



# Digital Historical Maps

Report from WP1

## Existing systems and demands on user functionality

Final version

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Deliverable 2

Björn Peck

Swedish National Heritage Board

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## Enclosures

Appendix 1: WP1 project description

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# 1 WP1

## 1.1 Scope

The aim of work package 1 (WP1) is to make a survey on users needs and requirements with regard to availability, functionality and quality. One should also tabulate and analyse existing storage and access systems for historical maps, such as catalogue records, search paths storage technologies and distribution channels. The results are to be used as a basis for decisions in coming work-packages dealing with functionality and specifications of the system.

In the project description the users are divided into five main categories: planners and developers, education and research, government agencies concerned with man-made environment issues, the multimedia industry and local history groups.

The user needs were to be identified through of interviews with users from each category in each country in the consortium. The questions should deal with search paths into the material, functionality requirements, frequency of use, readiness to pay, quality requirements, the need for links to other information etc.

Use should also be made of earlier and parallel studies made by the NHB and the NLS.

The results of the survey should be verified at a workshop with the members of the smaller reference group (see WP8). The result, in the form of a report will be circulated to the larger reference group (see WP8).

The main responsibility for WP 1 rests with the NHB, assisted by the University of Greifswald.

## 1.2 Accomplishment

The time schedule for WP1 was month 1-4 of the project. As the project start was postponed until March 1, the first workpackage was instead carried through between March and June.

In early spring preparatory meetings were held by the project members to decide the principles and the practical outline of the survey. The plan and the details were presented to the project leader and the project quality controller at the NLS.

The following weeks a number of interviews were made in the participating countries, in Sweden by the NHB, in Denmark by KMS and in Germany by the University of Greifswald.

The same participants also developed texts on existing systems.

Preliminary national reports and conclusions were presented and accepted at a workshop in Stockholm (June 3) with the small reference group. The results were presented to the steering group at a meeting June 4.

After this meeting Björn Peck of the NHB has elaborated the report text which is now to be delivered to the steering group and the larger reference group.

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## 2 Report on existing systems

WP1 includes the task to “tabulate and analyse existing storage and access systems for historical maps, such as catalogue records, search paths storage technologies and distribution channels”.

The study of existing systems can hardly be done without also mentioning the material involved. For this reason every country prepared a general overview on types and volume of the historical maps, focusing on the material that the consortium intends to make accessible. These are followed by descriptions upon localisation and accessibility.

### 2.1 Danish historical maps

#### 2.1.1 Topographic maps

The first total survey of Denmark was done by *Videnskabernes Selskab* (the Danish Royal Society) 1762-1821. It then comprised besides the kingdom of Denmark also the duchy of Slesvig and parts of the duchy of Holsten and the principality of Lauenburg. During the time span the methods improved. The scale of the survey was 1:20.000, and the printed maps were made in 1:120.000 (except the Copenhagen area in 1:80.000).

As the military could not accept the slow pace, it started its own survey.

*Generalkvartermesterstaben*, later *Generalstaben* (the General Staff) surveyed the eastern part of Denmark 1808-60. These surveys were also made in 1:20.000 and have not been published.

As the new department, *Generalstabens topografiske Afdeling* (the Topographical department of the General Staff) took over 1842, a new plan of surveying was initiated. Better equipment, especially for measurement of height and distances was used, and the new system of triangulation was introduced. The products of this plan was drawings of each village (*bymålinger*) and special printed maps for the army, both in 1:20.000, beginning in 1845. These maps were not for public use, but some have slipped from the military use. The first public edition came later in the century, beginning around 1870. All the printed editions are called *Målebordsblade*. These have been revised from time to time.

#### 2.1.2 Cadastral maps

The latest cadastre of the kingdom of Denmark (not comprising the duchy of Slesvig) was made 1806-20. Prior to the work, a lot of maps were collected, especially those which had been used in connection with the land redistribution reform taking place immediately before. Many of these maps - or copies from them - were used as basis for the cadastral maps, so the first editions of these not only have the cadastral information, but also historic information of names of fields, land use and much more. The maps are in 1:4.000 but can be difficult to read, as they may contain information of the land redistribution, the cadastral work and the updating up to app. 1860. Then new maps were made.

These maps were not handy for the administration, partly because of the size, partly as only an *ejerlav* (usually a village) was on the map. So app. 1816-1900 *minorerede sognekort* (cadstral

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maps, consisting of a parish, in the scale 1:20.000) were made. The basis of these were the first cadastral maps, and so a lot of information of land use, buildings and other themes were copied too. These maps are the ones chosen for this work.

### 2.2 Access to Danish historical maps

The main body of the aforesaid maps is to be found in *Kort & Matrikelstyrelsen* (National Survey and Cadastre - Denmark). Many of the printed maps can also be found at *Det kongelige Bibliotek* (the Royal Library). Maps of land redistribution can also be found other places, mainly at *landsarkiverne* (the National Archives, regional divisions).

In *Kort & Matrikelstyrelsen* the maps can be found through some registers, the indexing varying. The cadastral maps and the *minorerede sognekort* are to be found through the name of the parish (and in the former case also through the name of the *ejerlav*). The number of topographical maps is not known, but the number of cadastral maps is app. 100.000, 10% being the oldest edition.

It is possible to buy photos or scanned pictures of almost all maps. The price of the photos varies from 60 to 100 ECU. Delivery time is usually 1 week. Photocopies (cost app. 10-20 ECU) are only made from few types of maps.

As the use of maps is increasing, the wear and tear is not negligible, and even though there is an ongoing conservation, the closing of access to some of the types has been considered. As most of the maps do not exist outside the institution, there also is a demand to make it easier beforehand to see what is in the archives in order to save time and money.

### 2.3 German historical maps in Greifswald

The Swedish Matrikel Maps have been produced on the basis of a land survey (a local triangulation, "Kleintriangulation") in Swedish Pomerania between 1692 and 1698. The survey has been carried out in the field during summer, and afterwards the maps have been drawn during winter. The aim of the survey was to get comprehensive data as a basis for taxation. The historical information consists of the maps themselves and associated text volumes with data on

- the location of the village, conditions of ownership and administration, names of owners, their status (Vollbauer, Halbbauer, Kossat) or profession (tailor, smith, ...),
- the size and quality of the arable fields (cultivated, not cultivated), description of meadows, pasture, forest, waters, roads,
- soil quality, amounts of seed, yield, livestock, taxation, services to be contributed to manorial farms.

The first drawn map (original map) is called "Urkarte". Later on, hand made copies of the original maps have been produced, parts of them not before the second half of the 18<sup>th</sup> century. These copies are called "Reinzeichnungen".

In the Institute of Geography and the Library of Greifswald University 139 of the matrikel maps (hand made, coloured copies from the 18<sup>th</sup> century) are stored. These maps cover the area of the

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former counties of Barth, Franzburg and Barth and parts of the former district of Stralsund (127 maps in the Institute of Geography), and several villages of Rügen (12 maps in the University Library).

All maps are drawn at a scale of app. 1:8300. Most of the maps depict the entire area of one village; in the case of very small villages, two of them are drawn on one map sheet.

Arable fields are marked with capital letters (A: summer field, B: winter field, C: fallow land) and with coloured borderlines (different colours for the categories A, B and C). Inside the fields are differentiated using small letters, depending on the type of crop (wheat, barley, ...) and soil type (humus, clay, ...). The combination of capital and small letters provides the full information (e.g.: Aa = wheat on humus soil).

The area of meadows is coloured in dark green, pastures in light green, and woodlands are marked with green tree signatures. Waters are depicted with a blue borderline.

Houses are shown as red rectangles, churches with an additional steeple. Mills are depicted in red colour as well, with a mill signature.

The maps generally have a size of 72 x 50 cm. For larger villages, more paper is attached to the ordinary map sheet format in order to depict the entire area of the village on one single map. All maps are well preserved, except some fractures at folds.

The associated text volumes are written in Swedish language. They are stored in the archive (Landesarchiv Greifswald).

### References:

CURSCHMANN, F.: Matrikelkarten von Vorpommern 1692-1698. Karten und Texte, Teil 1, Rostock 1948.

DROLSHAGEN, C.: Die schwedische Landesaufnahme und Hufenmatrikel von Vorpommern als ältestes deutsches Kataster. Greifswald, 1920, 1923. 2 Bände

## **2.4 Access to German historical maps in Greifswald**

The maps are kept in the Institute of Geography (127 maps) and in the University Library (15 maps). They are accessible during opening hours without payment of any fee. Preliminary announcement is necessary, if access to the maps in the Institute of Geography is wanted.

It is possible to order copies (paper, photo) of the maps. The costs of copies have to be paid.

The catalogue consists of alphabetically arranged lists of village names on paper. The only search path is to look for names in the lists.

Access to the associated text volumes exclusively is possible at the archive (Landesarchiv Greifswald) during opening hours.

Much more Swedish matrikel maps of Pomerania are kept in the archive (> 1400). Usually they are not accessible in a direct way, but copies can be ordered.

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## 2.5 Swedish historical maps

### 2.5.1 Geometric Maps, 1630 –1700 (1750)

The systematic mapping of Sweden started 1628 when a national land survey was founded. The aim was to gain increased knowledge about assets of the country but also to facilitate taxation.

Until around 1650 so-called geometrical maps were produced for several thousand farmsteads. The older geometric maps were sorted after village, parish and district and delivered as books, “Geometriska Jordeböcker”, to the central survey office at the royal castle in Stockholm. In the same period a large amount of similar maps were drawn, describing properties held by the nobility. Geometric maps were also produced in the holdings outside the borders of today’s Sweden.

The maps are rather uniform in their design, but limited in their themes. Usually only the infields were covered i.e. fields and meadows. Boundaries and fences were also mapped. The village is marked by a symbol. The colouring is sparse. A short text describes the size of the farmsteads and nature of ownership as well as sowing and the productivity of meadows, pastureland, forest and other assets. The scale is usually 1: 5 000 and the sheet are normally smaller than 0,5 meters in any direction.

