

Hanöbukten, an important wintering area for waterbirds in South Sweden

Hanöbukten, ett viktigt övervingringsområde för sjöfåglar i södra Sverige

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Abstract

Hanöbukten in SE Sweden (including Blekinge archipelago) is an important wintering and staging area for a number of waterbird species. The inshore parts have been covered by counts from the shore during the International Waterbird Counts (IWC) since 1969. In the present study we analyze these counts for the period 1969–2014. When the counts started the total number of wintering waterbirds varied between 20 000 and 40 000 per year. However, from the early 1990s the number doubled, reaching 60 000 to 80 000 birds per year. All species with the exception of the Long-tailed Duck *Clangula hyemalis* showed similar increase. The area had a high proportion of the Swedish wintering population of Pochard *Aythya*

ferina and Smew *Mergellus albellus*. Large numbers of Tufted Duck *Aythya fuligula* also wintered in the area, and some parts of the archipelago had internationally important concentrations of Tufted Duck and Smew. The increase in numbers in the study area showed the same pattern as in all Sweden and was most probably a result of milder winters in recent years.

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Introduction

The Blekinge archipelago in the innermost part of Hanöbukten, is the southernmost archipelago area in Sweden, showing a somewhat different appearance from the larger archipelago areas further north in the Baltic Sea and on the Swedish west coast. The Blekinge archipelago is rather shallow with few islands further out to sea compared with the other archipelagos in Sweden. Together with the offshore parts of Hanöbukten, the area has been well-known as an important area for various species of wintering waterbirds. Being the southernmost archipelago in the country it offers vast shallow feeding areas and sheltered wintering areas for the waterbirds, and the area remain free of ice for a longer period of the winter than the archipelagos further to the north in the Baltic Sea.

When the International Waterfowl Counts (IWC) started in 1967 it was realized that this area was important to cover on a regular basis. Thus from 1969, large scale annual counts have been organized from the shore in a systematic way covering most of the inshore parts of Hanöbukten from Åhus

to Torhamnns udde (Figure 1) producing a valuable long-term dataset allowing us to analyze the change in numbers of the populations of wintering waterbirds over more than four decades.

From the early years it was also well-known that the offshore parts of Hanöbukten were important

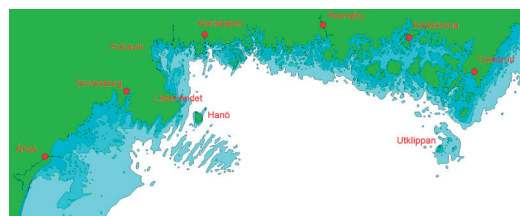


Figure 1. Map of the northern part of Hanöbukten (mainly the Blekinge archipelago), showing the position of different areas mentioned in the text. Blue color denotes different depth from <6 m, 6–10 m and 10–20 m, when going from darker to lighter tone.

Karta över norra delen av Hanöbukten (huvudsakligen Blekinge skärgård) med de i texten nämnda lokalerna markerade. Blå färg markerar olika djup från <6 m, 6–10 m och 10–20 m när man går från mörkare till ljusare nyanser.







Figure 2. Different habitats in the archipelago of Blekinge.
Habitatbilder från olika delar av Blekinges skärgård.



for wintering seabirds and regular surveys were undertaken in the area from the patrol boats of the Swedish Coast Guard during the 1960ies and 1970s (Nilsson 1972, 1980). In later years, extensive aerial surveys of the offshore parts of Hanöbukten were performed as part of Baltic Sea-wide surveys in 2007–2011 and in 2016 (Nilsson 2012, 2016).

In the present paper we summarize the surveys of wintering water birds undertaken in inshore parts of the area (the archipelago of Blekinge and adjacent areas in NE Skåne) during the years 1969–2014 to illustrate the importance of the area and to investigate the changes in the wintering water bird populations. The occurrence of seabirds in the offshore waters of Hanöbukten will not be analyzed here as these aspects have been treated previously (see Nilsson 1972, 2012, 2016, Nilsson et al. 2016).

Study area

The western part of Hanöbukten (Skåne) is mainly characterized by large sandy beaches, whereas the northern, inshore parts of the area, which has been covered by the counts presented here, is mainly an archipelago habitat (Figure 1). The islands in the northeastern part of Skåne (Åhus) and eastwards to Sölvesborg in Blekinge are small, low moraine islands. Vast areas of very shallow waters are found in this area, especially around the islands.

The western part of Blekinge, Listerlandet, has an open coast but the part from Pukavik to Torhamn a vast archipelago. The western part of the archipelago is rather narrow and mostly made up of rocky islands, and rather narrow. In the eastern part of the archipelago, from SE of Ronneby to Torhamn, there is a chain of larger islands separating the inner waters from the more exposed outer areas. Even if there are rocky islands also in this area, moraine islands dominate. Some typical areas are shown in Figure 2.

The inner parts of the archipelago are characterized by large areas of shallow water and extensive meadows of underwater vegetation with a rich fauna of different important food species, e.g. crustaceans, molluscs and other invertebrates. The marine habitats of the area were extensively studied during the MARMONI- project and are thoroughly documented in Wijkmark et al. (2015).

In the west, Hanö is a more isolated island separated from the mainland. In the east a group of small skerries, Utklippan, is situated far out at sea

south of Torhamns udde. These two areas are not included in the regular surveys but have been covered from the air on some occasions.

