

## The status of breeding waders in Nord-Trøndelag county — in comparison with the existing estimates of Norwegian population sizes

Per Gustav Thingstad

Thingstad, P. G. 1984: The status of breeding waders in Nord-Trøndelag county — in comparison with the existing estimates of Norwegian population sizes. — Ann. Zool. Fennici 21:351–357.

This paper attempts to adjust the previous distribution maps given for breeding waders in Nord-Trøndelag county, and discusses the existing estimates of breeding population sizes. Information is obtained by reviewing newer relevant literature, the local faunal card files and the maps of the Atlas-project in Nord-Trøndelag county.

According to the Atlas maps *Haematopus ostralegus*, *Vanellus vanellus*, *Calidris maritima*, *Philomachus pugnax* and *Numenius arquata* have expanded their distribution, whereas *Eudromias morinellus*, *Calidris alpina* and *C. temminckii* demonstrate a far more scattered distribution in the eastern alpine areas than previous supposed.

Some of the previous estimates are based upon insufficient knowledge of the distribution and abundance of the waders' occurrence in this county, and these will be pointed out in this paper. The following species are considered to have greater population sizes than previously estimated: *Vanellus vanellus*, *Philomachus pugnax*, *Tringa totanus*, *T. glareola*, *Numenius phaeopus* and *Phalaropus lobatus*. The populations of *Charadrius hiaticula*, *Eudromias morinellus*, *Calidris temminckii* and *C. alpina* are considered to be overestimated in Nord-Trøndelag county.

Some of the problems concerning estimating a population size are shown for *Pluvialis apricaria*. The great variations in habitat amplitude and crowd density that this species shows in Nord-Trøndelag county, give an example of the difficulties of estimating a population size for greater geographic regions. It must therefore be stressed that the existing estimates can only be considered as very rough appraisements of the populations of the breeding waders in Norway, where the numbers estimated may be several times higher or lower than the true population size.

Per Gustav Thingstad, University of Trondheim, The Museum, Erling Skakkesgt. 47A, N-7000 Trondheim, Norway.

### 1. Introduction

At the 2nd Nordic Ornithological Congress at Örsta 1979 Kålås & Byrkjedal (1981) presented new distribution maps and population estimates of the Norwegian waders. In the "NOF-estimates" for Southern Norway no estimate from the local organization of NOF (Norwegian Ornithological Society) in Nord-Trøndelag was included, as the local report and rarities committee (LRSK) in Nord-Trøndelag did not consider itself competent to estimate the local populations at the time of inquiry in 1979. LRSK Nord-Trøndelag is still of the opinion that our knowledge is too sparse to give accurate population estimates. However, by now LRSK has received so many

field observations that a better basis for comment on the distribution and the population estimates of the different species is at hand. I think that this is necessary, as several estimates presented for Nord-Trøndelag seem to be several hundred per cent off. Only the species for which new data seem to indicate a need for corrections will be discussed here.

### 2. Materials and methods

The estimates of Kålås & Byrkjedal (1981) for the wader populations of Nord-Trøndelag are listed in Table 1. The estimates are based upon faunal reports and published quantitative studies. These have been correlated with the areas of the "habitats" in question given in "Statistical Yearbook 1978" and in "Environmental Statistics 1978".

Table 1. The wader populations in Nord-Trøndelag, according to Kålås & Byrkjedal 1981. The relative adjustments proposed in this article are also shown. The symbols are: ++ = a considerably larger population; + = larger population; 0 = not enough information at hand for adjustment; - = smaller population, and -- = a considerably smaller population. Parantheses indicate uncertain conclusions.

