R-04-10

Human population and activities in Forsmark

Site description

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SwedPower AB

December 2004

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Abstract

The Swedish Nuclear Fuel and Waste Management Co (Svensk Kärnbränslehantering AB, SKB) is in the process of selecting a safe and environmentally acceptable location for a deep repository of radioactive waste. Two alternative locations are under investigation. These are Forsmark, Östhammars kommun[1] and Simpevarp/Laxemar, Oskarshamns kommun. SKB has expressed the importance of describing the humans and their activities in these areas and therefore has this synthesis concerning the human population in Forsmark been produced.

The description is a statistical synthesis, mainly based upon statistical data from SCB (Statistics Sweden) that has been collected, processed and analysed. The statistical data has not been verified through site inspections and interviews. When using statistical data, it is advisable to note that the data becomes more unreliable if the areas are small, with small populations.

The data in this description is essential for future evaluations of the impact on the environment and its human population (Environmental Impact Assessments). The data is also important when modelling the potential flows of radio nuclides and calculating the risk of exposure in future safety assessments.

The actual area for the study is in this report called “the Forsmark area”, an area of 19.5 km^2 near Forsmark nuclear power plant. The land use in the Forsmark area differs notably from the land use in Uppsala län. Only 0.04% of the total area is developed (built-up) compared to 4.9% in Uppsala län and only 4% is agricultural land compared to 25% in the county. Furthermore, there are far more forest, wetlands and water areas in the Forsmark area. The forest area represents as much as 72.5% of the total area.

The Forsmark area is uninhabited, and its surroundings are very sparsely populated. In 2002, the population density in Forsmark församling was 1.8 inhabitants per square kilometre, which was 24 times lower than in Uppsala län. The population density in the parish has been fairly unchanged during the last ten years.

There are no workplaces within the Forsmark area and consequently no commuting into the area. There is, however, major commuting to Forsmark power plant close to the Forsmark area. There are five holiday houses and three farms within the Forsmark area. This indicates that the area has a small holiday population.

There is one agricultural enterprise in use within the Forsmark area. This farm has beef cattle and probably some fodder production. The standard yield of barley in harvest area 0322, in which the Forsmark area is located, is only 66% of the average standard yield in Sweden in 2003. The fertility of the arable land in Forsmark församling is therefore assumed to be poor.

The forests are heavily influenced by forestry; some 45% of the productive forest within the regional model area is younger than 30 years. The average age is 46 years. About half of the logging products are used for pulp production, and half for timber.

[1] Kommun = municipality. For other swedish terms see List of terms.

The Forsmark area is most likely visited for outdoor activities, such as hunting and fishing, as well as picking of wild berries and mushrooms. The hunting is more extensive in Forsmark församling and Östhammars jaktvårdskrets than in Uppsala län as a whole. The harvest of moose has in average been almost 1.5 times higher in Forsmark församling than in Uppsala län, since the season 1999/2000.

Sammanfattning

Svensk Kärnbränslehantering AB, SKB, ansvarar för att hitta en säkerhetsmässigt och miljömässigt lämplig plats för det framtida djupförvaret av använt kärnbränsle. Två tänkbara lokaler undersöks nu närmare. Dessa är Simpevarp i Oskarshamns kommun samt Forsmark i Östhammars kommun.

På uppdrag av SKB har därför SwedPower AB tagit fram en beskrivning över de människor som bor i Forsmarksområdet och hur de använder sig av marken inom området. Arbetet har innefattat insamling av tillgängligt material (i huvudsak statistiskt material från SCB) bearbetning och analys av materialet samt i vissa fall beräkningar. Beskrivningen är således en statistisk sammanställning. Det har inte ingått i uppdraget att verifiera det statistiska materialet genom platsbesök. Det bör även noteras att den statistiska osäkerheten ökar när man väljer att studera små områden med liten befolkning, vilket är fallet i denna studie.

Materialet kommer att vara värdefullt i miljökonsekvensbeskrivningsarbetet samt vid flödes- och dosmodellering i säkerhetsanalysarbetet. Det utgör även en grundlig nulägesbeskrivning ”baseline” inför det framtida övervakningsprogrammet.

Det egentliga området för denna beskrivning kallas i rapporten för ”the Forsmark area”, ett område på 19,5 km^2 intill Forsmark kärnkraftverk. Området består av åtta avrinningsområden; Forsmark 1 till 8. Data har samlats in för Forsmark area samt alla avrinningsområden inom Forsmark area utom Forsmark 6, som är alltför litet för att samla data ifrån. Data har även samlats in för ett delavrinningsområde runt sjön Eckarfjärden inom Forsmark 2, då detta område är av särskilt intresse.

För att kunna ge en god beskrivning har jämförande data samlats in för fyra högre geografiska nivåer. Dessa är huvudavrinningsområdet (54/55), Forsmark församling, Östhammars kommun samt Uppsala län. Data har så långt som möjligt samlats in för en tidsserie på 10 år, vilket ger en bättre och säkrare beskrivning av en variabel än data från ett enskilt år. Med flerårig variabeldata kan även trender synliggöras och beskrivas.

Forsmark area är ett obebott område. Det finns fem fritidshus i området, vilket talar för att ett litet antal människor vistas där sommartid och under helger. Det finns även tre obebodda lantbruk inom området, varav ett är i bruk. Detta lantbruk har biffkor och utnyttjar marken till bete och sannolikt även foderproduktion. Området utnyttjas sannolikt till friluftsliv i form av jakt, fiske samt bär- och svampplockning. Det jagas mer i Forsmark församling och Östhammars jaktvårdskrets än i länet i stort. Det har i genomsnitt fällts närmare 1,5 gånger fler älgar i församlingen än i länet i stort sedan säsongen 1999/2000.

Markanvändningen i Forsmark area skiljer sig påtagligt från markanvändningen i Uppsala län. Endast 4 % av arealen utgörs av jordbruksmark och endast 0,04 % av bebyggd mark jämfört med 25 % respektive 4,9 % i Uppsala län. Skogsmarken är klart dominerande i Forsmark area och utgör hela 72,5 % av den totala arealen, vilket kan jämföras med 55,9 % i länet.

Skogen är kraftigt utnyttjad för skogsbruk; ungefär 45% av den produktiva skogen inom det regionala modellområdet är yngre än 30 år. Medelåldern på skogen är ca 46 år. Ungefär hälften av den avverkade skogen används för massatillverkning och den andra hälften som timmer.

Om vi istället tittar på Forsmark församling så kan vi konstatera att församlingen har en befolkningsdensitet på 1,8, vilket är drygt 20 gånger lägre än länet i stort (42,7). Folkmängden har dock varit relativt stabil under den senaste 10-års perioden. Det har inte byggts några nya hyreshus eller småhus sedan 1993 enligt statistiken, vilket visar att församlingen inte är något tillväxtområde. Det har dock beviljats några få bygglov sedan 1996, så nybyggnation lär förekomma.

Det är emellertid en påtaglig inpendling av människor till församlingen under dagtid. Merparten pendlar in till Forsmarks Kraftgrupp. Den förvärvsarbetande dagbefolkningen är 13 gånger så stor som den förvärvsarbetande nattbefolkningen som är bosatt i området (929 jämfört med 71 personer år 2002). Det finns förhållandevis fler fritidshus och lantbruk i Forsmark församling än i länet i stort. Fritidshusen utgör den största andelen med 37,4 %, medan lantbruken utgör 28 %. Småhusfastigheterna utgör 30 % av fastigheterna. Åkermarken används huvudsakligen till foderproduktion. I Uppsala län används enbart 18 % av åkermarken till foderproduktion.

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1 Introduction

The Swedish Nuclear Fuel and Waste Management Co (Svensk Kärnbränslehantering AB, SKB) is in the process of selecting a safe and environmentally acceptable location for a deep repository of radioactive waste. Since the spring 2002, two alternative locations have been the subject of preliminary site characterisation. These are Forsmark in Östhammars kommun and Simpevarp/Laxemar in Oskarshamn kommun. More information about the site investigations and the planned schedule for the whole process of planning and construction of the deep repository is found in the report "Program för platsundersökning vid Forsmark" /SKB, 2001/.

1.1 Aim of this description

It is important for SKB to obtain a good understanding of the human population and the human activities within the investigation areas around Forsmark and Simpevarp, as part of the basis for future safety assessments and monitoring programmes. With a good knowledge of the human population and its land use, the potential pathways of exposure to radionuclides can be identified and characterised. Characterisation of the population and its land use are also important in the Environmental Impact Assessment (EIA). Land use may, in some cases, also affect the deep repository, chiefly through mineral extraction and mining.

The aim of this synthesis is therefore to provide a compilation of data concerning the people in the area and their land use. The data can be used to:

- Evaluate the effect of development and operation of the deep repository on the environment and its human population (EIA);
- Establish a "baseline" for future impact and safety assessments as well as monitoring programmes;
- Model material flows in the biosphere and calculate the risks of exposure to radionuclides for future safety assessments.

The variables associated with human land use and their application in assessments and monitoring programmes were first characterised in the year 2000 /Lindborg and Kautsky, 2000/. A more detailed description over the available variables concerning the biota was produced in /Berggren and Kyläkorpi, 2002/. The report included information on land use such as agriculture, forestry, hunting and fishing as well as outdoor life. Some data were obtained, but only for the latest available year and only for a few geographic areas.

This report assembles statistical data for the variables above and for additional variables related to land use, such as horticulture, aquaculture, mineral extraction and water supply. This report also assembles statistical demographic data for the area.

A baseline survey would not be robust if it were based upon data for a single year. The present synthesis has therefore gathered data for a time series of ten years, wherever such a time series has been available. If not, a shorter time series has been acquired.

The outcome of this synthesis is a description of the population in terms of density, age-structure and vital events (life history statistics), where and how the people live, how they make a living and how they commute in and out of the area. The description also includes human activities in terms of land use, such as production of barley, wood extraction, water withdrawal and harvest of wildlife. Observed trends in these characteristics are described.

Furthermore, the degree of self-sufficiency in Forsmark församling (parish) is roughly estimated as well as the in-coming and out-going flow of organic products. The degree of self-sufficiency is a theoretical figure over the potential self-sufficiency, where the production in the parish is ratioed with the consumption. By studying the flow of locally produced food products the description aims to clarify the amount of products that are consumed by a small local population respectively by a larger regional or national population.

1.2 Concept

A quantitative description concerning the human population and the human activities in Forsmark and Simpevarp has been produced. The task has included collection of available data (mainly statistical data from SCB, Statistics Sweden), processing and analysis. The result is a statistical synthesis. The statistical data has not been verified through inspection and interviews.

Six different levels of resolution have been used in order to achieve a description of high quality (see Figure 1-1). The primary area for this study is called “the Forsmark area” and it is composed of eight drainage areas (also called sub-areas in this report). These eight areas have been named Forsmark 1 to 8, by the department of Limnology at Uppsala University /Brunberg, 2003, personal communications/. Within Forsmark 2 there is a smaller drainage area around lake Eckarfjärden that is of special interest. Data has therefore been obtained for this particular area, called Eckarfjärden 2:10 (see Figure 1-2). The area Forsmark 6 has been excluded from this synthesis, as it is far too small for data gathering purposes.

Comparable data for four larger areas have been included to enable us to draw conclusions from the statistical material. These geographic areas are the main drainage area (54/55), Forsmark församling (parish), Östhammars kommun (municipality) and Uppsala län (County).

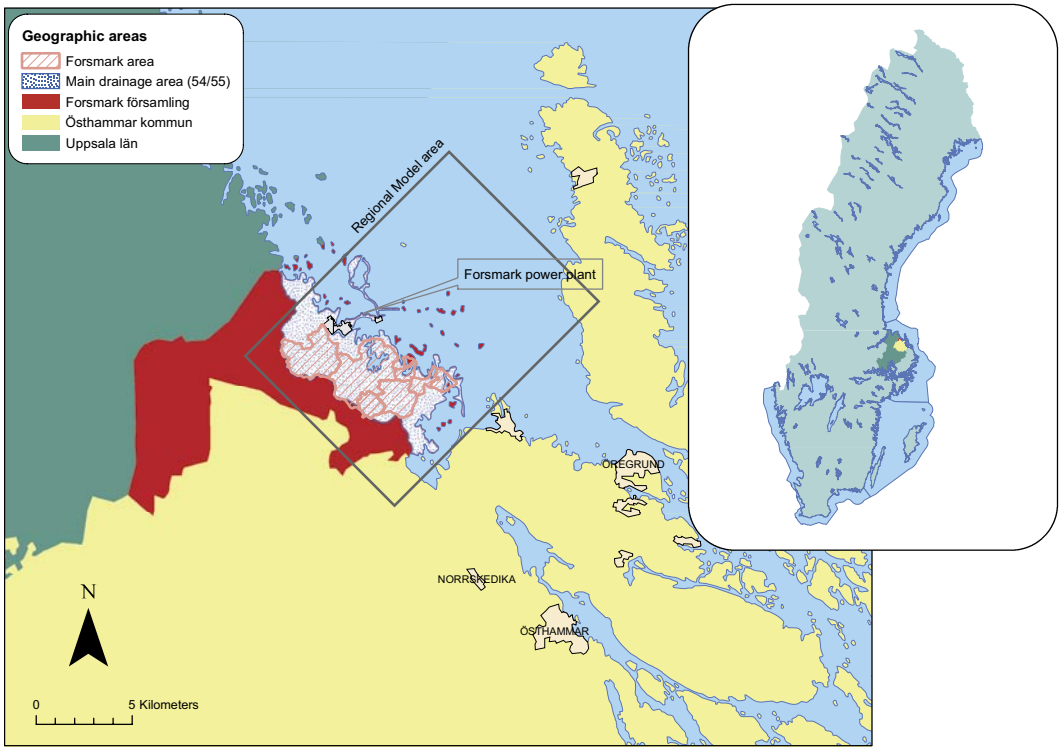

Figure 1-1. *The levels of resolution included in the human description. The areas are listed in Table 2-1.*

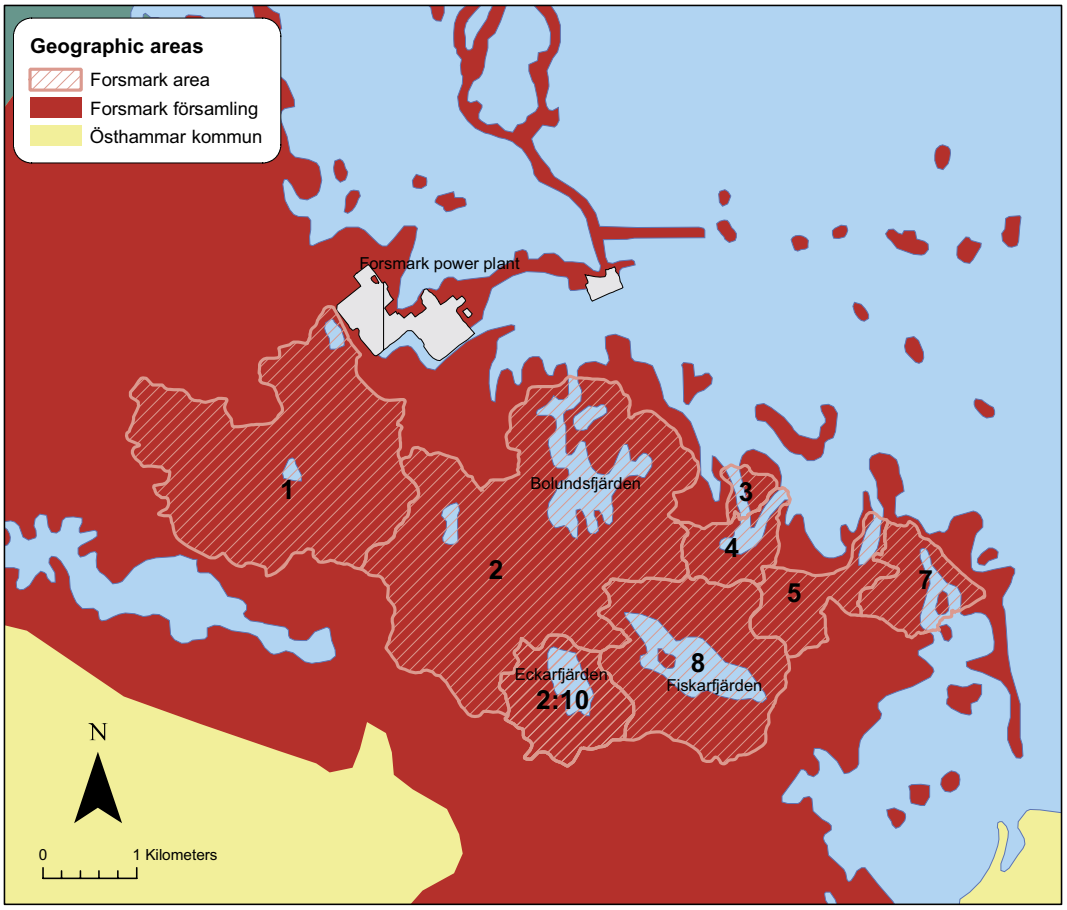

Figure 1-2. *The Forsmark area and its drainage areas.*

2 Data quality and processing

2.1 General

The data for this report were compiled during the autumn of 2003. Most of the data were obtained from SCB (Statistics Sweden). When only a single object is found within a geographic area, SCB adjusts this single object to a "false" zero for reasons of secrecy. If two objects are found, the count is adjusted to three /SCB, 2003d/. This can result in incoherence between the sum of values for different categories and the total number (as an example the total number of inhabitants and the sum of inhabitants per age class). As Forsmark församling is a very sparsely populated area this is a potentially significant source of error. Irrespective of this deliberate reporting bias, such sparsely populated areas may result in data with higher statistical uncertainty.

Normally, zeros are missing in SCB's statistical material, no matter whether they are "true" or "false" zeros, according to /Sehlin, 2003, personal communication/. However, in this statistical material some zeros have been delivered (Table 4-6 and Table 4-11). They can be interpreted as "false" zeros according to /Haldorson, 2003, personal communication/. In this report, zeros have been added to the tables that were missing some data.

Wherever possible, the data has been collected for a time series of ten years. However, data for a time period of ten years has not been available for all variables, so shorter time series occur as well. By assembling data for time series, mean values could be calculated and trends could be analysed.

The variables in this description are most often shown as an actual value from the latest year for which data were available (normally 2002), a mean value with a standard deviation, a minimum value, a maximum value and a value per unit area (e.g. kg/km^2 or 10^6 m^2). When calculating numbers per unit area, the area values shown in Table 2-1 have been used.

Table 2-1. Area sizes.

Geographic area	Area (km^2)	Source
Forsmark 1	5.1	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Forsmark 2	8.6	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Eckarfjärden 2:10	1.3	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Forsmark 3	0.2	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Forsmark 4	0.7	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Forsmark 5	0.9	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Forsmark 7	0.9	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Forsmark 8	2.9	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Forsmark area	19.5	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Main drainage area (54/55)	33.9	Calculated based on the polygons in ArcGIS (see Figure 1-2)
Forsmark församling (parish)	94.2	/SCB, 2003f, internet/
Östhammars kommun (municipality)	1 451	/Länsstyrelsen i Uppsala län, 2002/
Uppsala län (county)	6 989	/Länsstyrelsen i Uppsala län, 2002/
Sweden (The country)	410 934	/Länsstyrelsen i Uppsala län, 2002/

2.2 Human population

2.2.1 Demography

Input data

Population data has been obtained from SCB for all levels of resolution and for a time series of ten years, 1993–2002 /SCB, 2003g/. The variables characterised were the number of inhabitants at the 31st of December divided in five age classes (0–15, 16–24, 25–44, 45–64 and ≥ 65 years) as well as population changes; in-migration, out-migration, live births and deaths.

The study of demographical statistics revealed some errors. Until 1999, the population in the Forsmark area was stable at around 10 persons (all residing in subareas Forsmark 1 and Forsmark 8). However, in the year 2000, the Forsmark area was suddenly characterized as uninhabited and there is no explanation for the depopulation in the migration or deaths statistics. The inhabited properties in 1999 cannot be found in 2000, according to SCB. Instead, the persons are registered on properties located outside the Forsmark area. It seems as if the coordinates of the properties have changed as the properties are not to be found in 2000. According to the property statistics there were five farms in the Forsmark area in 1996, but only three in 2002.

Furthermore, when calculating the net population change for each year (in-migration and live births minus out-migration and deaths) one can see that the net change figures are not fully equal to the difference between the numbers of inhabitants in two consecutive years (the number of inhabitants in December in year 2 minus the number of inhabitants in December in year 1). It is obvious that SCB cannot achieve a precise determination of population characteristics.

Data processing

The population density, that is the number of inhabitants per unit area, has been calculated. Mean values for the other demographic variables have been calculated as well as a mean value for the population density (minimum and maximum values and standard deviations (SD) have also been calculated). The number of inhabitants per age class has been calculated as a percentage in order to be able to compare the age structures at the different levels of resolution. A net population change (in-migration and live births minus out-migration and deaths) has also been calculated.

2.2.2 Health

Input data

Health data in terms of ill-health figures were obtained from /SCB, 2003g/. The measure of ill-health used is the number of days with sickness benefit due to illness, rehabilitation and occupational injury, as well as days with early retirement pension per person between 16 and 64 years of age.

Ill-health data has been obtained for all levels of resolution and for a time series of five years, 1998–2002. The ill-health data has been acquired for the population as a whole (16–64 years) and by sex. According to SCB, the statistics from 1998–2002 cannot be compared with older statistics. For that reason, statistics from earlier years have been excluded. There is only health data from 1998 and 1999 for the Forsmark area as a whole (and from Forsmark 1 and Forsmark 8) as these areas were uninhabited after 1999.

When calculating an ill-health figure for a very small population, such as the main drainage area (54/55), the individual ill-health has a significant impact on the statistics and the ill-health figure can fluctuate considerably over time.

Data processing

A mean value for each time series has been calculated, together with minimum- and maximum values and a standard deviation (SD).

2.2.3 Properties and buildings

Input data

Data on the number of properties, by category, have been obtained from SCB for all levels of resolution and for the years 1996 and 2002 /SCB, 2003g/. The variation in the state of properties is very small between years, which is why only two different years are included in this synthesis. The categories are farms, one- or two-dwelling buildings, multi-dwelling buildings, holiday-houses and other.

Statistics concerning the number of completed (newly constructed) dwellings have been obtained for all levels of resolution and for a time series of ten years, 1993–2002. However, there are no figures for the resolutions lower than the municipality. It is assumed that no new dwellings have been completed during this time period.

Statistics concerning the number of building permits for business premises and dwellings have also been obtained for all levels of resolution and for a time series of seven years, 1996–2002. When it comes to building permits, there are not many figures from the parish and the main drainage area (54/55) and no figures from the Forsmark area.

The statistics concerning building permits and completed dwellings are not fully coherent. Construction must begin within two years of issue of a permit and be completed within five years from the start of construction. Normally 99% of the building permits lead to a completed building, according to SCB /Sahlén, 2003, personal communication/. According to SCB the disparity between the two statistics is probably due to delayed reporting from the municipal administration.

Furthermore, the statistics of the number of properties are not fully consistent with the statistics of the number of building permits and completed dwellings.

Data processing

The property density, that is the number of properties per unit area, has been calculated. Furthermore, the types of properties have been calculated as a percentage of the total amount.

Mean values for the variables concerning new buildings have been calculated as well as mean values for the number of building permits per unit area and the number of completed dwellings per unit area. Minimum- and maximum values and standard deviations (SD) have also been calculated.

2.2.4 Employment

Definitions

The term employment comprises paid employment and self-employment, full-time as well as part-time.

The term employed day-time population comprises the people that have their work place in the area in question. These people may, or may not, be registered or residents in the area.

The term employed night-time population refers to those persons that are also registered in the area in question. People registered in an area may, or may not, also be residents in the area. As long as they are registered in the area, regardless of where they actually live, they are included in the employed night-time population if they are working. The location of the work place, within or outside the area, is not relevant to their categorisation.

The non-employed population between 20 and 64 years of age are those that are studying, unemployed, early retired, in the military service or non-employed of other reason.

Data processing

Statistics concerning employed night- and day populations, non-employed population and the number of work places have been obtained from SCB /SCB, 2003g/. The statistics are based on the population between 20 and 64 years of age.

When using an area smaller than the municipality there is, according to SCB, an underestimate in employed day-time population, commuting and work places, as the address data for work places are incomplete. Some of the work places cannot be located geographically. The underestimate is considered to be approximately 10%, according to SCB. This is most likely the reason why the net commuting figure is not exactly equal to the difference between the employed night- and day populations.

Employed night- and day population

Input data

The figures for the employed night- and day populations have been obtained for all levels of resolution and for a time series of five years, 1997–2001. The number of employed inhabitants is shown by type of business according to SE-SIC Swedish Standard Industrial Classification, coarse classification (Table 2-2).

Table 2-2. Employment categories.

1	Agriculture, forestry, hunting, fishing.
2	Mining and manufacturing.
3	Electricity-, gas- and water supply. Sewage and refuse disposal.
4	Construction.
5	Trade and communication.
6	Financial intermediation, business activities.
7	Education and research.
8	Health and social work.
9	Personal and cultural activities.
10	Public administration etc.
11	Unknown.

Data processing

The number of workers per type of business has been calculated as a percentage of the total number of workers in order to be able to compare the employment between different levels of resolution. Mean values for the variables concerning employment have been calculated. Minimum- and maximum values and standard deviations (SD) have also been calculated.

Work places

Definition

A work place is every address, property or group of properties where a company runs a business. A company has at least one work place. The following conditions must be met if an additional work place is to be registered to a company:

- some type of business operation must be conducted at the site,
- the operation must be geographically located at the site,
- the operation must be conducted for a long (permanent) period of time,
- employed personnel must be present, at least to the level of 50% of an employee-year per year.

Input data

Data on the number of work place have been obtained for all levels of resolution and for a time series of six years, 1997–2002. The work places are shown by type of business according to SE-SIC Swedish Standard Industrial Classification, coarse classification (see above).

Data processing

The number of work places per type of business has been calculated as a percentage of the total number of work places in order to be able to compare the share of work places between different levels of resolution.

Mean values for the time series have been calculated. Minimum- and maximum values and standard deviations (SD) have also been calculated.

Commuting

Input data

Statistics concerning in- and outgoing commuting have been obtained from SCB for all levels of resolution and for one year, 2001 /SCB, 2003g/. There is no detailed information about the commuters. It is possible though to obtain data from SCB on the municipality and county from which the commuters are coming or to which they are going to.

Data processing

The net commuting has been calculated in order to see whether it is inward (positive number) or outward (negative number).

Non-employed population

Input data

Data on the non-employed population have been obtained from SCB for all levels of resolution and for a time series of five years, 1997–2001 /SCB, 2003g/. The number of non-employed inhabitants is shown by category. The categories are studying, unemployed, joining the military service, early retirement and other.

Data processing

The number of non-employed inhabitants per category has been calculated as a percentage of the total number of non-employed inhabitants in order to be able to compare the non-employment between different levels of resolution. Furthermore, the non-employed population has been calculated as a percentage of the total population. Mean values for the time series have been calculated. Minimum- and maximum values and standard deviations (SD) have also been calculated.

2.3 Human activities

2.3.1 Land use

Input data

The area of land use, by category, for Uppsala län has been obtained from /SCB, 1998/. The area of land use by category in the Forsmark area has been obtained from the vegetation classification carried out by /Boresjö-Bronge and Wester, 2003/.

Data processing

The areas have been calculated through geoprocessing in ArcGIS. The vegetation classification map does not cover the entire Forsmark area. 14 hectares are therefore classified as unknown. The areas have been calculated as a percentage of the total area in order to be able to compare the land use in Uppsala län and the Forsmark area.

2.3.2 Forestry

Input data

Data for calculating wood extraction from the Forsmark model area was retrieved from the local forestry management plan /Sveaskog, 1999/. For a more detailed description of the forests of the area, see /Kyläkorpi, 2004/.

Data processing

The amount of wood extracted from the model area during the past 10 years was calculated based on data from the forestry management plan /Sveaskog, 1999/. This was achieved by multiplying the average volume in mature forest of the area with the forest area that is 0–9 years old. Thereafter this sum was divided by 10.

2.3.3 Agriculture

General

Data for this study has been gathered from the following sources:

- The Register of Enterprises in Agriculture and Forestry, later referred to as the Farm Register (Lantbruksregistret, LBR) produced by SCB.
- The Agricultural Yearbook 2003, published by Jordbruksverket (the Swedish Board of Agriculture).
- Statistiska Meddelanden from Jordbruksverket and SCB.
- Dairy production statistics by Swedish Milk (Svenska Mjölk), published in the Agricultural Yearbook 2003.
- Egg production statistics by Swedish Egg (Svenska Ägg), published in the Agricultural Yearbook 2003.
- Statistics from Livsmedelsverket (National Food Administration).
- General data on agricultural production by LivsmedelsSverige, an interest group consisting of members from Livsmedelscentrum Lund, Livsmedelsverket, Livsmedelsföretagen (Li), Lantbrukarnas riksförbund LRF, Konsumentverket, Sveriges lantbruksuniversitet SLU, Svensk Dagligvaruhandel, och Sveriges Hotell- och Restaurangföretagare.
- Facta on Agriculture and livestock, summaries on research projects at SLU, Sveriges Lantbruksuniversitet.

Most of the information on land areas, crops and animals has been derived from the Farm Register and has then been complemented with average animal production statistics from other sources. National statistics and data for counties, municipalities and parishes can be acquired directly from SCB and Jordbruksverket at no cost and other production-related data can be viewed on the homepages of the above-mentioned organisations.

SCB have carried out an annual registration of enterprises (farms, holdings) in agriculture and forestry since 1968, but the data collection method has been modified several times since then. Data on all farms in Sweden were updated in 1999 and before that in 1995 and 1990. Since 2000 data have not been gathered on all farms. Instead, the questionnaires have been sent only to a selected group of those who have applied for agricultural support. Complete registration of all farms will be carried out again in 2003, 2005 and 2007 in relation to claims from the EU. Due to the changes in data gathering methodology over the years all comparisons should be made with great caution.

