

# Status of Caspian Terns *Sterna caspia* in the Baltic

Martti Hario, Taivo Kastepõld, Mikael Kilpi, Roland Staav & Torsten Stjernberg

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An interbaltic census made in Finland, Sweden and the Estonian SSR, in the summer of 1984, revealed that the Caspian Tern population in the Baltic Sea had decreased by a quarter since the early 1970s. These countries share the whole Baltic population at present. In Finland and Sweden, the population had decreased by about 30% and a slight decrease in mean colony size was also noted. In Estonia, the population had remained stable or even increased slightly. The reasons for these changes are largely unknown. Ring recovery data give certain evidence of a higher mortality rate on the wintering grounds during dry years.

There is an urgent need for up-to-date population studies in the Baltic in order to assess the reasons for the population changes.

*Martti Hario, Finnish Game and Fisheries Research Institute, Game Division, Turunlinnantie 8, SF-00930 Helsinki, Finland; Taivo Kastepõld, Matsalu Bird-Ringing Centre, SU-203190 Lihula, Estonia USSR, Mikael Kilpi and Torsten Stjernberg, Department of Zoology, University of Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki, Finland; Roland Staav, Swedish Museum of Natural History, P.O. Box 50007, S-10405 Stockholm, Sweden.*

## Introduction

The cosmopolitan Caspian Tern, *Sterna caspia*, has a highly disjunct breeding range (Voous 1960). The Baltic population is a distinct unit, with no apparent interchange with its nearest neighbouring population in the Black Sea (Staav 1979).

In the beginning of the 1980s, indications of a population decrease in the Caspian Tern were first noted in Finland and Sweden by bird-ringers familiar with the species (see Kilpi 1984). Finland, Sweden and the Estonian SSR share the whole present population of the Baltic; breeding in the GDR having ceased by 1972 (Hario 1986; for the history of the Baltic population, see Bergman 1980). In this paper, we present results from the latest interbaltic census, made in 1984, and discuss factors behind the population decrease observed. The results are compared with those of the 1971 census (Staav et al. 1972, Väisänen 1973).

## Material and methods

Methods employed in the censuses are detailed in the national reports (Staav 1985, Kilpi et al. 1986). A

total of about 95 volunteers in Finland, Sweden and the Estonian SSR participated in the summer of 1984 field work, mainly during May and June. The field work was concentrated on the outer archipelago, the principal resort of the species. The vast archipelago areas were divided into several subareas where the census work was conducted by experienced ringers and ornithologists, familiar with the area in question. The work was completed in 1985 when the remaining areas were censused. The coverage of the survey is considered accurate enough to allow a sufficiently detailed assessment of the present population size. Of solitary pairs, nevertheless, a certain amount of breeding sites (e.g. at most 55 in Finland) have remained undetected.

## Results

The Finnish population in 1984 consisted of 762 colonial pairs, divided into 19 colonies (2–93 pairs in each), and of 72 solitary pairs; altogether 834 pairs (Table 1, Fig. 1). Sweden had 546 pairs, in 13 colonies (4–90 in each), and 56 solitary pairs; in total 602 pairs. Estonia had four colonies totaling about 380 pairs and one solitary pair.

Table 1. The number of breeding pairs of the Caspian Tern, in the Baltic, in 1971 and 1984. The 1971 figures are derived from Staav et al. 1972 and Väisänen 1973.

	1971		1984	
	Survey	Adjusted	Survey	Adjusted
Finland	c.1000	1200–1300	834	850
Sweden	852	850–950	602	600–700
Estonia	356	360	380	400
Total	c.2200	2410–2610	1816	1850–1950

Only the Estonian part of the Baltic population had remained stable or even increased slightly when compared with the census made in 1971 (Table 1). In Sweden and Finland, the population had diminished by a third in the period 1971–1984. Assessment of the Finnish population is somewhat uncertain, as the 1971 figures were based on a less thorough census than the 1984 figures. The results indicate a decrease of a fourth, but we suggest that the real decrease is greater, about a third (see Table 1).

The mean colony size has become slightly smaller in Finland and Sweden. In 1971, the median colony size was 50 pairs in 33 Finnish and Swedish colonies (range 2–132, recalculated from Väisänen's (1973) material). In 1984, the median was 45 pairs in 31 Finnish and Swedish colonies (range 2–93). The difference is not significant ( $U=470$  Mann-Whitney test). The amount of minor colony units of 2–8 pairs, which Bergman (1980) considers remnants of larger colonies (splintered by disturbance), has not changed significantly ( $\chi^2=0.264$ ,  $df=3$ ) from the 1971 survey in Finland and Sweden. This implies that the slight decrease in colony size is not due to the splintering effect.

## Discussion

The reasons for the population decrease in Finland and Sweden are, so far, unknown. There have been some incidents of illegal persecution on the Finnish breeding islands (e.g. culling of broods, shooting of adults). The Finnish annual totals of ringed chicks have decreased alarmingly, being in 1984 only half of those at the beginning of the 1970s (Kilpi 1984). A similar trend has been found in Sweden from 1981 on (Staav 1985). Only about a quarter of the Finnish Caspian Terns nest on protected islands; in Sweden all colonies are protected. In Estonia, the species is