	Present estimate	Proposed adjustment
<i>Haematopus ostralegus</i>	3 000	0
<i>Charadrius hiaticula</i>	4 000	--
<i>Eudromias morinellus</i>	300	-(-)
<i>Pluvialis apricaria</i>	7 000	(+)
<i>Vanellus vanellus</i>	200	0
<i>Arenaria interpres</i>	200	-
<i>Calidris temminskii</i>	200	-
<i>C. maritima</i>	300	(+)
<i>C. alpina</i>	800	--
<i>Philomachus pugnax</i>	400	++
<i>Limicola falcinellus</i>	10	(-)
<i>Tringa totanus</i>	1 000	+(+)
<i>T. nebularia</i>	2 000	0
<i>T. ochropus</i>	100	(+)
<i>T. glareola</i>	200	++
<i>T. hypoleuca</i>	15 000	0
<i>Numenius phaeopus</i>	600	+(+)
<i>N. arquata</i>	400	(+)
<i>Scolopax rusticola</i>	2 000	0
<i>Gallinago gallinago</i>	4 000	(-)
<i>G. media</i>	200	0
<i>Phalaropus lobatus</i>	50	+(+)

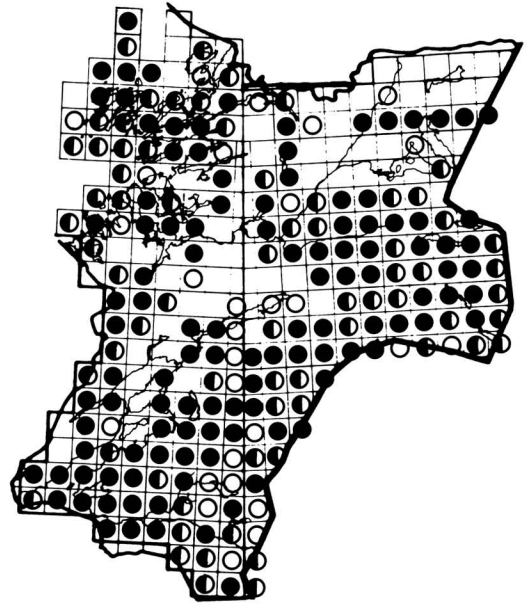


Fig. 1. The atlas squares investigated to Nord-Trøndelag by the end of 1982. The open circles show the poorly investigated, the half-open circles the insufficiently investigated, and the black circles the well investigated 10 × 10 km squares.

Since 1979 an extensive registration of birds in Nord-Trøndelag has been carried out; partly through NOF's Atlas project, partly through counts of breeding seabirds (The Seabird project for the Directorate for Wildlife and Freshwater Fish) and also in connection with investigations concerning 10-year conservation of waterfalls and investigations for waterpower concessions. In addition a few minor reports from different areas have been published. This material has been used for this survey, together with information from LRSK's local fauna card files.

Most information on distribution derives from the Atlas project (Thingstad & Rygh 1980) and maps showing the known distribution (data included up to 1.1.1983) are presented in Fig. 2. However, far from all Atlas squares' registrations have been carried out as of this date (see Fig. 1). Of the more recent faunal reports from Nord-Trøndelag that have become available since 1979, I would like to refer to many reports in Trøndersk Natur and in Det Kgl. Norske Videnskabers Selskab Muséet Rapport Zoologisk Serie that have not been listed in the references (see Thingstad 1983b).

### 3. Results and discussion

In this article only short comments will be given on the species that show a different distribution pattern than previously presumed

(Haftorn 1971, Kålås & Byrkjedal 1981), or which seem to exist in different quantities than the existing population estimated indicate (see Table 1). For more detailed information, see Thingstad (1983b). *Pluvialis apricaria*, however, will be discussed more thoroughly in order to give one example of the problems that arise in connection with population estimations.

*Haematopus ostralegus* has become more numerous in the inner parts of the county in later years (Fig. 2), where it breeds in fields in many places. *Charadrius hiaticula* occurs sparsely across the county (Fig. 2), without being numerous in any one place. For example, during the sea bird registrations in Nord-Trøndelag in 1982, when most of the coast was investigated, only 10 ind. of *Ch. hiaticula* were registered, while in the same area 1564 *H. ostralegus* were counted (letter from County Environmental Protection Department, Nord-Trøndelag). It is therefore reasonable to assume that the existing estimate of 4000 pairs of breeding *Ch. hiaticula* is far too high compared to the estimate of 3000

pairs for *H. ostralegus*. The registered moderate coastal population size of *Ch. hiaticula* could be a result of a recent catastrophic decline, as earlier registered e.g. for the coastal population in Finland (Hildén & Hyytiä 1981). Kålås & Byrkjedal (1981) have based their estimates upon some years older information. At that time the population size might have been somewhat greater than the result from 1982 shows.