Between 1650 and 1680 there was a break in the production of large scale geometric maps in advantage to small scale geographic maps, partly due to military reasons. After the war with Denmark the production was continued, not least in the new provinces of Skåne, Blekinge, Halland, Bohuslän, Jämtland, Härjedalen and Gotland. The king also needed maps over confiscated former nobility estates.

After the year 1700 the systematic mapping stopped, but for another half century geometric maps were produced where particular issues on ownership or production had to be solved. The design got more varied. Often also pastureland and forest was included.

### 2.5.2 Redistribution maps

#### The “Storskifte” (great redistribution) 1757 – ca 1820

The aim of the redistribution was to increase production by replacing the scattered land owning structure - still based on medieval principles – with larger units for every farmer. The ”Storskifte” redistribution maps covered most of the populated areas, with exception for vicarages and farmsteads or estates with single owners. Most of them are however limited to the infields as forest and outland was still common.

The maps normally consist of one or several meter-sized sheet in the scale 1:4000. The geometric quality is surprisingly high, with high accuracy in distance and area but sometimes with angular faults. They show fields, meadows, the farmstead site, sometimes also distant meadows, forest and grazing land. The colouring is rich, the details are many and the aesthetic values are often considerable. The

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maps normally also have a detailed text description, often comprising 10 or more folio pages. The storskifte maps were made in three copies, which were given to the landowners, the regional land survey office and the national land survey office.

### **The “Enskifte” 1803 – 1927**

The authorities were not content with the results of the Storskifte. Another attempt was made through the “Enskifte”. The principles of this redistribution were however hard to follow in areas where nature made the fields irregular. Its importance was thus limited to the southern and southwestern parts of the country.

### **The “Laga skifte” 1827 – ca 1926 (1972)**

The greatest changes in the Swedish agrarian landscape took place during the Laga Skifte redistribution. The process continued into the twentieth century. This time one succeeded in gathering every owner’s land into large continuous areas. A dramatic consequence was that the villages were shattered, as the farmsteads were moved into their respective new land areas.

The Laga Skifte maps usually were made in 1:4000 or 1:8000 and cover the entire land of the villages. The geometric accuracy is very high. Usually they comprise several rectangular sheets of more than one square meter each.

Land use, all buildings and other physical features of importance are shown in great detail. Only the fences are poorly described. The colouring of the maps is standardised and easy to interpret. Ownership, areas and quality of the land is listed in detail in associated text pages, sometimes forming minor books.

### **2.5.3 Other handmade maps**

Several other categories of maps were produced during the above periods. Among these are border maps, road maps and “avvittringskartor”, maps made for delimitation of crown land from privately owned land. Of course many of these contain useful information. A large number of small-scale geographical maps were also made like maps of parishes and counties.

### **2.5.4 Early printed maps**

#### **The older economic map “Häradskartan” (judicial district map) 1860 – 1934**

At the time of the Laga Skifte redistribution the local maps were also compiled into hand-drawn so called Sockenkartor (parish maps) in 1:20 000. From 1860 these were replaced by printed maps in 1:20 000 or 1:50 000. As they were published for a judicial district they were named Häradskartan.

The coloured maps are printed in a handy format and give a good view of vegetation, landuse, buildings, communications, borders etc. They have an associated economic-statistical description, which is published in the form of books for every county. The total amount of sheets is about 620.

#### **Generalstabskartan (the ordnance map) 1830 - 1920 (1960)**

From 1805 the production of geographic maps was taken over by the military.

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From 1857 their maps were published as so called Ordnance Maps. The surveying and revision of older sheets went on until 1920, but the map was printed and used into the sixties.

The map, which covers the whole country, is printed in black and white and shows nature geography (with altitudes), buildings, roads and general landuse. The scale is 1:100 000 for southern Sweden and the coastland of northern Sweden. The inner parts of northern Sweden are mapped in 1: 200 000. The total amount of sheets is about 1500.

### **Ekonomiska kartan (the economic map) 1937 - 1973**

From 1937 a new large-scale map based on aerial photography was produced in 1:10 000 and in the inner parts of northern Sweden in 1:20 000 in format 50x50 centimetres. It covers most of Sweden except the mountain areas. The total amount of sheets is about 13000.

The map focuses on landuse and ownership and is quite detailed with property registration designations, indications of heights, arable land, names of places, forests, official and private buildings, both dwellings and outhouses, all presented on top of an aerial photo. The first edition was finished in 1973. (After that, revised versions have been produced with partly different content, design and scale.)

The economic map has had a basic role in the building of the Swedish society. It has been used for environmental and physical planning, as well as served as a base for the cadastral index map in the countryside. In research the economic map is an invaluable link between the old agrarian Sweden and the modern society, as it contains both traditional and recognisable modern features. The maps made until 1950 show the landscape when farming was as most important, the following years they demonstrate its decline.

Today the printed version is almost out of stock, although there still is some demand for it on the market.

## **2.6 Access to Swedish historical maps**

The early handmade maps are sometimes still to be found at the farmsteads, but generally the remaining maps are kept in the NLS central archives in Gävle (180 km north of Stockholm) or in regional archives.

**The central archives** contains approximately 217 000 handmade maps from 1628 to 1973. They can be found through a register based on county, parish and name of the village. The register is today also available digitally (Access 2.0 and Oracle) but this register is not yet public or for sale. There are also around 60 000 printed maps.

The early geometrical maps are not normally available for protection reasons. Instead microfilmed copies of varying quality can be obtained. The other and later maps can be studied in the visitors room at the archives.

It is possible to buy photos or scanned pictures of almost any map and also to buy facsimiles printed on paper. The prize for diapositives is about 70 ECU and the double

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for a facsimile. Delivery-time is usually several weeks. Photocopies are not made as this may damage the maps.

It can be mentioned that the maps can sometimes be in poor condition and the effects of repeated modern use is a definite threat to the material. There is of course ongoing conservation, but unfortunately not enough to counter the decay.

The **regional archives**, situated at the county administrations, contain more than two million maps of which many have historical interest. The regional archives can be visited; one can take own photos and even sometimes photocopies of handmade maps.

Other archives of importance are the War archives, the Royal Library and the National Archives. Maps are sometimes also available at county museums at universities or in private archives. None of these sources will however be used in the DHM project.

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### 3 Report on the user survey

#### 3.1 Method

According to the project description the task was to “identify user needs and requirements with regard to availability, functionality and quality”. This led to several questions that had to be reflected on, such as:

- How many people should and could we ask? How should we choose our “users”? The choice would obviously influence the answers that we get and the validity of the survey.
- Which form should the questions have?
- Which questions should be asked?
- How shall people express their need for a material that they have yet not seen?
- Which national modifications would be necessary or desirable?

##### 3.1.1 User sample and representation

###### User categories

In the project description five main user categories are identified:

- government agencies
- planners and developers
- education and research
- local history groups
- multimedia industry

The borders between the groups are however not always easy to apply to the factual conditions. This goes especially for the groups *government agencies* versus *planning*. Planning is done by private professionals and consultants but mainly by government agencies on national and county levels and by municipal authorities.

The border between *education* and *government agencies* is also sometimes hard to maintain, as heritage authorities have evident interests in education. The work by the *education associations* often coincides in scope and ambition to that of *local history groups*. It should also be remembered that the interviewed persons sometimes gathered their experience and competence by employment or private interest in other user categories than the present.

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For these reasons we have used the category division mainly to make sure that the groups particular aspects are represented in the study. It was however not possible to obtain a strict 1 to 1 relation between person and group and consequently separate the groups in the report. Instead the aim is to point out significant group differences where they are visible.

The hardest category to handle was the multimedia industry. Very few with any interest or knowledge in the historical material could be found.

### Representation

The number of people each user category represents is not known and hard to estimate. The knowledge in each user group also differs. As always in IT-related surveys it is also hard to estimate the changes in size of the potential future user groups.

Some interviewed people answered for themselves, while other represent organisations with thousands of members or had other knowledge of large groups.

This meant that we were not able to gather data that statistically represented the factual number of users, today or in the future. Instead we limited our aims to getting each user groups aspects represented in the study. The answers therefore not be treated quantitatively, but will have to be interpreted in a qualitative way, as useful information for each user group.

### Number of interviews

According to the project description the information should be gathered by interviews. This limited the number of people that could answer our questions. In Denmark some of the persons got the questionnaire by post or mail and answered it writing.

All in all 32 persons answered the questions, eight from Denmark, ten from Germany and fourteen from Sweden. The distribution between user groups are presented in the national surveys, appendix 3-5.

#### 3.1.2 The questions

##### Development of the questionnaire

To obtain a structure for the interviews, a detailed questionnaire was elaborated (see below) but the interview situation also enabled follow-up questions and explanations. This was valuable as our potential users include experts as well as novices. The interviews normally took between 40 minutes and an hour.

The outlay of the questions was discussed on project meetings revised on E-mail. We ended up with around 50 questions in two parts. The first part deals with the users present situation, the second with user reactions to our proposed product. The aim was to facilitate the distinction between existing demands and (hopefully) enthusiastic comments on the new possibilities.

It was agreed upon that although the maps have notable differences in content and comprehensibility, the same questions would be used. However follow-up questions could be used to understand the specific conditions.

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### Structure and content of the questionnaire

The questions started with the use of historical geographic information as such. The interview then lead on to historical maps and the present knowledge and use of it. It is essential that we understand which aspects of information one uses in the maps, in order to give our product the desired quality.

In the second part we presented our concept for the coming product, demonstrated examples of digital products and received comments and attitudes from our potential users. From a principle point of view this part was somewhat problematic, as the demo-material forestalls the final product, which in its turn should be designed according to our user study. The problem was partly avoided by mentioning different levels or concept variations.

It was also considered important that we focused on the material and the access as such, and not confuse our clients with details on interface design etc..

To sum up:

#### Present knowledge, needs and demands.

- Use of, and interest in historical landscape information
- Present knowledge of the historical map material
- Demands on quality and contents today

#### What would the DHM concept imply for the user?

- Does the DHM concept give new user possibilities?
- Demands and requirements on quality and contents
- Demands and requirements on search possibilities
- Demands and requirements on technique and accessibility
- Willingness to pay for the information
- Thoughts on future products and possible developments

## 3.2 Results of the WP1 user survey

The text below reflects and combines the results of the national interview surveys. The general trends and views tended to show great similarities. The national reports can be found in appendix 3-5 and of course contain valuable specific information.

