

CRANE (GRUS GRUS) MIGRATION OVER THE NETHERLANDS

Henk Wessels
The Netherlands

Introduction

Since autumn 1976 I gather and study crane-observations in the Netherlands, more specifically in the area north of the river Waal.

Crane-observations south of the river Waal are studied by *Vergoossen*.

Unfortunately the raw data from the southern part were not available for interpretation. There fore this lecture will only concern the situation north of the river Waal, and everywhere where I speak of the Netherlands, I actually mean the area north of the river Waal.

The study of cranes in the Netherlands is not based on systematical observations. For most of the data I have to rely on observations by amateur-ornithologists.

To stimulate these ornithologists to report their observations, summonings are published in Dutch Birding reviews and regional newspapers every year.

Even regional radio-stations in areas where cranes are expected, are asked to give attention to crane-migration.

If this publicity is given in a period with high migration activity, large numbers of crane observations are reported.

Interesting in the same way, is the seeming correlation between migration intensity and week-ends or holidays.

It will be clear that cranes are not tied to flying during week-ends, at the most to flying under good weather conditions, when also the largest numbers of observers are likely to be in the field an additional problem is the possibility of migration geese being reported as cranes by unexperienced observers.

Interpreting the rawdata brought together in this way, I try to find to the following questions concerning the migration of cranes:

- What numbers are involved in crane migration over the Netherlands?
- How is the observed migrations distributed over the spring and autumn migration periods? And what factors determine this distribution?
- What is the importance of the Netherlands for the crane during its migration?
- What is the importance of halting-places, and how can they be protected?

Methods

All observations of migration (flying) and halting cranes from autumn 1976 unto autumn 1984 are gathered and analysed. The data can be separated into three groups: observation during spring, summer and autumn.

Summer observations will not be dealt with in the lecture, because they only concern a few incidental observations. For all reported observations the following characteristics were filed: date, time of day, number of observed cranes, indication

of place and grid number (5×5 KM grid), ratio of adult and juvenile birds, flight formation, flight direction, sounds, particular details and the name of the observer.

Often, however, only date, numbers and place are reported, sometimes complemented with the time of the day and the flight direction.

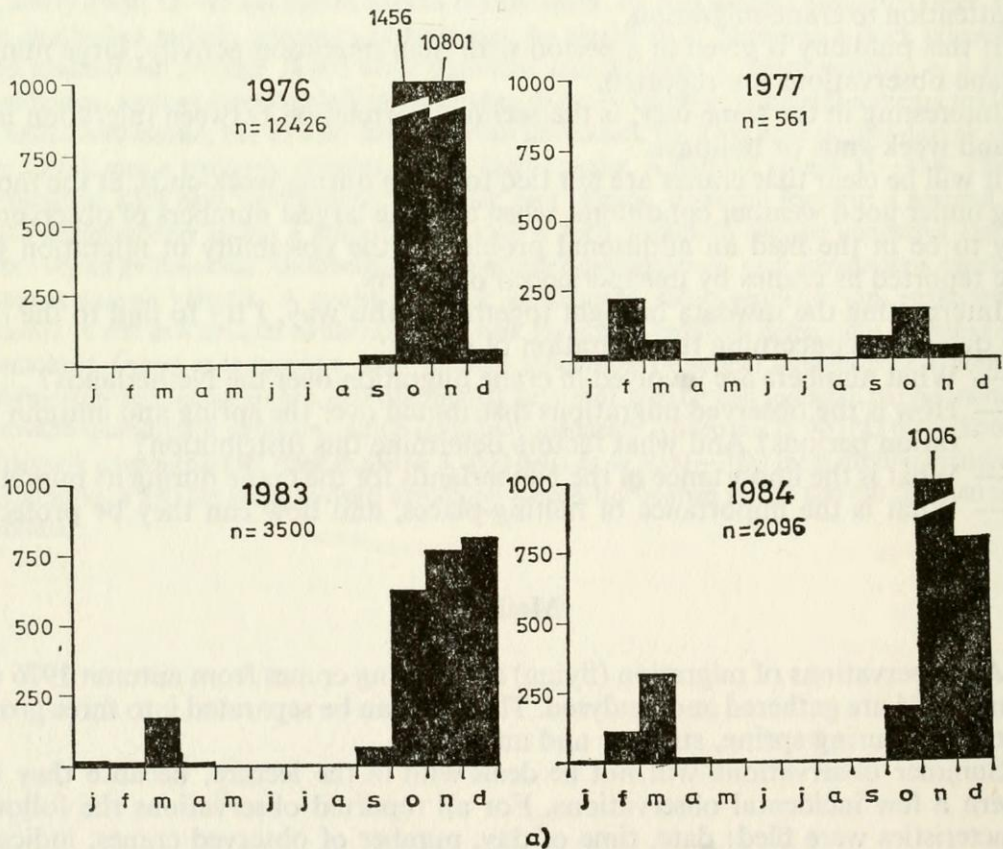
These data are analysed in relation to:

- 1 — the numbers of migration cranes observed (migration intensity);
- 2 — the regions in the Netherlands from which cranes are reported;
- 3 — the time of the year (migration period);
- 4 — some weather characteristics;
- 5 — time of the day;
- 6 — average groups sizes;
- 7 — preferential flight direction;
- 8 — migration routes and migration speed;
- 9 — halting places and landscape types.

Results

Migration intensity

The numbers of cranes which are observed migration through the Netherlands can vary a lot from migration period to migration period (fig. 1).



In some periods hardly any cranes are observed at all, while in other periods mass migration occurs. Two autumn and one spring period in the span of the research showed extreme high numbers.

In 'normal' years in autumn on average 900 cranes are observed, but in autumn 1976 nearly 12500 and in autumn 1982 up to 17000 specimens — which is about half the migration population — were counted?

In 'normal' spring periods an average of 300 cranes is observed, but spring 1980 showed about 3000 cranes.