*Eudromias morinellus*, *Calidris temminckii* and *Calidris alpina* all have sparser distribution than previously assumed (Fig. 2). Neither do they occur in such large quantities in any place that the magnitude of the existing population estimate can be correct. *E. morinellus* only seems to occur in any quantity in places higher than 1000 m above sea level far to the east in Lierne (Thingstad 1983a). The coastal habitats of *C. temminckii* are in many places being disturbed (Thingstad 1983b), and the distribution of *C. alpina* is comparable to that of *E. morinellus* in the mountains, it only occurs more commonly in Meråker (Haftorn 1974) and Lierne (Thingstad 1983a). The coastal population of *C. alpina* seem to be quite limited in Nord-Trøndelag (letter from County Environmental Protection Department, Nord-Trøndelag).

*Vanellus vanellus* and *Philomachus pugnax* have shown a great expansion, especially north- and east-wards (Fig. 2). The coastal population of *Ph. pugnax*, however, seems to be very sparse. Both *V. vanellus* and *Ph. pugnax* belong to the more common waders on many of the bogs in this county (e.g. Nygård et al. 1976, Moksnes 1977, Nygård 1979, Bevanger & Vie 1981) and occur in such quantities that it is reasonable to assume that the present populations are somewhat bigger than stated by Kålås & Byrkjedal (1981).

*Calidris maritima* has now been found in the previously reported gap of its distribution in the eastern mountain areas of Namdalen (Fig. 2). It has, however, also been recorded as breeding in the western coastal mountains of Namdalen.

*Tringa totanus*, *Numenius phaeopus* and *Phalaropus lobatus* have a distribution according to the Atlas archives that corresponds well to the previously published distribution maps (Haftorn 1971, Kålås & Byrkjedal 1981), but the populations in Nord-Trøndelag seem to be underestimated by Kålås & Byrkjedal (1981). *T. totanus* and *N. phaeopus* have

been registered, especially in plots on bogs, in densities that clearly surpasses the assumed densities in the given estimates (see Thingstad 1983b).

*Tringa glareola* has a clearly eastern distribution but it has probably also has been breeding on the western side of Trondheimsfjorden (Fig. 2). In northeastern parts of the county, however, it seems to be more common than previously believed, which has caused a previous underestimation of the population (Table 1).

