g4j_80_rek_sub. Kartan ingår i mosaiken 6g4ij_6g5ij_80.	30 rekt.pts, RMS 6,7 rekt:RST/närmaste granne. Warp grad 2. 6g4j_42_rek, 6g4j_42_rek_sub. Kartan ingår i mosaiken 6g4ij_6g5ij_42.
6G 5f	Kulltorp	4 rekt.pts, RMS 1,6 rekt:RST/närmaste granne. 6g5f_80_rek, 6g5f_80_rek_sub. Kartan ingår i mosaiken 6g4ef_6g5f_80.	40 rekt.pts, RMS 8,6 rekt:polynomial/närmaste granne. Warp grad 2. 6g5f_43_rek, 6g5f_43_rek_sub. Kartan ingår i mosaiken 6g4ef_6g5f_43.
6G 5g	Slisshult	RST, närmaste granne. 4pts RMS 0.7. 6G5g_80_rek_sub. Ingår i mosaiken 6G4gh_6G5gh_80	Polynomial, närmaste granne.50pts RMS 7.3. Warp 3. 6G5g_43_rek_sub
6G 5h	Mörtfors	RST, närmaste granne. 4pts RMS 1.0. 6G5h_80_rek_sub. Ingår i mosaiken 6G4gh_6G5gh_80	Polynomial, närmaste granne.35pts RMS 7.0. Warp3. 6G5h_43_rek_sub
6G 5i	Grönhult	4 rekt.pts, RMS 0,9 rekt:RST/närmaste granne. 6g5i_80_rek, 6g5i_80_rek_sub. Kartan ingår i mosaiken 6g4ij_6g5ij_80.	40 rekt.pts, RMS 7,4 rekt:RST/närmaste granne. Warp grad 3. Dålig överensstämmelse mellan tidsskikten. 6g5i_42_rek, 6g5i_42_rek_sub. Kartan ingår i mosaiken 6g4ij_6g5ij_42.
6G 5j	Hökhult	4 rekt.pts, RMS 1,1 rekt:RST/närmaste granne. 6g5j_80_rek, 6g5j_80_rek_sub. Kartan ingår i mosaiken 6g4ij_6g5ij_80.	28 rekt.pts, RMS 6,9 rekt:polynomial/närmaste granne. Warp grad 2. 6g5j_43_rek, 6g5j_43_rek_sub. Kartan ingår i mosaiken 6g4ij_6g5ij_42.
6G 6i	Solstadström	RST, närmaste granne. 4pts RMS 0.5. 6G6i_80_rek_sub. Ingår i mosaiken 6G6ij_80	Polynomial, närmaste granne.29pts RMS 8.7, warp 2. 6G6i_43_rek_sub. Ingår i mosaiken 6G6ij_43
6G 6j	Hunö	RST, närmaste granne. 4pts RMS 0.5. 6G6j_80_rek_sub. Ingår i mosaiken 6G6ij_80	Polynomial, närmaste granne. 34pts RMS 8.0, warp 2. 6G6j_43_rek_sub. Ingår i mosaiken 6G6ij_43
6H 2a	Rönnarna	4 rekt.pts, RMS 0,9 rekt:RST/närmaste granne. 6h2a_80_rek, 6h2a_80_rek_sub. Kartan ingår i mosaiken 6h2a_6h3a_80.	14 rekt.pts, RMS 3,7 rekt:RST/närmaste granne. Warp grad 2. 6h2a_42_rek, 6h2a_42_rek_sub. Kartan ingår i mosaiken 6h2a_6h3a_42.
6H 3a	Ävrö	4 rekt.pts, RMS 0,4 rekt:RST/närmaste granne. 6h3a_81_rek, 6h3a_81_rek_sub. Kartan ingår i mosaiken 6h2a_6h3a_81.	35 rekt.pts, RMS 7,1 rekt:polynomial/närmaste granne. Warp grad 2. 6h3a_42_rek, 6h3a_42_rek_sub. Kartan ingår i mosaiken 6h2a_6h3a_42.
6H 4a	Gersebo	RST, närmaste granne. 4pts RMS 0.7. 6H4a_80_rek_sub	RST, närmaste granne. 28pts RMS 7.3. 6H4a_43_rek_sub