Enterprises (farms) involved in agriculture, animal husbandry and horticulture are recorded in the Farm Register. As data are gathered from only those farms that had more than 2 hectares of arable land or a significant number of livestock, this means that land used only for forestry or grazing is not classified as an agricultural enterprise (farm) and is therefore excluded from the Farm Register. This means that for example the large forestry companies are excluded from the Farm Register. As the production data is recorded by farm, this means that when only one farm – even with a considerable amount of land and livestock – is found in the search area, no numbers can be due the protection of the farm owners personal integrity. It should also be noted that the values describe the situation as it is recorded in June every year, not annual average values.

Farms included in the Farm Register are divided into the three following categories:

1. Farms with at least 2 hectares arable land.
2. Farms with less than 2 hectares arable land but a considerable number of animals.
3. Horticultural cultivations with a greenhouse area larger than 200 m^2 or a minimum 2,500 m^2 outdoors cultivation area; household cultivation and private gardens are not included.

The following statistical information is recorded for every enterprise

- Farm land classification (ha) in the following categories:

The area of arable land, grazing land, forest, other type of farm land

- Number of animals in the farm.

Dairy cows, cows for breeding, heifers, bulls and bullocks older than 1 year, sheep and lambs, boars, sows and other pigs, chickens and laying hens

- The following crops and the cultivation area (ha) in the farm.

Winter and spring wheat, rye, barley, oats, triticale, mixed grain, leguminous plants (peas, processing peas brown beans), potatoes (table potatoes and potatoes for processing), sugar beet, oil seed crops (winter and spring rape, winter and spring turnip rape), horticultural plants (vegetables, flowers, pot plats, fruit, berries), green fodder and plants for silage, grass on arable land for hay and silage, seed lay, temporary grasses and also the arable area that is used as pasture and the area not utilized at all.

Statistics on arable area and number of farms

Input data

Data on the number of farms in seven size categories and the amount of farm land in four categories at the county, municipality and parish levels in 1990, 1995 and 1999 were acquired from SCB. However, due to the low number of farms in the Forsmark area (from field observations only one farm) no agricultural production data for the Forsmark area in 1990–1999 were available. With the help of Vegetation Mapping /Boresjö-Bronge and Wester, 2003/, the amount of arable land was estimated by geoprocessing the data in ArcGIS.

Data processing

The average number of farms (1990–1999) and the change in percentage was calculated for Uppsala län, Östhammars kommun and Forsmark församling. An estimate for the farm density (1990–1999) was then calculated by dividing the average number of farms (1990–1999) by the respective areas.

Estimates for the fraction of arable land have been calculated by dividing the amount of arable land (average amount for county, municipality and parish in 1990–99, and for the Forsmark area the amount of arable land as estimated in Vegetation Mapping, /Boresjö-Bronge and Wester, 2003/ by the total land area.

Crop production statistics

Input data

Data on the area used for cultivation of different crop, the area used for pasture and the unutilised area in 1990, 19995 and 1999 in Uppsala län, Östhammars kommun and Forsmark församling were obtained from SCB.

Data on the expected yield (standard yield estimates for 2002, 2003) and statistics on harvested yield both for yield per hectare and the total yield (1997–2002) were acquired from SCB. The estimates for standard yields for the ongoing season are published in June every year. Preliminary results for the yield per hectare and for the total production are calculated in August every year. Final results for crop yields per hectare and for the total production are presented in summer the following year.

Crop production statistics can be shown for the following geographical areas:

- Sweden.
- 8 production areas (PO8-areas).
- 21 counties.
- 106 yield survey districts (SKO-areas).

The standard yield (normskörd) is an estimate for the yield that can be expected if the weather and other conditions that influence the crops are normal. Estimates are computed for winter and spring wheat, rye, spring barley, oats, winter and spring rape, winter and spring turnip rape and for both table and processing potatoes. Since 1998, a revised model for estimating the standard yields has been implemented. The mean of the yield data for the last 15 years enhanced with an estimated yearly increase forms the standard yield of a region. The model is applied to all crops and all regions. The standard yield estimate for a specific crop is calculated by SCB only if the crop is grown in the area to major extent. Since 1998 no estimates for fodder and ensilage plants have been produced. /Jordbruksverket and SCB, 2003a; Jordbruksverket and SCB, 2002b/.

Statistics on crop yield per hectare (hektarskörd) and total production (total skörd) have been calculated for more than 35 years. Between 1968–1995, data were gathered using a method based on probabilistic sampling and physical measurements on samples taken from the fields. The system was altered in 1995 and statistics were based on data gathered with both the help of interviews and measurements taken in test areas in 32 out of 106 yield prognoses areas (SKO-areas) all over Sweden. Since 1998, statistics on cereals, peas and oil seed crops have been based entirely on interview surveys and, since 1999, the statistics for potatoes have been gathered by postal enquires to a sample of farmers. The selected farms represent a random sample throughout the country. Yields per hectare at the farm level area are calculated by dividing the production by the crop area of the farm. The total production has been calculated from final data on usage of arable land. /Jordbruksverket and SCB, 2003a; Jordbruksverket and SCB, 2002b; Jordbruksverket and SCB, 2003c/.

For this study, data on both harvested crops (yield per hectare and total yield) and the estimates for standard yield have been acquired from Agricultural Yearbooks 2003 /Jordbruksverket and SCB, 2003a/. The standard yield estimates for the years 2002 and 2003 were available. Statistics for areas used for cultivation of crops are from the years 1995 and 1999 and the average area was used in calculations. The yield estimates are from 2002. This has to be taken account in the calculations by relating the standard yield in 2002 to the average of harvested yield over a longer period in this study to the data on harvested yield in 1997–2002.

Data processing

Two different estimates for the crop production in Forsmark församling have been produced: one for the average production over the period 1990–1999 and another for the production in 1999. Crop production within the Forsmark area has not been estimated due to lack of data. The area used for cultivation of a particular crop has been multiplied by the yield estimate in 2002 instead of separate estimates for each year. The production in 2002 can then be set into a perspective by comparing the average yield per hectare in Sweden 1997–2002 (see Table 2-4).

As Forsmark församling is located completely within the SKO-area 0322 (see Figure 2-1), the standard yield estimates (SKO area 0322) have been primarily used (see Table 2-3). No standard yield estimates for oats and potatoes were available within the SKO 0322 area even though these crops were grown there. Therefore, the estimates in the SKO area 0312 and Uppsala län see have been used instead.

Two different yield estimates were available, the standard yield estimate (skördeprognos) and the harvested yield per hectare (hektarskörd). The former alternative was chosen, as it represents an estimate based on parameters such as yearly weather conditions and the 15 years' average and was therefore considered more appropriate for this study. Standard yield estimates for grass and silage plants have not been calculated after 1998 so the actual value for harvested grass, hay and silage plants per hectare in Sweden in 2002 were used in the calculations /Jordbruksverket and SCB, 2001, 2002a–d, 2003d–f/.

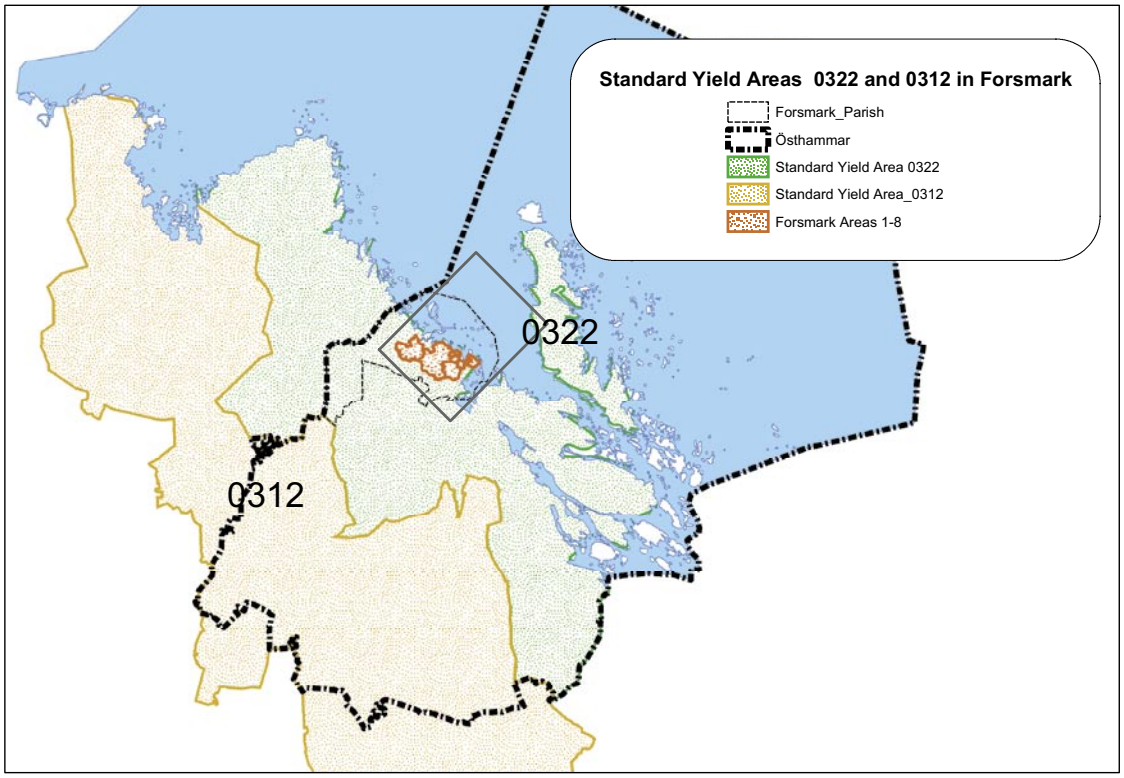

Figure 2-1. *The Forsmark Area, Forsmark församling, Östhammars kommun and standard yield areas (SKO areas) 0322 and 0312. /Jordbruksverket and SCB, 2003b/.*

The yield and variation for different crops in the whole country 1997–2002 can be seen in Table 2-4. As shown in Table 2-5, yields of different crops in Sweden have varied from 80% to 120% of the average of the time period 1997–2002. Generally, the yields for 2002 are above the average, in total some 4%, even 6–8% above the average for grain but –10% for potatoes. These results can be used when appreciating the average yearly yield in the Forsmark area in 1990–1999 based on the standard yield estimates from 2002.

Different assumptions can be made as to how great a share of the production in the parish is being produced in the Forsmark area. A very coarse assumption is that, since there were four farms in Forsmark församling (the average in 1990–1999) and only one in the Forsmark area, one quarter of the parish production is produced in the Forsmark area. As the average amount of arable area in the parish (1990–1999) is known and the arable area in the Forsmark area can be estimated with the help of the Vegetation mapping /Boresjö-Bronge and Wester, 2003/, this ratio gives a second estimate on how much of the parish production is likely to be produced in the Forsmark area. None arable areas in the Forsmark area is currently used for cultivation of crops but instead for pasture for breeding of cattle due to the economic incentive of EU and should be interpreted as a short-term situation /Karlsson, 2003, personal communication/.

The standard yield estimates for 2002 were used in calculations instead of separate estimates for each year 1990, 1995 and 1999. As the yields vary from year to year, the estimates for standard yield in 2002 can be set to a larger perspective by comparing the harvested yields in Sweden (1997–2002) (see Table 2-4).

The yield and variation for different crops in the whole country 1997–2002 was studied briefly. As shown in yield for different crops in Sweden has varied from 80%–120% of the average of the time period 1997–2002 (see Table 2-5).

As the year 2002 was slightly above the average, some 3% by judging the harvested yields in Sweden 1997–2002 (see Table 2-3) this factor should be taken into consideration when estimating the average yearly yield over a longer period. Since 1998 the standard yield estimate for green fodder and silage are no longer available through SCB. The harvested yield of temporary grasses per hectare in Sweden (2002) is known, however (see Table 2-4), and has been used as an estimate in calculations.

Since the yields vary from year to year depending on weather, it is interesting to take a look at the yield variation. As we can see in Table 2-6 the yields for different crops vary considerable over this time period. The year 2002 was a relatively good year, with the yield for most crops some 4% over the long time average. The preliminary results for the year 2003 have been excluded from the calculations as well as the yield for linseed, which varies significantly due to changes in measuring methods.

Table 2-3. Standard yield for SKO-areas 0322, 0312 and Uppsala län.

Standard yield (kg/ha)	SKO 0322		SKO 0312		Uppsala län	
	2002	2003	2002	2003	2002	2003
Winter wheat	0	0	4 933	4 887	5 486	5 441
Spring wheat	0	0	0	0	4 699	4 764
Rye	0	0	0	0	4 308	4 272
Barley	2 846	2 834	3 832	3 778	4 336	4 275
Oats	2 564	2 490	3 523	3 477	3 986	4 010
Table potatoes	0	0	22 172	21 575	22 151	22 092
Potatoes for processing of starch	0	0	0	0	0	0
Winter rape	0	0	0	0	0	0
Spring rape	0	0	0	0	2 077	2 185
Winter turnip rape	0	0	0	0	1 640	1 680
Spring turnip rape	0	0	0	0	1 720	1 755
Sugar beets	0	0	0	0	0	0
Oil seed crops	0	0	0	0	0	0

/Jordbruksverket and SCB, 2003b/

Table 2-4. Sweden, yield (kg) per hectare 1997–2002.

Sweden, yield (kg) per hectare	1997	1998	1999	2000	2001	2002	2003 (prel)
Winter wheat	6 210	5 740	6 320	6 100	6 040	6 470	5 630
Spring wheat	5 350	4 820	5 060	5 100	4 650	4 960	4 950
Rye	4 810	4 640	4 790	5 430	5 270	5 330	4 930
Winter barley	4 970	5 360	4 930	5 090	5 270	5 390	4 620
Spring barley	4 390	3 730	3 820	3 970	4 140	4 340	4 240
Oats	4 120	3 650	3 450	3 960	3 550	4 100	4 000
Triticale	4 920	4 600	4 730	4 600	4 410	5 540	4 620
Mixed grain	3 700	2 920	2 820	3 470	3 230	3 580	3 500
Table potoes	35 640	34 720	28 820	26 720	26 160	26 470	
Potatoes for processing	37 420	47 440	37 620	38 700	35 820	35 050	
Sugar beet	44 200	43 400	46 400	46 900	48 500	48 600	46 626
Peas	3 490	1 780	2 720	2 660	2 860	3 130	3 280
Winter rape	2 300	2 990	2 860	3 250	3 100	2 910	2 860
Spring rape	1 840	1 950	2 040	2 010	1 980	2 110	1 920
Winter turnip rape	1 510	1 630	1 880	1 750	1 460	1 760	1 490
Spring turnip rape	1 540	1 460	1 670	1 550	1 550	1 510	1 360
Linseed	1 280	420	950	770	780	1 700	1 850
Temporary grasses						5 240	

/Jordbruksverket and SCB, 2003c/

Table 2-5. Comparisons of yields in Sweden 1997–2002.

Comparison of yields in Sweden 1997–2002	Average 1997–2002 (kg/ha)	Min (kg/ha)	Max (kg/ha)	Min (% of average)	Max (% of average)	2002 (% of average)
Winter wheat	6 147	5 740	6 470	93	105	105
Spring wheat	4 990	4 650	5 350	93	107	99
Rye	5 045	4 640	5 430	92	108	106
Winter barley	5 168	4 930	5 390	95	104	104
Spring barley	4 065	3 730	4 390	92	108	107
Oats	3 805	3 450	4 120	91	108	108
Triticale	4 800	4 410	5 540	92	115	115
Mixed grain	3 287	2 820	3 700	86	113	109
Table potoes	29 755	26 160	35 640	88	120	89
Potatoes for processing	38 675	35 050	47 440	91	123	91
Sugar beets	46 333	43 400	48 600	94	105	105
Peas	2 773	1 780	3 490	64	126	113
Winter rape	2 902	2 300	3 250	79	112	100
Spring rape	1 988	1 840	106	2 110	93	106
Winter turnip rape	1 665	1 460	106	1 880	88	113
Spring turnip rape	1 547	1 460	1 670	94	108	98
Linseed excluded						

/Jordbruksverket and SCB, 2003b,c/

Table 2-6. Normalized yields in Sweden 1997–2002.

Normalized yields in Sweden 1997–2002 (% of average)	1997	1998	1999	2000	2001	2002
Winter wheat	101	93	103	99	98	105
Spring wheat	107	97	101	102	93	99
Rye	95	92	95	108	104	106
Winter barley	96	104	95	98	102	104
Spring barley	108	92	94	98	102	107
Oats	108	96	91	104	93	108
Triticale	103	96	99	96	92	115
Mixed grain	113	89	86	106	98	109
Table potoes	120	117	97	90	88	89
Potatoes for processing	97	123	97	100	93	91
Sugar beets	95	94	100	101	105	105
Peas	126	64	98	96	103	113
Winter rape	79	103		112	107	100
Spring rape	93	98	103	101	100	106
Winter turnip rape	91	98	113	105	88	106
Spring turnip rape	100	94	108	100	100	98
Linseed	130	43	97	78	79	173
Average (linseed excluded)	101.9	96.8	98.6	101.0	97.9	103.8

/Jordbruksverket and SCB, 2003b,c/

Animal production statistics

Input data

Data was on the number of livestock in Uppsala län, Östhammars kommun and Forsmark församling in 1990, 1995 and 1999 were acquired from SCB. Data on the total animal production and the number of livestock in Sweden was derived from the Farm Register trough several publications /Jordbruksverket and SCB, 2002a–e, 2003a–g/ and compared with data acquired from other data acquired from summaries of academic research and organisations connected to food industry /SLU, 1999, 2001; LivsmedelsSverige, 2004a–g, internet; Svensk Fågel, 2004, internet/ and /Swedish Meats, 2004, internet/.

Data processing

The necessary estimates, average yearly production per animal, were derived from the national statistics in 1997–2002 /Jordbruksverket and SCB, 2002e, 2003a,g, 2004/. The total number of slaughtered cattle, pigs, sheep, lambs and chickens was divided with the total number of animals in each group so that an estimate for the percentage of the yearly slaughtered animals was established. The total quantities of slaughtered cattle, pigs, sheep, lambs and chickens were divided by the total number of slaughtered animals in each group, which gave an estimate for the average slaughter weight for each. In a similar manner the total number of dairy production was divided with the total number of dairy cows in order to produce an estimate for the yearly milk production per cow. The total egg production was divided with the number of fowls older than 20 weeks in order to estimate the yearly egg production per fowl. /Jordbruksverket and SCB, 2003a/. These estimates have then been compared with general information on animal production acquired from academic sources /SLU, 1999, 2001/ and organisations close to food industry /LivsmedelsSverige, 2004a–g, internet; Svensk Fågel, 2004, internet/ and /Swedish Meats, 2004, internet; Clausson, 2004, personal communication; Strandberg, 2004, personal communication; Eklund, 2004, personal communication; Alarik, 2001/.

According the Agricultural Yearbook 2003 /Jordbruksverket and SCB, 2003a (p 225)/ “the production of beef was 142,300 ton, the production of mutton 3,900 ton and the production of pork 283,800 ton”. When the Tables 15.1, 15.2 and 15.3 are studied more closely /Jordbruksverket and SCB, 2003a (p 232–233)/ we see that they give the number of slaughtered animals and the slaughtered quantities, that is the weight of carcasses, which is not the same as the weight of meat regardless of what was said earlier in p 225. This was confirmed by Annette Palme /Palm, 2004, personal communication; Jordbruksverket, 2002/.

As it is necessary to estimate the amount of meat derived from the slaughtered quantities, an estimate for the meat percent has to be established, preferably for each animal group separately. For the time being the only available meat percent estimate is for pigs (57%) and it has been used in all calculations, also with cattle and sheep. The average Swedish pig carcass, if defined according to EUROP system (a carcass with the head and bones), contains approximately 57% meat /SLU, 1997/. This estimate has then been used in calculations for pigs, cattle and sheep. The meat percent for a chicken is somewhat higher, 75%, and that of a hen 65% /Strandberg, 2004, personal communication/.

The animal production in Forsmark församling has been estimated using the national animal production estimates described above and the numbers on livestock in Forsmark församling in 1990, 1995 and 1999 from SCB. As no data on the number of animals in the Forsmark area was available, the animal production there could be estimated in a similar way as the crop production, namely related to either the number of farms in Forsmark församling or to the amount of arable land. These assumptions are considered to be unduly simplistic, though. At the present moment only breeding cattle is kept in the Forsmark area

partly as a consequence of EU Agricultural support measures /Karlsson, 2003, personal communication/. With the help of the area suitable for grazing and the area needed per animal the potential number of breeding cattle can be estimated. According to a study on dairy cows and grazing land /SLU, 2001/ some 1.8–3.0 hectare grazing land is needed per dairy cow a year. Theoretically this would mean that a herd of 9–15 animals could graze on the 26.6 hectare large area within Forsmark 5.

The production of milk and beef

There are approximately 420,000 dairy cows while the total number of cattle is some 1.6 million in 2002 in Sweden. Both the total number of cattle and the number of dairy cows decreased significantly since the 1980's; the total number of cattle by 300,000 and the number of dairy cows by 240,000. The decreasing trend has continued, not as dramatically, though, in the 90's and in the beginning of 21st century. /Jordbruksverket and SCB, 2002a/. The average size of herd has increased, now being some 40 dairy cows (2003) when it was less than 30 in 1995. The corresponding average sizes for breeding cattle herds were a little over 40 (1995) and almost 60 (2003).

The production cycle of beef and milk is as follows. A heifer is inseminated by the age of 15–18 months and then gives birth to her first calf at the age of two years. Thereafter she has a calf once a year and gives milk during 10 months every year. An average dairy cow is then slaughtered at the age of 5 years after she has given birth to 3 calves. However, some cows are allowed to survive beyond 5 years.

Most of the young animals that are slaughtered at the age of 18 months are bulls. The tradition of slaughtering calves that have only been fed on milk is changing and very few calves are slaughtered so young but a considerable number are slaughtered at the age of 6 months. Almost all of the heifers become dairy cows and are slaughtered later at the age of 5 years.

With the help of the total number of dairy cows and the delivered milk in Sweden in 1997–2002 (see Table 2-8) we can estimate that a dairy cow produces approximately 7,495 kg milk per year. When this estimate is compared with the number given by /LivsmedelsSverige 2004f, internet/ which is approximately 8,000 litres milk by dairy cow a year, it seems that we have a reliable estimate.

The number of slaughtered cattle in Sweden is approximately 28.5% of the total number of cows, adult cattle, heifers, bull, bullocks and calves as recorded in June every year (see Table 2-7). Slaughtered cattle consists of several different types: calves, bullocks, bulls, heifers, adult cattle and bulls and their average slaughter weights vary from approximately 110 kg up to almost 320 kg. In order to simplify the calculations the total amount of slaughtered quantity has been divided with the number of slaughtered cattle. The average slaughter weight 290 kg is somewhat more than the average slaughter weight of a cow and slightly less than the average slaughter weight of full grown cattle /LivsmedelsSverige, 2004e, internet/.

In order to calculate the amount of beef the following estimates (see Table 2-7 and Table 2-8) have been used. In these calculation we make the assumption that the meat percentage of the slaughter weight of cattle is 57, the same estimate as with slaughtered pigs /SLU, 1997/. This estimate corresponds rather well with the estimate of 50% given by Stefan Clausson /Clausson, 2004, personal communication/.

Table 2-7. Cattle – beef production in Sweden (1997–2002).

Cattle – beef production	Average	1997	1998	1999	2000	2001	2002
Number of cattle	1 700 830	1 780 823	1 738 496	1 712 920	1 683 767	1 651 511	1 637 465
Number of slaughtered cattle	485 208	518 639	486 096	479 681	489 989	463 986	472 855
Slaughtered cattle as a percentage of total number of cattle	28.5	29.1	28.0	28.0	29.1	28.1	28.9
Slaughtered quantities of cattle (1 000 ton)	142	144.71	138.54	139.75	145.43	139.12	142.30
Average slaughter weight of cattle (kg)	292.2	279.0	285.0	291.3	296.8	299.8	300.9

/Jordbruksverket and SCB, 2003a/

Table 2-8. Cattle – milk production in Sweden (1997–2002).

Cattle – milk production	Average	1997	1998	1999	2000	2001	2002
Dairy cows	438 134	467 981	449 130	448 520	427 621	418 471	417 082
Dairy cows as a percentage of total number of cattle	25.8	26.3	25.8	26.2	25.4	25.3	25.5
Milk production (ton)	3 277 667	3 276 000	3 278 000	3 299 000	3 297 000	3 290 000	3 226 000
Milk produced per cow a year (kg)	7 493.5	7 000.3	7 298.6	7 355.3	7 710.1	7 862.0	7 734.7
Milk produced per cow a day (kg)	21.0	19.7	20.5	20.7	21.7	22.1	21.7

/Jordbruksverket and SCB, 2003a/

The production of mutton

There are approximately 430,000 sheep and lambs in Sweden (2002). Mutton is still produced on a relatively small scale. The domestic production equals only 50% of the consumption and has not increased in spite of all efforts. Since most of the lambs are born at the beginning of the year and slaughtered at the age of 5–6 months the supply of fresh mutton can satisfy the demand only during the autumn season. Most of the lambs are slaughtered at the age of 5–6 months when they weigh approximately 40 kg which in its turn produces a carcass of 18–23 kg /LivsmedelsSverige, 2004c/.

The following estimates were used in calculations (see Table 2-9): The number of slaughtered sheep is estimated to be approximately 14.3% of the total number of sheep and the number of slaughtered lambs is 69.4% of the total number of lambs.

The average slaughter weight of a sheep is around 25.9 kg and the average slaughter weight of a lamb 18.1 kg, slightly lighter than what the numbers from LivsmedelsSverige suggest.

Even though a sheep is physically rather different from a pig, the same estimate for meat percentage, 57%, has been used when the amount of mutton has been estimated.

Table 2-9. Production of mutton in Sweden (1997–2002).

Sheep and lambs – mutton production	Average	1997	1998	1999	2000	2001	2002
Sheep	196 487	194 948	186 707	193 644	198 268	207 623	197 734
Lambs	238 653	247 154	234 482	243 605	233 666	243 971	229 037
Total number of sheep and lambs	435 140	442 102	421 189	437 249	431 934	451 594	426 771
Sheep as a percentage of the total number	45.2	44.1	44.3	44.3	45.9	46.0	46.3
Lambs as a percentage of the total number	54.8	55.9	55.7	55.7	54.1	54.0	53.7
Number of slaughtered sheep	27 971	31 226	27 911	27 850	28 301	27 205	25 332
Number of slaughtered lambs	165 406	158 892	155 401	162 729	173 849	170 221	171 345
Slaughtered sheep as a percentage of the total number	14.3	16.0	14.9	14.4	14.3	13.1	12.8
Slaughtered lambs as a percentage of the total number	69.4	64.3	66.3	66.8	74.4	69.8	74.8
Slaughtered quantities of sheep (1 000 ton)	0.72	0.78	0.71	0.71	0.73	0.72	0.69
Slaughtered quantities of lambs (1 000 ton)	2.99	2.73	2.78	2.95	3.18	3.13	3.17
Total quantity of slaughtered sheep and lambs (1 000 ton)	3.71	3.51	3.49	3.66	3.91	3.85	3.86
Average weight of a slaughtered sheep (kg)	25.9	25.0	25.4	25.5	25.8	26.5	27.2
Average weight of a slaughtered lamb (kg)	18.1	17.2	17.9	18.1	18.3	18.4	18.5

/Jordbruksverket and SCB, 2003a/

Table 2-10. Production of pork in Sweden (1997–2002).

Pigs – pork production	Average	1997	1998	1999	2000	2001	2002
Total number of boars, sows and other pigs	2 073 927	2 351 201	2 286 030	2 115 213	1 917 917	1 891 456	1 881 743
Number of slaughtered pigs	3 552 668	3 914 568	3 872 887	3 797 533	3 251 100	3 197 802	3 282 118
Slaughtered pigs as a percantage of the total number	171.4	166.5	169.4	179.5	169.5	169.1	174.4
Total quantiety of slaughtered pigs (1 000 ton)	302.98	325.35	330.41	325.43	276.98	275.87	283.81
Average weight of a slaughtered pig (kg)	85.3	83.1	85.3	85.7	85.2	86.3	86.5

/Jordbruksverket and SCB, 2003a/

There are almost 1,900,000 pigs in Sweden in 2002 of which some 10% sows and 2% boars. However, every year, over three million pigs are slaughtered in Sweden. At first this number seems to be totally incorrect but we can study the numbers more closely. First we know that the total number of animals represents the situation as is recorded in the beginning of June every year and the number of slaughtered animals represents the total number of animals slaughtered during the whole course of the year.

A closer look at a pig's life cycle makes this odd ratio between the total number of pigs and the number of slaughtered pigs more reasonable. A sow's pregnancy lasts normally 16 weeks and then she gives birth to 6–10 piglets. One single sow can therefore produce over 20 piglets every year. Most of the pigs are slaughtered at the age of 6–7 months /LivsmedelsSverige 2004d, internet/.

The following estimates have been used in calculations (see Table 2-10): The number of slaughtered pigs is estimated to be 170% of the total number of pigs as it is recorded in June every year. The meat percentage of a carcass (of the slaughter weight according to the EUROP system when the head is included) is estimated to be 57% /SLU, 1997/.

The production of eggs and chicken meat

The total number of chickens and hens is approximately 6.,3 million out of which almost 5 million lay eggs (June 2002). The number has been rather stable during the 90's but has started to decrease during the 21st century. Almost 77 million chickens are slaughtered every year.

Before the statistics on chicken and eggs is studied more closely a few words of warning are necessary /Jordbruksverket and SCB, 2002a; Svenska Ägg, 2004, internet/.

Firstly the statistics available on laying hens is misleading. Data on hens, fowls and chickens are only presented in two categories and their names are rather obscure: 'höns, 20 veckor eller äldre', translated in the column title as 'fowls' and 'kycklingar av värpras', translated as 'laying hens'. After discussions with Jordbruksverket /Tranberg, 2004, personal communication; Eklund, 2004, personal communication/ we can conclude that fowls produce eggs and the so-called 'laying hens' are chickens younger than 20 weeks that will become laying hens. When the total egg production is divided by the total number of fowls we get an estimate for the average yearly production that is slightly less than 20 kg or almost one egg a day. This number correlates with data acquired from other sources /LivsmedelsSverige 2004g, internet; Svensk Fågel 2004, internet/.