### 3.2.1 Use of, and interest in historical landscape information

#### Professionals

Everyone uses historical landscape information in his or her profession. In their work historical maps normally constitute an essential source of information.

Government agencies and planners use historic landscape information in

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- planning and exploitation, facilitating and supporting preservation and conscious changes and development. The importance for nature conservation planning is underlined. Historic maps are also used for understanding town development through times.
- education and service for local inhabitants, explaining the development of their village or neighbourhood in order to promote heritage and nature assets and to achieve a better understanding among the local citizens for agency initiatives.
- distribution of subsidies in the agrarian landscape (Sweden).

In education historical landscape information is used in teaching, courses and lecturing for understanding the history, continuity and change in the surrounding environment and landscape. This interest is shared by local history groups who often study the structure of their villages and the names of fields and users. Research institutions emphasise the information in historical maps of landscape and archaeology related themes.

The historical landscape information is used either continuously or episodically, depending on the nature of the projects. For some people at government agencies the use is regular, sometimes daily. Still the use is still very much dependant on the individual's knowledge In education the intensity varies between full time and intermittent. The multimedia representative only uses the material indirectly.

In Sweden and Denmark the use of historic landscape information in planning is beginning to get standard procedure. It is however still much dependant on the interests and knowledge of individuals. However one foresees a general increase in interest. In education and for history groups the importance is also increasing. In Germany no essential changes in importance of historical landscape information were to be detected. If changes were reported, it was a slight increase in importance

All professionals would appreciate an increased use of the material in the future. At government agencies and in planning and education one hopes that this would increase and promote the caretaking of nature and cultural assets in the environment. Historical maps makes it possible to "read the landscape", understanding the connections and to analyse changes in economy and physical surroundings. Planning and decision making could be based on more and better information, if historical material is taken into account. The historic maps also offer new ways of conveying knowledge. This can further the sense of responsibility among people for ones owns landscape and environment.

### Private users

The interest by local history groups is evident. In the local history movement it is used for research and as material for excursions alone or in-group where one tries to increase the knowledge of the neighbourhood. The use of historical maps makes it possible to recognise oneself and enables people to interpret the physical landscape and use it as a source of information. Instead of looking at interesting points in the landscape one can understand the totality and the connections. Also here an increased environmental awareness is mentioned.

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Some of the professional users also make minor studies privately concerning their property or neighbourhood or sometimes in connection with trips.

### 3.2.2 Present access to historical landscape information

In Denmark the main sources are the maps of KMS, the Royal Library and the National Archives.

In Germany the main source is historical maps, but also additional text if existing.. Older air photographs are used as well. For persons from science the analysis of maps and texts is complemented by fieldwork.

In Sweden government agencies and planners mostly use historical maps but also literature, statistics, manuscripts, registers of owners, taxes or the NHB Ancients Monuments Register.

Interested private users and local history groups gain knowledge by field studies and excursions in combination with literature and historical maps (where available).

### 3.2.3 Present knowledge of the historical map material

All persons were more or less familiar with historical maps except the multimedia representative (Sweden).

Some of the planning professionals had limited education on historical maps. In their university studies the historical maps were sometimes mentioned but rarely used directly. They had mostly learnt by later professional training or by own interest. None of the private users and history groups representatives had education on historical maps. Only those who are dealing with historical maps in the field of science knew them from their education.

### 3.2.4 Present access to the historical map material

In Denmark access is provided by having copies or books, visiting the reading room at KMS.

In Germany most historical maps are stored in archives and libraries and have to be used there. Maps for more recent time layers are to be found at the land survey agencies. It is possible to order copies on paper or slides

An access to the Swedish Matrikel Maps of Pomeranian in the archive (Landesarchiv Greifswald) usually is not possible, but in the Institute of Geography and the University Library it is. The text volumes for all Swedish matrikel maps (including those, which are stored in the Institute of Geography and the University Library) are available in the archive and can be used there.

In Sweden government agencies and planners got access to the material through

- hand-drawn copies from archives such as NLS central and regional archives.
- photo copies (where allowed) from some regional archives.
- ordered diapositives from the NLS
- sometimes through own collections of printed older maps

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- sometimes through CD from the NLS. (This material is a result of a co-operation between the NHB and the NLS, which preceded the DHM project.)

Other professionals involved in planning used

- maps produced by the NHB
- photo copies (where allowed) from some regional archives.
- CD from NHB
- private archive via historical group

Private users and local history groups obtained the material through

- visits and hand drawn copies at NLS central or regional archives
- ordered diapositives
- CD through the NHB landscape project

Material for education was compiled through

- books
- NLS central or regional archives
- photo-copies from regional archives
- facsimiles from the NLS

### 3.2.5 Costs today for accessing the material

Every user has had costs for the material, mainly travel and ordering of diapositives, photocopies, CD or facsimiles. The time-costs obviously depend on if the archives are close to the users. They are not calculated here but are probably substantial. For professional users this is paid by the institution or the client. The budget is however limited. As the government agencies are the most frequent users their costs are the highest.

The costs were hard to estimate and figures were only given by two Swedish users. Vägverket (National Roads Authority) gives a figure, which equals 1000 – 2000 ECU per year.

Svenska Hembygdsförbundet (Swedish Folklore Society) ordered diapositives for the equal of 5.000 ECU per year. Usually however, the costs are quite modest, also for professional users, depending on small budgets.

### 3.2.6 View on the present accessibility

All groups generally find the access unsatisfactory, many even very insufficient. The interview persons were many times very explicit, describing the access as complicated, expensive and very time-consuming. The material itself is normally only to be found in one location and sometimes even there, in the archive, difficult to get access to (especially Germany).

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A very important aspect is that search possibilities are unsatisfactory. It is hard or impossible to know whether the material noted in the register is relevant and should be ordered. Any possibility to look at a simple copy of the map would be welcome. The register structure could also be improved in some aspects.

### 3.2.7 Suggestions for future solutions

All users mention an Internet solution as a basic concept. This would include:

- digital registers for fast search routines
- preview function of the maps for the determination of their relevance
- download and viewing the maps, also giving the ability to print portions of the map.

Several users also mention distribution of maps on CD. Paper copies (larger formats) are still important and could perhaps be sold regionally.

For those not using Internet a printed version of the catalogue volume would be of interest, accompanied by a regional (paper) overview of the mapping coverage.

### 3.2.8 Demands on quality and contents today

Most of the maps information content is relevant and looked at as *often useful* or *essential*.

Land use is generally considered essential for most users. Other physical structures are also very interesting, both manmade and natural. The importance of place names and land ownership differs among the users but are still important information themes.

Access to the separate text pages is usually considered important.

Although the aesthetics and authenticity are of minor importance for a professional analysis, many stress its importance in a later work stage when the material is to be presented.

### 3.2.9 Users view on the potential of DHM concept

#### Professional users

All professional users are convinced of the potential benefits of the DHM concept. The importance is however dependent on the coverage and relevancy of the material made available. The users believe that one could achieve

- easier and quicker search for relevant material.
- easier and quicker access to the maps

For professional users this would mean

- more frequent use
- better service and flexibility.
- higher quality in results

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- improved possibilities to spread knowledge and convince.

One also mentions the benefits of original map preservation.

The DHM concept would give new possibilities in at least three ways:

- New target groups and users. Everybody believes think that the improved access will increase the use of historical maps. The use will spread among professional planners. The latter also foresees a commercial niche in finding and developing maps for others. In education new material will be available for the user group.
- New technical possibilities in analysis, especially the possibility to create semi-transparent layers or using the historical map as a background for own data.
- New presentation possibilities. In the field of landscape planning the DHM concept could help to improve the technical presentation of material and resulting in a better visualisation. At the whole, this could improve the mediation process in landscape planning.

### Private users

For private users, such as local history groups, the interest seems to vary among the countries. In Sweden there is an evident interest, where the users hope to achieve

- easier and quicker search for relevant material.
- easier and quicker access to the maps

The improved availability can lead to

- more efficient research
- easier interpretation
- increased use and interest for ones own district

This also reflects the situation in Denmark. In Germany on the other hand the DHM concept seems be of little interest for private users. Potential private users seem to look more for paper copies than for digital map data.

### 3.2.10 Demands and requirements on quality and contents

In the suggested Internet solution the overview functionality is necessary for most users and considered often important by the rest. The same goes for the zoom functionality, which is considered indispensable for a majority of the users and often useful by the rest. Colour reproduction is not as important for professional users as for instance in education. It is however sometimes useful both for distinguishing the land use and for attractive presentations (as in question 29). Access to the text pages is necessary for most Swedish users and “sometimes or often important and useful” for others.

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A possible alternative to the compressed Internet files is to distribute original quality files on CD. In Sweden a third of the users are interested in buying information on CD while the rest are hesitant or negative. In Denmark and Germany most users were interested in buying CD.

*(Comment: Perhaps this might reflect a higher share of professional users in the interviews)*

The accepted delivery time would be 1-2 weeks for Danish and German customers. In Sweden those who were interested could wait between one and four weeks, with an average of 2,5 weeks.

Another alternative is reproductions on paper or cloth. In Denmark most users were interested in reproductions, while in Sweden and Germany the majority was hesitant or not interested.

### 3.2.11 Demands and requirements on search possibilities

All groups would use both map and register entries, with a slight preference to the map browser. Other search entries mentioned are

- modern property division, municipality and county division
- direct search on place-names
- former and recent village-names
- name of surveyor, mapping year,
- map type
- geographical-chronological register
- road maps as searchable concept

### 3.2.12 Demands and requirements on geo-coding

Only occasional comments from Denmark and Sweden, probably because the material has mostly been used for locally correct overlays, not in a GIS. One educational representative points out the advantages in using the maps in connection with a GPS in field computers on excursions (already in practice).

In Germany, the more common use of GIS by professionals, raises demands for essential parameters for geo-coding (e.g. co-ordinates of map/image corners).

### 3.2.13 Technical resources for receiving and processing the information

Nearly all potential users, that have been interviewed, have access to personal computers with today's standard software. They usually have access to Internet.

