

NATURAL CATASTROPHES IN THE FLAMINGO COLONY OF BONAIRE, NETHERLANDS ANTILLES

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In the past 25 years the Red Flamingos (*Phoenicopterus ruber ruber*) of Bonaire, estimated by ROOTH (1965) to comprise a population of at least 5,000 breeding birds, have suffered more than once from harmful human interference. Between 1944 and 1947 they even had left the island altogether, a situation which in the memory of the Bonaire people had never occurred before. Considerable losses of eggs as a result of abandoning the nests, following thoughtless visits by tourists, photographers, and other inquisitive people, have been reported in 1951, 1954, and 1955. The last serious disturbance by tourists took place in January 1966, resulting in the abandoning of about 1,300 nests and eggs. In this particular case, about 1,200 incubating flamingos had been counted as early as 12 December 1965 and the total number of adults feeding in the Pekelmeer by that time was approximately 3,000. On 5 January 1966 about 500 breeding adults had remained. Only a few hundred young were ultimately reared.

Throughout their breeding areas in other continents, nesting colonies of flamingos of all species are known to have suffered serious losses of eggs and young as the result of adverse weather conditions from time to time. This also happened to the Bonaire flamingos in December 1966, the report of which, based on observations by the first author, follows below.

Summer 1966

June and July 1966 brought exceptionally heavy rains in Bonaire: 68.8 mm in June and 36.9 mm in July, which is more than three times and more than twice the monthly averages of these months over the past 30 years, respectively. By August large numbers of flamingos had returned to Bonaire and had started nest building at their traditional nest sites in the southern Pekelmeer.

November 1966

Exceptionally heavy rains, thought not to have been equalled since 1944, caused the water of the Pekelmeer to rise considerably, thereby flooding

a large proportion of the flamingos' nest mounds which at that time contained eggs and young. Neither the actual number of breeding pairs, eggs, and young, nor the age of the young moving through the colony at that time, are known.

On 10 and 11 November 48.2 mm and 53.4 mm of rain, respectively, was measured. The wind, which is a fairly strong and constant easterly trade-wind during most of the year and usually gentle and variable in November and December, changed from north (9-14 November) towards southwest (14 November) with force 6, flooding the nest sites. After the rains stopped the water which had fallen on the higher ground of South Bonaire gradually flowed southward and into the Pekelmeer depression causing the level of the lake to continue to rise; the westerly wind raising the water in the eastern part of the Pekelmeer to unusually high levels. In addition, southern and south-western winds recorded on 2 and 14 November (and again on 6 December) caused high sea levels on the coast.

On 12 November following the rains of 10 and 11 November numerous eggs floating in the water of the Pekelmeer were reported by JOHN EISDEN, warden, and at least a thousand eggs were found washed ashore on 13 November. An unknown proportion of these eggs, with desiccated contents, apparently originated from the colony deserted in January 1966; others were "heavy", containing large, fresh chicks, some of which were at the point of hatching.

On 14 November it was found that at least 800 nests in the central part of the colony had been destroyed, but 200-300 nests built on a small, low rock slab were still standing above the water. On all visible nests, even on those hardly emerging from the water, adult flamingos were incubating. Over 200 young of various ages, including those only few days old, had survived the weather and were moving among the nest sites. In the deeper water of the Pekelmeer a flock of 1,000 adults was seen feeding.

After the middle of November the water level fell gradually; new nests were constructed on the higher ground, but at the end of the month new rains set in. Between 26 and 30 November 76.2 mm of rain was measured and newly built flamingo nests were inundated.

The total rainfall in Bonaire in November 1966, measured at Kralendijk, was 233.7 mm, which should be compared with the monthly mean of 129.3 mm calculated for the 30-year period 1931-1960 (ROOTH 1965:15).

December 1966

Heavy and continual rains again flooded the nesting area. Between 6 and 10 December 83.2 mm of rain was measured at Kralendijk (monthly mean for December: 87.4 mm; ROOTH 1965:15). Many of the new nests were inundated. Between 12 and 31 December the water dropped at least 13 cm (measured with a gauging-rod). What had survived from the flamingo colony can be summarized as follows:

11 December: 800-900 adult birds were counted, 700-800 of which were at the remaining nests.

18 December: About 550 adult birds were present, some 260 of which were at the nests.

On 11 December another count was made of flamingo eggs washed ashore: of 720 eggs found, only a quarter (180) belonged to the recent broods, the remaining ones (540) originated from the nests already deserted in January. Eggs floating in the water and stuck in the mud have not been counted.

January 1967

No more rains were recorded.

1 January: The water level had dropped to such an extent that an area, almost as large as that present in early November, emerged in the centre of the southern Pekelmeer. On 1 January the number of adult flamingos was estimated at 1,000. At that time the colony was again in full activity: new nests were being made, birds were incubating, chicks of a few days old were observed, as well as other young of various sizes, probably up to half grown.