No data on 'slaughter chickens', that is the number of chickens alive in the beginning of June that will be slaughtered during the coming 12 month period can be found in publications showing the number of live animals in Sweden /Jordbruksverket and SCB, 2004; Jordbruksverket and SCB, 2003a/. Per Eklund /Eklund 2004, personal communication/ was able to extract data directly from the Farm Register for years 1995, 1999, 2000 and 2002 but since this data were not of even quality (the numbers for 2000 were from August and clearly differing from others) it was excluded from this study. The number of the yearly slaughtered chickens has been acquired from the animal production statistics /Jordbruksverket and SCB, 2003g/ and then the percentage of slaughtered chickens has been counted as a percentage of the total number of live chickens and fowls in June every year /Jordbruksverket and SCB, 2004; Jordbruksverket and SCB, 2003a (Tables 6.1, 6.15 and 6.16)/ even though this total number does not contain the slaughter chickens.

The production cycle of eggs and chicken meat can briefly summarized as follows. Those chickens that are to become laying hens are sorted out at the age of 14–15 weeks while the rest are slaughtered. The normal hen lays her first egg at the age of 18–19 weeks. The first eggs are often quite small weighing some 45–50 g but they soon increase in size. By the age of 25–30 weeks egg production reaches a level of almost one egg a day. The active laying period ends around the age of 75–78 weeks, after which the hen is slaughtered. Since the egg production continues throughout the year without special seasons there is a steady flow of new hens brought up all the time.

The following estimates (see Table 2-11 and Table 2-12) have been used in calculations: A fowl lays in average 18.7 kg eggs per year. The number of slaughtered chickens is estimated to be 925% of the total number of fowls (laying hens) and chickens (young chickens that will become laying hens). The meat percentage (meat/slaughter weight) is estimated to be 75%.

Table 2-11. Production of chicken meat in Sweden (1997–2002).

Fowls and chickens – meat production	Average	1990	1995	1997	1998	1999	2000	2001	2002
Fowls (20 weeks and older)	5 664 296	6 391 943	6 100 270	5 724 509	5 361 748	5 647 509	5 669 655	5 686 894	4 731 837
Fowls as a percentage of the total number	75.0	74.6	77.1	75.3	71.3	71.9	77.4	76.8	75.5
Chickens	1 892 229	2 175 676	1 811 509	1 881 407	2 154 682	2 202 333	1 654 063	1 721 342	1 536 819
Chickens as a percentage of the total number	25.0	25.4	22.9	24.7	28.7	28.1	22.6	23.2	24.5
Total number of fowls and chickens	7 556 525	8 567 619	7 911 779	7 605 916	7 516 430	7 849 842	7 323 718	7 408 236	6 268 656
Number of slaughtered chickens				65 987 000	62 345 000	66 608 000	66 608 000	68 617 000	73 355 000
Slaughtered chickens as a percentage of the total number	925.2			867.57	829.45	848.53	909.48	926.23	1 170.19
Total quantity of slaughtered chickens (1 000 ton)	90.76				79.8	86.6	89.9	96.1	101.4
Average weight of a slaughtered chicken (kg)	1.34				1.28	1.30	1.35	1.40	1.38

/Jordbruksverket and SCB, 2003a/

Table 2-12. Egg production in Sweden (1997–2002).

Egg production	Average	1997	1998	1999	2000	2001	2002
Eggs delivered to wholesalers (1 000 ton)	68.4	69.6	68.7	67.5	65.1	71.5	68.2
Total production 1 000 ton (35% of production not delivered to wholesale trade)	102.3	107.0	106.0	107.0	102.0	98.0	94.0

Egg production	Average	1997	1998	1999	2000	2001	2002
Fowls	5 470 359	5 724 509	5 361 748	5 647 509	5 669 655	5 686 894	4 731 837
Eggs produced by a hen per year (kg)	18.7	18.7	19.8	18.9	18.0	17.2	19.9
Number of eggs produced by a hen per year (á 62.5 g)	300.0	299.1	316.3	303.1	287.8	275.7	317.8
Number of eggs produced by a hen per day (á 62.5 g)	0.8	0.8	0.9	0.8	0.8	0.8	0.9

/Jordbruksverket and SCB, 2003a/

The animal production in Forsmark församling has been estimated with the help of the national estimates shown in Table 2-13. The animal production in the Forsmark area has not been estimated due to lack of data.

Table 2-13. Animal production statistics in Sweden (1997–2002).

Cattle	
Milk (kg) produced by a cow per year	7 493.5
Milk (kg) produced by a cow per day	21.0
Dairy cows as a percentage of total number of cattle	25.8
Slaughtered cattle as a percentage of total number of cattle	28.5
Average slaughter weight of cattle (kg)	292.2
Sheep and lambs	
Sheep as a percentage of the total number	45.2
Lambs as a percentage of the total number	54.8
Slaughtered sheep as a percentage of the total number	14.3
Slaughtered lambs as a percentage of the total number	69.4
Average slaughter weight of a sheep (kg)	25.9
Average slaughter weight of a lamb (kg)	18.1
PigsSlaughtered pigs as a percantage of the total number	171.4
Average slaughter weight of a pig (kg)	85.3
Fowls and chickens	
Fowls as a percentage of the total number	75.0
Chickens as a percentage of the total number	25.0
Slaughtered chickens as a percentage of the number of fowl and chickens	925.2
Average slaughter weight of a chicken (kg)	1.3
Weight (kg) of eggs produced by hen per year	18.7
Number of eggs produced by hen per year (à 62.5 g)	300.0
Number of eggs produced by hen a day (à 62.5 g)	0.8

/Jordbruksverket and SCB, 2003a/

2.3.4 Horticulture

Input data

Statistics concerning the number of horticultural holdings in Uppsala län have been obtained from /SCB, 2003a/. The report includes the number of holdings in each county, but no data for any smaller areas. Accordingly, it is not possible to demonstrate the actual number of holdings for other levels of resolution through the statistics from SCB.

The number of horticultural holdings in Östhammars kommun can however be found in /Östhammars Näringslivsutveckling AB, 2003a, internet/. The register includes all registered enterprises in the municipality, according to Östhammars Näringslivsutveckling AB. The number of enterprises can therefore be demonstrated for all levels of resolution. There are no available data on the amount of production in Östhammars kommun.

2.3.5 Aquaculture

Input data

Statistics concerning the number of enterprises in Uppsala län have been obtained from /SCB, 2003b/. The report includes the number of holdings in each county, but not for any smaller areas. Accordingly, it is not possible to demonstrate the actual number of holdings in other levels of resolution through the statistics from SCB.

The number of enterprises, and their location in Östhammars kommun, has however been obtained from the municipal key plan /Östhammars kommun, 2003a/. The number of enterprises can therefore be demonstrated for all levels of resolution. There is no available data on the amount of production in Östhammars kommun.

2.3.6 Mineral extraction

Input data

Data on mineral extraction leases within the county of Uppsala was gathered from Länsstyrelsen i Uppsala län (the County Administrative Board of Uppsala) /Albjär, 2003, personal communication/. The information consisted of an Excel file with data on the leases within the county.

Data processing

The Excel-file was converted into a dBase-file and imported to ArcGIS. Thereafter, the parish theme was used as an overlay to sort the leases within the area.

2.3.7 Water supply

Input data

Statistics concerning water use and water withdrawal were purchased from SCB for two levels of resolution, the county and the municipality, and for three different years, 1990, 1995 and 2000 /SCB, 2003g/.

The water withdrawal is divided into groundwater and surface water, and is also distinguished into private supply and public waterworks. The water use is divided into the categories household, agriculture, industry and others. The category "Industry" does not include the water use within nuclear power plants. The category "Others" includes water used in business sectors such as government services, trading, hotels and restaurants, construction and transportation. Water use in holiday houses is included in the "Household" figure. These distinctions are based on the statistics in /SCB, 2003c/.

The survey performed in 2000 was not comprehensive at the municipal level. There are no data concerning agricultural water use and no data on groundwater and surface water withdrawals. Likewise there are no data concerning water withdrawal from private water supplies.

Data processing

As there were no available data on water use within the parish or smaller areas these figures have to be calculated based on specific assumptions. The figures on water use and water withdrawal in 2000 at the parish and smaller areas are therefore estimated and not precise.

The following assumptions, used by /SCB, 2003c/, are applied:

- The average water use per person within households is 189 litres per day
- The holiday houses are in average used by three persons for 60 days per year

The following assumptions have been used in this synthesis:

- All the holiday houses have summer water and private sewage. According to /SCB, 2003c/ the water use in holiday houses with summer water and private sewage is 100 litres per person and day.
- The average water use per farm in the municipality in 1995 is applied for smaller areas, that is 1,067 m^3 per farm (571,000 m^3/535 farms).
- The number of work places in the parish (and smaller areas) has been calculated as a percentage of the work places in the municipality in 2000. The percentage is assumed to be tolerably equal to the percentage water use within the industry sector and other business sectors.
- The distribution between water withdrawals by public waterworks and private water supply in the municipality in 1995 is assumed to be applicable in the smaller areas.
- The distribution between water withdrawals from groundwater respectively surface water in the municipality in 1995 is assumed to be applicable at the smaller areas.

The average water use within households (including holiday houses) in Östhammars kommun in 2000 is 188 litres per day, according to the figures delivered from SCB. The inhabitants in the municipality must use less water than the average (189 litres per day) as there are a considerable number of holiday houses in the municipality and their water use is supposed to be included in the household figure. The calculated value for Forsmark församling is therefore probably an overestimate.

The water use by Forsmark nuclear power plant has been added to the calculated figures for the parish and smaller areas. Forsmarks Kraftgrupp uses Forsmarksån, i.e. surface water, as a private water supply.

2.3.8 Coastal fishing

Catch by commercial fishermen

Input data

Statistics concerning the commercial sea fisheries were obtained from Fiskeriverket, Avdelningen för Fiskerikontroll (the National Board of Fisheries, Department of Fisheries Control). The figures included three levels of resolution (the county, the municipality and the postcode areas within the municipality) and a time series of eight years, 1995–2002 /Fiskeriverket, 2003/. The data from 1995 were excluded since they differed remarkably from the other data and were therefore considered improbable. The catch data varies markedly between the other years, which can be seen in Table 4-32, when comparing the latest figure (2002) and the mean value.

Fiskeriverket registers all commercial fishing vessels with a length of more than 5 metres. Professional fishermen with vessels above 12 metres are required to record information about their catch in a logbook according to EU regulations. Beside information on the catch (kg/species) they must report the type of fishing gear and the fishing position (longitude, latitude). The logbook is associated with the vessel, but it can also be related to the fishermen that own the vessel. Fishermen with short vessels are required to keep a logbook when trawling. If they are not trawling they only need to keep a fishing journal every month. The journal shall contain obtained catch (kg/species), but it needs not contain the exact position for the catch.

Fiskeriverket is responsible for controlling catches and landing of fish as well as for the official fishery statistics. The statistics are based on information that comes from fishing logbooks, fishing journals, landing declarations and sales notes.

Fiskeriverket can produce catch data per postcode area, as the catch is registered on the logbook- or journal keeping fisherman and his address. This has been done for the postcode zones within the Östhammars kommun. It is possible though to see what parish/es a postcode zone includes through /Posten, 2003, internet/. Forsmark församling has the code 02. The catch data cannot be demonstrated at smaller areas.

Fiskeriverket keeps statistics of the catch within an offshore grid (EU-grid). The grid size is approximately 30×30 nautical miles (56×56 km). The data only comprise the catch from the logbook-keeping vessels, as they report the tackle position. Second, the catch is registered in the square where the tackle is placed, but that does not necessarily mean that the fish has been caught in that particular square. Fishing boats can trawl a long distance and therefore catch the main part of the fish in a neighbouring square /Lundgren, 2003, personal communication/. The catch data at each EU-square varies therefore considerably between years, which can be seen in Table 4-33, when comparing the latest figure (2002) and the mean value.

Grid data has been obtained for nine squares off the coast of Uppsala län. These are 50G7, 47G8–50G8 and 47G9–50G9 (see Figure 2-2).

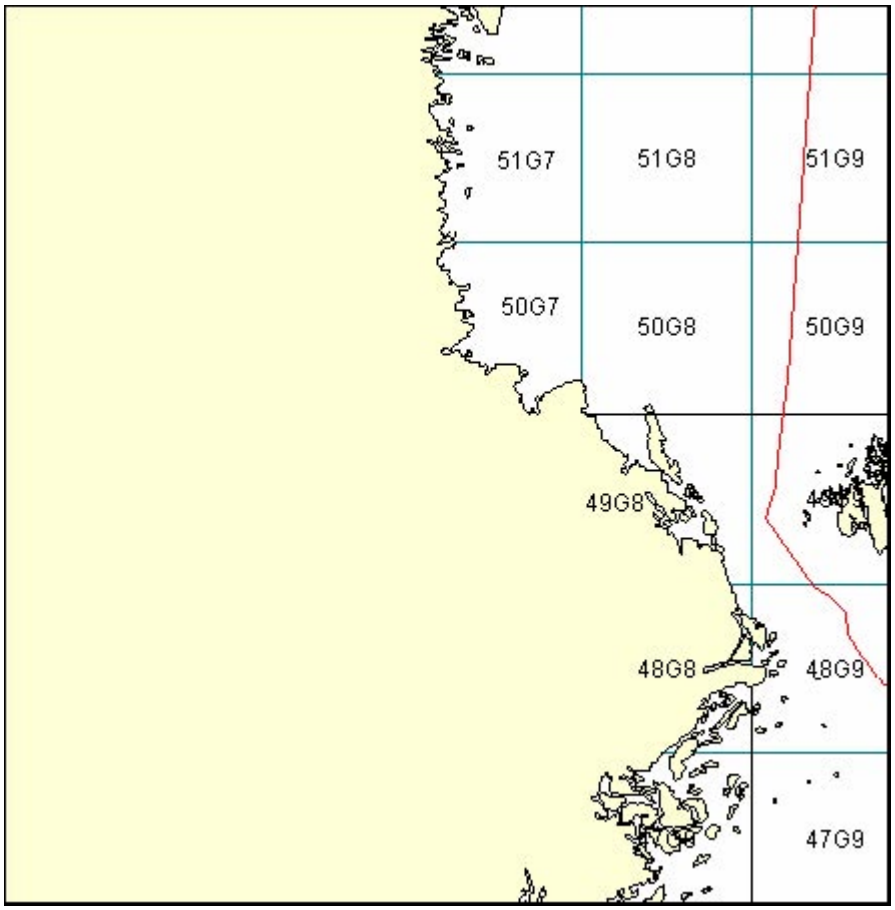

Figure 2-2. *Map showing the EU-grid for fisheries on the coast of Uppsala län.*

Data processing

The offshore-grid was obtained in paper form from Fiskeriverket. The grid was in the world coordinate system WGS 1984 (latitude and longitude). The coordinates were digitalized and converted to coordinate system RT 1990 2.5 gon West in ArcGIS.

The catch per unit area for each EU-square was calculated. The water area within each square was obtained through geoprocessing in ArcGIS. Mean values for the total catch and the catch per unit area were calculated together with minimum and maximum values and standard deviations (SD) of the mean. The dominating species were calculated as a percentage of the total catch.

Number of fishermen

Input data

Fiskeriverket does not have data on the total number of fishermen as claimed by /Berggren and Kyläkorpi, 2002/. The data obtained from Fiskeriverket for 1995–2002 /Fiskeriverket, 2003/, does only include the number of logbook- or journal-keeping fishermen (one fisherman per vessel). The total number of fishermen is larger.

The data from 1995 were excluded as they differed remarkably from the other data and were therefore considered improbable. The smallest area obtained is the postcode zones within Östhammars municipality. The associated parish has been estimated by using /Posten, 2003, internet/.

Data processing

According to the municipality key plan /Östhammars kommun, 2003a/ there are 20 commercial fishermen in Östhammars kommun. According to Fiskeriverket, the number of logbook- or journal-keeping fishermen was ten in 2002. The numbers obtained from Fiskeriverket have therefore been multiplied with 2 in order to estimate the total number of fishermen. A mean value of the number of fishermen has been calculated. Minimum and maximum values and standard deviations (SD) of the mean were also calculated.

Landing declarations and sales notes

Input data

The number of commercial/authorized receivers in the county and the amount of landed fish has been obtained from Fiskeriverket for the year 2002 /Fiskeriverket, 2003/. The figures include information about the final use of the fish – human consumption or animal food.

The landed amount declared by the receivers in the county is not equal to the amount of fish caught by fishermen living in the county. The receivers can obtain fish from vessels coming from other counties and the local fishermen can sell their fish further on their own or to receivers in other counties.

The authorized receivers are obliged to leave landing declarations in accordance with the statute book from Fiskeriverket, FIFS 1995:23 /Berggren and Kyläkorpi, 2002/. Despite this obligation, missing accounts occur and some trade occurs to other receivers. According to FIFS, a catch below 50 kg does not need to go through authorized receivers /SCB and Fiskeriverket, 2004).

2.3.9 Outdoor life

Input data

The average time spent on sports and outdoor activities per person have been obtained from /SCB, 2003e/. The study included a population between 20 and 84 years of age.

The total amount of outdoor hours per year in Forsmark församling has been calculated. Children and youths are normally outdoors more than adults, especially children. When calculating, the average time outdoors obtained from the national study has been used after all. The number of outdoor minutes per day and person has been multiplied with the number of inhabitants in 2002 and 365 days.

Hunting of wildlife

Moose – input data

Statistics concerning hunting permits and harvest of moose were purchased from Länsstyrelsen i Uppsala län (the County Administrative Board of Uppsala) for three levels of resolution (the parish, municipality and county) and for a time series of five years, 1999–2003 /Länsstyrelsen i Uppsala län, 2003b/. The hunting season starts in October (depending on the part of the country) and ends on the 31st of January. The latest figure is from the season that ended in 2003.

Four different hunting zones exist; A, B, E and Ä-zones. Länsstyrelsen i Uppsala län gives hunting permits for adult moose in A-zones. Harvest of one moose is permitted in a B-zone, whereas harvest of one calf is permitted in an E-zone. Hunting is accepted without a license within an Ä-zone (moose protection area) as long as there is a management plan.

Figures concerning carcass weight in Saxmarken, north of Forsmark, have been obtained from /Svensk Viltförvaltning AB, 2003/. This report gives a local account of the carcass weights and is therefore more accurate than the figures that are given by Svenska Jägareförbundet (the Swedish Association for Hunting and Wildlife Management). The carcass weights are lower in Saxmarken due to a generally low average age. The carcass weight of a moose calf has been obtained from /Svenska Jägareförbundet, 2003a, internet/ as this figure is missing in the synthesis from Svensk Viltförvaltning AB.

The carcass weight, that is the body without the head, intestines and the lower parts of the legs, is normally 55% of the total living weight according to Svensk Viltförvaltning AB /Cederlund, 2003, personal communication/. The utilized carcass weight (bones excluded) for moose has not been found in any publication. According to Svensk Viltförvaltning AB approximately 80% of the carcass weight can be utilized.

Moose – data processing

The hunting zones and the moose protection areas can be extended over an administrative border such as the parish boundary. The hunting statistics for each hunting zone are registered with the parish, in which the main part of the hunting zone is located. The total hunting area can, therefore, be larger than the land area of the parish. When calculating the number of harvested moose per unit area the total hunting area has been used. The calculated value is applied to the associated parish.

The mean number of harvested moose per unit area in the parish is applied to the smaller areas. This is presumed to be realistic as the landscapes are comparable. The number of harvested moose has been calculated based on the mean value and the different area figures.

The carcass weight has been calculated based on the figures given by Svensk Viltförvaltning AB and Jägareförbundet. According to Svensk Viltförvaltning AB, the carcass weights in Saxmarken are 161 kg for a bull and 146 kg for a cow (mean value for 1999–2002). These figures may be compared to the carcass figures from /Svenska Jägareförbundet, 2003a, internet/, which are 180–230 kg for a bull, 170–200 kg for a cow and 70 kg for a calf. When calculating we have chosen to use a carcass weight of 161 kg for a bull, 146 kg for a cow and 70 kg for a calf.

When calculating the live weights the carcass weights have been divided by 0.55. When calculating the utilized carcass weights the carcass weights have been multiplied by 0.80.

The live-, carcass-, and utilized carcass weights in the smaller areas (the main drainage area (54/55), Forsmark area and its subareas) have been calculated based on the mean number of harvested moose per unit area and the mean distribution between harvested bulls, cows and calves in the parish.

Other wildlife – input data

The estimated number of harvested wildlife other than moose has been obtained from Jägareförbundet for one level of resolution and for a time series of five years, 1997–2001 /Svenska Jägareförbundet, 2003e, internet/. The level of resolution is Östhammars jaktvårdskrets (Östhammar hunting association) that was established in 1971. The association covers a district of 850 km^2, which was the old municipality area before the municipality-fusion in 1974. Today the hunting zone covers 59% of the land area in Östhammars kommun /Östhammars jaktvårdskrets, 2003, internet/.

Svenska Jägareförbundet collects voluntary reports from the local hunting associations. About 35 species, mainly birds, are included in the reports. To achieve a high reliability the reports should cover at least 50 percent of the hunting area. Today, those requirements are not normally fulfilled. According to Svensk Viltförvaltning AB, the actual harvested numbers is higher than these figures.

We have chosen to include hunting of roe deer and hare, both common (European) hare and alpine (mountain) hare in this synthesis. These three species are hunted for consumption. The other species are hunted on a very limited scale.

Live weights for roe deer have been obtained from Svensk Vilförvaltning AB /Cederlund and Liberg, 1995/. An adult buck weights 22–28 kg, an adult goat weights 21–27 kg and a fawn weights 12–16 kg. The carcass weight of roe deer is approximately 55% of the living weight and the utilized carcass weight is approximately 80% of the carcass weight according to Svensk Viltförvaltning AB.

The distribution between harvested adult roe deer and fawns has been obtained from /Kindberg, 2002/. 31% of the harvested roe deer are on average fawns, 42% are on average bucks and 27% are on average goats.

An adult common hare weights 4–6 kg and an adult alpine hare weights 3–5 kg according to the information at /Svenska Jägareförbundet, 2003b–c, internet/. No figures concerning the carcass weight have been found. We have been advised by Svensk Viltförvaltning AB to estimate the carcass weight as 55% of the living weight and the utilized carcass weight as 80% of the carcass weight.

Other wildlife – data processing

To obtain an estimate of the number of harvested roe deer and hares at the parish and smaller areas, the harvested number per unit area in the hunting zone has been applied.

The live weights are assumed to be 25 kg for a buck, 24 kg for a goat and 14 kg for a fawn. Furthermore, the living weights are assumed to be 5 kg for a common hare and 4 kg for an alpine hare.

The total live weight of roe deer has been calculated based on the average distribution between bucks, goats and fawns given by /Kindberg, 2002/.

When calculating the carcass weights, the live weights have been multiplied by 0.55. When calculating the utilized carcass weights, the carcass weights have been multiplied by 0.80.

Recreational fishing

Catch by sport fishermen – input data

Fiskeriverket (the National Board of Fisheries) has carried out a national survey concerning recreational fishing /Fiskeriverket, 2000/. 55% of the population aged between 16 and 74 years expressed some interest in fishing according to this study. A majority (75%) of the interested population considered themselves as sport fishermen and they caught on average 18 kg fish that year. A minority (9%) were subsistence fishermen that caught on average 67 kg. The rest were so called generalists that use both nets and rods. There are no data on the extent of recreational fishing within Uppsala län.

Data processing

A theoretical value of the yearly catch can be calculated based on the information in /Fiskeriverket, 2000/, presuming that 55% of the population between 16 and 64 years are sport fishermen that catch 18 kg per year. This seems like a very high figure, but as it is the only available data today it is used. When calculating, a population between 16 and 64 years old has been used, although the national survey included a population between 16 and 74 years old. Our demography data has only five age classes, where "≥ 65 years" is the highest, so it is not detailed enough to get a value for a population between 16 and 74 years.

Sport fishing clubs and attractive fishing waters – input data

In order to obtain a sufficient description of the recreational fishing, the number of sport fishing clubs and attractive fishing waters has been included in this synthesis. Figures concerning these variables have been obtained from /Sveriges Sportfiske- och Fiskevårdsförbund, 2003, internet/ and from /Hägglund and Hultman, 2003/.

Other outdoor activities

The number of jogging tracks, open air baths, marinas and guest harbours, golf courses, hiking trails, ornithological areas, canoe routes, camping grounds and boat renters have been obtained from different internet sites during the autumn of 2003. These figures have not been confirmed by other sources.

The picking of wild berries and mushrooms has been calculated based on the information in /Berggren and Kyläkorpi, 2002/.

2.3.10 Degree of self-sufficiency

The degree of self-sufficiency has been calculated for one level of resolution, the parish, using data on production of a number of food resources in the parish divided by the consumption of the population living in the same area. This means that the output is the theoretical degree of self-sufficiency that could be achieved, not the actual utilisation of local food resources within the area. The consumption figures have been calculated by multiplying the population figure within the parish in 2002 by the mean consumption in Sweden in 2001 as given by /Jordbruksverket, 2003/.

3 Input data – an overview

A summary of all the variables, data sources and most of the processing steps is presented in Table 3-1, below. For more detailed information and discussion of the various issues relating data and processing, please refer to the previous section.

Table 3-1. Overview of input data, sources and processing.

Variable	Time series	Data source	Most detailed level obtained	Data processing
Demography				
Total population and population per age class	1993–2002	SCB (SCB)	subarea	A mean value for 1993–2002 has been calculated (together with minimum and maximum value and standard deviation (SD) of the mean). The population density has been calculated. The number of inhabitants per age class has been calculated as a percentage.
Population changes (Births, deaths, in-migration and out-migration)	1993–2002	SCB	subarea	A net population change (in-migration and live births minus out-migration and deaths) has been calculated in order to determine if it is negative or positive. A mean value for 1993–2002 was calculated for the variables (together with minimum and maximum value and standard deviation (SD) of the mean).
Health				
Ill-health[1]	1998–2002	SCB	subarea	A mean value for 1998–2002 has been calculated (together with minimum and maximum value and standard deviation(SD) of the mean).
Properties and buildings				
Type of properties	1996 and 2002	SCB	subarea	The number of properties per category has been calculated as a percentage. The property density has been calculated.
Building permits	1996–2002	SCB	subarea	A mean value for 1993–2002 has been calculated (incl minimum, maximum value and SD).
Completed dwellings	1993–2002	SCB	subarea	A mean value for 1993–2002 has been calculated (together with minimum and maximum value and standard deviation(SD) of the mean). The density has been calculated, that is number of new dwellings per unit area.
Employment				
The employed night-time population by type of business[2] (20–64 years)	1997–2002	SCB	subarea	The number of workers by type of business has been calculated as a percentage. A mean value for 1997–2002 has been calculated (together with minimum and maximum value and standard deviation (SD) of the mean).
The employed day-time population by type of business (20–64 years)	1997–2002	SCB	subarea	The number of workers by type of business has been calculated as a percentage. A mean value for 1997–2002 has been calculated (together with minimum and maximum value and standard deviation (SD) of the mean).
Work places by type of business	1997–2002	SCB	subarea	The number work places by type of business has been calculated as a percentage. A mean value for 1997–2002 has been calculated (together with minimum and maximum value and standard deviation(SD) of the mean).