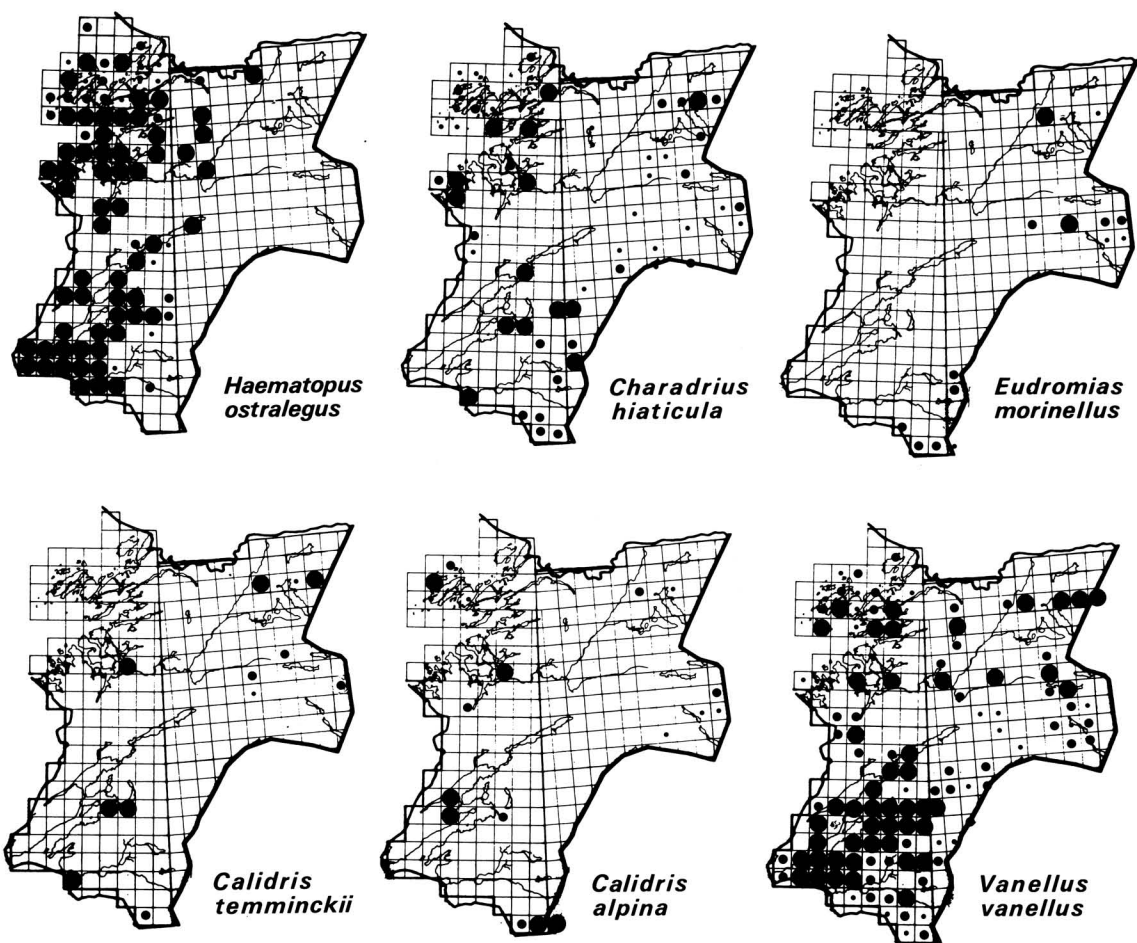
*Numenius arquata* has a clearly western distribution, even though it has been found more to the east than previously reported (Fig. 2).

*Pluvialis agricaria* represents a species on which a great deal of information exists. The present population estimate for the breeding population of Nord-Trøndelag is 7000 breeding pairs (Table 1); this is based on an average density of 1 pair/km<sup>2</sup> in potential *P. agricaria* habitats (Kålås & Byrkjedal 1981).

In Nord-Trøndelag the distribution of *P. agricaria* has, according to the information received in the Atlas project, been in good accordance with the previously presented distribution maps (Haftorn 1971, Kålås & Byrkjedal 1981). There is therefore no reason for reevaluating the present population estimate on this basis.

According to Haftorn (1971) *P. agricaria* requires open moors or plains with short vegetation: coastal *Calluna* heath, bogs and alpine lichen heath. This species is not generally to be found as high up in the mountains as *Eudromias morinellus*. However, it also breeds on the coastal heath, so the habitat requirements are far wider than "area above treeline" used by Kålås & Byrkjedal (1981).

What is the area of potential *P. agricaria* habitats in Nord-Trøndelag? According to Kålås & Byrkjedal this area is 7000 km<sup>2</sup> above the treeline, which is a reasonable estimate for this type of habitat. It is true that "Environmental Statistics 1978" gives the area above the treeline in Nord-Trøndelag as 9496 km<sup>2</sup>, but this includes high alpine areas that are not favourable for *P. agricaria* and other quite unfavourable areas. But what about the other habitats? Some of the densest populations of *P. agricaria* can be found on some of the bogs below the treeline. It seems that the bog areas of 1100 km<sup>2</sup> in the zone between 300 and 600 m a.s.l. support the densest populations in Nord-



Trøndelag. The area of coastal *Calluna* heaths is difficult to estimate, but also here large areas should be included.

