

P-04-21

Oskarshamn site investigations

Bird surveys in Simpevarp 2003

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March 2004

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

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Sammanfattning

Denna rapport sammanfattar resultaten från fågelinventeringarna i Simpevarpsområdet under 2003. För arter listade i den Svenska Rödlistan och/eller EU:s Fågelskyddsdirektiv Annex 1 ges en sammanfattning av förekomsten under 2002 och 2003. Fågelinventeringarna ingår som en del i SKB:s platsundersökningar och syftar till att karakterisera områdets fågelfauna på ett så detaljerat vis som krävs för en god miljökonsekvensbeskrivning. Inventeringarna utgör också en övervakning av den eventuella påverkan som platsundersökningarna kan ha på områdets fåglar, både när det gäller fågelfaunan i stort och specifikt för skyddsvärda (listade) arter. Inventeringarna har så här långt koncentrats på den häckande fågelfaunan.

Fågelinventeringarna inleddes under 2002, men 2003 var det första året då en fullskalig inventering av hela området, och alla fågeltyper, kunde ske. Under året genomfördes linje- och punkttaxeringar inom hela det *Regionala modellområdet* öster om E22-an (en genomgång). *Kandidatområdet* undersöktes mer i detalj med tätare linje- och punkttaxeringar (två genomgångar), samt revirkartering i tre ca 30 ha stora områden kring planerade borrhåtorter (Ävrö, Hålö och Laxemar). Listade arter, nattaktiva arter samt hackspettar inventerades med speciella metoder inom hela det *Regionala modellområdet*. I skärgårdsdelen av området inventerades dels en central del av den inre skärgården och dels det ytterskärgårdsområde som inventerades även 2002. Totalt registrerades 126 häckande fågelarter inom Simpevarpsområdet under 2003. Av dessa var 28 arter upptagna antingen i den Svenska Rödlistan eller i EU:s Fågelskyddsdirektiv Annex 1. Totalt har nu under åren 2002–2003 29 listade arter noterats som troligen häckande i området. Sju av dessa förekommer endast i skärgårdsdelen.

Under linjetaxeringarna 2003 registrerades betydligt högre tätheter av fågel än under 2002, troligen som en följd av god häckningsframgång för en del tidigt häckande, allmänna småfåglar (t ex rödhake, mesar och bofink). Till viss del beror troligen skillnaden mellan åren även på skillnader mellan olika inventerare. Även punkttaxeringarna visade på högre fågeltätheter under 2003 jämfört med 2002, helt i linje med resultaten från linjetaxeringarna. Skillnaden mellan åren var dock inte lika stor i detta fall. Revirkarteringarna visade på normala tätheter av häckande fåglar i samtliga områden. Listade arter förekom endast i de karterade områdena på Ävrö och i Laxemar (tre revir av tre arter på Ävrö och två revir av två arter i Laxemar). Inventeringen av listade arter visade på oväntat riklig förekomst av nattskärna, trädlärka och törnskata. För nattskärnans del når Simpevarps området upp till den s k ”1%-nivån” vilket innebär att området kan klassas som nationellt betydelsefullt för arten (ca 1% av den uppskattade svenska populationen återfinns i området). För listade arter där häckningsutfallet följdes upp under 2003 så hade havsörnarna ett dåligt år utan lyckade häckningar. Huruvida detta på något sätt var kopplat till SKB:s platsundersökningar är oklart, men delvis inte uteslutet. Fiskgjusarna däremot hade en god häckningsframgång med i genomsnitt 2,1 flygg unge per påbörjad häckning. Berguvarna hade en dålig häckningssäsong utan lyckade häckningar, men ingenting tyder på att detta skulle bero på platsundersökningarna.

Sammanfattningsvis kan sägas att bilden av Simpevarpsområdets fågelfauna har klarnat betydligt efter 2003 års inventeringar. Området måste klassas som fågelrikt med goda förekomster av både allmänna fåglar samt vissa listade arter. Karakteriseringen av områdets fågelfauna kommer att avslutas efter 2004 års fältsäsong, varefter monitorering av delar av fågelfaunan kommer att fortsätta. En första utvärdering av eventuella effekter från de pågående platsundersökningarna på fågelfaunan kommer att göras efter 2004 års fältsäsong.

Contents

1	Introduction	7
2	Objective and scope	9
3	Equipment	11
3.1	Description of equipment	11
4	Methods	13
4.1	Line transects and point counts	13
4.2	Territory mapping in areas around drilling sites	14
4.3	Woodpeckers and other birds with an early activity peak	14
4.4	Nocturnal species	15
4.5	Listed species (Swedish red list; EU Birds directive annex 1)	15
4.6	Coastal birds	16
4.7	Execution	16
4.8	Data handling	17
4.9	Analyses and interpretations	18
5	Results	19
5.1	Line transects	19
5.2	Point counts	21
5.3	Territory mapping	22
5.4	Listed species	22
5.5	Birds in coastal areas	37
6	Discussion	39
7	References	41
	Appendix 1	43
	Appendix 2	47
	Appendix 3	51
	Appendix 4	55
	Appendix 5	59
	Appendix 6	63
	Appendix 7	65

1 Introduction

This document reports the data gathered within the bird surveys, one of the activities within the site investigations at Simpevarp, during 2003. The bird surveys started in 2002, but 2003 was the first full scale year. The aim of the surveys is to make a complete large-scale characterisation of the bird fauna in the area, to be used both in the environmental impact assessment and in modelling work concerning possible transportation routes of radio activity in case of leakage from a future deep deposit. Furthermore, the surveys aim at monitoring the effects of the site investigations on the bird fauna. The surveys were conducted according to activity plan AP PS 400-02-001. The project has been conducted by the Department of Animal Ecology, Lund University. This document is a summary of the data gathered in 2003, but in some cases also involving data gathered in 2002.

The surveys made in 2003 were the first full scale year with coverage of the complete regional model area east of the E22 highway. One year is not enough to give a satisfactory overview of an areas' bird fauna when using relatively low intensity methods, as in this case with only one visit per season in most parts. Several studies have shown that during each survey event, even experienced observers may miss as much as about 50% of the present birds. This simply because the birds in question may be silent or out of sight at any given time. Increasing the number of survey events will hence increase the likelihood of achieving more correct results. This document aims at presenting the bird fauna of the area as it is known at present. The full picture will not be clear until after next years surveys.

So far, the surveys have been aimed at the breeding bird fauna and this report deals with breeding birds only. Additional surveys of wintering waterbirds are planned to take place during 2003–2004.

2 Objective and scope

The aims of the surveys are to gather good, basic data about the bird fauna in the area to be used in the environmental impact assessment, and possibly also in models concerning transport of radio nuclides through the ecosystem. The surveys are also the base-line in the monitoring programme regarding effects from the site investigations on the bird fauna. The surveys aims at covering all breeding birds, both common and widespread ones which are dealt with in a general way, as well as a more detailed coverage and monitoring of listed species (species listed in the Swedish Red List /Gärdenfors, 2000/ and/or the European Unions Birds directive 79/409/EEG: Annex 1, /www.environ.se/). A list of the species in question can be found in the Activity Plan AP PS 400-02-001, Appendix 2, Table 5-1 and 5-2. A satisfactory coverage of the breeding bird fauna for the characterisation is expected after the field surveys in 2004. Monitoring of certain listed species and of effects from the site investigations should carry on as long as the site investigations are active to fully evaluate the effects of these investigations.

The surveys are made at three different levels. 2003 was the first year with full scale surveys (due to a late start, only parts of the regional model area was covered in 2002, /Green, 2003/).

Large regional level. This level covers a large region (about 10 000 km²) around the site investigations. Bird data will be collected from national surveys, in most cases from the standardised line transects that form a part of the Swedish Environmental Protection Boards' (SNV:s) National Monitoring Program /<http://www.biol.lu.se/zooekologi/birdmonitoring/>. Surveys on this scale will not be dealt with any further in this report, but will be involved as reference material in the characterisation report (planned for 2004/2005). Surveys on this level will also be used as reference material for the future monitoring programme when the characterisation phase of the project is completed.

Regional model area. This is a medium level covering an area of about 270 km² (area of possible large-scale effects). In Simpevarp the land area of the regional model area is about 150 km². This area is shown by a thick unbroken line in Figure 2-1. Within this area the complete bird fauna is surveyed by area-covering but low intensity methods such as a combination of line transects and point counts. A more detailed coverage of threatened and vulnerable habitats and species, especially listed ones are also made in this area.

Local model area. This level involves a smaller area covering all the potential drilling sites, and is the core area of the site investigations. The size of the area in Simpevarp is about 20 km² (in 2002 a larger preliminary local model area of about 50 km² was used, but this was scaled down to the present one before the surveys in 2003). The local model area is shown with thick broken lines in Figure 2-1. The local model area is surveyed more in detail compared to the regional model area. Special attention is directed at the drilling sites and their infra-structure as well as other possible disturbances caused by the activities within the site investigations. Overall, the local model area is also surveyed by a combination of line transects and point counts, but in order to get a more detailed coverage, the area is surveyed twice each season compared to only once for the regional model area. Also in this area special attention is directed at special habitats and listed species. In order to study direct impacts from drilling activities a smaller area (about 30 ha) around three such sites is censused by territory mapping.

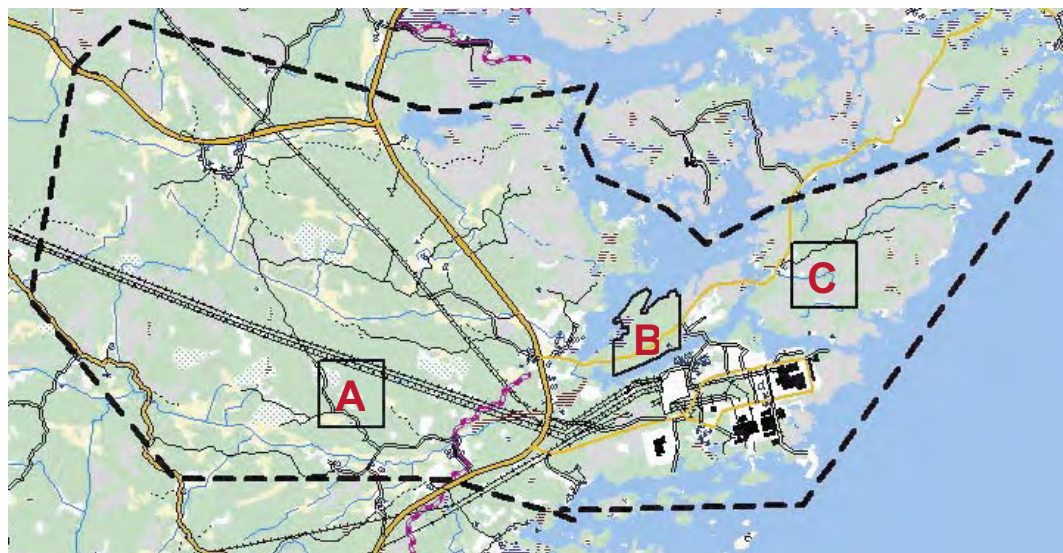
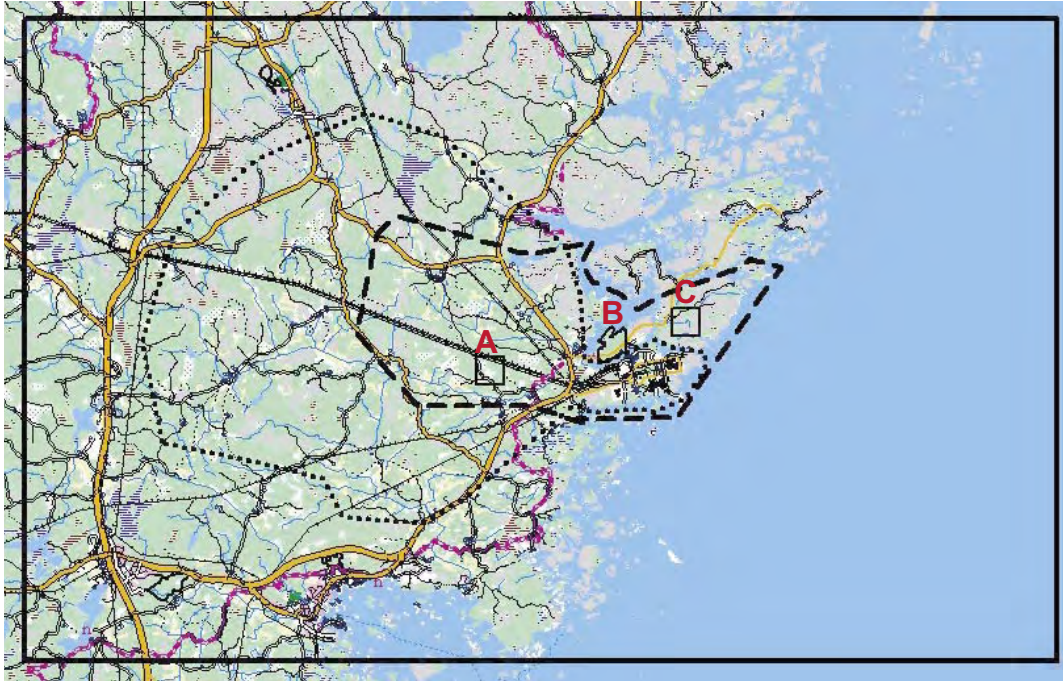


Figure 2-1. Map of the survey area in Simpevarp (upper). The regional model area is shown with a thick unbroken line, the local model area is shown with thick broken lines. The preliminary larger, local model area used in 2002 is shown with dotted lines. The territory mapping areas (A, B, C) are also shown. The lower map shows the local model area (enlarged).

3 Equipment

3.1 Description of equipment

The following equipment was used when conducting the bird surveys.

- GPS (Garmin 12).
- Binoculars.
- Field maps showing each days work.
- Note books and protocols.
- Vehicles for transport to and from the study area.
- Cell phones (safety equipment when working alone in the field).

4 Methods

The methods used is described in detail in activity plan AP PS 400-02-001. More information about the methods can be found at: [/www.biol.lu.se/zooekologi/birdmonitoring/metoder.htm/](http://www.biol.lu.se/zooekologi/birdmonitoring/metoder.htm/) as well as in /Svensson, 1975/ and /SNV, 1978/.

An overview of the methods used in the regional- and local model areas are presented below. To cover the bird fauna in general, incorporating also the commoner bird species, a combination of line transects and point counts is used. The method is more or less directly taken from the manual for standardised breeding bird counts used by the Swedish Environmental Protection Boards' National Monitoring Program since 1996. By using the identical methods as in these surveys we get the possibility of making direct comparisons with the data gathered at national and regional level (at a larger scale than the surveys presented here). Territory mapping is used in smaller areas around three drilling sites. Special surveys of listed species and coastal areas are also made.

4.1 Line transects and point counts

The aim of the line transects and point counts is to get a good overview of the breeding bird fauna of the area that can be compared with other areas. Another aim is to cover the area in search for listed species. The surveys are based on the Swedish Grid (RT-90) The line transects, both in the regional- and local model areas are made along the north-south axes of this grid, with grid lines being 1 km apart. To get a more detailed coverage of the local model area, an additional transect in between the RT-90 lines is added so that the local model area is gone through along north-south directed lines being 500 m apart. Point counts are made at every full km at the regional scale, the corners of the km-squares of the Swedish Grid. At the local scale the point for the extra lines (in between the RT-90 lines) is moved to the midpoint of the km square (according to the grid) to get a better geographic coverage of the area in total. Since the regional model area in Simpevarp is very large, and since it from the start has been very likely that the site investigations should be concentrated to the eastern part of this area, the parts situated west of the E22 highway were excluded from further bird surveys.

Each line transect, and the point counts along these, are made once each season in the regional model area and twice each season in the local model area. Along the lines all birds seen and heard are counted while the observer is walking at slow speed, stopping, listening and looking around when needed. The observer registers bird species, number of individuals and the local time. To allow rapid data gathering in the field, all common species are summed (by the observer in the field) per five minute period. The registration of time is important for linking the bird observations to the GPS-registered route and hence for positioning all bird observations correctly (see below). Observations of listed species (see Appendix 2, Table 5-1 and 5-2 in the activity plan AP PS 400-02-001), are registered individually with data on time and position (from GPS) directly in the field.

During the point counts all heard and seen birds are counted during five minutes (disregarding what has been recorded along the line transects). The start and stop time of each counting period as well as the position from where the count is made is recorded. The count is, if possible, conducted from the pre-determined location. If the pre-determined location can not be reached, counting from a location not deviating more than 250 m from the pre-determined one is allowed.