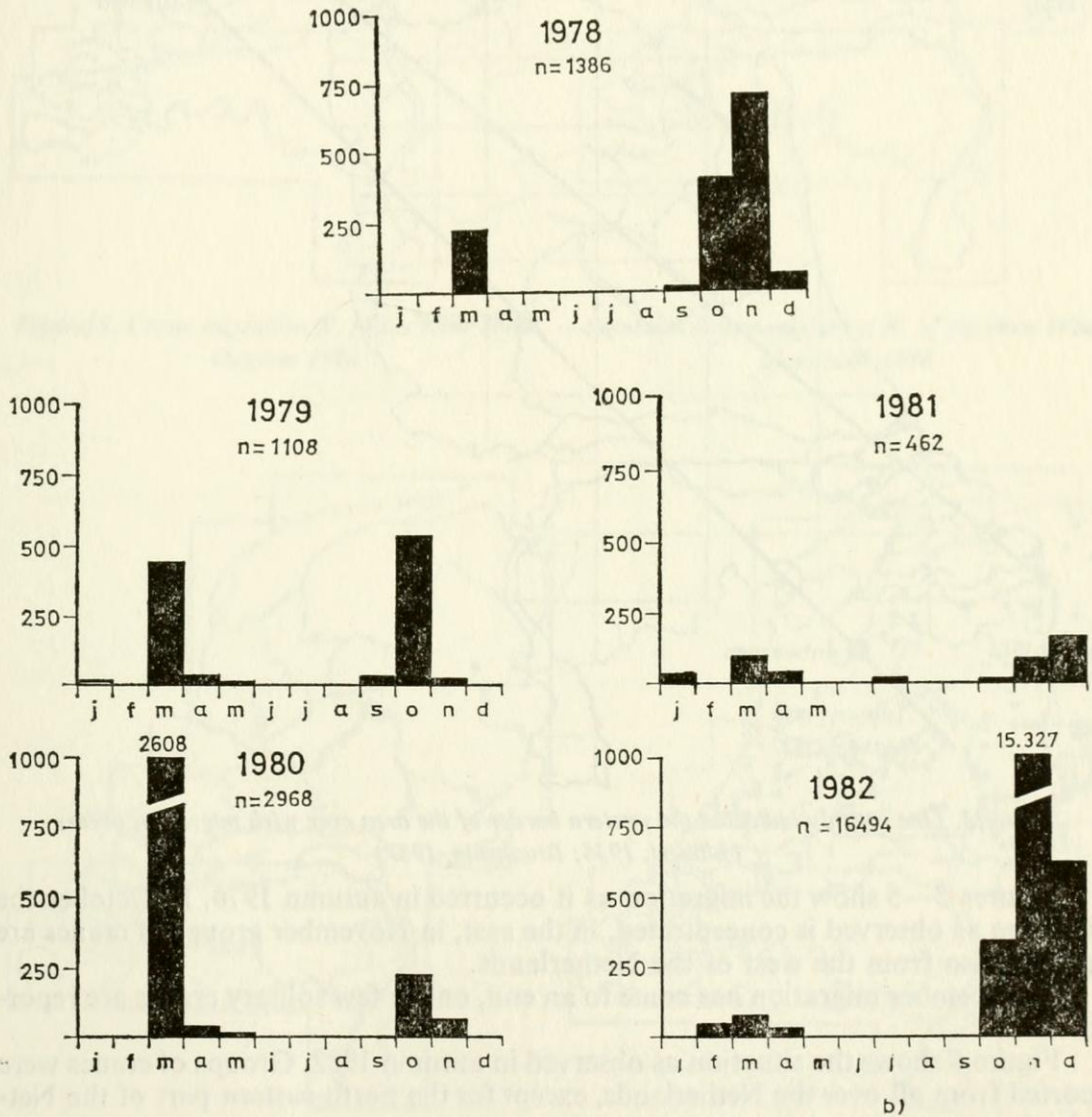


Figure 1. The numbers of cranes which are observed migration through the Netherlands can vary a lot from migration period to migration period (a—b) P.T.O.

The western border of the migration area

In some older literature it is stated that migration cranes are normally observed east of the line *Lübeck, Bremen (West-Germany), Deventer (The Netherlands) and Antwerpen (Belgium)*. This line roughly indicated the western border of the area over which migration occurs (*Libbert, 1936; Braaksma, 1937*) (fig. 2).

