Daily movements of Black-headed Gulls (*Larus ridibundus L.*) in the region of Brussels Airport

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A. Introduction

Brussels Airport, like many other airfields, has to do with birdstrike problems. In a study, from november 1977 till april 1979, dealing with feeding habits and daily movements of Black-headed Gulls, we proceeded from the situation on this airfield. Each day, about sunrise, thousands of Gulls fly at very low altitude over the airfield aswel as over the approach and climb out areas.
Most of these Gulls feed on a garbage dump, adjacent to the airport. They spent all day in the neighbourhood and often rest on the airfield, even on the runways and taxitracks. About two hours before sunset, again, thousands of Gulls cross the airfield in the opposite direction on their way to their roosting areas.

B. Feeding habits of wintering Gulls.

(1) Materials and methods

From november 1977 till april 1979, observations on Gull activities on the garbage dump and on the airfield were made with the aim to evaluate the importance of the dump to wintering Gulls. These regular observations gave already a good idea of the daily program and the feeding habits of the Gulls.
In addition to this, during the winter of 1978-1979, 85 Gulls were shot at the airfield and the content of their stomachs was analysed.

Important for stomach-analysis is that the content of the stomach is fixated as soon as possible after death. In our case, it was done with *formaldehyde 40%*. This chemical stops the digestive enzymes and makes analyses more agreable. The gullets and stomachs were removed and stored in a deepfreezer till there was enough material to start analysis.

Stomach-analysis is never easy but determination of rubbish gave still more problems. Most of the stomachs contained some insects, worms, a small amount of plants, stones and most of all a lot of white particles. These could be soft or hard, smaller or larger. Fat, bread, bone and even plastic were often really resembling. Therefore some techniques for chemical analysis were worked out. All white and undefinable "things" were treated with *p-dimethylaminobenzaldehyde*. This chemical gives a selective violet colouration for material containing starch (as for exemple bread). Next the particles were treated with "Sudan II". This chemical gives a selective red colouration for animal fats, some days after treatment.

With these methods as help, all items were count, measured and weighed as precise as possible. Than the results were calculated by numeric, gravimetric and volumetric methods. These calculations are to tecnical to discuss here and can be found, completely, in the original paper.

(2) Results

On the diagram (fig. 1), the evolution of stomach-contains can be followed during winter.

In *september*, the Gulls eat only food of natural origin. This is characterized by the occurence of :

- small stones (which will always be present)
- a small amount of plants, most of all grass (most of the plants are likely eaten occasionally when searching for worms and other small invertebrates)
- "insects" (including spiders, Millipedes and Centipedes)
- "worms", most of all earth-worms, *Lumbricus sp.*.

In *october*, the diet changes radically. The first garbage appears in the analyses. Very characteristic is the presence of small pieces of glass. It's probable that they are eaten occasionally on the dump. However some pieces were several square centimeters large and often very sharp. Remarkable is that a diet of garbage is nearly always characterized by the presence of glass. During winter, even empty stomachs contained glass particles.