During line transects and point counts a GPS is used for registration of the route. The GPS log position data automatically every five minutes and after each days field work the logged positions (all with data on time as well) are down-loaded and stored as a conventional text file in PC-format.

Line transects and point counts do not give direct measures of absolute bird densities within an area. The density values given are though possible to re-calculate to absolute densities using different assumptions. Furthermore the data given by line transects and point counts can be used for index values and density estimates that can be used for comparisons between different areas, habitats etc as long as the same methods are used when collecting the data and when calculating the indices and density values.

4.2 Territory mapping in areas around drilling sites

In a small area around three possible drilling sites, about 30 ha in size, all breeding birds are mapped with the territory mapping method. Each area is visited at least five times during the time when the highest activity of breeding birds can be expected. The method gives a direct measure of bird densities (for detailed descriptions see /Svensson, 1975; SNV, 1978/) and hence possibilities of a detailed picture of changes in relation to ongoing activities. At each visit the observer walks through the area in such a detailed way that no part of the area is more than 50 m away from the observer (100 m in open habitats). The observer marks all individual observations of birds likely to breed in the area on a field map with different symbols showing species identity and behaviour of the bird. All observations are then transferred to species maps (one for each species) where after the number of territories are evaluated following standardised criteria after the field work is completed. Territory mapping was made in three areas in Simpevarp during 2003; Ävrö (30.25 ha), Hålö (26.32 ha) and Laxemar (30.25 ha, Figure 2-1). The Hålö area is smaller, as parts of it are water and it is only the land area that is surveyed.

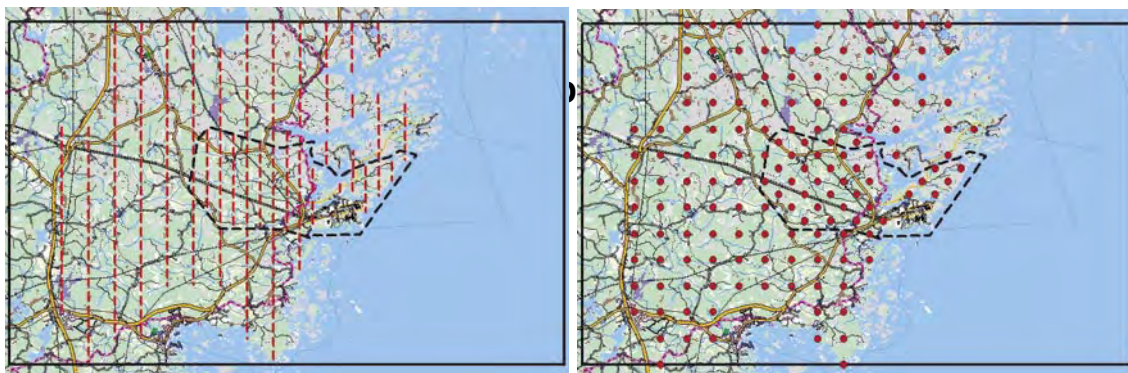


Figure 4-1. Map of the Simpevarp area showing planned line transects (broken, red, north-south directed lines, left) and planned positions for point counts (red dots, right) in 2003.

Birds with a seasonally early activity peak are not covered well by the standardised line transects and point counts, hence special surveys directed at these are needed. In Simpevarp this was made by visiting all parts the regional model area (east of E22) at least two times during the early spring period (primarily March – early April). The visits were made by walking along all accessible roads listening for calling or drumming woodpeckers, complemented by visits to habitats suspected to hold listed species of woodpeckers. All observations of woodpeckers (and other birds with an early activity peak) were registered with position (either from GPS or marked on a field map), species, number of birds and local time.

4.4 Nocturnal species

Species with their main activity period during night time are surveyed with special methods. Night-time listening along roads are used both for owls and other night active birds (i.e. nightjars and wood larks in the Simpevarp area). The observers are travelling along all accessible roads in the area and make stops not more than 1 km apart. In total 95.4 km of road was covered in this way in 2003. At each stop the observers listen for five minutes and then carry on to the next stop and so on. The method gives a good overview of the present night active birds but of course there are limitations due the availability of roads. In the Simpevarp area however, there are roads enough to give a satisfactory coverage of whole area, although some parts will remain uncovered. All observations of night active birds are registered with data on bird species, number of birds, position (from GPS or recorded on field maps) and local time. The area is covered both early in the season (March–April) when surveying calling owls and again in June for nightjars, wood larks and young owls.

4.5 Listed species (Swedish red list; EU Birds directive annex 1)

The species in question are shown in Appendix 2, Table 5-1 and 5-2 in the activity plan AP PS 400-02-001. For terrestrial species the following set up is used. Basic data is gathered during the line transects and point counts. For some species there already exists local knowledge about nest sites and territories that can be used. In these cases the known sites are checked and if possible (and desirable) the breeding results are followed up as well. Also for breeding sites found during the line transects and point counts there is an aim of following up breeding results of at least certain species. As an addition extra visits are made to areas not directly covered by the line transects and point counts, if these are suspected to hold any of the species in question. During both 2002 and 2003 (still in the characterisation phase of the project) most time has been directed at finding out where these birds are and how many they are. Detailed following up of breeding results were only made for white-tailed eagles, ospreys and eagle owls.

4.6 Coastal birds

The outer archipelago (Figure 4-2) is surveyed by the regional authorities since many years back. All islands and skerries within the area are visited by boat once each breeding season and the number of territorial pairs or nests of occurring species are counted. Starting from 2003, parts of the inner archipelago within or close to the local model area (Figure 4-2) is covered in the same way. To get measures of the land birds present on the islands in this area, point counts were made once from each small island during 2003.

4.7 Execution

The field work was carried out during the period 2003-02-08 – 2003-07-21 (surveys of woodpeckers, nocturnal species, line transects, point counts, territory mapping, coastal birds and special surveys of listed species). All planned activities within the Bird Survey programme were executed during the year (see below). The field work was mainly carried out by local ornithologists and the main part of the field work was done by Tommy Larsson, Emmy Petersson, Leon Axelsson, Arne Schönbeck, Sören Svensson, Nils Söderbom, Michael Carlsson, Christer Håkansson, Johan Eriksen and Stefan Sehlstedt. Arne Schönbeck made the surveys and follow ups of breeding results of white-tailed eagles, ospreys and eagle owls. The white-tailed eagle work is carried out within the ongoing national project concerning this species. In addition to the people mentioned above the project leader Martin Green carried out part of the territory mapping work and part of the surveys of listed species.

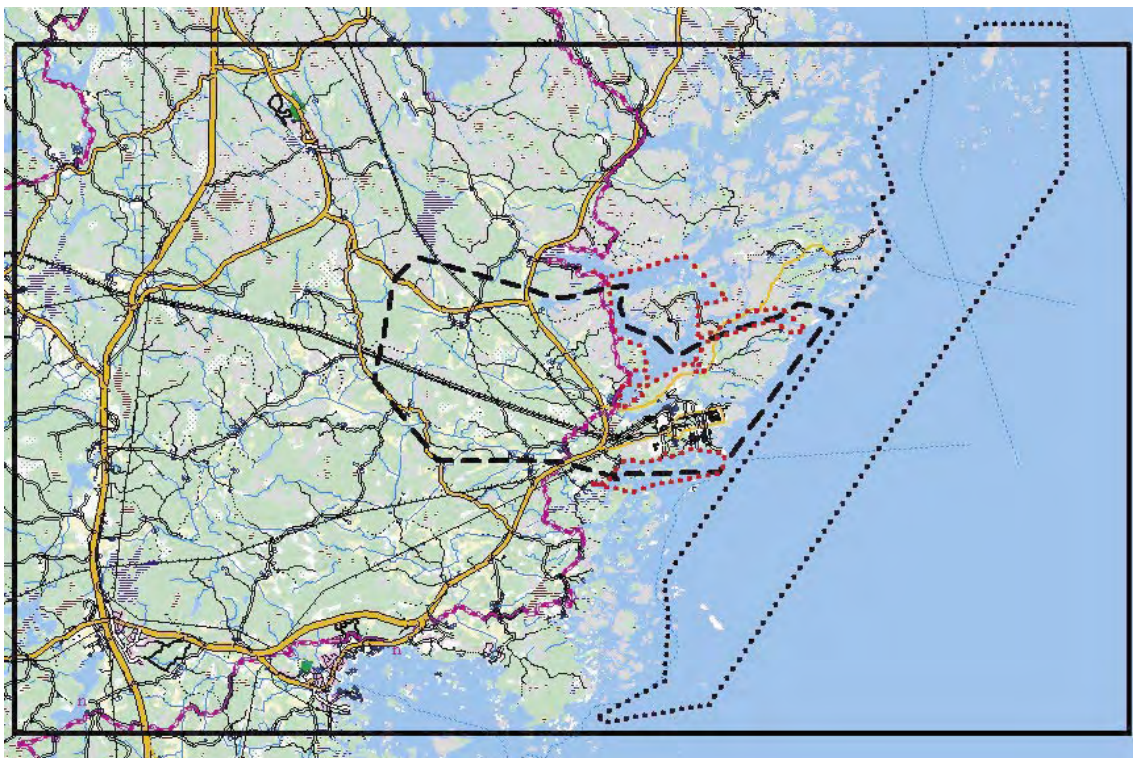


Figure 4-2. The survey area in the outer archipelago (black dotted line) and the inner archipelago (red dotted line).

All the activities carried out during 2003 are shown in the following list.

- Woodpecker and owl surveys (Feb 2 – April 4).
- Line transects and point counts in the local model area, part 1 (April 15 – May 2).
- Line transects and point counts in the regional model area and the local model area (May 2 – July 10).
- Territory mapping, three areas (May 23 – June 22).
- Survey of the parts of the inner archipelago within the local model area (April 28 – May 19).
- Survey of the outer part of the archipelago (May–June).
- Special surveys for white-tailed eagles, ospreys and eagle owls (March – July).
- Special surveys for listed species (June).
- Surveys of nocturnal birds (June).

4.8 Data handling

In the field (line transects, point counts, listed species) all registered birds were recorded in notebooks with data on species, number of individuals and time together with additional data on bird behaviour and circumstances where such data were relevant. Common (numerous) species were summed already in the field in five minute periods while more scarce, and especially listed species were recorded with individual data for each observation. At the same time position and time were automatically registered by GPS every fifth minute. Observations of listed species were registered with exact position individually taken directly from the GPS in the field. After each days field work the bird and time data were transferred to pre-made protocols. The logged position and time data were downloaded from the GPS to text files in PC-format with the programme *Waypoint1803*. Bird and time data were then entered into Excel-files from protocols where after the files were cross-checked against the field notes by the project leader. After this, the bird and time data were linked to the position/time data whereby each observation where given a geographic position. The time resolution (five minutes for common species) gives a geographical resolution of about 100–150 m for these. Positions for listed species have the same resolution as the GPS-system. This base-file with data on species, numbers and positions can then be used for different GIS applications, for evaluating bird densities and further calculations.

During territory mapping all bird observations (seen or heard) within the mapping areas were registered on pre-made field maps. The observations were then transferred to species maps after each field visit. After the field season, these species maps were evaluated and the number of territories for each species in the area was decided. The evaluation was used following guide-lines from /SNV, 1978/. The evaluation was made by two persons independently from each other (the field personnel, in this case Tommy Larsson, and the project leader). Deviations between the different evaluators (usually non-existent or in some cases very minor) were then discussed between us before the final number of territories was established. The results have at present only been filed as a list for each area showing the number of territories for each species. Each territory will shortly be digitised and given a position according to the Swedish Grid (RT-90), but this work remains to be done.

4.9 Analyses and interpretations

No deeper analysis is made in this report as the results gathered are a provisional picture of the bird fauna of the area. Instead the bird fauna is presented as we know it today. Special emphasis is laid on listed species and the common bird fauna is treated very superficially. A deeper analysis will be presented when the characterisation of the whole area is completed (after 2004) and when the monitoring phase of the project have some more substantial data to present (also after 2004).

5 Results

126 bird species were recorded as possible breeding ones in Simpevarp 2003. This figure can be compared to 112 species in 2002, when a smaller part of the area was covered (cf Figure 2-1). We are now probably getting quite close to the true number of breeding species and another year of surveys will probably not alter this figure to any larger degree. The number of listed species (regarded as possible breeders) found within the area during 2003 was 28 (22 in 2002). In total 29 listed species (possible breeders) have now been found in the area during the two years. Seven of these are confined to the archipelago. English names of the birds are used throughout the results part, Latin and Swedish names are given the first time a species is mentioned. Swedish names are also shown in the results for listed species. A complete list of English, Latin and Swedish names for all bird species breeding in Sweden is given in Appendix 1.

5.1 Line transects

In total 208 km of line transects were made between 15 April and 10 July 2003 (Figure 5-1). This figure actually exceeds the planned distance of transects (172 km), as the observers sometimes did not only count birds along the north-south directed lines as planned but also along the east-west directed 'transport stretches' between these lines. In all there was a complete coverage of the area according to the plans. The local model area was surveyed

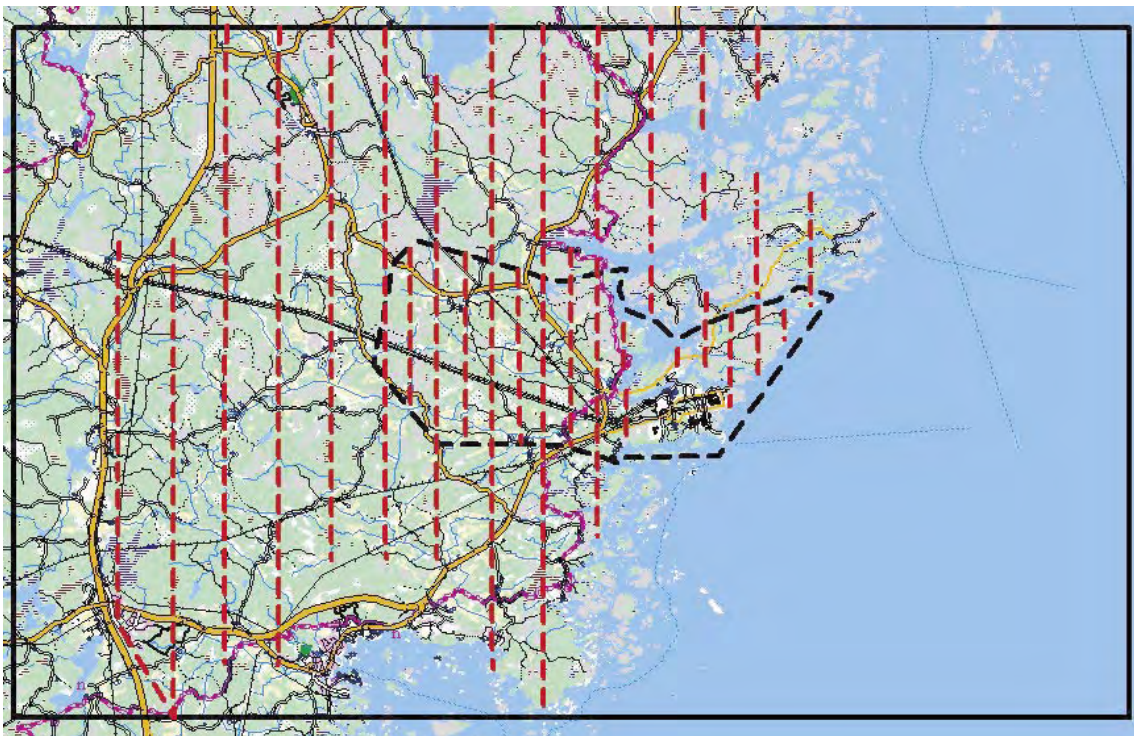


Figure 5-1. Line transects made in Simpevarp 2003 (red, broken lines directed from north to south).

twice, 15 April – 2 May and 18 June – 10 July respectively. The latter part of the survey was unfortunately delayed due to intensive rain in late June. The regional model area was surveyed between 2 May and 25 June. Overall, 14 052 birds of 106 species were counted. After removing observations of birds that definitely were migrants only passing through the area, the final total was 13 783 birds of 104 species. The number of birds/km line transect was 66.2. These figures can be compared with a total of 4807 birds (94 species) on 107 km of line transect in 2002 (44.9 birds/km). A compilation of all birds registered during line transects is given in Appendix 2 where also a comparison with densities recorded in 2002 is made.