In which densities does *P. apricaria* occur in different breeding habitats? The population along the coast seem to be quite moderate, as only 16 ind. were registered during the sea bird registrations of 1982 (letter from County Environmental Protection Department, Nord-Trøndelag). This quantity nevertheless represents an absolute minimum figure, as larger islands were not searched by foot, neither were the potential breeding areas on heath on the mainland examined.

Also on the lower, eastern bog areas *P. apricaria* has been recorded as breeding. On the Steinkjermyra (200 m a.s.l.) by Snåsa, which is known for high bird densities (Nygård 1979), 6 territories were observed in 1978 and this represents a density of 4.7

terr./km<sup>2</sup>. The study plots on the large bogs, at the same altitude, at Luru and Leirsjøen in Snåsa in 1981 and 1982 had no *P. apricaria* territories (Thingstad & Nygård 1982), even though strip surveys showed that the species was present in moderate numbers (<1 % of all registered birds). This is a good example of one of the problems one encounters by using such rough means as found in "Environmental Statistics" and "Statistical Yearbook".

Another circumstance that impedes the estimations are annual variations in breeding populations. At the bogs along Forra, which lies in a more optimal altitude of 400 m a.s.l., Moksnes (1977) found 8.8 terr./km<sup>2</sup> in 1970, while the corresponding figures for 1971 and 1972 were 9.6 and 7.4, respectively. These figures shows that there is a stable situation in this optimal habitat. Larger fluctuations must be expected in less optimal areas. In low alpine

