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MAMMALS AND BIRDS OF THE TOWNSVILLE DISTRICT, NORTH QUEENSLAND. 1. INTRODUCTION AND MAMMALS

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SUMMARY

A survey of mammals in the Townsville district, north Queensland, made during 1965-1966, is described. Fifty-three species were recorded, including two Monotremata, 20 Marsupialia and 31 Eutheria, seven of the last introduced. Marsupials included six possums and eight macropodids, and eutherians seven rodents and 19 bats. Habitat types and estimates of abundance ranging from scarce to abundant are given.

I. INTRODUCTION

Since late 1958 field studies of waterfowl (Anatidae) and some other native fauna have been in progress with headquarters at Townsville, north Queensland. Regular traverses through much of the faunal habitat in the vicinity of that city provided background knowledge for a more detailed survey of the mammals and birds undertaken from April 1965 to November 1966.

II. THE TOWNSVILLE DISTRICT

The Townsville district (Figure 1) is of approximately 500 square miles around the coastal city of Townsville. Natural boundaries are provided to the north-east by low-water tide mark of the Pacific Ocean and to the south-west by Paluma Range. The north-western and south-eastern boundaries were defined arbitarily because similar coastal plain extends for considerable distances in both of these directions.

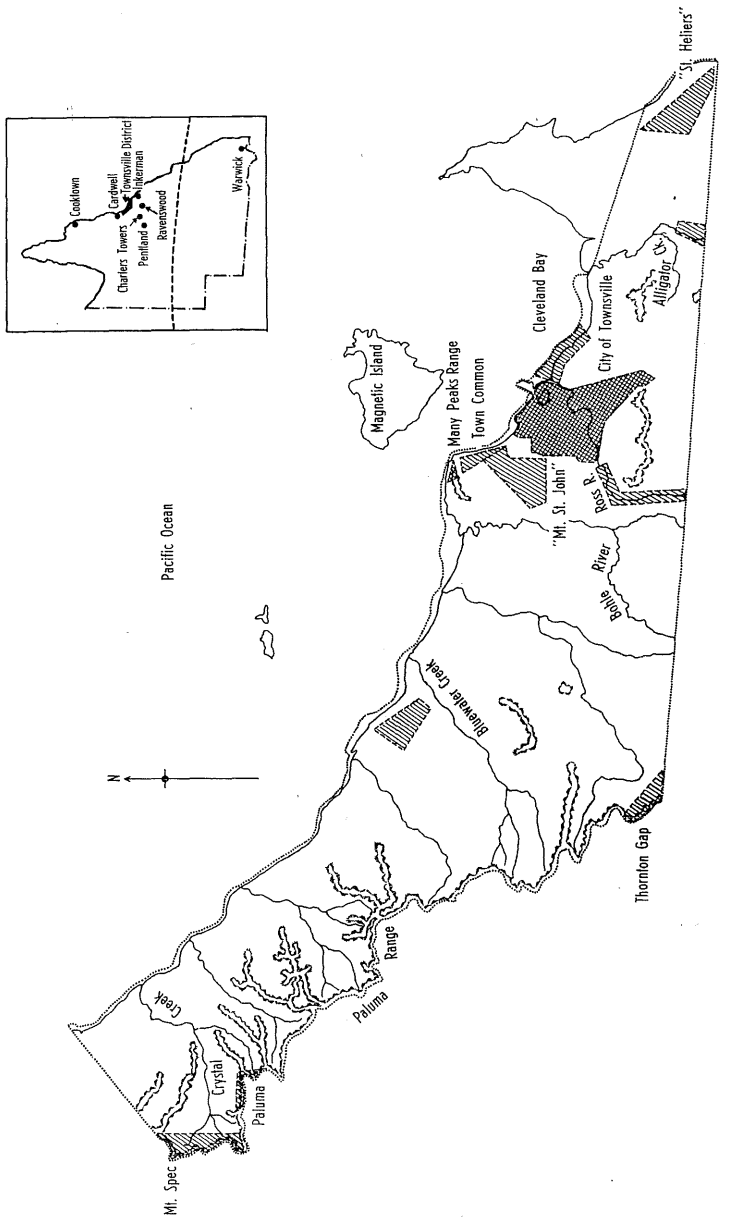

Fig. 1.—The Townsville District. Fauna survey 1965-66. Areas of intensive study diagonally hatched.