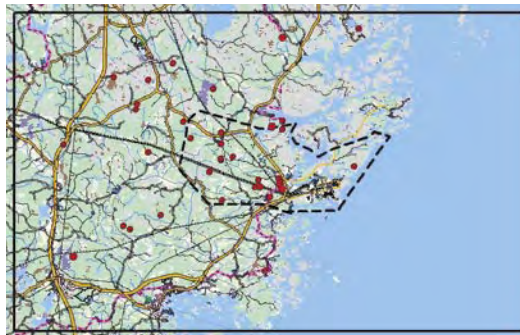
The most numerous species were (number of individuals within parenthesis): Chaffinch *Fringilla coelebs* Bofink (2505), Great tit *Parus major* Talgoxe (1635), Willow warbler *Phylloscopus trochilus* Lövsångare (1264), Robin *Erythacus rubecula* Rödhake (1127) and Blue tit *Parus caeruleus* Blåmes (1039). Three of these species were among the top five also in 2002 (chaffinch, willow warbler and robin) but the two tits were recorded in unusually high numbers in 2003.

As examples of line transect results the occurrence of two waders Common Snipe *Gallinago gallinago* Enkelbeckasin and Green Sandpiper *Tringa ochrupus* Skogssnäppa as well the Cuckoo *Cuculus canorus* and the Pheasant *Phasianus colchicus* Fasan is shown in Figure 5-2.

Common Snipe



Green sandpiper



Cuckoo



Pheasant

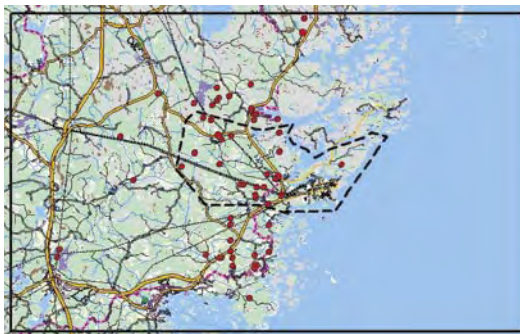


Figure 5-2. The recorded geographical distribution of common snipe, wood sandpiper, cuckoo and pheasant in Simpevarp 2002–2003 according to the line transects. Different sizes of dots indicate increasing number of individuals (1–3).

5.2 Point counts

225 five minute point counts from 149 discrete localities (here the planned positions for point counts are regarded as discrete locations even if the actual count was made from a position within a radius of 250 m from the planned one) were conducted in association with the line transects during 2003. Point counts on smaller islands in the inner archipelago are treated under “coastal birds”. Once again (cf Line transects) the number of point counts exceeds the number of planned point counts (193 from 152 discrete locations). In this case this depends on some points being both end- and start points of different line transects and hence being counted more times than actually necessary.

During the point counts 2866 birds of 89 species were registered. After removing a few observations of birds definitely on stop-over during migration, the total ends on 2796 birds (12.4 birds/point). Also for the point counts the figures are higher than the corresponding ones from 2002. Then 1217 birds of 66 species were counted at 119 point counts (10.2 birds/point). The five most common species were Chaffinch (415), Great tit (263), Willow warbler (238), Blackbird *Turdus merula* Koltrast (171) and Robin (168). A complete list of all the birds observed during the point counts 2003 is given in Appendix 3.

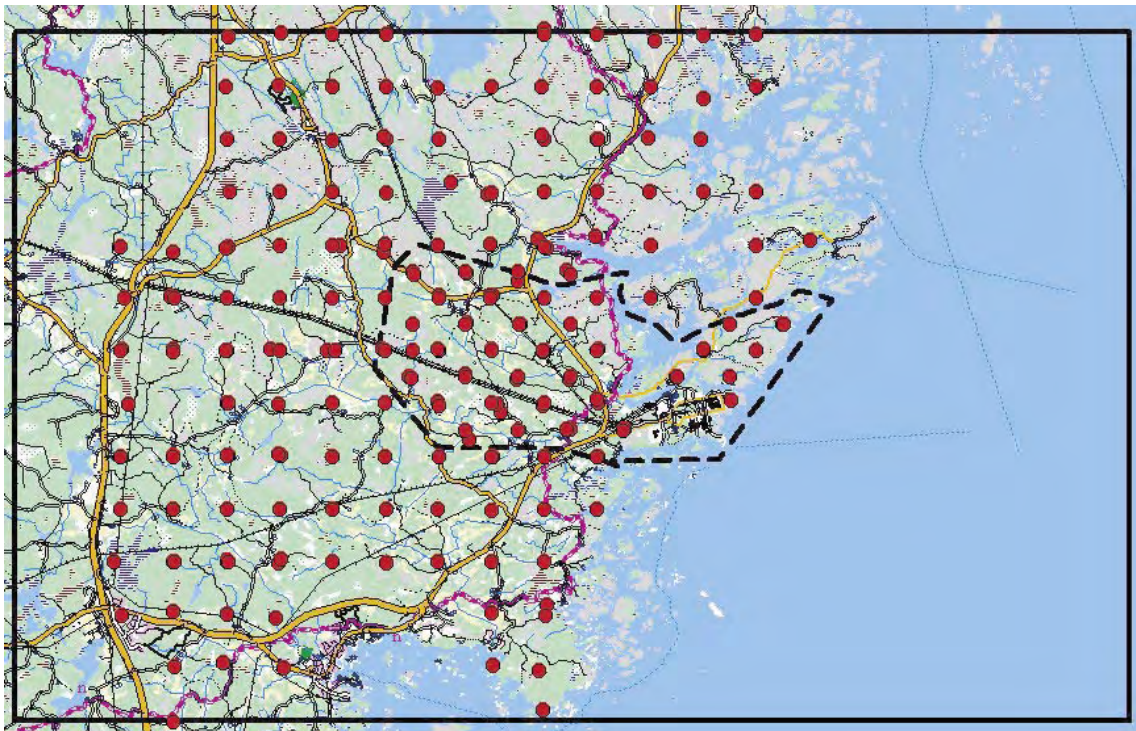
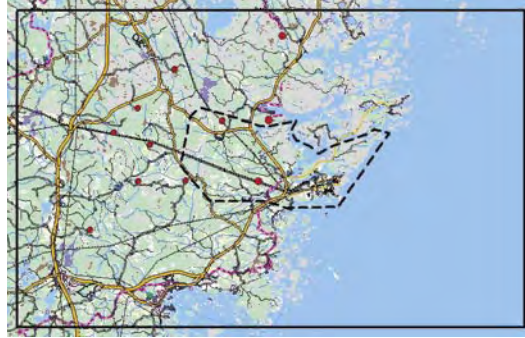


Figure 5-3. Point counts made in Simpevarp (red dots) in 2003. Note that from several discrete localities (positions) several counts were made.

Common Snipe



Green sandpiper



Cuckoo



Pheasant

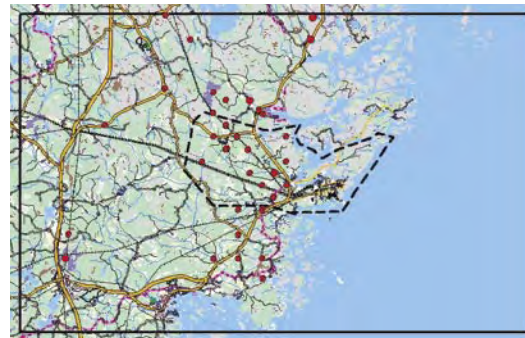


Figure 5-4. The recorded geographical distribution of common snipe, wood sandpiper, cuckoo and pheasant in Simpevarp 2002–2003 according to the point transects. Different sizes of dots indicate increasing number of individuals (1–2). Note the similarity in distribution between results from line transects and point counts!

5.3 Territory mapping

Territory mapping in areas A–C (Figure 2-1) were conducted between May 23 and June 22. Each area was visited five times during this period. A total of 494 territories of 44 species were registered, among these there were five territories of three listed species. The results from the territory mapping are shown in detail in Appendix 4. Laxemar (C) and Ävrö (A) showed the higher densities of breeding birds and higher overall number of species compared to Hälö (B). The listed species were also found in the two richer areas. Any meaningful analysis of the territory mapping is not possible until at least another year of surveys is made.

5.4 Listed species

The following section gives a detailed summary of the occurrence of species listed as endangered, threatened or vulnerable according to the Swedish Red List /Gärdenfors, 2000/, and/or species listed in the European Unions' Birds Directive Annex 1 (79/409/EEG) within the Simpevarp area. SKB has from the start of the site investigations requested detailed information of the geographical and numerical distribution of these species within the area. The following information is based on data gathered both in 2002 and 2003 and

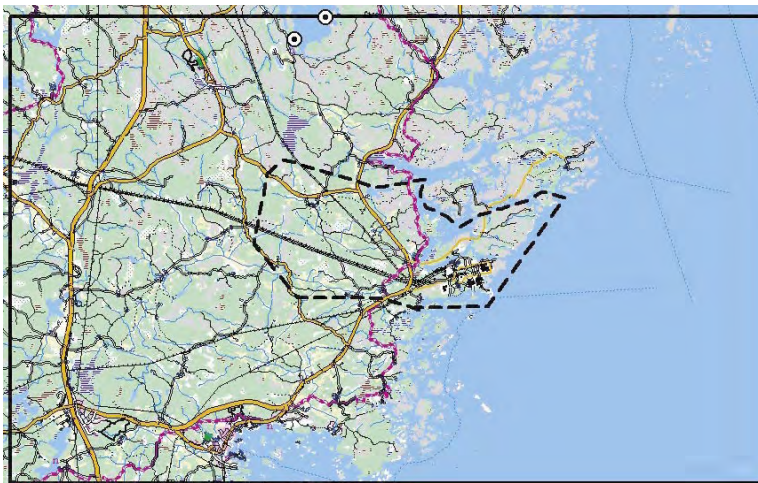
shows a summary of our knowledge about these birds at present. The knowledge of both geographical and numerical distribution of listed birds has improved greatly since the last report (2002) /Green, 2003/ but still, the picture provided here should be regarded as a temporary one. The full picture of both numbers and geographical distribution is not expected until after next years field studies (2004). In addition to the listed species, this section also deals with the occurrence of non-listed raptors and owls and one non-listed woodpecker, a special request from the local site investigations. As most of the nocturnal species and woodpeckers are listed, these birds are treated in this section.

For most species the geographic distribution is shown on a map where territories, pairs or colonies are shown with dots. The dots show estimated territories based on observations made during line transects, point transects, territory mappings and special studies during the seasons 2002 and 2003. In order to maintain a certain amount of secrecy around the nesting sites of vulnerable birds, maps are not shown for neither diurnal or nocturnal birds of prey (raptors and owls), nor for Galliform forest birds. After the names of each species three numbers are presented. These show: i) the number of known territories within the *regional model area* outside of the local model area, ii) the number of known territories within the *local model area* and iii) the estimated total number of territories within the regional model area including the local model area. For each species there is also a note on whether it is listed according to Swedish Red List or the EU:s Birds Directive. There is only one species breeding in Simpevarp that is also found on the Global Red List (considered as globally threatened) and this is the White-tailed eagle. The text about the White-tailed Eagle is written by Björn Helander.

During 2003, 28 listed species were registered within the area as possible breeding birds. Three more listed species were registered in 2003: Lesser Black-backed Gull *Larus fuscus* Silltrut, Razorbill *Alca torda* Tordmule and Ortolan Bunting *Emberiza hortulana* Ortolansparv, but none of these are likely to be breeding in the area and thus not dealt with any further. In total, 29 listed species have been registered as possible breeding birds in 2002–2003. 14 of these are listed in the Swedish Red List and 21 in the EU:s Birds Directive, 6 species are found in both lists. Seven of the listed species are confined to the archipelago. In addition to the listed species four non-listed raptors and two non-listed owls breed in the area.

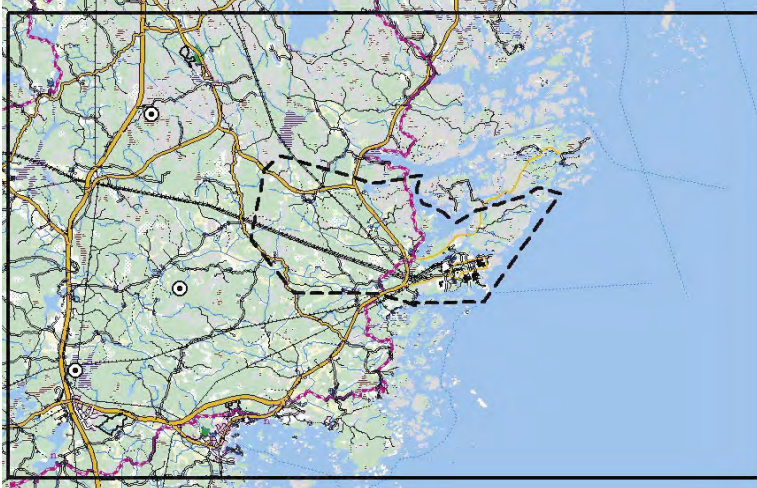
Black-throated Diver *Gavia arctica* Storlom (2; 0; 2; EU Annex 1)

Two pairs in the Lake Göttemaren in the northern part of the regional model area. The coastal areas do not hold any breeding pairs of black-throated divers unlike the situation further up north along the Swedish coast of the Baltic.



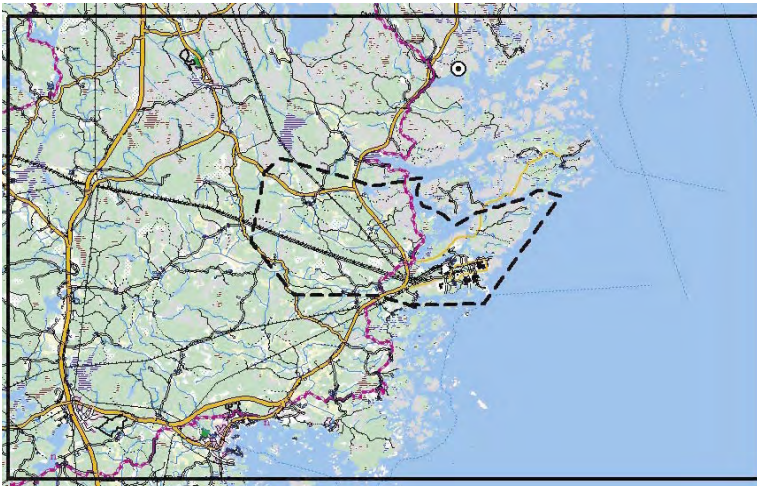
Whooper Swan *Cygnus cygnus* Sångsvan (3; 0; 3; EU Annex 1)

The whooper swan is probably at present establishing itself as a breeding bird in the area (it is increasing in numbers and has extended its geographical distribution greatly in Sweden during later decades). No confirmed breeding have been recorded so far, even though territorial birds are found in at least three wetlands. Breeding is expected within the next few years.



Gadwall *Anas strepera* Snatterand (1; 0; 1; Sw. Red List)

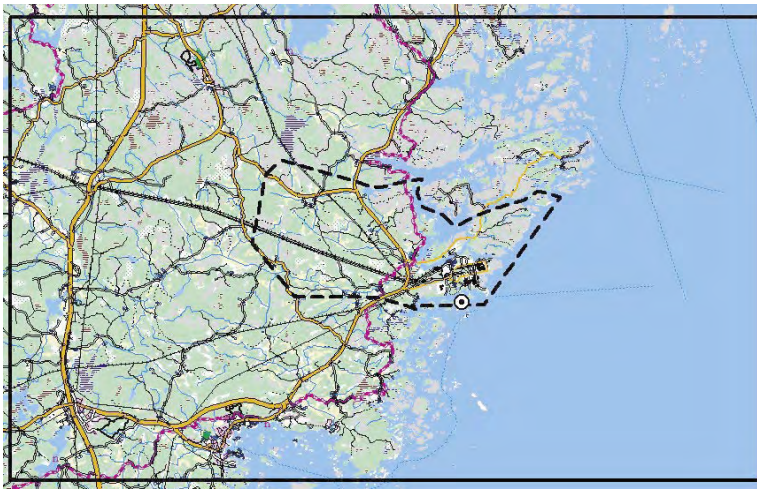
One pair in the northern, mainland parts.



Shoveler *Anas clypeata* Skedand (1; 0; 1; Sw. Red List)
One pair in the outer archipelago.



Velvet scoter *Melanitta fusca* Svärta (1; 1; 1-5; Sw. Red List)
Occurs in low densities in the archipelago. One pair was found in the outer archipelago in 2002 and one pair in the inner parts close to the nuclear power plant in 2003.



Honey Buzzard *Pernis apivorus* Bivråk (1; 1-2; 2-3; Sw. Red List; EU Annex 1)
Not observed in 2003 (but in 2002), but this species is notoriously difficult to survey and it is likely that a few pairs occur in the area.