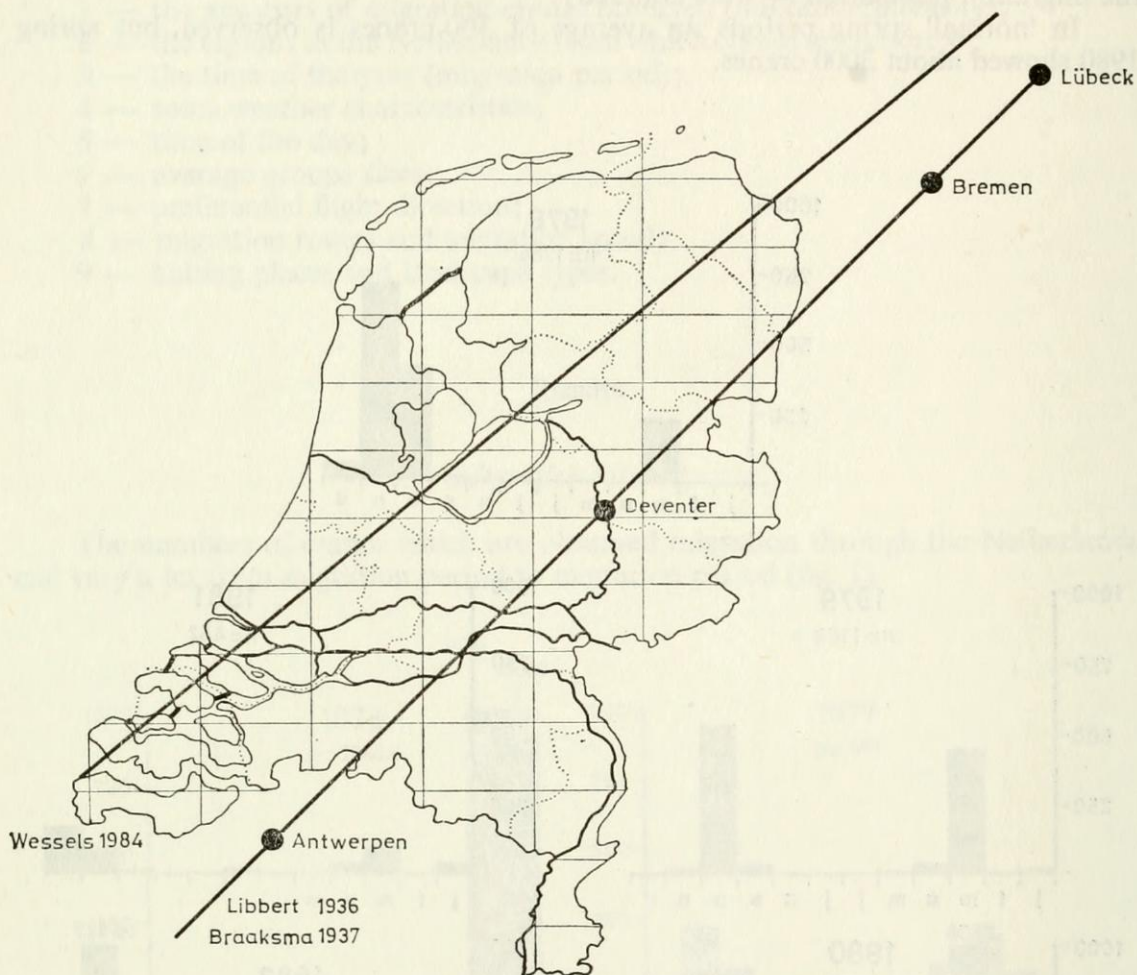


Figure 2. Line roughly indicated the western border of the area over which migration occurs (Libbert, 1936; Braaksma, 1937)

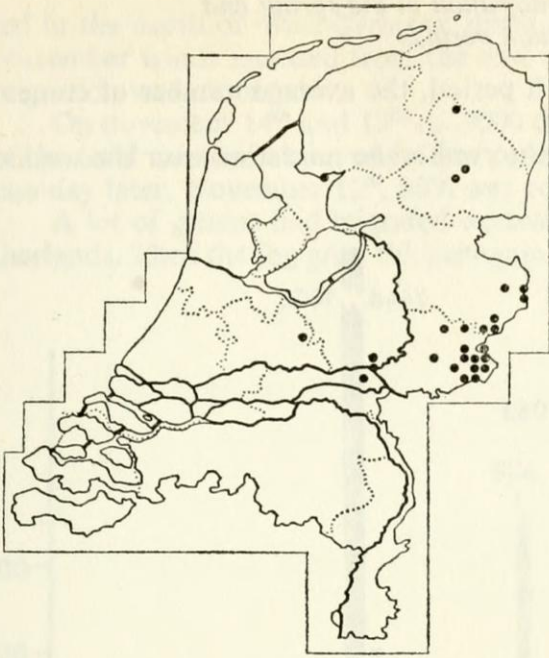
Figures 3—5 show the migration as it occurred in autumn 1976. In October the migration as observed is concentrated, in the east, in November groups of cranes are reported also from the west of the Netherlands.

In December migration has come to an end, only a few solitary cranes are reported.

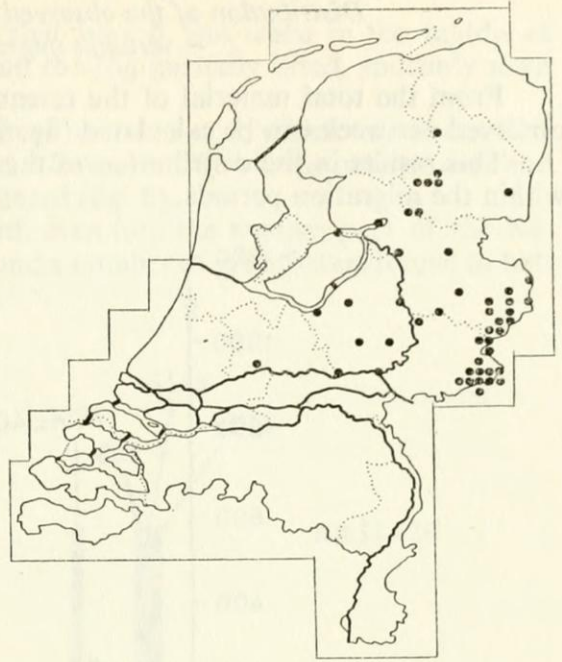
Figure 6 shows the situation as observed in autumn 1982. Groups of cranes were reported from all over the Netherlands, except for the north-eastern part of the Netherlands.

There are only a few groups, that were probably migration south over the *Waddenzee*, and along the coast-line, were reported.

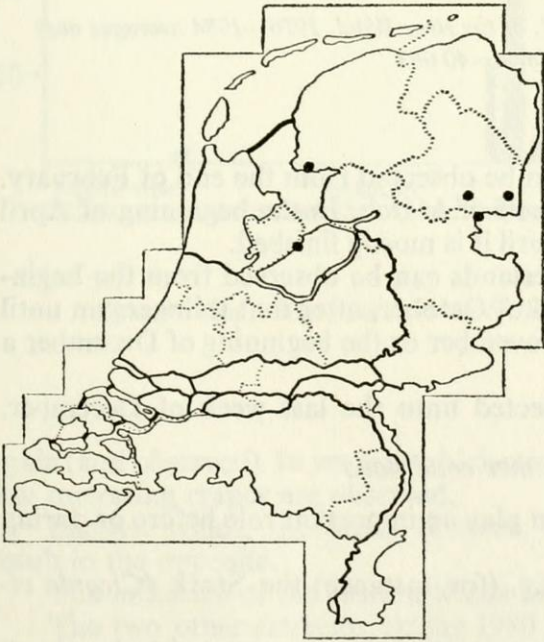
These recent data show that the western border of the migration area actually lies over the provinces of *Groningen, the Flevopolders, Zuid Holland and Zeeland*.