Topography is essentially coastal plain bounded by the sea along one front and a long, low coastal range along the other. Bohle River, Ross River and many other lesser streams descend from the hills and flow more or less directly to the sea. The soil types are mainly red podzolics and red earths on the ranges and adjacent pediments, solodic soils on most of the coastal plain, solonchak

soils on saltpans, and deep sands on beaches and open forest dunes behind these beaches. On hills the steep escarpments are mostly of fine-grained acid rocks with boulder-strewn slopes at lower levels.

Mean temperatures and rainfall each month at Garbutt, Townsville, over the study period are illustrated in Figure 2 as representative of most of the region; only the Mt. Spec area differed markedly in having an annual rainfall of approximately 67 in. (Townsville City Council 1965 record, Crystal Creek) distributed seasonally as elsewhere in the region, and slightly lower temperatures.

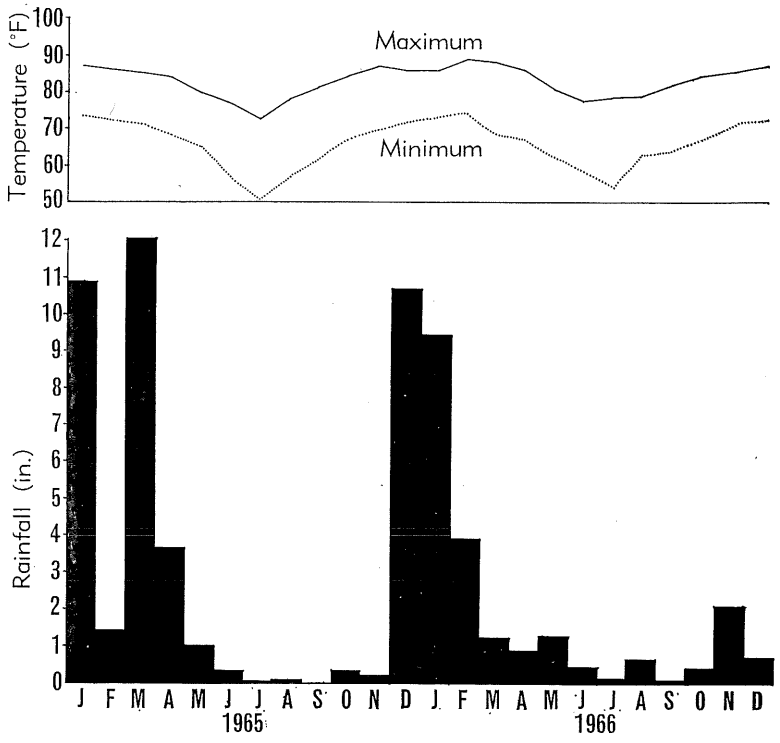

Fig. 2.—Monthly mean maximum and minimum temperatures and total rainfall recorded at Garbutt, Townsville, 1965 and 1966.

For survey purposes habitat types recognized were rain-forest, dry scrub, open forest, cultivation, freshwaters, saline areas and urban. Rain-forest is confined to relatively small areas on the peaks of Paluma Range and includes a wide variety of softwood species; these trees occur with introduced species such as lantana (*Lantana camara* L.) as dry scrub in even smaller areas along edges of streams almost to the sea and in some remote gullies. Elsewhere natural vegetation is largely open eucalypt forest which, in some areas, has been cleared of trees by ringbarking to increase the productivity of native pastures for domesticated stock; construction of water impoundments for stock has led to an increase in the number of freshwater areas, mostly on the coastal plain. Maximum discharge from streams occurs in the wet season (December-April), with little flow for the remainder of the year. Saline habitat occurs along the sea-shore

where there are rocky headlands, sandy beaches and some areas of mangroves (see MacNae 1966); saltpans dominated by samphire (*Salicornia australis* Sol.) and coastal club rush (*Scirpus littoralis* Schrad.) are common behind the coastal dunes. Urban development is extensive only in the city of Townsville.