White-tailed eagle *Haliaeetus albicilla* Havsörn (Global Red List, Sw. Red List; EU Annex 1)

Background

The white-tailed eagle is one of the bird species that has suffered most from pollution in Sweden and in large parts of Europe. The Baltic population was among the ones most severely affected and was on the brink of extinction in the early 1970-ies. Retrospective analyses has shown that the effects of, mainly organo-chloric, pollutants can be traced back as early as to the beginning of the 1950-ies, resulting in a significant decline in number of produced young. The number of breeding attempts resulting in at least one fledged young decreased from 72% before the 1950-ies to on average only 23% during the period 1966–1982. The successful broods during this period also contained only one juvenile compared to the normal level of two juveniles/brood. As white-tailed eagles normally has a high adult survival and hence reach an old age, the effects of decreasing reproductive success on overall population size will no be evident until after quite a long time. The problem for the eagles was hence not found until about ten years after it originally appeared. The population along the Swedish coast of the Baltic was halved from the 1950-ies to the 1970-ies, when only about 50 pairs remained. The majority of these birds were however not capable of producing young and the effective part of the population (the ones actually reproducing) was less than half of the overall population size (i.e. < 25 pairs). The age structure within the population was at this time very skewed with a high dominance of adult birds.

During the first half of the 1970-ies the use of organo-chloric substances such as PCB and DDT was restricted and/or banned. The concentrations of these substances decreased in biota, but it was not until the 1980-ies that the first signs of an increase in the reproductive ability in white-tailed eagles appeared. The reason for this delay was partly because the concentrations of DDE (from DDT) in the eagles were many times higher than the critical level when reproductive disturbances appear, and partly because many old individuals had chronic toxications. The decreasing levels did thus not really help. The increase in reproductive output from the 1980-ies onwards depends on recruitment of new birds not exposed to the high levels of organic chloride compounds occurring previously. The proportion of successful breeding attempts reached the same level as before 1950 by the end of the 1990-ies. The brood sizes are however still significantly lower than during the reference level (before 1950). Probably as a result of a certain amount of PCB-effects still lingering on.

Surveys

The white-tailed eagle has been surveyed nationally since the mid-1960-ies through Svenska Naturskyddsföreningen. From 1971 onwards within the frame work of 'Projekt Havsörn'. The studies of the reproductive output of white-tailed eagles is a part of the Swedish Environmental Protection Board's National Monitoring Program (programområde Hav, projekt Marina toppkonsumerter) since 1989. Results from this programme is produced yearly in reports from the marine research centra in Stockholm.

The survey is made in two steps. First nests are surveyed in March–April to see if they are occupied or not (aerial surveys or long-distance observations, no visit to nests are made at this time). Then the breeding results are surveyed in May–June with nest visits, ringing of young birds etc).

Results, Simpevarp 2003

The breeding success for white-tailed eagle in 2003, 2002 and 1998–2001 in the Simpevarp area and in a reference area to the north and south of Simpevarp is summarised in the table below.

Table 5-1. Per cent successfully breeding pairs of white-tailed eagle in 2003, 2002 and 1998–2001 (n = number of checked breeding attempts).

Area	2003	2002	1998–2001	n
Simpevarp	0	100	88	12
Reference	83	86	78	36

The start in 2003 of the investigations and measurements by SKB around Simpevarp lead to a strong increase in human activities in the area. This might be the cause of failure for one eagle pair. Another pair in the area started their breeding attempt in normal time in January but was strongly disturbed at their nest in February by forestry activities, and deserted the nest site. It will take several years to evaluate the magnitude of an impact on the breeding success of the eagles from the activities in the prospect area at Simpevarp.

Marsh harrier *Circus aeruginosus* Brun kärnhök (1; 0; 1; EU Annex 1).

One breeding site is known and this is basically the only suitable breeding site within the area.

Osprey *Pandion haliaetus* Fiskgjuse (3; 0; 3; EU Annex 1)

Three nests in the area, all three resulting in successful breedings during 2003. Breeding results in the regional model area in comparison to two reference areas south of this area are shown in Table 5-2.

Table 5-2. Breeding results (mean number of produced young per nest and year) of Ospreys in the Simpevarp area and two reference areas during the last five years.

Year	Regional model area (Total n = 9 nests)	Ref. area 1 (Total n = 20 nests)	Ref. area.2 (Total n = 18 nests)
1999	1.0	1.3	2.0
2000	2.0	2.0	2.0
2001	2.0	1.4	2.0
2002	2.0	1.7	2.0
2003	2.7	2.5	2.0
Mean	2.1	1.8	2.0

Note the generally very high number of produced young per year but keep in mind that these refer only to the successful nests. There are no data about how many breeding attempts that were conducted in each year, except for 2003 in Simpevarp when the number of successful nests equals the number of breeding attempts. On a general level though, breeding results in Simpevarp and adjoining parts of the east coast seems to be almost exceptionally good.

Goshawk *Accipiter gentilis* Duvhök (2; 0; > 2; Not listed)

One nesting site is known (birds present during 2003). Another territory is present in another part of the regional model area. There could be more territories as the Goshawk is quite secretive during the breeding season.

Sparrowhawk *Accipiter nisus* Sparvhök (2; 1; > 3; Not listed)

At least three territories including one nest site found. This species is also notoriously difficult to census due to its secretive habits. In many areas of southern Sweden this is the most common breeding raptor, and it is likely that the true number of territories is much higher what we show here, probably equalling the numbers found in Buzzard (cf Buzzard below).

Buzzard *Buteo buteo* Ormvråk (11; 3; 14-16; Not listed)

The most widespread and common raptor in the area. At least 14 territories are known, but it is likely that a few more exist. The area with forested parts combined with small-scale agricultural areas is a very suitable area for buzzards and the densities found are high for Swedish standards.

Hobby *Falco subbuteo* Lärkfalk (3; 0; 3-5; Not listed)

At least three territories. Probably a few more exist in peripheral areas of the regional model area.

Black grouse *Tetrao tetrix* Orre (19; 1; 20; EU Annex 1)

20 lekking cocks found in 2003 and nine in 2002 when a much smaller area was surveyed, all confined to the northern parts. So far not a single hen has been observed during two seasons of surveys, which is surprising. Probably this is due to that most observations concern audial observations (the hens are silent).

Capercaillie *Tetrao urogallus* Tjäder (5; 0; 5; EU Annex 1)

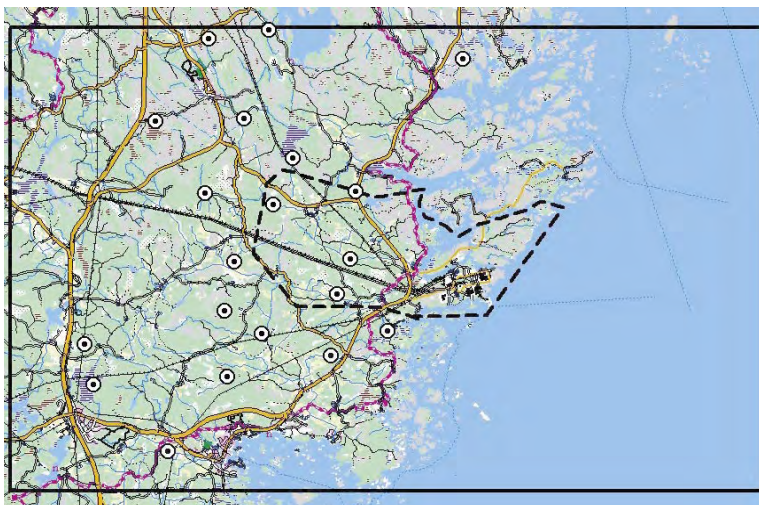
Found in low densities throughout the area. Breeding confirmed in 2002, but not in 2003. No lekking sites are known but must exist, perhaps as solitary lekking males.

Hazelhen *Bonasia bonasia* Järpe (0; 2; ?; EU Annex 1)

Found at only two sites. Surely not a common bird but still there must be more hazelhens than this in the area.

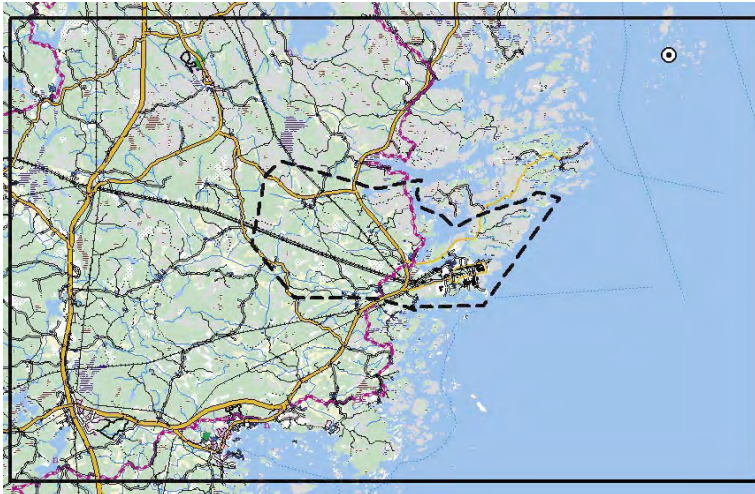
Crane *Grus grus* Trana (16; 4; 20; EU Annex 1)

Well spread over the area with pairs in most suitable places. The high densities of cranes in the area reflect a large increase in numbers that has occurred over much of southern Sweden during the last few decades.



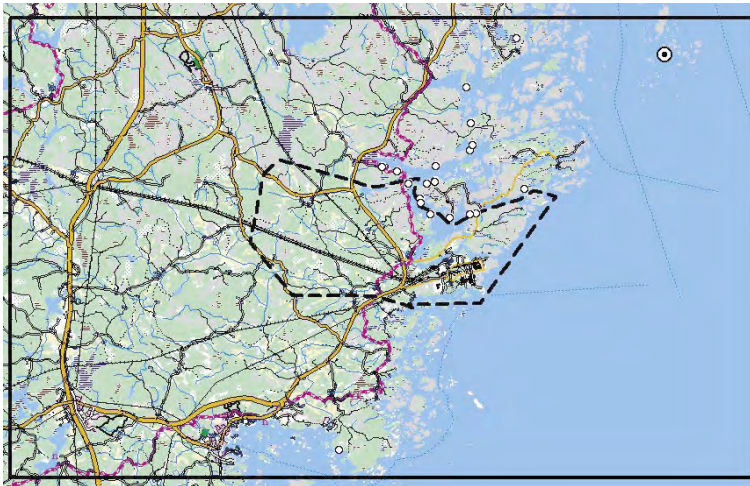
Turnstone *Arenaria interpres* Roskarl (3; 0; 3-5; Sw. Red List)

Three pairs in the outer archipelago in 2003. In 2002 two pairs were registered in the outer archipelago and one pair in the southern inner archipelago, a part that was not surveyed in 2003.



Caspian tern *Sterna caspia* Skröntärna (1; 0; 1; Sw. Red List; EU Annex 1)

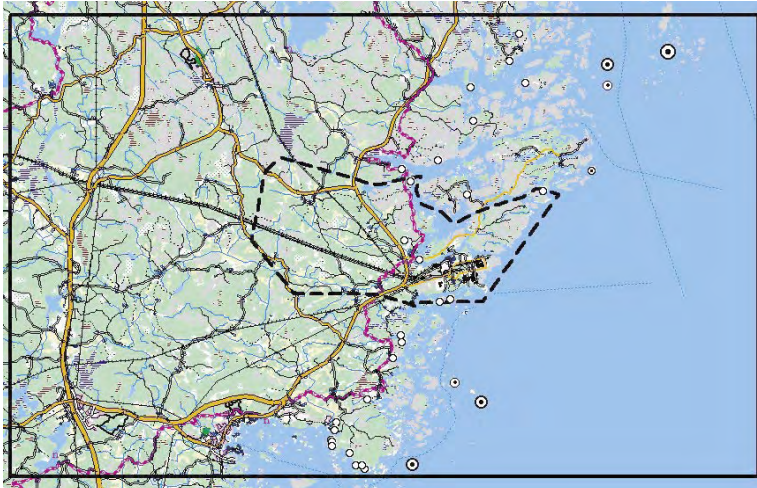
One pair in the outer archipelago in both years. The inner archipelago is used as a fishing (foraging) area by breeding and non-breeding birds originating in a much larger area. Small white dots on the map show observations of foraging birds.



Arctic tern *Sterna paradisaea* Silvertärna (80; 0; 100: EU Annex 1)

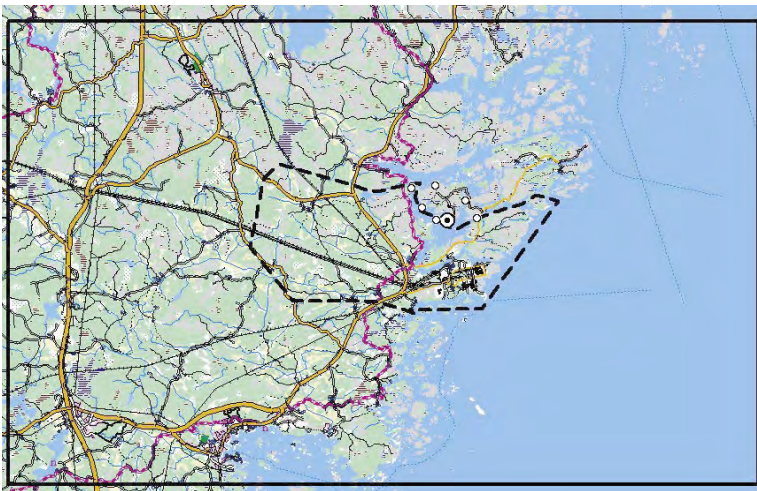
80 pairs were found in scattered colonies in the outer archipelago in 2003, the largest colony holding 36 pairs. Corresponding figures from 2002 were 84 pairs in total with a much higher proportion found in the largest colony, 65 pairs. In addition to these there are probably up to 20 pairs in parts of the inner archipelago not covered by our surveys in 2003 (13 pairs found in a small part of the southern inner archipelago in 2002). Terns do regularly change breeding locations between years and the size of individual colonies may vary greatly between years even though numbers in a larger area may remain fairly constant.

Arctic terns use much of the coastal parts of the regional model area for foraging. Observations of foraging arctic terns are shown with small open dots.



Common tern *Sterna hirundo* Fisktärna (0; 9; 9; EU Annex 1)

One small colony in the inner archipelago. It seems as if common terns use a much smaller area for foraging than their relatives, the arctic terns. This is probably a result of that there are much fewer common terns present in the area compared to the sister species. As for the other terns observations of foraging birds are shown with small open dots



Pygmy Owl *Glaucidium passerinum* Sparvuggla (5; 3; 10, EU Annex 1)

Eight registered territories well spread over the inland parts of the area. It is not unrealistic to assume that there are at least ten territories over all. Nothing is known about breeding results, as the specific nest sites are unknown.

Tengmalms' owl *Aegolius funerus* Pärflugla (1; 1-2; ?; EU Annex 1)

One calling male registered in 2002 and two in 2003. It is however possible that these birds were just passing the area during migration and it is not completely clear whether Tengmalms' owls actually breed in Simpevarp. Possibly there could be one or two territories though.

Eagle owl *Bubo bubo* Berguv (3, 1, 4; Sw. Red List; EU Annex 1)

Birds were present in all four territories during 2003, the breeding result was however poor and no juveniles were produced. Three pairs in the areas north and south of the regional model area all produced young, in total seven. The low breeding output within the regional model area is however probably not at all related to the ongoing site investigations, but must have other causes. Two of the pairs only recently established themselves in the area, and such pairs do rarely produce young. Also for older, well established, pairs breeding success normally varies between years with successful years alternating with unsuccessful ones in a two to three year cycle. The two established pairs in Simpevarp had their latest successful year in 2001, when both produced fledged young. The breeding output of these two pairs during 1993–2003 is shown in Table 5-3.

Table 5-3. Breeding results (number of young) in two territories of Eagle Owls in the Simpevarp area. Territory 2 was established in 1994 and hence no data is available from 1993.