Variable	Time series	Data source	Most detailed level obtained	Data processing
Commuting (20–64 years)	2001	SCB	subarea	The net commuting was calculated for 2001.
The non-employed population by type of category (20–64 years)	1997–2001	SCB	subarea	The number of non-employed inhabitants per category has been calculated as a percentage. The total number of non-employed inhabitants was calculated as a percentage of the total population. A mean value for 1997–2002 has been calculated (together with minimum and maximum value and standard deviation(SD) of the mean).
Forestry	1999	Sveaskog	Subarea	The amount of wood extracted from the model area during the past 10 years was calculated by multiplying the average volume of mature forest of the area with the forest area that is 0–9 years old. Therafter this sum was divided by 10.
Agriculture	1990 1995 1999	SCB	Parish	
Farm density		SCB	Parish	The number of farms divided by the area
Arabla Land Ratio		SCB, /Boresjö-Bronge, 2003/	Parish	Arable area divided by the total area
Crop production		SCB	Parish	Crop production areas multiplied by the standard yield prognosis
Animal production		SCB	Parish	The number of producing animals multiplied by the national average production per animal
Horticulture			Parish	
Number of holdings	2002	Östhammars Näringslivs-utveckling	Parish	The number of holdings in Östhammars kommun and Forsmark församling has been established through Östhammars Näringslivsutveckling.
Production of fruit, berries and vegetables	–	–	none	–
Aquaculture				
Number of enterprises	2002	Östhammars kommun	Parish	The number of enterprises in Forsmark församling has been established through Östhammars key plan.
Production for consumption	–	–	none	–
Mineral extraction	2003	Länsstyrelsen i Uppsala (County Administrative Board of Uppsala)	Subarea	The number of mineral leases and their location has been established through GIS-assessment
Water supply				

Variable	Time series	Data source	Most detailed level obtained	Data processing
Water use, by category; household, agriculture, industry and other	1990, 1995 and 2000	SCB	municipality	The water use within smaller areas has been calculated based on some assumptions (see chapter 2).
Water withdrawal subdivided in private and public supply	1990, 1995 and 2000	SCB	Municipality	The water withdrawal (subdivided in private and public supply) within smaller areas has been calculated based on some assumptions (see chapter 2).
Water withdrawal subdivided in ground water and surface water	1990, 1995 and 2000	SCB	Municipality	The water withdrawal (subdivided in griundwater and surface water) within smaller areas has been calculated based on some assumptions (see chapter 2).
Commersial fishing				
Number of fishermen	1995–2002	Fiskeriverket (the National Board of Fisheries)	Postcode zones within Östhammars kommun	The number of logbook or journal keeping fishermen was obtained from Fiskeriverket. The number of fishermen in Forsmark församling was estimated with the guidance in /Posten, 2003, internet/.The number was multiplied by 2 to get an estimate of the total number of fishermen (see chapter 2).
Total catch by fishermen living in the geographic areas	1995–2002	Fiskeriverket (the National Board of Fisheries)	Postcode zones within Östhammars kommun	No fishermen seem to live in Forsmarks församling, so no further calculations have been done.
Total catch per EU-square	1995–2002	Fiskeriverket (the National Board of Fisheries)		The mean catch during 1995–2002 has been calculated as well as the catch per unit area and the mean catch per unit area (together with minimum and maximum value and standard deviation (SD) of the mean)
Outdoor life				
Harvested moose in number	1997–2003	Länsstyrelsen i Uppsala (County Administrative Board of Uppsala)	Parish	The harvested number in smaller areas has been calculated based on the number per unit area in the parish. A mean value for 1997–2003 was calculated (together with minimum and maximum value and standard deviation (SD) of the mean).
Harvested moose in weight (live-, carcass- and utilized carcass weight)		Svenska Jägareförbundet (Swedish Association for Hunting and Wildlife Management) and Svensk Viltförvaltning AB		The live weight has been calculated based on information from Svensk Viltförvaltning AB. The carcass weight has been calculated based on carcass data from Svensk Viltförvaltning AB and Svenska Jägareförbundet. The utilized carcass weight has been calculated based on information from Svensk Viltförvaltning AB

Variable	Time series	Data source	Most detailed level obtained	Data processing
Harvested roe deer in number	1997–2001	Svenska Jägareförbundet (Swedish Association for Hunting and Wildlife Management)	Östhammars hunting association (Östhammars jaktvårdskrets)	The latest coarse estimated number of harvested roe deer per ha in Östhammars jaktvårdskrets was obtained from Svenska Jägareförbundet. This number was applied to the parish and smaller areas. A mean value for 1997–2001 was calculated (together with minimum and maximum value and standard deviation(SD) of the mean).
Harvested roe deer in weight (live-, carcass- and utilized carcass weight)		Svenska Jägareförbundet (Swedish Association for Hunting and Wildlife Management) and Svensk Viltförvaltning AB		The total live weight has been calculated based on data from Svenska Jägareförbundet. The carcass weight and the utilized carcass weight have been calculated based on information from Svensk Viltförvaltning AB. A mean value for 1997–2001 was calculated (together with minimum and maximum value and standard deviation (SD) of the mean).
Harvested of hares in number (alpine hare and common hare)	1997–2001	Svenska Jägareförbundet (Swedish Association for Hunting and Wildlife Management))	Östhammars hunting association (Östhammars jaktvårdskrets)	The latest coarse estimated number of harvested hares per ha in Östhammars jaktvårdskrets was obtained from Svenska Jägareförbundet. This number was applied to the parish and smaller areas. A mean value for 1997–2001 was calculated (together with minimum and maximum value and standard deviation(SD) of the mean).
Harvested hares in weight (live-, carcass- and utilized carcass weight)		Svenska Jägareförbundet (Swedish Association for Hunting and Wildlife Management) and Svensk Viltförvaltning AB		The total live weight has been calculated based on data from Svenska Jägareförbundet. The carcass weight and the utilized carcass weight have been calculated based on information from Svensk Viltförvaltning AB.
Picking of wild berries	1997	/Berggren and Kyläkorpi, 2002/	Country	The picking (litres per square kilometre land area) has been calculated based on the estimated amount picked in Sweden.
Picking of mushrooms	1997	/Berggren and Kyläkorpi, 2002/	Country	The picking (litres per square kilometre land area) has been calculated based on the estimated amount picked in Sweden.
Number of attractive fishing waters	2003	Länsstyrelsen i Uppsala län, /Brunberg and Blomqvist, 1998/	Parish	
Number of sport fishing clubs	2003	Sveriges Sportfiske och Fiskevårdsförbund	Parish	
Catch by sport fishermen	2002	Fiskeriverket	Country	A theoretical value has been calculated based on the information in /Fiskeriverket, 2000/.
Number of golf courses	2003	Upplands golfförbund	Parish	
Number of jogging tracks	2003	Östhammars kommun	Parish	
Number of hiking trails	2003	Länsstyrelsen i Uppsala län	Parish	

Variable	Time series	Data source	Most detailed level obtained	Data processing
Number of attractive spots for bird watching	2003	Upplands Ornitologiska Förening	Parish	
Number of canoe routes	2003	Kanotguiden	Parish	
Number of canoe renters	2003	Kanotguiden	Parish	
Number of open air baths	2003	/Östhammars Näringslivsutveckling AB, 2003b/ and /Östhammars kommun, 2003b/	Parish	
Number of camp sites and holiday villages	2003	Östhammars Näringslivsutveckling AB and Upplandsstiftelsen	Parish	
Number of marinas	2003	Östhammars kommun	Parish	
Number of guest harbours	2003	Östhammars kommun	Parish	

[1] The
as well as days with early retirement pension per person between 16 and 64 years of age.

[2] 1 Agriculture, forestry, hunting, fishing.
2 Mining and manufacturing.
3 Electricity-, gas- and water supply. Sewage and refuse disposal.
4 Construction.
5 Trade and communication.
6 Financial intermediation, business activities.
7 Education and research.
8 Health and social work.
9 Personal and cultural activities.
10 Public administration etc.
11 Unknown

4 Results

4.1 Human population

4.1.1 Demography

There have not been any inhabitants within the Forsmark area and its subareas since 2000 according to SCB (see Table 4-1 and Table 4-2). Note that there is sometimes incoherency between the sum of values for the different age groups and the total number of inhabitants. This is a result of the deliberate reporting bias that has been mentioned before.

In 1999 ten persons were registered in the Forsmark area, all residing in Forsmark 1 and 8. 60% of the population had an age over 65 years. There are vital statistics for the Forsmark area and its subareas, but the statistics do not show exactly what happened to the population between 1999 and 2000 (Table 4-3 and Table 4-4). It is possible that the coordinates for their properties have changed for some reason (more information in chapter 2).

In the main drainage area (54/55) there were eight inhabitants in the year 2002. The number of inhabitants has decreased during the last ten years. In 1993 the number was 20. The population has diminished by an average of 1.3 persons per year. The decline depends mainly on out-migration (see Table 4-4). The sudden unexplainable population drop within the Forsmark area in 2000 is observable in the main drainage area (54/55) as well. The population density in the main drainage area (54/55) was 0.2 persons per square kilometre in 2002. That is nine times lower than in the parish.

The population density has been fairly unchanged in Forsmark församling during the last ten years, with a mean value of 1.8, whereas the population density in Östhammars kommun shows a slow downward trend during the last ten years, 1993–2002 (see Figure 4-1). The population in the municipality reached a minimum in 1999, but has since then increased slightly.

The population density is approximately eight times higher in Östhammars kommun than in the parish and approximately 24 times higher in Uppsala län than in the parish.

Overall, the main drainage area (54/55) is a very sparsely populated district with a declining population. Forsmark församling is also a sparsely populated district with a small but stable population. Östhammars kommun has a much lower population density than the average in Uppsala län. The population shows a downward tendency even if the trend has declined during the last three years. That is due to the fact that the municipality had an excess of in-migration over out-migration during the years 2000–2002. The excess of births over deaths has been negative since 1997, that is to say the death rate has been higher than the birth rate.

In Figure 4-2, it is shown that 409 persons were living within a radius of 10 km from Forsmark nuclear power plant and 3 persons were living within a radius of 2 km in 2002.

Table 4-1. Population by sex and age, subareas within the Forsmark area.

Geographic area	Year	No of inhabitants	0–15 years		16–24 years		25–44 years		45–64 years		> 65 years	
			men	women	men	women	men	women	men	women	men	women
Forsmark 1	2002	0	0	0	0	0	0	0	0	0	0	0
Mean value	93–02	4	0	0	0	0	0	0	0	0	2	1
Standard deviation		3	0	0	0	0	0	0	0	0	1.4	1.4
Min value		0	0	0	0	0	0	0	0	0	0	0
Max value		6	0	0	0	0	0	0	0	0	3	3
Forsmark 2	93–02	0										
Eckarfjärden 2:10	93–02	0										
Forsmark 3	93–02	0										
Forsmark 4	93–02	0										
Forsmark 5	93–02	0										
Forsmark 7	93–02	0										
Forsmark 8	2002	0	0	0	0	0	0	0	0	0	0	0
Mean value	93–02	4	0	0	0	0	0	0	0	1	0	0
Standard deviation		2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0
Min value		0	0	0	0	0	0	0	0	0	0	0
Max value		6	0	0	0	0	0	0	0	3	0	0

Source: Statistics Sweden, Registret över totalbefolkningen.
Calculated: A mean value with standard deviation together with minimum- and maximum values.

Table 4-2. Population by sex and age, the Forsmark area and larger areas.

Geographic area	Year	No of inhabitants	0–15 years		16–24 years		25–44 years		45–64 years		> 65 years	
			men	women	men	women	men	women	men	women	men	women
Forsmark area	2002	0	0	0	0	0	0	0	0	0	0	0
mean value	93–02	7	0	0	0	0	0	0	0	1	2	1
standard deviation		5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4
min value		0	0	0	0	0	0	0	0	0	0	0
max value		12	0	0	0	0	0	0	0	3	3	3
Main drainage area (54/55)	2002	8	0	0	0	0	3	0	3	3	0	0
percentage distribution	2002			0.0%		0.0%		37.5%		75.0%		0.0%
mean value	93–02	14	0	0	1	0	3	1	2	3	2	1
standard deviation		6.9	0.0	0.0	1.6	0.9	2.3	1.3	1.6	1.5	1.4	1.4
min value		3	0	0	0	0	0	0	0	0	0	0
max value		23	0	0	4	3	7	3	3	4	3	3
Forsmark församling	2002	168	13	17	4	6	22	18	28	25	15	20
percentage distribution	2002			17.9%		6.0%		23.8%		31.5%		20.8%
mean value	93–02	170	13	15	5	7	23	22	26	23	17	19
standard deviation		5.9	2.9	3.0	3.1	1.3	3.8	2.5	1.8	1.7	1.0	0.8
min value		162	9	8	3	5	18	18	22	22	15	18
max value		181	17	18	12	9	29	25	28	27	18	21
Östhammars kommun	2002	21 827	2 315	2 098	1 100	1 046	2 625	2 447	3 225	2 943	1 852	2 176
percentage distribution	2002			20.2%		9.8%		23.2%		28.3%		18.5%
mean value	93–02	22 080	2 434	2 309	1 186	1 104	2 835	2 630	2 986	2 704	1 799	2 094
standard deviation		331.9	85.2	135.6	104.3	76.7	154.0	143.5	146.5	161.3	29.2	43.1
min value		21 680	2 315	2 098	1 067	1 008	2 625	2 447	2 748	2 437	1 743	2 028
max value		22 591	2 561	2 484	1 362	1 250	3 113	2 887	3 225	2 943	1 852	2 176
Uppsala län	2002	298 655	28 685	27 104	19 365	20 228	42 754	42 017	38 015	37 870	18 425	24 192
percentage distribution	2002			18.7%		13.3%		28.4%		25.4%		14.3%
mean value	93-02	291 106	29 144	27 730	19 259	20 028	42 219	41 667	34 833	34 542	17 846	23 838
standard deviation		4 660.7	272.0	385.9	341.8	254.4	291.0	226.8	2 256.3	2 301.1	315.0	243.9
min value		283 006	28 685	27 104	18 731	19 664	41 883	41 435	31 251	30 869	17 301	23 409
max value		298 655	29 393	28 245	19 787	20 485	42 754	42 017	38 015	37 870	18 425	24 192

Source: Statistics Sweden, Registret över totalbefolkningen.
Calculated: Inhabitants per age class expressed as a percentage, a mean value with standard deviation, min- and max value.

Table 4-3. Population and vital statistics, subareas within the Forsmark area.

Geographic area	Year	Number of inhabitants	Inhabitants per km² and 106 m²	Net population change	In-migrated	Out-migrated	Live births	Deaths
Forsmark 1	2002	0	0.0	0	0	0	0	0
mean value	93-02	4	0.7	0	0	0	0	0
standard deviation		3	0.5	0	0	0	0	0
min value		0	0.0	0.0	0.0	0.0	0.0	0.0
max value		6	1.2	0.0	0.0	0.0	0.0	0.0
Forsmark 2	93-02	0						
Eckarfjärden 2:10	93-02	0						
Forsmark 3	93-02	0						
Forsmark 4	93-02	0						
Forsmark 5	93-02	0						
Forsmark 7	93-02	0						
Forsmark 8	2002	0	0.0	0	0	0	0	0
mean value	93-02	4	1.3	0	0	0	0	0
standard deviation		3	0.9	1.4	0.9	0.9	0.0	0.0
min value		0	0.0	–3	0	0	0	0
max value		6	2.1	3	3	3	0	0

Source: Statistics Sweden, Registret över totalbefolkningen.
Calculated: Population density and net population change, mean values with standard deviation, min- and max value.

Table 4-4. Population and vital statistics, the Forsmark area and larger areas.

Geographic area	Year	Number of inhabitants	Inhabitants per km² and 106 m²	Net population change	In-migrated	Out-migrated	Live births	Deaths
Forsmark area	2002	0	0.0	0	0	0	0	0
mean value	93–02	7	0.4	0	0.3	0.3	0.0	0.0
standard deviation		5	0.3	1.4	0.9	0.9	0.0	0.0
min value		0	0.0	–3	0	0	0	0
max value		12	0.6	3	3	3	0	0
Main drainage area (54/55)	2002	8	0.2	4	4	0	0	0
mean value 93-02		14	0.4	0	3	3	0	0
standard deviation		6.9	0.2	3.0	2.5	2.9	0.0	0.0
min value		3	0.1	–6	0	0	0	0
max value		23	0.7	4	8	9	0	0
Forsmark församling	2002	168	1.8	–2	9	7	0	4
mean value	93–02	170	1.8	1	15	14	2	2
standard deviation		5.9	0.1	6.8	5.3	4.2	1.7	1.8
min value		162	1.7	–11	9	7	0	0
max value		181	1.9	13	27	22	4	4
Östhammars kommun	2002	21 827	15.0	–17	1 115	1 084	191	239
mean value	93–02	22 080	15.2	–50	1 004	1 047	225	231
standard deviation		332	0.2	164	209	175	54	16
min value		21 680	14.9	–248	681	889	163	209
max value		22 591	15.6	283	1 342	1 489	317	260
Uppsala län	2002	298 655	42.7	2 032	13 102	11 857	3 322	2 535
mean value	93–02	291 106	41.7	2 008	12 704	11 643	3 381	2 434
standard deviation		4 661	0.7	1 195	635	782	420	71
min value		283 006	40.5	658	11 528	9 573	2 919	2 339
max value		298 655	42.7	4 386	13 446	12 281	4 091	2 535

Source: Statistics Sweden, Registret över totalbefolkningen.
Calculated: Population density and net population change, mean values with standard deviation, min- and max value.

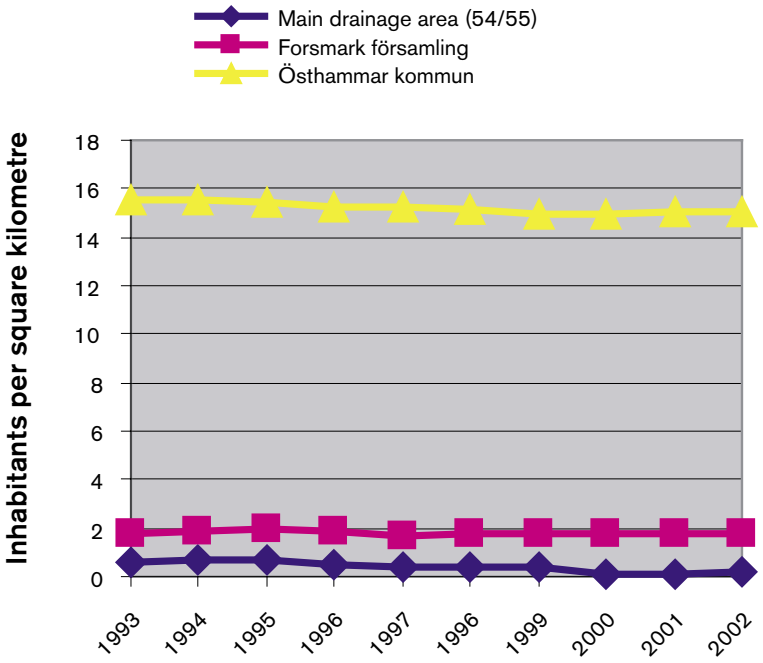

Figure 4-1. *The development of the population density between 1993 and 2002 in Östhammars kommun, Forsmark församling and the main drainage area (54/55).*

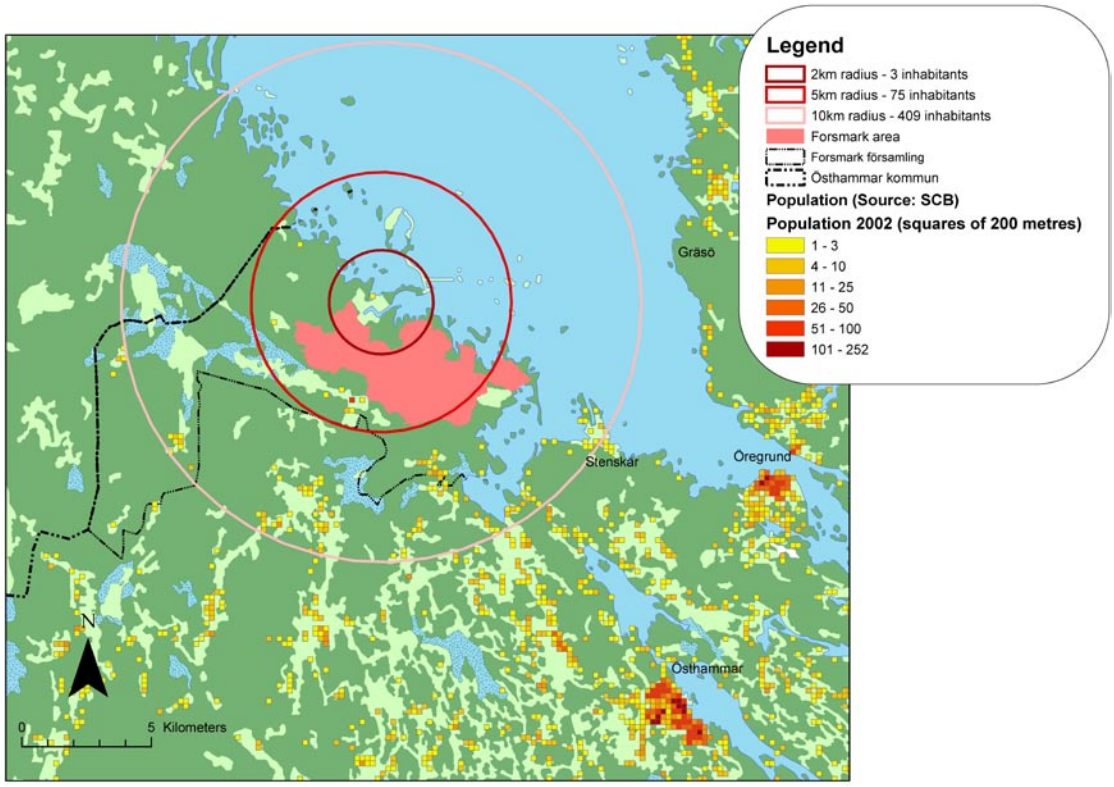

Figure 4-2. *The distribution of population within Forsmark församling and surroundings.*

4.1.2 Health

The average ill-health (1998–2002) is very low for the population of the main drainage area (54/55), where we have a very low population density. When the statistics are based on a very small population, each individual has a great weight. The average ill-health among the women is zero. In Forsmark församling and in Östhammars kommun on the other hand, the mean value (98–02) is higher than in Uppsala län (see Table 4-5).

The ill-health has increased remarkably in the parish from 1998 to 2002 (see Figure 4-3). The increase is 300%. Meanwhile, ill-health has increased by 50% in the municipality and 30% in the county. The ill-health in women is higher than the ill-health in men in the parish and at larger areas.

The ill-health situation in Forsmark differs from that in Uppsala län, as shown in a study performed in 2000 by /Carlsson and Lambe, 2001/. 3.1% of the men and 8.4% of the women in Östhammars kommun claimed that their general state of health was bad or very bad, compared to 6.1% of the men respectively 8.8% of the women in Uppsala län. Furthermore, the percentage of people with low physical state of health was lower in Östhammars kommun than in Uppsala län, whereas the percentage of people with a long-term health problem was approximately the same in Östhammars kommun as in Uppsala län. 3.7% of the men and 13.4% of the women in Östhammars kommun had low physical health state compared to 9.9% and 16.2% in Uppsala län. 28.3% of the men and 32.0% of the women in Östhammars kommun had a long-term health problem compared to 27.9% and 32.7% in Uppsala län.

Table 4-5. Ill-health (inhabitants 16–64 years) numbers for the Forsmark area and larger areas.

Geographic area	Year	Ill-health total	Ill-health men	Ill-health women
Forsmark 1	1998	5.5	7.3	0.0
Forsmark 1	1999	11.5	0.0	0.0
Forsmark 8	1998	0.0	0.0	0.0
Forsmark 8	1999	0.0	0.0	0.0
Forsmark area	1998	3.7	7.3	0.0
Forsmark area	1999	7.7	11.5	0.0
Main drainage area (54/55)	2002	0.0	0.0	0.0
mean value	98–02	2.5	2.0	0.0
standard deviation		2.5	2.8	0.0
min value		0.0	0.0	0.0
max value		5.8	5.8	0.0
Forsmark församling	2002	70.8	51.8	90.2
increase from 1998	98-02	306%	435%	262%
mean value		38.7	21.9	61.4
standard deviation		24.4	18.1	33.4
min value		17.4	9.72	4.9
max value		70.8	51.8	90.2
Östhammars kommun	2002	48.8	37.0	61.5
increase from 1998	98–02	50%	45%	54%
mean value		34.2	31.1	50.8
standard deviation		19.4	14.7	24.5
min value		32.5	25.6	40.0
max value		48.8	37.0	61.5

Geographic area	Year	Ill-health total	Ill-health men	Ill-health women
Uppsala län	2002	41.6	32.9	50.1
increase from 1998	98–02	30%	22%	36%
mean value		31.1	30.5	44.3
standard deviation		17.5	14.1	20.9
min value		31.9	27.0	36.7
max value		41.6	33.0	50.1

Source: Statistics Sweden, ill-health figures (inhabitants 16-64 years of age).
Calculated: A mean value with standard deviation, minimum and maximum values and the increase since 1998.
Definition: The ill-health figure is the number of days with sickness benefit due to illness, rehabilitation and occupational injury, as well as days with early retirement pension per person between 16 and 64 years of age.

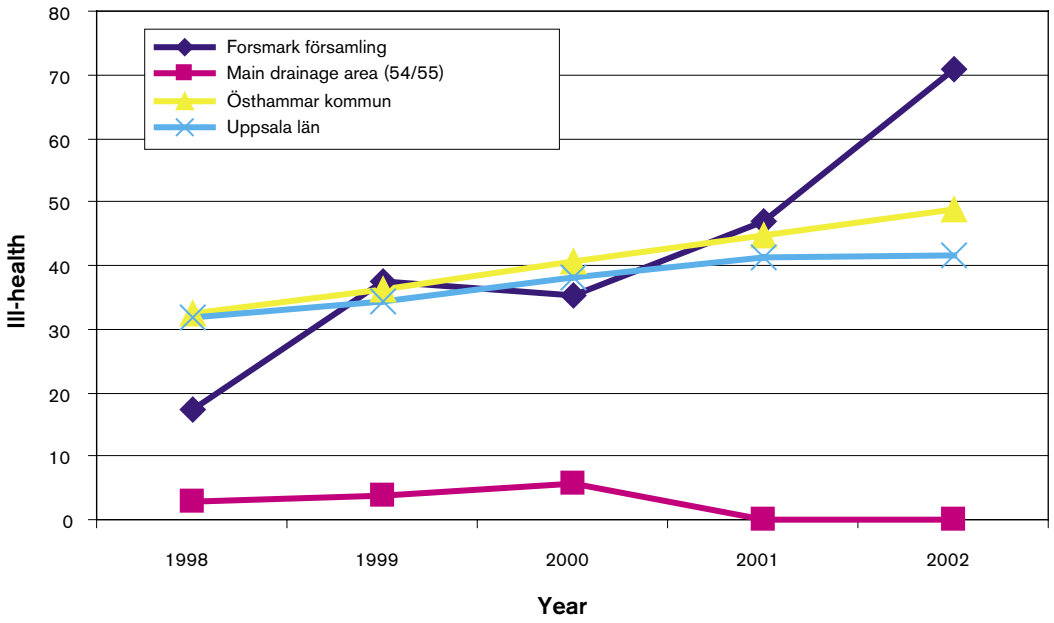

Figure 4-3. *The development of ill-health in Forsmark församling and larger areas.*

4.1.3 Properties and buildings

Type of properties

According to the demographic statistics there are no inhabitants within the Forsmark area today. However, the property data shows that there are five holiday houses and two or three farms within the Forsmark area. The holiday houses are located within Forsmark 1 and 2 (see Table 4-6). This indicates that the Forsmark area has a small holiday population. According to the Employment and agriculture data, there is only one farm in operation.

Table 4-6. Number of properties by type of property in the subareas within the Forsmark area.

Geographic area	Year	Farms	One- or two dwelling	Holiday-houses	Multi-dwelling	Other
Forsmark 1	1996	3	0	3	0	0
Forsmark 1	2002	0	0	3	0	0
percentage distribution	2002	0.0%	0.0%	100.0%	0.0%	0.0%
number/square kilometre	2002	0.00	0.00	0.59	0.00	0.00

Geographic area	Year	Farms	One- or two dwelling	Holiday-houses	Multi-dwelling	Other
Forsmark 2	1996	0	0	3	0	0
Forsmark 2	2002	0	0	3	0	0
percentage distribution	2002	0.0%	0.0%	100.0%	0.0%	0.0%
number/square kilometre	2002	0.00	0.00	0.35	0.00	0.00
Eckarfjärden 2:10	96+02	0	0	0	0	0
Forsmark 3	96+02	0	0	0	0	0
Forsmark 4	96+02	0	0	0	0	0
Forsmark 5	96+02	0	0	0	0	0
Forsmark 7*	1996	0	0	0	0	0
Forsmark 7*	2002	0	0	0	0	0
Forsmark 8*	1996	0	0	0	0	0
Forsmark 8*	2002	0	0	0	0	0

* a false zero hiding a one.
Source: SCB, Fastighetstaxeringsregistret 1996-01-01 and 2002-01-01.
Calculated: the number per square kilometre and the percentage distribution of the types of properties.

Holiday houses dominate in the main drainage area (54/55). Apart from the holiday houses there were 14 houses, but only eight inhabitants, in the year 2002. Apparently some of the houses are uninhabited. There are no multi-dwelling/family houses in the main drainage area (54/55) (see Figure 4-4).

Holiday houses also dominate in the parish. The inhabitants live in one- or two- family houses or in farm houses. There are no multi-dwelling houses in the parish. In Östhammars kommun, there are primarily one- or two- family houses and holiday houses.

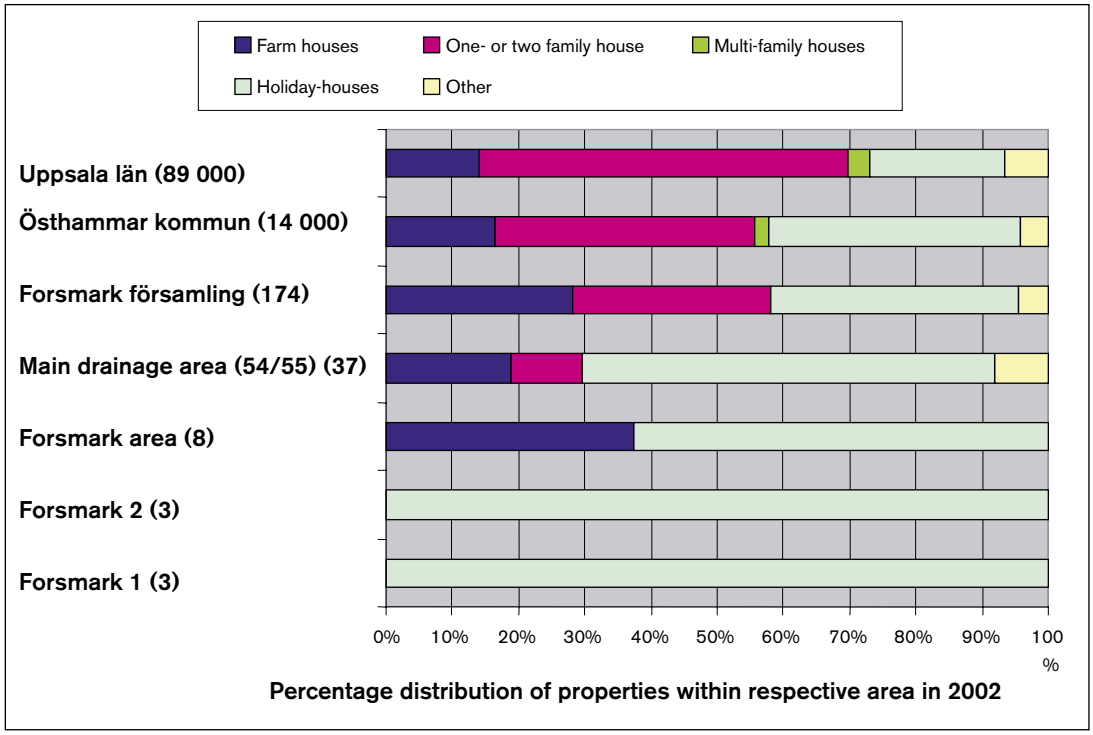

Figure 4-4. *Distribution of properties in 2002 (number of properties in brackets).*

Table 4-7. Number of properties by type of property in the Forsmark area and larger areas.