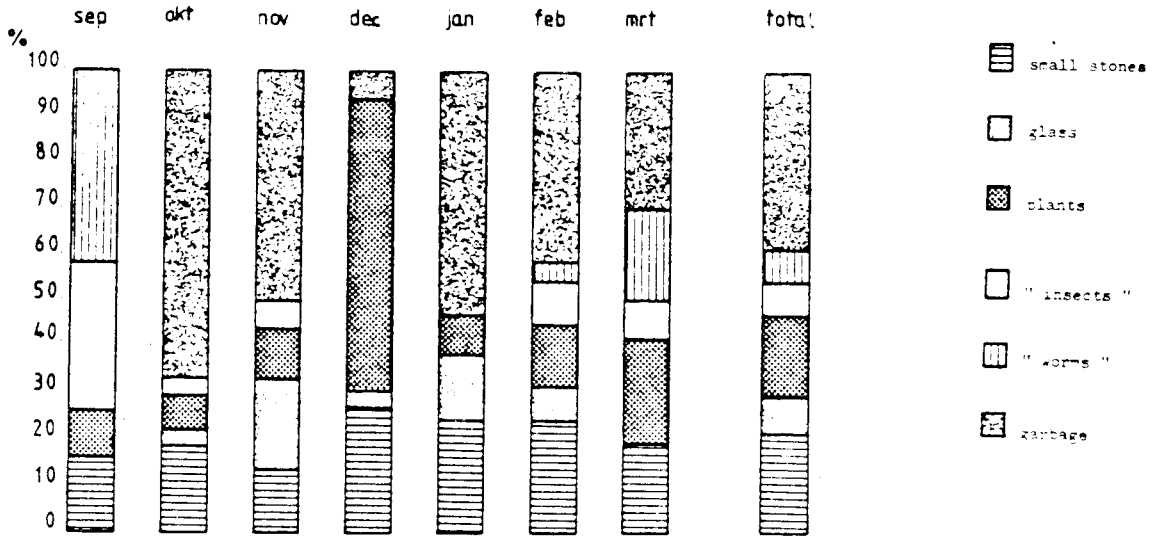

Fig. 1 : Percentual representation of the importance of food-items, classified per month.

Most of all,the garbage is composed of pieces of fat, bread and some things likely occasionally eaten as plastic, hair, pieces of wood and so on.
In october, only a small amount of "insects" are found and they are most of all of "garbage-origin" as for exemple *Diptera-larvae*. "Worms" are alredy completely absent.

In *november* only some small differences with october were noted.

December gave bad results because the Gulls were shot early in the morning before they had eaten. The stomachs contained only slowly digesting material as plants and garbage.

January gave about the same results as october and november, but now there were no longer "insects" available.
In *februari* and *march*, with the first ploughing and other agricultural activities, the first worms appear again and the amount of "insects" increases. The garbage-level drops and in relation to this the glass-level too. Glass is already completely absent in march.

(3) Conclusion

Finally, we can conclude that the Gulls prefere food of natural origin if sufficiently available. When it's to cold to find worms and "insects", they will change on garbage. The garbage dump of Nossegem makes it possible for the Gulls to survive during the coldest periods and this implicates a permanent presence of Gulls on the airfield during winter and a much higher birdstrike-risk than there should be without garbage-dump.

C. Daily movements of wintering Gulls.

The second problem that was studied were the daily movements of the Gulls. When you can observe, each day on the same place, approximately the same number of Gulls and when you see them arriving in the morning and leaving the evening, some questions will rise : "Where do these Gulls come from and where do they go to?"
"Are it always the same birds who return?"

(1) Materials and methods

To answer these questions, the major Gull feeding-, loafing- and roosting-areas were visited regulary and for each place counts were made at different times. For the observations of flying Gulls, number, height and direction were noted and all these data were plotted on a map. Also the fidelity of Gulls to their feeding-sites was checked. To facilitate our investigations, at different