Year	Territory 1	Territory 2
1993	0	
1994	0	0
1995	2	0
1996	0	0
1997	2	0
1998	0	0
1999	2	1
2000	0	0
2001	1	2
2002	0	0
2003	0	0

Tawny Owl *Strix aluco* Kattuggla (25; 8; 40; Not listed)

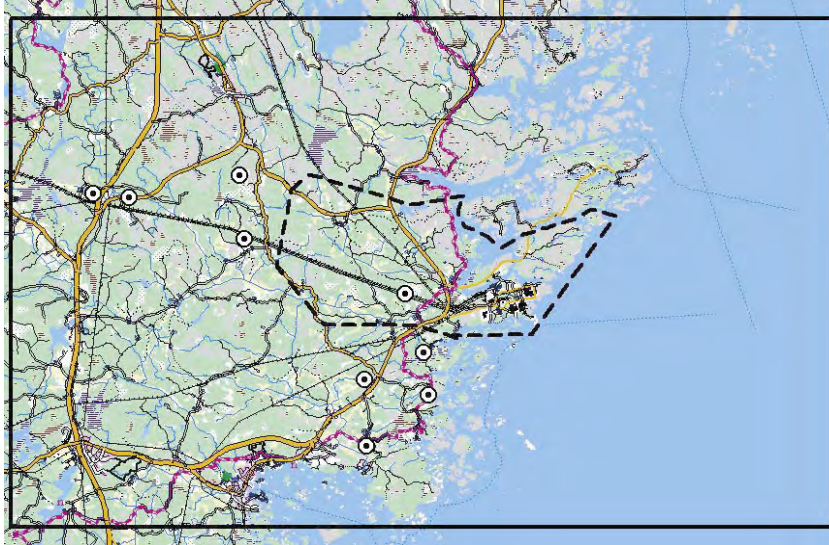
Occurs in high densities all over the regional model area. At present we have registered 33 territories, but it is very likely that this figure will increase when more surveys are made next spring. Breeding results were very poor during 2003, only two broods with young were recorded. Breeding results of tawny owls, as many other predators, are dependent of rodent densities with more young (and more successful breedings) in years with high numbers of rodents.

Long-eared Owl *Asio otus* Hornuggla (4; 1; ?; Not listed)

Calling males heard at five locations. As for Tengmalms' Owl we can not be sure that these birds were not just passing birds on migration. No confirmed breedings were recorded during 2003. The area does however seem very suitable for long-eared owls and a low breeding output is in line with the poor breeding results of tawny owls, indicating low numbers of rodents in the area.

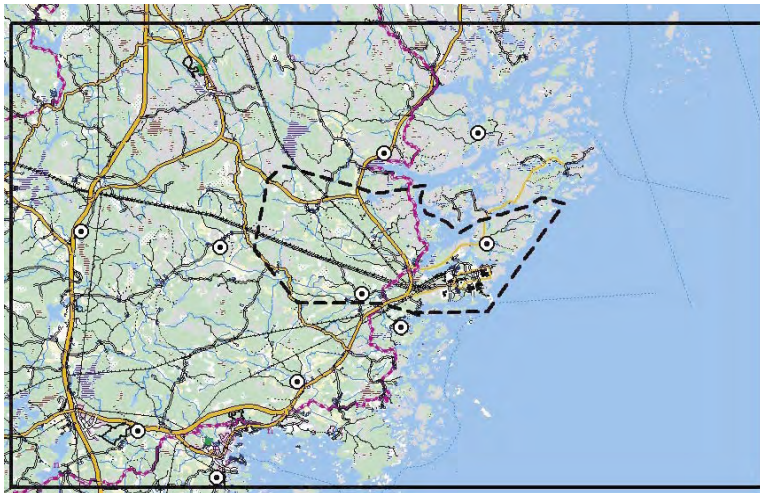
Wryneck *Jynx torquilla* Göktyta (8; 1; 10-20; Sw. Red List)

Only nine recorded territories so far. Even though there probably are more territories present than we know, all available local knowledge confirms the general low densities of this nationally declining species.



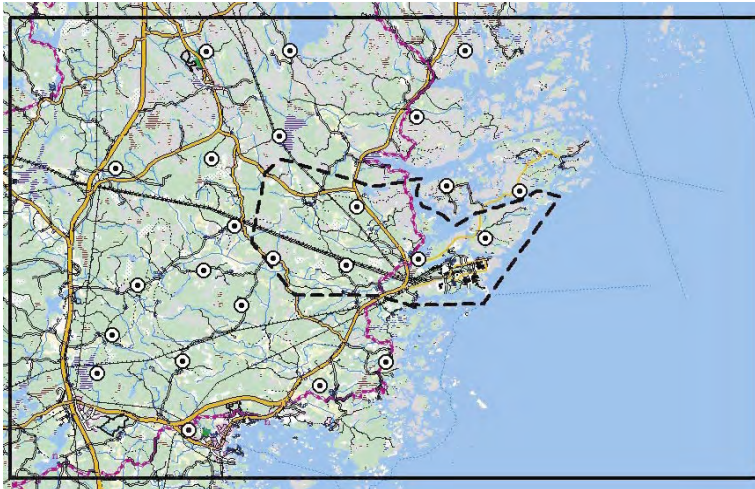
Lesser spotted woodpecker *Dendrocopus minor* Mindre hackspett (8; 2; ≤ 15; Sw. Red List)

Ten territories, most of which are found in relatively close proximity to the coast. This species is dependent on dead wood in broad-leaved forest and the distribution probably reflects where such areas are found. Judging from studies of vegetation maps there are a few more areas that possibly could hold the species but numbers are definitely not much higher than the confirmed ones.



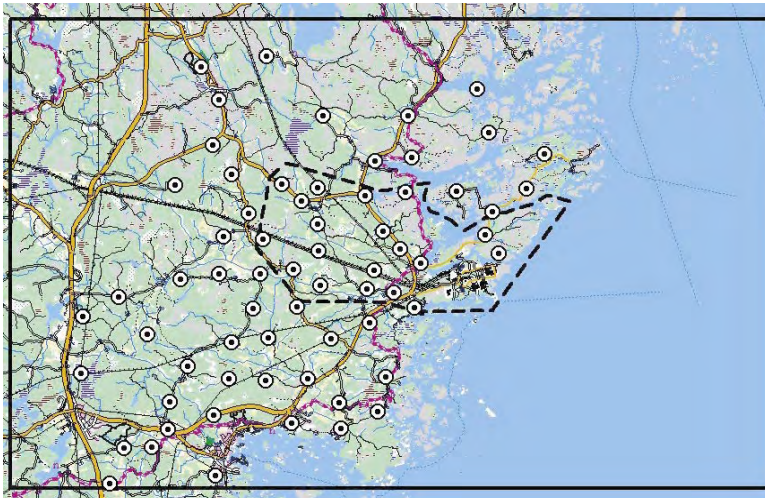
Black woodpecker *Dryocopus martius* Spillkråka (20; 5; 25; EU Annex 1)

Evenly spread over the whole regional model area. A species where we probably have a very good overview of its present status.



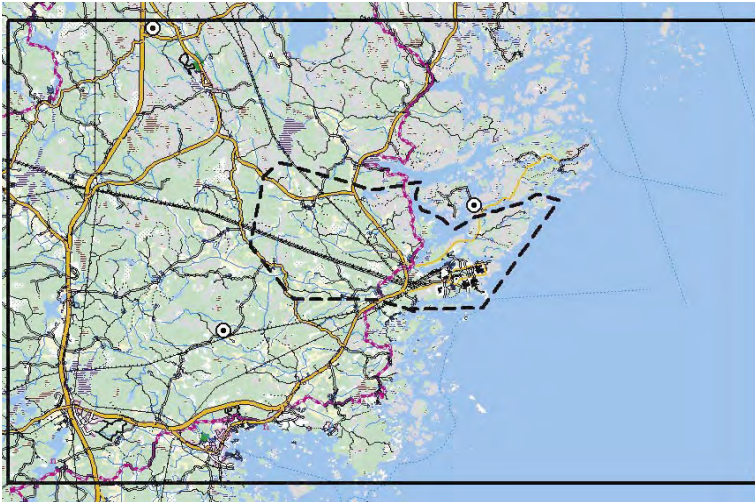
Green woodpecker *Picus viridis* Gröngöling (47; 20; 70; Not listed)

At least 67 territories registered, well spread over the area but with the highest densities found in the southern and eastern parts of the regional model area.



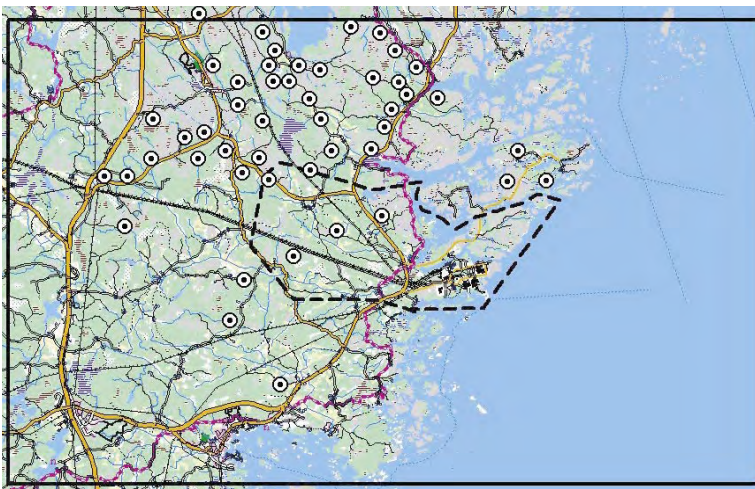
Stock dove *Columba oenas* Skogsduva (4; 0; 5; Sw. Red List)

A species that is surprisingly scarce in the area despite the existence of seemingly suitable localities. Local knowledge confirms the picture of the stock dove as a scarce breeding bird at Simpevarp.



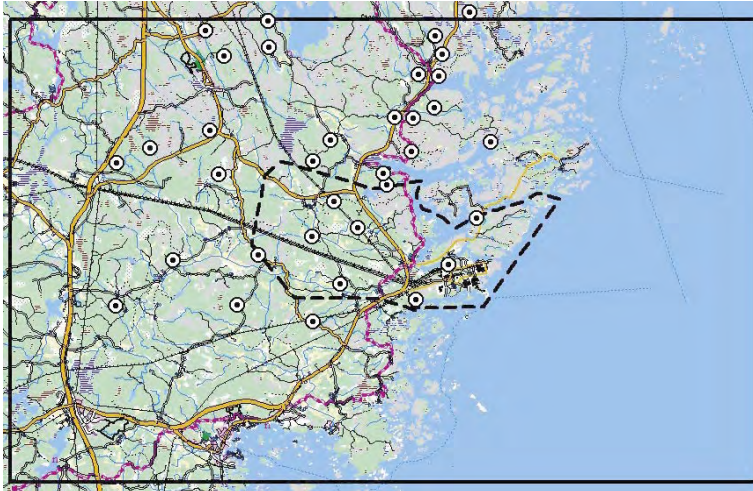
Nightjar *Caprimulgus europaeus* Nattskärra (42; 5; 50; Sw. Red List; EU Annex 1)

Unexpected high densities were found during a special survey in June. Very high densities occur mainly in the northern part of the regional model area, while nightjars are almost absent from the southern parts. Numbers found in the Simpevarp area are probably of national importance for the species, as the '1% criteria' is fulfilled. This criteria is a commonly used way of classifying the importance of areas for nature conservation purposes, and states that if an area holds 1% or more of a total population (in this case the Swedish nightjar population), the area is an important one for the population in question. Densities found in the north part of the regional model area are among the highest recorded ones for nightjars in Sweden. In addition more territories are found outside (north of) the regional model area, one of these just on the border.



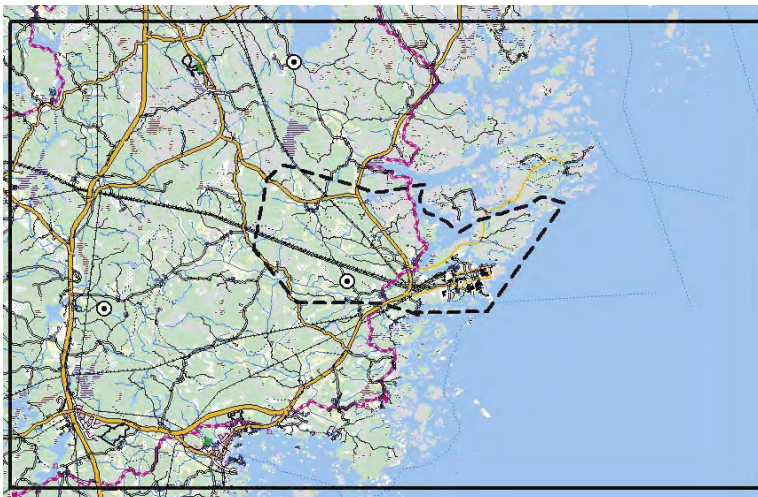
Wood lark *Lullula arborea* Trädlärka (24; 9; 40; EU Annex 1)

Another species with high numbers in the area. Since the wood lark has similar habitat requirements as the nightjar, this is not surprising when knowing the abundance of nightjars. Also the geographic distribution of wood larks is very similar to the one for nightjars with most territories found in the north and none in the southernmost parts.



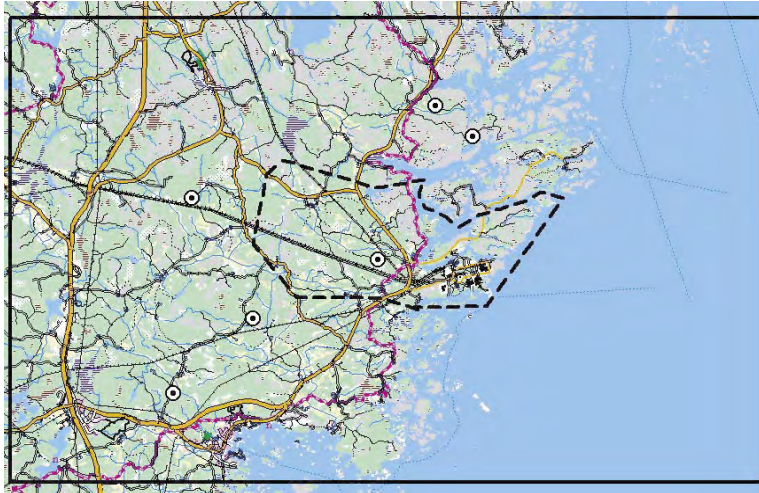
Red-breasted Flycatcher *Ficedula parva* Mindre flugsnappare (2; 1; ?; Sw. Red List, EU Annex 1)

Three singing males recorded in 2003. Even though it is possible that these birds were just temporarily occurring in the area, one can not exclude the possibility of breeding attempts for this species.



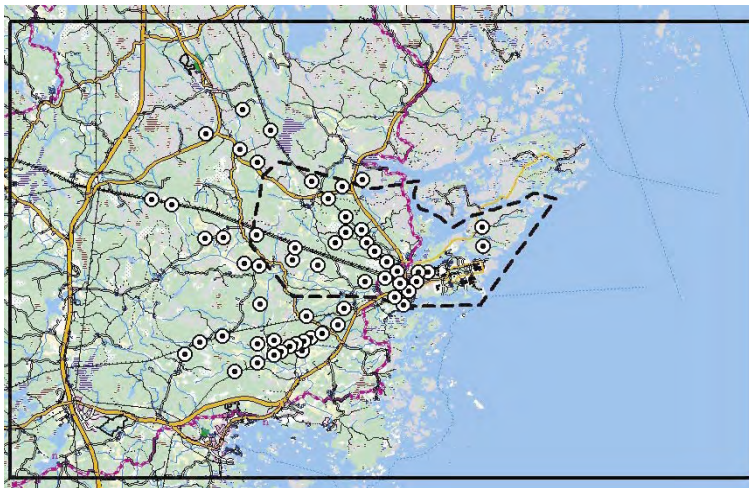
Nutcracker *Nucifraga caryocatactes* Nötkråka (5; 1; 5-10, Sw. Red List)

At least six territories spread out over the area. This species is quite secretive during the breeding season but the given picture probably reflects the true distribution fairly well.



Red-backed shrike *Lanius collurio* Törnskata (34; 26; > 100; EU Annex 1).

Another species with unpredicted very high densities. 60 territories found and it is likely that the true number exceed 100. Interestingly a large part of registered territories are found under electrical power wires (37 of 60, 62%). Apparently this is as very inviting habitat to shrikes if these areas are grazed or managed in some other way, keeping them open with scattered bushes.



5.5 Birds in coastal areas

644 pairs of 28 species were recorded in the outer parts of the archipelago (Figure 4-2) during 2003. This can be compared with 703 pairs of 27 species in the same area during 2002. The results of both years are shown in detail in Table 5-4. The decrease in number of pairs was mainly confined to the two larger gull species Herring Gull *Larus argentatus* Gråtrut (-52 pairs) and Greater Black-backed gull *Larus marinus* Havstrut (-20 pairs). Otherwise the changes were small or moderate between the years. Four of the species recorded in 2003 are listed (85 pairs). The results are presented in detail (per island) in Appendix 5.

