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Breeding of Tufted Duck *Aythya fuligula* in De Beemster (Noord-Holland) in 1979

Het broeden van Kuifeend *Aythya fuligula* in De Beemster (NH) in 1979

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In Western Europe, the range of the Tufted Duck *Aythya fuligula* has shifted towards the south-west since 1900 (Cramp & Simmons 1977). The species has strongly increased as a breeding bird in Holland since 1950. The reasons for this increase may be intrinsic and environmental factors that have to be studied both in the wintering and breeding areas.

In 1979 the Tufted Duck was studied in one of the Dutch breeding areas, the Beemster polder. The aim of this investigation was to estimate the breeding success by counting paired adults early in the season and females with broods of ducklings later. The data collected in this way contribute to an evaluation of population changes as recorded in recent years (Zomerdijk 1976).

Study area

The study was made in the polder Beemster (7200 ha) which is enclosed by a more or less circular channel (de Ringvaart) that delimits the polder boundaries. The Beemster is a reclaimed lake (reclamation 1608-12), crossed by straight roads and furrowed by many ditches of different width and water level, though generally not over 1 m deep. Surplus water is removed to the Ringvaart by two pumping stations. The area is mainly used for stock raising and agriculture. Farms are regularly spaced all over the polder and there are some well-delimited villages. As the entire polder was far too large to be regularly checked for numbers of Tufted Duck, a study area was selected in the south-western part (figure 1). This was also the area with the densest population of the species, as appeared from a preliminary census.

From the literature (Hildén 1964) it is known that two important elements in the choice of the breeding habitat of the Tufted Duck are water of sufficient depth, warranting the food supply, and a safe place where the nest can be built. In the Beemster these elements are found in the fields used as meadows, with ditches near at hand, not too deep and with a muddy bottom. These ditches are rich in chironomid larvae and small crustaceans, organisms forming a large part of the food of young Tufted Ducks (Bengtson 1971). The borders of the ditches provide a grassy substrate, well suited for the nest to be built in. Risks for breeding ducks are disturbance by people and cattle, loss of nests by changes in water level, and predation by domestic cats; predators of ducklings include Pike *Esox lucius* and Grey Heron *Ardea cinerea*.

Methods

The breeding population was estimated by counting pairs. A male and female were considered to form a pair when they were observed close together in a likely breeding place. Breeding success was estimated by counting the number of females with young and the number of ducklings. Methods used were simple; observations were made with help of a 8×30 fieldglass and a 15-45×60 telescope. Counts were carried out mainly from the roads and sometimes also from the fields, from behind a screen as well as crawling through the grass. The counts were per-

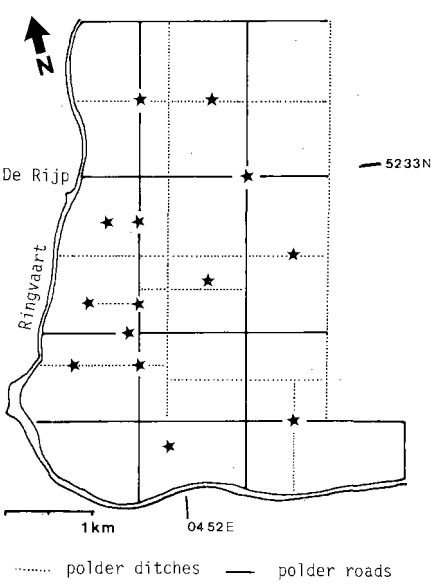
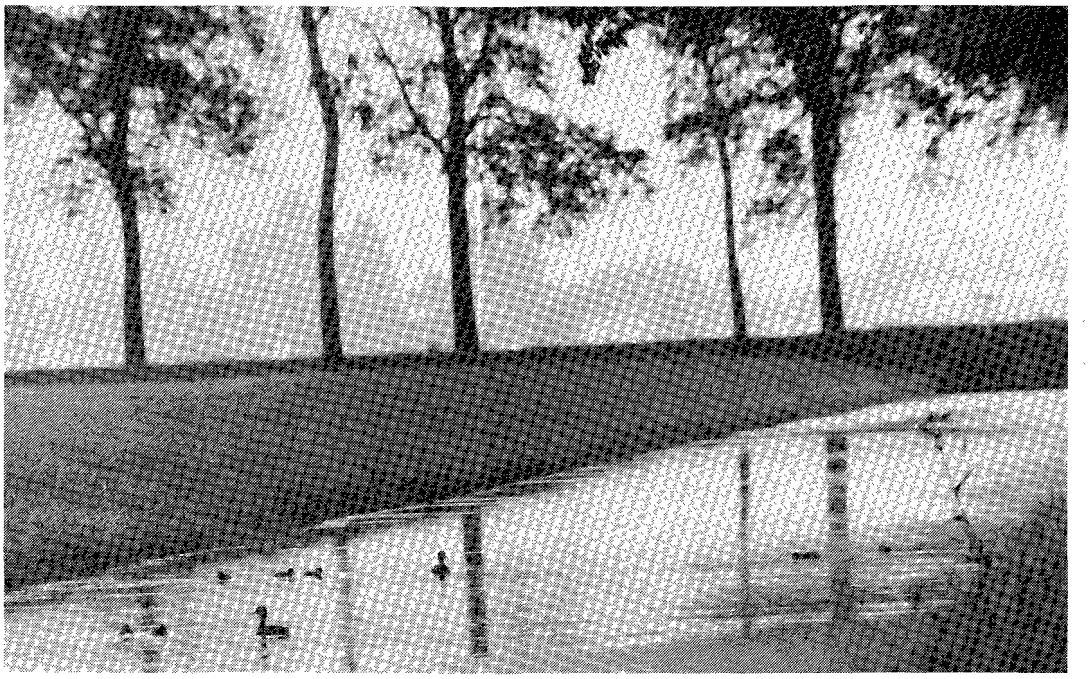