Methods

The waterbird counts in the inner parts of Hanöbukten are a part of the International Waterfowl Counts (IWC). In this project the entire Swedish coast has been divided into smaller counting units that are covered by observers from the ground (cf. Nilsson 1975, 2008, Nilsson & Haas 2016). Observations are made from observation points using telescope and binoculars.

In the archipelago it is not possible to cover all sectors completely, because parts of a sector can be concealed behind an island. Instead, in the present study, the observation points were selected so that it was possible to cover all important parts of the sectors. As the counts were made in the same way, using the same observation points, over the years, the total numbers obtained will be fully comparable between years and over the long-term period.

On some occasions (1971–1973, 1987–1989, 2004 and 2015), country-wide midwinter surveys were undertaken in the inshore waters of the Swedish coast using a combination of aerial surveys and ground counts (Nilsson 1975, 2008, Nilsson & Haas 2016). On these occasions aerial surveys have also been made in the Blekinge archipelago, showing that the ground counts discussed here give a representative picture of the waterbird communities in the area. In connection with these aerial surveys, Hanö and Utklippan were also surveyed.

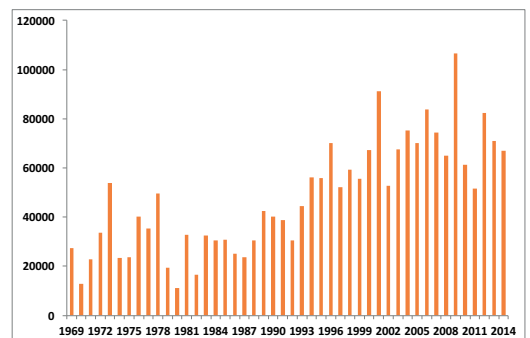


Figure 3. Total number of waterbirds counted in the Blekinge archipelago and NE Skåne at the midwinter counts in 1969–2014.

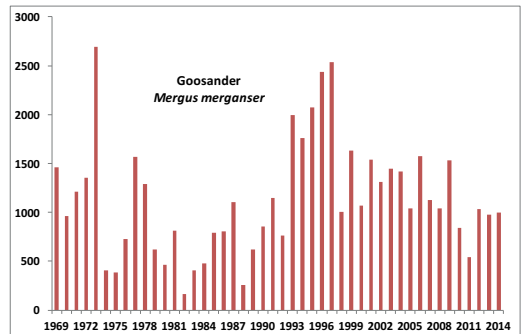
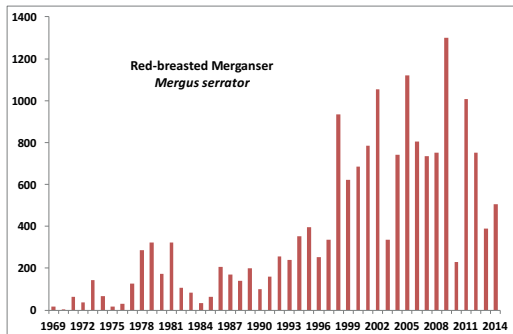
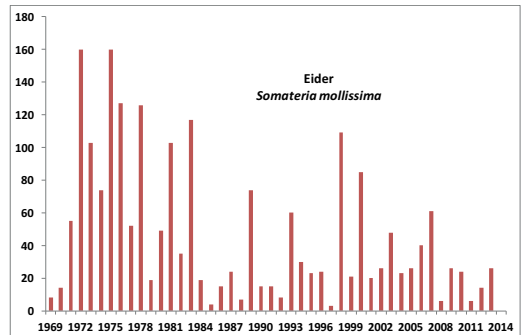
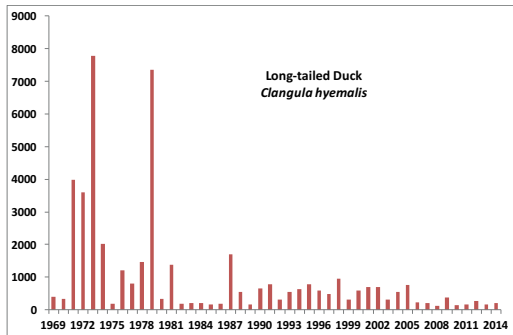
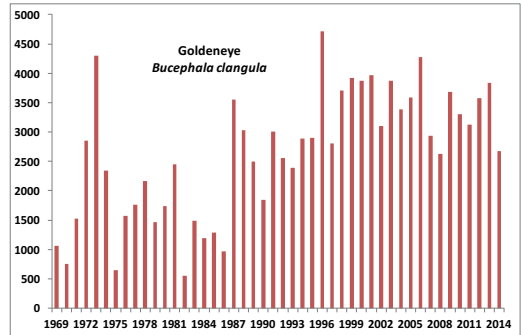
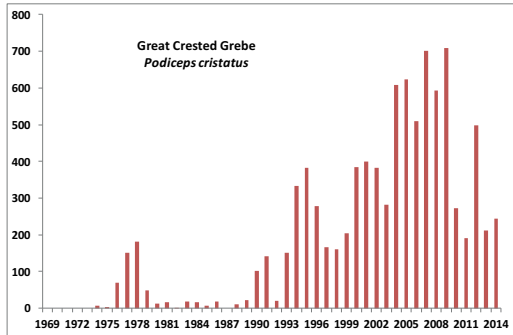
Totalantalet inräknade sjöfåglar i Blekinge skärgård och NE Skåne vid midvinterinventeringarna 1969–2014.