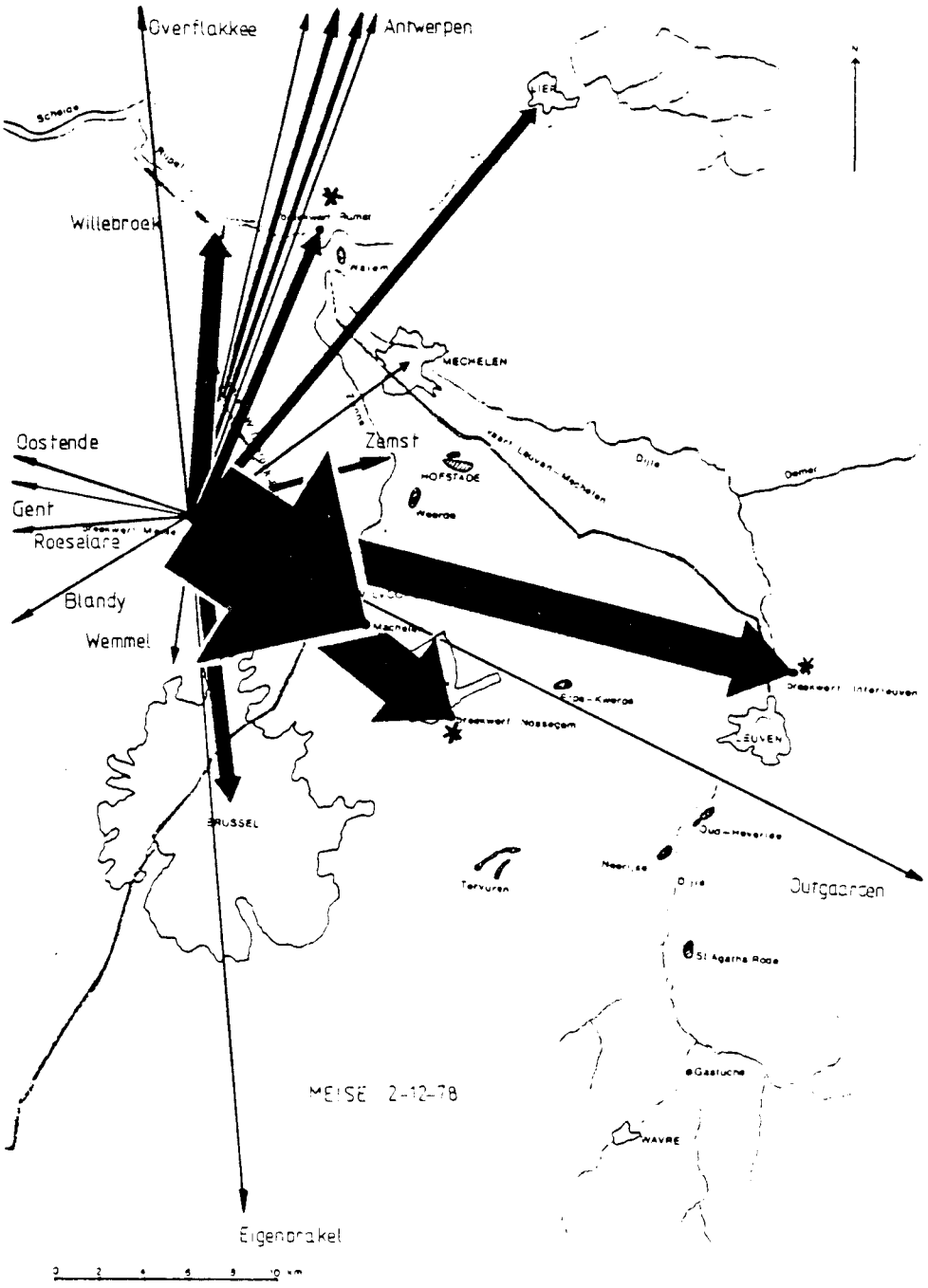

Fig. 2 : Some recoveries of marked birds. 383 Black-headed Gulls were painted at the garbage dump of Meise (beginning of the arrows). 80 of them were recovered later (20.9 %).
** are other garbage dumps.*

sites and over a period of 6 non-consecutive days, about 1100 Gulls were trapped with a cannon-net, banded and colour-marked. For colouring 5 different paints were used in addition with coloured plastic wing-tags. On each marking day, different colour-patterns were used. Only for the garbage dump near the airfield, about 150 Gulls were marked individually. Of the 1100 marked birds, 170 recoveries were noted. That is about 15 %.

(2) Results

Plotting the recoveries on a map (fig. 2) shows that there is a very large exchange between the feeding places.
It happened several times that a bird, marked and released on one dump, was observed already the following day on another dump, 30 to 50 kilometers from there. It happened too that, when marking more than 200 Gulls on a dump, the following day NO marked birds were observed on that same place.
Of course, it can be possible that capturing and marking were such an aversive stimuli for the birds that they wouldn't come back for a time.
Now, what about the fidelity of Gulls to their feeding-places? To get some more information about this problem, on the garbage dump adjacent to the airfield, 150 Black-headed Gulls were marked individually by combination of 2 colours on different parts of the body. Of the 150 birds, 19 recoveries were made. Of these 19 birds, only 8 were seen again on that specific garbage dump but it were never the same birds who returned more than one time. We found no arguments for a possible adhesion of single birds or groups to feeding-places.
All the results of the recoveries now, together with the results of the field observations were plotted on a map, giving us the plan of the morning-flights of the Gulls from their roosting- to their feeding-areas (fig. 3).
We have to add that the situation on the map can change rather quickly. It's enough that another dump is opened or that a pond

or lake, as for exemple the drainage-pond of the new airfreight-building of Brussels Airport, is created to change the situation radically.