Some users in Denmark and most professional users in Germany and Sweden have software for more advanced handling. Many make use of Geographical Information Systems, or could use it in their institution. Commonly used GIS software is ARC/INFO, archive, ATLAS-GIS (Germany) or Map-info (Sweden).

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### 3.2.14 Users technical development of the material

Many users will or plan to develop the material further. This is common with government agencies, but at least in Sweden also with many private users and local history groups as IT-based genealogical research has created a significant technical knowledge.

If the material is to be further developed, it is mainly by geometric correction and GIS application. The aim of these further steps of processing is to overlay selected geographical objects from the historical maps (such as land use and the hydrographical network) with modern topographical maps.

### 3.2.15 Commercial use

Most persons do want to use the material in order to create new products such as illustrations in reports, thematic maps for planning or research. The aim is however not to make commercial use of the maps as such.

One multimedia representative wanted to include and distribute maps in a new product. One planner could imagine using the digital historical maps for the production of brochures and flyers for commercial purposes and advertising.

### 3.2.16 Willingness to pay for the information

The alternatives given were

- web small-scale overview with details missing
- web 1:1 zoom ca 10x10 cm
- web 1:1 whole screen
- CD or tape with full information
- reproduction

The professional users will not pay just for a web overview with details missing, nor the web 1:1 zoom of 10x10 cm. The willingness to pay for the information seems to start with the level 1:1 whole screen, where around half of the users accept costs. Comments are made that only a small amount of money would be paid and that should then include the download of the map. Everybody accepts costs for full information on CD or a reproduction. In Germany a price near today's copy costs would be accepted (between 10 and 30 ECU), perhaps a little bit more.

For private users the answers are the same in Denmark and Sweden. One will not pay for web overview with details missing or 1:1 zoom of 10x10 cm. In Denmark it was a hesitancy to pay for web 1:1 whole seen unless it also could be downloaded. In Sweden half of the private users would pay. Everyone who needed reproduction or CD was prepared to pay for this.

In Germany there is little interest for private use of digital historical maps at all. Due to this result, the willingness to pay here concentrates on paper reproductions at a price of today's copy costs.

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Educational representatives stress the common shortage of money and suggest special user agreements for students.

One might add that the willingness to pay is affected by the associated user rights. These were not decided on at the time of this study. The figures above generally mirror private and professional *ad hoc* use.

### 3.2.17 Useful links to other information that could be included

Suggested links to other sources are (depending on country)

- place-name register
- NHB ancient monuments register and buildings register
- tingsrätternas fastighetsregister (courts property register) from 18:th to 19:th century.
- owner records
- modern real estate register
- genealogical records, “gravebooks” etc.
- register on person names
- the book “Trap” and “Atlas over Danmarks administrative Inddeling”
- references to Danish land redistribution acts and the former cadastre of 1688.
- information on nature protection, nature assets, other restrictions

Related information in the form of “help files” is also suggested, not least by the history groups. Examples of such files could be

- general guide for using and reading the maps
- dialect words
- interpreting handwriting
- translation guide to older measurements
- documents, literature and general information on the historical background of the region
- metadata about the historical maps, other map registers and map catalogues
- institutions working with historical maps and other users of the digital historical maps (user pool)

### 3.2.18 Thoughts on possible future developments and products

Geometrically correct material and semi-transparent overlays are frequently requested but sometimes also vectorised information for GIS analysis. (Some planning consultants commented that geometric correction and overlay production could probably be developed into a business concept.)

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In Denmark there was a demand for an overall register of maps, also covering maps in the National Archives and the Royal Library. In Germany a translation of the associated text volumes of the Swedish matrikel maps was proposed.

### 3.3 Other studies by the Swedish National Heritage Board

For several years the NHB has worked with developing methods for using historical maps in heritage protection. The work has comprised geometric correction, data modelling and the creation of vector data. The reason for this has been a general demand by authorities for historic map information, to be used in both heritage protection and nature conservation.

As a basis for the continued work by the NHB, a Swedish user study was recently carried out among professionals involved in heritage protection and nature conservation. It comprised the administrations and museums of 13 counties, several government agencies and some university institutions.

The survey shows that historic maps are frequently used in several ways and that the use is steadily increasing. However the present handling is considered ineffective and other methods are sought for. There is also a demand for the ability to handle more detailed information than what is normally possible today, when most copying and geometric correction is done by hand. This raises the demand for digital raster data. One also mentions the need for handling the material in a more generalised scale, looking at larger areas. A possible solution to this could be the use of vectorised data.

An important step would be the ability to use digital historic map information in a GIS together with other spatial information. Presently this is only done at two county administrations and two county museums. Otherwise county administrations and government authorities have a high technical standard, using GIS for all kind of planing purposes. Information is standardised and well-known systems are used. Only the lack of suitable material stops them from also using the historic landscape information.

At the museums the use of digital maps and GIS is considerably lower, although several institutions are notable exceptions. An important reason are economic obstacles which stops the museums from acquiring equipment, education and not least the necessary geographic background information. At the universities the knowledge may be high, but the information is seldom standardised among the institutions and different aspects are emphasised. This can make the exchange of data difficult.

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## 4 Comments and conclusions

### 4.1 Present and future use

In all three countries historic landscape information is used by authorities in heritage protection and for nature conservation and restoration. In education historical landscape information is used in teaching, courses and lecturing for understanding the history, continuity and change in the surrounding environment and landscape.

The material itself offers new important ways of conveying knowledge. Historical maps makes it possible to “read the landscape”, understanding the connections and analysing changes in economy and physical surroundings. This can further the sense of responsibility for ones own landscape/environment and thus promoting the development of a sustainable society.

The extent of the use and the future development between the countries does however show some differences mainly due to the varying coverage and interpreting difficulties of the material. One should also note that only a very small part of the German material is considered in this project.

The future use and potential will of course also depend on the extent of maps made available over the Internet. The data acquisition by the DHM project is only a very small percentage of the total amount of maps. Obviously more material will have to be made available before the system can offer practical and systematic solutions for planning authorities and others. The standards and the interface developed by the project will however give the practical distribution possibilities for this, something that has not existed before.

### 4.2 User demands on functionality

The users underline the need for more efficient search methods. Search should be possible both through register and a map browser. As the material lacks co-ordinates, the latter may be problematic.

When it comes to the distribution of the material, an overview of the map is essential. This is needed both as a part of the search process and for getting a general impression of the landscape character.

Obviously this has to be supported by zoom possibilities as the overview rarely allows text and details to be seen. The survey study shows that normal use includes interpretation of land use and landscape elements, often represented by minute details and very thin lines, such as the Swedish “laga skifte” enclosures.

As the users often look at many maps at the same occasion, access must be as quick as possible. The possibility of ordering dia-positives or CD-files already exists, but takes time. To be advantageous the DHM project must provide something else, such as a tile-type zoom solution where screen-sized portions of the maps can be downloaded and viewed. This technique already exists. By only accessing smaller portions of the map at the time file sizes can be kept down and still allow a detailed picture. One avoids a time-consuming download of the whole map, which is not

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always necessary for the user. Full colour resolution is however not as necessary at this level, but is more used in professional presentations. For this purpose and for creating geometric correct material the whole file can be delivered as full information on CD.

The conclusion of this is that the material should be stored in three *quality levels*:

- Small compressed file: Overview on whole map.
- Larger compressed file where all details are visible. Important for users with PC who can not process large file sizes.
- Full information: Mainly for information development. Normally to be delivered on CD, The full information can also be reproduced on paper.

Finally there is a view that the maps would gain more efficient and widespread use if some kind of help-files could be linked to them. Suggestions so far include themes like

- general guide for using and reading the maps
- help files for dialect words, older measurements and other text translations
- metadata and links to other sources

Producing such material is well in line with the ambitions of for instance the NHB.

### 4.3 Willingness to pay

The results of the survey show that users will not pay anything for a map overview and only sometimes pay for viewing parts of the map. On the other hand there is a total acceptance of paying for CD or printed copies. The cost levels are however not mentioned.

The issue was unfortunately not possible to examine in full detail in this study, as the user rights, necessarily associated with a transaction of this kind, could not be specified by the project. The extent of the user rights will of course influence the willingness to pay.

### 4.4 Comments on implications for WP 5.

The task of WP5 is primarily to develop copyright issues and procedures for charging (though not the amounts). One shall however also decide upon access levels of the material and which levels should be charged or free. Already in the project description for WP5 though, a division into three quality levels is proposed along with suggestions for charging. The information content of each level is however left undefined, with the exception of level three that prescribes “print-quality”, but not for what purpose.

As the DHM project also prescribes an extensive user study, specifically aiming at determining needs, demands and willingness to pay, it seems reasonable to discuss whether these presupposed levels are supported by the outcome of the WP1 user study.

If the proposed division is to be maintained, it means an adjustment of information content in relation to the willingness to pay, which may be seen as a somewhat backward way of defining the levels. To

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make the product interesting in the long run one should perhaps rather look at the information levels mostly needed by the users and then move on to discuss practical solutions in regard of costs for the producer.

As was already mentioned, the WP1 results supports a functionality with *three information quality levels*; These are; small compressed file with overview on whole map, larger compressed file enabling zoom to detail level and finally full information on CD, mainly for information development.

This could perhaps be developed into *three access levels* which might be made to correspond with the proposed WP 5 levels:

- Overview on whole map and zoom to detail level in screen-sized tiles. This will satisfy a large number of non-professional users as well as professionals wanting to gain a quick and good impression of a limited area. No charge.
- Downloading the larger compressed file, enabling certain geometric corrections etc. User rights and charging?
- Full information on CD, mainly for information development. This will satisfy professional users or ambitious amateurs. The full information can also be reproduced on paper. Ordered and charged.

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## Appendix 1:

### *WP1 project description*

**Title:** Survey of user functionality and existing systems.

**Lead partner for this WP:** NHB and Greifswald.

**Initial state, work already done, preconditions for starting tasks, end result expected:**

The project will identify users needs and requirements with regard to availability, functionality and quality. It will further tabulate and analyse existing storage and access systems for historical maps, such as catalogue records, search paths storage technologies and distribution channels.