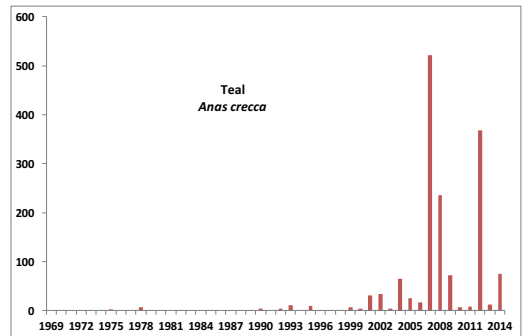
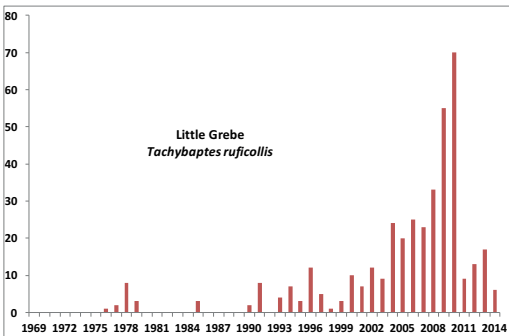
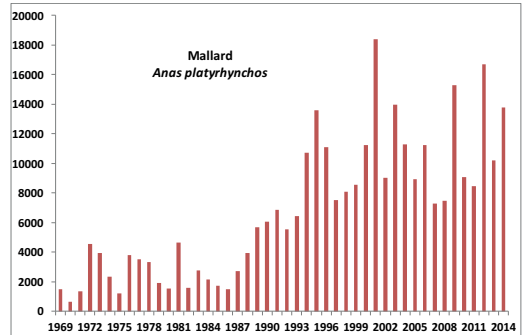
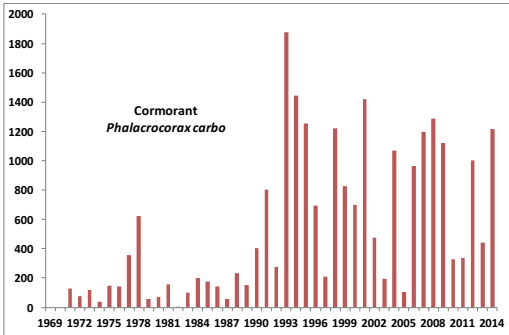
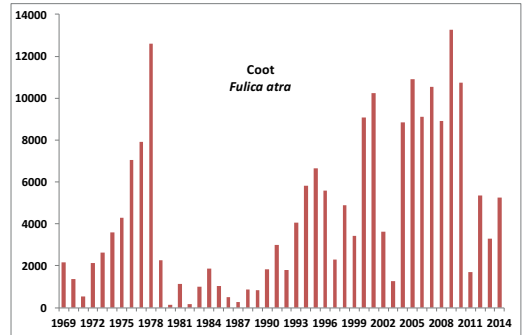
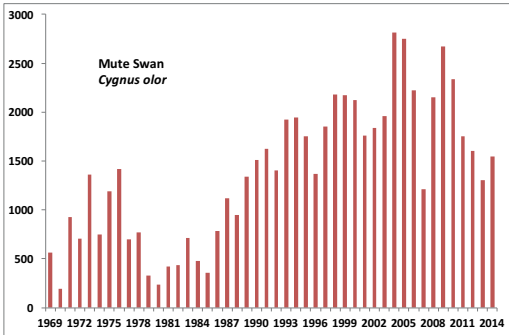
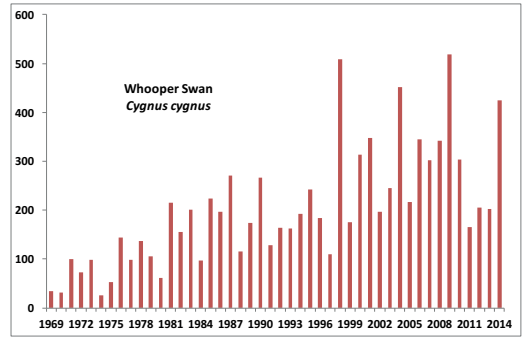
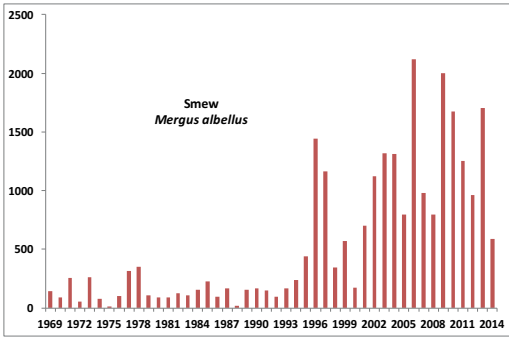
Two different teams have surveyed the areas between Åhus and Sölvesborg (Skåne) and between Sölvesborg and Torhamn, however the same observers have covered the same sectors over a long period of years.