Geographic area	Year	Farms	One- or two dwelling	Holiday-houses	Multi-dwelling	Other
Forsmark area	1996	5	0	5	0	0
Forsmark area	2002	3	0	5	0	0
percentage distribution	2002	37.5%	0.0%	62.5%	0.0%	0.0%
number/square kilometre	2002	0.15	0.00	0.26	0.00	0.00
Main drainage area (54/55)	1996	10	3	23	0	5
Main drainage area (54/55)	2002	7	4	23	0	3
percentage distribution	2002	18.9%	10.8%	62.2%	0.0%	8.1%
number/square kilometre	2002	0.21	0.03	0.68	0.00	0.09
Forsmark församling	1996	53	52	65	0	9
Forsmark församling	2002	49	52	65	0	8
percentage distribution	2002	28.2%	29.9%	37.4%	0.0%	4.6%
number/square kilometer	2002	0.52	0.55	0.69	0.00	0.08
Östhammars kommun	1996	2 291	5 614	5 504	270	606
Östhammars kommun	2002	2 359	5 662	5 478	294	591
percentage distribution	2002	16.4%	39.4%	38.1%	2.0%	4.1%
number/square kilometre	2002	1.63	3.90	3.78	0.20	0.41
Uppsala län	1996	12 159	47 554	18 482	2 776	6 313
Uppsala län	2002	12 532	49 311	18 104	2 916	5 827
percentage distribution	2002	14.1%	55.6%	20.4%	3.3%	6.6%
number/square kilometre	2002	1.79	7.06	2.59	0.42	0.83

Source: SCB, Fastighetstaxeringsregistret 1996-01-01 and 2002-01-01.
Calculated: the number per square kilometre and the percentage distribution of the types of properties.

New buildings

According to the building register, no dwellings were built in the parish during the period 1993–2002 (Table 4-8). This does not correspond with the fact that three building permits were granted two years in a row, 1997 and 1998 (see Table 4-9). Construction must begin within two years of issue of a permit and be completed within five years from the start of construction. Normally 99% of the building permits lead to a completed building, according to SCB /Sahlén, 2003, personal communication/. He claims that the discrepancy between the two data sets is probably due to a delayed report from the municipality.

In the municipality, construction is continuous with some new dwellings each year, except for the year 2001. Construction was exceptional in 1993, when as many as 80 new dwellings were built in Östhammars kommun. Compared to the county, the establishment of new buildings is sparse. The number of building permits per square kilometre in Östhammars kommun is approximately ten times below the average in Uppsala län.

The building statistics indicate that the parish is a region without growth, which corresponds to the demographic statistics.

Table 4-8. Completed dwellings in one-, two- or multi dwelling houses in the Forsmark area and larger areas.

Geographic area	Year	Dwellings	Business premises	Total	No per km² and 106 m²
Forsmark area	93-02	0	0	0	0
Main drainage area (54/55)	93-02	0	0	0	0
Forsmark församling	93-02	0	0	0	0
Östhammars kommun	2002	2	0	2	0.00
mean value	93-02	6.2	6.5	12.7	0.01
standard deviation		7.3	16.9	24.0	0.02
min value		0	0	0	0.00
max value		26	54	80	0.06
Uppsala län	2002	325	551	876	0.13
mean value	93-02	205.3	453.9	659.2	0.09
standard deviation		118.1	498.6	610.0	0.09
min value		98	100	236	0.03
max value		479	1 796	2 275	0.33

Source: Statistics Sweden.
Calculated: mean values with SD, minimum- and maximum values, number per unit area.

Table 4-9. Building permits for business premises and dwellings in the Forsmark area and larger areas.

Geographic area	Year	Dwellings	Business premises	Total	No per km² and 106 m²
Forsmark area	96–02	0	0	0	0
Main drainage area (54/55) [1]	2002	0	3	3	0.09
Forsmark församling [2]	2002	0	3	3	0.03
mean value	96–02	0.9	0.4	1.3	0.01
standard deviation		1.5	1.1	1.6	0.02
min value		0	0	0	0.00
max value		3	3	3	0.03
Östhammar kommun	2002	37	14	51	0.04
mean value	96–02	27	6.9	34	0.02
standard deviation		8.4	9.3	16.5	0.0
min value		19	0	19	0.01
max value		38	23	55	0.04
Uppsala län	2002	561	100	661	0.09
mean value (96–02)		294	131	425	0.06
standard deviation		150.9	24.5	148.7	0.02
min value		138	100	247	0.04
max value		561	177	661	0.09

[1] Statistics were only delivered for year 2002. The number is therefore assumed to be zero the other years.
[2] No statistics were delivered for Forsmarks församling for the years 1996 and 1999–2001. The number is assumed to be zero for those years.
Source: Statistics Sweden.
Calculated: mean values with SD, minimum- and maximum values, number per unit area.

4.1.4 Employment

Employed population

There are no work places within the Forsmark area according to the statistics from SCB (Table 4-12). According to Table 4-11, there is no employed day-time population within the Forsmark area. However, “false zeros” were provided though for the Forsmark area, as shown in Table 4-11. This indicates that there is one employed person in the area.

Most of the employed population in the main drainage area (54/55) work within the business sector electricity-, gas- and water supply, sewage and refuse disposal (see Table 4-10). We can assume that the main part of this group work at the Forsmark power group that is located within the main drainage area (54/55), but outside the Forsmark area. Financial intermediation and business activities is the second largest type of business within the day- and night population, with five work places. 889 people worked within the main drainage area (54/55) in 2001, but only four workers lived within the main drainage area (54/55). Accordingly almost 100% of the employed day-time population is commuting into the area, which is also shown in Table 4-13.

The picture is almost the same for Forsmark församling. A majority of the employed day-time population commutes into the parish. 929 people worked within the parish in 2001, but only 71 workers lived in the parish. Forsmark power group is by far the biggest work place within the parish. 79% of the day population worked within the business sector electricity-, gas- and water supply, sewage and refuse disposal in 2001. Financial intermediation and business activities is the second largest type of business within the day population and the largest within the night population. There were in total 17 work places within the parish in 2002 (see Table 4-12). The majority, nine sites, are within financial intermediation and business activities. There is only one farm in Forsmark församling.

In Östhammars kommun, on the other hand, the majority of the work places (32.8% in 2002) are found within the sectors agriculture, forestry, hunting and fishing. A majority of the workers (25% of the day population and 23% of the night population) worked with mining and manufacturing in 2001. Compared to the parish there is a net commuting out of the municipality, which is also the case for the whole county (see Table 4-13). The outgoing commuters are twice as many as the ingoing commuters.

It should be noted that there are a substantial number of work places and workers within Östhammars kommun with an unknown parish affiliation. In 2001, for example, there were 619 work places and 1,233 workers (day population) with an unknown parish affiliation.

Table 4-10. Employed night-time population (20–64 years), by type of business, in the Forsmark area and larger areas.

Geographic area	Year	Total	1 Agriculture, forestry, hunting, fishing.	2 Mining and manufacturing	3 Electricity-, gas- and water supply. Sewage and refuse disposal.	4 Construction	5 Trade and communication	6 Financial intermediation, business activities.	7 Education and research	8 Health and social work	9 Personal and cultural activities	10 Public administration etc.	11 Unknown activity
Forsmark area	97–01	0	0	0	0	0	0	0	0	0	0	0	0
Main drainage area (54/55)	2001	4	0	0	3	0	0	0	0	0	0	0	0
percentage distribution	2001		0.0%	0.0%	75.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
mean value	97–01	6	0	0	3	2	0	0	0	0	0	0	0
standard deviation		2	0	0	0	2	0	0	0	0	0	0	0
min value		3	0	0	3	0	0	0	0	0	0	0	0
max value		8	0	0	3	4	0	0	0	0	0	0	0
Forsmark församling	2001	71	4	7	14	3	5	20	5	7	4	0	0
distribution	2001		5.6%	9.9%	19.7%	4.2%	7.0%	28.2%	7.0%	9.9%	5.6%	0.0%	0.0%
mean value 97-01		70	4	6	14	4	5	19	4	8	5	0	1
standard deviation		2	1	2	1	2	0	2	1	2	1	0	1
min value		67	3	4	14	3	4	16	3	6	4	0	0
max value		72	5	8	15	7	5	22	6	10	5	0	3
Östhammars kommun	2001	9 813	362	2 254	568	760	1 440	955	775	1 746	440	387	126
percentage distribution	2001		3.7%	23.0%	5.8%	7.7%	14.7%	9.7%	7.9%	17.8%	4.5%	3.9%	1.3%
mean value	97–01	9 541	407	2 180	661	718	1 390	807	713	1 712	413	402	138
standard deviation		183	52	46	61	31	44	119	50	36	16	25	8
min value		9 340	360	2 131	568	675	1 334	675	653	1 655	400	383	126
max value		9 813	480	2 254	727	760	1 440	955	775	1 746	440	439	146
Uppsala län	2001	137 359	2 578	16 690	1 593	9 393	24 710	18 658	17 226	27 224	8 863	8 713	1 711
percentage distribution	2001		1.9%	12.2%	1.2%	6.8%	18.0%	13.6%	12.5%	19.8%	6.5%	6.3%	1.2%
mean value	97–01	130 685	2 706	16 627	1 832	8 634	23 287	16 148	16 329	26 355	8 379	8 601	1 787
standard deviation		5 391	110	144	152	564	1 219	2 039	863	629	406	90	116
min value		123 764	2 578	16 404	1 593	8 031	21 683	13 803	15 097	25 495	7 846	8 480	1 687
max value		137 359	2 870	16 798	1 998	9 393	24 710	18 658	17 226	27 224	8 863	8 713	1 944

Source: SCB, Registerbaserad arbetsmarknadsstatistik, according to SE-SIC Swedish Standard Industrial Classification, coarse classification.
Calculated: mean value with SD, minimum and maximum value, percentage distribution of the type of business.

Table 4-11. Employed day-time population (20–64 years), by type of business, in the Forsmark area and larger areas.

Geographic area	Year	Total	1 Agriculture, forestry, hunting, fishing.	2 Mining and manufacturing	3 Electricity-, gas- and water supply. Sewage and refuse disposal.	4 Construction	5 Trade and communication	6 Financial intermediation, business activities.	7 Education and research	8 Health and social work	9 Personal and cultural activities	10 Public administration etc.	11 Unknown activity
Forsmark area*	2001	0	0	0	0	0	0	0	0	0	0	0	0
mean value	97-01	0	0	0	0	0	0	0	0	0	0	0	0
standard deviation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Main drainage area (54/55)	2001	889	0	0	734	8	0	139	0	0	8	0	0
percentage distribution	2001		0.0%	0.0%	82.6%	0.9%	0.0%	15.6%	0.0%	0.0%	0.9%	0.0%	0.0%
mean value	97–01	869	0	0	824	3	0	40	0	0	2	0	0
standard deviation		28.0	0.0	0.0	69.1	4.4	0.0	61.5	0.0	0.0	3.6	0.0	0.0
min value		836	0	0	734	0	0	0	0	0	0	0	0
max value		901	0	0	900	8	0	139	0	0	8	0	0
Forsmark församling	2001	929	0	0	734	9	3	171	0	0	11	0	0
percentage distribution	2001		0.0%	0.0%	79.0%	1.0%	0.3%	18.4%	0.0%	0.0%	1.2%	0.0%	0.0%
mean value	97–01	958	0	3	824	18	4	96	0	0	14	0	0
standard deviation		32.9	0.0	4.3	69.1	6.0	1.0	44.7	0.0	0.0	1.8	0.0	0.0
min value		929	0	0	734	9	3	66	0	0	11	0	0
max value		1 003	0	10	900	25	5	171	0	0	15	0	0
Östhammars kommun	2001	8 431	411	2 128	756	606	836	720	774	1 446	362	270	122
percentage distribution	2001		4.9%	25.2%	9.0%	7.2%	9.9%	8.5%	9.2%	17.2%	4.3%	3.2%	1.4%
mean value	97–01	8 348	481	2 045	878	554	860	641	724	1 431	331	270	133
standard deviation		48	72	50	82	37	19	69	49	22	22	12	8
min value		8 313	408	2 006	756	513	836	570	661	1 398	309	259	122
max value		8 431	576	2 128	965	606	880	720	774	1 456	362	289	140
Uppsala län	2001	117 472	2 587	14 455	1 426	8 362	17 193	13 925	16 643	26 604	7 384	7 456	1 437
percentage distribution	2001		2.2%	12.3%	1.2%	7.1%	14.6%	11.9%	14.2%	22.6%	6.3%	6.3%	1.2%
mean value	97–01	112 274	2 726	14 025	1 729	7 622	16 653	12 131	15 741	25 589	6 781	7 610	1 666
standard deviation		3 707	128	270	200	556	549	1 302	813	715	406	380	138
min value		108 199	2 587	13 787	1 426	7 066	16 102	10 851	14 599	24 668	6 389	7 228	1 437
max value		117 472	2 893	14 455	1 967	8 362	17 283	13 925	16 643	26 604	7 384	8 182	1 801

* false zero that hides a one.

Source: Statistics Sweden, Registerbaserad arbetsmarknadsstatistik, 20-64 years of age according to SE-SIC Swedish Standard Industrial Classification, coarse classification.

Calculated: mean values with SD, minimum- and maximum values, percentage distribution of the type of business.

Table 4-12. Work places by type of business in the Forsmark area and larger areas.

Geographic area	Year	Total	1 Agriculture, forestry, hunting, fishing.	2 Mining and manufacturing	3 Electricity-, gas- and water supply. Sewage and refuse disposal.	4 Construction	5 Trade and communication	6 Financial intermediation, business activities.	7 Education and research	8 Health and social work	9 Personal and cultural activities	10 Public administration etc.	11 Unknown activity
Forsmark area	97–02	0	0	0	0	0	0	0	0	0	0	0	0
Main drainage area (54/55)	2002	9	0	0	0	0	0	5	0	0	0	0	0
percentage distribution	2002		0.0%	0.0%	0.0%	0.0%	0.0%	55.6%	0.0%	0.0%	0.0%	0.0%	0.0%
mean value	97–02	3	0	0	0	0	0	1	0	0	0	0	0
standard deviation		4	0	0	0	0	0	2	0	0	0	0	0
min value			0	0	0	0	0	0	0	0	0	0	0
max value			0	0	0	0	0	5	0	0	0	0	0
Forsmark församling	2002	17	0	0	0	3	0	9	0	0	3	0	0
percentage distribution	2002		0.0%	0.0%	0.0%	17.6%	0.0%	52.9%	0.0%	0.0%	17.6%	0.0%	0.0%
mean value	97–02	12	0	0	0	3	2	5	0	0	1	0	0
standard deviation		3	0	0	0	1	2	2	0	0	2	0	0
min value			0	0	0	0	0	3	0	0	0	0	0
max value			0	0	0	3	3	9	0	0	3	0	0
Östhammars kommun	2002	2 337	766	158	12	203	389	360	41	90	248	10	60
percentage distribution	2002		32.8%	6.8%	0.5%	8.7%	16.6%	15.4%	1.8%	3.9%	10.6%	0.4%	2.6%
mean value	97–02	2 488	727	145	15	206	398	330	40	95	226	12	294
standard deviation		89	37	10	2	15	9	22	1	4	13	2	127
min value			671	132	12	186	387	299	38	90	214	10	60
max value			766	158	17	229	411	360	42	99	248	13	400
Uppsala län	2002	28 064	5 223	1 547	97	2 208	4 633	7 498	1 026	1 755	3 296	139	642
percentage distribution	2002		18.6%	5.5%	0.3%	7.9%	16.5%	26.7%	3.7%	6.3%	11.7%	0.5%	2.3%
mean value	97–02	27 142	4 419	1 427	145	2 011	4 541	6 460	900	1 602	2 877	150	2 610
standard deviation		714	484	93	24	143	57	796	103	141	327	6	1 333
min value			3 966	1 305	97	1 840	4 461	5 512	768	1 439	2 499	139	642
max value			5 223	1 547	158	2 208	4 633	7 498	1 026	1 755	3 296	155	3 986

* no statistics were delivered for the years 1997–1999 in the main drainage area.
The number is therefore assumed to be zero.
Source: SCB; Företagsdatabasen (FDB), according to SE-SIC Swedish Standard Industrial Classification, coarse classification.
Calculated: mean values with SD, minimum- and maximum values, percentage distribution of the type of business.

Table 4-13. Commuting in the main drainage area and larger areas.

Geographic area	Number of persons		
	Outgoing-commuting	Ingoing-commuting	Net commuting
Main drainage area (54/55)	0	886	886
Forsmark församling	32	902	870
Östhammars kommun	2 856	1 422	–1 434
Uppsala län	40 965	20 684	–20 281

Source: Commuting 2001 (20–64 years), Statistics Sweden, Registerbaserad arbetsmarknadsstatistik.
Calculated: the net commuting.

Non-employed population

None (or possibly one) of the inhabitants in the main drainage area (54/55) were non-employed in the year 2001 (see Table 4-14). In Forsmarks församling, 15.3% of the total population was non-employed , which is more than in both Östhammars kommun and Uppsala län. Compared to the situation in Uppsala län, the early retired and unemployed are proportionately more numerous in the parish. This is also true of the category Other. Students, the other hand, are proportionately less in the parish.

The percentage non-employed has declined in the municipality and county since 1997 (see Figure 4-5). In Forsmark församling, the proportion of non-employed inhabitants is approximately the same in 2001 as in 1997. The percentage distribution of the non-employed in Östhammars kommun is about the same as in Forsmarks församling.

Table 4-14. Non-employed population (20–64 years), by category, in the Forsmark area and larger areas.

Geographic area	Year	Inhabitants 0–100 years	Percent non employed of the inhabitants	Total	Studying	Un-employed	Military service	Early-retirement	Other
Forsmark area	97–01			0	0	0	0	0	0
Main drainage area (54/55)	2001	5		0	0	0	0	0	0
percentage distribution	2001								
mean value	97–01	10		0	0	0	0	0	0
Forsmark församling	2001	170	15.3%	26	3	3	0	9	12
percentage distribution	2001				11.5%	11.5%	0.0%	34.6%	46.2%
mean value	97–01	166	15.0%	25	3	8	0	6	9
standard deviation				2	0	4	0	2	2
min value		162	13.9%	23	3	3	0	3	6
max value		170	16.2%	27	3	12	0	9	12
Östhammars kommun	2001	21 842	11.2%	2 440	325	292	13	801	1 009
percentage distribution	2001				13.3%	12.0%	0.5%	32.8%	41.4%
mean value	97–01	21 859	12.2%	2 657	371	545	32	803	905
standard deviation				217	38	199	19	29	90
min value		21 680	11.2%	2 440	325	292	13	753	815
max value		22 120	13.5%	2 989	420	801	58	821	1 009
Uppsala län	2001	296 627	14.5%	42 942	13 821	3 730	191	8 786	16 414
percentage distribution	2001			46 357	32.2%	8.7%	0.4%	20.5%	38.2%
mean value	97–01	293 025	15.8%	3 155	15 688	6 328	360	9 076	14 905
standard deviation				42 942	1 407	2 243	141	526	1 059
min value		290 473	14.5%	50 773	13 821	3 730	191	8 326	13 929
max value		296 627	17.5%		17 388	9 375	573	9 630	16 414

Source: Non employed population (20–64 years) Statistics Sweden, Registerbaserad arbetsmarknadsstatistik.
Calculated: mean value with SD, minimum- and maximum value, percentage distribution of the categories.

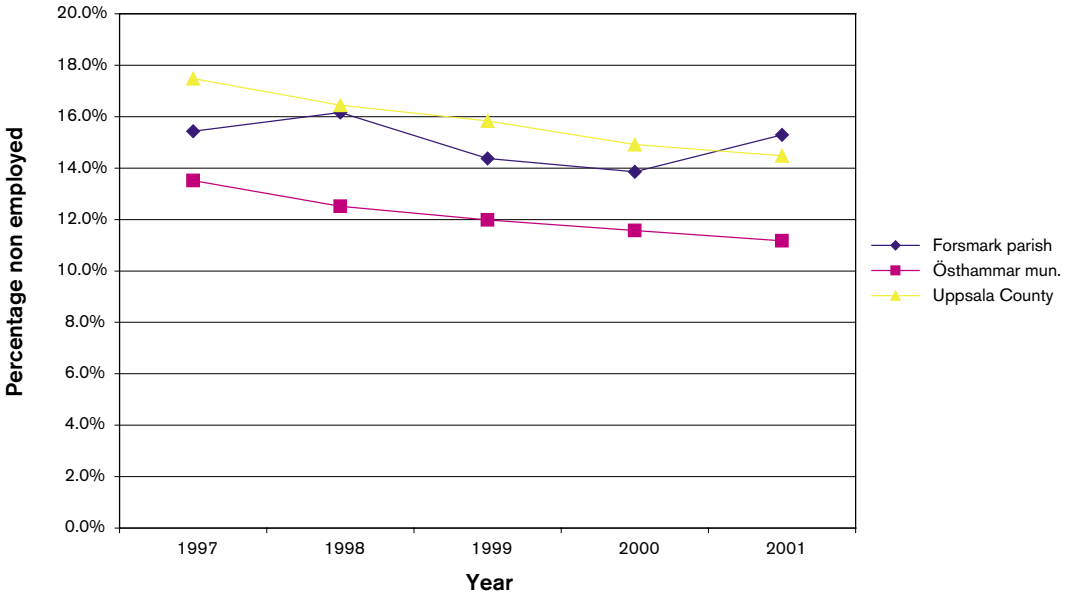

Figure 4-5. *Non-employed inhabitants as a percentage of the total population.*

4.2 Human activities

4.2.1 Land use

The land use within the Forsmark area differs markedly from the average land use in Uppsala län (see Table 4-15). There is proportionally more forest, wetlands and water in the Forsmark area. On the other hand, the area of agricultural and developed land is proportionally smaller.

Table 4-15. Land use in Uppsala län and the Forsmark area.

Type of land use	Uppsala län Area (hectares)	Percentage distribution	Forsmark area Area (hectares)	Percentage distribution
Agricultural land	79 940	25.1%	84.0	4.3%
Forest	401 500	55.9%	1 410.5	72.5%
Developed	34 900	4.9%	0.7	0.04%
Pites, mines etc	250	0.0%	0.0	0.00%
Wetlands -mire	17 000	2.4%	206.4	10.6%
Bare rocks, high mountaines, other	65 320	9.1%	66.6	3.4%
Water	19 380	2.7%	163.2	8.4%
Unknown			14.3	0.7%
Total	718 290	100.0%	1 945.8	100.00%

Source: Land area for Uppsala län from the report Markanvändning i Sverige, table 5 /SCB, 1998/.
Calculated: Land area for Forsmark area from Vegetation Classification /Boresjö-Bronge and Wester, 2003/.

4.2.2 Forestry

The amount of wood extracted from the model area during the past 10 years was calculated based on data from the forestry management plan /Sveaskog, 1999/ as described above. This resulted in an average amount of approx 176 m^3 sk/km^2/yr.

4.2.3 Agriculture

Agricultural activities

Agricultural activities are scarce in Forsmark församling when compared to Östhammars kommun and Uppsala län. As there is only one farm the Forsmark area, /Karlsson, 2003, personal communication/ no data was available through Farm Register. Therefore the data presented here describes mainly the characteristics of Forsmark församling and it is assumed that the Forsmark area represents a typical area of the parish.

In order to gain an overview both the number of farms (the average number, the change in percentage and the farm density) and the amount of farm land (the average amount, the change in percentage and the arable land ratio) are studied more closely on different levels, both locally (in the parish and municipality) and regionally.

Farms are classified in seven different categories according the size in the Farm Register. When calculating the density only the total number of farms has been divided by the total amount of land. Farm land is classified in four different categories in the Farm Register, as arable land, grazing land, forest and other. An arable land ratio has been calculated by dividing the amount of arable land by the total area. Even though the data come from two different sources, the amount of arable land in the county, municipality and parish from the Farm Register and the amount of amount of arable land in the Forsmark area from geo-processing the data from the Vegetation Mapping /Bronge-Boresjö and Wester, 2003/ (see Figure 4-6), it is interesting to notice that the arable land ratio in both Forsmark församling and the Forsmark area are very similar.

Only a few percent of the total land area in Forsmark församling and the Forsmark area is classified as arable land which is considerably less than in the municipality (12%) or in the county (22%) as we see when we study the arable land ratio (see Table 4-18). The amount of arable land is almost equal to the amount of grazing land in Forsmark församling. In the municipality and the county the amount of arable land is 6–10 times more than the grazing land (see Table 4-16). When the data on crops cultivated in the arable areas is studied later we see that the land classified as arable is not necessarily always being cultivated. In Forsmark församling only a quarter of the land classified as arable (on average 1990–1999) is actually being used for cultivating different crops while the percentage is considerably higher on both the municipality (appr. 40%) and the county (60%) level (see Figure 4-6).

When the farm density is studied the picture of Forsmark församling as an area with very little agriculture is confirmed. The farm density in both Forsmark församling and the Forsmark area is only 0,05 farm/km^2 on average which is considerably less than in the municipality (0,36 farms/$km^{2)}$ and county (0,43 farms/km^2) (see Table 4-21).

Generally, it can be observed that some trends are common at all levels, county, municipality and parish. The total amount of arable land has decreased slightly on all studied levels 1990–1999 whereas the amount of land classified as grazing has increased, most significantly in Forsmark församling (see Table 4-16 and Table 4-17). The total number of farms has decreased as well, but large farms have increased in number, which means that farms became fewer but larger (see Table 4-19 and Table 4-20).

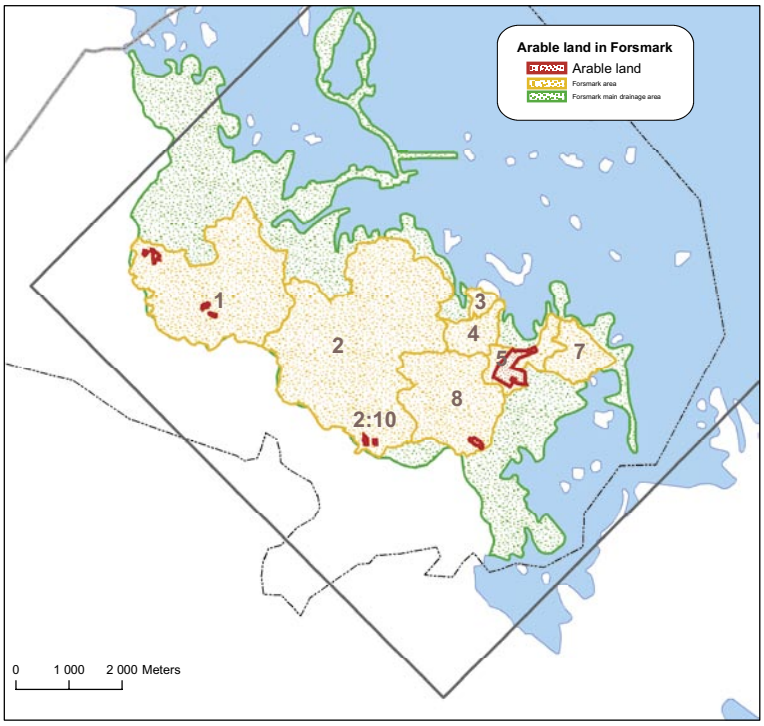

Figure 4-6. *Map over the arable land in the Forsmark area /Boresjö-Bronge and Wester, 2003/.*

Table 4-16. Farm land (ha) average (1990–1999) in Uppsala län, Östhammar kommun and Forsmark församling.

Farm land (ha), average 1990–1999	Uppsala län	Östhammar	Forsmark församling
Arable land	154 209	17 158	149
Grazing land	16 446	3 265	160
Forest	–	36 681	206
Other	–	6 062	58
Total farm land		63 166	572

SCB, Farm Register.

Table 4-17. Farm land change in 1990–1999 (%) in Uppsala län, Östhammar kommun and Forsmark församling.

Farm land, change 1990–1999 (%)	Uppsala län	Östhammar	Forsmark församling
Arable land	–4	–1	–3
Grazing land	38	65	153
Forest	–	0	1
Other	–	–9	–3
Total farm land	1	2	4

SCB, Farm Register.

Table 4-18. Arable land ratio 1990–1999 in Uppsala län, Östhammar kommun and Forsmark församling.

Arable land ratio	Arable land average 1990–1999 (ha)	Total land (ha)	Arable %
Uppsala län	154 209	698 900	22
Östhammar	17 158	145 100	12
Forsmark församling	149	9 420	2
The Forsmark area [1]	34	2 076	2

[1] = no average 1990–1995 but the result from the vegetation classification.
Source: SCB (data on län, kommun, församling); Boresjö-Bronge and Wester, 2003 (Forsmark 1–8)/.

Table 4-19. Average number of farms (1990–1999) in Uppsala län, Östhammar kommun and Forsmark församling.

Number of farms, average 1990–1999			
Size in hectares	**Uppsala län**	**Östhammar**	**Forsmark församling**
2.1–5.0	167	48	0.3
5.1–10.0	250	59	0.7
10.1–20.0	478	124	1.0
20.1–30.0	400	89	1.0
30.1–50.0	598	94	1.3
50.1–100.0	773	83	0.7
100.1–	332	22	0.0
Total number	2 998	519	5.0

Source: SCB, Farm Register.

Table 4-20. Change (%) in the number of farms in Uppsala län, Östhammar kommun and Forsmark församling 1990–1999.

Number of farms, change 1990–1999 (%)			
Size in hectares	**Uppsala län**	**Östhammar**	**Forsmark församling**
2.1–5.0	0	4	–100
5.1–10.0	13	–5	0
10.1–20.0	–11	–8	0
20.1–30.0	–20	24	–100
30.1–50.0	–21	–32	–50
50.1–100.0	–15	9	0
100.1	–18	59	0
Total number	–10	–10	–33

Source: SCB, Farm Register.

Table 4-21. Farm density, farms per km², average in 1990–1999.

Farm density, farms per km²	Uppsala län	Östhammar	Forsmark församling	The Forsmark area
Number of farms, average 1990-1999	2 998	519	5	1
Area, km²	6 989	1 451	94.2	20.76
Farms per km²	0.43	0.36	0.05	0.05

Source: SCB, Farm Register.