Users are divided into five main categories: planners and developers, education and research, government agencies concerned with man-made environment issues, the multimedia industry and local history groups. User needs will be identified by means of interviews with users from each category in each country in the consortium. The questions, to be structured as a questionnaire, will deal with search paths into the material, functionality requirements, frequency of use, readiness to pay, quality requirements, the need for links to other information etc.

The user needs will be verified at a workshop with the members of the smaller reference group (see WP8). The report from this WP will be circulated to the larger reference group (see WP8). These reference groups will then continue to monitor the ongoing work of the project.

Use will be made of existing studies from the NHB on users need for historical maps as a planning resource and existing prototype at NHB for sorting one "Geometric Land Book".

Previous studies, as well as existing specifications for data acquisition and a report on technical resources at the NLS, will also be used. Information about the partners existing systems will be gathered through study visits to each country, interviews with archive and IT managers, and the collection of existing documentation. In addition, the managers of similar systems in countries outside the consortium will be contacted, e.g. the management of historical maps by the Ordnance Survey.

The work will result in a report specifying requirements and needs. The report will also contain a tabulation and analysis of existing systems relating to catalogues, search paths, storage technologies and distribution channels. The analysis will take into account future developments, functionality, compatibility and costs.

**Tasks:**

Identification of users needs and their requirements with regard to availability, functionality and quality. Tabulation and analysis of existing systems for storage and accessing of historical maps.

**Management 1,5 mm, Technical 1 mm, marketing 4 mm, other 5,5 mm.**

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## Appendix 2:

### *Questionnaire*

#### *Part 1: Present knowledge, needs and demands.*

##### **Use of, and interest in historical landscape information (not only from maps)**

1. Do you make use of historical landscape information in your profession?
  2. In what way?
  3. How often?
  4. *If not*: why not?
5. Will historical landscape information change in importance in your profession/field? 6. Which changes or developments would be desirable?
  7. Why?
8. Do you make use of historical landscape information privately?
  9. In what way?
  10. How often?

##### **Present knowledge of the historical map material**

11. Which are your sources to historical landscape information
12. Are you familiar to historical maps?
13. Have you been using historical maps professionally?
  14. In what way?
  15. How often?
  16. *If not*: why not, which obstacles occur?
17. Did you use historical maps in your education?
  18. In what way?
  19. How often?
20. Have you been using historical maps privately?
  21. In what way?
  22. How often?

##### **Present access to the historical map material**

23. How did you get access to the maps and the map information?

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24. What is your view on the present accessibility?
25. How should the accessibility be organised? Suggestions and ideas?
26. Have you already had costs for this kind of information?
27. Type of costs?
28. How much?

### **Demands on quality and contents today**

29. Which information in the maps do you mainly use?

30. Which is the importance or usefulness of:

- |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| a. Land use, land use division  |   |   |   |   | 1 | 2 | 3 | 4 |
| b. Ownership and ownership division   |   |   |   |   | 1 | 2 | 3 | 4 |
| c. Administrative division.   | 1 | 2 | 3 | 4 |   |   |   |   |
| d. Names  |   |   |   |   | 1 | 2 | 3 | 4 |
| e. Roads  |   |   |   |   | 1 | 2 | 3 | 4 |
| f. Rivers and shorelines  |   |   |   |   | 1 | 2 | 3 | 4 |
| g. Buildings  |   |   |   |   | 1 | 2 | 3 | 4 |
| h. Other physical features (wells, monuments, ponds, bridges, stonewalls etc) |   |   |   |   | 1 | 2 | 3 | 4 |
| i. Colour reproduction and information through colour coding?                 |   |   |   |   | 1 | 2 | 3 | 4 |
| j. Text information on the map?   |   |   |   |   | 1 | 2 | 3 | 4 |
| k. Text in associated text pages?   |   |   |   |   | 1 | 2 | 3 | 4 |
| l. The map as a piece of art (aesthetic values)                               |   |   |   |   | 1 | 2 | 3 | 4 |
| m. The map as historical object (impression of authenticity)                  |   |   |   |   | 1 | 2 | 3 | 4 |

*1 = no or little importance*

*2 = sometimes important or useful*

*3 = often important and useful*

*4 = necessary*

*(The aim of question 30 is primarily to adjust technical specifications so that the desired information is reproduced in an adequate way.)*

### ***Part 2: What would the DHM concept imply for the user?***

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(The interviewer gives a description of the DHM concept and demonstrates a selection of possible products.)

### **Does the DHM concept give new user possibilities?**

31. Would the DHM concept be of use in your profession/field?

32. In what way?

33. How often?

34. Do you foresee new possibilities in your field?

35. Would the DHM concept be of interest for you as private user?

36. In what way?

37. How often?

38. Do you foresee new possibilities in your field of interest?

### **Demands and requirements on quality and contents**

39. If the maps are to be distributed over the Internet, the information must be reduced due to technical limitations. How do you judge the importance of the following aspects?

- |  |   |   |   |   |
|--|---|---|---|---|
| a. Possibility to zoom to full resolution            | 1 | 2 | 3 | 4 |
| b. Overview of the whole map (with lower resolution) | 1 | 2 | 3 | 4 |
| c. Colour reproduction                               | 1 | 2 | 3 | 4 |
| d. Access to associated text pages                   | 1 | 2 | 3 | 4 |

40. Are you interested in original quality files, distributed on tape or CD?

41. Which are your demands on delivery time?

42. Are you interested in reproductions, distributed on paper or cloth?

### **Demands and requirements on search possibilities**

43. Which entries would you like to use when you look for accessible maps?

44. Map browser?

45. Register based on parish and village division?

46. Other solutions?

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### **Demands and requirements on technique and accessibility**

47. Which (kind of) technical resources do you have today for receiving and processing geographic information?

48. Is the material to be further developed?

49. Image processing?

50. Geometric correction?

51. GIS application?

52. Other?

53. How important is geo-coding?

54. Which are your demands on geocoding?

### **Willingness to pay for the information**

*Professional users:*

55. Which quality levels of information are you prepared to pay for?

(If possible estimate how much?)

1. web overview with details missing,

2. web1:1 zoom ca 10x10 cm

3. web 1:1 whole screen

4. CD or tape with full information

5. reproduction)

*Private users:*

56. Which quality levels of information are you prepared to pay for?

(If possible estimate how much?)

1. web overview with details missing,

2. web1:1 zoom ca 10x10 cm

3. web 1:1 whole screen

4. CD or tape with full information

5. reproduction on paper or cloth

### **Commercial use**

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57. Do you use the material to create new products?

**Thoughts on future products and possible developments**

58. Which features would you like to have if the DHM concept was further developed?

Examples:

geometrically corrected maps,

semi-transparent overlays on modern material

vectorised information for GIS analysis

3D applications

59. What links to other information would be useful?

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## Appendix 3

### *Danish user study*

#### **Use of, and interest in historical landscape information (not only from maps)**

##### **1. Do you make use of historical landscape information in your profession?**

Everyone did, but the extent differed considerably.

##### **2. In what way?**

Government agencies used the information in planning, in providing legal background for preservation. It could also be used for reconstruction of streams. It was used as a means to make better understanding among the local citizens for agency initiatives.

Research institutions emphasise the information in historical maps of landscape and archaeology related themes.

Local historians mention the structure of villages and the names of fields and users.

##### **3. How often?**

Except for the government agencies the use of historical maps is sporadic, usually linked to certain investigations. It is still very much dependant on the individual's knowledge.

##### **5. Will historical landscape information change in importance in your profession/field?**

An increase is expected in planning, local history and family history.

##### **6. Which changes or developments would be desirable?**

Any kind of better access would be welcome.

##### **8. Do you make use of historical landscape information privately?**

Most people do, but very little.

##### **9. In what way?**

In connection with trips or research of one's property.

#### **Present knowledge of the historical map material**

##### **11. What are your sources to historical landscape information.**

Mostly the maps of KMS, Royal Library and from books.

##### **12. Are you familiar to historical maps?**

Everyone was familiar, but to very varying degrees.

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### **13. Have you been using historical maps professionally?**

As in question 12.

### **14. In what way?**

Landscape analysis, town development through times, foundation of thematic maps, finding and identification of places.

### **17. Did you use historical maps in your education?**

Very few did, although one used it a lot for his thesis. Most historians have learnt by doing.

### **23. How did you get access to the maps and the map information?**

By having copies or books, visiting the reading room at KMS.

### **24. What is your view on the present accessibility?**

All groups find the accessibility unsatisfactory. They can only be found in Copenhagen, and it is not possible to determine in advance whether the maps will be useful. Better search registers and the possibility to see the map in advance (even a poor copy) would be useful.

### **25. How should the accessibility be organised?**

An internet solution is generally recommended. Also is emphasis put upon search registers. The possibility to see maps on the screen and to get copies from the net.

### **26. Have you already had cost for this kind of information?**

Everyone has had cost, but to different degrees. Most at the professional users at the government agencies.

### **27. Type of costs?**

For government agencies it has mostly been money, at the distance to the archives is not great. The other users spend both time and money. Travel time takes a lot.

### **28. How much?**

Only few users gave an amount, and it was hard to use, as they were not the sole users in their institutions.

## **Demands on quality and contents today**

### **29. Which information in the maps do you mainly use?**

The answers were very spread. Planners and to some degree archaeologists stress the importance of land use (field, meadow, wood), whereas other mention buildings or name themes. It depends much upon who you are, what is presently your need and what kind of map you want.

### **30. Which is the importance or usefulness of:**

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		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
a. land use		1	1	2	4
b. ownership		0	2	4	2
c. administrative division		1	0	0	7
d. names	0	2	3	3	
e. roads		0	1	5	2
f. rivers and shorelines		0	3	0	5
g. buildings		0	2	3	3
h. other physical features		0	2	3	3
i. colour reproduction		0	3	2	3
j. text information on the map		0	3	2	3
k. text in associated pages		1	1	3	3
l. the map as a piece of art		4	4	0	0
m. the map as historical object		0	1	0	7
n. height equidistances		1	1	4	3

### **Does the DHM concept give new user possibilities?**

#### **31. Would the DHM concept be of use in your profession/field?**

Yes. The problem will be of search possibilities and the material made available.