Results

When the counts started in 1969 (some areas were counted during the first years of the IWC, 1967

and 1968, but 1969 was the first year with a full cover count), the total annual number of waterbirds counted was in the order of 25 000 (Figure 3). The total number of waterbirds in the surveyed area did not show any clear trend for the first twenty years, merely fluctuations around a mean between 20 000 and 30 000 with one peak of more than 50 000. During the 1990s, the numbers of wintering birds started to increase reaching annual means between 60 000 and 80 000 for the





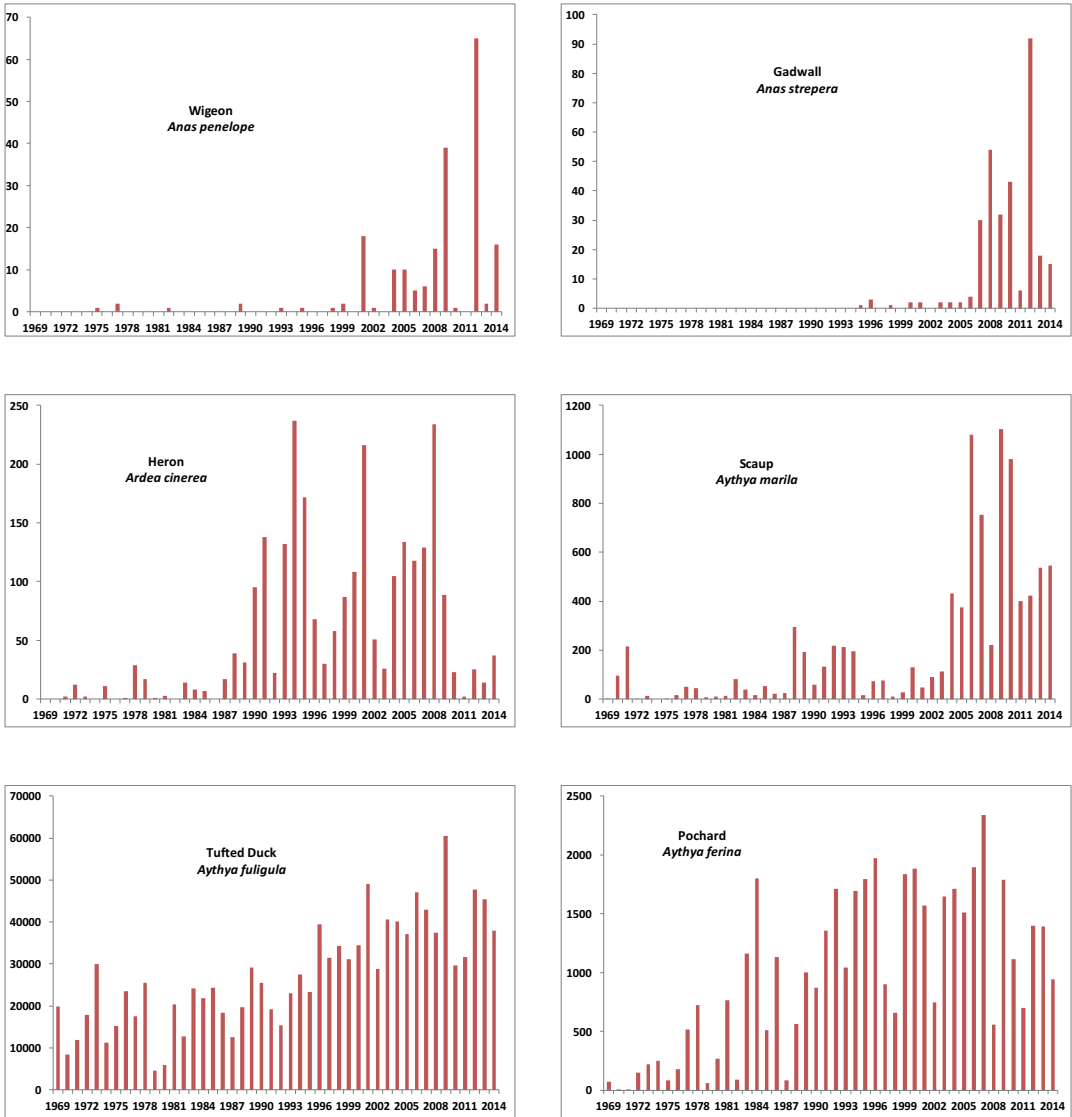


Figure 4. Total numbers counted of different waterbird species in the Blekinge archipelago and NE Skåne 1969–2014. *Antalet inräknade individer av olika sjöfågelarter i Blekinge skärgård och NE Skåne 1969–2014.*

mid-1990s and a top value of more than 100 000 in January 2009.

The results for the different species will be presented in a series of graphs (Figure 4) and maps showing the distribution of some waterbird species in the area in January 2012, a typical mild winter for the more recent part of the survey period (Figure 5).

During the first years of IWC in Sweden very

few grebes were counted in the country. Larger number of Great-crested Grebes *Podiceps cristatus* being counted first during the mild winters in the 1970s with small numbers also being seen in the following years until the 1990ies. The same applies to Hanöbukten, where some flocks were seen during these years (Figure 4). During the 1980s only small numbers were counted and it was not until the 1990s, when an increase in the wintering num-