Five State Forest and National Park Reserves (total area 106,683 acres) have been established around Mt. Spec, and 10 other localities (totalling 31,609 acres) also have been declared Fauna Sanctuaries (see Roff 1962). No reserve, however, is fully protected from economic exploitation.

III. METHODS

Areas representative of the main habitat types were selected for intensive study (see Figure 1) and provided most of the records. The remainder of the region was examined to check obvious differences from the studied areas. Random traverses, during daylight and at night with the aid of a spotlight, were made at regular intervals during 1965 and 1966 through all intensively studied areas. Collections were effected with guns and rifles when possible, and for the more cryptic species break-back and wire-cage traps baited with either apple, raisins, sweet potato or leather soaked in linseed oil were used. As many as 100 traps were laid in lines at selected places and inspected daily for one week. Aerial mammals were taken mostly after sunset, using a spotlight and shotgun. Mist nets were used to take some bats.

Specimens of most species collected were housed either at the Queensland Museum, Australian Museum, National Museum of Victoria or Queensland Department of Primary Industries' Animal Health Station, Townsville.

Four ratings indicating abundance were used as follows, the broad basis for each being numbers observed or collected during each visit to, or trapping period in, any habitat type:

Abundant: Usually large numbers.

Common: Always at least one, often more.

Uncommon: Not every visit, but more than twice during the survey.

Scarce: Not more than twice during the survey.

No estimate of abundance was provided for apparently uncommon species for which no thorough search was made.

IV. RESULTS

Species collected are listed below, together with habitat types and estimated abundance in each type. An asterisk indicates that the record is based on a sighting only. Names for all species other than the scientific names for Chiroptera are after Iredale and Troughton (1934); with one exception those for Chiroptera are after Calaby (1964). Identification of *Hipposideros ater* Templeton followed recent revision of the genus by Hill (1963). Common names for Chiroptera accepted in current literature (for example, Simpson and Hamilton-Smith (1965)) are given in brackets.

MONOTREMATA

Ornithorhynchus anatinus (Shaw and Nodder). Platypus. Freshwaters, one collected.

Tachyglossus aculeatus (Shaw and Nodder). Echidna. Open forest, common; cultivation, scarce.

MARSUPIALIA

Antechinus stuartii Macleay. Brown marsupial mouse. Rain-forest and dry scrub, common.

Planigale ingrami (Thomas). Northern planigale. Open forest, one collected.

**Satanellus hallucatus* (Gould). Little northern native cat. Open forest, uncommon.

Isoodon macrourus (Gould). Larger northern bandicoot. Open forest, abundant; cultivation and urban, common.

Isoodon torosus (Ramsay). Giant brindled bandicoot. Open forest, uncommon.

Perameles nasuta Geoffroy. Long-nosed bandicoot. Rain-forest (open floor), one collected.

**Petaurus breviceps* Waterhouse. Sugar glider. Open forest, one observed.

Dactylopsila picata Thomas. Striped possum. Rain-forest, scarce.

Pseudocheirus peregrinus (Boddaert). Grey Queensland ring-tail. Rain-forest and marginal dry scrub, and open forest, common.

Pseudochirops archeri (Collett). Striped ring-tail. Rain-forest, scarce.

Schoinobates volans (Kerr). Greater possum-glider. Open forest (coastal plain, boulder-strewn slopes and level hill-tops), common.

Trichosurus vulpecula (Kerr). Common brush-tailed possum. Open-forest, abundant; urban, common.