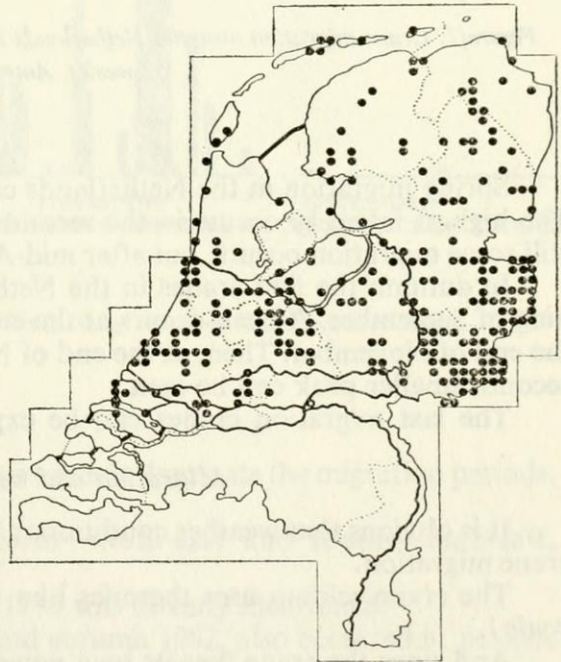
Figure|3. Crane migration N. of the river Waal,
October 1976



Figure|4. Crane migration N. of the river Waal,
November 1976



Figure|5. Crane migration N. of the river Waal,
December 1976



Figure|6. Crane migration over the Netherlands N.
of the river Waal, autumn 1982, September,
October, November, December

Distribution of the observed migration in the spring and autumn migration periods

From the total material of the research period, the average number of cranes observed per week can be calculated (fig. 7).

This results in the distribution of the observed crane migration over the weeks within the migration periods.

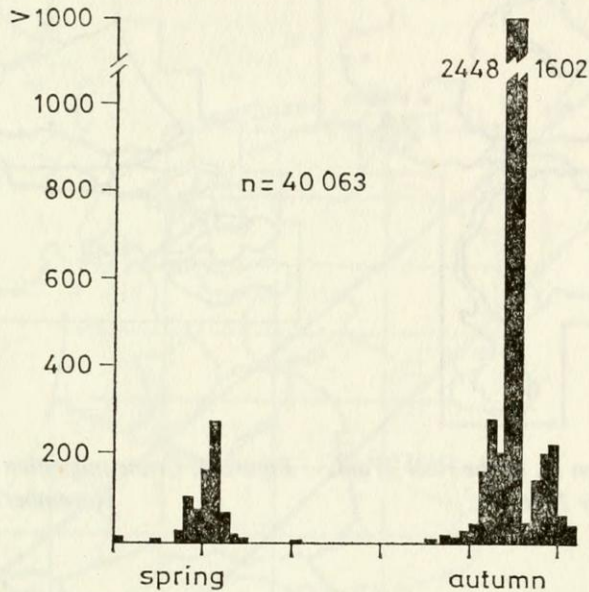


Figure 7. Crane migration over the Netherlands N. of the river Waal, 1976—1984 averages over 52 weeks. Anterior n=40 063

Spring migration in the Netherlands can be observed from the end of February. The highest intensity occurs in the second half of March. In the beginning of April still some migration occurs, but after mid-April it is mostly finished.

In autumn the first cranes in the Netherlands can be observed from the beginning of September. A peak occurs at the end of October, after that it lingers on until the end of November. Then, at the end of November or the beginning of December a second, smaller peak can be seen.

The last migration cranes can be expected unto the last week of December.

Migration and weather conditions

It is obvious that weather conditions can play an important role before or during crane migration.

The crane seldom uses thermics like e.g. (for instance) the Stork (*Ciconia ciconia*).

And since the crane flies its own power, migration can be expected to be observed under a wide range of weather conditions. The direction of the wind, the strength of the wind, and sight appear to be most important.

When the autumn of 1976 large parts of *West-Germany*, and the Netherlands were covered with fog, no migration cranes were observed. Possibly many cranes hal-

ted in the north of *West-Germany* during that period. But when in the middle of November winds increased from the east and the fog partially lifted, suddenly mass migration was observed.

On November 14th and 15th ca. 9000 cranes were counted, which was about 72% of the total number observed in that period. November 14th was the median date and one day later, November 15th, 90% was counted (fig. 8).

A lot of groups had migrated westward, even into the western part of the Netherlands. Then the fog grew thicker again and a number of groups were forced to halt

