

CRANE (*GRUS GRUS*) MIGRATION OVER FRANCE FROM AUTUMN 1981 TO SPRING 1984

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France

Introduction

The last study specifically concerned with crane migration over France was published at the end of the last century (*Ternier*, 1899). More recently, different ornithological books or articles give general patterns of this phenomenon but without new precisions (*Dorst*, 1956; *Geroudet*, 1978; *Cramp—Simmons*, 1980; *Johnsgard*, 1983), or only speaking about some particular aspects (Section technique O.N.C., 1983). In fact, the best study is found in *Glutz von Blotzheim et al.* (1973) with a relatively precise map, but the authors point out the lack of information in some parts of the country.

So, the aim of this paper is to complete as much as possible this view with recent examples of normal and exceptional migration, but also to describe the important modifications actually observed in the migratory behaviour of the species in France.

Method

Data used for the study are principally issued from intensive observations carried out for some years by many ornithologist associations of France.

The map of the country is divided into squares ($0,25 \times 0,25$ Grade, say 17 km west-east \times 25 km north-south). In each of these quadrats, the number of cranes observed is computed for each migration from autumn 1981 to spring 1984. The values, clustered into five classes (see legend of fig. 1) are then plotted on maps. The same method is applied for resting cranes in autumn 1982 and spring 1984.

Results

Travelling routes of the cranes in autumn (fig. 1, left). Cranes migrating over France fly obviously along a general NE—SW heading track direction, avoiding completely the Rhone valley (where not more than 100 birds are seen per year). However, as a result of different wind conditions, more or less important drifts may occur, mainly in autumn. Studies over long periods show that the average migration direction shifts to the west in this season (*Salvi*, 1984b; *De Liedekerke*, 1984), even if some flocks travel through the most eastern part of France (East-Lorraine, Rhine valley (*Salvi*, op. cit.)).

Normal autumn migration was observed in 1981 whereas extreme and opposite examples of drift were found in 1982 and 1983.

At the beginning of November 1982, an exceptional migration occurred over the southern Netherlands (*Marteijn et al.*, 1984), Belgium (*Symens*, 1984; *Peero et al.*,