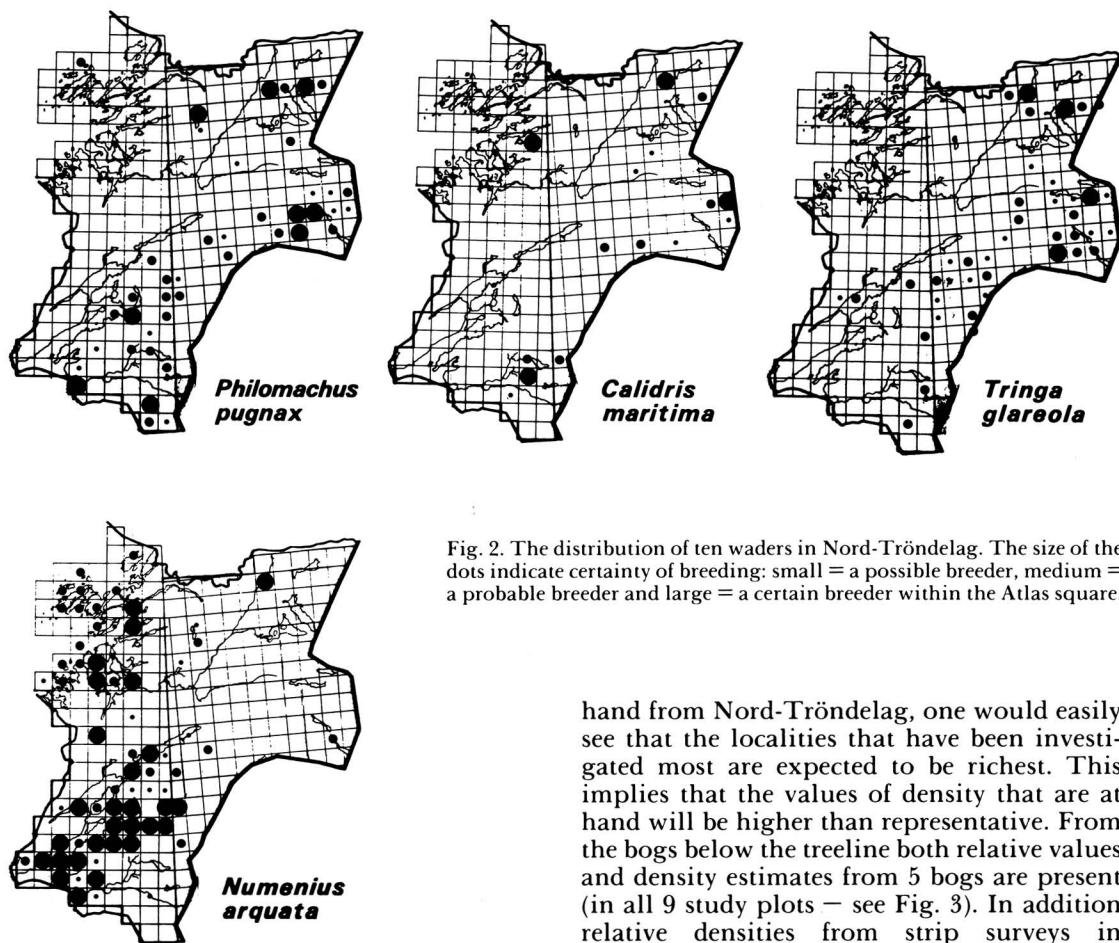


Fig. 2. The distribution of ten waders in Nord-Trøndelag. The size of the dots indicate certainty of breeding: small = a possible breeder, medium = a probable breeder and large = a certain breeder within the Atlas square.

terrain in Nord-Fosen Reitan et al. (1982) found a relative occurrence of 15% of *P. apricaria* by strip surveys, while Moksnes (1973) found 6%. Also, on a seemingly more optimal bog, 390 m a.s.l. in Sörli, to the far east in the county, large variations between different years have been found: in 1975 10 ind. (Nygård et al. 1976), in 1979 not a single individual (Bevanger & Vie 1981). This difference is probably a result of the methodical weakness that such study plots are often too small to give accurate density estimates of species with a considerable home range. Consequently one might ask if it is at all possible to get reliable numbers for average densities for the different vegetation types.

One assumption is that one has access to representative data on the population densities in different vegetation types. If one takes a closer look at the localities where material is at

hand from Nord-Trøndelag, one would easily see that the localities that have been investigated most are expected to be richest. This implies that the values of density that are at hand will be higher than representative. From the bogs below the treeline both relative values and density estimates from 5 bogs are present (in all 9 study plots — see Fig. 3). In addition relative densities from strip surveys in Meltingen (Krogstad 1980), Stjørdalsvassdraget (Bevanger et al. 1981), Nesåa (Bevanger 1981a) and Oгна (Bevanger 1981b) are at hand. The average relative quantity of *P. apricaria* on all the examined bogs is 4%, which corresponds to a density of about 1.7 terr./km<sup>2</sup> (Fig. 3). If one considers that probably the richest areas have been investigated, the density of 1 terr./km<sup>2</sup> (Kålås & Byrkjedal 1981) is a usable estimate for *P. apricaria* on the bogs in Nord-Trøndelag. From the alpine area density estimates of only one study plot is available, from the Blåfjell Mountains in Lierne (Bevanger & Vie 1981), where 2.5 terr./km<sup>2</sup> were recorded (frequency 10%). According to strip surveys made in 13 different alpine areas in Nord-Trøndelag, the average frequency of *P. apricaria* is 8%, which would imply an average density of about 2 terr./km<sup>2</sup>.

From the above information one can arrive at the following population estimate for Nord-Trøndelag:



"Coastal population"	100–200 pairs
"Bog population"	
(1 terr./km <sup>2</sup> × 1100 km <sup>2</sup> )	1100 pairs
"Alpine population"	
(2 terr./km <sup>2</sup> × 7000 km <sup>2</sup> )	14 000 pairs
Total population	about 15 250 pairs

This population estimate more than doubles that given by Kålås & Byrkjedal (1981), but many sources of error have to be considered such as 1) Problems with estimating the areas of potential *P. apricaria* habitats and 2) Very uncertain estimation of the average density in different "vegetations types".

For example, it is not certain that very high relative densities necessarily reflect high real densities, as this wholly depends on the total density in the bird communities; and data from alpine areas in Nord-Trøndelag are generally lacking.