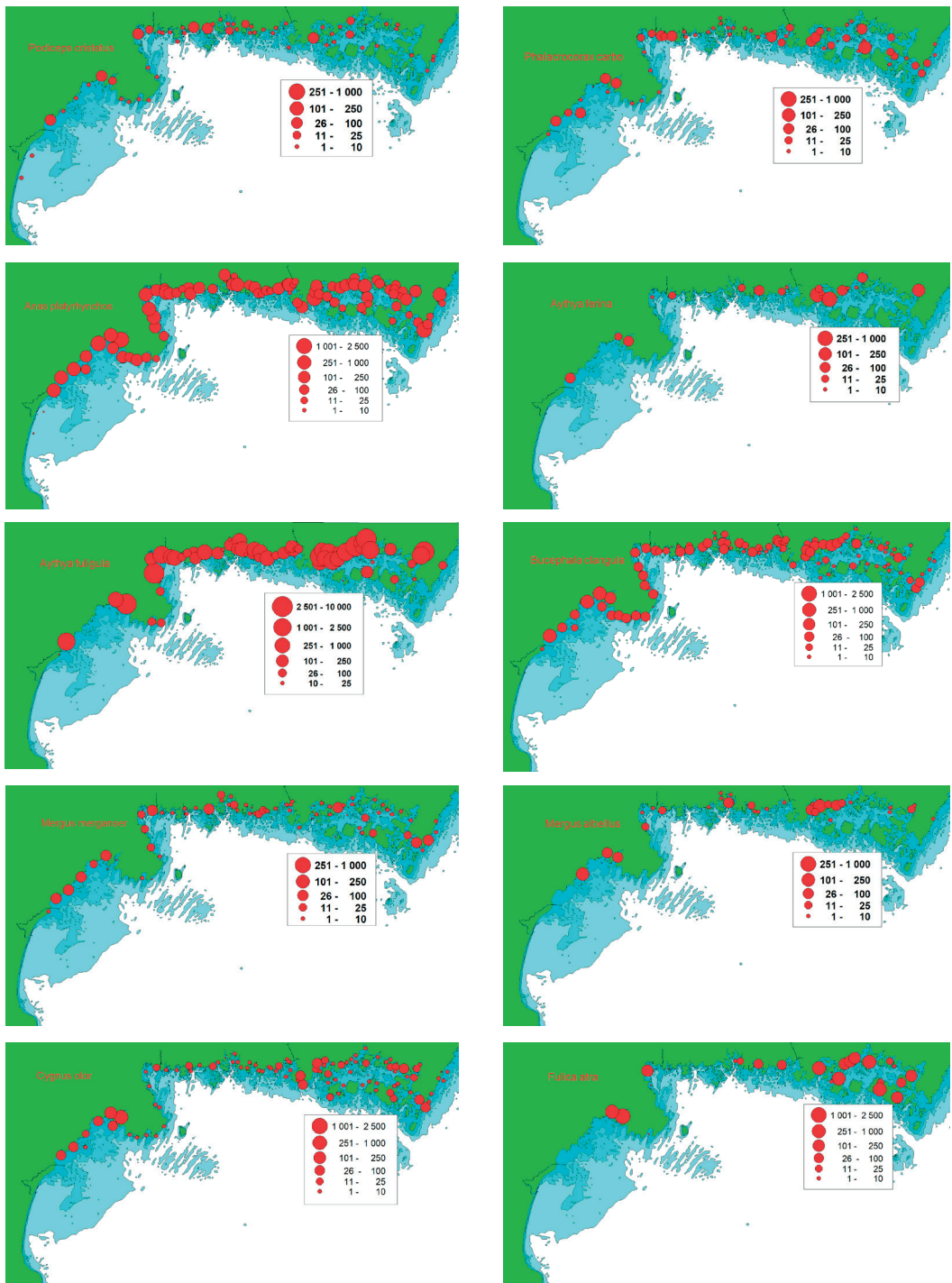


Figure 5. Distribution of some waterbird species in the Blekinge archipelago and NE Skåne at the midwinter count in January 2012.

Utbredning för några olika sjöfågelarter i Blekinge skärgård och NE Skåne vid midvinterinventeringen i januari 2012.

bers started, reaching peaks of 600–700 wintering grebes in 2005–2010. The Great-crested grebes were found in groups well spread out over the area (Figure 5). During 1969–1990, Little Grebes *Tachybaptus ruficollis* were only seen in smaller numbers in some years. However, this species has become more regular in later years, with a peak count of 70 individuals in 2010. Small numbers of Slavonian Grebe *Podiceps auritus* and Red-necked Grebe *Podiceps griseigena* were seen in several winters.

Cormorant *Phalacrocorax carbo* and Grey Heron *Ardea cinerea* show similar pattern in the counts, although the Cormorant has been much more common than the Heron. Both species have increased a lot in numbers after 1990 and especially the Heron was more irregular before 1990 (Figure 4). The Cormorant is normally evenly spread over the entire area in midwinter (Figure 5).

The Mallard *Anas platyrhynchos* has been a common species in the study area since the start of the counts. It shows a similarly increasing pattern as several other waterbird species, with relatively low numbers (2 000–4 000) during the first half of the study period and then a marked increase to a level between 8 000 and 10 000 with some higher peaks during the latter part of the study period (Figure 4). The Mallard is normally distributed over the entire study area (Figure 5). Before 2000, only single individuals of other dabbling ducks were seen in the area in the winter. After 2000, also Teal *Anas crecca*, Wigeon *Anas penelope* and Gadwall *Anas strepera* were regularly counted although in quite low numbers (Figure 4), and Pintail *Anas acuta* and Shoveler *Anas clypeata* were seen in single individuals in some winters.

The Tufted Duck *Aythya fuligula* was the most common waterbird species in the area. Until the mid-1990s numbers fluctuated around 20 000 with up to 30 000 in one year (Figure 4), then numbers increased to around 40 000 in later years with a peak of 60 000 in 2009. The Tufted Duck was distributed all over the inner bays of the archipelago from Pukavik to Torhamn and also in some bays in the western part of the area (Figure 5). The Tufted Duck is night active and it roosts in protected areas during daytime from which it disperses over the feeding areas in the evening. The largest number of Tufted Ducks were found in the shallow bays between Gö (east of Ronneby) and Karlskrona. In this area, the numbers exceeded the criteria for being identified as of international importance (Figure 6).