Aepyprymnus rufescens (Gray). Rufous rat-kangaroo. Open forest (coastal plain and level hill-tops), common.

Petrogale inornata Gould. Plain rock-wallaby. Open forest (escarpments and boulder-strewn slopes), common; dry scrub and urban, uncommon.

Thylogale stigmatica Gould. Red-legged pademelon. Rain-forest and dry scrub, common.

Wallabia agilis (Gould). Sandy wallaby. Open forest (coastal plain, boulder-strewn slopes and level hill-tops), abundant; cultivation, common; saline areas and urban, uncommon.

**Wallabia bicolor* (Desmarest). Black-tailed wallaby. Dry scrub (margin), one seen.

Wallabia elegans (Lambert). Whiptail wallaby. Open forest (boulder-strewn slopes and level hill-tops), common.

Osphranter reginae (Schwarz). North Queensland wallaroo. Open forest (boulder-strewn slopes and level hill-tops), common.

Macropus giganteus Shaw. Grey kangaroo. Open forest (coastal plain and boulder-strewn slopes), common.

EUTHERIA

Hydromys chrysogaster Geoffroy. Water rat. Freshwaters and saline areas, abundant.

Rattus assimilis (Gould). Allied rat. Rain-forest and dry scrub, abundant.

Rattus norvegicus (Berkenhout). Norway rat. Urban, common.

Rattus rattus (L.). Ship rat. Urban, abundant.

Uromys caudimaculatus (Krefft). Giant scale-tailed rat. Rain-forest and dry scrub, common.

Melomys cervinipes (Gould). Fawn-footed scale-tailed rat. Rain-forest and dry scrub, including margins of open forest, common.

Mus musculus L. House mouse. Cultivation and urban, common; open forest, uncommon.

Lepus europaeus L. Hare. Cultivation, common; open forest, uncommon.

Canis dingo Meyer. Dingo. Rain-forest, open forest and cultivation, common; urban, scarce.

Felis catus L. Cat. Dry scrub, open forest and cultivation, uncommon.

Equus sp. Brumby. Open forest and cultivation, common.

Sus scrofa L. Feral pig. Dry scrub, open forest and cultivation, common.

Pteropus gouldii Peters. Gould's flying-fox. Open forest, saline areas and urban, abundant.

Pteropus scapulatus Peters. Collared flying-fox. Open forest, saline areas and urban, common.

Syconycteris australis (Peters). Little flying-fox. Open forest, uncommon.

Nyctimene robinsoni Thomas. Robinson's tube-nosed bat. Open forest, uncommon.

Taphozous australis Gould. Gould's free-tailed bat. Open forest (with caves), common.

Taphozous georgianus Thomas. Larger free-tailed bat (unpouched free-tailed bat). Open forest (with caves), uncommon.

Taphozus flaviventris Peters. Yellow-bellied free-tailed bat. Open forest, common.

Taphozous nudicluniatus De Vis. De Vis' free-tailed bat. Open forest, common.

Rhinolopus megaphyllus Gray. Horseshoe bat (eastern horseshoe bat). All habitat types, common.

Hipposideros ater Templeton. Brown horseshoe bat. Open forest (in cave), one collected.

Tadarida norfolkiensis (Gray). Eastern micronomus. Open forest, common.

Tadarida colonicus (Thomas). Plicated bat. Open forest, uncommon.

Chalinolobus gouldii (Gray). Gould's lobe-lipped bat (Gould's wattled bat). Open forest and urban, uncommon.

Chalinolobus morio (Gray). Chocolate lobe-lipped bat. Rain-forest, dry scrub and open forest, common.

Eptesicus pumilus (Gray). Little bat (little brown bat). Open forest, abundant.

Nycticeius orion (Troughton). Eastern broad-nosed bat. Open forest, scarce.

Nycticeius greyii (Gould). Grey's bat. Open forest (particularly adjacent to freshwaters), common.

Miniopterus schreibersii (Kuhl). Large long-tailed bat (bent-winged bat). All habitat types, common.

