

SHORT COMMUNICATIONS

DIET OF SOME BIRDS IN ARAUCARIA AND PINUS FORESTS IN PAPUA NEW GUINEA

From April until December 1977 I was engaged in ornithological research involving mist-netting in Papua New Guinea. Although a study of the feeding habits was not the main purpose of the projects, whenever specimens were collected, the stomachs were preserved and the contents subsequently analysed by A. Kairo, PNG Forestry College, and Dr Hywel Roberts, Forest Research Station, Bulolo. This paper summarizes the identified stomach contents and the habitats from which the birds were taken.

Previous publications (particularly handbooks on bird identification) for New Guinean birds tend to be general in their description of stomach contents, specifying little more than 'large insect' or 'fruit of . . . diameter'. In this paper the fruits and insects found in the stomachs are identified as closely as possible.

Despite the fact that many birds are recorded in the literature as being mainly vegetarian, pigeons alone were found with *only* plant material in their stomachs. All other species had insects in greater or smaller quantities, perhaps because much sampling was carried out in immature forest plantations where the most abundant food was probably insects.

The study sites were plantations of *Araucaria* of four different ages, one compartment of *Pinus* plantation and two of natural *Araucaria* forest. These are tabulated as follows:

Plantations of *Araucaria cunninghamii*:

- A: 25-year-old, thinned to final spacing but not yet fully mature;
- B: 19-year-old, pruned but not thinned to final spacing;
- C: 14-year-old, pruned but not thinned; fairly dense;
- D: 7-year-old plantation, neither pruned nor thinned.

Plantation of *Pinus*:

- E: approximately ten years old. Surveyed during an infestation by lymantrid caterpillars; this plantation was originally anthropogenic grassland of long standing but the *Araucaria* plantations were on cut-over sites.

Natural *Araucaria* forest:

- F: in the Bulolo area, Morobe Province. One site in the Head's Hump Logging Area, the other in McAdam National Park.

Sites A, B, C, D and F were at approximately 900 metres asl but E was at approximately 1,650 metres asl.

CONTENTS OF STOMACHS

After the English name of the bird the number in brackets is the number of specimens, followed by a letter(s) to show at which site this specimen was taken.

Macropygia amboinensis Brown Cuckoo-Dove (2) E, F
Numerous finely mashed grass seeds; many small stones.

Trichoglossus haematodus Rainbow Lorikeet (1) B
Only plant remains, including a few grass seeds and many small rounded fragments thought to be plant leaves. Many small stones.

Cuculus saturatus Oriental Cuckoo (3) E
Many (up to 26) large and fewer small larvae of *Lymantria* sp, *Pinus* shoots and needles. All fragments large.

Cuculus variolosus Brush Cuckoo (4) E
Larvae of *Lymantria* sp (more large than small), lymantrid sp, geometrid sp, spiders, weevils and a few grass seeds. Large fragments.

Cuculus pyrophanus Fan-tailed Cuckoo (3) E
Large fragments of lymantrid larvae (more large than small), lymantrid sp and geometrid sp were found.

Chrysococcyx lucidus Shining Bronze-Cuckoo (1) E
Large fragments of lymantrid sp larvae (more small than large) and geometrid species were found.

Merops ornatus Rainbow Bee-eater (1) B
Diptera: family Pipunculidae, 6; family Mydidae, 4. Coleoptera: family Brentidae, 1. Hymenoptera: Apoidea, 7, *Apis mellifera* honey bee, 5 workers.

Eurystomus orientalis Dollarbird (1) C
Cetoniinae, family Scarabaeidae.

Coracina papuensis White-bellied Cuckoo-shrike (1) D
Mostly insect remains with grass seeds and a few rough-surfaced black seeds thought to be ginger. Insects mostly Hemiptera, family Pentatomidae (plant-sucking bugs) and a few caterpillar mandibles.

Coracina caeruleogrisea Stout-billed Greybird (2) F & B
Mainly adult Coleoptera, family Curculionidae (weevils); fewer larvae of Lepidoptera, families Saturniidae and Geometridae.

Peltops montanus Mountain Peltops Flycatcher (1) F
Insect fragments including adult Coleoptera and adult Hemiptera (plant-sucking bug).

Poecilodryas hypoleuca Black-and-white Flycatcher (1) F
Only indeterminate insect material. Small fragments.

Pachycephala simplex Grey Whistler (1) F
Indeterminate adult insect fragments.

Colluricincla megarrhyncha Little Shrike-thrush (1) E
Large fragments of larvae of geometrids; weevils, other insects, spiders and *Pinus* needles.

Monarcha manadensis Black-and-white Monarch (1) F
Indeterminate insect fragments plus a caterpillar, possibly of Lepidoptera, family Geometridae.