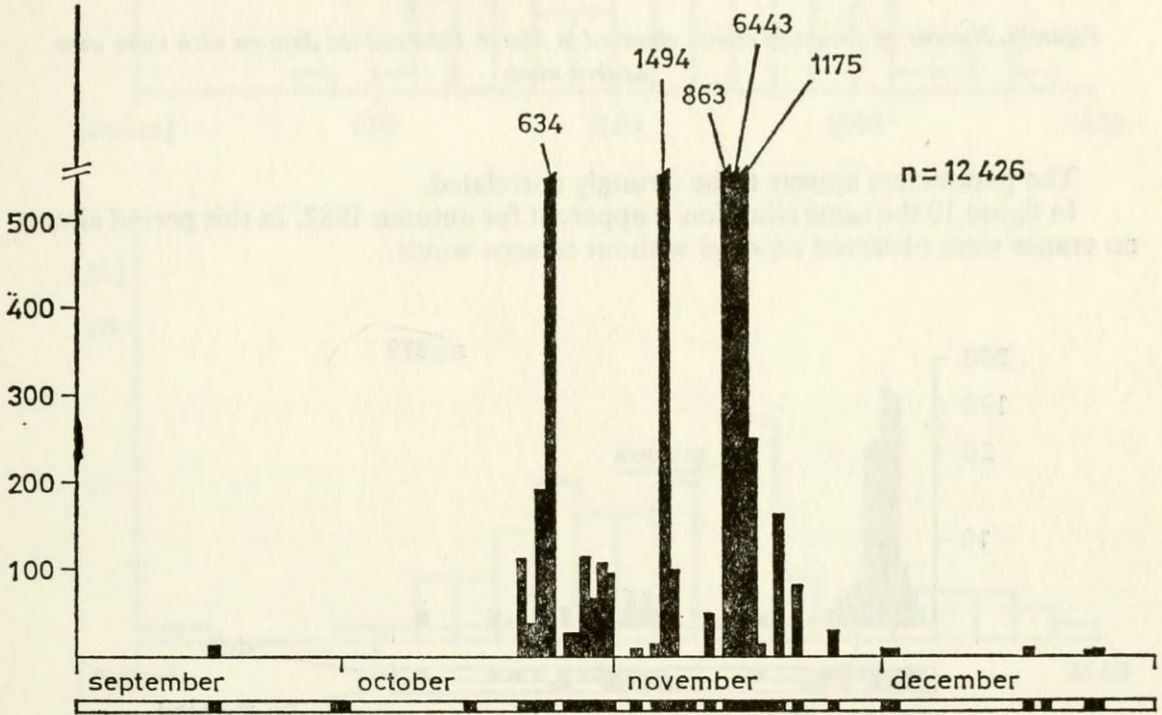


Figure 8. Crane migration over the Netherlands N. of the river Waal, autumn 1976

again (and observed). In years in which western winds dominate the migration periods, few migrating cranes are observed.

Eastern winds, all winds between north—north-east and south—south-east, result in the opposite.

The influence of the eastern winds in 1976 was already mentioned.

The two other extremes, spring 1980 and autumn 1982, also occurred in periods dominated with strong eastern winds, even storms in 1982.

Figure 9 shows the number of groups of cranes observed in March 1980 and the days on which there were eastern winds.

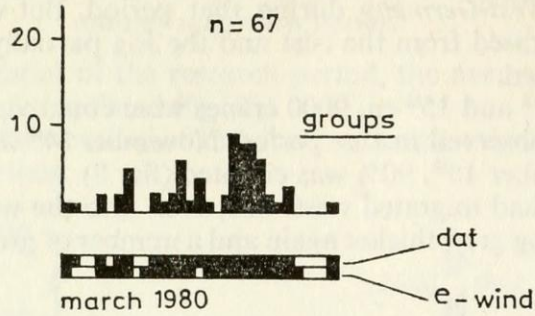


Figure 9. Number of groups of cranes observed in March 1980 and the days on which there were eastern winds

The parameters appear to be strongly correlated.

In figure 10 the same situation is apparent for autumn 1982. In this period almost no cranes were observed on days without eastern winds.

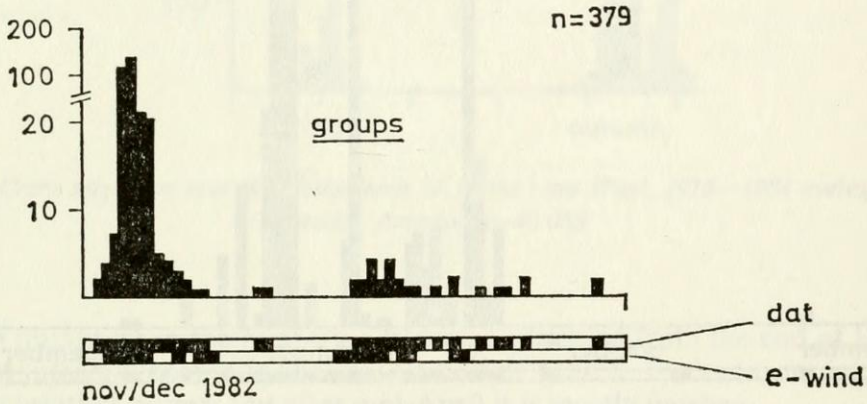


Figure 10. The same situation is apparent for autumn 1982

Distribution of migration intensity in the day

In research in the 'Ruhrthal' in West-Germany it was shown that cranes in spring show the highest migration intensity in the afternoon. In autumn, at the same place, numbers appeared to be evenly spread in the day (Metser, 1961).

In the Netherlands the data from 1976 unto 1984 were analysed with respect to the hour of the day in which the observations were done. In spring about 30% of the cranes is observed to pass in the morning, between 6 p.m. and mid-day (fig. 11). Between 12.00 and 18.00 h, in the afternoon, about 55% passes, and in the evening, between 18.00 h and 24.00 h about 12% passes. In autumn the distribution in the day is roughly the same: about 35% in the morning, about 50% in the afternoon and about 14% in the evening.

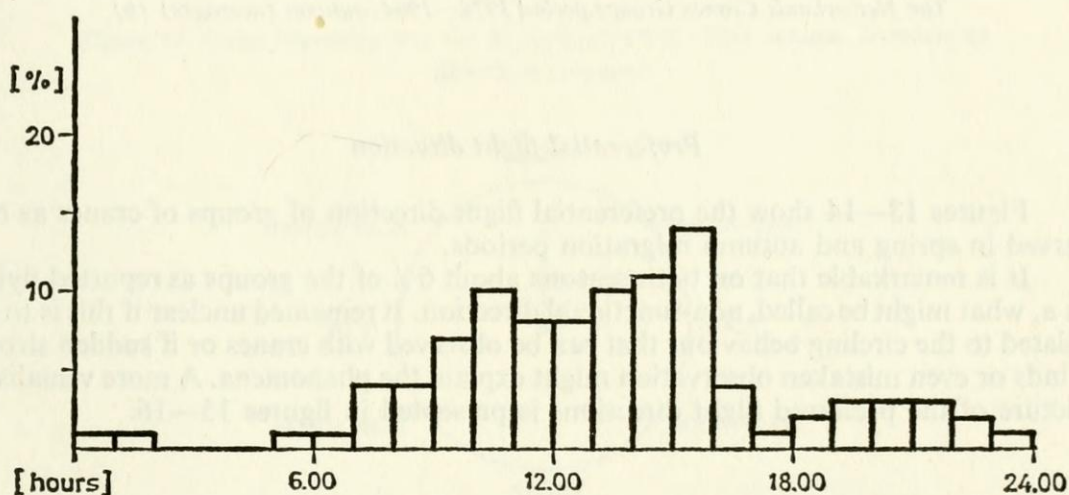
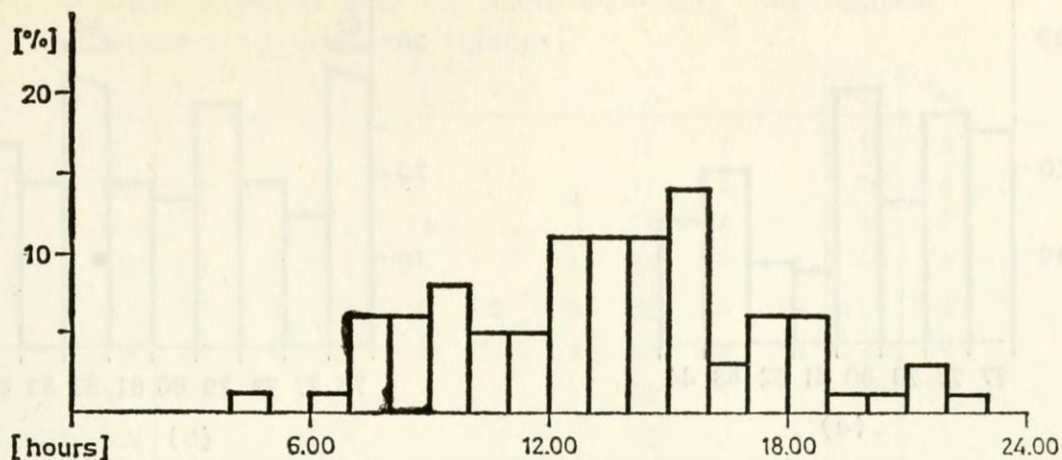