#### **32. In what way?**

Better knowledge of what exists - it will be used because it is easy to find. And better use in products.

#### **33. How often?**

It differs much, professional users see an urgent need, the others will have to get used to it.

#### **34. Do you see new possibilities in your field?**

New target groups. Use in education, especially the possibility of semi-transparent layers or to be able to shift between layers. Using the historical map as a background for own data.

#### **35. Would the DHM concept be of interest for you as private user?**

Little, but yes.

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### **Demands and requirements on quality and contents**

**39. If the maps are to be distributed over the internet, the information must be reduced due to technical limitations. How would you judge the importance of the following aspects?**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
a. possibility to zoom to full resolution	0	1	2	5
b. overview of the whole map	0	2	4	2
c. colour reproduction	1	2	3	2
d. access to associated text area	1	1	4	3

The tendency to prefer overview tended to be preferred by the least experienced users. Some of the experienced users indicated that the overview was needed for orientation, so the difference may not be as great as the numbers indicate. People may not be aware of the problems, especially with larger maps.

**40. Are you interested in original quality files, distributed on tape or CD.**

Most were interested in buying CD.

**41. Which are your demands on delivery time?**

People find today's standard of a week OK, on internet it should be app. 1 minute.

**42. Are you interested in reproductions on paper?**

Most were.

### **Demands and requirements on search possibilities.**

**43. Which entries would you like to use when you look for accessible maps?**

All would like to use both map and register entries. No special preferences as such, but it depends on the map in use.

### **Demands and requirements on technique and accessibility**

**47. Which (kind of) technical resources do you have today for receiving and processing geographic information?**

PC and Internet. Almost all have software for picture handling as Adobe. A few have software for more advanced handling, esp. government agencies.

**48. Is the material to be developed further?**

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Not necessarily.

#### **49-52. How?**

#### **53-54. How important is geo-coding? Which are your demands?**

Not much.

#### **Willingness to pay for the information**

#### **55. Which quality levels of information are you prepared to pay for? (professional users)**

People said no to pay for web overview with details missing and web 1:1 zoom ca 10x10 cm. There was hesitancy to web 1:1 whole screen unless it also could be downloaded. Everyone who needed reproduction would pay for a CD.

#### **56. Which quality levels of information are you prepared to pay for? (private users)**

The answers tended to be the same as in 55.

#### **Commercial use**

#### **57. Do you use the material to create new products?**

Publication in electronic shape, home page, making overlays/possibilities to have several levels of maps. But not much in commercial use as such.

#### **Thoughts on future products and possible developments**

#### **58. Which features would you like to have if the DHM concept was further developed?**

Many answers. Most would like to have an overall register of maps, also covering maps in the National Archives and the Royal Library. Semi-transparent overlays and vectorised files were mentioned by professional users.

#### **59. What links to other information would be useful?**

The book "Trap" and "Atlas over Danmarks administrative Inddeling" were mentioned. Also references to land redistribution acts and the former cadastre of 1688.

Help files e.g. about the value of the map as a historical source were mentioned.

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**Interviewed persons:**

- Gunner Lind, Historical Institute, University of Copenhagen
- Susanne Andersen, Skov- og Naturstyrelsen (government agency dealing with preservation and planning concerning landscape, building and historical monuments)
- Niels Hørlück Jensen, Skov- og Naturstyrelsen
- Niels-Christian Clemmensen, Skov og Naturstyrelsen  
(although they are from the same institution, they cover different educational angels and different working areas)
- Mogens Schou Jørgensen, Rigsantikvarens Arkæologiske Sekretariat (The Secretariat of the Director of the National Museum)
- Asbjørn Hellum, Town and Local Archives of Vejle, also SLA (Association of Local Archives)
- Peter Blumensaadt, Town and Local Archives of Holbæk
- Lise Høyrup, Advisor to Local Archives in the county of West Zealand

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## Appendix 4:

### *German user study*

This part of the report is based on the results of 10 intensive interviews with potential users from these user type categories:

- planning and government agencies (6),
- research (2),
- history and cultural conservation (2).

### *Part 1: Present knowledge, needs and demands.*

#### **Use of, and interest in historical landscape information (not only from maps)**

##### **1. Do you make use of historical landscape information in your profession?**

###### **2. In what way?**

###### **3. How often?**

###### **4. *If not: why not?***

All users already today make use of historical landscape information in their profession. Mainly the map information is used, but to a considerable extent also additional text is of importance, if existing. Sometimes older air photographs are used as well. For persons from science the analysis of maps and texts is complemented by field work.

The historical landscape information is used either continuously or episodically, depending on the projects concerned with.

##### **5. Will historical landscape information change in importance in your profession/field?**

###### **6. Which changes or developments would be desirable?**

###### **7. Why?**

No essential changes in importance of historical landscape information were to be detected. If changes were reported, it was a slight increase in importance, which then was estimated as desirable, because planning and decision making could be based on more and better information, if historical information is taken into account.

##### **8. Do you make use of historical landscape information privately?**

###### **9. In what way?**

###### **10. How often?**

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Most users do not use the historical information privately. If they do, the information is used for a better insight in the history of the own housing place, for the preparation of private journeys, and in one single case as a volunteer for taking care of archaeological sites.

### **Present knowledge of the historical map material**

#### **11. Which are your sources to historical landscape information**

The main source for historical landscape information are historical maps of different age and time levels. The oldest time layer is represented by the Swedish matrikel maps of Pomerania from the end of the 18<sup>th</sup> century, but younger layers are used as well– depending on the region and project under consideration, but to a certain extent also depending on the accessibility and costs of the material. Older air photographs are used as well.

#### **12. Are you familiar to historical maps?**

All persons are more or less familiar with historical maps.

#### **13. Have you been using historical maps professionally?**

##### **14. In what way?**

##### **15. How often?**

##### **16. *If not: why not, which obstacles occur?***

All users make use of historical maps in their profession. If possible, also additional text is used. Maps are analysed for the reconstruction of former landscapes, of landscape changes, of land use changes, and for the surveying of cultural relics in the landscape.

Planners consider historical maps as an important source for their work, e.g. in order to reconstruct the former drainage system, the former distribution of bogs or the disappearance of certain cultural or natural biotope types (e.g. hedges, ponds). They do need this information as a basis for nature conservation planning and landscape planning.

The historical maps are used either continuously or episodically, depending on the nature of the ongoing projects.

#### **17. Did you use historical maps in your education?**

##### **18. In what way?**

##### **19. How often?**

The use of historical maps in education is different. Those, who are dealing today with historical maps in the field of science do know them already from their education and include them in their teaching. Not all of the planners used historical maps in their education, but they have to use the maps now professionally.

#### **20. Have you been using historical maps privately?**

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## **21. In what way?**

## **22. How often?**

Most persons do not use historical maps privately. If they do, the information is used for a deeper look at the history of the village or town, for the preparation of private journeys, and in one single case as a volunteer for taking care of archaeological sites. (cf. question 8)

## **Present access to the historical map material**

### **23. How did you get access to the maps and the map information?**

Most historical maps are stored in archives and libraries and have to be used there. Maps for more recent time layers are to be found at the land survey agencies. It is possible to get copies on paper or slides. Copies have to be ordered, and this seems to be a time consuming process. An access to the Swedish Matrikel Maps of Pomerania in the archive (Landesarchiv Greifswald) usually is not possible, but in the Institute of Geography and the University Library it is. The text volumes for all Swedish matrikel maps (including those, which are stored in the Institute of Geography and the University Library) are available in the archive and can be used there.

### **24. What is your view on the present accessibility?**

The present accessibility is estimated unsatisfactory, partly even very insufficient:

- It is even difficult to get access to the original maps, just in order to look at them in the archive; referring to the Swedish matrikel maps, usually slide or paper copies have to be ordered to get the access in the way wanted; this procedure is estimated as time consuming
- Problems with the search occur, when the user is looking not only for the map of one single village, but for all maps of a certain region or area of interest.
- The procedure of searching and getting access to the information is estimated much too slow. The time span from the start of searching until getting access to the information should be minimised.

### **25. How should the accessibility be organised? Suggestions and ideas?**

As a first step, catalogues should be optimised and transformed to a more modern type, which allows fast search routines. Any kind of publishing of catalogues would be welcome. The best solution of the search problem today would be an Internet based system. This seems to be common sense now. But also a printed version of the catalogue volume would be of interest, completed by a regional overview of the existing map sheets on a paper map. This printed version is important for those having no access to Internet.

### **26. Have you already had costs for this kind of information?**

### **27. Type of costs?**

### **28. How much?**

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All users already have had costs for getting access to the historical map information. Usually these costs are caused from buying copies of the maps (paper or slides). The costs range approximately from 10 to 30 ECU.

### **Demands on quality and contents today**

#### **29. Which information in the maps do you mainly use?**

By all users mainly the map information on land use or landscape structure elements is used.

#### **30. Which is the importance or usefulness of:**

a. Land use, land use division	1	2	3	4
b. Ownership and ownership division	1	2	3	4
c. Administrative division.	1	2	3	4
d. Names	1	2	3	4
e. Roads	1	2	3	4
f. Rivers and shorelines	1	2	3	4
g. Buildings	1	2	3	4
h. Other physical features (wells, monuments, ponds, bridges, stonewalls etc)	1	2	3	4
i. Colour reproduction and information through colour coding?	1	2	3	4
j. Text information on the map?	1	2	3	4
k. Text in associated text pages?	1	2	3	4
l. The map as a piece of art (aesthetic values)	1	2	3	4
m. The map as historical object (impression of authenticity)	1	2	3	4

*1 = no or little importance*

*2 = sometimes important or useful*

*3 = often important and useful*

*4 = necessary*

*(The aim of question 30 is primarily to adjust technical specifications so that the desired information is reproduced in an adequate way.)*

The highest value in most cases is given to land use, roads, rivers and shorelines, buildings, and other physical features. In the middle range comes ownership(-division), text information on the map, names, and colour reproduction. Low values – not in every interview - are given to the map as a

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piece of art. Text in associated text pages is estimated differing, depending on the type of map under consideration. At least for the Swedish matrikel maps of Pomerania from the end of the 18<sup>th</sup> century the importance of the associated text volumes are estimated high.