Together with the Tufted Ducks, but also to some extent in pure flocks, reasonable numbers of win-

tering Scaup *Aythya marila* and Pochard *Aythya ferina* were found on some sites in the archipelago. Larger numbers of Scaup were only found during 2005–2014, with peaks of more than 1 000 in 2006 and 2009. The Pochard was sparse when the counts started but then increased to a higher level from the mid-1980s, showing fluctuations between years with very few in the ice winter of 1987 and a peak of more than 2 000 in 2007. The Pochard was found in the same sites as the Tufted Duck with the largest flocks in the areas west of Karlskrona (Figure 5).

With the exception of a marked peak with more than 4 000 individuals in 1974, the Goldeneye *Bucephala clangula* shows the same picture as most of the other species with lower counts during the years until the late 1980s and then fluctuations between 3 000 and 4 000 in later years (Figure 4). The Goldeneye was spread all along the coast, both along open shores in the west and in the archipelagos in the east, but flocks were generally smaller east of Karlskrona (Figure 5).

During the early years of the study large flocks of Long-tailed Ducks *Clangula hyemalis* were seen in some years from the shores of the western part of the study area and in Pukavik, where in two years counts of more than 7 000 were obtained. These areas are close to the main offshore areas used by the species in Hanöbukten (Nilsson 1972, 2012). In later years, only small numbers of Long-tailed Ducks were counted from the shore in the study area. Very few Long-tailed Ducks were counted in the archipelago, a picture that was verified during aerial surveys in 2007–2009 and 2016 (Nilsson 2012). For the offshore distribution, see Nilsson (2016) and Nilsson et al. (2016).

Scoters *Melanitta* spp. were only seen in very low numbers in the land-based counts, but can occur in the offshore areas with large numbers in some years (Nilsson 2012). In spite of Blekinge archipelago being a breeding area for the Eider *Somateria mollissima*, small and decreasing numbers were found in this area in the midwinter counts (Figure 4).

The Red-breasted Merganser *Mergus serrator* is a species that prefers open coasts and is normally seen in small numbers in the archipelago, and most individuals counted occurred in the western part of the study area. Few individuals were counted in the first years but numbers increased during the latter part of the study, and in some years more than 1 000 were counted (Figure 4).

The Goosander *Mergus merganser* is a more wide-spread species with flocks appearing in all

parts of the area with the exception of Listerlandet (Figure 5). The number of Goosanders over the study period show a more variable picture that differs somewhat from the other species, with one high count in 1973 and some high counts in the late 1990ies (Figure 4).

The Smew *Mergus albellus* shows a pattern that is more similar to the other species with low fluctuating counts until the mid-1990ies, when numbers increased markedly although showing large variation between years. The highest count during the study period was 2 000 birds in 2006 (Figure 4). The Smeews occurred in flocks in some protected areas in the archipelago with the majority being found in the shallow areas west of Karlskrona (Figure 5).

Both the Whooper Swan *Cygnus cygnus* and the Mute Swan *Cygnus olor* increased over the study period although the increase for the Mute Swan started already in the 1980s as for several other species (Figure 4). Mute Swans were well spread out over the study area without any marked concentrations (Figure 5).

The Coot *Fulica atra* is the species that shows the largest changes in numbers in the data from the inner parts of Hanöbukten (Figure 4). During the early part of the study, there was a very marked increase from 2 000 to 12 000 over a short period of years. Then, after the hard winter of 1979 hardly any Coots were found in the area in 1980 and the same was true for the hard ice winters of 1982 and

1987. In the 1990s the numbers started to increase again, with annual fluctuations, before a peak of almost 13 000 was reached in 2009. The Coot was found in protected areas within the archipelago (Figure 5).

Discussion

From the count results presented here it is clear that Hanöbukten is an important wintering area for several species of waterbirds. During recent years, two country-wide surveys of wintering waterbirds have been undertaken in Sweden, in 2004 (Nilsson 2008) and 2015 (Nilsson & Haas 2016). In these two surveys of the whole Swedish coastline, for some species Hanöbukten was harboring a high proportion of the total wintering population. The largest concentration was noted for the Pochard, where Hanöbukten had 51% and 78%, respectively of the population. The area also had a high proportion of the Swedish wintering population of the Smew (27%, resp. 18%) and the Coot (26% resp. 55%). For the most common species in the inshore parts of Hanöbukten, the Tufted Duck, the area accounted for 14% (2004) and 21% (2015), respectively. It should however be noted that the number of counted Tufted Ducks in Hanöbukten did not differ between 2004 and 2015, as it was actually the total wintering population of Tufted Ducks in Sweden that was lower in 2015 than in 2004 (Nilsson & Haas 2016).