Figure 11. Migration Cranes over the Netherlands, spring 1977-1984 (a) Migration Cranes over the Netherlands, autumn 1976-1984 (b) % 24 hours

Average groupsize

In analysing the data with respect to the average group sizes were observed, it was tried to avoid double countings as much as possible. But especially when smaller groups have united to larger groups farther on on their migration routes, this is difficult to recognize from the reported data.

Also it is possible that groups have been missed by observers farther on. From reports on observation done late at night e.g. (for instance), it is clear that they are often done by sheer coincidence.

Figure 12 shows the average group sizes for all migration periods in the research period. It is remarkable that average to be larger in periods with a high migration intensity (mark spring 1980 and autumn 1976 and 1982).

In the same sense group size tends to be larger in autumn than in spring.

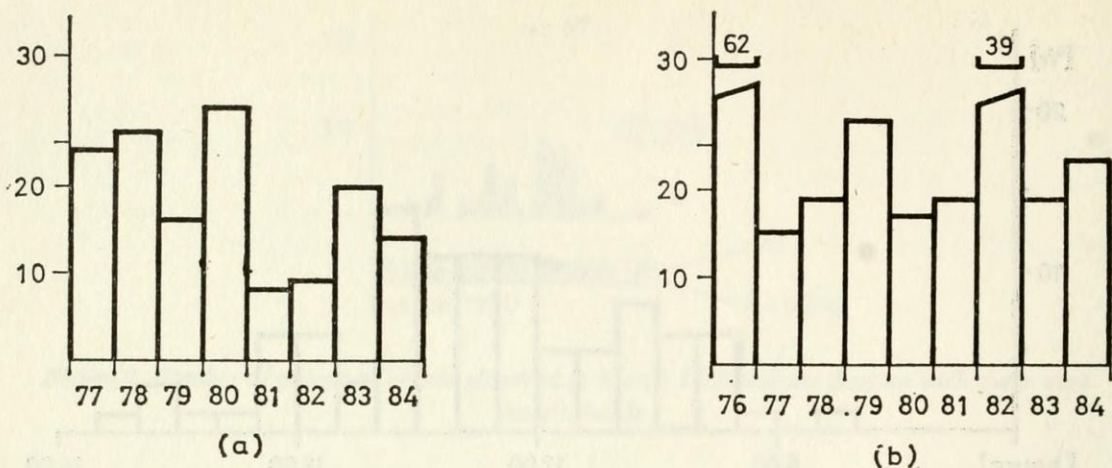


Figure 12. The Netherlands Cranes Groups period 1977—1984, spring (averages) (a)
The Netherlands Cranes Groups period 1976—1984, autumn (averages) (b)

Preferential flight direction

Figures 13—14 show the preferential flight direction of groups of cranes as observed in spring and autumn migration periods.

It is remarkable that on both seasons about 6% of the groups as reported flying in a, what might be called, non-functional direction. It remained unclear if this is to be related to the circling behaviour that can be observed with cranes or if sudden strong winds or even mistaken observation might explain the phenomena. A more visualised picture of the preferred flight directions is presented in figures 15—16.

Crane migration over the Netherlands 1977—1984 Spring
Numbers by directions (groups)

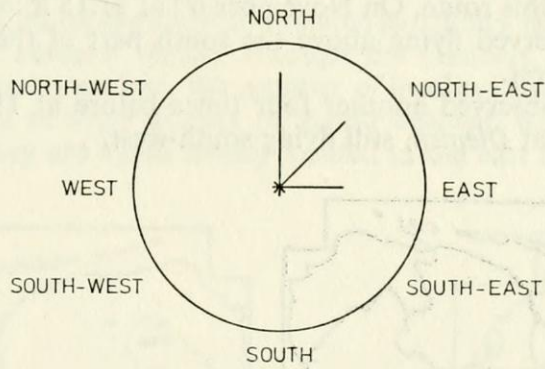
									TOT	%
N	22	50	26	24	30	20	50	7	229	39
NO	44	50	42	44	50	50	33	14	191	32
O	22		16	15	8	20	17		98	17
ZO				6	8				14	2
Z			5	2		10			17	3
ZW			5	4					9	1
W			5						5	
NW	11			2				1	14	2
	77	78	79	80	81	82	83	84	577	100

Figure 13. Crane migration over the Netherlands 1977—1984 spring. Numbers by directions (groups)