Table 5-4. Number of breeding pairs of birds for all different species in the outer archipelago in 2002 and 2003. English and Swedish names are given.

Species	No of pairs/nests 2002	No of pairs/nests 2003
Herring gull, Gråtrut	214	162
Common Eider, Ejder	150	143
Arctic Tern, Silvertärna	84	80
Common gull, Fiskmås	67	59
Great Black-backed Gull, Havstrut	45	25
Black-headed Gull, Skrattmås	35	37
Tufted Duck, Vigg	26	33
Greylag Goose, Grågås	18	26
Oystercatcher, Strandskata	9	9
Red-breasted Merganser, Småskrake	8	10
Mute Swan, Knölsvan	7	8
White wagtail, Sädesärta	7	8
Rock Pipit, Skärpiplärka	7	6
Mallard, Gräsand	5	9
House Martin, Hussvala	3	4
Whitethroat, Törnsångare	3	3
Common Sandpiper, Drillsnäppa	2	2
Turnstone, Roskarl	2	3
Wheatear, Stenskvätta	2	2
Ringed Plover, Större strandpipare	2	2
Lesser Whitethroat, Ärtsångare	1	2
Shelduck, Gravand	1	0
Redshank, Rödbena	1	3
Great Crested Grebe, Skäggdopping	1	2
Caspian Tern, Skröntärna	1	1
Goosander, Storskrake	1	0
Velvet Scoter, Svärta	1	0
Teal, Kricka	0	2
Chaffinch, Bofink	0	1
Willow warbler, Lövsångare	0	1
Shoveler, Skedand	0	1
Sum	703	644

The surveyed part of the inner archipelago (the area within- and close to the local model area, Figure 4-2) held 188 pairs of 17 species of waterbirds in 2003 (Table 5-5). Twelve pairs of three listed species of waterbirds were registered (Osprey is classified as a waterbird in this case. The details are shown in Appendix 6.

It should be noted that the inner archipelago is used as foraging areas for several species that do not breed there as Cormorants *Phalacrocorax carbo* Storskarv, herring gulls, black-headed gulls and the terns (see above).

27 point counts were made on islands in the inner archipelago area. In total 347 birds were registered during these (57 species). Six listed species were recorded during the point counts, among them the Lesser Black-backed Gull, not breeding in the area. Densities of birds during the point counts in the inner archipelago was very similar to densities recorded inland in Simpevarp (12.9 birds/point in the inner archipelago vs 12.4 birds/point inland). The results from these point counts are shown in Appendix 7.

Table 5-5. Number of breeding pairs of waterbirds in the surveyed part of the inner archipelago in 2003.

Species	North of Ävrö	South of Ävrö	Sum
Great Crested Grebe, Skäggdopping	8	3	11
Heron, Gråhäger	0	75	75
Mute Swan, Knölsvan	5	5	10
Greylag Goose, Grågås	5	9	14
Canada Goose, Kanadagås	1	0	1
Teal, Kricka	1	0	1
Mallard, Gräsand	8	12	20
Tufted Duck, Vigg	4	6	10
Common Eider, Ejder	2	7	9
Goldeneye, Knipa	2	0	2
Velvet Scoter, Svärta	0	1	1
Goosander, Storskrake	5	3	8
Osprey, Fiskgjuse	1	1	2
Redshank, Rödbena	1	1	2
Green Sandpiper, Skogssnäppa	1	0	1
Common Sandpiper, Drillsnäppa	8	4	12
Common Tern, Fisktärna	9	0	9
Sum	61	127	188

6 Discussion

The number of recorded birds differed greatly between 2002 and 2003. Generally, early breeders were recorded in much higher numbers in 2003. This led to a big difference in the relation in numbers between the most common species recorded during the line transects. Tits, robins and chaffinches were recorded in much higher relative numbers compared to willow warblers in 2003. In part this can be explained by a very good breeding output for early breeders (tits, robins and chaffinches) in 2003. The young of these birds fledge in June and after a good breeding season high numbers are present during the later period of the line transects. In part the results (and differences compared to 2002) could also be explained by differences between observers in the ability to record different species. It could also be that the inclusion of other areas in 2003, not being optimal for willow warblers would reduce their relative numbers. This could only explain part of the difference between the years though as this is one of the most common species in Sweden, occurring in high densities in most types of habitats. The fact that the absolute densities of willow warblers were relatively similar between 2002 and 2003 (Appendix 2) while densities of the other four species were much higher in 2003 supports the interpretation of a high breeding output for early breeders, combined with differences between observers. The figures from 2003 do underline the need for more than one survey year if one is to obtain sound and representative results telling anything about an area in a larger perspective. This statement is also emphasised by the, in some cases, large variation in recorded densities of other species, apart from the ones mentioned above, that is evident in Appendix 2.

The difference in overall numbers between the years was however not at all as big during the point counts as on the line transects. Bird numbers were on average 22% higher in 2003 compared to 2002 during the point counts but as much as 48% higher during the line transects. The difference between the two methods is unclear. In general the pattern between the years were similar between the methods with species being more numerous on the line transects in 2003 also being more numerous in the point counts in 2003 and vice versa. The differences were in many cases smaller when looking at the point count data.

Even though our knowledge about the bird fauna in Simpevarp have increased substantially since the first surveys in 2002, we still do not have the complete picture of the whole area. As most of the regional model area is visited only once every breeding season, coverage can not be regarded as good until at least one early and one late visit has been made (hence involving at least two field seasons). Getting a full-scale season in next year is of prime importance for achieving such a picture and finishing a high profile characterisation in time. Still, the surveys in 2003 have somewhat changed the view of the Simpevarp area, which has turned out to have a richer bird fauna than anticipated after the first years surveys in a smaller part. The area holds quite many listed species in general, including some species of very high conservation priority (e.g. white-tailed eagle). It may even be of national importance for one listed species, the nightjar. The present status of this species in Sweden is somewhat uncertain although most authors agree on that it has decreased in numbers during the latest century /SOF, 2002/. The combination of small-scale agriculture, including holding cattle in forested parts, together with large areas of dry open pine forests in Simpevarp probably makes this area especially suitable for nightjars. Most of the nightjars in Simpevarp occur outside the local model area, where the most intensive site investigations are carried out and are hence not likely to be affected by these. Even though nightjars are not extremely sensitive to human disturbances it would be appreciated if direct disturbances from the site investigations could be avoided at places holding nightjar

territories, at least during the breeding season (June–Aug). Preferably, the nightjars could be included in the planning of activities within the site investigations in the same way as is done for white-tailed eagles and a few more species, in order to avoid direct disturbances.

7 References

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Appendix 1

List of all bird species breeding in Sweden with Latin, Swedish and English names.

Latin-genus	Latin-species	Swedish	English
<i>Clangula</i>	<i>hyemalis</i>	Alfågel	Long-tailed Duck
<i>Riparia</i>	<i>riparia</i>	Backsvala	Sand Martin
<i>Aythya</i>	<i>marila</i>	Bergand	Scaup
<i>Fringilla</i>	<i>montifringilla</i>	Bergfink	Brambling
<i>Bubo</i>	<i>bubo</i>	Berguv	Eagle Owl
<i>Pernis</i>	<i>apivorus</i>	Bivråk	Honey Buzzard
<i>Turdus</i>	<i>pilaris</i>	Björktrast	Fieldfare
<i>Circus</i>	<i>cyaneus</i>	Blå kärrhök	Hen Harrier
<i>Parus</i>	<i>caeruleus</i>	Blåmes	Blue Tit
<i>Anas</i>	<i>penelope</i>	Bläsand	Wigeon
<i>Fringilla</i>	<i>coelebs</i>	Bofink	Chaffinch
<i>Aythya</i>	<i>ferina</i>	Brunand	Pochard
<i>Circus</i>	<i>aeruginosus</i>	Brun kärrhök	Marsh Harrier
<i>Saxicola</i>	<i>rubetra</i>	Buskskvätta	Whinchat
<i>Acrocephalus</i>	<i>dumetorum</i>	Busksångare	Blyth's Reed Warbler
<i>Pyrhula</i>	<i>pyrrhula</i>	Domherre	Bullfinch
<i>Actitis</i>	<i>hypoleucos</i>	Drillsnäppa	Common Sandpiper
<i>Turdus</i>	<i>viscivorus</i>	Dubbeltrast	Mistle Thrush
<i>Accipiter</i>	<i>gentilis</i>	Duvhök	Goshawk
<i>Larus</i>	<i>minutus</i>	Dvärgmåås	Little Gull
<i>Somateria</i>	<i>mollissima</i>	Ejder	Ejder
<i>Gallinago</i>	<i>gallinago</i>	Enkelbeckasin	Common Snipe
<i>Parus</i>	<i>palustris</i>	Entita	Marsh Tit
<i>Phasianus</i>	<i>colchicus</i>	Fasan	Pheasant
<i>Pandion</i>	<i>haliaetus</i>	Fiskgjuse	Osprey
<i>Larus</i>	<i>canus</i>	Fiskmåås	Common Gull
<i>Sterna</i>	<i>hirundo</i>	Fisktärna	Common Tern
<i>Locustella</i>	<i>fluviatilis</i>	Flodsångare	River Warbler
<i>Motacilla</i>	<i>cinerea</i>	Forsärla	Grey Wagtail
<i>Milvus</i>	<i>milvus</i>	Glada	Red Kite
<i>Tadorna</i>	<i>tadorna</i>	Gravand	Shelduck
<i>Phylloscopus</i>	<i>collybita</i>	Gransångare	Chiffchaff
<i>Muscicapa</i>	<i>striata</i>	Grå flugsnappare	Spotted Flycatcher
<i>Anser</i>	<i>anser</i>	Grågås	Greylag Goose
<i>Carduelis</i>	<i>flammea</i>	Gråsiska	Redpoll
<i>Passer</i>	<i>domesticus</i>	Gråsparv	House Sparrow
<i>Picus</i>	<i>canus</i>	Gråspett	Grey-headed Woodpecker
<i>Larus</i>	<i>argentatus</i>	Gråtrut	Herring Gull
<i>Anas</i>	<i>platyrhynchos</i>	Gräsand	Mallard
<i>Locustella</i>	<i>naevia</i>	Gräshoppsångare	Grashopper Warbler
<i>Tringa</i>	<i>glareola</i>	Grönben	Wood Sandpiper
<i>Carduelis</i>	<i>chloris</i>	Grönfink	Greenfinch
<i>Picus</i>	<i>viridis</i>	Gröngöling	Green Woodpecker
<i>Carduelis</i>	<i>spinus</i>	Grönsiska	Siskin

<i>Phylloscopus</i>	<i>sibilatrix</i>	Grönsångare	Wood Warbler
<i>Emberiza</i>	<i>citrinella</i>	Gulspurv	Yellowhammer
<i>Motacilla</i>	<i>flava</i>	Gulärla	Yellow Wagtail
<i>Troglodytes</i>	<i>troglodytes</i>	Gärdsmyg	Wren
<i>Cuculus</i>	<i>canorus</i>	Gök	Cuckoo
<i>Jynx</i>	<i>torquilla</i>	Göktyta	Wryneck
<i>Larus</i>	<i>marinus</i>	Havstrut	Great Black-backed Gull
<i>Haliaeetus</i>	<i>albicilla</i>	Havsörn	White-tailed Eagle
<i>Asio</i>	<i>otus</i>	Hornuggla	Long-eared Owl
<i>Delichon</i>	<i>urbica</i>	Hussvala	House Martin
<i>Ardea</i>	<i>cinerea</i>	Häger	Grey Heron
<i>Carduelis</i>	<i>cannabina</i>	Hämpling	Linnet
<i>Hippolais</i>	<i>icterina</i>	Härmsångare	Icterine Warbler
<i>Sylvia</i>	<i>nisoria</i>	Höksångare	Barred Warbler
<i>Bonasia</i>	<i>bonasia</i>	Järpe	Hazel Grouse
<i>Prunella</i>	<i>modularis</i>	Järnsparv	Dunnock
<i>Corvus</i>	<i>monedula</i>	Kaja	Jackdaw
<i>Branta</i>	<i>canadensis</i>	Kanadagås	Canada Goose
<i>Strix</i>	<i>aluco</i>	Kattuggla	Tawny Owl
<i>Sterna</i>	<i>sandvicensis</i>	Kentsk tärna	Sandwich Tern
<i>Bucephala</i>	<i>clangula</i>	Knipa	Goldeneye
<i>Cygnus</i>	<i>olor</i>	Knölsvan	Mute Swan
<i>Turdus</i>	<i>merula</i>	Koltrast	Blackbird
<i>Crex</i>	<i>crex</i>	Kornknarr	Corncrake
<i>Corvus</i>	<i>corax</i>	Korp	Raven
<i>Anas</i>	<i>crecca</i>	Kricka	Teal
<i>Corvus</i>	<i>corone cornix</i>	Kråka	Hooded Crow
<i>Alcedo</i>	<i>atthis</i>	Kungsfiskare	Kingfisher
<i>Regulus</i>	<i>regulus</i>	Kungsfågel	Goldcrest
<i>Aquila</i>	<i>chrysaetos</i>	Kungsörn	Golden Eagle
<i>Acrocephalus</i>	<i>palustris</i>	Kärrsångare	Marsh Warbler
<i>Stercorarius</i>	<i>parasiticus</i>	Labbe	Arctic Skua
<i>Hirundo</i>	<i>rustica</i>	Ladusvala	Swallow
<i>Strix</i>	<i>nebulosa</i>	Lappuggla	Great Grey Owl
<i>Phylloscopus</i>	<i>trochiloides</i>	Lundsångare	Greenish Warbler
<i>Falco</i>	<i>subbuteo</i>	Lärfalk	Hobby
<i>Phylloscopus</i>	<i>trochilus</i>	Lövsångare	Willow Warbler
<i>Dendrocopos</i>	<i>medius</i>	Mellanspett	Middle Spotted Woodpecker
<i>Ficedula</i>	<i>parva</i>	Mindre flugsnappare	Red-breasted Flycatcher
<i>Dendrocopos</i>	<i>minor</i>	Mindre hackspett	Lesser Spotted Woodpecker
<i>Loxia</i>	<i>curvirostra</i>	Mindre korsnäbb	Crossbill
<i>Charadrius</i>	<i>dubius</i>	Mindre strandpipare	Little Ringed Plover
<i>Scolopax</i>	<i>rusticola</i>	Morkulla	Woodcock
<i>Caprimulgus</i>	<i>europaeus</i>	Nattskärva	Nightjar
<i>Luscinia</i>	<i>luscinia</i>	Näktergal	Thrush Nightingale
<i>Nucifraga</i>	<i>caryocatactes</i>	Nötkråka	Nutcracker
<i>Garrulus</i>	<i>glandarius</i>	Nötskrika	Jay
<i>Sitta</i>	<i>europaea</i>	Nötväcka	Nuthatch
<i>Buteo</i>	<i>buteo</i>	Ormvråk	Buzzard