Bladkod	Bladnamn	Yngre ekonomiska kartan	Äldre ekonomiska kartan
6H 4b	Boskär	RST, närmaste granne. 4pts RMS 0.3. 6H4b_80_rek_sub	RST, närmaste granne. 17pts RMS 8.1. 6H4b_43_rek_sub
6H 5a	Klintemåla	RST, närmaste granne. 4pts RMS 0.7. 6H5a_80_rek_sub	RST, närmaste granne. 30pts RMS 7.5. 6H5a_43_rek_sub
6H 5b	Strupö	RST, närmaste granne. 4pts RMS 0.7. 6H5b_80_rek_sub	RST, närmaste granne. 20pts RMS 11.3. 6H5b_43_rek_sub
6H 6a	Hamnö	4 rekt.pts, RMS 0,9 rekt:RST/närmaste granne. 6h6a_80_rek, 6h6a_80_rek_sub. Kartan ingår i mosaiken 6h6ab_6h7ab_80.	28 rekt.pts, RMS 5,8 rekt:polynomial/närmaste granne. Warp grad 2. 6h6a_43_rek, 6h6a_43_rek_sub. Kartan ingår i mosaiken 6h6ab_6h7ab_43.
6H 6b	Örö	4 rekt.pts, RMS 0,6 rekt:RST/närmaste granne. 6h6b_80_rek, 6h6b_80_rek_sub. Kartan ingår i mosaiken 6h6ab_6h7ab_80.	17 rekt.pts, RMS 8,6 rekt:polynomial/närmaste granne. Warp grad 2. 6h6b_43_rek, 6h6b_43_rek_sub. Kartan ingår i mosaiken 6h6ab_6h7ab_43.
6H 7a	Eknö	4 rekt.pts, RMS 0,2 rekt:RST/närmaste granne. 6h7a_80_rek, 6h7a_80_rek_sub. Kartan ingår i mosaiken 6h6ab_6h7ab_80.	22 rekt.pts, RMS 5,9 rekt:RST/närmaste granne. Warp grad 2. 6h7a_43_rek, 6h7a_43_rek_sub. Kartan ingår i mosaiken 6h6ab_6h7ab_43.
6H 7b	Kälmö	4 rekt.pts, RMS 0,9 rekt:RST/närmaste granne. 6h7b_80_rek, 6h7b_80_rek_sub. Kartan ingår i mosaiken 6h6ab_6h7ab_80.	25 rekt.pts, RMS 7,5 rekt:polynomial/närmaste granne. Warp grad 3. 6h7b_43_rek, 6h7b_43_rek_sub. Kartan ingår i mosaiken 6h6ab_6h7ab_43.

Metadata, map of hundreds (häradskartan), Forsmark

Bladbeteckning	
112_100_21	64 rekt. pts, RMS 2,5 rekt:polynomial/närmaste granne. 4 graden warp. Eko.blad: 112_100_21_rek. 12i9j, 12j 9ab,13i0j, 13j0ab.
112_92_13a	6 rekt. pts, RMS 1,6 rekt:polynomial/närmaste granne. 1 graden warp. 112_92_13a_rek. Eko.blad: 12i5e.
112_92_14b	6 rekt. pts, RMS 1,6 rekt:polynomial/närmaste granne. 1 graden warp. 112_92_14b_rek. Eko.blad: 12i5e.
112_92_3A	112_92_3A_0_rek är rektifierad emot en mosaik med kartorna 12i7cde_12i8cde_12i9cde. Polynomial 4, närmaste granne. 71 pts. RMS 2.8
112_92_3B	
112_92_4	Omfattar eko-bladen 12i7def_8def_9def. Polynomial 4, närmaste granne, RMS
112_92_5	Polynomial, närmaste granne. 47 pts, RMS 3.1. Omfattar ekobladen 12i_789efg
112_92_8a	Polynomial, närmaste granne. 58 pts. RST 7.7, warp 3. Omfattar ekonomiska kartbladen 12i7cde och 12i8cde
112_92_8b	RMS, närmaste granne. 21 pts RST 3.2. Omfattar ekonomiska kartbladen 12i7e_12i6e
112_92_9A	Polynomial, närmaste granne. 61 pts. RMS 2.0. Omfattar ekonomiska kartbladen 12i6ef och 12i7ef
112_92_9B	RST, närmaste granne. 4 pts RMS 4.7 Omfattar ekonomiska kartbladet 12i6e. Endast lite gräns på kartan.
112_93_1	polynomial, närmaste granne. 67 pts. RST 6.1, warp 4. Omfattar ekonomiska kartbladen 12i7j, 12i8j, 12i8j och 12j7ab, 12j8ab och 12j9ab
112_93_2	Polynomial, närmaste granne. 31 pts. RMS 8.0. Omfattar ekonomiska kartbladen 12j7bc och 12j8b
112_93_6	polynomial, närmaste granne. 88 pts RST 2.8. Warp 4. Omfattar ekonomiska kartbladen 12i7j, 12i6j, 12i5ab. 12j6ab och 12i7ab. Väldigt svår att få rätt i hörnen.
112_93_7_klippt	Polynomial närmaste granne. 56 pts. RMS 3.4Warp 4. Omfattar ekonomiska kartbladen 12j5b, 12j6bc och 12j7bc
112_93_11_klippt	RST närmaste granne. 22 pts. Warp 2. Omfattar ekonomiska kartbladen 12j5ab och 12j6ab
112_93_12_klippt	Polynomial. Närmaste granne. 27 pts. Warp 2. RMS 4.4. Omfattar ekonomiska kartbladen 12j5b och 12j6b
112_99_12_klippt	Polynomial närmaste granne. 37pts. RMS 7.4 warp3. Omfattar ekonomiska kartbladen 13i23abc
112_99_13	polynomial, närmaste granne. 65 pts. Rms 7.1 warp 4. Omfattar ekonomiska ksrbladen 13i3cde och 13i4cde.
112_99_15_klippt	Polynomial, närmaste granne. 21 pts. RMS 5,0.omfattar ekonomiska kartbladet 13i3i
112_99_17	71 rekt. pts, RMS 4,6 rekt:polynomial/närmaste granne. 3 graden warp. Eko.blad: 112_99_17_rek. 13i1abc, 13i2abc, 13i3abc.
112_99_18	72 rekt. pts, RMS 3,8 rekt:polynomial/närmaste granne. 4 graden warp. Eko.blad: 112_99_18_rek. 13i 1cde, 13i2cde, 13i3cde.
112_99_19	47 rekt. pts, RMS 4,0 rekt:polynomial/närmaste granne. 3 graden warp. 112_99_19_rek. Fel mellan kartsikket vid kustlinjen, öar och skär. Eko.blad: 13i1ef, 13i2ef.
112_99_20_klippt	polynomial, närmaste granne. 50 pts. RMS1.9, warp4. Omfattar ekonomiska kartbladen 13i3ij, 13i3ij ovh 13i1ij
112_99_22_0	45 rekt. pts, RMS 3,0, rekt:polynomial/närmaste granne. 3 graden warp. 112_99_22_0_rek. Eko.blad: 12i9abc, 13i0abc, 13i1abc.
112_99_23a	75 rekt. pts, RMS 4,3, rekt:polynomial/närmaste granne. 4 graden warp. 112_99_23a_rek. Eko.blad: 12i9cde, 13i0cde, 13i1cde.
112_99_23b	15 rekt. pts, RMS 4,0, rekt:polynomial/närmaste granne. 1 graden warp. 112_99_23b_rek. Eko.blad: 12i9de, 13i0e.