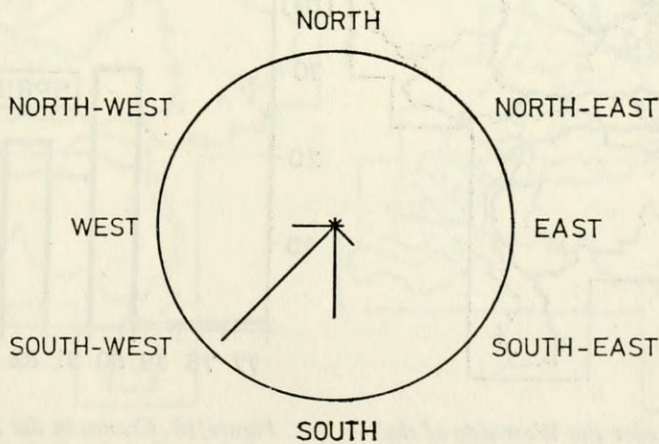
Crane migration over the Netherlands 1976 – 1984 autumn
 Numbers by directions (groups)

											TOT	%
N	1						12	1			14	2
NO	1						11	2			14	2
O	2						11	2			14	2
ZO	8	1	4	4		1	24	5	2		49	8
Z	16	3	7	6	3	3	90	20	11		159	26
ZW	54	6	27	5	11	3	108	43	33		290	46
W	17	4	4	1	1	3	26	15	1		72	12
NW	2		1					2	2	1	8	1
	76	77	78	79	80	81	82	83	84		620	100

Figure|14. Crane migration over the Netherlands 1976—1984 autumn. Numbers by directions (groups)



Figure|15. Crane migration over the Netherlands, period 1977—1984, spring



Figure|16. Crane migration over the Netherlands, period 1976—1984, autumn

The measure of prevalence is indicated by the length of the lines. The radius of the circle is equal to 50%.

The flight directions as observed in the autumn migration periods show a tendency of a change in flight direction from south-west to west—south-west, the more westward groups are observed.

Migration routes and migration speed

The observations on different groups of cranes, gathered and mapped over the years, give an impression of how the migration over the Netherlands occurs. Normally the cranes migrate, both in spring and autumn, over the south-east part of the Netherlands.

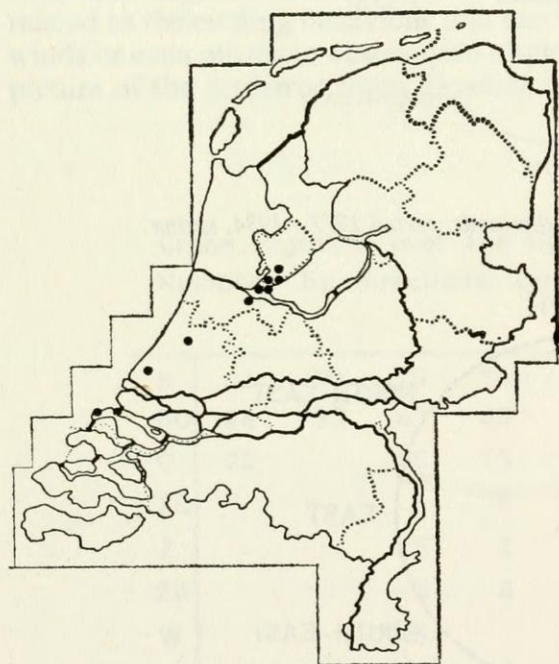
By studying the movements of individual groups, it was tried to reconstruct the route which a certain group followed. This appeared to be very difficult for groups travelling over the east part of the Netherlands.

The large number of groups observed in that part and their interference, made it impossible to recognize individual groups over a long trajectory.

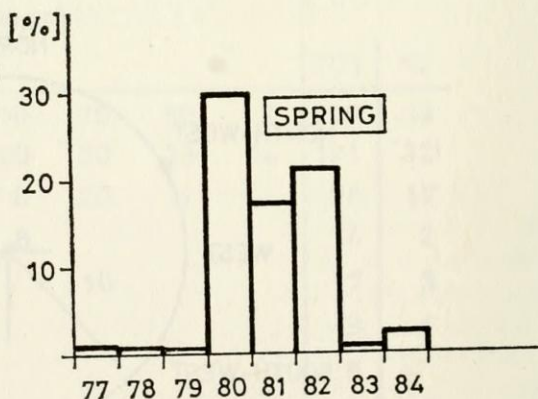
For one group in the autumn of 1982, migrating south over the west part of the Netherlands it appeared to be possible to reconstruct its migration route.

Figure 17 shows this route. On November 6th at 11.15 h in the morning a group of 90 cranes was observed flying above the south part of the *Ijsselmeer*. Its flight direction was south-west.

The group was observed another four times before at 11.30 h. It reached the coast of the *Ijsselmeer* at *Diemen*, still flying south-west.



Figure|17. Cranes over the West-side of the Netherlands. One group ± 90 cranes
6 November, 1982



Figure|18. Cranes in the Netherlands
% birds on halting places

One hour later the group was observed near *Den Haag*. Flight direction south. A short time later the group was observed near the coast at *Hoek Van Holland*.

Flight direction south—south-west. At 14.00 h it was observed again. This time above the islands of *Zuid Holland*.

The trajectory which was partially over water, was covered at an average speed of 50 km/h.

It is, however, unknown if the group has halted somewhere on the trajectory. Therefore, this speed is no more than an indication of the migration speed!

In the east part of the Netherlands a speed of 45 km/h was found for a somewhat shorter distance over land.

Halting places in the Netherlands in spring and autumn

The numbers of cranes which were observed halting in spring and autumn can be expressed as a percentage of the total number of cranes observed in the particular period (fig. 18). There are almost no cranes observed halting in autumn. In spring however halting groups are seen regularly. This difference between spring and autumn is not quite understood.

Figure 19 shows all blocks in which cranes were observed to halt, for all spring migration periods in the research period. They appear to be located mostly in the east and the north-east of the Netherlands.

Some observations along the coast are related to solitary birds. Figure 20 shows the same data for the autumn period. Although the numbers of cranes that were observed halting in autumn are less, the number of localities equals that of the spring period. With exception of some locality in *Zuid-Flevoland*, where in autumn 1982 some groups halted, they are again mostly located in the east and north-east of the Netherlands.