Arses telescophthalmus Frilled Monarch (1) D

Many fragments of Homoptera, family Tettigonetridae; fewer Orthoptera, family Gryllidae (crickets) and Coleoptera, family Curculionidae. (1) B: many small indeterminate insect fragments.

Rhipidura rufiventris Northern Wagtail (1) B

Diptera, families Stratiomyidae and Tipulidae and Coleoptera, families Chrysomelidae and Curculionidae.

Rhipidura atra Black Fantail (2) F

Mainly insect material with some indeterminate plant material and many small stones. Coleoptera species and caterpillars of unknown family present, as well as other indeterminate insect matter.

Pitohui dichrous Black-headed Pitohui (1) D

Pupa of Lepidoptera, family Geometridae; Hemiptera, families Lygaeidae and Membracidae, with grass seeds.

Megalurus timoriensis Tawny Grassbird (1) E

Finely mashed weevils, other insect fragments (not lymantrids or geometrids) and pine needles.

Crateroscelis murina Lowland Fernwren (2) F

Many small indeterminate fragments.

Xanthotis chrysotis Brown Xanthotis (2) B & F

Insects; in one, Orthoptera, family Acrididae and Dictyoptera, family Blattidae (cockroaches); in other many small indeterminate insect fragments.

Xanthotis polygamma Spotted Xanthotis (1) F

Insects, mainly indeterminate; also few caterpillars.

Meliphaga montana White-eared Mountain Meliphaga (1) A

Plant material thought to be ginger seeds.

Melilestes mearnsi Long-billed Honeyeater (2) A

Spiders and other arthropod fragments present.

Melidectes torquatus Cinnamon-breasted Wattlebird (1) E, (2) E*

Pine needles in one with many larvae of *Boarmia* sp, Hemiptera (Heter-

optera) fragments; in the other larvae of *Boarmia* sp, fragments of adult Coleoptera.

Oedistoma iliolophum Grey-bellied Longbill (1) F

Indeterminate adult insect fragments.

Toxorhamphus poliopterus Slaty-chinned Long-bill (1) F

Insect fragments, including indeterminate plant bug.

Oriolus szalayii Brown Oriole (1) D

Grass seeds, a caterpillar.

Sphecotheres viridis Figbird (1) B

Grass seeds, large spherical brown seeds and indeterminate insect material.

Dicrurus hottentottus Spangled Drongo (1) B

Insects including Coleoptera, families Curculionidae and Lariidae (*Timesisteinus trivittatus*); Hemiptera.

Cracticus cassicus Black-headed Butcherbird (1) D

Caterpillars of Lepidoptera (either Lymantriidae or Notodontidae) and black rough-surfaced seeds thought to be ginger.

*After the *Lymantria* population had suddenly collapsed.

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EFFECTS OF DROUGHT ON GREEN PYGMY-GESE AND COMB-CRESTED JACANAS IN NORTHERN TERRITORY

INTRODUCTION

Lack (1966) has shown that in severe winters in Britain the Grey Heron *Ardea cinerea* decreases significantly below what appear to be optimum levels. These optimum levels may then be exceeded temporarily in following years. Bock and Lepthien (1976) found a similar decrease and recovery in Cattle Egrets *Ardeola ibis* in North America. Though the Darwin area is not subject to severe winters it is subject to droughts, which could have a similar effect on the numbers of some waterbirds.

The present paper documents changes in numbers of Green Pygmy-Geese *Nettapus pulchellus* and Comb-crested Jacanas *Irediparra gallinacea* on Fogg Dam following the particularly poor rains of the 1969-70 wet season. Comparison is made between this period and two other years, 1967 and 1971.

ENVIRONMENT AND BREEDING

The climate of the Darwin area has been described by McAlpine (1969). A feature of the climate is the almost rainless dry season, which lasts from May to September. The monsoons generally occur in

January-February. Rainfall in the 1966-67 wet season was above average with particularly heavy rains in March. During the early part of 1970 the monsoon ended in mid-February and March and April were unusually dry. In contrast, in the following wet season heavy rain was received in early December and wet weather continued intermittently until April (Crawford 1972).

A general description of the habitats of waterbirds is given by Frith and Davies (1961a) and Story (1969). During the wet season these habitats are very extensive, covering several thousand square kilometres. By the end of the dry season they may be reduced to less than two per cent of their extent during the wet season. *I. gallinacea* and *N. pulchellus* prefer fairly deep water, which does not seem to be much reduced until about three months after the end of the wet season. It is at about this time that numbers start to rise significantly in refuges like Fogg Dam (Fig. 1). This coincides with a general increase in other species in these refuges. In the wet season most of the surface of Fogg Dam was covered