Bladbeteckning

112_99_24a	55 rekt. pts, RMS 2,8, rekt:polynominal/närmaste granne. 3 graden warp. 112_99_24a_rek. Eko.blad: 12i9efg, 13i0efg, 13i1fg.
112_99_24b	23 rekt. pts, RMS 2,3 rekt:polynominal/närmaste granne. 2 graden warp. 112_99_24b_rek. Eko.blad: 13i0efg, 13i1efg.
112_99_25a	32 rekt. pts, RMS 3,7 rekt:polynominal/närmaste granne. 112_99_25a_rek. 2 graden warp. Kartan uppdelad i två halvor pga stora felritningar i orginalkartan. Eko.blad: 12i9gh, 13i0gh.
112_99_25b	37 rekt. pts, RMS 4,8 rekt:polynominal/närmaste granne. 112_99_25b_rek. 2 graden warp. Stora felritningar i orginalkartan. Eko.blad: 12i9ij, 13i0ij, 13i1ij.

Metadata, old cadastral maps, Forsmark

A27_6_1_4	A27_6_1	A113-17:1	A113-17:7
1839-1840. Ägore- dovisning över Storskäret.	1734-1736. Ägomätning äver Forsmark nr 2.	1709. Ägoredovisning skattl beredn, Valö kyrkby	1829-37 Fastställd: 1845 Laga skifte Valö kyrkoby
A27_6_4_h: Polynomial, närmaste granne. RMS 7.0. A27_6_4_a: Polynomial, närmaste granne. RMS: 14.4. A27_6_1_j: Polynomial, närmaste granne. RMS: 23.9. A27_6_4_f: Polynomial, närmaste granne. RMS: 32.0. A27_6_4_e: Polynomial, närmaste granne. RMS 25.7. Betesmark som på kartan är markerad som inmark ingår i ängslagret. Hagar som i textlagret är beskrivna tillsammans med tomterna och på kartan markerade som inmark ingår i ängslagret.	A27_6_1_a: Polynomial, närmaste granne. RMS 56.8. A27_6_1_2a: Polynomial, närmaste granne. RMS 36.1. A27_6_1_2b: Polynomial, närmaste granne. RMS 48.7. A27_6_1_z: Polynomial, närmaste granne. RMS 42.8. A27_6_1_y: Polynomial, närmaste granne. RMS 27.3	32 rekt.pts. RMS 4,6, rek:polynomial. Warp grad 2. A_113_17_7_a_rek. A_113_17_1_a_rek. 45 rekt.pts. RMS 16,9, rek: polynomial. Warp grad 3. A_113_17_1_b_rek. 12 rekt.pts. RMS 4,9, rek:polynomial. Warp grad 3. A_113_17_1_cbit_rek. 40 rekt.pts. RMS 14,0 rek:polynomial. Warp grad 3. A_113_17_1_d_rek. 25 rekt.pts. RMS 18,3 rek:polynomial. Warp grad 3. A_113_17_1_e_rek. 26 rekt.pts. RMS 11,1 rek:polynomial. Warp grad 3. A_113_17_1_f_rek. 24 rekt.pts. RMS 15,5 rek:polynomial. Warp grad 2. A_113_17_1_g_rek. 36 rekt.pts. RMS 11,8 rek:polynomial. Warp grad 3. A_113_17_1_h_rek. 38 rekt.pts. RMS 21,2 rek:polynomial. Warp grad 3. A_113_17_1_i_rek. 40 rekt.pts. RMS 13,3 rek:polynomial. Warp grad 3. A_113_17_1_j_rek. 24 rekt.pts. RMS 28,9 rek:polynomial. Warp grad 3. A_113_17_1_k_rek. 24 rekt.pts. RMS 21,6 rek:polynomial. Warp grad 3. A_113_17_1_l_rek. 20 rekt.pts. RMS 24,7 rek:polynomial. Warp grad 2. A_113_17_1_m_rek. 17 rekt.pts. RMS 17,9 rek:polynomial. Warp grad 3. A_113_17_1_n_rek. 7 rekt.pts. RMS 8,6 rek:polynomial. Warp grad 1. A_113_17_1_o_rek. 3 rekt.pts. RMS 0,0 rek:polynomial. Warp grad 1. A_113_17_1_p_rek. 12 rekt.pts. RMS 11,2 rek:polynomial. Warp grad 2. A_113_17_1_q_rek. 11 rekt.pts. RMS 42,1 rek:polynomial.	