If the assumed correspondence between relative and real density is not correct for the Blåfjell Mountains, this would have a great influence on the estimate given above. Therefore the basis for the alpine estimate is very speculative (cf. Table 1). The conclusion must be that the population of *P. apricaria* in Nord-Trøndelag is probably bigger than 7000 breeding pairs.

#### 4. Conclusions

The purpose of this article has been to try to bring up to date the breeding status of waders in Nord-Trøndelag, and tie this in with the problems concerning population evaluations across larger geographical areas.

What different field surveys most easily reveal are changes in the distribution of different species. An increase in distribution is either due to a real expansion or due to increased knowledge. Likewise, a seemingly decreased range does not necessarily reveal a population decrease, as previous distribution maps may have been based on insufficient field investigations.

In Nord-Trøndelag, however, *Haematopus ostralegus*, *Vanellus vanellus* and *Philomachus pugnax* seem to have expanded considerably during the past few years, while *Calidris maritima* and *Numenius arquata* have also been observed outside the previously given distribution areas. *Eudromias morinellus*, *Calidris alpina* and *C. temminckii* seem to occur more scattered than previously assumed.

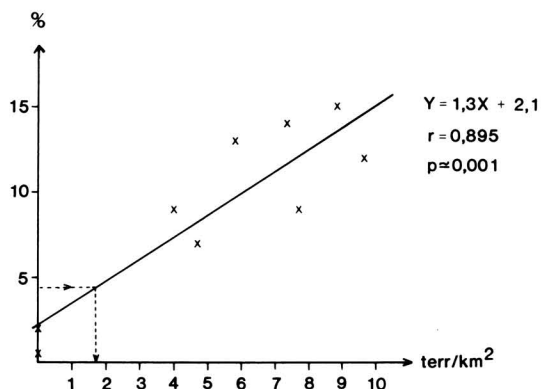


Fig. 3. The connection between the relative density of Golden Plover *Pluvialis apricaria* found by means of strip surveys (%) and the density in 9 different study plots (terr./km<sup>2</sup>) at the Forra bogs (Moksnes 1977), at the Faundal bogs (Nygård et al. 1976), at the Steinkjer bog (Nygård 1979), at the Bergli bog (Bevanger & Vie 1981), and at the bogs by Luru/Leirsjøen (Thingstad & Nygård 1982). Broken lines shows the connection between the present average relative density from 13 different strip surveys (4.5%) and the estimated real density (1.7 terr./km<sup>2</sup>).

Even though we have slowly received some quantitative data concerning the populations in the different parts of the county, it is far more difficult to estimate the numbers of breeding pairs than to bring up to date the distribution maps. Some large differences in the densities of seemingly similar habitats further strengthen the difficulties of estimating the populations. Generally there seem to be a marked gap between eastern and more western localities. It also seems that the previously given estimates based on average densities in the different "habitat types" for the whole of Southern Norway must be too rough a method for valid estimates.

When population estimates are presented, there is a tendency to use these uncritically in literature, without reference to a basis for such estimates (see, e.g., Cramp & Simmons 1983). This implies that the estimates can be misused as references during later evaluations of population variations. It is therefore important to stress that such estimates only must be looked upon and used as rough appraisements of the populations.

*Acknowledgements.* I would like to thank all the active field ornithologists who have sent their observations to the Atlas project and LRSK Nord-Trøndelag. I also thank Öyvind Spjøtvoll and Geir E. Vie, both LRSK-members in

Nord-Trøndelag, for their good cooperation. Finally I thank the County Environmental Protection Department, Nord-Trøndelag, who most kindly put the material from the sea bird counts at my disposal.