Crop production

Relatively few crops, mainly barley but also some oats and potatoes are cultivated in Forsmark församling when compared to the municipality (see Table 4-22). In order to illustrate the average distribution of different crops cultivated in the arable area (1990–1999) the crops have been grouped in the following six categories

1. cereals,
2. root vegetables (potatoes and sugar beet),
3. vegetables and fruit,
4. leguminous plants and oil seed crops,
5. green fodder and silage,
6. other plants and not utilized land,

and the result is the presented as charts (see Figure 4-7, Figure 4-8 and Figure 4-9).

When the variety of cultivated crops is studied at different levels we see that not only a greater span of different crops is being cultivated in Uppsala län in general and Östhammars kommun (see Table 4-22) when compared to Forsmark församling but also the area used for cultivation of green fodder and silage is considerably lower in the county and municipality.

The cultivated crops in Forsmark församling and the change in percentage are presented in Table 4-23. The trend is evident as the area used for cultivating crops decreases and only the area for grass increases.

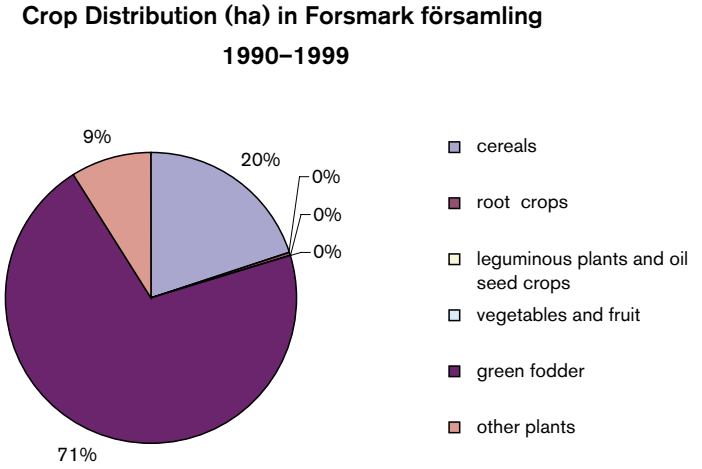

Figure 4-7. *Crop distribution (ha) in Forsmark församling 1990–1999. Source: SCB, Farm Register.*

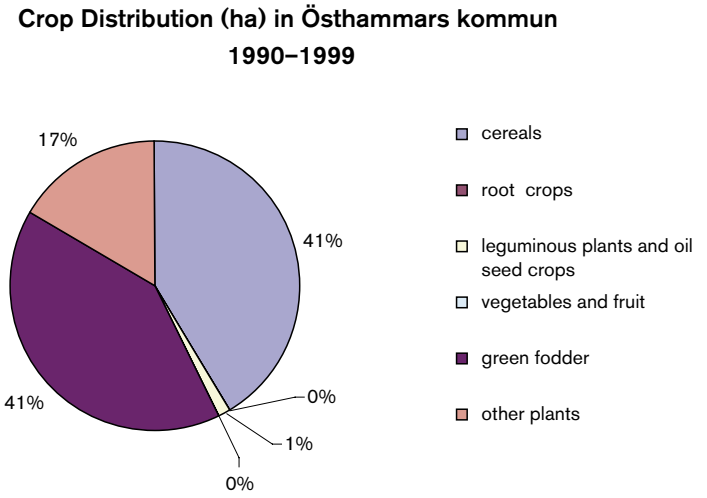

Figure 4-8. *Crop distribution (ha) in Östhammars kommun 1990–1999. Source: SCB, Farm Register.*

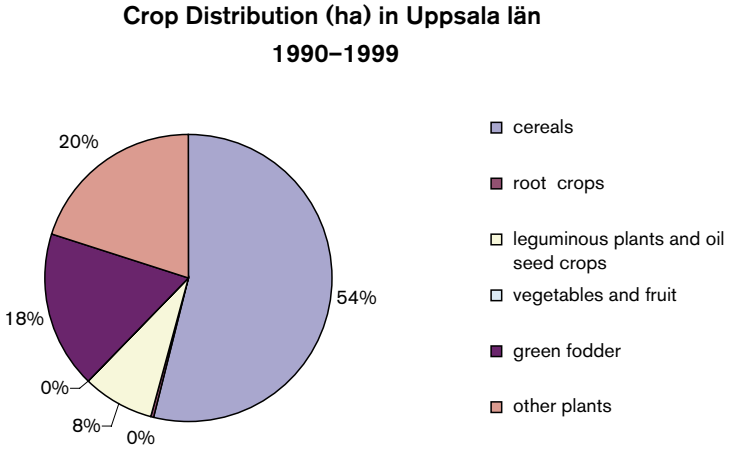

Figure 4-9. *Cultivated crops (ha) in Uppsala län 1990–1999. Source: SCB, Farm Register.*

Table 4-22. Cultivated crops, average acreage in 1990–1999 in Uppsala län, Östhammar kommun and Forsmark församling.

Cultivated crops (ha), average 1990–1999	Uppsala län	Östhammar	Forsmark församling
Winter wheat	17 056	364	0
Spring wheat	3 924	78	0
Rye	1 553	23	5
Barley	43 397	4 082	25
Oats	15 845	1 673	0
Mixed grain and triticale	2 900	727	0
Leguminous plants	1 154	30	0
Fodder peas, vetches, beans	2 505	30	0
Processing peas	0	0	0
Brown beans	0	0	0
Grass, hay, silage, green fodder	18 499	6 842	105

Cultivated crops (ha), average 1990–1999	Uppsala län	Östhammar	Forsmark församling
Pasture	8 255	134	0
Grass land for seed production	122	1 472	10
Potatoes	421	38	0
Sugar beets	0	0	0
Winter rape	177	6	0
Spring rape	4 127	27	0
Winter turnip rape	869	39	0
Spring turnip rape	2 665	103	0
Other	27 195	1 531	0
Fallow, other untilled arable land	18 156	1 184	3
Energy forest	1 349	23	0
Horticultural plants	28	2	0
Linseed	1 189	25	0
Total area	171 385	18 432	149

Source: SCB, Farm Register.

Table 4-23. Cultivated crops (ha) in Forsmark församling 1990–1999.

Cultivated crops in Forsmark församling (ha)					
Crop	1990	1995	1999	average	% change
Rye	13.0	1.0	0.0	4.7	–100.0
Barley	26.8	32.7	14.5	24.7	–45.9
Oats	0.0	1.0	0.0	0.3	
Grass, hay or silage, green fodder	99.2	104.5	112.4	105.4	13.3
Pasture/arable land not utilized	1.0	0.0	0.0	0.3	–100.0
Potatoes	0.6	0.3	0.2	0.4	–66.7
Pasture, grass land for seed production	0.0	17.0	12.5	9.8	
Bare fallow, untilled arable land	3.0	6.1	0.0	3.0	–100.0
Total area	143.6	162.6	139.6	148.6	–2.8

Source: SCB, Farm Register.

Table 4-24. Standard yield estimates in SKO area 0322, Uppsala län and Sweden.

Standard yield estimates (kg/ha) (2002)					
	SKO 0322	Uppsala län	Sweden	SKO 0322/ Uppsala län (%)	SKO 0322/ Sweden (%)
Spring barley	2 846	4 336	4 340	66	66
Oats	2 564	3 986	4 100	64	63

Source: SCB, Farm Register.

Crop production in Forsmark församling has been estimated by using statistics on cultivated crops (ha) in 1990, 1995 and 1999 and standard yield estimates (2002) for the standard yield area 0322 to which Forsmark församling belongs. When the necessary estimates were lacking the standard yield estimates for the SKO area 0312 and Uppsala län were used instead. Two different estimates for the yearly yield (kg) have been calculated, the first one

based on the average cultivated area (1990–1999) for each crop and the second one based on the area used for cultivation in 1999. Then an estimate for yield per area (kg/m^2) has then been calculated by dividing the yearly yield by the whole area that was being studied, in this case Forsmark församling (see Table 4-25).

As the standard yield estimates used in calculations are all for the year 2002, the estimate for the average yearly yield (1990–1999) and the estimate for the yield in 1999 should be adjusted. The harvested yield per hectare for different crops 1997–2002 in Sweden is known and in general the year 2002 was 4% above the average of that time period.

Table 4-25. Crop production in Forsmark församling 1990–1999.

Crop production in Forsmark församling (94,2 km^2)	1990 (ha)	1995 (ha)	1999 (ha)	Average (ha)	Aver yearly yield (kg)	Yield 1999 (kg)	Aver yearly yield kg/m^2	Yield 1999 kg/m^2
Winter wheat	0.0	0.0	0.0	0.0				
Spring wheat	0.0	0.0	0.0	0.0				
Rye	13.0	1.0	0.0	4.7	20 104.0	0.0	0.0002134	0.0000000
Barley	26.8	32.7	14.5	24.7	70 201.3	41 267.0	0.0007452	0.0004381
Winter barley	0.0	0.0	0.0	0.0				
Spring barley	0.0	0.0	0.0	0.0				
Oats	0.0	1.0	0.0	0.3	854.7	0.0	0.0000091	0.0000000
Mixed grain and triticale	0.0	0.0	0.0	0.0				
Leguminous plants	0.0	0.0	0.0	0.0				
Brown beans	0.0	0.0	0.0	0.0				
Grass, silage, green fodder	99.2	104.5	112.4	105.4	552 121.3	588 976.0	0.0058612	0.0062524
Arable land not utilized	1.0	0.0	0.0	0.3				
Potatoes	0.6	0.3	0.2	0.4	8 129.7	4 434.4	0.0000863	0.0000471
Sugar beet	0.0	0.0	0.0	0.0				
Winter rape	0.0	0.0	0.0	0.0				
Spring rape	0.0	0.0	0.0	0.0				
Winter turnip rape	0.0	0.0	0.0	0.0				
Spring turnip rape	0.0	0.0	0.0	0.0				
Other plant types	0.0	0.0	0.0	0.0				
Pasture for seed production	0.0	17.0	12.5	9.8				
Bare fallow	3.0	6.1	0.0	3.0				
Fodder peas and beans	0.0	0.0	0.0	0.0				
Processing peas	0.0	0.0	0.0	0.0				
Linseed	0.0	0.0	0.0	0.0				
Horticultural plants	0.0	0.0	0.0	0.0				
Energy forest	0.0	0.0	0.0	0.0				
Total arable area	143.6	162.6	139.6	148.6				

Source: SCB, Farm Register.

Animal production

The development of livestock has been rather similar in both Uppsala län and Östhammars kommun but that in Forsmark församling diverges from the common trend. The number of cattle, sheep and pigs increases in both county and municipality; in the latter even more than in the county in average when breeding cows and pigs are concerned. At the same time the number of poultry and dairy cows decreases significantly. In Forsmark församling the situation is quite different; the number of livestock decreases with only one exception: slaughter cattle; (see Table 4-26 and Table 4-27).

Table 4-26. Livestock in county, municipality and parish; average in 1990–1999.

Livestock, number of heads, average 1990–1999	Uppsala län	Östhammar	Forsmark församling
Dairy cows	17 343	4 509	58
Cows for breeding	4 668	691	18
Heifers, bulls and bullocks > 1 year old	18 596	4 563	56
Calves < 1 year old	18 112	3 717	43
Sheep and lambs	15 965	2 581	97
Boars and sows	8 600	849	0
Other pigs	60 735	6 196	3
Fowls and chickens	210 381	16 888	157

Source: SCB, Farm Register.

Table 4-27. Livestock in county, municipality and parish change in 1990–1999 (%).

Livestock, change (%) 1990–1999	Uppsala län	Östhammar	Forsmark församling
Dairy cows	–29	–24	–2
Cows for breeding	125	228	–29
Heifers, bulls and bullocks > 1 year old	10	22	42
Calves < 1 year old	–5	12	86
Sheep and lambs	24	23	–19
Boars and sows	–3	–13	0
Other pigs	11	41	–100
Fowls and chickens	–46	–50	–40

Source: SCB, Farm Register.

The estimated total animal production (kg) in Forsmark församling, both the average yearly production based on 1990, 1995 and 1999 and the estimated production in 1999 is presented in Table 4-28. The total production has been divided by the total study area, in this case Forsmark församling in order to estimate the production per area (kg/m^2). The results are presented in Table 4-29.

Table 4-28. Estimates for total animal production (kg) in Forsmark församling (1990–1999).

Estimates for animal production in Forsmark församling	1990	1995	1999	average	change (%)
Dairy cows	65	45	64	58	–2
Breeding cows	17	25	12	18	–29
Heifers, bulls and bullocks > 1 year	33	89	47	56	42
Calves	35	28	65	43	86
Total number of cattle	150	187	188	175	25
Estimate for the number of slaughtered cattle (28.5% of the total number of cattle)	43	53	54	50	25
Estimate for produced beef (57% of average slaughter weight 292 kg)	7 115	8 870	8 918	8 301	25
Estimate for produced milk (7 495 kg per a dairy cow a year)	487 175	337 275	479 680	434 710	–2
Sheep and lambs	113	88	91	97	–19
Estimate for the number of sheep (45 % of the total number of sheep and lambs)	51	40	41	44	–19
Estimate for the number of lambs (55% of the total number of sheep and lambs)	62	48	50	53	–19
Estimate for the number of slauhtered sheep (14% of all sheep)	7	5	5	6	–27
Estimate for the number of slaughtered lambs (69% of all lambs)	43	33	35	37	–19
Estimate for weight of slaughtered sheep (kg), average slaughter weight 25.9 kg	189	134	138	154	–27
Estimate for weight of slaughtered lambs (kg), average slaughter weight 18.1 kg	778	606	626	670	–19
Estimate for produced mutton, 57% of slaughter weight (kg)	551	422	436	470	–21
Boars and sows	0	0	0		
Other pigs	10	0	0	3	–100
Total number of pigs	10	0	0		–100
Estimate for the number of slaughtered pigs (170% of all pigs)	17	0	0	6	–100
Estimate for weight of slaughtered pigs (kg), average slaughter weight 85.3 kg	1 450	0	0	483	–100
Estimate for produced pork (kg), 57% of slaughter weight	827	0	0	276	–100
Fowls and chickens	200	150	120	157	–40
Estimate for fowls (75% of all fowls and chickens)	150	113	90	118	–40
Estimate for the number of slaughtered chickens (925% of all fowls and chickens)	1 850	1 388	1 110	1 449	–40
Estimate for the weight of slaughetered chickens (kg), average slaughter weight 1.3 kg	2 405	1 804	1 443	1 884	–40
Estimate for produced chicken meat, 75% of the slaughter weight	1 804	1 353	1 082	1 413	–40
Estimate for produced eggs (18.7 kg per a fowl a year)	2 805	2 104	1 683	2 197	–40

Table 4-29. Summary of animal production in Forsmark församling (kg/m²) 1990–1999.

Estimates for animal production in Forsmark församling (94,2 km²)	1990 (kg)	1995 (kg)	1999 (kg)	average 1990–1999 (kg)	average 1990–1999 (kg/m²)	1999 (kg/m²)
Milk	487 175	337 275	479 680	434 710	0.0046148	0.0050921
Beef	7 115	8 870	8 918	8 301	0.0000881	0.0000947
Mutton	551	422	436	470	0.0000050	0.0000046
Pork	827	0	0	276	0.0000029	0.0000000
Eggs	2 805	2 104	1 683	2 197	0.0000233	0.0000179
Chicken meat	1 804	1 353	1 082	1 413	0.0000150	0.0000115

4.2.4 Horticulture

According to /SCB, 2003a/ there were 28 horticultural holdings with at least 0.25 hectares outdoor cultivation in Uppsala län in 2002. The total area was 63.1 hectares (0.63 km²), which represents 0.5% of the total outdoor area in the country. Compared to 1999, when the total area was 91 hectares, the area has decreased by 31%. The number of holdings was 30 in 1999. Among the vegetables the cultivation of carrots was predominant and accounted for 30% of the total area for vegetables. Cultivation of strawberries and apples was predominant for fruits and berries and in all accounted for 93% of the total area for fruit and berries.

The area for cultivation of fruit and berries accounted for approximately 80% of the total area. In Sweden as a whole, 60% of the outdoor area is used for vegetable cultivation, whereas 35% is used for fruit and berry cultivation.

According to /Östhammars Näringslivsutveckling AB, 2003a/, there are three horticultural holdings in Östhammar kommun. These are:

1. Fredrikssons Handelsträdgård, Hargshamn.
2. Handelsträdgården i Ed, Östhammar.
3. Östhammar TrädgårdsCenter, Östhammar.

None of them is located in Forsmark församling.

4.2.5 Aquaculture

According to /SCB, 2003b/ there are five enterprises in Uppsala län. Two of these produce fish for consumption, whereas three produce fish for stocking. The production of rainbow trout for consumption is demonstrated in /SCB, 2003b/. For Uppsala län, there are no data concerning the rainbow trout production, as the number of enterprises is only two.

According to the municipality key plan /Östhammars kommun, 2003a/ there are three enterprises in the municipality. One in Söderboda on the island Gräsö, one at Stora Risten, an island south of Gräsö and one at Raggarön, an island in the parish of Hargshamn. Rainbow trout (regnbågsöring) is the dominating fish species, but Atlantic salmon (lax) is also produced.

There is no aquaculture within Forsmarks församling.

4.2.6 Mineral extraction

Within Forsmarks församling, no leases for mineral extraction are active.

Within Östhammars kommun, seven leases area active; one lease for extraction of trash stones (skrotsten), one lease for gravel (grus) extraction, four for bedrock extraction (bergtäkt) and one lacking data on extraction material.

4.2.7 Water supply

The survey performed in 2000 does not have full coverage. However, the figures from 2000 show that water use in Östhammars kommun has decreased since 1995, from 5,411,000 m^3 to 2,431,000 m^3, if we assume that the water use within agriculture is unchanged (see Table 4-30). The water use in the industry has decreased remarkably. According to SCB the performance of the two surveys concerning industrial water use are comparable. They have no reasonable explanation for the radical decrease, which seems unlikely. If the reported decrease has occurred, industrial water use accounts for as little as 5% of the total water use, which is considerably below the average in the country. The number of work places has decreased between 1997 and 2000, but not in proportion to the decrease of industrial water use.

Table 4-30. Water supply (thousand of cubic meters) in Östhammars kommun and larger areas.

Geographic area	Year	Total with-drawal	Water use				Water withdrawal		Water withdrawal	
			house-holds	agri-culture	industry	others	public	private	Ground-water	Surface water
Östhammars kommun	1990	5 030	1 231	624	2 747	428	1 426	3 604	1 877	3 153
percentage distribution			24.5%	12.4%	54.6%	8.5%	28.3%	71.7%	37.3%	62.7%
Östhammars kommun	1995	5 411	1 539	571	2 922	379	1 983	3 428	2 089	3 322
percentage distribution			28.4%	10.6%	54.0%	7.0%	36.6%	63.4%	38.6%	61.4%
Östhammars kommun	2000		1 493	no data	130	237	1 860	no data	no data	no data
percentage distribution*			61.4%		5.3%	9.7%				
Uppsala län	1990	134 406	16 394	6 575	97 022	14 415	33 292	101 114	34 696	99 710
percentage distribution			12.2%	4.9%	72.2%	10.7%	24.8%	75.2%	25.8%	74.2%
Uppsala län	1995	106 639	19 745	5 823	69 775	11 296	29 055	77 584	32 288	74 351
percentage distribution			18.5%	5.5%	65.4%	10.6%	27.2%	72.8%	30.3%	69.7%
Uppsala län	2000	93 491	20 448	5 636	57 970	9 437	28 051	65 440	31 111	62 380
percentage distribution			21.9%	6.0%	62.0%	10.1%	30.0%	70.0%	33.3%	66.7%
The country*	2000	3 241 000	618 000	135 000	2 166 000	321 000	942 000	2 299 000	542 000	2 539 000
percentage distribution			19.1%	4.2%	66.8%	9.9%	29.1%	70.9%	16.7%	78.3%

* if we assume that the water use within agriculture is the same as in 1995.
Source: SCB.
Calculated: the total withdrawal and the percentage distribution.

The reduction in water use within households between 1995 and 2000 is probably a result of a decreased population, from 22,366 to 21,733 between 1995 and 2000.

By comparing the water use and water withdrawal in the year 1995, it can be seen that proportionately more water is used for agriculture and less is used for industry in Östhammars kommun compared to Uppsala län. Proportionately more water is taken from the groundwater in Östhammars kommun than in the county and more water comes from the public water supply in Östhammars kommun than in the county. Others includes water use in business sectors such as government services, trading, hotels and restaurants,

construction and transportation.

The water use within Forsmark församling (and smaller areas) in the year 2000 has been roughly calculated based on the number of inhabitants in 2000, the number of work places in 2000, the number of farms in 1999 (there are no figures from 2000) and the number of holiday houses in 2002 (there are no figures from 2000) (see Table 4-31). Some assumptions must be made in order to calculate the water use and the water withdrawal. These assumptions are described in chapter 2. According to /Forsmarks Kraftgrupp AB, 2002/ the use of freshwater was 257,000 m^3 in 2002, of which 131,000 m^3 were used as processwater.

Table 4-31. Calculated water supply (thousand m^3) in the Forsmark area, the main drainage area and Forsmark församling.

Geographic area	Year	Total with-drawal	Water use						Water withdrawal		Water withdrawal	
			house-holds	holi-day	agri-culture	indus-try	nuclear	others	public	private	ground water	surface water
Forsmark area	2000	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.03	0.06
			0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	36.6%	63.4%	38.6%	61.4%
Main drainage area (54/55)	2000	258.1	0.2	0.4	0.0	0.2	257.0	0.3	0.4	257.7	0.4	257.7
			0.1%	0.2%	0.0%	0.1%	99.6%	0.1%	0.2%	99.8%	0.2%	99.8%
Forsmark församling	2000	275.7	11.5	1.2	4.3	0.6	257.0	1.2	6.8	268.8	7.2	268.5
			4.2%	0.4%	1.5%	0.2%	93.2%	0.4%	2.5%	97.5%	2.6%	97.4%

The water use at Forsmark nuclear power plant represents the main part of the total water use within Forsmark församling and the main drainage area (54/55).

The number of work places in the parish is very low, only 0.5% of the work places in Östhammars kommun. The water use within the industry sector, excluding the nuclear industry, and the sector “other” are therefore estimated to be very low.

4.2.8 Coastal fishing

According to the municipality key plan there are approximately 20 licensed fishermen in Östhammar kommun /Östhammars kommun, 2003a/. They undertake a coastal small-scale fishing for consumption and they sell their catch to local grocers´ stores. Common species are salmon (lax), salmon trout (laxöring), pike-perch (gös) and lavaret species (sikfiskar). The fishing water off the coast of Östhammar is also used by fishermen from the coast of northern Sweden.

According to the National Board of Fisheries the number of logbook- or fishing journal keeping fishermen was ten in Östhammars kommun in 2002 (see Table 4-32). Only one of them lives within the postal code zone of Östhammar (742 93 Östhammar), but according to the Swedish Post´s postal code catalogue the addresses within that postal code zone belong to Börstil parish. The others live within a postal code zone of Öregrund (74071). No registered fishermen seem to live in Forsmark församling, at least no logbook- or journal-keeping fishermen. Fishermen living in Östhammars kommun catch 74% of the total catch by fishermen living in Uppsala län. Fishermen living in Tierp kommun and Älvkarleby kommun catch the remainder.

Table 4-32. Commercial fishing in Forsmark församling and larger areas.

Geographic area	Year	Number of logbook- or journal keeping fishermen	Total number of fisher-men	Catch (kg)
Forsmark församling		0		0
Östhammars kommun	2002	10	20	805 213
mean value	96–02	11	22	241 600
standard deviation		1	2	252 362
min value		10	20	108 636
max value		12	24	805 213
Uppsala län	2002	24	48	1 084 070
mean value	96–02	25	51	549 607
standard deviation		1	3	238 453
min value		23		409 720
max value		27		1 084 070

Source: Number of logbook- or journal keeping fishermen and total catch by fishermen living in Östhammars kommun and Uppsala län from Fiskeriverket (the National board of Fisheries).
Estimated: The number of logbook- or journal keeping fishermen in Forsmark parish. The total number of fishermen in all geographic areas.

The catch per unit area is considerably lower in the EU-grid for fisheries off the coast of Uppsala län compared to the squares off the southeast of Sweden. The fisheries are most productive in EU-square 47G9, approx 115 km southeast of the Forsmark area (see Table 4-33 and Figure 4-10). The mean catch is 781 kg/km^2 (1995–2002). Among the EU-squares along the coastline, the catch per unit area is largest in square 50G7 (both in 2002 and for the average 95–02), which begins approximately 25 km north of the Forsmark area.

In EU-square 49G8, which includes the Forsmark area, the catch has on average been 224 kg/km^2 (1995–2002). The dominating species (78%) is Baltic herring (sill/strömming). The second most frequent species (8.3%) is lavaret species (sikfiskar). The two dominating species in the off-shore grid are Baltic herring and sprat (skarpsill). Cod (torsk) dominates in the square near Åland (49G9), but is insignificant in other squares.

Only two commercial receivers of fish are located in Uppsala län, one in Öregrund and one in Östhammar. These two received 66,640 kg of fish from fishermen fishing off the coast of Uppsala län during the year 2002. This is only 8.3% of the weight of fish that the fishermen in Östhammar caught that year. The received fish were used for consumption. This figure corresponds to the information in the key plan that the fishermen mainly sell their fish to local stores. It is also possible that they sell their fish to a commercial receiver outside the county border.

Table 4-33. Catch per EU-square off the coast of Uppsala län (kg).

EU-square	Year	Baltic herring	Sprat	Lavaret species	Cod	Total (kg)		Water area (km^2 and 10^6 m^3)	Catch (kg per km^2 and 10^6 m^3)	
47G8	2002	26 060	30 000	2 046	768	64 334		1 661	39	
Mean catch (SD)	95–02	90 314	40 625	1 728	224	142 429	(186 623)		86	(112)
Percentage distribution	95–02	63.4%	28.5%	1.2%	0.2%					
Min value	95–02	1 648	0	1 329	0	10 091			6	
Max value	95–02	367 190	200 000	2 046	768	449 125			270	
47G9	2002	1 278 000	2 964 000	0	0	4 242 000		3 172	1 337	
Mean catch (SD)	95–02	1 262 407	1 213 581	62	275	2 478 058	(1 826 593)		781	(576)
Percentage distribution	95–02	50.9%	49.0%	0.0%	0.0%					
Min value	95–02	23 000	9 000	0	0	32 060			10	
Max value	95–02	2 505 000	2 964 000	211	2 200	4 669 000			1 472	
48G8	2002	64 100	67 000	560	0	137 347		390	352	
Mean catch (SD)	95–02	11 777	8 375	819	52	30 703	(43 653)		79	(112)
Percentage distribution	95–02	38.4%	27.3%	2.7%	0.2%					
Min value	95–02	1 746	0	414	0	6 306			16	
Max value	95–02	64 100	67 000	1 785	412	137 347			352	
48G9	2002	1 358	0	1 554	0	3 343		3 010	1	
Mean catch (SD)	95–02	509 555	76 313	1 019	6 481	622 453	(1 505 394)		207	(500)
Percentage distribution	95–02	81.9%	12.3%	0.2%	1.0%					
Min value	95–02	615	0	787	0	3 343			1	
Max value	95–02	3 710 150	420 000	1 554	50 664	4 341 724			1 442	
49G8	2002	339 743	0	19 615	8 553	400 975		1 414	284	
Mean catch (SD)	95–02	246 552	491	26 191	5 391	316 237	(51 545)		224	(36.4)
Percentage distribution	95–02	78.0%	0.2%	8.3%	1.7%					
Min value	95–02	199 200	0	19 615	2 490	275 462			195	
Max value	95–02	339 743	3 930	52 677	10 552	400 975			284	
49G9	2002	2 720	0	0	4 775	7 727		2 098	4	
Mean catch (SD)	95–02	4 346	2 875	221	6 581	16 317	(12 948)		8	(6.2)
Percentage distribution	95–02	26.6%	17.6%	1.4%	40.3%					
Min value	95–02	0	0	0	4 510	4 621			2	
Max value	95–02	15 000	23 000	900	10 892	34 283			16	
50G7	2002	606 284	0	38 927	0	684 449		1 782	384	
Mean catch (SD)	95–02	632 361	585	40 573	77	711 047	(142 822)		399	(80.1)
Percentage distribution	95–02	88.9%	0.1%	5.7%	0.0%					
Min value	95–02	538 772	0	36 033	0	613 686			344	
Max value	95–02	966 175	4 680	58 019	480	1 057 750			594	
50G8	2002	670 130	0	1 455	0	673 043		3 026	222	
Mean catch (SD)	95–02	174 520	313	3 040	550	180 752	(210 770)		60	(69.6)
Percentage distribution	95–02	96.6%	0.2%	1.7%	0.3%					
Min value	95–02	3 200	0	0	0	3 239			1	
Max value	95–02	670 130	2 500	7 794	4 400	673 043			222	
50G9	2002	50 500	7 500	0	0	58 000		3 041	19	
Mean catch (SD)	95–02	39 324	3 188	24	0	42 551	(95 259)		14	(31.3)
Percentage distribution	95–02	92.4%	7.5%	0.1%	0.0%					
Min value	95–02	0	0	0	0	0			0	
Max value	95–02	255 000	18 000	130	0	273 065			90	

Input data: Total catch and catch of the three most common species (kg). Source: National Board of Fisheries. Calculated: Catch per square kilometre based on a water area, that is calculated in Arc View.
Mean value with a standard deviation, minimum- and maximum values and the mean catch by species expressed as a percentage.