52 rekt.pts. RMS 16,0, rek: polynomial. Warp grad 3. A_113_17_7_b_rek. 24 rekt. pts. RMS 14,2, rek: polynomial. Warp grad 2. A_113_17_7_c_rek. 42 rekt.pts. RMS 8,7, rek:polynomial. Warp grad 2. A_113_17_7_d_rek. 43 rekt.pts. RMS 10,4, rek: polynomial. Warp grad 3. A_113_17_7_e_rek. 24 rekt.pts. RMS 13,4, rek: polynomial. Warp grad 2. A_113_17_7_f_rek. 16 rekt.pts. RMS 6,7, rek:polynomial. Warp grad 2. A_113_17_7_g_rek. 23 rekt.pts. RMS 20,0, rek: polynomial. Warp grad 2. A_113_17_7_h_rek. 36 rekt.pts. RMS 18,8, rek: polynomial. Warp grad 2. A_113_17_7_i_rek. 40 rekt.pts. RMS 12,1, rek: polynomial. Warp grad 3.

Metadata, old cadastral maps, Oskarshamn

G63-51:5.	G63-51:3	G63-51:2	G63-51:1
1872. Laga skifte över Ekerum.	1813. Åbodelning över Lilla Laxemar	1793. Storskifteskarta över Ekerum, Lilla Laxemar och Ström.	1689. Ekonomisk avmätning över Lilla Laxemar, Ekerum, Ström och Sandsböle.
Kartan över Ekerum från 1831 är uppdelad i tre delar. Kartan över Ekerum från 1831 är uppdelad i tre delar: G63_51_4_a, G63_51_4_b och G63_51_4_c. G_63_51_4_a: Polynominal, närmaste granne. RMS 10.2. G63_51_4_b: Polynominal, närmaste granne. RMS 7.3. G_63_5	Kartan är uppdelad i två delar, G63_51_1_a: Polynominal, närmaste granne. RMS 12,9. G63_51_1_b: polynominal, närmaste granne. RMS 18.7.	3:e graden polynominal, närmaste granne. RMS 10.1. Kustlinjen var svår- rektifierad och ligger inte helt rätt i förhållande till fastighetskartan.	Svårrektifierad karta. Vissa delar av odlingsmarken har rektifierats separat. G63_51_1: Polynominal, närmaste granne. RMS:63.2. G63_51_1_c: Polynominal, närmaste granne. RMS 21.3. G63_51_1_b: polynominal, närmaste granne. RMS 69.5. G63_51_1_c1: polynomi

Definitions for population

Based on Winberg, Christer. 1977 *Folkökning och proletarisering* p 41 ff.

Ståndspersoner

Godsägare

Civila och militära ämbetsmän

Präster

Högre studerande och lärare

Brukspatroner

Possessionater, dvs godsägare

Tjänstemän: Directeurer, Kamererare, Inspectorer, Gårdsfogdar, Bokhållare, fogdar, rättare

Auditeurer, Regements- och Mönsterskrifvare

Informatörer som ej är präster

Bönder

Besuttna – egen jord (skatte), annans jord (frälse, krono)

(Seminanter)

Torpare

Soldater

Ryttare, dragoner, soldater, båtsmän

Övriga jordlösa/egendomslösa

Backstugusittare, inhyses m.fl.