## ***Part 2: What would the DHM concept imply for the user?***

(The interviewer gives a description of the DHM concept and demonstrates a selection of possible products.)

Does the DHM concept give new user possibilities?

### **31. Would the DHM concept be of use in your profession/field?**

#### **32. In what way?**

#### **33. How often?**

#### **34. Do you foresee new possibilities in your field?**

All users are convinced of the potential benefits of the DHM concept. It is expected to support

- an easier and faster access to the maps at all
- above all: much faster search routines
- also: more comfortable procedures for search
- hopefully: more complete results of the search
- and: better preservation of the map originals, when using digital maps or paper copies of dig. maps

The potential use would in most cases be periodical, in some cases episodic ("if required"), in one case continuous.

New technical possibilities are foreseen, if it would be possible to import map data into other applications, e.g. text processing, computer cartography and digital map production. This applies, above all, to the field of planning. Here an improved and fastened technical handling of map data could also lead to an improvement of the planning work, because less time would have to be spent on getting access to the historical map material, and more time could be spent on working with the contents of the maps themselves.

In the field of landscape planning it is expected, that the DHM concept could help to improve the technical presentation of material and results and lead to a better technique of visualisation on the spot. At the whole, this could improve the mediation process in landscape planning.

### **35. Would the DHM concept be of interest for you as private user?**

#### **36. In what way?**

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### 37. How often?

### 38. Do you foresee new possibilities in your field of interest?

As a result of the interviews, which have been carried out until now, the DHM concept would be of little interest for private users. If there is an interest at all, it is at a low level. Potential private users seem to look more for paper copies than for digital map data.

### Demands and requirements on quality and contents

**39. If the maps are to be distributed over the Internet, the information must be reduced due to technical limitations. How do you judge the importance of the following aspects?**

<b>a. Possibility to zoom to full resolution</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>b. Overview of the whole map (with lower resolution)</b>			<b>1</b>	<b>2</b>
<b>c. Colour reproduction</b>			<b>1</b>	<b>2</b>
<b>d. Access to associated text pages</b>			<b>1</b>	<b>2</b>

The most important feature seems to be a possibility to zoom to full resolution of the map raster data. It is followed by a feature that allows an overview of the whole map with lower resolution. Both aspects usually are estimated „necessary“ (4). The aspects of colour reproduction and access to associated text pages in most cases have been estimated as „sometimes or often important and useful“ (2,3).

### **40. Are you interested in original quality files, distributed on tape or CD?**

### **41. Which are your demands on delivery time?**

Nearly every potential user is interested in original quality files, which should be distributed on CD within 1-2 weeks.

### **42. Are you interested in reproductions, distributed on paper or cloth?**

Most (but not all) of the potential users, that have been asked until now, are not interested in map reproductions on paper or cloth. But again, reproductions (on paper) are valuable for persons who don't have access to computer resources.

### Demands and requirements on search possibilities

### **43. Which entries would you like to use when you look for accessible maps?**

#### **44. Map browser?**

#### **45. Register based on parish and village division?**

#### **46. Other solutions?**

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The most useful tool for the search would be a map browser, but several potential users also want a digital register that is based on villages names. Both, former and recent names should be included in such a register data bank. In one case it was proposed to distribute these register data not exclusively via Internet, but also on CD.

### **Demands and requirements on technique and accessibility**

#### **47. Which (kind of) technical resources do you have today for receiving and processing geographic information?**

Nearly all potential users, that have been interviewed, do have access to personal computers with today's standard software (MS office). They usually have access to Internet. Most of them make use of Geographical Information Systems, or could use it in their institution. If GIS software is used, it is ARC/INFO, ArcView or ATLAS-GIS. Not frequently used is sophisticated image processing software (e.g. ERDAS Imagine).

#### **48. Is the material to be further developed?**

##### **49. Image processing?**

##### **50. Geometric correction?**

##### **51. GIS application?**

##### **52. Other?**

If the material is to be further developed, it is mainly by geometric correction and GIS application. The aim of these further steps of processing is to overlay selected geographical objects from the historical maps (e.g. land use and the hydrographical network) with modern topographical maps. Today this is often done manually on paper maps, but if digital historical maps would be available, it is wanted to do it with help of GIS technique.

#### **53. How important is geo-coding?**

#### **54. Which are your demands on geo-coding?**

Due to the answers to questions 48-52, geo-coding is very important for the majority of potential users. The aim of geo-coding is map overlay with recent topography. Therefore, the demands on the wanted product include rectified map images in a standard data format (tif, jpeg, ...) together with essential parameters for geo-coding (e.g. co-ordinates of map/image corners).

### **Willingness to pay for the information**

#### ***Professional users:***

#### **55. Which quality levels of information are you prepared to pay for?**

**(If possible estimate how much?)**

##### **1. web overview with details missing,**

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2. web1:1 zoom ca 10x10 cm
3. web 1:1 whole screen
4. CD or tape with full information
5. reproduction

None of the potential users wants to pay just for a web overview with details missing or a web 1:1 zoom 10x10 cm. The willingness to pay for the information seems to start with level 3: web 1:1 whole screen, but not in every case; if so, just a small amount of money would be paid. For the full information on CD (not on tape), a price near today's copy costs would be accepted (between 10 and 30 ECU), perhaps a little bit more.

*Private users:*

**56. Which quality levels of information are you prepared to pay for?**

(If possible estimate how much?)

1. web overview with details missing,
2. web1:1 zoom ca 10x10 cm
3. web 1:1 whole screen
4. CD or tape with full information
5. reproduction on paper or cloth

There is little interest for private use of digital historical maps at all. Due to this result, the willingness to pay here concentrates on paper reproductions at a price of today's copy costs.

**Commercial use**

**57. Do you use the material to create new products?**

Most persons do want to use the material in order to create new products, e.g. new thematic maps for planning and research. But this is looked at not as a „commercial“ use. There was just one person (a planner), who could imagine to use the digital historical map material for the production of brochures and flyers for commercial and advertising purposes.

**Thoughts on future products and possible developments**

**58. Which features would you like to have if the DHM concept was further developed?**

- Examples:**
- geometrically correct maps,
  - semi-transparent overlays on modern material
  - vectorised information for GIS analysis
  - 3D applications

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Here mainly geometrically correct maps and vectorised information for GIS analysis have been pointed out. There was no interest in 3D applications.

With respect to the Swedish matrikel maps, a translation of the associated text volumes into German language was proposed.

### **59. What links to other information would be useful?**

Here the following items have been mentioned:

- Other map catalogues
- Metadata about the historical maps
- Institutions concerned with historical maps
- Some general information about the historical background of the region
- Other users of the digital historical maps (user pool)

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## Appendix 5:

### *Swedish user study*

#### Use of, and interest in historical landscape information (not only from maps)

##### 1. Do you make use of historical landscape information in your profession?

Everyone uses historical landscape information except the multimedia representative who only needs it indirectly.

##### 2. In what way?

Government agencies and planners use historic landscape information in

- planning and exploitation, facilitating preservation and conscious changes and development. The importance for nature preservation planning is underlined
- distribution of subsidies in the agrarian landscape.
- education and service for local inhabitants, explaining the development of their village or neighbourhood in order to promote heritage and nature assets.

Architects mention

- gaining experience of functional aspects in the environment
- consciousness on historical continuity
- inspiration.

In education historical landscape information is used in teaching, courses and lecturing for understanding the history, continuity and change in the surrounding environment and landscape.

##### 3. How often?

For some people at government agencies the use is regular, sometimes occurring every day. In education the intensity varies between full time and intermittent. The interviewed architects use historical maps about every second month.

##### 5. Will historical landscape information change in importance in your profession/field?

At many county authorities the use of historic landscape information is beginning to get standard procedure. It is however still partly depending on the interests and knowledge of individuals. One foresees a general increase in interest for planning. In education and for private studies the importance is also increasing. No visible trend in architecture.

##### 6. Which changes or developments would be desirable?

Everybody would appreciate an increase.

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## 7. Why?

At government agencies and in planning and education one hopes to promote the caretaking of nature and cultural assets in the environment. Authorities especially point out the agrarian landscape. The material itself offers new ways of conveying knowledge. Historical maps makes it possible to “read the landscape”, understanding the connections and analysing changes in economy and physical surroundings. This can further the sense of responsibility for ones own landscape/environment.

## 8. Do you make use of historical landscape information privately?

The interest of local history groups is evident. Some of the professional users also make minor studies privately, preferably their own neighbourhood.

## 9. In what way?

In local history movement it is used for research and as material for excursions alone or in-group where one tries to increase the knowledge of the neighbourhood. The use of historical maps makes it possible to recognise oneself and enables people to interpret the physical landscape and use it as a source of information. Instead of looking at interesting points in the landscape one can understand the totality and the connections. Also here an increased environmental awareness is mentioned.

## 10. How often?

-

## Present knowledge of the historical map material

### 11. Which are your sources to historical landscape information?

Government agencies and planners mostly use historical maps but also literature, statistics, manuscripts, registers of owners, taxes or the NHB Ancients Monuments Register.

Interested private users and local history groups gain knowledge by field studies and excursions in combination with literature and historical maps (where available).

### 12. Are you familiar to historical maps?

Everyone was familiar to historical maps except the multimedia representative.

### 13. Have you been using historical maps professionally?

Everyone had in some way used historical maps except the multimedia representative who was planning to do so.

### 14. In what way?

As in question 2

### 15 How often?

As in question 3

### 16. If not, why not

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### **-17. Did you use historical maps in your education?**

The professionals sometimes had limited education on historical maps, and mostly had learnt by later professional training or by own interest. None of the private users and history groups representatives had education on historical maps.

### **18. In what way?**

In university studies the historical maps were sometimes mentioned but rarely used directly.