Nyctophilus timoriensis (Geoffroy). Large long-eared bat (greater long-eared bat). Rain-forest, uncommon.

V. DISCUSSION

The mammal fauna of the Townsville district is as diverse as that of any other area of Australia for which comprehensive records have been sought (see, for example, Calaby 1965). Within Queensland, comparison with the situation in the Warwick district, south Queensland (Kirkpatrick 1966), indicates a broadly similar fauna with specific differences at Townsville resulting mainly from the New Guinea influence (see also Harrison 1962). No mammal is peculiar to the Townsville district.

Extension of the Townsville district by relatively short distances in all directions incorporates a great range of other species: of macropodids, for example, the authors collected also the black-striped wallaby (*Wallabia dorsalis* (Gray)) to the immediate south-east (Inkerman), the spectacled hare-wallaby (*Lagorchestes conspicillatus* Gould) to the south-east (Inkerman) and south-west (Charters Towers), and the red kangaroo (*Megaleia rufa* (Desmarest)) to the south-west (Charters Towers), while timber-cutters reported occasional Lumholtz' tree-kangaroos (*Dendrolagus lumholtzi* Collett) at a small area of hoop pine (*Araucaria cunninghamii* Ait.) at Bog Hole Creek on the western fall of Paluma Range near Thornton Gap, and foresters reported some musk rat-kangaroos (*Hypsiprymnodon moschatas* Ramsay) from Cardwell Range to the north-west. The sighting of one individual of the musk rat-kangaroo at Mt. Spec in the study area by Tate (1952) was not confirmed despite particular efforts at collection.

The ratings uncommon and scarce allocated to some species are subjective and should be interpreted with caution; these may indicate the capacities of the observers as much as the abundance of the animals, which too may reflect climatic conditions peculiar to the time of searching. Included in the latter, general conditions for the district were dry and followed a succession of dry years. It is

noteworthy that in some years cyclonic disturbances have a noticeable effect on bird distribution in the district (see Lavery and Hopkins 1963) and this may apply to bats (for example, the little bent-winged bat (*Miniopterus australis* Tomes) collected by the authors at Ravenswood (October 1965)).

Two mammals which might be expected from the Townsville district on the basis of past records but not found during this survey were the tiger cat (*Dasyurops maculatus* (Kerr)) and pygmy glider (*Acrobates pygmaeus* (Shaw)); both may occur in restricted local distributions. The mobility of bats and the fortuitous means by which these were collected suggest that records for this group are most likely to be incomplete; *S. australis, N. robinsoni, Taphozous* species, *H. ater, Tadarida* species, *Chalinolobus* species, *Nycticeius* species and *N. timoriensis* are recorded from the region for the first time, while Semon's horseshoe bat (*Hipposideros semoni* Matschie) recorded at Townsville in 1944 (single specimen Reg. No. C1018 in National Museum of Victoria, Melbourne) was not found but may occur.

Possibly the only species which may have ceased to exist within the study area since European settlement is the koala (*Phascolarctos cinereus* (Goldfuss)); this is a more southerly species which is reputed to have been sighted occasionally until 1930 in the Hervey Range area near Thornton Gap and for which there have been more recent records further north near Cooktown and west at Pentland (Tate 1952). Individuals released on Magnetic Island, 7 miles east of Townsville across Cleveland Bay, are now common (unpublished records, Queensland Department of Primary Industries).

The effects of European man on the mammal fuana in the Townsville district are clearly reflected in the introduced species: The Norway rat, ship rat and house mouse are commonest in urban areas and the hare, cat, brumby and feral pig commonest in cultivation, while open forest, dry scrub and rain-forest are progressively less infested by these species. Further settlement by man in natural habitat types will result in the alteration of these with consequent increase in introduced species at the expense of native species; natural habitat of all types is still extensive but the potential effect of further exploitation on the survival of native animals in the district is evident.

VI. ACKNOWLEDGEMENTS

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