Nybyggare

Tjänstefolk och betjänter

Drängar

Ogifta

Torparsöner

Bondsöner

Fångar

Spinneri-Idkare och dervid Arbetande på Landsbygd.

Jägare

Bruksarbetare

Arbetare och hantverkare på ”Bärgbruket”

Sågverksarbetare

Kolare

Brännmästare, dvs en person som förestod bränningen vid ett tegelbruk

Kalkbrytning och Bränning

Pottaske-bränning

Hantverkare på landet

Hantverkare, främst skomakare, skräddare, smeder, hovslagare och snickare, men även andra

Mjöltnare

Gästgivare

Tractör eller värdshusvärd

Skeppare och sjömän

Fiskare

Skärkarlar

Borgare

Minuthandlande Borgerskapet

Af sig komne Ledamöter af Borgerskapet

Borgerskapets öfrige handlande Ledamöter

Fabriques Idkare i allmänhet

Övriga

Apotekare

Arrendatorer

Främmande religionsförvanter

Fältskärare

Lantmän, som ej är bönder, torpare eller stånds personer

”Lappar Kringstrykande och Vallhjon”

Pensionerade

Personer som ej höra till annan titel

”Stånd. Bet.” (Överlovsta 1751)

”Stånd. Hed.” (Överlovsta 1749–50)

Trädgårdsmästare

Konstnärer som icke äro Borgare

The people in the area

In order to populate the landscapes described above, the following section provides examples of households and families that were living in some of the houses and crofters during certain years. The names of the inhabitants are given and their family situations are described.

Valö in the county of Uppsala

Vreta 1751–62

In the mid-18th century Jacob Jansson (b. 1684) and his wife Anna (b. 1688) lived in Vreta. The household included their son (b. 1721. His first name is not legible in the source material) and his wife Margareta (b. 1727), and Jacob's and Anna's other son Olof Jacobsson (b. 1733), his wife Lisa (b. 1731) and their son Jacob (b. 1760). Additionally one more person (b. 1731) is included in the household, but no name or relationship is discernible.

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:1, s. 131. År 1751–1762)

Vreta 1800-06

Between 1762 and 1800 a generation shift has taken place. Vreta is now cultivated by Jacob Olsson (b. 1760). In the previous priest's register (see above) he was a little child – at most two years old – now he is about 45 years old. Jacob lives here with his wife Cajsa Mattsdotter (b. 1766, now 37 years old). They have no children. The household also includes the farm-hand Joh. Nilsson (b. 1787), the farm-hand Erik Jansson (b. 1782), and the maids Stina Jansdotter (b. 1781), Maria Lars (?) dotter (b. ?), Cajsa Jansdotter (b. 1784) and Cajsa ? (her surname could possibly be Jansdotter too, but it is barely legible) (b. 1788). However, the two maids named Cajsa did not live at the farm at the same time even though they overlapped; the one born in 1784 moved from Vreta in 1804 and the other (b. 1788) arrived in 1800.

There is a second household at Vreta, which comprises Jacob Olsson's parents, Olof Jacobsson (b. 1733) and Lisa Andersdotter (b. 1733). We also get to know that Jacob's father Olof Jacobsson is a verger (Sw. *kyrkovaktmästare*).

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:4b, s. 27. År 1800–1806)

Vreta 1850–54

In the middle of the 19th century a man named Olof Jansson (b. 1803) and his wife Anna Larsdotter (b. 1805) live at Vreta. They don't seem to be related to the residents from 1800. Olof and Anna have three daughters named Johanna Margareta (b. 1841), Anna Charlotta (b. 1843) and Sofia Christina (b. 1845). A widow named Greta Olsdotter (b. 1767), who is the mother of J.M.S. recently died in 1851. (There is no information on who J M S could be) Olof's brother Matts Jansson (b. 1798) is farm-hand at Vreta and there are two maids named Maja Greta Jansdotter (b. 1827) and Anna Wahlberg (b. 1834).

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:12, s. 37. År 1850–1854)

Vreta 1891–95

Now the farm is set to 1/4th *mantal*. Vreta is cultivated by Gustaf Forsberg (b. 1844 in Forsmark) and his wife Anna Charlotta Olsdotter (f. 1843). Anna Charlotta was one of the three daughters who lived here in 1850. Apparently she is the one who inherited the farm. The household also includes the farm-hands Petter (Topp) Karlsson (b. 1865) and Mattias Olsson (b. 1873), and the maids Maria Margareta Mattsdotter (b. 1859) and Maria Augusta Hällinder (b. 1869).

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:20, s. 40. År 1891–1894)

Lund 1751–62

Anders Persson (b. 1716) and his wife Brita (f. 1714) live here together with their sons Per (b. 1743) and Anders (b. 1751), and their four daughters Katarina (b. 1740), Anna (b. 1745), Maria (b. 1749) and Brita (b. 1754). Anders' father (b. 1685) (his name is not legible) and his mother Anna (b. 1681) comprise a part of the household. However, Anders' father dies in 1761. Furthermore the farm-hand Matts (b. 1729) and the maid Maria (b. 1722) are also included in the household.