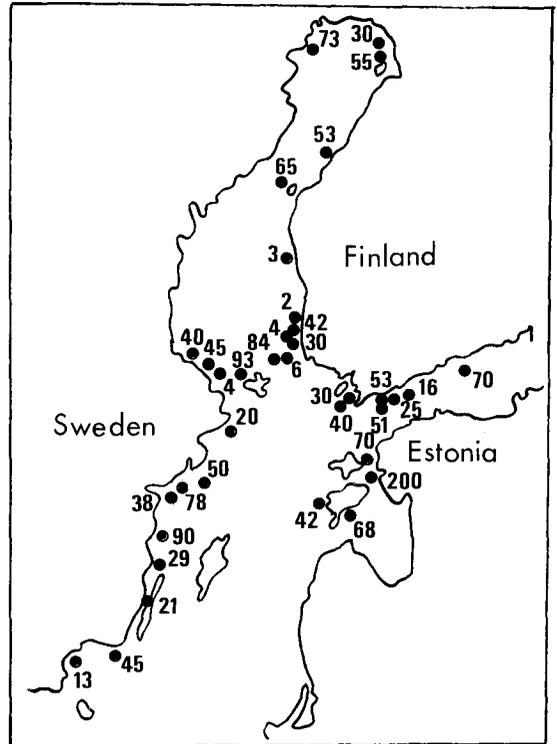


Fig. 1. Location of Caspian Tern colonies in the Baltic in 1984. The figures denote colony sizes.

protected well, legally. It does not seem probable that persecution in Finland is the main cause for the decrease in the whole of the Baltic. The species has proved fairly traditional in its choice of breeding sites. The numbers of birds on the traditional islets or islet groups are decreasing slowly and probably only a few long-distance moves to new localities occur nowadays (for "deserting flights" in connection with disturbance, see Väisänen 1973, Bergman 1980). The site-tenacity of the species has been found to be strong in North America also. On the Great Lakes, Caspian Terns are known to have nested at only 15 different sites since the beginning of the century, and in 1980, they still nested at 13 of those localities (Struger & Weseloh 1985). In the Baltic, the huge number of islands makes the situation more complex (over 80,000 islands and islets alone on the Finnish coasts!).

One reason for the population decrease could be a higher mortality rate on the African wintering grounds. According to Finnish and Swedish recoveries the most important area in Africa is the inundation zone of the river Niger, in Mali (see Kilpi

& Saurola 1984, Staav 1986). At the beginning of the 1980s, the drought in the Sahel zone was severe, resulting in low stocks of spawning fish in the Niger. This in turn resulted in increased competition for fish, and increased human persecution of piscivorous birds. Most Caspian Terns recovered in Africa have been killed by people (Kilpi & Saurola 1984, Staav 1985). The severe drought in the Sahel zone affecting the conditions of Caspian Terns wintering in Mali, has shown considerable fluctuation during the last 20 years (Svensson 1985). The 1960s were mostly normal or wet years, while severe rain deficits occurred in the early 1970s and the early 1980s (see also Staav 1986). Based on Svensson (1985) and Staav (1986) we defined 13 seasons during 1966–1984 as dry (rain deficit at least 10% compared with the average) and only 6 seasons had rain near normal. During the six wet seasons the total recovery rate for first-year Finnish and Swedish birds was 0.28% and during the thirteen dry seasons this value was 0.51% (based on 119 African recoveries with mean recovery rate as 0.45; for calculation of recovery rates, see Saurola 1985). The difference between the years is significant ( $\chi^2=6.8$ ,  $df=1$ ,  $P<0.01$ ), indicating that the mortality rate during the dry years is higher. The period preceding the population peak was mostly wet (years 1950–69), and the period after, mostly dry (1970–84). The main question is when the population decrease in the Baltic started, in relation to the drought in Africa. Accurate data on the population parameters required for a reliable analysis of the decrease are, however, not available. Mortality and natality estimates obtained from the population peaks (Soikkeli 1970, 1973) cannot be considered reliable for decreasing populations. We do not even know what the recent decrease should be called. Is it a slow decrease, affected by “biotic” factors, or is it a human-caused population “crash”, or both?

The history of the colonial breeding of Caspian Terns in the Baltic Sea is fairly short, only about 80 years (see Bergman 1980). The figures for the size of the Baltic population, put forward by different authors (see Glutz & Bauer 1982 and references therein), reflect the development of this population, previously increasing but now decreasing. 1935: 500 pairs, 1953: 1200, 1971: 2200 (our estimate; 2410–2610), and 1984: 1850–1950 pairs.

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## Selostus: Itämeren räyskäkannan kehitys ja tila

Räyskän kokonaiskanta Itämeressä on taantunut neljänneksellä vuodesta 1971 vuoteen 1984. Suomessa ja Ruotsissa kanta pieneni noin kolmanneksen, Virossa se säilyi ennallaan tai jopa hieman kasvoi. Keskimääräinen yhdyskuntakoko Suomessa ja Ruotsissa pieneni, joskaan ei merkittävästi. Pienten yhdyskuntien (2–8 paria) osuus suomalaisista ja ruotsalaisista yhdyskunnista säilyi muuttumattomana, mikä ei viittaa siihen, että yhdyskuntakoon lievä lasku olisi seurausta yhdyskuntien pirstoutumisesta.

Kannan taantumista on vaikea täsmällisesti ajoittaa. Kuolevuuslaskelmat, jotka on tehty kannan nousuvaiheessa, eivät enää päde kannan laskiessa. Kuitenkin kuivuus lajin talvehtimisalueilla Afrikassa oli yleistä jo 1970-luvulla, ja rengaslöytöaineistoissa esiäikeisten ikäluokkien kuolevuus on kuivina vuosina ollut merkittävästi suurempaa kuin sademäärältään normaaleina vuosina. Poikasrengastusmäärien lasku Suomen ja Ruotsin pesimäpaikoilla viittaa tuotannon heikkenemiseen 1970-luvulta alkaen, mutta pesimämenestyksestä ei ole aineistoa.

Suomalaisia, ruotsalaisia ja virolaisia ornitologeja kehoitetaan ryhtymään asian vaatimiin pesimäbiologisiin perusselvityksiin räyskän pesimäluodoilla.

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