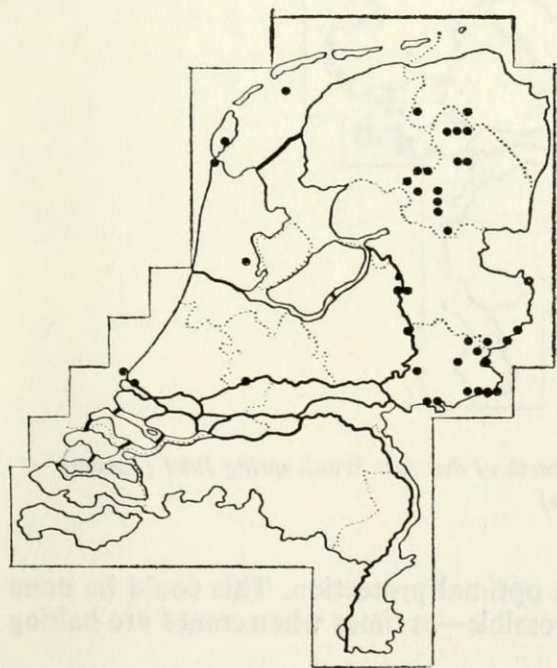


Figure 19. The Netherlands halting-places, spring 1977—1984

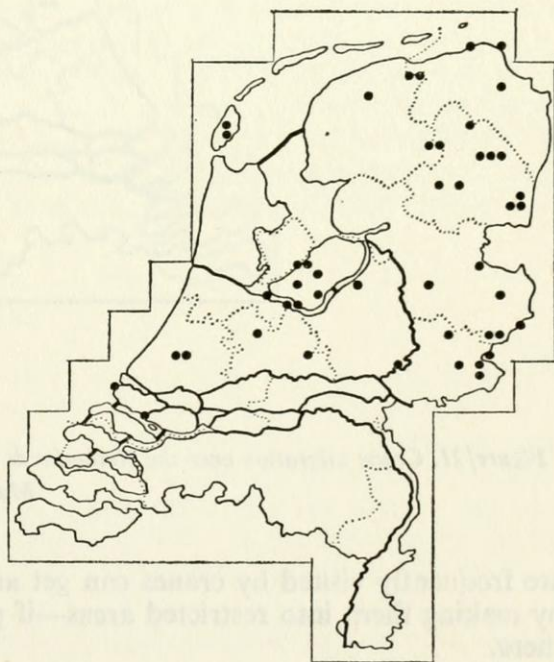


Figure 20. The Netherlands halting-places, autumn 1976—1984

Halting places and landscape types

When the data on halting cranes are analysed with respect to the landscape-type used, three landscape types emerge, being equally dominant: bogpeat and heather areas with 33%, meadows with 29% and arable land with 25%.

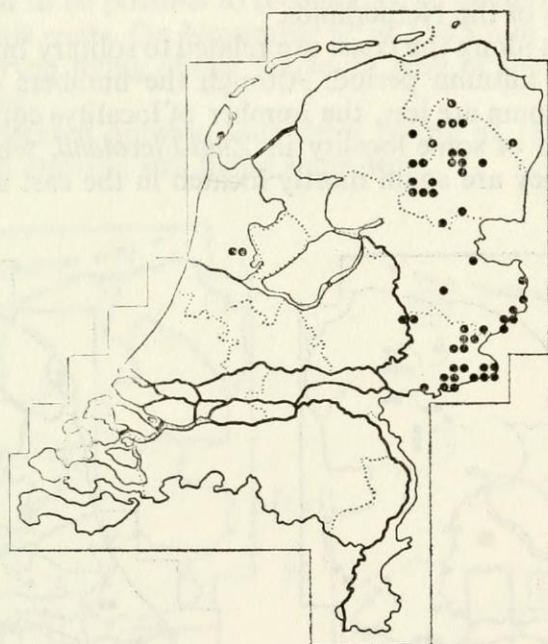
The remaining 13% was observed in forelands, the *Ijsselmeerpolders*, the *Wadden* and some other coast areas.

The importance of halting places

There are only very few halting places in the Netherlands and they are exposed many negative influences.

They are mostly situated in areas which are least populated, but especially those areas are often visited for recreation, which causes a lot of disturbance for the halting cranes.

In certain years, like spring 1980, relatively many halt in the Netherlands, and not only the traditional places (fig. 21). At that time a lot of disturbance was caused by curious people. I think it of essential importance, that at least those places which



Figure/21. Crane migration over the Netherlands north of the river Waal, spring 1980 (January—May)

are frequently visited by cranes can get an optimal protection. This could be done by making them into restricted areas—if possible—at times when cranes are halting there.

If we want protect the cranes, which are also endangered outside the Netherlands, think of the disturbance of breeding cranes, the destruction of habitats, recreation, high tension cables, and hunting from their threatening extinction.

If we want to protect them as species, but also as a part of the avifauna, we have to come up with effective measures on national and international level.

Author's address:
Henk Wessels
Orion 12
7122 XG Aalten
the Netherlands

A daru (*Grus grus*) vonulása Hollandiában

H. Wessels
Hollandia

A szerző 1976-tól összegzi a daru átvonulására vonatkozó megfigyeléseket Hollandiában. A tapasztalatok szerint az őszi vonuláson átlagosan 900 darut számolnak, de kiugró volt az 1976-os ősz, amikor 12 500, illetve az 1982-es ősz, amikor 17 000 darut észleltek. A tavaszi vonuláson jóval kisebb a szám, átlagos években: 300; kiemelkedő az 1980-as év tavasza, amikor a 3000 példányt is elérte az észlelt darvak mennyisége.

A szerző sürgeti a darvak pihenőhelyeinek védelmét, mivel ezek általában a ritkán lakott területeken vannak. Ugyanakkor a kirándulóforgalom jelentős része éppen ezekre a helyekre irányul, ami számottevően zavarja a darvak ott-tartózkodását.