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:1, s. 133. År 1751–1762)

Lund (Lunds by) 1800–06

Household nr1: This comprises the dismissed solider Mats Glad (b. 1734 d. 1805) and his wife Cajsa Jansdotter (b. 1749 or 1748, 65 years). Their son Erik Wahlund (b. 1764, 44 years), who is an unskilled worker (Sw. *grovarbetare*), and his wife Stina Wahlund (b. 1783, 22 years) also live here together with their son Erik (b. 1806). The household also comprises the “mother” (possibly Stina's mother) Cajsa Jönsdotter (b. 1751), who is “blind and miserably poor”, and the old maid Ingrid (b. 1785). The brother Matts Mattson (b. 1778, 27 years) and his wife Maria Jansdotter (b. 1778, 27 years) live here with their son Matts (b. 1804) and their daughter Cajsa (b. 1800). The widow Cajsa Persdotter (b. 1787 d. 1804) used to be part of the household.

Household nr 2: Erik Hansson (b. 1771, 34 years) and his wife Anna Persdotter (b. 1761, 44 years) live in the second household with their son Jan (b. 1797, 8 years) and the mother in law Cajsa. (She is probably deceased since her name is crossed out).

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:4b, s. 35. År 1800–1806)

Lund (under Forsmark) 1850–56

The farmstead is set to 4 ½ *mantal*. Until 1854, Matts Pehrsson (b. 1791) and his wife Anna Jansdotter (b. 1792) lived here with their daughter Christina Catarina (b. 1825) and their sons Pehr (b. 1828) and Johan (b. 1832). In 1854 the family moved to Tierp.

Anders Jansson (b. 1826) moved in in 1854. The household comprises: the maid Anna Charlotta Mattsdotter (b. 1830); Anders Jansson's father the verger (Sw. *kyrkovaktmästare*)

Jan Mattson (b. 1789) and his wife Maria Mattsdotter (b. 1794). Three of Anders Jansson's siblings also lived here; the sister and maid Katarina Jansdotter (b. 1822), the sister and maid Greta Stina Jansdotter (b. 1830), the sister and maid Charlotta Jansdotter (b. 1832) and the brother and farm-hand Erik Jansson.

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:12, s. 73. År 1850–1854)

Lund (nr 3) 1891–95

The farm is set to ½ farm. The stableman Anders Petter Blom (b. 1851) and his wife Kristina Wahlström (b. 1854) live here. They have seven children: Per Johan (son, b. 1875), Mattias (son, b. 1876), Johanna Sofia (daughter, b. 1878), August Albert (son, b. 1880), Gerhard Wilhelm (son, b. 1883), Ester Kristina (daughter, b. 1886) and Hilda Maria (daughter, b. 1889).

The stableman Karl Adolf Karlsson (b. 1866) and his wife Helena Matilda Larsdotter (b. 1866) are also household members. They have two sons Karl Fredrik (b. 1890) and Erik Joel (b. 1891). Gustaf Holmgren (b. 1858) and his wife Anna Gustava Blom (b. 1850) are further household members.

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:20, s. 71. År 1891–1894)

Tomta 1751–62

The widow Agneta Nordelid (b. 1705) and her sons Per (b. 1733), Nils (b. 1741) and Jacob (b. 1744) live here. The names of Per and Nils are crossed over, but it is not stated if they died or moved. Agneta's daughter Kristina (or Stina) (b. 1737) is crossed over as she died in 1761. A farm-hand Jan (b. 1733) and three maids; Margareta (b. 1730), Maja (b. 1734) and Cajsa (b. 1731) are also members of the household.

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:1, s. 144. År 1751–1762)

Tomta 1800–06

The farm comprises two households. The crofter Anton (d. 1803) and his daughter Margareta (b. 1750) cultivate lot number one. The maids Stina (b. 1761), Cajsa Jansdotter (b. 1771), Greta Andersdotter (b. 1774) and Greta Larsdotter (b. 1767) are part of the household. However, the maid Greta Andersdotter moved to Prästgården in 1801. The farm-hand Anders Eriksson (b. 1782) also lives at Tomta.

The second household comprises the farmer Erik Andersson (b. 1758, 47 years old), his wife Stina Ohlsdotter (b. 1768, 37 years old) and their eight children: their sons Anders (b. 1782), Olof (b. 1786), Johan (b. 1802) and Erik (b. 1805), and their daughters Marta (b. 1788), Stina (b. 1789), Cajsa (b. 1796) and Greta (b. 1800).

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:4b, s. 40. År 1800–1806)

Tomta 1850–54

On this farm live Per Eriksson (b. 1816), his wife Brita Maja Jansdotter (b. 1820), their two daughters Maria Helena (b. 1841) and Christina (b. 1852), and their two sons Johan Erik (b. 1843) and Anders (b. 1845). Two twin daughters called Charlotta and Anna Catarina were born in September 1850 but both died after only two days.