Figure 1. Study area. *Onderzoekgebied.* (★) Observation spot. *Waarnemingsplek.*



Polder ditch in De Beemster (*P. J. Zomerdijk*). *Poldervaart in De Beemster.*

formed 1-3 times a week (except in the week 10-16 June), mostly between the first hours of the afternoon and sunset. Covering the whole area took some hours. The usual means of transport was a car. A fixed route was followed, stopping from time to time to watch the ditches that run at right angles to the road. No search was made for nests.

Results

Total numbers of males and females reached a peak in the first week of June when 110 ♂♂ and 74 ♀♀ were counted (figure 2). On 29 May 76 pairs were recorded, so the number of breeding pairs corresponds closely to the maximum number of females and may be estimated at between 70 and 75.

The first female with young was observed on 19 June. On 13 July, a day with particularly favourable weather conditions, peak numbers were counted: 35 broods totalling 208 young (figure 3). The number of females was 37, of which 34 accompanied a brood, giving an average of 5.9 young per female, assuming that the female belonging to the unaccompanied brood was away on a foraging trip. This average decreased to values between 4 and 4.5 in the course of the season. The total number of young decreased sharply after 13 July, which refers mainly to young at the ¼ stage of growth (figure 4). More than half of the number counted on that day had disappeared on 17 July. As the number of females with broods also fell sharply, it was concluded that many entire broods were gone.

Most young reached the full-grown stage in about six weeks. Within the first three weeks the young were strongly gregarious and they moved never far from the nesting place. This behaviour was coordinated and reinforced by the presence of the mother. In the following three weeks the broods broke up and moved all over the area. Almost all individuals left the area in the beginning of September, except a few that hatched late in the season.

Discussion

The Tufted Duck population in the Beemster has been studied by Zomerdijk (1976) in 1974 and 1976. The results of the 1979 season may be compared with partially unpublished data for earlier seasons. In 1974 the number of breeding pairs was estimated at 65. 31 females were observed with 130 young at the ¼ stage of growth. In 1979 there were about 70 pairs, resulting in 34 (35) females with 208 ducklings. Although the number of pairs was about the same, there is a substantial difference in the number of young. In 1974 the mean number of ducklings per female was 4.2, in 1979 it was 5.9. Later in the season the absolute numbers were reversed (1974: 35 ♀♀ with 121 young; 1979: 22 ♀♀ with 90 young), but the number of ducklings per female was still higher in 1979 (4.1 against 3.5 in 1974). Comparison of these data shows that the breeding season of 1979 may in some respects have