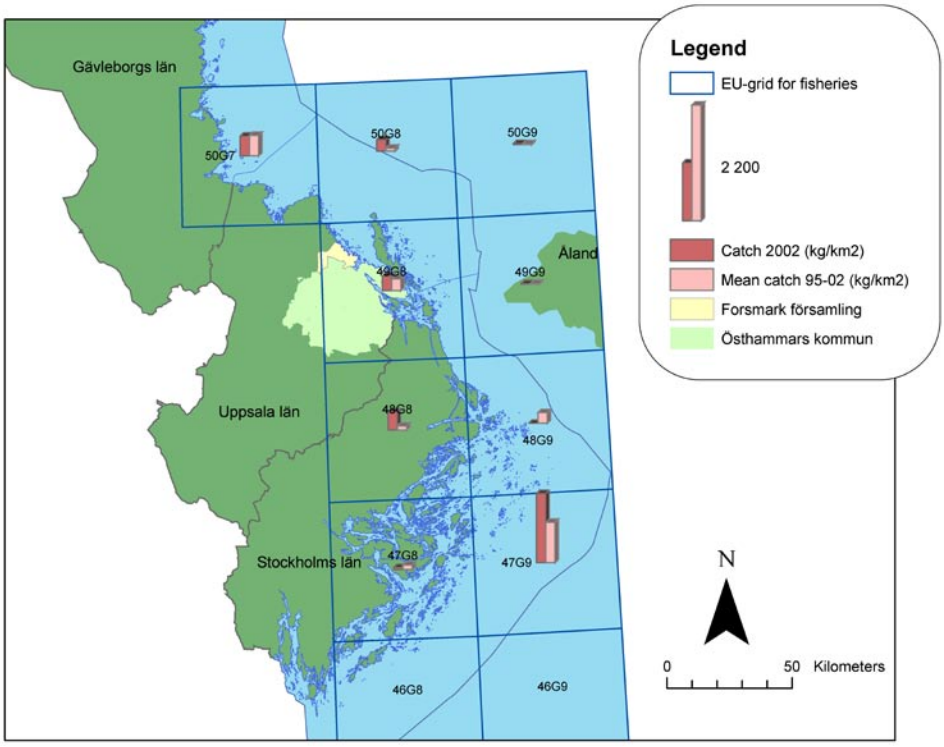

Figure 4-10. *The catch per unit area in 2002 (kg/km²) and the mean catch per unit area 95–02 (kg/km²) in the EU-grid outside the coast of Uppsala län.*

4.2.9 Outdoor life

In general

According to a national survey conducted by /SCB, 2003e/ concerning the human time use in 2000/2001, the average time spent on sports and outdoor life had increased since 1990/1991. The study included a population between 20 and 84 years of age. Excluding the time spent on indoor sports the time spent on outdoor sports and outdoor life is in average approximately 32 minutes per day for women and 35 minutes per day for men. The outdoor life includes walks in the country and other walks, hunting, fishing, excursions by car as well as other outdoor life. The group that spends most time outdoors is the 65–84 year old group (living together). Single parents spend the shortest time on sports and outdoor life.

The total amount of outdoor hours per year in Forsmark församling can be calculated based on the assumption that the inhabitants in the parish spend 35 minutes per day on outdoor sports and outdoor life. Although children and youths are normally outdoors more than adults, a value of 35 minutes per day was used for all inhabitants when calculating. This may be a slight underestimate.

The number of inhabitants in 2002 is 168, which gives a total outdoor time of 35,770 hours per year. Part of this time will of course be spent outside the parish border, but in compensation will some individuals from neighboring parishes spend some of their time within Forsmark församling.

Wildlife hunting

Moose hunting

According to the figures from the Länsstyrelsen i Uppsala län, moose hunting is more extensive in Forsmark församling than in the municipality and county as a whole (0.53 individuals per km^2 compared to 0.37 respectively 0.35, in 2003) (see Table 4-34).

According to the survey based on pellet sampling conducted by Svensk Viltförvaltning AB /Cederlund et al. 2003/ the population density of moose was estimated to 0.83 individuals per km^2 in the Forsmark area in the spring 2002. That means that more than every second moose is harvested. This seems unlikely. The population density might have been temporarily low when the sampling was conducted, which is also mentioned by Svensk Viltförvaltning AB.

No obvious trend can be seen in the data between 1999 and 2003. The number of harvested moose per km^2 reached a peak in 2000–2001. During the last two seasons the number per km^2 has decreased (see Figure 4-11). The harvest was almost equal in Forsmark församling, Östhammars kommun and Uppsala län in 1999, but since then the harvest has been more intensive in Forsmark församling.

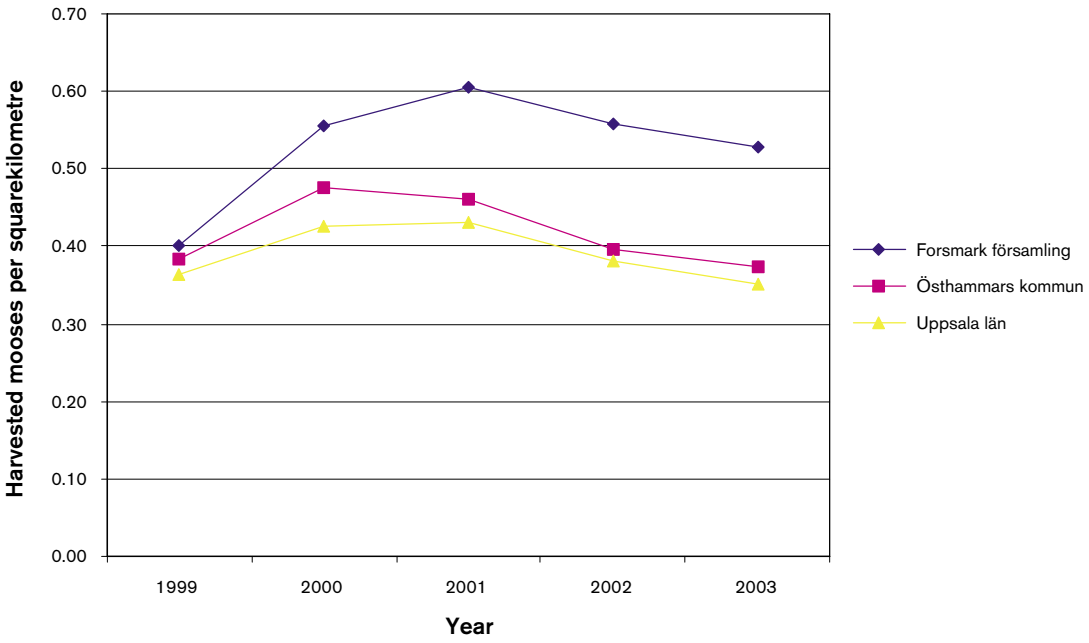

Figure 4-11. *Harvest of moose per km^2 in Forsmark församling, Östhammar kommun and Uppsala län, during the time period 1999–2003.*

Table 4-34. Harvest of moose in Forsmark församling and larger areas.

Geographic area	Year	Hunting-zone	No of zones	Area (km^2)	Total permit	Harvested bulls	Harvested cows	Harvested bull calves	Harvested cow calves	Harvest, number of individuals	Harvest, individuals per km^2 and 10^6 m^3	Live weight (kg)	Live weight (kg) per km^2 and 10^6 m^3	Carcass weight (kg)	Carcass weight (kg) per km^2 and 10^6 m^3	Utilized carcass weight (kg)	Utilized Carcass weight (kg) per km^2 and 10^6 m^3
Forsmark församling	2003	Total	6	130.9	98	22	21	14	12	69	0.53	15 324	117	8 428	64	6 742	52
mean value	**99–03**	Total		128.7		20.6	20.0	14.2	13.4	**68**	**0.53**	**14 852**	**115**	**8 169**	**63**	**6 535**	**51**
standard deviation										10	0.08	2 281	17	1 255	9	1 004	7
min value										51	0.40	11 100	87	6 105	48	4 884	38
max value										79	0.61	17 231	132	9 477	73	7 582	58
Östhammars kommun	2003	Total	230	1 584.7	852	186	168	114	126	594	0.37	129 589	82	71 274	45	57 019	36
mean value	**99–03**	Total		1 550.6		194.4	179.6	138.8	134.6	**647**	**0.42**	**139 378**	**90**	**76 658**	**49**	**61 326**	**40**
standard deviation										68	0.05	14 293	9	7 861	5	6 289	4
min value										578	0.37	123 216	82	67 769	45	54 215	36
max value										730	0.47	157 420	101	86 581	55	69 265	44
Uppsala län	2003	Total	848	6 565.6	3 285	693	657	475	479	2 304	0.35	498 682	76	274 275	42	219 420	33
mean value	**99–03**	Total		6 574.9		745.2	673.8	595.8	556.8	**2 572**	**0.39**	**543 698**	**83**	**299 034**	**45**	**239 227**	**36**
standard deviation										241	0.04	49 395	7	27 167	4	21 734	3
min value										2 304	0.35	498 473	76	274 160	42	219 328	33
max value										2 843	0.43	601 233	91	330 678	50	264 542	40

Source: Number of harvested moose, hunting area and total permits from Länsstyrelsen i Kalmar. Calculated: live-, carcass- and utilized carcass weight has been calculated based on figures from Svensk Viltförvaltning AB and Jägareförbundet. The values have also been calculated on a unit area basis.

Table 4-35. Calculated harvest of moose in the main drainage area (54/55) and smaller areas.

Geographic area	Year	Area (km^2)	Harvest, number of individuals	Harvest, individuals per km^2 and 10^6 m^3	Live weight (kg)	Live weight (kg) per km^2 and 10^6 m^3	Carcass weight (kg)	Carcass weight (kg) per km^2 and 10^6 m^3	Utilized carcass weight (kg)	Utilized carcass weight (kg) per km^2 and 10^6 m^3
Forsmark 1	2003	5.1	2.7	0.53	587	115	323	63	258	51
mean value	99–03	5.1	2.7	0.53	590	116	324	64	259	51
Forsmark 2	2003	8.6	4.5	0.53	990	115	545	63	436	51
mean value	99–03	8.6	4.6	0.53	994	116	547	64	437	51
Eckarfjärden 2:10	2003	1.3	0.7	0.53	150	115	82	63	66	51
mean value	99–03	1.3	0.7	0.53	150	116	83	64	66	51
Forsmark 3	2003	0.2	0.1	0.53	23	115	13	63	10	51
mean value	99–03	0.2	0.1	0.53	23	116	13	64	10	51
Forsmark 4	2003	0.7	0.4	0.53	81	115	44	63	35	51
mean value	99–03	0.7	0.4	0.53	81	116	45	64	36	51
Forsmark 5	2003	0.9	0.5	0.53	104	115	57	63	46	51
mean value	99–03	0.9	0.5	0.53	104	116	57	64	46	51
Forsmark 7	2003	0.9	0.5	0.53	104	115	57	63	46	51
mean value	99–03	0.9	0.5	0.53	104	116	57	64	46	51
Forsmark 8	2003	2.9	1.5	0.53	334	115	184	63	147	51
mean value	99–03	2.9	1.5	0.53	335	116	184	64	148	51
Forsmark area	2003	19.5	10.3	0.53	2 245	115	1 235	63	988	51
mean value	99–03	19.5	10.3	0.53	2 254	116	1 240	64	992	51
Main drainage area (54/55)	2003	33.9	17.9	0.53	3 903	115	2 147	63	1 717	51
mean value	99–03	33.9	17.9	0.53	3 919	116	2 156	64	1 724	51

Source: The number of harvested individuals per unit area in Forsmark församling has been applied to the lower levels of resolution. Calculated: the total number of harvested moose, live-, carcass- and utilized carcass weight. The weight figures have been calculated based on figures from Svensk Viltförvaltning AB and Jägareförbundet.

Other wildlife

Roe deer

The hunting of roe deer is most extensive in the southern part of Sweden (Götaland) and most concentrated in Kalmar län, Hallands län and the northwest part of Skåne län according to the visualised statistics in Figure 4-12.

According to Figure 4-12 it seems like hunting of roe deer is more intensive in Östhammars kommun and the eastern part of Uppsala län than the average hunting pressure in Uppsala län.

The estimated figures in Table 4-36 concerning the harvest at parish and smaller areas are based on the figures for the hunting zone of Östhammars jaktvårdskrets (Östhammar hunting association), obtained from Svenska Jägareförbundet (Swedish Association for Hunting and Wildlife Management). According to these figures, the harvest has on average been 1.9 individuals per km^2 in the parish during the period 1997–2001.

According to the survey based on pellet sampling conducted by Svensk Viltförvaltning AB /Cederlund et al. 2003/ the population density of roe deer was estimated at 5.9 individuals per km^2 in the Forsmark area in the spring 2002. This implies that every third roe deer is harvested.

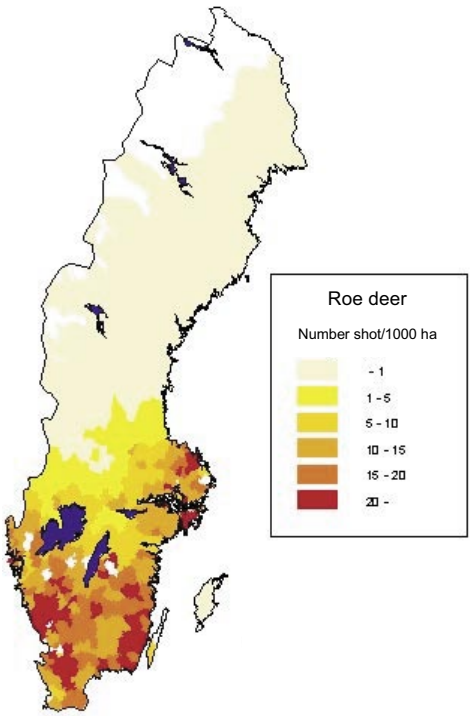

Figure 4-12. *Roe deer hunting distribution in Sweden. /Svenska Jägareförbundet, 2003d, internet/.*

Table 4-36. Calculated harvest of roe deer in Forsmark församling and smaller areas.

Geographic area	Year	Report cover	Harvest, individuals per km² and 10^6 m³	Harvest, number of individuals	Live weight (kg)	Live weight (kg) per km² and 10^6 m³	Carcass weight (kg)	Carcass weight (kg) per km² and 10^6 m³	Utilized carcass weight (kg)	Utilized carcass weight (kg) per km² and 10^6 m³
Forsmark 1	2001	21%	1.0	5.1	109	21	60	12	48	9
mean value	97–01	28%	1.9	9.7	207	41	114	22	91	18
Forsmark 2	2001	21%	1.0	8.6	184	21	101	12	81	9
mean value	97–01	28%	1.9	16.4	349	41	192	22	154	18
Eckarfjärden 2:10	2001	21%	1.0	1.3	28	21	15	12	12	9
mean value	97–01	28%	1.9	2.5	53	41	29	22	23	18
Forsmark 3	2001	21%	1.0	0.2	4	21	2	12	2	9
mean value	97–01	28%	1.9	0.4	8	41	4	22	4	18
Forsmark 4	2001	21%	1.0	0.7	15	21	8	12	7	9
mean value	97–01	28%	1.9	1.3	28	41	16	22	13	18
Forsmark 5	2001	21%	1.0	0.9	19	21	11	12	8	9
mean value	97–01	28%	1.9	1.7	37	41	20	22	16	18
Forsmark 7	2001	21%	1.0	0.9	19	21	11	12	8	9
mean value	97–01	28%	1.9	1.7	37	41	20	22	16	18
Forsmark 8	2001	21%	1.0	2.9	62	21	34	12	27	9
mean value	97–01	28%	1.9	5.5	118	41	65	22	52	18
Forsmark area	2001	21%	1.0	19.5	417	21	229	12	183	9
mean value	9–01	28%	1.9	37.2	792	41	436	22	349	18
Main drainage area (54/55)	2001	21%	1.0	34.0	724	21	398	12	319	9
mean value	97–01	28%	1.9	64.6	1 378	41	758	22	606	18
Forsmark församling	2001	21%	1.0	94.4	2 012	21	1 107	12	885	9
mean value	97–01	28%	1.9	179.5	3 828	41	2 105	22	1 684	18
standard deviation			0.5	49.5	1 055	11.2	580	6.2	464	4.9
min value			1.0	94.4	2 012	21.4	1 107	12	885	9
max value			2.3	212.1	4 523	48.0	2 488	26	1 990	21

Source: Jägareförbundet, Report cover (see chapter 2) and number of harvested individuals per unit area for Östhammars jaktvårdskrets. The figures are applied to Forsmark församling and smaller areas.
Calculated: Number of harvested individuals, live weight, carcass weight and utilized carcass weight. The weight figures have been calculated based on figures from Svensk Viltförvaltning AB and Jägareförbundet.

Hare

According to Figure 4-13, hunting of common hare/European hare (fälthare) is most extensive in Hallands län and Skånes län as well as the southern part of Öland. According to the statistics from Jägareförbundet the harvest has on average been 0.28 individuals per square kilometre in the parish during the period 1997–2001 (see Table 4-37). In 2001 the harvest was 0.10 common hare per square kilometre in Forsmark församling.

The alpine hare/mountain hare (skogshare) population has declined in number over the last years. As a natural consequence, hunting has diminished as well. The harvest is most concentrated in the eastern part of Norrbottens län. In Uppsala län the harvest of alpine hare is more extensive in the region around Forsmark than in the rest of the county according to Figure 4-14. According to the statistics from Jägareförbundet, the harvest has on average been 0.13 individuals per square kilometre in the parish during the period 1997–2001 (see Table 4-38). In 2001 the harvest was 0.03 individuals per square kilometre.

According to the survey based on faecal pellet sampling conducted by Svensk Viltförvaltning AB /Cederlund et al. 2003/ the population density was estimated to be 3.2 individuals per km^2 of common hare and to be 4.4 individuals/km^2 of alpine hare in the Forsmark area in the spring of 2002.

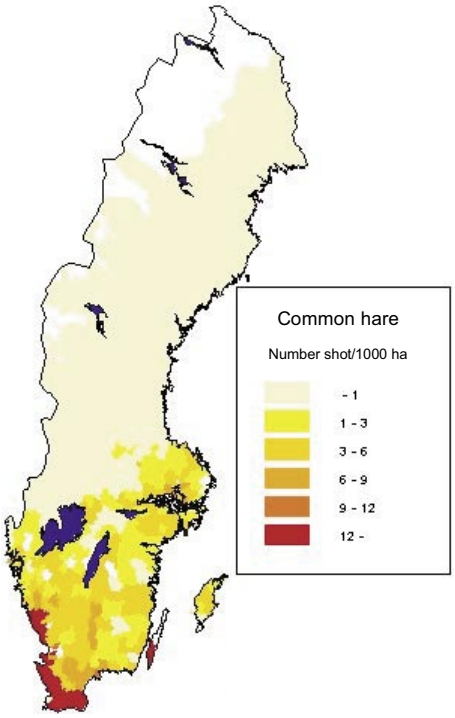

Figure 4-13. *Common hare hunting distribution in Sweden. /Svenska Jägareförbundet, 2003d, internet/.*

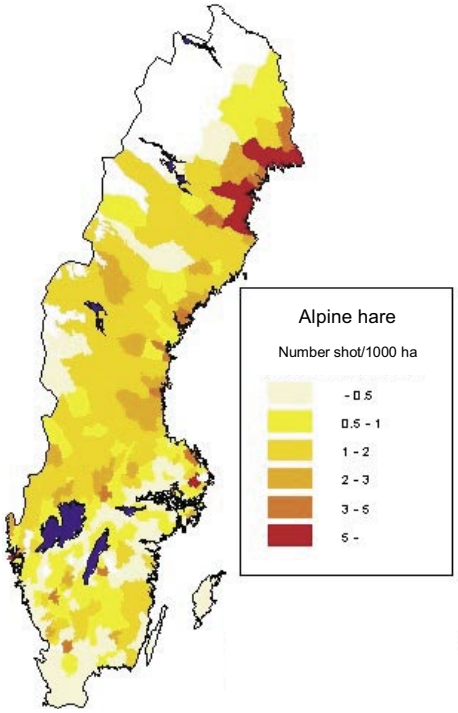

Figure 4-14. *Alpine hare hunting distribution in Sweden. /Svenska Jägareförbundet, 2003d, internet/.*

Table 4-37. Calculated harvest of common hare in Forsmark församling and smaller areas.

Geographic area	Year	Report cover	Harvest, individuals per km^2 and 10^6 m^3	Harvest, number of individuals	Live weight (kg)	Live weight (kg) per km^2 and 10^6 m^3	Carcass weight (kg)	Carcass weight (kg) per km^2 and 10^6 m^3	Utilized carcass weight (kg)	Utilized carcass weight (kg) per km^2 and 10^6 m^3
Forsmark 1	2001	21%	0.10	0.5	2.7	0.5	1.5	0.29	1.2	0.23
mean value	97–01	28%	0.28	1.4	7.2	1.4	4.0	0.78	3.2	0.62
Forsmark 2	2001	21%	0.10	0.9	4.5	0.5	2.5	0.29	2.0	0.23
mean value	97–01	28%	0.28	2.4	12.2	1.4	6.7	0.78	5.3	0.62
Eckarfjärden 2:10	2001	21%	0.10	0.1	0.7	0.5	0.4	0.29	0.3	0.23
mean value	97–01	28%	0.28	0.4	1.8	1.4	1.0	0.78	0.8	0.62
Forsmark 3	2001	21%	0.10	0.0	0.1	0.5	0.1	0.29	0.0	0.23
mean value	97–01	28%	0.28	0.1	0.3	1.4	0.2	0.78	0.1	0.62
Forsmark 4	2001	21%	0.10	0.1	0.4	0.5	0.2	0.29	0.2	0.23
mean value	97–01	28%	0.28	0.2	1.0	1.4	0.5	0.78	0.4	0.62
Forsmark 5	2001	21%	0.10	0.1	0.5	0.5	0.3	0.29	0.2	0.23
mean value	97–01	28%	0.28	0.3	1.3	1.4	0.7	0.78	0.6	0.62
Forsmark 7	2001	21%	0.10	0.1	0.5	0.5	0.3	0.29	0.2	0.23
mean value	97–01	28%	0.28	0.3	1.3	1.4	0.7	0.78	0.6	0.62
Forsmark 8	2001	21%	0.10	0.3	1.5	0.5	0.8	0.29	0.7	0.23
mean value	97–01	28%	0.28	0.8	4.1	1.4	2.3	0.78	1.8	0.62
Forsmark area	2001	21%	0.10	2.0	10.1	0.5	5.6	0.29	4.5	0.23
mean value	97–01	28%	0.28	5.5	27.5	1.4	15.2	0.78	12.1	0.62
Main drainage area (54/55)	2001	21%	0.10	3.5	17.6	0.5	9.7	0.29	7.8	0.23
mean value	97–01	28%	0.28	9.6	47.9	1.4	26.3	0.78	21.1	0.62
Forsmark församling	2001	21%	0.10	9.8	49.0	0.5	26.9	0.29	21.6	0.23
mean value	97–01	28%	0.28	26.6	133.1	1.4	73.2	0.78	58.6	0.62
standard deviation			0.1	11.9	59.6	0.6	32.8	0.35	26.2	0.28
min value			0.1	9.8	49.0	0.5	26.9	0.29	21.6	0.23
max value			0.4	37.4	187.2	2.0	103.0	1.09	82.4	0.87

Source: Jägareförbundet, Report cover (see chapter 2) and number of harvested individuals per unit area for Östhammars jaktvårdskrets. The figures are applied to Forsmark församling and smaller areas.
Calculated: Number of harvested individuals, living weight, carcass weight and utilized carcass weight. The weight figures have been calculated based on figures from Svensk Viltförvaltning AB and Jägareförbundet.

Table 4-38. Calculated harvest of alpine hare in Forsmark församling and smaller areas.

Geographic area	Year	Report cover	Harvest, individuals per km² and 10^6 m³	Harvest, number of individuals	Live weight (kg)	Live weight (kg) per km² and 10^6 m³	Carcass weight (kg)	Carcass weight (kg) per km² and 10^6 m³	Utilized carcass weight (kg)	Utilized carcass weight (kg) per km² and 10^6 m³
Forsmark 1	2001	21%	0.03	0.2	0.6	0.12	0.3	0.07	0.3	0.05
mean value	97–01	28%	0.13	0.7	2.7	0.52	1.5	0.29	1.2	0.23
Forsmark 2	2001	21%	0.03	0.3	1.0	0.12	0.6	0.07	0.5	0.05
mean value	97–01	28%	0.13	1.1	4.5	0.52	2.5	0.29	2.0	0.23
Eckarfjärden 2:10	2001	21%	0.03	0.0	0.2	0.12	0.1	0.07	0.1	0.05
mean value	97–01	28%	0.13	0.2	0.7	0.52	0.4	0.29	0.3	0.23
Forsmark 3	2001	21%	0.03	0.0	0.0	0.12	0.0	0.07	0.0	0.05
mean value	97–01	28%	0.13	0.0	0.1	0.52	0.1	0.29	0.0	0.23
Forsmark 4	2001	21%	0.03	0.0	0.1	0.12	0.0	0.07	0.0	0.05
mean value	97–01	28%	0.13	0.1	0.4	0.52	0.2	0.29	0.2	0.23
Forsmark 5	2001	21%	0.03	0.0	0.1	0.12	0.1	0.07	0.0	0.05
mean value	97–01	28%	0.13	0.1	0.5	0.52	0.3	0.29	0.2	0.23
Forsmark 7	2001	21%	0.03	0.0	0.1	0.12	0.1	0.07	0.0	0.05
mean value	97–01	28%	0.13	0.1	0.5	0.52	0.3	0.29	0.2	0.23
Forsmark 8	2001	21%	0.03	0.1	0.3	0.12	0.2	0.07	0.2	0.05
mean value	97–01	28%	0.13	0.4	1.5	0.52	0.8	0.29	0.7	0.23
Forsmark area	2001	21%	0.03	0.6	2.3	0.12	1.3	0.07	1.0	0.05
mean value	97–01	28%	0.13	2.5	10.1	0.52	5.6	0.29	4.5	0.23
Main drainage area (54/55)	2001	21%	0.03	1.0	4.1	0.12	2.2	0.07	1.8	0.05
mean value	97–01	28%	0.13	4.4	17.6	0.52	9.7	0.29	7.8	0.23
Forsmark församling	2001	21%	0.03	2.5	10.2	0.11	5.6	0.06	4.5	0.05
mean value	97–01	28%	0.13	12.1	48.6	0.52	26.7	0.28	21.37	0.23
standard deviation			0.2	14.5	57.9	0.6	31.8	0.34	25.5	0.27
min value			0.0	2.5	10.2	0.1	5.6	0.06	4.5	0.05
max value			0.4	37.4	149.6	1.6	82.3	0.87	65.8	0.70

Source: Jägareförbundet, Report cover (see chapter 2) and number of harvested individuals per unit area for Östhammars jaktvårdskrets. The figures are applied to Forsmark församling and smaller areas.
Calculated: Number of harvested individuals, living weight, carcass weight and utilized carcass weight. The weight figures have been calculated based on figures from Svensk Viltförvaltning AB and Jägareförbundet.

Picking of wild berries and mushrooms

According to /Berggren and Kyläkorpi, 2002/, 23.0 million litres of berries were picked for own-consumption in Sweden in 1997. The main part (83%) was lingonberries and blue berries. The total area of forest and mires in Sweden is 284,000 km² /SCB, 1998/, which gives an average amount of 81 litres/km² of wild berries in the forests and mires. The total amount of picked berries has been calculated for the Forsmark area, Östhammars kommun and Uppsala län. There are no available data of the forest area in Forsmark församling. Forsmark församling is therefore excluded from Table 4-39.

Table 4-39. Picking of wild berries in the Forsmark area, Östhammar kommun and Uppsala län.

Geographic area	Litres per km² land area of forest and mire (average in Sweden)	Forest area[1] (km²)	Picked berries (litres)	Land area (km²)	Picked berries, litres/km² land area
Forsmark area	81	16	1 296	18	73
Östhammars kommun	81	950	76 950	1 451	53
Uppsala län	81	4 185	338 985	6 989	49

[1] The forest area for Uppsala län includes mires.
Source: Forest area for the municipality and county from /SCB, 1998/. The forest area and land area for Simpevarp area from /Boresjö-Bronge and Wester, 2003/. The forest and mire area for Sweden from /SCB, 1998/.
Calculated: The total amount (litres) of berries picked in Forsmark area, Östhammar kommun and Uppsala län, expressed as litres and litres/km² land area.The average amount picked per km² forest and mire area has been obtained by dividing the estimated amount that is picked in Sweden yearly, with the forest- and mire area in Sweden.

According to /Berggren and Kyläkorpi, 2002/, 15.3 million litres of mushrooms were picked for own-consumption in Sweden in 1997. The total area of forest and mires in Sweden is 284,000 km² /SCB, 1998/, which gives an average amount of 54 litres/km² of mushrooms in the forests and mires. The total amount of picked mushrooms has been calculated for the Forsmark area, Östhammars kommun and Uppsala län. There are no available data of the forest area in Forsmark församling. Forsmark församling is therefore excluded from Table 4-40.

Table 4-40. Picking of mushrooms.

Geographic area	Litres per km² land area of forest and mire (average in Sweden)	Forest area[1] (km²)	Picked mushrooms (litres)	Land area (km²)	Picked mushrooms, litres/km² land area
Forsmark area	54	16	864	18	49
Östhammars kommun	54	950	51 300	1 451	35
Uppsala län	54	4 185	225 990	6 989	32

[1] The forest area for Uppsala län includes mires.
Source: Forest area for the municipality and county from /SCB, 1998/. The forest area and land area for Forsmark area from /Boresjö-Bronge and Wester, 2003/. The forest and mire area for Sweden from /SCB, 1998/.
Calculated: The total amount (litres) of mushrooms picked in Forsmark area, Östhammars kommun and Uppsala län, expressed as litres and litres/km2 land area.The average amount picked per km2 forest and mire area has been obtained by dividing the estimated amount that is picked in Sweden yearly, with the forest- and mire area in Sweden.

Fishing

Catch by sport fishermen

The amount of recreational fishing within the municipality is not very well analysed. According to /Hägglund and Hultman, 2003/ the coast attracts an increasing amount of recreational fishermen, even if Dalälven is the most attractive fishing water in the county.

A theoretical value of the annual catch has been calculated (Table 4-41) based on the data in /Fiskeriverket, 2000/ presuming that the recreational fishers (55% of the population between 16 and 64 years) are sport fishermen that catch 18 kg per year (see also chapter 2). This seems like a very high value, so the calculations are definitely not underestimated. The catch per geographic area is fully dependant on the number of inhabitants and has no connection to the number of fishing waters and their area.