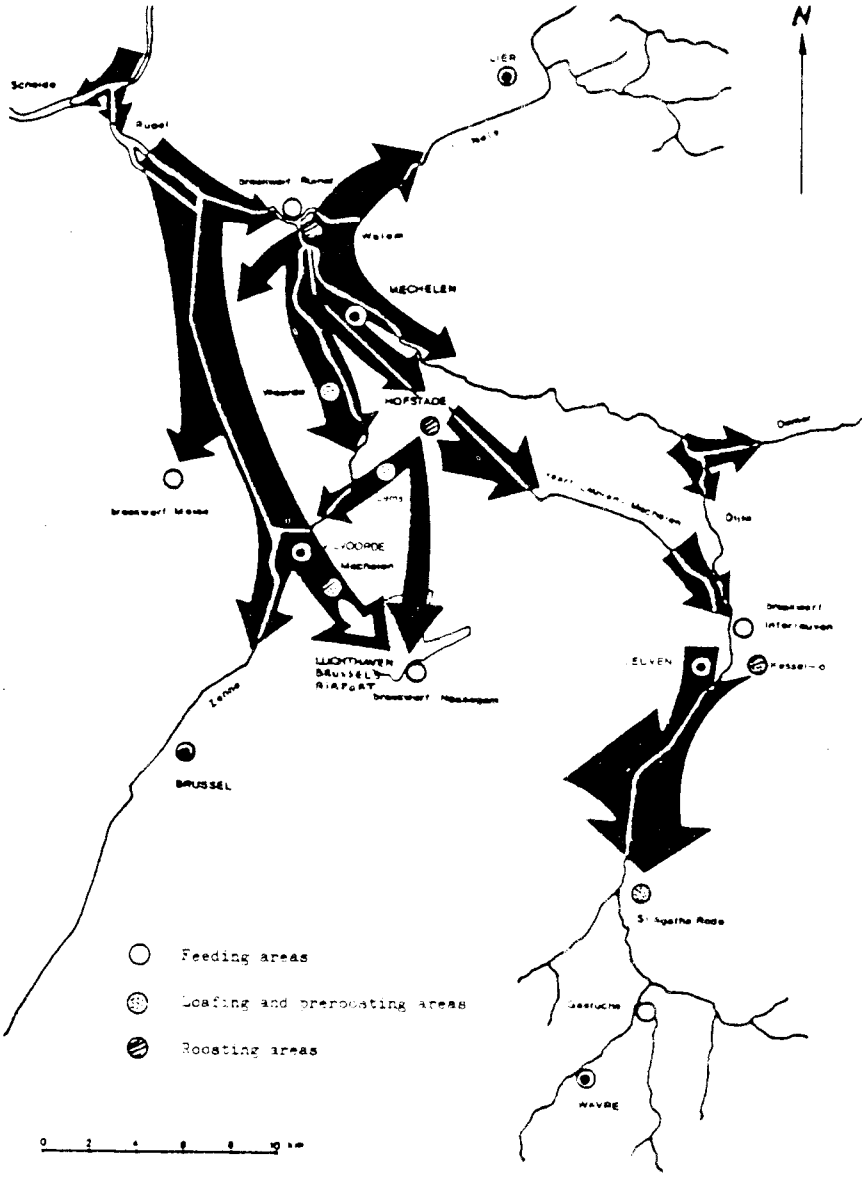

Fig.3 : Daily movements of Black-headed Gulls between their roosting- and feeding-areas.

(3) Conclusion

Observations and counts made it possible to compose a map of the daily morning-flights of the Gulls between their roosting- and feeding-areas. The dump, at the southern side of the airfield, is responsible for the occurence of Gulls on, and the regular flights of these birds over the airfield. This implicates a large birdstrike-risk.

D. Final conclusions and recommendations

Regular field-work (observations, counts) and stomach-analysis of Gulls shot at the airfield, proved that the feeding-flights over and the presence of Gulls at the airfield are mainly caused by the occurence of a garbage dump at the southern side of the airfield.
This situation could possibly be remediated by a policy of aggresive scaring (distress-calls, shooting pyrotechnics and live ammunition ...) on the dump aswel as on the airfield. These actions should start in late summer, at the moment the first Gulls arrive at the dump.
A final and permanent solution of the problem should only be found by closing the dump and by creating simultaneously another site of attraction, north of the airfield.

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