<i>Tetrao</i>	<i>tetrix</i>	Orre	Black Grouse
<i>Emberiza</i>	<i>hortulana</i>	Ortolansparv	Ortolan Bunting
<i>Passer</i>	<i>montanus</i>	Pilfink	Tree Sparrow
<i>Aegolius</i>	<i>funereus</i>	Pärluggla	Tengmalm's Owl
<i>Perdix</i>	<i>perdix</i>	Rapphöna	Partridge
<i>Columba</i>	<i>palumbus</i>	Ringduva	Woodpigeon
<i>Carpodacus</i>	<i>erythrinus</i>	Rosenfink	Rosefinch
<i>Arenaria</i>	<i>interpres</i>	Roskarl	Turnstone
<i>Tringa</i>	<i>totanus</i>	Rödbena	Redshank
<i>Erithacus</i>	<i>rubecula</i>	Rödhake	Robin
<i>Phoenicurus</i>	<i>phoenicurus</i>	Rödstjärt	Redstart
<i>Turdus</i>	<i>iliacus</i>	Rödvingetrast	Redwing
<i>Botaurus</i>	<i>stellaris</i>	Rördrom	Bittern
<i>Gallinula</i>	<i>chloropus</i>	Rörhöna	Moorhen
<i>Acrocephalus</i>	<i>scirpaceus</i>	Rörsångare	Reed Warbler
<i>Larus</i>	<i>fuscus</i>	Silltrut	Lesser Black-backed Gull
<i>Sterna</i>	<i>paradisaea</i>	Silvertärna	Arctic Tern
<i>Pica</i>	<i>pica</i>	Skata	Magpie
<i>Anas</i>	<i>clypeata</i>	Skedand	Shoveler
<i>Columba</i>	<i>oenas</i>	Skogsduva	Stock Dove
<i>Tringa</i>	<i>ochropus</i>	Skogssnäppa	Green Sandpiper
<i>Panurus</i>	<i>biarmicus</i>	Skäggmes	Bearded Tit
<i>Larus</i>	<i>ridibundus</i>	Skrattmå	Black-headed Gull
<i>Sterna</i>	<i>caspia</i>	Skräntärna	Carpian Tern
<i>Podiceps</i>	<i>cristatus</i>	Skäggdopping	Great Crested Grebe
<i>Anthus</i>	<i>petrosus</i>	Skärpiplärka	Rock Pipit
<i>Strix</i>	<i>uralensis</i>	Slaguggla	Ural Owl
<i>Tachybaptus</i>	<i>ruficollis</i>	Smådopping	Little Grebe
<i>Mergus</i>	<i>serrator</i>	Småskrake	Red-breasted Merganser
<i>Porzana</i>	<i>porzana</i>	Småfläckig sumphöna	Spotted Crake
<i>Sterna</i>	<i>albifrons</i>	Småtärna	Little Tern
<i>Anas</i>	<i>strepera</i>	Snatterand	Gadwall
<i>Fulica</i>	<i>atra</i>	Sothöna	Coot
<i>Accipiter</i>	<i>nisus</i>	Sparvhök	Sparrow Hawk
<i>Glaucidium</i>	<i>passerinum</i>	Sparvuggla	Pygmy Owl
<i>Anser</i>	<i>brachyrhynchus</i>	Spetsbergsgås	Pink-footed Goose
<i>Dryocopus</i>	<i>martius</i>	Spillkråka	Black Woodpecker
<i>Sturnus</i>	<i>vulgaris</i>	Stare	Starling
<i>Carduelis</i>	<i>carduelis</i>	Steglits	Goldfinch
<i>Coccothraustes</i>	<i>coccothraustes</i>	Stenknäck	Hawfinch
<i>Oenanthe</i>	<i>oenanthe</i>	Stenskvätta	Wheatear
<i>Anas</i>	<i>acuta</i>	Stjärtand	Pintail
<i>Aegithalos</i>	<i>caudatus</i>	Stjärtmes	Long-tailed Tit
<i>Gavia</i>	<i>arctica</i>	Storlom	Black-throated Diver
<i>Phalacrocorax</i>	<i>carbo</i>	Storskarv	Cormorant
<i>Mergus</i>	<i>merganser</i>	Storskrake	Goosander
<i>Numenius</i>	<i>arquata</i>	Storspov	Curlew
<i>Haematopus</i>	<i>ostralegus</i>	Strandskata	Oystercatcher
<i>Cinclus</i>	<i>cinclus</i>	Strömstare	Dipper

<i>Dendrocopos</i>	<i>major</i>	Större hackspett	Great Spotted Woodpecker
<i>Loxia</i>	<i>pytyopsittacus</i>	Större korsnäbb	Parrot Crossbill
<i>Charadrius</i>	<i>hiaticula</i>	Större strandpipare	Ringed Plover
<i>Ficedula</i>	<i>hypoleuca</i>	Svartvit flugsnappare	Pied Flycatcher
<i>Podiceps</i>	<i>auritus</i>	Svarthakedopping	Slavonian Grebe
<i>Sylvia</i>	<i>atricapilla</i>	Svarthätta	Blackcap
<i>Parus</i>	<i>ater</i>	Svartmes	Coal Tit
<i>Chlidonias</i>	<i>niger</i>	Svarttärna	Black Tern
<i>Melanitta</i>	<i>fusca</i>	Svärta	Velvet Scoter
<i>Alauda</i>	<i>arvensis</i>	Sånglärka	Skylark
<i>Motacilla</i>	<i>alba</i>	Sädesärka	White Wagtail
<i>Emberiza</i>	<i>schoeniclus</i>	Sävspurv	Reed Bunting
<i>Acrocephalus</i>	<i>schoenobaenus</i>	Sävsångare	Sedge Warbler
<i>Parus</i>	<i>major</i>	Talgoxe	Great Tit
<i>Parus</i>	<i>montanus</i>	Talltita	Willow Tit
<i>Turdus</i>	<i>philomelos</i>	Taltrast	Song Thrush
<i>Columba</i>	<i>livia</i>	Tamduva	Feral Pigeon
<i>Tetrao</i>	<i>urogallus</i>	Tjäder	Capercaillie
<i>Cephus</i>	<i>grylle</i>	Tobisgrissla	Black Guillemot
<i>Parus</i>	<i>cristatus</i>	Tofsmes	Crested Tit
<i>Vanellus</i>	<i>vanellus</i>	Tofsvipa	Lapwing
<i>Falco</i>	<i>tinnunculus</i>	Tornfalk	Kestrel
<i>Alca</i>	<i>torda</i>	Tordmule	Razorbill
<i>Apus</i>	<i>apus</i>	Tornseglare	Swift
<i>Grus</i>	<i>grus</i>	Trana	Crane
<i>Acrocephalus</i>	<i>arundinaceus</i>	Trastsångare	Great Reed Warbler
<i>Picoides</i>	<i>tridactylus</i>	Tretåig hackspett	Three-toed Woodpecker
<i>Certhia</i>	<i>familiaris</i>	Trädkrypare	Treecreeper
<i>Lullula</i>	<i>arborea</i>	Trädlärka	Wood Lark
<i>Anthus</i>	<i>trivialis</i>	Trädpiplärka	Tree Pipit
<i>Sylvia</i>	<i>borin</i>	Trädgårdssångare	Garden Warbler
<i>Streptopelia</i>	<i>decaocto</i>	Turkduva	Collared Dove
<i>Streptopelia</i>	<i>turtur</i>	Turturduva	Turtle Dove
<i>Lanius</i>	<i>collurio</i>	Törnskata	Red-backed Shrike
<i>Sylvia</i>	<i>communis</i>	Törnsångare	Whitethroat
<i>Coturnix</i>	<i>coturnix</i>	Vaktel	Quail
<i>Lanius</i>	<i>excubitor</i>	Varfågel	Great Grey Shrike
<i>Rallus</i>	<i>aquaticus</i>	Vattenrall	Water Rail
<i>Aythya</i>	<i>fuligula</i>	Vigg	Tufted Duck
<i>Carduelis</i>	<i>flavirostris</i>	Vinterhämpling	Twite
<i>Dendrocopos</i>	<i>leucotos</i>	Vitryggig hackspett	White-backed Woodpecker
<i>Anas</i>	<i>querquedula</i>	Årta	Garganey
<i>Circus</i>	<i>pygargus</i>	Ängshök	Montagu's Harrier
<i>Anthus</i>	<i>pratensis</i>	Ängspiplärka	Meadow Pipit
<i>Sylvia</i>	<i>curruca</i>	Ärtsångare	Lesser Whitethroat

Appendix 2

Total number of birds registered during the line transects in Simpevarp 2003. English and Swedish names are shown. Listed species in bold text. Densities (No birds/km) are shown both for 2003 and 2002 for comparison.

Species	No of birds (2003)	No of birds/km (2003)	No of birds/km (2002)
Chaffinch, Bofink	2505	12.03	7.10
Great Tit, Talgoxe	1635	7.85	1.55
Willow warbler, Lövsångare	1264	6.07	7.15
Robin, Rödhake	1127	5.41	2.22
Blue tit, Blåmes	1039	4.99	0.58
Blackbird, Koltrast	978	4.70	2.24
Song thrush, Taltrast	436	2.09	1.89
Wood Pigeon, Ringduva	418	2.01	1.63
Yellowhammer, Gulsparv	278	1.34	0.87
Hooded Crow, Kråka	275	1.32	0.56
Siskin, Grönsiska	228	1.10	0.81
Goldcrest, Kungsfågel	226	1.09	0.38
Herring Gull, Gråtrut	176	0.85	0.07
Tree Pipit, Trädpiplärka	176	0.85	1.71
Cuckoo, Gök	150	0.72	0.75
Starling, Stare	141	0.68	0.49
Fieldfare, Björktrast	124	0.60	0.17
Greenfinch, Grönfink	118	0.57	0.29
Swift, Tornseglare	110	0.53	1.11
Wood Warbler, Grönsångare	105	0.50	0.21
Cormorant, Storskarv	100	0.48	–
Jay, Nötskrika	89	0.43	0.46
Mallard, Gräsand	75	0.36	0.11
Crested Tit, Tofsmes	73	0.35	0.59
Great Spotted Woodpecker, Större Hackspett	72	0.35	0.23
Mute Swan, Knölsvan	71	0.34	0.01
Crossbill, Mindre Korsnäbb	67	0.32	0.45
Nuthatch, Nötväcka	66	0.32	0.24
Coal Tit, Svartmes	66	0.32	0.38
Dunnock, Järnsparv	65	0.31	0.63
Goosander, Storskrake	64	0.31	0.01
White Wagtail, Sädesärta	61	0.29	0.39
Blackcap, Svarthätta	57	0.27	0.80
Black-headed Gull, Skratmås	55	0.26	–
Common Gull, Fiskmås	54	0.26	0.01
Wren, Gärdsmyg	53	0.25	0.67
Garden Warbler, Trädgårdssångare	51	0.24	0.81
Green Woodpecker, Gröngöling	49	0.24	0.36
Greylag Goose, Grågås	48	0.23	0.30
Raven, Korp	47	0.23	0.22
Barn Swallow, Ladusvala	46	0.22	0.57

Lesser Whitethroat, Ärtsångare	51	0.22	0.48
Tufted Duck, Vigg	45	0.22	–
Pheasant, Fasan	43	0.21	0.16
Marsh Tit, Entita	40	0.19	0.19
Pied Flycatcher,			
Svartvit Flugsnappare	40	0.19	0.42
Grey Heron, Häger	36	0.17	0.05
Common Snipe, Enkelbeckasin	33	0.16	0.20
Reed Bunting, Sävsparv	30	0.14	0.04
Arctic Tern, Silvertärna	30	0.14	–
House Sparrow, Gråsparv	29	0.14	0.07
Unidentified Crossbill, Obestämd Korsnäbb	29	0.14	1.08
Tree Sparrow, Pilfink	29	0.14	0.04
Green Sandpiper, Skogssnäppa	29	0.14	0.11
Redstart, Rödstart	27	0.13	0.07
Common sandpiper, Drillsnäppa	26	0.12	0.01
Great Crested Grebe, Skäggdopping	23	0.11	–
Treecreeper, Trädskrypare	23	0.11	0.10
Crane, Trana	23	0.11	0.26
Willow Tit, Tallita	20	0.10	0.31
Common Eider, Ejder	19	0.09	–
Black Woodpecker, Spillkråka	18	0.09	0.16
Magpie, Skata	17	0.08	0.03
House Martin, Hussvala	16	0.08	0.26
Buzzard, Ormvråk	16	0.08	0.13
Redwing, Rödvingetrast	16	0.08	0.02
Caspian Tern, Skräntärna	15	0.07	–
Goldeneye, Knipa	14	0.07	0.01
Rosefinch, Rosenfink	14	0.07	0.01
Long-tailed Tit, Stjärtmes	14	0.07	0.04
Spotted Flycatcher, Grå Flugsnappare	13	0.06	0.57
Black Grouse, Orre	13	0.06	0.05
Mistle Thrush, Dubbeltrast	12	0.06	0.11
Bullfinch, Domherre	11	0.05	0.03
Great Black-backed Gull, Havstrut	10	0.05	0.01
Red-backed Shrike, Törnskata	10	0.05	0.25
Jackdaw, Kaja	9	0.04	–
Linnet, Hämpling	8	0.04	–
Wood Lark, Trädlärka	8	0.04	0.08
Skylark, Sånglärka	7	0.03	–
Woodcock, Morkulla	6	0.03	0.01
Parrot Crossbill, Större korsnäbb	6	0.03	–
Thrush Nightingale, Näktergal	5	0.02	0.04
Wheatear, Stenskvätta	5	0.02	0.01
Lapwing, Tofsvipa	5	0.02	–
Whitethroat, Törnsångare	5	0.02	0.08
Winchat, Buskskvätta	4	0.02	0.05
Canada Goose, Kanadagås	4	0.02	–

Teal, Kricka	4	0.02	–
Lesser Spotted Woodpecker, Mindre hackspett	4	0.02	–
Nutcracker, Nötkråka	4	0.02	–
Whooper Swan, Sångsvan	4	0.02	0.01
Wryneck, Göktyta	3	0.01	0.06
Chiffchaff, Gransångare	3	0.01	–
Capercaillie, Tjäder	3	0.01	0.07
Goshawk, Duvhök	2	0.01	0.01
Shelduck, Gravand	2	0.01	–
Icterine warbler, Härmsångare	2	0.01	–
Nightjar, Nattskärra	2	0.01	–
Sedge warbler, Sävsångare	2	0.01	–
Stock Dove, Skogsduva	2	0.01	0.03
Sparrowhawk, Sparvhök	2	0.01	–
Hazelhen, Järpe	1	0.005	–
Redbreasted Flycatcher, Mindre flugsnappare	1	0.005	–
Sum	13 783	66.20	44.93

Appendix 3

Total number of birds registered during the point counts in Simpevarp during 2003. Listed species in bold text. English and Swedish bird names are shown. Densities (No of birds/point) are shown both for 2003 and 2002 for comparison.

Species	No of birds 2003	No of birds/point 2003	No of birds/point 2002
Chaffinch, Bofink	415	1.84	1.53
Great Tit, Talgoxe	263	1.17	0.27
Willow Warbler, Lövsångare	238	1.06	1.35
Blackbird, Koltrast	171	0.76	0.45
Robin, Rödhake	168	0.75	0.46
Blue tit, Blåmes	166	0.74	0.17
Wood Pigeon, Ringduva	131	0.58	0.47
Song thrush, Taltrast	113	0.50	0.66
Siskin, Grönsiska	86	0.38	0.13
Hooded Crow, Kråka	79	0.35	0.21
Cuckoo, Gök	75	0.33	0.40
Yellowhammer, Gulsparv	61	0.27	0.23
Herring Gull, Gråtrut	57	0.25	0.03
Tree Pipit, Trädpiplärka	54	0.24	0.45
Greenfinch, Grönfink	46	0.20	0.08
Green Woodpecker, Gröngöling	32	0.14	0.10
Pheasant, Fasan	30	0.13	0.12
Blackcap, Svarthätta	28	0.12	0.12
Goldcrest, Kungsfågel	25	0.11	0.06
Greylag Goose, Grågås	24	0.11	0.07
Wood Warbler, Grönsångare	24	0.11	0.08
Great Spotted Woodpecker, Större Hackspett	24	0.11	0.07
Mallard, Gräsand	21	0.09	0.11
Mute Swan, Knölsvan	20	0.09	–
Jay, Nötskrika	20	0.09	0.08
Wren, Gärdsmyg	18	0.08	0.13
Nuthatch, Nötväcka	18	0.08	0.02
Tufted Duck, Vigg	18	0.08	–
Raven, Korp	17	0.08	0.08
Goosander, Storskrake	16	0.07	–
Dunnock, Järnsparv	15	0.07	0.17
Pied Flycatcher, Svartvit Flugsnappare	15	0.07	0.13
Barn Swallow, Ladusvala	14	0.06	0.08
Swift, Tornseglare	14	0.06	0.17
Marsh Tit, Entita	13	0.06	0.01
Starling, Stare	13	0.06	0.08
Reed Bunting, Sävsparv	12	0.05	0.03
Crossbill, Mindre Korsnäbb	11	0.05	0.07
House Martin, Hussvala	10	0.04	0.03
Green Sandpiper, Skogssnäppa	10	0.04	0.03

Fieldfare, Björktrast	9	0.04	0.02
Common Snipe, Enkelbeckasin	9	0.04	0.08
White Wagtail, Sädesärå	9	0.04	0.04
Arctic Tern, Silvertärna	9	0.04	–
Coal Tit, Svartmes	9	0.04	0.03
Crested Tit, Tofsmes	9	0.04	0.12
Lesser Whitethroat, Ärtsångare	8	0.04	0.10
Black Grouse, Orre	8	0.04	0.04
Redstart, Rödstart	8	0.04	0.07
Garden Warbler, Trädgårdssångare	8	0.04	0.24
Grey Heron, Häger	7	0.03	0.01
Jackdaw, Kaja	7	0.03	–
Redwing, Rödvingetrast	7	0.03	0.01
Black-headed Gull, Skratmås	7	0.03	–
Cormorant, Storskarv	7	0.03	–
Crane, Trana	7	0.03	0.10
House Sparrow, Gråsparv	5	0.02	–
Buzzard, Ormvråk	5	0.02	0.06
Reed Warbler, Rörsångare	5	0.02	0.01
Bullfinch, Domherre	4	0.02	–
Common Gull, Fiskmås	4	0.02	0.01
Unidentified Crossbill, Obestämd Korsnäbb	4	0.02	0.13
Tree Sparrow, Pilfink	4	0.02	0.02
Black Woodpecker, Spillkråka	4	0.02	0.04
Long-tailed Tit, Stjärtmes	4	0.02	–
Treecreeper, Trädkrypare	4	0.02	0.01
Spotted Flycatcher, Grå Flugsnappare	3	0.01	0.16
Goldeneye, Knipa	3	0.01	–
Lesser Spotted Woodpecker, Mindre hackspett	3	0.01	0.01
Skylark, Sånglärka	3	0.01	–
Magpie, Skata	3	0.01	0.01
Willow Tit, Talltita	3	0.01	0.05
Common sandpiper, Drillsnäppa	2	0.01	–
Osprey, Fiskgjuse	2	0.01	–
Whooper Swan, Sångsvan	2	0.01	–
Great Crested Grebe, Skäggdopping	2	0.01	–
Whitethroat, Törnsångare	2	0.01	0.03
Winchat, Buskskvätta	1	0.004	0.01
Mistle Thrush, Dubbeltrast	1	0.004	0.05
Chiffchaff, Gransångare	1	0.004	–
Icterine warbler, Härmsångare	1	0.004	–
Thrush Nightingale, Näktergal	1	0.004	–
Nutcracker, Nötkråka	1	0.004	–
Stock Dove, Skogsduva	1	0.004	–
Wheatear, Stenskvätta	1	0.004	–
Oystercatcher, Strandskata	1	0.004	–

Red-backed Shrike, Törnskata	1	0.004	0.07
Wood Lark, Trädlärka	1	0.004	0.02
Water Rail, Vattenrall	1	0.004	–
Sum	2866	12.4	10.23

Appendix 4

A. Number of territories and densities (territories/km²) per bird species in territory mapping area A: Ävrö. English and Swedish names are shown. Listed species in bold text.