## References

- Bevanger, K. 1981a: Fuglefaunaen i Nesåas nedbørfelt, Nord-Trøndelag. — K. Norske Vidensk. Selsk. Mus. Rapport Zool. Ser. 1981-15. 51 pp.
- 1981b: Fuglefaunaen i Ognas nedbørfelt, Nord-Trøndelag. — K. Norske Vidensk. Selsk. Mus. Rapport Zool. Ser. 1981-17. 58 pp.
- Bevanger, K., Rofstad, G. & Sandvik, J. 1981: Fuglefaunaen i Stjørdalsvassdragets nedbørfelt, Nord-Trøndelag. — K. Norske Vidensk. Selsk. Mus. Rapport Ser. 1981-21. 88 pp.
- Bevanger, K. & Vie, G. 1981: Fuglefaunaen i Sörlivassdraget, Lierne og Snåsa kommuner, Nord-Trøndelag. — K. Norske Vidensk. Selsk. Mus. Rapport Zool. Ser. 1981-6. 65 pp.
- Cramp, S. & Simmons, K. E. L. (eds.) 1983: The Birds of the Western Palearctic. III. — 913 pp. Oxford Univ. Press., Oxford, London, New York.
- Haftorn, S. 1971: Norges Fugler. — 862 pp. Universitetsforlaget, Oslo.
- 1974: Rangledalen i Meråker/Tydal og områdene sør til Essandsjøen. — Duplicated report: 6 pp.
- Hildén, O. & Hyytiä, K. 1981: Finlands häckande vadere — populationstendenser och nuvarande utbredning (Summary: The population changes and present status of waders in Finland). — Proc. Second Nordic Congr. Ornithol. 1979:19-37. Stavanger.
- Krogstad, K. 1980: Fuglefaunaen i Meltingenområdet, Mosvik og Leksvik kommuner. — K. Norske Vidensk. Selsk. Mus. Rapport Zool. Ser. 1980-4. 49 pp.
- Kålås, J. A. & Byrkjedal, I. 1981: Vadefuglenes hekkstatus i Norge med Svalbard (Summary: The status of breeding waders Charadrii in Norway including Svalbard). — Proc. Second Nordic Congr. Ornithol. 1979: 57-74. Stavanger.
- Moksnes, A. 1973: Registreringer av det høyere dyreliv i det planlagte militære øvingsområde po Fosenhalvøya. Foreløpig rapport etter undersøkelsene sommeren 1973. — Duplicated report. 17 pp. Zool. Dept., Univ. Trondheim.
- 1977: Fuglefaunaen i Forraområdet i Nord-Trøndelag. Sluttrapport fra undersøkelsene 1970-72. — K. Norske Vidensk. Selsk. Mus. Rapport Zool. Ser. 1977-3. 56 pp.
- Nygård, T. 1979: Fuglelivet på Steinkjermyra i Snåsa, og i områdene omkring. — Trøndersk Natur, Supplement 2, 1979:1-39.
- Nygård, T., Thingstad, P. G., Karlsen, S., Krogstad, K. & Kvam, T. 1976: Ornitologiske undersøkelser i fjellområdet fra Vera til Sørli, Nord-Trøndelag. — K. Norske Vidensk. Selsk. Mus. Rapport Zool. Ser. 1976-3. 91 pp.
- Reitan, O., Jordhøy, P., Leirseth, A. B. & Andersen, R. 1982: Viltbiologi, jakt og fiske i Nord-Fosenområdet. Undersøkelser i anledning planlagt skytefelt. — DVF — Reguleringsundersøkelsene Rapp. 1982-6. 114 pp.
- Thingstad, P. G. 1983a: Faunaregistreringer i Hestkjølen, Lierne 1981-1983. — Duplicated report: 24 pp.
- 1983b: Vadefuglenes hekkstatus i Nord-Trøndelag (Summary: Distribution of waders in Nord-Trøndelag, Central Norway). — Vår Fuglefauna 6:244-251.
- Thingstad, P. G. & Rygh, O. 1980: Atlas-prosjekt i Trøndelag. Situasjons rapport pr. 10.2.1980. — Trøndersk Natur, Supplement 1 1980:1-55.
- Thingstad, P. G. & Nygård, T. 1982: Ornitologiske undersøkelser i Sanddøla- og Luruvassdragene. — K. Norske Vidensk. Selsk. Mus. Rapport Zool. Ser. 1982-6. 112 pp.

Received 19.IX.1983

Printed 16.XI.1984