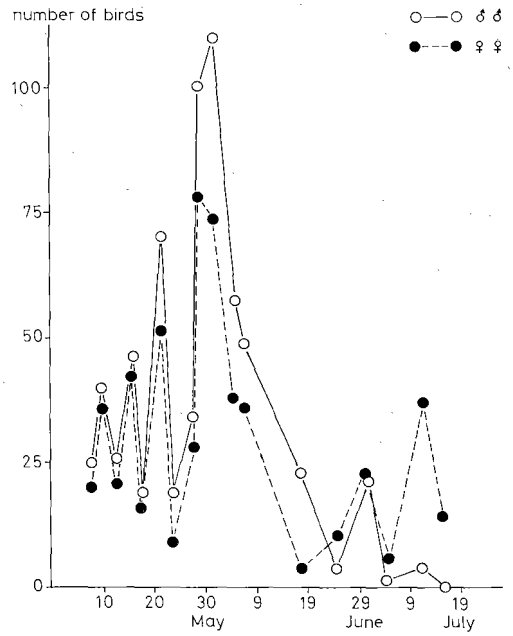


Figure 2. Number of males and females in the course of the breeding season. *Aantal mannetjes en vrouwtjes in de loop van het broedseizoen.*

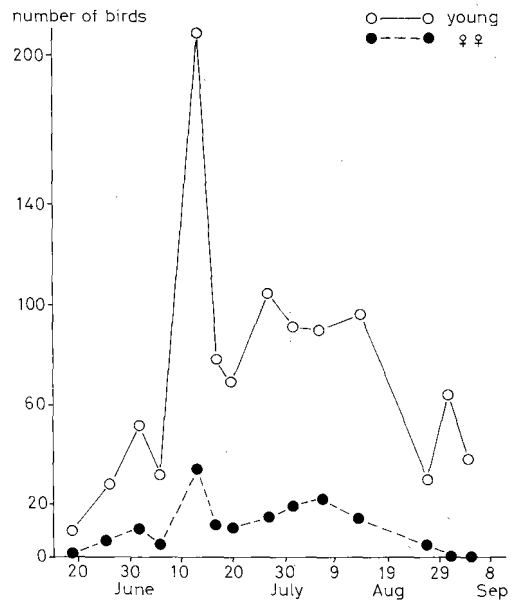


Figure 3. Number of females with young and number of young. *Aantal vrouwtjes met jongen en aantal jongen.*

been more favourable than that of 1974.

However, the summer of 1979 was marked by a sudden fall in numbers of young ducks. Several possible reasons for this sharp decline may be suggested. There may have been a high predation pressure on ¼ grown ducklings; there may have been some kind of epidemic disease; or part of the females with broods may have moved

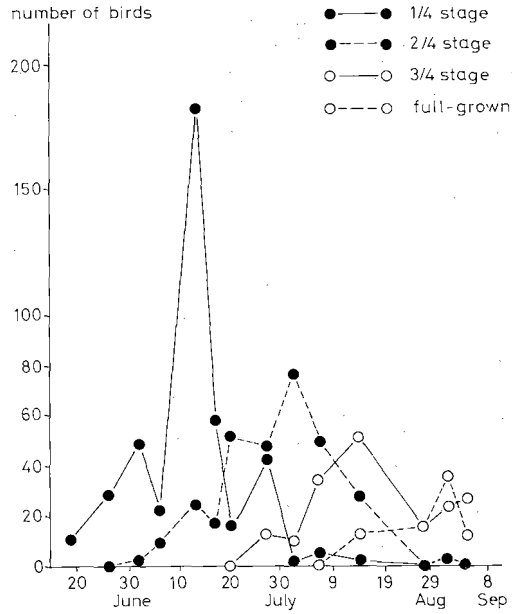


Figure 4. Number of young at different stages of growth. *Aantal jongen in verschillende groeistadia.*

out of the study area. Emigration of broods may be induced by insufficient food supply. Actual predation has not been recorded, although there were quite a few Grey Herons and domestic cats about. To explain this sudden drop in numbers more data would have been needed about the situation in the Beemster. In future studies special attention should be paid to food supply, predation and possible emigration.

From figure 1 it is apparent that males are more numerous than females at the beginning of the breeding season. The sex ratio was 1.5 at this time. After breeding had started, the number of males dropped considerably. This is in accordance with data from the literature (Hildén 1964) indicating that males tend to depart when females are incubating. The total number of breeding pairs is about the same as the number of females. This means, that almost all females stay to breed. As the Tufted Duck reaches sexual maturity in its first year (Bengtson 1971) this stands to reason.