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:12, s. 81. År 1850–1854)

Tomta 1891–95

The farm is set to a half mediated assessment unit of land (Sw. *förmedlat mantal*). The crofter Johan Erik Persson (b. 1843) lives here. In 1870 he married Johanna Charlotta Davidsdotter (b. 1850). They have eight children; Johan Henrik (son, b. 1871), Anna Agda (daughter, b. 1873), Anders Petter (son, b. 1875), Erik (son, b. 1877), Kristina Charlotta (daughter, b. 1879), Elin Maria (daughter, b. 1881), Sven (son, b. 1883), Knut (son, b. 1887), Lovisa (daughter, b. 1888) and Albert (son, b. 1890). The stableman Frans Viktor Jansson (b. 1866) and his wife Emma Lovisa Wahlström (b. 1868) are also members of the household. They were married in 1893 and have one daughter called Ebba Viktoria (b. 1894). The farm-hand Anders Andersson (b. 1871) also lives here.

(Source: Riksarkivet Arninge, Husförhörslängder, Uppsala län, Valö socken, AI:20, s. 40. År 1891–1894)

Misterhult in the county of Kalmar

The crofter's holding Grönlid 1851–60

The shoemaker Olof Nilsson (b. 1800) and his wife Maja Nilsson (b. 1802) live here together with their sons Nils Johan (b. 1842) and Per (b. 1845), and their daughters Lisa Karin (b. 1834) and Lotta (b. 1831). Lotta moved to Grönlid in 1852 from Uthammar and she has two sons, Otto Fredrik (b. 1854) and Carl Johan (b. 1856). Both of her sons died before they were one year old. The farm-hand Carl Westerberg (b. 1822) is also part of the household. He was divorced from his wife in 1854, which must have been fairly uncommon.

(Source: Riksarkivet Arninge, Husförhörslängder, Kalmar län, Misterhult socken, AI:6A, s. 309. År 1851–1860)

The crofter's holding Grönlid 1893–99

The crofter's holding comprises three households. In the first household a generation shift occurred between 1860 and 1893 and the sailor Nils Johan Olofsson (b. 1842) took over the crofter's holding at Grönlid from his parents. He was their oldest son, see Grönlid 1851–60 above. Nils Johan lives here with his wife Stina Karolina Nilsson (b. 1834 i Misterhult). They married in 1866, but have no children mentioned. The worker Karl Johan Nilsson (b. 1858) and their adopted son Karl Axel Karlsson (b. 1889) also live here.

In the second household the seaman Viktor Nilsson (b. 1867) used to live. He was married to Hilda Ottilia Nilsson (b. 1867) in 1891 and they have one son named Karl Henrik (b. 1893). However this family moved from Grönlid in 1894. Now the widow Lovisa Nilsson (b. 1842) lives here with her four sons Karl Peter Nikodemus (b. 1879), David Martin (b. 1885), Josef Albin (b. 1887) and Erik Emanuel (b. 1892). The son David Martin moved away from the crofter's holding in 1899.

The third household comprises Axel Erik Gran (b. 1874) and his wife Albertina Wilhelmina Källinge (b. 1869). They were married in 1896 and have one son Bengt August (b. 1898). Axel Erik's father the worker Gustaf Nilsson Gran (b. 1816) lives here too. Furthermore the dependent (Sw. *inhyses*) maid Anna Sofia Alexanderdotter (b. 1846) is part of the household. However, this third household moved away from Grönlid in 1898.

(Source: Riksarkivet Arninge, Husförhörslängder, Kalmar län, Misterhult socken, AI:17A, s. 142. År 1893–1899)

Lilla Laxemar 1851–60

This farm is set to 1/8th assessment unit of land (Sw. *mantal*). Nils Joh. Nilsson (b. 1820) and his wife Greta Lisa Svensdotter (b. 1823) live here. The family has six children and three of them are stepchildren. This probably indicates that Greta was previously married to another man and has three children from this marriage. The children are called; Sven Petter Pettersson (b. 1841, step-son), Johan Fredrik (b. 1849), Stina Maria Josefina (b. 1843, step-daughter), Greta Matilda (b. 1846, step-daughter), the son Carl Oskar (b. 1852) and the daughter Stina Sofia (b. 1857). Two farm-hands are part of the household; Carl Pet. Andersson (b. 1837) and Sven Johan Persson (b. 1833) and the two maids Anna Maria Andersdotter (b. 1820) and Charlotta Olofsdotter (b. 1835). Furthermore, two other people (called "girls") belong to the household; Carolina Arvidsdotter (b. 1835) och Maja Lisa Sörensdotter (b. 1837).