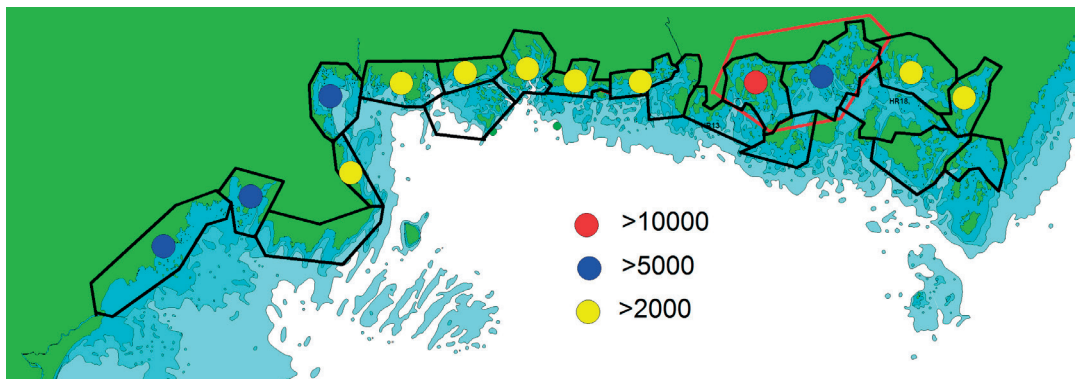


Figure 6. Important wintering areas for waterbirds in the inner parts of Hanöbukten. The smaller counting units have been grouped into larger, more functional units. The colour symbols show the mean total waterfowl counts for the larger units for the last decade. The area marked with red denotes an area classified as internationally important for the Tufted Duck and Smew according to the criteria of Wetlands International (Delany & Scott 2006).

Viktiga övervintringsområden för sjöfåglar i den inre delen av Hanöbukten. De små räkningsenheterna har slagits samman till större mer funktionella enheter. Färgerna betecknar medeltalet sjöfåglar inom respektive enhet för den senaste tioårsperioden. Det med rött markerade området uppfyller kriterierna för internationell betydelse för vigg och salskrake enligt Wetlands International (Delany & Scott 2006).

To establish the importance of different parts of the study area for wintering waterbirds, the counts from the smaller counting sectors were joined into “functional units” (Figure 6). For these units the mean wintering numbers of all species were calculated for the last ten years, providing indications of which areas were the most important for the wintering waterbirds. Combining two of these functional units west of Karlskrona (Figure 6), the mean counts for Tufted Duck and Smew exceed the criteria for a wintering site of international importance according to Wetlands International (Delany & Scott 2006).

As is apparent from Figure 4, most wintering species in the inshore areas of Hanöbukten show an increase over the 45 years long study period. Seven species were counted in such numbers that TRIM-indices for the period 1971–2015 could be calculated with some confidence for different regions along the Swedish coast (Nilsson & Haas 2016). Of these, Mallard, Tufted Duck, Goldeneye, Red-breasted Merganser, Mute Swan and Coot showed highly significant increasing trends in the study area, whereas no trend was found in the number of wintering Goosanders. Significantly increasing trends were found for Mallard, Tufted Duck, Goldeneye and Mute Swan for other east-coast regions of Sweden.

More local wintering species occurring in high numbers in Hanöbukten like the Pochard and the Smew, both showed nationally increasing trends in Sweden (Nilsson & Haas 2016).

The number of Long-tailed Ducks seen in the inner parts of Hanöbukten showed a marked decrease and this was also the case for the inshore parts of the coasts of Skåne and the offshore areas of Hanöbukten (Nilsson 2012, 2016). The Eider also showed a decrease over the years although it was counted in small numbers in the inner parts of Hanöbukten.

The regional trends presented here are fairly similar to the national trends for these species (Nilsson & Haas 2016). Nationally, all species except the Long-tailed Duck showed significantly increasing trends over the entire series of midwinter counts. There were, however, fluctuations and several species had decreased over the last ten years in the nation-wide counts. With counts in only one region, it is difficult to separate changes due to real changes in population size and changes in winter distribution dependent on climate change and milder winters.

Nilsson & Haas (2016) compared the distribution patterns of the more common coastal winter-

ing waterbirds between the country-wide surveys in 1971, 2004 and 2015 and found a marked shift northward in the Baltic Sea archipelagos related to more ice-free conditions in recent years. On a larger scale, Lehtikoinen et al. (2013) analyzed the IWC data for the Tufted Duck, Goldeneye and Goosander in NW Europe and found marked increases in the north and decreases further to the south in Europe. Similar changes in the distribution on a larger scale was found for the Smew (Pavo-Jordan et al. 2015), which could explain the marked increase for these species in Swedish coastal areas including the Blekinge archipelago.

Acknowledgements

The waterfowl counts in the area is a part of the International Waterfowl Counts (IWC) in Sweden supported by the Swedish Environmental Protection Agency. Over the years, several observers have taken part in the counts. In the Hanöbukten area, we would like to give our sincere thanks to Thomas Nilsson, Johan Wolgast, Ulf Oscarsson, Rolf Larsson, Lars Olsson, Jörgen Westergren and observers from Nordöstra Skånes Fågelklubb.

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Sammanfattning

Blekinge skärgård i den inre delen av Hanöbukten är den sydligaste skärgården i Sverige och visar lite annan karaktär än övriga skärgårdar längre norrut i landet. Tillsammans med de yttre delarna av Hanöbukten har området också blivit känt som ett viktigt övervintringsområde för olika sjöfågelarter. Som den sydligaste skärgården i landet erbjuder den stora grunda födosöksområden för sjöfågeln samt skyddade övervintringsområden. Området är också isfritt under längre perioder än övriga kustområden

När de internationella midvinterinventeringarna av sjöfågel startade stod det klart att området var viktigt att täcka vid inventeringarna. Med start 1969 har omfattande årliga inventeringar utförts i de strandnära områdena på ett sätt så att merparten av de inre områdena kunnat täckas.