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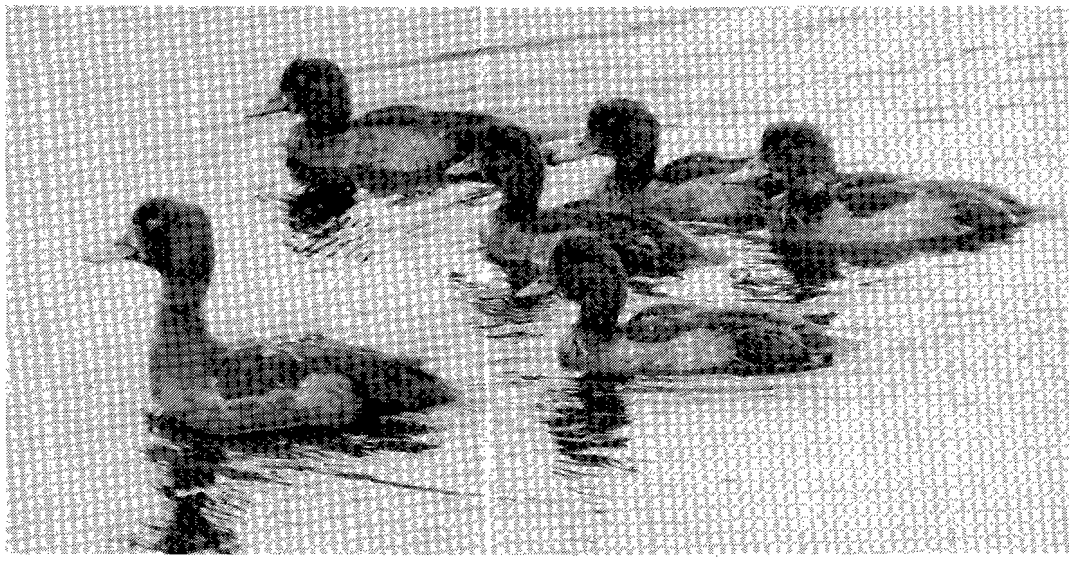

Female Tufted Duck with ducklings of about six weeks, De Beemster (*P. J. Zomerdijk*). *Vrouwtje Kuifeend* Aythya fuligula *met jongen van ongeveer zes weken.*

Summary

This paper concerns an investigation on the breeding success of the Tufted Duck *Aythya fuligula* in one of the North-Holland polders, the Beemster (figure 1). The species under study was especially concentrated in the south-western part of the area; the number of breeding pairs was about 70. Initial production of young was estimated at about 200 belonging to 35 broods. The number quickly decreased in the week following the peak count stabilizing at about 100 belonging to some 25 broods (figure 2). The reasons for this decrease may be mortality, either by predation or disturbance, or emigration of some females with broods towards adjacent areas which may offer more food to the ducklings. This will have to be tested by further research concentrating on the ecology and the habits of the species during the breeding season.

Samenvatting

Dit artikel behandelt een onderzoek naar het broedsucces van de Kuifeend *Aythya fuligula* in één van de Noordhollandse polders, de Beemster (fig. 1). De onderzochte soort kwam vooral in het zuidwestelijk deel van de polder voor, met ongeveer 70 broedpaar. De jongenproductie werd geschat op *c.* 200 jongen, behorend tot 35 broedsels. Het aantal pulli daalde snel in de week na het maximumaantal en stabiliseerde op *c.* 100, behorend tot *c.* 25 tomen (fig. 2). De oorzaak voor deze afname kan sterfte door predatie of verstoring zijn. Ook wegtrek van vrouwtjes met tomen naar aangrenzende gebieden, met betere voedselvoorwaarden voor de jongen, is een mogelijke verklaring. Dit zal door verder onderzoek naar de oecologie en het gedrag van de Kuifeend in de broedtijd moeten worden getoetst.

Riassunto

Questo lavoro fornisce i dati ottenuti con una ricerca, compiuta nel Beemster (fig. 1), un polder del Nord Olanda, sul successo della nidificazione della Moretta *Aythya fuligula* durante l'anno 1979. Questa specie si é presentata con una discreta concentrazione nella parte a sud-est dell'area in studio, raggiungendo circa le 70 coppie nidificanti. La produzione iniziale di giovani é stata stimata per circa 200 piccoli, per un totale di circa 35 covate (fig. 2). Tale numero ha peró subbito un istantaneo decremento nella settimana successiva al valore di picco ottenuto durante i conteggi. Il numero si é successivamente stabbilizzato sui valori di circa 100 giovani per un totale di 25 covate. I motivi di questo decremento possono essere diversi, dovuti a mortalitá, a predazione o a disturbo o anche allo spostamento di alcune femmine con covate verso zone limitrofe piú ricche in cibo per i giovani in via di sviluppo. Tutte queste ipotesi dovranno essere meglio controllata per mezzo di ricerche future, concentrate sullo studio dell'ecologia e delle abitudini della specie in studio, durante il periodo della riproduzione.

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