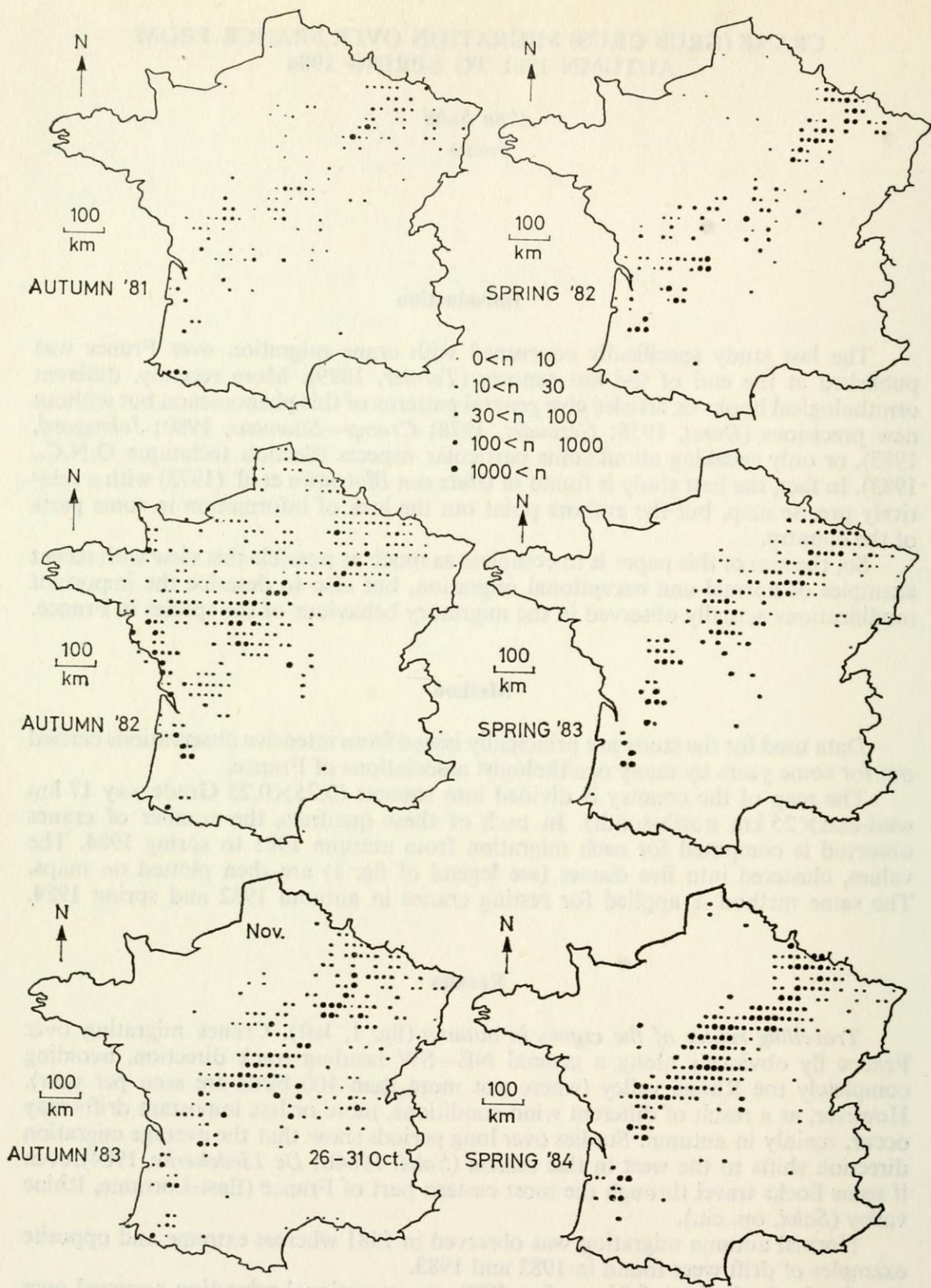


Figure 1. Travelling of the cranes in France

1984) and West-France (Service technique O.N.C., 1983) as far as in England where some hundred cranes were observed (Mac Minn, 1983). Drifted by a strong south-east wind, the birds reached the north and west coasts of France where some thousand cranes stayed for some days. As soon as the tempest stopped, most birds began to take flight towards the southern winter quarters. The last previous comparable migration had taken place twenty years before in 1963 (Wille, 1964; Cramp—Simmons, 1980).

During the last days of October 1983, a couple of thousand cranes (1500 to 2000) following the eastern border of France crossed the country along a very unusual axis. In fact, this phenomenon appears almost each year with a slight intensity, and without such a drift to the south. So, assuming that cranes compensate completely for wind drift over land (Alerstam, 1975), and since the main migratory wave peaked twelve days later, this observation supports the pseudodrift hypothesis (Salvi, op. cit.). However, it can only be confirmed by the analysis of departures from German staging places, which would answer the question whether some migrants prefer to travel along favoured track directions under different wind conditions (Alerstam, 1975).

Travelling routes of the cranes in spring (fig. 1, right). As shown by long-term studies, migration in spring is always more regular than in autumn. It usually takes place through a more central and narrower 200 km wide passage without any significant drift. This fact is observed not only in north-east France but also in the south-western part of the country (Petit, pers. comm.).

In fact, it seems that in spring cranes respond to unfavourable north-eastern winds rather by stopping migrating and spending more time staging than by drifting (Salvi, 1984b). This may simply be due to the natural scarcity of tempests at the end of the winter, but perhaps also to the fact that nocturnal flights and fogs seem to be less frequent in spring than in autumn. Compensation for wind drift can then be more efficient, as the cranes use landmarks (Alerstam, 1975).

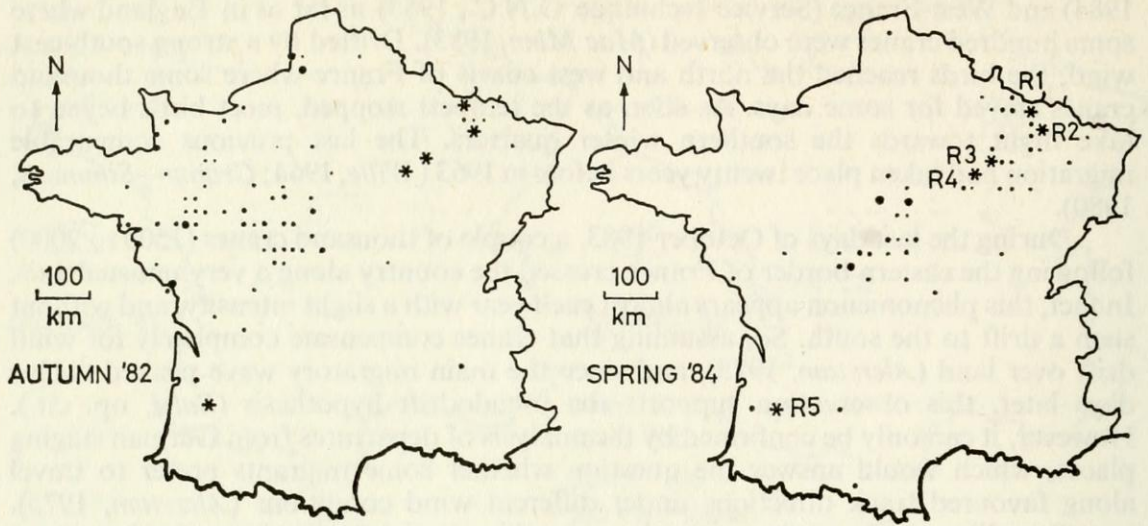
Like in autumn, the way through the Pyrenees is not known well. Actually, one pass is regularly surveyed only in autumn, and it is crossed by some thousand cranes (maximum 4000 in the autumn of 1982).