### **19. How often?**

-

### **20. Have you been using historical maps privately?**

As in question 8

### **21. In what way?**

As in question 9

### **22. How often?**

-

### **Present access to the historical map material**

### **23. How did you get access to the maps and the map information?**

Government agencies got access to the material through

- diapositives or CD
- drawing and copying at archives (such as NLS central and regional archives or the War Archive)
- sometimes through own collections of printed older maps

Other professionals involved in planning used

- maps produced by the NHB
- photocopies made at from regional archives
- CD from NHB
- private archive via historical group

Private users and local history groups obtained the material through

- visits at NLS central or regional archives
- diapositives
- CD through the NHB landscape project

Material for education was compiled through

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- books
- National Land Survey central or regional archives
- photo-copies from regional archives
- facsimiles

#### **24. What is your view on the present accessibility?**

All groups generally find the access unsatisfactory. The interview persons were many times very explicit, describing it as complicated, time-consuming and expensive. An important aspect is that not only the maps themselves are difficult to get hold of. The search possibilities are unsatisfactory and it is hard to know whether the material in the register is relevant and should be ordered.

#### **25. How should the accessibility be organised? Suggestions and ideas?**

An Internet solution is generally recommended, also giving the ability to print portions of the map. Paper copies are important and could perhaps be sold regionally. Several users also mention distribution of maps on CD.

#### **26. Have you already had costs for this kind of information?**

Everyone has had costs for the material. For professional users this is paid by the institution or the client. The budget is however limited.

#### **27. Type of costs?**

Mainly travel and ordering of diapositives, photocopies, CD or facsimiles

Time-costs are not calculated here but are probably substantial.

#### **28. How much?**

The costs were hard to estimate and figures were only given by two users:

- Vägverket (National Roads Authority) gives a figure, which equals 1000 – 2000 ECU per year.
- Svenska Hembygdsförbundet (Swedish Folklore Society) ordered diapositives for the equal of 5.000 ECU per year.

Usually however, the costs are quite modest, also for professional users, depending on small budgets.

### **Demands on quality and contents today**

#### **29. Which information in the maps do you mainly use?**

Most of the maps information content is relevant to the users and looked at as *often useful* or *essential*. An exception is the shorelines whose value suffers from limited accuracy. Land use, roads and buildings are considered essential for almost everyone. Other physical structures are also

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interesting, both manmade and natural, while administrative dimensions like ownership is used mainly in education and by history groups.

The importance of names and information text differs among the users. Access to the separate text pages is often considered important.

Although the aesthetics and authenticity are of minor importance for a professional analysis, many stress its importance in a later work stage when the material is to be presented.

### 30. Which is the importance or usefulness of:

	no or little importance	sometimes important or useful	often important or useful	necessary
a. Land use, land use division	1	1	2	10
b. Ownership and ownership division	1	3	6	4
c. Administrative division.	2	1	3	7
d. Names	1	3	2	8
e. Roads	0	0	4	10
f. Rivers and shorelines	1	2	6	4
g. Buildings	0	0	4	10
h. Other physical features (wells, monuments, ponds, bridges, stonewalls etc.)	1	0	3	9
i. Colour reproduction, info. through colour coding	1	2	6	4
j. Text information on the map	0	5	3	7
k. Text in associated text pages	1	2	2	8
l. The map as a piece of art (aesthetic values)	3	7	2	1
m. The map as historical object (impression of authenticity)	3	3	4	1

### Does the DHM concept give new user possibilities?

#### 31. Would the DHM concept be of use in your profession/field?

Yes, definitely. The importance is however dependent on coverage and relevancy of the material made available.

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### **32. In what way?**

The users believe that it can give

- easier and quicker search for relevant material.
- easier and quicker access to the maps

For professional users this means

- increased own knowledge
- better service and flexibility.
- improved possibility to spread knowledge.
- more frequent use
- higher quality products which make it easier to convince.

### **33. How often?**

Hard to estimate, but the use would be frequent.

### **34. Do you foresee new possibilities in your field?**

Government agencies believe in new target groups and users. Other professionals think that the improved access will increase the use of historical maps. The latter also foresees a commercial niche in finding and developing maps for others. In education new material will be available for the user group.

### **35. Would the DHM concept be of interest for you as private user?**

Varying answers, mostly yes.

### **36. In what way?**

The users believe that it can give

- easier and quicker search for relevant material.
- easier and quicker access to the maps

For private users and local history groups the improved availability can lead to

- efficient research
- easier interpretation
- increased use and interest for ones own district

### **37. How often?**

When possible

### **38. Do you foresee new possibilities in your field of interest?**

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### Demands and requirements on quality and contents

**39. If the maps are to be distributed over the Internet, the information must be reduced due to technical limitations. How do you judge the importance of the following aspects?**

	no or little importance	sometimes important or useful	often important or useful	necessary
a. Possibility to zoom to full resolution	0	0	5	8
b. Overview of the whole map	0	0	0	14
c. Colour reproduction		1	6	5
	2			
d. Access to associated text pages	1	2	2	7

It is evident that the overview function is vital for all users. The zoom functionality is considered indispensable for a majority of the users and often useful by the rest. Colour reproduction is not as important for professional users as for instance in education. It is however useful both for distinguishing the land use and for attractive presentation (also see question 29). Access to the text pages is necessary for most users.

### **40. Are you interested in original quality files, distributed on tape or CD?**

A third of the users are interested in buying information on CD while the rest are hesitant or negative.

### **41. Which are your demands on delivery time?**

For those interested the delivery time generally varies between one and four weeks with an average of 2,5 weeks.

### **42. Are you interested in reproductions, distributed on paper or cloth?**

A third of the users are interested in buying reproductions while the rest are hesitant or negative.

### Demands and requirements on search possibilities

### **43. Which entries would you like to use when you look for accessible maps?**

All groups would use both map and register entries, with a slight preference to the map browser.

### **46. Other solutions?**

Other search entries mentioned are

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- modern property division, municipality and county division
- direct search on place-names
- name of surveyor, mapping year,
- map type
- geographical-chronological register
- road maps as searchable concept

### **Demands and requirements on technique and accessibility**

#### **47. Which (kind of) technical resources do you have today for receiving and processing geographic information?**

Most users have PC, some (also) have Mac.

#### **48. Is the material to be further developed?**

Half of the users will or plan to develop the material further.

#### **49-52 How?**

Mainly attempts to make the material geometrically correct and produce overlays. This is common with government agencies but also with many private users and local history groups

#### **53. How important is geo-coding?**

#### **54. Which are your demands on geocoding?**

Only occasional comments, probably because the material is mostly used for locally correct overlays, not in a GIS. One educational representative points out the advantages in using the maps in connection with a GPS in field computers on excursions (already in practice).

### **Willingness to pay for the information**

#### **55. Which quality levels of information are you prepared to pay for? (professional users)**

<i>web overview with details missing</i>	generally no or hesitant
<i>web 1:1 zoom ca 10x10 cm</i>	generally no or hesitant
<i>web 1:1 whole screen</i>	half of the users yes, the rest no or hesitant
<i>CD or tape with full information reproduction</i>	yes (for all who need CD)
	yes (for all who need reproduction)

#### **56. Which quality levels of information are you prepared to pay for? (private users).**

<i>web overview with details missing</i>	generally no or hesitant
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<i>web1:1 zoom ca 10x10 cm</i>	generally no or hesitant
<i>web 1:1 whole screen</i>	half of the users yes, the rest no or hesitant
<i>CD or tape with full information</i>	yes (for all who want CD)
<i>reproduction</i>	yes (for all who reproduction)

The willingness to pay is dependent of the user rights. These were not decided on at the time of this study. The figures above generally mirror private and professional *ad hoc* use.

Educational representatives stress the common shortage of money and suggest special user agreements for students. It can be noted that county authorities and county museums already have special user rights through an agreement that the NHB has with the NLS. This will however soon expire.

### Commercial use

#### 57. Do you use the material to create new products?

Historical maps (or more often parts of them) are often used as illustration in reports, more rarely in books. The aim is however not to make commercial use of the maps as such.

The multimedia representative wants to include and distribute maps in a new product.

### Thoughts on future products and possible developments

#### 58. Which features would you like to have if the DHM concept was further developed?

Various answers, but geometrically correct material and semi-transparent overlays are frequently requested. Consultants comment that this could probably be developed into a business concept.

#### 59. What links to other information would be useful?

Suggested links to other information sources were

- information on nature protection, nature assets, other restrictions
- modern real estate register
- other map registers and archives such as the War Archive
- place-name register
- NHB ancient monuments register and buildings register
- tingsrätternas fastighetsregister (courts property register) from 18:th to 19:th century.
- ägarlängder (owner records)
- genealogical records, “gravebooks” etc.
- other documents or literature concerning the same area.
- person names

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Related information in the form of “help files” is also suggested, not least by the history groups. Examples of such files could be

- general guide for using and reading the maps
- dialect words
- interpreting handwriting
- translation guide to older measurements

One person even suggests a free rectification programme.

### **Interviewed persons**

The following 14 persons were interviewed in the Swedish study:

- Elisabet Essen, externally financed surveys and excavations at the NHB.
- Ann Sofie Nygren, officer at the Stockholm County Museum
- Jan Olof Montelius, culture historian at Vägverket (central authority for roads)
- Martin Sjö Dahl nature resource planning at the county administration of Kalmar.
- Magdalena Andåsen, planning architect, municipality of Strängnäs
- Jarmo Kukka, consultant and head of Svenska Naturskyddsföreningen (Swedish Association for Protection of Nature).
- Lena Pålsson and Torbjörn Einarsson, architects, Arken AB (partly large scale projecting).
- Roberto Dünkelberg, teacher, Näsby parkskolan, municipality of Täby.
- Dagmar Sjögren, Studieförbundet (educational association) in Linköping.
- Lars Strand, Hudiksvall, teacher on special project basis, municipality of Hudiksvall.
- Niklas Cserhalmy, formerly active in Sveriges Hembygdsförbund (Swedish folklore society), now (among many other things) doing group excursions at Arbetets museum, Norrköping.
- Elise Hovanta, researcher with professional experience from the County Museum of Gävle.
- Peter Johansson, head of Sveriges Hembygdsförbund (Swedish folklore society) and editor.
- Patrik Anderberg. Comcastmedia, private enterprise focussing on the Internet.