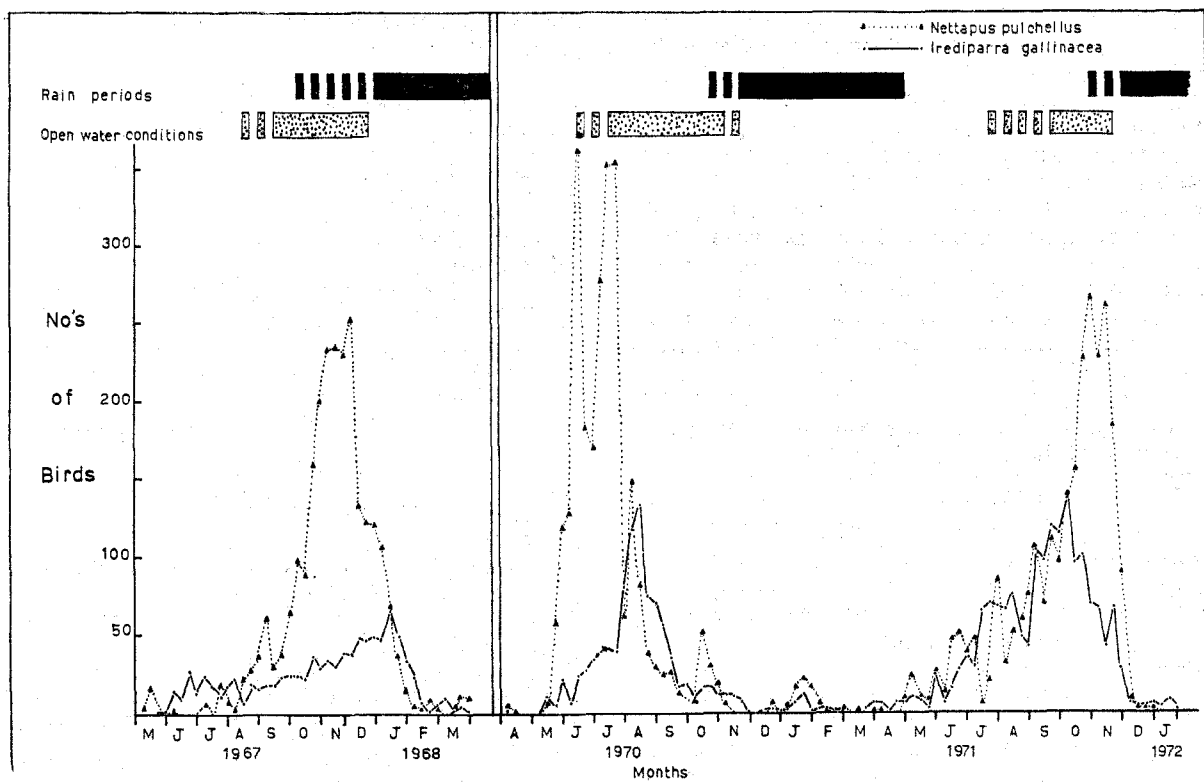


Figure 1. Seasonal fluctuations in numbers of *Nettapus pulchellus* and *Iridiparra gallinacea* on Fogg Dam.

by a dense layer of water-lilies and water-fern. During the dry season, as the number and variety of birds increase, this vegetation was heavily grazed and, as evaporation occurs, the area becomes shallow muddy open-water habitat. This transition had occurred by late September and early October in 1967 and 1971. In 1970, because intense grazing started early and the level of water was at first low, transition to open muddy habitat had occurred by late July.

Both the species now considered appear to breed from about December to May (Frith and Davies 1961b; Storr 1967; Crawford 1972). The breeding areas include Fogg Dam and the deeper lagoons on the edges of the river plains as well as the seasonal lagoons scattered through the upland open-forest country (Rhodes 1944). The breeding population in the refuges is very small compared with that of the dry season.

RESULTS AND DISCUSSION

Figure 1 shows the results of the weekly census for 1967-68 and 1970-72, as well as indicating when rainy periods and open muddy habitat occurred. Increases in numbers are the result of incoming birds exceeding those leaving or dying. Decreases

represent the opposite. The increase due to reproduction within the census area seemed slight.

The decreases, which seemed to occur regularly at the start of each wet season, appear to represent seasonal dispersal following the rapid expansion of suitable habitat. An abnormal situation seemed to develop on Fogg Dam during the drought of 1970 when there was an early increase in the numbers of both species. This indicates that they had to rely on the refuges much earlier than in 1967 or 1971.

By July 1970 very large numbers of other species, particularly species of *Anas* and *Dendrocygna* and Magpie Geese *Anseranus semipalmata*, had moved into Fogg Dam area much earlier than in the other two years. It is not known if any of these species compete with *I. gallinacea* and *N. pulchellus* for food under severe conditions but it was certain that radical changes took place in the habitat once large numbers of birds were present. The floating vegetation was grazed down completely so that *I. gallinacea* was forced to paddle round the edges. This change in the habitat occurred in September-October in 1967 and 1971, when *I. gallinacea* was also able to feed among new grass along the water's edge, which had germinated in response to the first show-