8 January: The number of adults had grown to about 1,500, about 600 of which were incubating. A flock of approximately 300 adults were tending an unknown number of young birds.

12 January: The dry nesting area had again somewhat increased in extent. There were now three centres of breeding activity, a few hundred metres apart: a central one in which incubating birds were seen densely packed, a western one where a new breeding colony had formed, and an eastern one, of about 500 birds, probably concentrating on a spot prospected for nest building. The old, inundated nests had now finally emerged, but no flamingos were seen in this spot. A group of 82 young birds had moved to the southern Pekelmeer (Red Pan) on 8 January.

Breeding season 1967

In order not to disturb the colony, the exact breeding success has not been recorded in detail in the months following the recovery of the colony. But on 23 April 1967 a flock of several thousand flamingos was seen in the colony, most of these being almost full grown young birds, but there were also orange-red adults. These birds were very restless, flying continuously. North of this central concentration, a flock of about 200 adults was congregating on drier ground, probably starting another new nesting colony.

On 4 June a renewed inspection revealed the presence of three concentrations of breeding birds, with a total number of approximately 500 adults. Incubating birds and numerous eggs, as well as young of various ages were observed. This time the nests were on dry ground, which is exceptional in this area. They were easily accessible over land from the north.

CONCLUSION

Through 1953 the flamingos in Bonaire had started nest building in April-May, reared their young during the summer months, and most of them left the island by the onset of the winter rains in November.

In recent times nest building and breeding have been observed in all months of the year. Serious calamities at the end of 1966 have not suppressed the continuous breeding activity in the winter months. Large numbers of eggs and young were destroyed by rains and inundations at least three times in succession, but a number of eggs and young seem to have survived each catastrophe, and new nests were built immediately after each disaster. Nest building apparently has taken place in every month of the period August 1966-June 1967. The exact numbers of the losses of eggs and young and of young reared to the flying stage are, however, unknown.

LITERATURE

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SAMENVATTING

De broedkolonie van Flamingo's in het Pekelmeer op Bonaire werd in de loop der jaren talrijke malen gestoord door toeristen, fotografen en andere nieuwsgierige mensen. Doch ook onberekenbare weersomstandigheden in het overigens zo regelmatige verloop der seizoenen op de Nederlandse Antillen hebben ernstige schade toegebracht aan het broedverloop van de Flamingo-kolonie. De laatst gemelde door toeristen veroorzaakte schade vond plaats in januari 1966, toen naar schatting omstreeks 1300 nesten met eieren verlaten werden en vervolgens slechts een paar honderd jongen werden groot gebracht. De in de loop van het jaar daarop volgende rampspoeden, veroorzaakt door de wisselvalligheden van het weer, waren voor de Flamingo's evenwel nog veel ernstiger. Zware regens die reeds in juni en juli 1966 bijna de driedubbele hoeveelheid van de gemiddelde neerslag op het eiland brachten, verhinderden de Flamingo's in hun overigens sinds januari niet geheel gestaakte broedactiviteit. In augustus waren zij evenwel weer op de bekende broedplaatsen terug en waren nestbouw en broeden in volle gang. Tussen midden november en midden december 1966 vielen wederom zulke zware regens dat de broedkolonie driemaal grotendeels of geheel door het stijgende water van het Pekelmeer tijdelijk overspoeld raakte. Onverdroten vingen na elke tegenslag de Flamingo's met nestbouw en broeden aan zodra zij daartoe door het zakkende water maar even de kans kregen. Het is onvoorstelbaar hoe de Flamingo's kans hebben gezien in elk noodweer nog enkele jongen in het leven te behouden. Nimmer tevoren werd in het Pekelmeer een dergelijk incasservermogen bij de Flamingo's vastgesteld. In

januari 1967 werden zowel broedende ouden, als de aanwezigheid van jonge vogels vastgesteld. In de loop van het jaar werden herhaaldelijk nieuwe broedconcentraties gezien. De laatste inspectie van het nestgebied vond plaats op 4 juni 1967, toen nog steeds broedende vogels en jongen van verschillende leeftijdsklassen aanwezig bleken te zijn.

POST-SCRIPT

5 November 1967: there were still about 150 occupied nests in the Pekelmeer, and a number of young. Rain had fallen a couple of days before and the water level of the Pekelmeer was consequently high, almost reaching the top of the nest mounds. It seems as if the Flamingos, in spite of the catastrophes, have been reproductively active for more than a year in succession.—G.

NASCHRIFT

Op 5 November 1967 waren nog steeds ongeveer 150 nesten in het Pekelmeer bezet, met enkele tientallen jonge vogels. Doordat het de afgelopen dagen weer flink had geregend, stonden de nesten diep in het water. Het lijkt dus wel alsof de voortplantingsactiviteit in de Flamingo-broedkolonie meer dan een jaar achtereen heeft geduurd en alleen door de natuurlijke catastrophes onderbroken is geweest.—G.