(Source: Riksarkivet Arninge, Husförhörslängder, Kalmar län, Misterhult socken, AI:6B, s. 107. År 1851–1860)

Lilla Laxemar 1893–99

This farm is divided between two farmers. The first farm is set to 1/8th-assessment units of land. This farmstead is owned by Karl Anton Lundgren (b. 1871). His wife is called Augusta Matilda Karlström (b. 1878) and they were married in 1895. They have two sons, Karl Tage Arthur (b. 1878) and Sture Robert (b. 1898). Two farm hands; Gustaf Leonard Andersson (b. 1877) and Karl Johan Johansson (b. 1881) and four maids; Susanna Anderström (b. 1873), sister Amanda Berg (b. 1879), Maria Lovisa Fransdotter (b. 1871) and Amanda Josefin Johansdotter (b. 1876) also live here.

The second 1/8th-assessment unit of land is cultivated by Karl Mickelm Larsson (b. 1841) and his wife Eva Maria Sonesdotter (b. 1839). They were married in 1866 and they have two sons, the twins Sven Magnus och Karl Johan (both b. 1866) and one daughter Augusta Matilda (b. 1878).

(Source: Riksarkivet Arninge, Husförhörslängder, Kalmar län, Misterhult socken, AI:17B, s. 971. År 1893–1899)

Example of a data table made from original cadastral material

Source: Jordebok 1871.

År	Härad	Socken	By	Antal gårdar	Jord-natur	Hemmans-tal	Anmärkning
1871	Frösåker	Valö	Annö	6	fr	4+1/2+1/2	
1871	Frösåker	Valö	Bennebo	1	fr	1/4	1887 överförd till skatte
1871	Frösåker	Valö	Bergsjö	1	sk nyb		
1871	Frösåker	Valö	Bergsjötorp	1	fr torp		På Pålsmora ägor
1871	Frösåker	Valö	Bol	1	fr	1	1887 överförd till skatte
1871	Frösåker	Valö	Dannebo	1	fr torp		På Vigelsbo ägor
1871	Frösåker	Valö	Dannebo	1	fr äng		
1871	Frösåker	Valö	Djuprudan	1	fr torp		På Pålsmora ägor
1871	Frösåker	Valö	Frebbenbo	1	fr	1	
1871	Frösåker	Valö	Greberg	1	sk äng		Grebergsäng
1871	Frösåker	Valö	Gubbo	1	fr	1/4	
1871	Frösåker	Valö	Gålmåla	1	fr	1	1887 överförd till skatte
1871	Frösåker	Valö	Hackbol	1	fr	1	1887 överförd till skatte
1871	Frösåker	Valö	Juvansbo	1	fr	1	1887 överförd till skatte
1871	Frösåker	Valö	Karö	2	sk	1/2+1/2	
1871	Frösåker	Valö	Karö	1	fr	1	
1871	Frösåker	Valö	Kjällinge	4	fr	3+1/2	
1871	Frösåker	Valö	Kjällinge	1	fr utj		
1871	Frösåker	Valö	Klockaregård	1	fr	1/4	
1871	Frösåker	Valö	Kyrkojorden	1	kr lgh		Upptagas i jordebok enl Kammarkoll beslut 1920
1871	Frösåker	Valö	Källinge eller Skrättan	1	sk äng		
1871	Frösåker	Valö	Källsvedsäng	1	sk äng		
1871	Frösåker	Valö	Lund	4	fr	4	1887 överförd till skatte
1871	Frösåker	Valö	Lund	1	fr utj		
1871	Frösåker	Valö	Lundsvedja	2	fr	2	1887 överförd till skatte
1871	Frösåker	Valö	Lundsvedja	2	fr	2	
1871	Frösåker	Valö	Norrby	7	sk	6+1/2	
1871	Frösåker	Valö	Prästgården	1	kr	1 1/4	
1871	Frösåker	Valö	Pålsmora	2	fr	2	
1871	Frösåker	Valö	Rovsättra	1	kr	1	
1871	Frösåker	Valö	Rovsättra	4	fr	4	1887 överförd till skatte
1871	Frösåker	Valö	Stummelbo	1	fr	1	1887 överförd till skatte
1871	Frösåker	Valö	Sunnanäng	1	fr	1	1887 överförd till skatte
1871	Frösåker	Valö	Svalsbo	2	fr torp		På Pålsmora ägor
1871	Frösåker	Valö	Tomta	1	sk	1/2	
1871	Frösåker	Valö	Uckerö	2	fr	1/2+1/2	1887 överförd till skatte
1871	Frösåker	Valö	Uckerö	1	fr utj		
1871	Frösåker	Valö	Vamsta	5	fr	2+1/2+1/2+1/2	1887 överförd till skatte
1871	Frösåker	Valö	Vigelsbo	2	fr	1/2+1/2	
1871	Frösåker	Valö	Vreta	1	sk	1/4	
1871	Frösåker	Valö	Västerbol	1	fr torp		1887 överförd till skatte
1871	Frösåker	Valö	Östensbo	1	fr	1/2	1887 överförd till skatte
1871	Frösåker	Valö	Östensmora	1	fr	1	