I denna uppsats analyserar vid materialet från de landbaserade inventeringarna för perioden 1969–2014. Hanöbukten är också ett viktigt område för havslevande dykänder, speciellt alfågeln. Förekomsten av dessa arter har tidigare behandlats av Nilsson (2012), Nilsson (2016) samt Nilsson et al. (2016).

Undersökningsområde

Den västra delen av Hanöbukten (Skåne) kännetecknas av vidsträckta sandstränder, medan den del som diskuteras här (Figur 1) i huvudsak utgörs av skärgård. En mindre skärgård återfinns i NE Skåne. I Blekinge är den västra delen mestadels öppen kust, men från Pukavik till Torhamn utbreder sig en

skärgård. I väster är denna mest av urbergskaraktär, medan den östra skärgården har mest karaktär av moränöar. Olika delar av skärgården visas i bilder i Figur 2.

De inre delarna av skärgården kännetecknas av vidsträckta grunda områden med rik undervattensvegetation och goda födosöksförhållanden för sjöfågeln. De marina habitaterna har studerats intensivt under MARMONI-projektet och har dokumenterats i Wijkmark et al. (2015).

Metodik

Inventeringarna i Hanöbukten ingår i de internationella midvinterinventeringarna av sjöfågel. Inom ramen för detta projekt har hela den svenska kusten delats in i mindre räkningsenheter, vilka täcks av markbaserade observatörer från olika observationsposter varifrån man kan täcka området med kikare eller tubkikare.

I en skärgård är det inte möjligt att täcka alla sektorer fullständigt vid markbaserade inventeringar eftersom delar av området kan döljas bakom öar. Inventeringarna har emellertid genomförts på ett standardiserat sätt så att resultaten mellan olika år skall kunna jämföras.

Vid några tillfällen har landsomfattande inventeringar genomförts av de inre svenska farvattnen, varvid en kombination av landbaserade inventeringar och flyginventeringar använts (Nilsson 1975, 2008, Nilsson & Haas 2015). Vid dessa tillfällen har flyginventeringar också genomförts i skärgårdarna i Blekinge och inom övriga delar av Hanöbukten. Dessa inventeringar har visat att de årliga landbaserade inventeringarna ger en representativ bild av fågelförekomsten i området.

Resultat

Under de första 20 - 25 åren visade inventeringarna ingen klar tendens i antalet övervintrande sjöfåglar utan detta varierade mellan olika år, bl.a. i relation till variationer i vinterns ”hårdhet”. Med början på 1990-talet har ett generellt ökande antal övervintrande sjöfåglar i området noterats och mer än 100000 noterades i januari 2009 (Figur 3). Antalet övervintrande sjöfåglar var generellt sett ungefär dubbelt så många under senare delen av undersökningsperioden jämfört med när inventeringarna startade.

I rapporten redovisas antalet övervintrande sjöfåglar av de olika arterna i en serie diagram för de arter som regelbundet noterades i någorlunda stora antal (Figur 4). Rent generellt kan konstateras att

alla arter som förekommer i de inre farvattnen ökat med undantag för alfågeln. Denna art har visserligen sin huvudförekomst i de yttre havsområdena, men i början av undersökningsperioden kunde betydande antal alfåglar räknas från stränderna, vilket inte varit fallet under senare år.

Förutom den generella ökningen som noterats för i princip alla arter så har tre arter etablerats som regelbundna övervintrare i området under perioden, nämligen kricka, bläsand och snatterand.

Utbredningen för de vanligaste arterna exemplifieras i en serie kartor baserade på inventeringarna under den förhållandevis milda vintern 2012 (Figur 5). Gräsand, knipa, storskrake och knölsvan var tämligen väl spridda över hela området, medan övriga arter var mer koncentrerade till skärgårdsområdena och andra skyddade områden. Utbredningsbilden för 2012 stämmer väl med den generella bild som erhållits från övriga inventeringsår.

Diskussion

De presenterade inventeringarna visar klart att Hanöbukten är ett viktigt vinterområde för flera sjöfågelarter. Vid de två senaste landsomfattande inventeringarna 2004 (Nilsson 2008) och 2015 (Nilsson & Haas 2016) noterades inte mindre än 51% resp. 78% av de övervintrande brunänderna i det aktu-

ella området. Området hyste också en betydande andel av det svenska vinterbeståndet av salskrake (27% resp. 18%) samt sothöna (26% resp. 55%). Vid den senaste inventeringen 2015 sågs inte mindre än 21% av viggarna i Hanöbuktsområdet.

Flera områden inom Hanöbukten kan betecknas som viktiga övervintringslokaler för sjöfåglar på en nationell skala (Figur 6). Ett område mellan Ronneby och Karlskrona uppfyller dessutom kriterierna för internationell betydelse som övervintringslokal för vigg och salskrake.

Flertalet arter visade en markant ökning som övervintrare under perioden. Enda undantaget var alfågeln som under senare år endast noterats i små antal vid de landbaserade inventeringarna och som visar samma bild ute till havs (Nilsson 2016). Sjöfågelbestånden i Hanöbukten visar samma ökande tendens som de nationella indexen. Genom åren har det dock förekommit en förskjutning av utbredningen mot nordligare områden inom Sverige (Nilsson & Haas 2016), dvs. ökningen i det övervintrande beståndet har varit större i de norra skärgårdarna än i Hanöbukten även om antalen ökat i båda dessa områden. Denna förskjutning mot nordligare övervintring har också konstaterats på internationell nivå för vigg, knipa, storskrake och salskrake (Lehikoinen et al. 2013, Pavo-Jordan et al. 2015).