Table 4-41. Catch by sport fishermen.

Geographic area	Year	Number of inhabitants (16–64 years) in 2002	Catch (kg)	Catch (kg/km²)
Main drainage area	2002	8	79	2.3
Forsmark församling	2002	103	1 020	10.8
Östhammars kommun	2002	13 386	132 521	91.3
Uppsala län	2002	200 249	1 982 465	283.7

Calculated: catch (kg and kg/km²) based on the facts in /Fiskeriverket, 2000/ and the number of inhabitants between 16 and 64 years in 2002.

Sport fishing clubs

According to /Sveriges Sportfiske- och Fiskevårdsförbund, 2003, internet/ there are no sport fishing clubs registered in Forsmark församling. In Östhammars kommun there is one club in Österbybruk, called the Österby sport fishing club.

Attractive fishing-waters

Two attractive fishing-waters have been pointed out in Forsmark församling by /Hägglund and Hultman, 2003/. The first is Södra Åsjön, a fishing-ground that requires a fishing licence, and the second is the waters around the Forsmark power plant.

According to /Brunberg and Blomqvist, 1998/ there is a fishing license area called Forsmarks fishing license area, which contains the lake Fiskarfjärden.

There are seven attractive fishing waters in Östhammars kommun according to the map in /Hägglund and Hultman, 2003/. Besides the coastal area there are six lakes that require a fishing licence. These are listed in Table 4-42.

Table 4-42. Lakes requiring fishing licence in Östhammars kommun.

Fishing water	Information
Södra Åsjön	Part of Domänverkets Domänfiskekort. Boats for rent.
Kalkgruvan	Small put and take water.
Vällen	Managed by Vällens FVO.
Gimo damm	Owned by Korsnäs Marma AB.
Rastsjön	Managed by Rastsjöns FVO. Boats for rent.
Dannemorasjön and others	Nearby Österbybruk. Managed by Österby Fiskeriförening.

Golf

There are no golf courses in Forsmark församling according to /Upplands Golfförbund, 2003, internet/, but three in Östhammars kommun, as listed in Table 4-43.

Table 4-43. Golf courses in Östhammars kommun.

Name	Description
Öregrunds golfklubb	a 18-hole golf course.
Olandsbygdens golfklubb, at Alunda	a 9-hole golf course.
Raggarön	a Pay & Play 9-hole golf course. No green card is required.

Hiking and jogging

Hiking trails

Nature reserves are attractive areas for outdoor life. There are three nature reserves in Forsmark församling according to /Länsstyrelsen i Uppsala län, 2003a, internet/. There are 21 nature reserves in Östhammar kommun. The three nature reserves in the parish are listed in Table 4-44.

Table 4-44. Nature reserves in Forsmark församling.

Name	Description
Skaten-Rångsen	an area of 2 300 hectares 3 km north of Forsmark nuclear power plant.
Kallriga	an area of 1 215 hectares, approx 2.5 km southeast of Forsmark nuclear plant.
Bruksbystan	an area of 4.1 hectares, approx 7 km west of Forsmark nuclear plant.

Jogging tracks

There are no jogging tracks within Forsmark församling according to /Östhammars kommun, 2003b, internet/. In Östhammars kommun however, there are seven jogging tracks.

Bird watching

According to /Upplands Ornitologiska Förening, 2003, internet/ there are two attractive spots within the parish. Biotestsjön at Forsmark nuclear plant is one of them. The cooling water from the power plant increases the temperature of the water in Biotestsjön by 8–10°. This makes Biotestsjön a famous bird watching spot during the winter, as the artificial lake attracts a large number of birds. The other spot is Kallrigafjärden.

Canoeing

There are no long-distance canoe routes within Östhammars kommun according to the information on /Kanotguiden, 2003, internet/. There are no canoe renters within the parish. Two canoe renters have been identified in Östhammars kommun (see Table 4-45).

Table 4-45. Canoe rental in Östhammars kommun.

Name	Parish	Other	Other source
Gräsö Kanotcentral/Rävstens stugby	Gräsö	Authorized by Svenska Kanotförbundet	/Rävsten stugby, 2003, internet/
Kanotcenter AB	Östhammar	Authorized by Svenska Kanotförbundet	/Kanotcenter i Östhammar AB, 2003, internet/

Sunbathing

There are 16 open air baths within Östhammars kommun (Table 4-46) according to /Östhammars kommun, 2003b, internet/. None of them are within Forsmark församling. According to /Östhammars Näringslivsutveckling AB, 2003b, internet/ there is, however, a bathing bridge and diving tower at Berkinge in Forsmark församling.

Table 4-46. Open air baths in Östhammars kommun.

Name	Parish	Other information
Aspobadet 1–3		Nature reserve between Gimo and Österbybruk. Aspobadet 3 has a camping site.
Gimo friluftsbad	Skäfthammar	Camping possibilities.
Gräsöbaden	Gräsö	Within the camping site. Bikes and rowing boats for rent.
Hammardammen	Morkarla	Approx 3 km from Morkarla.
Hargshamns friluftsbad	Harg	Camping nearby.
Krutudden	Östhammar	
Rastsjön	Morkarla	
Simbadet	Film (Österbybruk)	Pedal boats and bikes for rent. Camping.
Sundsbadet at Granfjärden	Börstil	
Sunnanöbadet	Öregrund	At Sunnanö camping, about 1.5 km south of Öregrund.
Tallparksbadet	Öregrund	
Vällenbadet, Norra Vällensjön	Ekeby	
Älvsnäs friluftsbad	Gräsö	At the southern part of Söderön at Raggaröfjärden.
Alunda landbad	Alunda	Tempered bath.

Camping

There are nine campsites (four larger) within Östhammars kommun of which two of the smaller ones are located within Forsmark församling, according to different sources. These nine are listed in Table 4-47.

Table 4-47. Camping sites in Östhammars kommun.

Name	Parish	Camping sites	Cottages	Other	Source
Gräsöbadens camping	Gräsö		5	Boats and bikes for rent.	/Östhammars kommun, 2003b, internet/
Sunnanö camping	Öregrund		14	Boats for rent.	/Östhammars kommun, 2003b, internet/
Klackskärs camping	Östhammar		18	Boats for rent.	/Östhammars kommun, 2003b, internet/
Hargshamn camping	Harg	About 45 caravan- and tent pitches.		Good fishing opportunities for herring fishing May–June.	/Östhammars kommun, 2003b, internet/
Aspobaden Camping		Small trailer/ caravan park in nature reserve.		Rod fishing allowed without a license.	/Östhammars Näringslivsutveckling, 2003b, internet/
Caravan Camping club, Sund	Börstil	Available to non-members as space permits.			/Östhammars Näringslivsutveckling, 2003b, internet/

Name	Parish	Camping sites	Cottages	Other	Source
Simbadet Camping and Bathing Area	Film	25 pitches		Rowing boats, pedal boats and canoes for rent.	/Östhammars Näringslivsutveckling, 2003b, internet/
Kallerö Naturcamping	Forsmark				/Östhammars Näringslivsutveckling, 2003b, internet/
Stora Rångsen	Forsmark	Small tentsite in nature reserve Skaten-Rångsen.			/Upplandsstiftelsen, 2003, internet/

Boat life

Guest harbours

Within the municipality there are two public harbours according to /Östhammars kommun, 2003b, internet/ and one private guest harbour according to /Östhammars Näringslivsutveckling, 2003b, internet/. These are listed in Table 4-48. There are no guest harbours within Forsmark församling.

Table 4-48. Guest harbours in Östhammars kommun.

Name	Parish	Guest sites	Other
Östhammar	Östhammar	20	They have toilets and showers are available at Klackskärs camping.
Öregrund	Öregrund	80	They have showers, toilets and laundry facilities.
Raggarö (private)	Hargshamn	8	They have dry closets, sauna, showers, a small bathing place and a golf course.

Marinas

There are six marinas in Östhammars kommun (Table 4-49) according to /Östhammars kommun, 2003b, internet/. The total number of berths is 1,085. There is no marina within Forsmark församling.

Table 4-49. Marinas in Östhammars kommun.

Name	Parish	Berths	Managed by
Östhammars småbåtshamn	Östhammar	460	Östhammars Segelsällskap.
Öregrunds småbåtshamn, Furuskär, Katrinörarna and Sunnanö	Öregrund	470	Öregrunds Båtklubb.
Hargshamn småbåtshamn	Hargshamn	155	Hargshamns Båtklubb. The marina is under expansion.

Boat renters

There are three boat renters in Forsmark församling according to different sources (Table 4-50).

Table 4-50. Boat rental enterprises in Forsmark församling.

Name	Source
Berking	/Östhammars Näringslivsutveckling AB, 2003b, internet/
Södra Åsjön	/Länsstyrelsen i Uppsala län, 2003a, internet/
Stora Rångsen, in the nature reserve Skaten-Rångsen	/Upplandsstiftelsen, 2003, internet/

Number of boats

According to the number of berths in the municipality, there are at least 1,085 pleasure boats in Östhammars kommun. There are of course a number of smaller pleasure boats that normally are not lying at a marina. According to national statistics from /SweBoat – Båtbranschens Riksförbund, 2003/ the small pleasure boats (canoes and open boats with motors below 10 hp) represent 64% of the total boat park. If we assume this applies in Östhammars kommun, there are in total 3,014 boats in the municipality.

The number of pleasure boats in Sweden is estimated to 1.3 million /SweBoat – Båtbranschens Riksförbund, 2003/. As the population in Sweden is approximately 9 million, 14.4% of the population has a pleasure boat. In Östhammars kommun, the population is 21,827 (31st of December 2002). If we assume there are 3,014 boats in Östhammar we can calculate that 13.8% of the population has a pleasure boat. This is consistent with national statistics.

Thus the boat life in Östhammars kommun seems to be in proportion to the average boat life in the country. However, as Östhammar kommun is located next to the archipelago, one would expect the boat life to be more widespread than elsewhere.

4.2.10 Degree of self-sufficiency

In Table 4-51 below, the theoretical degree of self sufficiency for some food products in Forsmark församling has been calculated. The average consumption per person and year (kg) has been obtained from /Jordbruksverket, 2003/, Table 4-52. The preliminary figures for 2001 have been used. Furthermore, the latest population figure (from 2002) has been used.

Table 4-51. Degree of self sufficiency in Forsmark församling.

Product	Consumption (kg)	Production (kg)	S-s degree (%)
Grain, flour and flour products	16 430	91 190	555
Potatoes	7 375	8 130	110
Vegetables, fresh	8 249	0	0
Beef and veal	1 630	8 330	511
Lamb	134	482	360
Pork	2 503	276	11
Chicken	2 134	1 163	55
Game meat	336	8 299	2 470
Meat and delicatessen, total	12 046	18 550	154
Own-produced meat (with bones)	50	18 550	
Fish [1]	3 125	1 020	33

Product	Consumption (kg)	Production (kg)	S-s degree (%)
Eggs	1 663	2 158	130
Milk products (cream, cheese and butter included)	32 592	450 602	1 383
Own-produced milk	218	450 602	

[1] The production figure is only fish caught by sport fishermen. The consumption figure is from 1990.

Table 4-52. Consumption per person and year (kg) in Sweden.

Food resources	1990	2001 prel
Grain, flour and flour products	83.6	97.8
Potatoes	60.4	43.9
Vegetables, fresh	37.9	49.1
Beef and veal	7.1	9.7
Lamb	0.7	0.8
Pork	10.3	14.9
Chicken	5.4	12.7
Game meat	2.6	2.0
Meat and delicatessen, total	53.6	71.7
Eggs	11.7	9.9
Milk products, litres (cream, cheese and butter included)	215	194.1
Own-produced meat (with bones)	0.4	0.3
Own-produced milk, litres	2.8	1.3
Fish and shellfish	18.6	–

/Jordbruksverket, 2003/

4.2.11 Transports (flows) of organic resources

An attempt to map out the ingoing and outgoing flows of organic resources from Forsmark församling has been done. The information is sparse. The amounts are normally unknown. It is not possible to calculate the amount of locally produced products that are consumed by a small local population, without a deeper investigation. One conclusion is that almost all resources are distributed nationwide or at least regionally. The amount of food products, produced within Forsmark församling, that are also consumed within Forsmark församling is therefore probably very small. The locally consumed food products are mostly game meat, own produced meat and milk as well as fish caught by commercial fishermen and fish caught by sport fishermen.

The information obtained is described below.

Food products

Meat (veal, mutton, pork)

Calves, sheeps and pigs are transported to the butchery of Swedish Meats in Uppsala. Swedish Meats produces meat details (75%) that is distributed regionally, cured (cooked) meats and provisions that is distributed nationwide. Swedish Meats delivers to all ICA-stores in the country, of which eight are located in Östhammars kommun. They do also deliver KRAV-labelled meat (“green” environmentally friendly label) to COOP-stores /Clausson, 2004, personal communication/.

Chicken and eggs

According to Svensk Fågel /Lindblad, 2004, personal communication/ and Jordbruksverket /Adamsson, 2004, personal communication/, neither chicken meat nor eggs are produced for sales in Forsmark församling.

According to the agricultural statistics obtained from /SCB, 2003g/ there were a few hens in the parish in 1999. It was not as many as 350, so that can explain why Svensk Fågel and Jordbruksverket do not have any information about the egg and chicken meat production in Forsmark församling. Moreover, the agricultural statistics are five years old. It is possible than there are no hens in the parish today.

Milk products

Milk from Forsmark församling is delivered to the dairy of Arla Stockholm in Kallhäll where it is made into fresh dairy products such as milk for drinking, cream, yoghurt, etc (products with short best-before dates). The fresh dairy products are distributed regionally within the Stockholm region, including Uppsala län /Holmberg, 2004, personal communication/.

Grain and flour

Information about grain could only be gathered on a municipal level. Wheat from Östhammars kommun is delivered to Nord Mills in Uppsala. From there, further sales are made to wholesalers and bakeries regionally and to Norrland.

Barley and oats from Östhammars kommun are primarily used for fodder production. Deliveries are carried out to livestock farms in Norrland and the fodder factory in Holmsund, nearby Umeå. Occasional deliveries occur to the fodder factory in Västerås /Minsér, 2003, personal communication/.

Fish

According to Stora Risten Fisk AB, one of two commercial receivers of fish in Uppsala län, the sales of fish are mostly regional with deliveries to Stockholm, Tierp, Roslagen and Uppsala. Pike is occasionally distributed to Gothenburg. As demonstrated in chapter 4.2.10 (Coastal fishing) the fishermen in Östhammars kommun undertake a coastal small-scale fishing for consumption and they sell their catch to local grocers´ stores. Commercial receivers in Uppsala län received only 8% of the total catch in 2002. If the local distribution and consumption of fish in Östhammars kommun is assumed to be 90% of the local catch, the consumption has on average been approximately 215,000 kg per year during the period 1996–2002. There has on average been approximately 2,000 inhabitants in Östhammars kommun during this period. That gives an average consumption of 10 kg per person and year.

Forest products

In all, 60,000 m^3 of forest products are handled. Of these, 75% originate from Forsmark and the rest from other parts of the country, according to Peter Andersson, Sveaskog. Transport of wood from Forsmark is distributed as follows /Andersson, 2004, personal communication/.

Fir (pine) timber

6,000 m^3 to Skinnskatteberg (Bergslagen).

3,750 m^3 to Nyby (north of Uppsala).

1,500 m^3 to Kastet (Gävle).

Spruce timber

9,750 m^3 to Ebysågen (between Uppsala and Sala).

600 m^3 to Orndals trä (north of Avesta).

Wood for pulp

From coniferous tree:

10,500 m^3 to Korsnäs and Skutskär (Gävle kommun).

Spruce pulp (granmassaved).

8,250 m^3 to Hallstavik.

2,250 m^3 to Fors kartong (Avesta).

From deciduous tree:

1,125 m^3 to Korsnäs and Skutskär.

Rötved (“skräpved”)

1,125 m^3 to Karlite AB (Uppsala).

Fuelwood

375 m^3 to Hofors.

Humans

The ingoing and outgoing commuting to Forsmark församling is discussed in chapter 2 and demonstrated in chapter 4, Table 4-13.

5 Summary

5.1.1 The Forsmark area

The main finding of this report is that the Forsmark area is uninhabited and its surroundings are very sparsely populated. There are no work places within the Forsmark area and consequently no commuting into the area. A “false zero” concerning the day population was delivered from SCB for the Forsmark area. This indicates that there is a day population of one person within the Forsmark area.

There are five holiday houses and three farms within the Forsmark area. This indicates that the area has a small holiday population. According to the agricultural statistics there is one agricultural enterprise in use within the Forsmark area. We know that this farm is located in Forsmark 5, in which the main part of the arable land is also found (93%) and that this farm has beef cattle. The agricultural land is used for grazing and probably some fodder production. For reasons of secrecy, there are no data concerning the production at this single farm.

The agricultural area in the Forsmark area is only 4% of the total area, considerably lower than in Uppsala län where it represents 25%. The land use in the Forsmark area differs notably from the land use in Uppsala län, in more than one way. Only 0.04% of the land area is developed (built-up) compared to 4.9% in Uppsala län. Furthermore, there are far more forest, wetlands and water areas in the Forsmark area. The forest area represents as much as 72.5% of the land area.

The Forsmark area is most likely visited for outdoor activities, such as hunting and fishing, as well as picking of wild berries and mushrooms. The amount of available wild berries and mushrooms per unit area are probably larger than in the county and country, as the forest area is more dominating in the Forsmark area. The lake Fiskarfjärden is a part of Forsmark fishing license area, but the other larger lakes in Forsmark area are probably also used for recreational fishing to some extent. The hunting in the Forsmark area has been estimated on the basis of data for Forsmark församling and Östhammars jaktvårdskrets. This results in estimates that on average 11 moose and 40 roe deer are harvested within the Forsmark area yearly. The harvest of moose per unit area has in average been almost 1.5 times higher in Forsmark församling than in Uppsala län since the season 1999/2000.

5.1.2 Forsmark församling

In Forsmark församling, the population density has been very low but fairly stable during the last ten years. The density has on average been 1.8 inhabitants per square kilometre. In 2002 the population density in Forsmark församling was 24 times lower than in Uppsala län. No multi dwellings or one- or two dwellings have been constructed in the parish since 1993, which show that it is a non-expanding region.

Electricity-, gas- and water supply, sewage and refuse disposal is the dominant sector within the Forsmark församling (as well as the main drainage area) and it relates to 79% of the employed day-time population (working in the area). Within the employed night-time population (living in the area) on the other hand, only 19.7% is working in that sector.

Thus there is a major ingoing commuting due to Forsmark nuclear power plant. The net commuting is positive in Forsmark församling, meaning the ingoing commuting is larger than the outgoing. The net commuting is, on the other hand, negative in Östhammars kommun and Uppsala län.

The agricultural data show that the main part of the arable land (89%) is used for fodder production and pasture/seed production. Only barley is produced according to data from 1999. The fertility of the arable land in Forsmark församling is poor. The standard yield of barley in harvest area 0322, in which the Forsmark area is located, is only 50% of the standard yield in Skåne län and only 66% of the average standard yield in Sweden in 2003. The arable land area in Forsmark församling has been small but fairly unchanged between 1990 and 1999. It is not very likely that the agricultural land use will increase in the future.

There are around 20 licensed fishermen in Östhammar kommun. None of them seem to live in Forsmark församling. They undertake coastal small-scale fishing for consumption and they sell their catch to local grocers' stores. The catch per unit area is considerably lower in the EU-grid for fisheries off the coast of Uppsala län compared to the squares off the southeast of Sweden.

6 Comparison between Simpevarp and Forsmark

The characteristics for Misterhult församling and Forsmark församling have been compiled in Table 6-1 to Table 6-11, in order to be able to compare the two areas that are the subject of preliminary site characterisation. The parishes have been compared with each other, as there are more reliable data at this level of resolution than at Simpevarp area and the Forsmark area. The aim with this report is not to make any comments on the differences and similarities or draw any conclusions from the differences between the two areas.

6.1 Humans

Table 6-1. Variable group – demography.

Variable	Results			
	Misterhult församling		Forsmark församling	
Population 2002	6.6 per km^2		1.8 per km^2	
mean 93–02	7.1 per km^2		1.8 per km^2	
Age structure 2002	0–15 years	17.0%	0–15 years	17.9%
	16–24 years	8.1%	16–24 years	6.0%
	25–44 years	19.4%	25–44 years	23.8%
	45–64 years	32.8%	45–64 years	31.5%
	≥ 65 years	22.7%	≥ 65 years	20.8%

Table 6-2. Variable group – properties and buildings.

Variable	Results	
	Misterhult församling	Forsmark församling
Type of properties 2002		
farms	0.95 per km^2	0.52 per km^2
one- or two dwellings	2.48 per km^2	0.55 per km^2
holiday houses	1.73 per km^2	0.69 per km^2
multi dwellings	0.09 per km^2	0.00 per km^2
other	0.25 per km^2	0.08 per km^2
Building permits		
dwellings 2002	3	0
mean 96–02	4	0.9
business premises 2002	5	3
mean 96–02	7	0.4
Completed dwellings 2002	0	0
mean 93–02	4.9	0

Table 6-3. Variable group – employment.

Variable	Results			
	Misterhult församling		Forsmark församling	
Employed night-time population (20–64 years)				
2001	2.98 per km^2		0.75 per km^2	
mean 97–01	2.99 per km^2		0.74 per km^2	
The employed night-time population by type of business[1] (20–64 years)	1	4.3%	1	5.6%
	2	24.2%	2	9.9%
	3	11.7%	3	19.7%
	4	7.3%	4	4.2%
	5	12.8%	5	7.0%
	6	7.7%	6	28.2%
	7	5.6%	7	7.0%
	8	18.8%	8	9.9%
	9	4.2%	9	5.6%
	10	2.5%	10	0.0%
	11	0.9%	11	0.0%
Employed day-time population (20–64 years)				
2001	3.66 per km^2		9.9 per km^2	
mean 97–01	3.78 per km^2		10.2 per km^2	
The employed day-time population by type of business[1] (20–64 years)	1	3.0%	1	0.0%
	2	12.7%	2	0.0%
	3	59.9%	3	79.0%
	4	1.8%	4	1.0%
	5	3.6%	5	0.3%
	6	0.7%	6	18.4%
	7	4.6%	7	0.0%
	8	10.8%	8	0.0%
	9	2.5%	9	1.2%
	10	0.0%	10	0.0%
	11	0.3%	11	0.0%
The number of work places				
2002	0.64 per km^2		0.18 per km^2	
mean 97–02	0.62 per km^2		0.12 per km^2	
Work places by type of business[1]	1	39.9%	1	0.0%
	2	5.3%	2	0.0%
	3	0.0%	3	0.0%
	4	4.6%	4	17.6%
	5	11.8%	5	0.0%
	6	9.1%	6	52.9%
	7	1.1%	7	0.0%
	8	6.1%	8	0.0%
	9	6.1%	9	17.6%
	10	0.0%	10	0.0%
	11	15.6%	11	0.0%
Commuting (20–64 years)				
Ingoing	538		32	
Outgoing	1 002		902	
Net commuting	464		870	
The non-employed population (20–64 years)				
2001	0.75 per km^2		0.28 per km^2	
mean 97–01	0.80 per km^2		0.27 per km^2	
% of total population 2001	11.0%		15.3%	

[1] 1 Agriculture, forestry, hunting, fishing.
2 Mining and manufacturing.
3 Electricity-, gas- and water supply. Sewage and refuse disposal.
4 Construction.
5 Trade and communication.
6 Financial intermediation, business activities.
7 Education and research.
8 Health and social work.
9 Personal and cultural activities.
10 Public administration etc.
11 Unknown

6.2 Human activities

Table 6-4. Variable group – forestry.

Variable	Results	
	Misterhult församling	Forsmark församling
Wood extraction	75 m^3 sk/yr/km^2	176 m^3 sk/yr/km^2

Table 6-5. Variable group – agriculture.

Variable	Misterhult församling Production kg/km^2 (1999)	Forsmark församling Production kg/km^2 (1999)
Winter wheat	138	0
Spring wheat	0.0	0
Rye	120	0
Barley	1 331	438
Oats	286	0
Mixed grain	209	0
Leguminous plants	140	0
Potatoes	48	47
Oilseed crops	3	0
Hay. silage. green fodder	6 611	6 252
Brrfl	97	95
Mutton	2	5
Pork	62	0
Chicken	5	11
Eggs	4	18
Milk	3 762	5 092

Table 6-6. Variable group – horticulture.

Variable	Results	
	Misterhult församling	Forsmark församling
Number of horticultural holdings	0	0
Production of fruit and vegetables	0	0

Table 6-7. Variable group – aquaculture.

Variable	Results	
	Misterhult församling	Forsmark församling
Number of enterprises	1	0

Table 6-8. Variable group – mineral extraction.

Variable	Results	
	Misterhult församling	Forsmark församling
Number of mineral extraction leases	3	0

Table 6-9. Variable group – water supply.

Variable	Results	
	Misterhult församling	Forsmark församling
Water use (estimated)		
households	192 000 m^3	11 500 m^3
holiday houses	13 000 m^3	1 200 m^3
agriculture	52 000 m^3	4 300 m^3
industry	66 000 m^3	600 m^3
nuclear	175 000 m^3	257 000 m^3
other	134 000 m^3	1 200 m^3
Water withdrawal		
public supply	314 000 m^3	6 800 m^3
private supply	316 000 m^3	269 000 m^3
Water withdrawal		
ground water	91 000 m^3	7 200 m^3
surface water	515 000 m^3	268 500 m^3
Sea water or unknown	25 000 m^3	

Table 6-10. Variable group – commercial fishing.

Variable	Results	
	Misterhult församling	Forsmark församling
Number of fishermen (estimated)	3	0
Catch 2002/mean 96–02	5 649 kg/18 507 kg	0

Table 6-11. Variable group – outdoor life.

Variable	Results	
	Misterhult församling	**Forsmark församling**
Harvested moose 2003 mean value	0.35 per km^2 0.49 per km^2 (97–03)	0.53 per km^2 0.53 per km^2 (99–03)
Harvested moose in utilized carcass weight 2003 mean value	32 kg/km^2 45.2 kg/km^2	52 kg/km^2 51 kg/km^2
Harvested roe deer 2001 mean 97–01	1.3 per km^2 2.15 per km^2	1.0 per km^2 1.9 per km^2
Harvested roe deer in utilized carcass weight 2001 mean 97–01	12.2 kg/km^2 20.1 kg/km^2	9.0 kg/km^2 18 kg/km^2
Picking of wild berries[1]	73 litres/km^2	73 litres/km^2
Picking of fungi[1]	48 litres/km^2	49 litres/km^2
Number of attractive fishing waters	1	2
Number of sport-fishing clubs	0	0
Catch by sport fishermen	39.6 kg/km^2	10.9 kg/km^2
Number of golf courses	1	0
Number of jogging tracks	3	0
Number of areas for country walks	7	3
Number of attractive spots for bird watching	2	2
Number of canoe routes	1	0
Number of canoe renters	1	0
Number of open air baths	6	1
Number of campsites and holiday villages	1	2
Number of marinas	5	0
Number of guest harbours	2	0
Number of boat renters	2	3

[1] Values for Simpevarp area and the Forsmark area.

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8 List of terms

English	*Svenska*
Alpine (mountaine) hare	Skogshare
Animal husbandry	Husdjurskötsel
Aquaculture	Vattenbruk
Arable land	Åkermark
Area for cultivation on open ground	Frilandsareal
Baltic herring	Sill/strömming
Bare fallow	Helträda
Barley	Korn
Bird watching club	Fågelklubb
Boar	Galt
Buck	Rådjursbock
Cattle	Nötkreatur
Cereals	Spannmål
Cod	Torsk
Common (european) hare	Fälthare
County	Län
Crop	Gröda
Cured (cooked) meats, provisions (delicatessen)	Charkvaror
Dairy cow	Mjölkko
Dairy products	Mejeriprodukter
Delicatessen	Charkvaror
Dwelling	Lägenhet (bostad)
Employed population	Förvärvsarbetande befolkning
Energy forest	Energiskog
Ewe	Tacka
Fallow	Träda
Fawn	Rådjurskid
Fowls	Höns
Grain	Säd
Grass	Vallgräs
Grass land for seed production	Vall för fröskörd
Grass on arable land for hay and silage	Vall
Grass on arable land for hay or silage	Slåttervall

Green fodder	Grönfoder
Heifer	Kviga
Horticultural plants	Trädgårdsväxter
Horticulture	Trädgårdsodling
Lavaret species	Sik-fiskar
Leguminous plants	Baljväxter
Linseed	Oljelin
Livestock	Kreatur, husdjur
Multi-dwelling/family building (s)	Flerbostadshus
Municipality	Kommun
Mutton	Fårkött
Nursery plants	Plantskolealster
Oil seed crops	Oljeväxter
One- or two-dwelling/family building(s)	Småhus
Parish	Församling
Pasture	Betesvall
Pike-perch	Gös
Pine timber	Talltimmer
Pit (*pl* pites)	Täkt, exempelvis sandtag (sandpit)
Plants for silage	Ensilageväxter
Potatoes for processing	Potatis för stärkelse
Processing peas	Konservärter
Ram	Bagge
Rape	Raps
Register of enterprises in agriculture and forestry	Lantbrukets företagsregister
Root crops	Rotfrukt
Rye	Råg
Salmon	Lax
Salmon trout	Laxöring
Seed lay	Frövall
Sow	Sugga
Sprat	Skarpsill
Spruce timber	Grantimmer
Steers, bullock	Stutar
Suckler cows	Amkor
Swedish board of agriculture	Jordbruksverket
Table potatoes	Matpotatis
Triticale	Rågvete

Turnip rape	Rybs
Untilled arable mark	Obrukad åker
Veal	Kalvkött
Vetches	Vicker
Vital events	Befolkningsförändringar
Winter rape	Höstraps
Winter rye	Höstråg
Winter turnip rape	Höstrybs
Winter wheat	Höstvete
Wood for pulp	Massaved
Yield	Skörd
Yield per hectare	Hektarskörd