Staging sites of cranes in France. France is an important stage on the way between breeding and wintering areas, chiefly because of its length (nearly 1000 km). Thus, it is not surprising to find different resting places. Five main sites are regularly used during each migration by about 1000 birds at least (fig. 2). They lie in wetlands, and except R5, near ponds or lakes which are used habitually as roosting places.

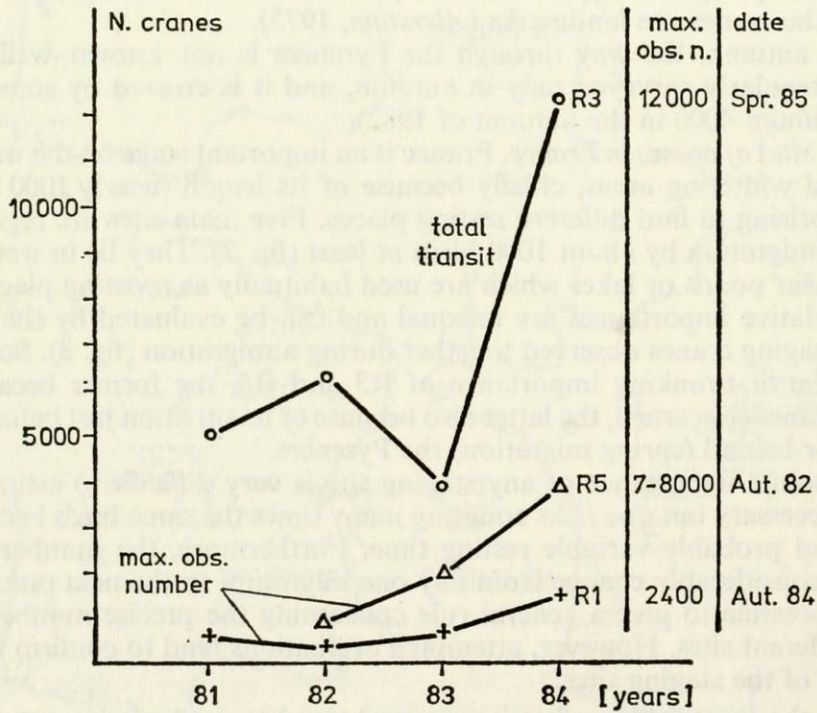
Their relative importances are unequal and can be evaluated by the maximum number of staging cranes observed together during a migration (fig. 3). So, one must emphasize the first-ranking importance of R3 and R5, the former because of the number of cranes concerned, the latter also because of its situation just before (autumn migration) or behind (spring migration) the Pyrenees.

The absolute importance of any staging site is very difficult to estimate. Daily counts are necessary but one risks counting many times the same birds because of the unknown and probably variable resting time. Furthermore, the number of resting cranes may considerably change from any one migration to the next one. Therefore it seems impossible to give a general rule concerning the precise numbers of birds using the different sites. However, attempted evaluations tend to confirm the relative importances of the staging sites.

Finally, the most striking fact is a general trend towards an important increase in the frequentation of these resting places. Cranes are increasingly more numerous and the duration of staging is increasingly longer. In fact, all these five sites have



Figure|2. Resting places of cranes in France during autumn 1982 and spring 1984. Stars show the main regular used resting places



Figure|3. Evolution of the number of cranes observed in the main resting places in France during the last years

become over the few years regular wintering areas for cranes (*Salvi, 1984a; Riols, 1985*). During normal migration, it seems that small secondary or occasional staging sites tend to disappear, while cranes concentrate at the large sites. During perturbed migration, cranes can rest in great numbers at other places. Thus in autumn 1982, thousands of cranes stayed in West-France (fig. 2, left). Likewise, in spring 1984, cold north-eastern winds stopped the cranes' migrating. Larger numbers of cranes staying longer are observed at the traditional stages but some exceptional thousand crane flocks rest for few days in central France (fig. 2, right).

Cranes in summer in France. In the past cranes were observed in the southern part of the country in summer (*Makatsch, 1970*) and especially in Camargue (*Glegg, 1932*). During the last ten years, similar observations were made in Normandie (1 bird) and Lorraine (2 birds). At the same time birds summered in central France (1 bird), Champagne (2—4 birds) and Lorraine (1 bird) at traditional staging sites (fig. 4). They were probably immature birds which migrated later than the adults (*Alonso et al., 1984*), currently observed in Lorraine in April and sometimes until May or June.