Species	No of territories	Densities No of territories/km ²
Willow Warbler, Lövsångare	42	138.84
Chaffinch, Bofink	27	89.26
Robin, Rödhake	14	46.28
Blackbird, Koltrast	9	29.75
Blackcap, Svarthätta	9	29.75
Great Tit, Talgoxe	7	23.14
Greenfinch, Grönfink	6	19.83
Wood Warbler, Grönsångare	6	19.83
Yellowhammer, Gulsparv	6	19.83
Goldcrest, Kungsfågel	6	19.83
Song Thrush, Taltrast	6	19.83
Garden warbler, Trädgårdssångare	6	19.83
Wood Pigeon, Ringduva	5	16.53
Tree Pipt, Trädpiplärka	5	16.53
Lesser Whitethroat, Ärtsångare	4	13.22
Marsh Tit, Entita	4	13.22
Dunnock, Järnsparv	4	13.22
Blue Tit, Blåmes	3	9.92
Siskin, Grönsiska	3	9.92
Nuthatch, Nötväcka	3	9.92
Pied Flycatcher, Svartvit flugsnappare	3	9.92
Jay, Nötskrika	2	6.61
Crested Tit, Tofsmes	2	6.61
Treecreeper, Trädkrypare	2	6.61
Cuckoo, Gök	1	3.31
Spotted Flycatcher, Grå flugsnappare	1	3.31
Lesser Spotted Woodpecker, Mindre hackspett	1	3.31
Rosefinch, Rosenfink	1	3.31
Black Woodpecker, Spillkråka	1	3.31
Great Spotted Woodpecker, Större hackspett	1	3.31
Goosander, Storskrake	1	3.31
Coal Tit, Svartmes	1	3.31
Red-backed Shrike, Törnskata	1	3.31
Total	193	638.02

B. Number of territories and densities (territories/km²) per bird species in territory mapping area B: Hålö. English and Swedish names are shown. Listed species in bold text.

Species	No of territories	Densities No of territories/km²
Chaffinch, Bofink	28	106.38
Willow Warbler, Lövsångare	24	91.19
Robin, Rödthake	11	41.79
Blackbird, Koltrast	7	26.60
Goldcrest, Kungsfågel	7	26.60
Great Tit, Talgoxe	7	26.60
Reed Warbler, Rörsångare	5	19.00
Blue Tit, Blåmes	4	15.20
Spotted Flycatcher, Grå flugsnappare	4	15.20
Wood Pigeon, Ringduva	4	15.20
Tree Pipit, Trädpiplärka	4	15.20
Wood Warbler, Grönsångare	3	11.40
Reed Bunting, Sävsparv	3	11.40
Blackcap, Svarthätta	3	11.40
Lesser Whitethroat, Ärtsångare	2	7.60
Siskin, Grönsiska	2	7.60
White Wagtail, Sädesärta	2	7.60
Coal Tit, Svartmes	2	7.60
Song Thrush, Taltrast	2	7.60
Crested Tit, Tofsmes	2	7.60
Common Sandpiper, Drillsnäppa	1	3.80
Marsh Tit, Entita	1	3.80
Cuckoo, Gök	1	3.80
Greenfinch, Grönfink	1	3.80
Yellowhammer, Gulspurv	1	3.80
Goosander, Storskrake	1	3.80
Pied Flycatcher, Svartvit flugsnappare	1	3.80
Willow Tit, Talltita	1	3.80
Garden warbler, Trädgårdssångare	1	3.80
Treecreeper, Trädkrypare	1	3.80
Total	136	516.72

C. Number of territories and densities (territories/km²) per bird species in territory mapping area C: Laxemar. English and Swedish names are shown. Listed species in bold text.

Species	No of territories	Densities No of territories/km ²
Chaffinch, Bofink	28	92.56
Willow Warbler, Lövsångare	23	76.03
Robin, Rödhake	18	59.50
Goldcrest, Kungsfågel	15	49.59
Blackbird, Koltrast	10	33.06
Great Tit, Talgoxe	10	33.06
Garden warbler, Trädgårdssångare	9	29.75
Wren, Gärdsmyg	7	23.14
Wood Warbler, Grönsångare	7	23.14
Blackcap, Svarthätta	5	16.53
Coal Tit, Svartmes	5	16.53
Song Thrush, Taltrast	5	16.53
Blue Tit, Blåmes	4	13.22
Siskin, Grönsiska	3	9.92
Nuthatch, Nötväcka	3	9.92
Great Spotted Woodpecker, Större hackspett	3	9.92
Treecreeper, Trädkrypare	3	9.92
Tree Pipt, Trädpiplärka	3	9.92
Bullfinch, Domherre	2	6.61
Marsh Tit, Entita	2	6.61
Spotted Flycatcher, Grå flugsnappare	2	6.61
Yellowhammer, Gulsparv	2	6.61
Dunnock, Järnsparv	2	6.61
Jay, Nötskrika	2	6.61
Wood Pigeon, Ringduva	2	6.61
Pied Flycatcher, Svartvit flugsnappare	2	6.61
Crested Tit, Tofsmes	2	6.61
Lesser Whitethroat, Ärtsångare	1	3.31
Green Woodpecker, Gröngöling	1	3.31
Tawny owl, Kattuggla	1	3.31
Lesser Spotted Woodpecker, Mindre hackspett	1	3.31
Green sandpiper, Skogssnäppa	1	3.31
Black Woodpecker, Spillkråka	1	3.31
Starling, Stare	1	3.31
Goosander, Storskrake	1	3.31
Willow Tit, Talltita	1	3.31
Total	188	621.49

Appendix 5

Breeding birds in the outer part of the archipelago in 2003. Listed species shown in bold.

Island	Species	No of pairs/nests
Betshällen	Common Eider, Ejder	8
	Great Black-backed Gull, Havstrut	1
	Common Gull, Fiskmås	18
	Herring Gull, Gråtrut	2
	Arctic Tern, Silvertärna	12
Uvöbåde	Common Eider, Ejder	2
	Great Black-backed Gull, Havstrut	1
Friskär	Mute Swan, Knölsvan	1
	Greylag Goose, Grågås	1
	Common Eider, Ejder	4
	Oystercatcher, Strandskata	1
	White Wagtail, Sädesärla	1
	Whitethroat, Törnsångare	1
Stora Rönnen	Mute Swan, Knölsvan	1
	Greylag Goose, Grågås	8
	Mallard, Gräsand	2
	Tufted Duck, Vigg	7
	Common Eider, Ejder	32
	Redbreasted Merganser, Småskrake	2
	Oystercatcher, Strandskata	1
	Redshank, Rödbena	1
	Herring Gull, Gråtrut	65
	Great Black-backed Gull, Havstrut	9
	Arctic Tern, Silvertärna	12
	Rock Pipit, Skärpiplärka	2
	White Wagtail, Sädesärla	1
	Wheatear, Stenskvätta	1
	Whitethroat, Törnsångare	1
	Lesser Whitethroat, Ärtsångare	1
	Willow Warbler, Lövsångare	1
Chaffinch, Bofink	1	
Lilla Rönnen	Greylag Goose, Grågås	2
	Common Eider, Ejder	9
	Common Gull, Fiskmås	2
	Rock Pipit, Skärpiplärka	1
Stora Skjutegrundet	Mute Swan, Knölsvan	1
	Greylag Goose, Grågås	1
	Common Eider, Ejder	4
	Common Sandpiper, Drillsnäppa	1
	Black-headed Gull, Skrattmås	4
	Arctic Tern, Silvertärna	3
	Rock Pipit, Skärpiplärka	1
White Wagtail, Sädesärla	1	

Lilla Skjutegrundet	Common Eider, Ejder	2
	Oystercatcher, Strandskata	1
	Common Gull, Fiskmåås	2
Stubbskärsrev	Mute Swan, Knölsvan	1
	Tufted Duck, Vigg	1
	Common Eider, Ejder	2
	Arctic Tern, Silvertärna	2
Stora Örskäret	Greylag Goose, Grågås	1
	Mallard, Gräsand	1
	Tufted Duck, Vigg	3
	Common Eider, Ejder	4
	Redbreasted Merganser, Småskrake	1
	White wagtail, Sädesärta	1
Lilla Örskäret	Tufted Duck, Vigg	2
	Common Eider, Ejder	4
	Oystercatcher, Strandskata	1
	Common Gull, Fiskmåås	2
	Great Black-backed Gull, Havstrut	1
Soen	Common Eider, Ejder	1
	Great Black-backed Gull, Havstrut	1
	House Martin, Hussvala	4
	Tufted Duck, Vigg	2
Stångskär	Common Eider, Ejder	4
	Common Gull, Fiskmåås	3
	Great Black-backed Gull, Havstrut	1
	Arctic Tern, Silvertärna	3
	Common Eider, Ejder	3
Dantaskär	Redbreasted Merganser, Småskrake	1
	Oystercatcher, Strandskata	1
	Great Black-backed Gull, Havstrut	1
	Mute Swan, Knölsvan	1
Fjöleskär	Tufted Duck, Vigg	2
	Common Eider, Ejder	4
	Redbreasted Merganser, Småskrake	1
	Oystercatcher, Strandskata	1
	Common Gull, Fiskmåås	4
	Arctic Tern, Silvertärna	12
	White Wagtail, Sädesärta	1
Boskärsarkipelagen	Great Crested Grebe, Skäggdopping	2
	Mute Swan, Knölsvan	3
	Greylag Goose, Grågås	13
	Teal, Kricka	2
	Mallard, Gräsand	6
	Shoveler, Skedand	1
	Tufted Duck, Vigg	16
	Common Eider, Ejder	60
	Redbreasted Merganser, Småskrake	4
	Oystercatcher, Strandskata	3
	Ringed Plover, Större strandpipare	2

Redshank, Rödbena	2
Common Sandpiper, Drillsnäppa	1
Turnstone, Roskarl	3
Black-headed Gull, Skrattmås	33
Common Gull, Fiskmås	28
Herring Gull, Gråtrut	95
Great Black-backed Gull, Havstrut	10
Caspian Tern, Skräntärna	1
Arctic Tern, Silvertärna	36
Rock Pipit, Skärpiplärka	2
White Wagtail, Sädesärta	3
Wheatear, Stenskvätta	1
Lesser Whitethroat, Ärtsångare	1
Whitethroat, Törnsångare	1

Appendix 6

Breeding waterbirds in the inner archipelago within the local model area (see Figure 2-1) 2003. Listed species are shown in bold.

Species	Get-bergs-fjärden	Bor-holms-fjärden	Norre fjärd	Gran-holms-fjärden	S Kärnkraftverket	Lång-skär	Strömsö	St Örningsholmen	Bylingen	Total
G Crested Grebe										
Skägg-dopping	1	4	1	2		1	1	1		11
Grey Heron										
Häger					75					75
Mute Swan										
Knölsvan		3	1	1	1	2	1	1		10
Greylag Goose										
Grågås	2	2	1		2	3	1	1	2	14
Canada Goose										
Kanadagås		1								1
Teal										
Kricka		1								1
Mallard										
Gräsand	3	3	1	1	3	4	2	2	1	20
Tufted Duck										
Vigg		2	2		2	4			2	12
Common Eider										
Ejder	2				3	2				7
Velvet Scoter										
Svärta					1					1
Goldeneye										
Knipa			1	1						2
Goosander										
Storskrake		3	1	1		2				7
Redshank										
Rödbena		1				1				2
Green Sandpiper										
Skogssnäppa		1								1
Common Sandpiper										
Drillsnäppa	3	3	1	1	1	1	2			12
Common Tern										
Fisktärna		9								9
Sum	11	33	9	8	89	20	7	5	5	185

Appendix 7

Total numbers of birds registered during point counts made at small islands in the inner archipelago (see Figure XX). Listed species are shown in bold.

Species	No of birds	No of birds/Point
Chaffinch, Bofink	46	1.70
Willow Warbler, Llövsångare	29	1.07
Greylag Goose, Grågås	28	1.04
Grey Heron, Häger	18	0.67
White Wagtail, Sädesärla	16	0.59
Lesser Whitethroat, Ärtsångare	14	0.52
Mute Swan, Knölsvan	14	0.52
Mallard, Gräsand	12	0.44
Swift, Tornseglare	11	0.41
Greenfinch, Grönfink	10	0.37
House Martin, Hussvala	10	0.37
Great Tit, Talgoxe	10	0.37
Common Sandpiper, Drillsnäppa	9	0.33
Barn Swallow, Ladusvala	9	0.33
Common Eider, Ejder	6	0.22
Common Tern, Fisktärna	5	0.19
Cuckoo, Gök	5	0.19
Herring Gull, Gråtrut	5	0.19
Siskin, Grönsiska	5	0.19
Hooded Crow, Kråka	5	0.19
Redstart, Rödstart	5	0.19
Tree Pipit, Trädpiplärka	5	0.19
Thrush Nightingale, Näktergal	4	0.15
Caspian Tern, Skräntärna	4	0.15
Blue Tit, Blåmes	3	0.11
Great Black-backed Gull, Havstrut	3	0.11
Blackbird, Koltrast	3	0.11
Redshank, Rödbena	3	0.11
Arctic Tern, Silvertärna	3	0.11
Goosander, Storskrake	3	0.11
Blackcap, Svarthätta	3	0.11
Whitethroat, Törnsångare	3	0.11
Common Gull, Fiskmå	2	0.07
Canada Goose, Kanadagås	2	0.07
Goldeneye, Knipa	2	0.07
Robin, Rödhake	2	0.07
Reed Bunting, Sävsparv	2	0.07
Lesser Black-backed Gull, Silltrut	2	0.07
Great Crested Grebe, Skäggdopping	2	0.07
Black-headed Gull, Skratmå	2	0.07
Black Woodpecker, Spillkråka	2	0.07
Goldfinch, Steglits	2	0.07
Pied Flycatcher, Svartvit flugsnappare	2	0.07

Crane, Trana	2	0.07
Tufted Duck, Vigg	2	0.07
Marsh Tit, Entita	1	0.04
Spotted Flycatcher, Grå flugsnappare	1	0.04
Chiffchaff, Gransångare	1	0.04
Green Woodpecker, Gröngöling	1	0.04
Wood warbler, Grönsångare	1	0.04
Goldcrest, Kungsfågel	1	0.04
Sparrowhawk, Sparvhök	1	0.04
Hawfinch, Stenknäck	1	0.04
Wheatear, Stenskvätta	1	0.04
Great Spotted Woodpecker, Större hackspett	1	0.04
Coal Tit, Svartmes	1	0.04
Song Thrush, Taltrast	1	0.04
Sum	347	12.85