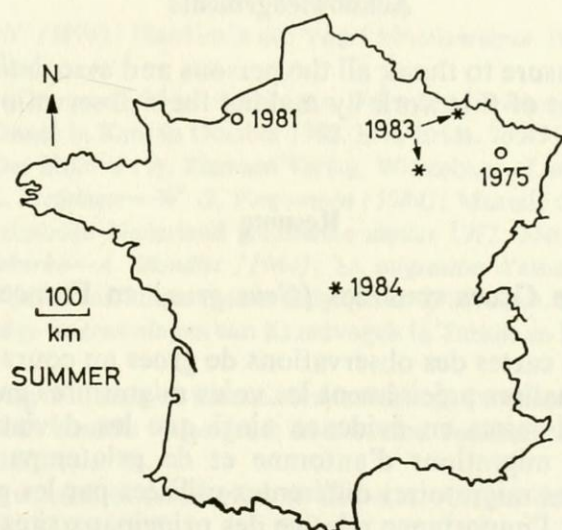


Figure 4. Observations of cranes in summer in France. Stars show summering birds, circles only-time observed birds

Discussion

To conclude this study, it is important to give a more complete view of the notable alternations observed in the migratory behaviour of cranes during the last ten years.

Like in France, more and more important concentrations of cranes are observed in Spain (*Fernandez et al., 1981*), and also in Hungary on the second European migration route (*Philippona, 1984*). Thus, this phenomenon cannot be due only to local environmental changes, even if the case of R3 is exceptional (since the creation of this lake in 1975, its frequentation has grown from some hundred to more than 12 000 cranes!). In fact, other additional factors must be responsible and these obser-

vations may be connected with the disappearance of three important staging sites in the Binnenland (G.D.R.) during the fifties and the sixties. This inverse phenomenon could neither be explained only by environmental factors (Mewes, 1976).

The development of new wintering habits is observed not only in France but also in Spain (Fernandez et al., 1981; Alonso et al., 1983). It may be more easily explained by new agricultural products and methods and by changes in the traditional winter quarters. However, weather constraints subsist especially in north-east France, and still, it seems that, little by little, cranes try to adapt themselves to these conditions.

Thus, a survey of crane behaviour appears to be the next essential step for a better understanding of these striking modifications. Yet at the same time we must not forget their contradictory consequences like necessary protection of the concerned sites and damage risks to fields under cultivation. Finally, further investigations should be carried out to test the pseudodrift hypothesis or the existence of different migratory strategies in autumn and in spring.

Acknowledgements

It is a special pleasure to thank all the persons and associations who contributed to the accomplishment of this work by making their observations available.

Resume

La migration des Grues cendrées (*Grus grus*) en France de l'automne 1981 au printemps 1984.

Le report sur des cartes des observations de grues au cours des quatre dernières années permet de visualiser précisément les voies migratoires en France. Les dérives principales sont ainsi mises en évidence ainsi que les déviations exceptionnelles. La comparaison des migrations d'automne et de printemps permet de suggérer l'existence de stratégies migratoires différentes utilisées par les grues selon la saison.

La localisation et l'importance relative des principaux sites de repos sont également précisées.

Les rares observations estivales de l'espèce sont également signalées mais l'accent est mis principalement sur les modifications récentes apparues dans le comportement migratoire des grues: apparition et extension vers le Nord de l'hivernage, concentrations des oiseaux de plus en plus denses sur certains sites.

Replacées dans le contexte européen, ces modifications apparaissent comme les éléments d'une évolution en cours, dont le déterminisme ne réside pas seulement dans des facteurs du milieu. Ainsi, une meilleure connaissance de l'éthologie de l'espèce doit permettre de progresser dans la compréhension de ce phénomène.

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A daru (*Grus grus*) vonulása Franciaország felett 1981 ősztől 1984 tavaszáig

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Franciaország

A századforduló óta kimondottan daruvonulási vizsgálatokat nem végeztek Franciaországban, csak a vonulás általános menete volt ismert. A dolgozat az 1981 ősze és az 1984 tavasza közötti és az ország teljes területére vonatkozó megfigyeléseket közli. A vonulás fő iránya északkelet—délnyugat tengely mentén fekszik, ezt az irányt a szélviszonyok némileg módosíthatják, viharos időben esetleg szélsőségesen. A tavaszi vonulás általában rendezettebb, mint az őszi. Számos pihenőhely ismert az országban, ezek közül 5 kiemelkedően fontos. Az elmúlt évek során mind a pihenő darvak száma, mind azok tartózkodási időtartama jelentősen megnövekedett. Az átnyaráló madarak száma is növekedett az utóbbi években. A daru viselkedésének alapos vizsgálata szükséges ahhoz, hogy megértsük az elmúlt években bekövetkezett változások okait.