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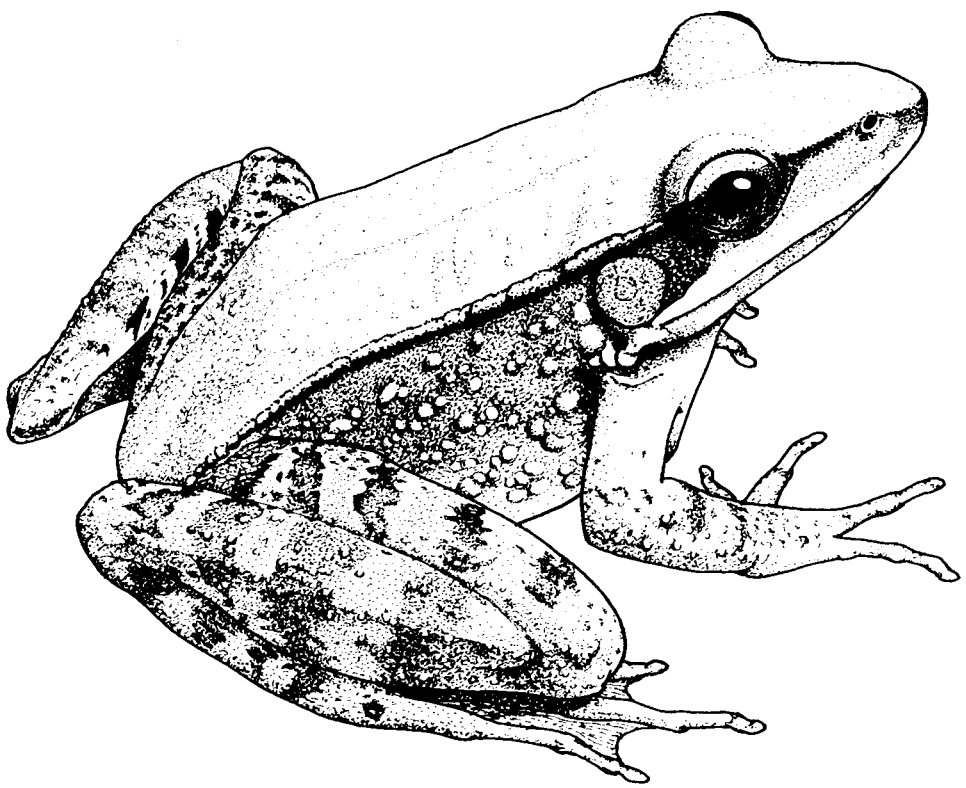

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The Herpetofauna of the Weipa Region, Cape York Peninsula

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ABSTRACT. The Weipa region has a rich and diverse herpetofauna of which many species are shared both with New Guinea and other regions of northern Australia. Twenty native species of frogs and 76 species of reptiles have been recorded in the Weipa region and individual species accounts, photos and identification keys are provided. The herpetofauna may include as many as four undescribed species but it lacks the high level of endemicity characteristic of the herpetofauna on the eastern side of Cape York Peninsula.

The arrival and establishment of the introduced Cane Toad (*Bufo marinus*) in the Weipa region is documented.

One crocodile and four marine turtles in the region are listed by the IUCN as vulnerable or endangered; a small burrowing snake has been proposed for the Squamata section of the IUCN Red Data Book. The region experiences a very dry winter (average monthly rainfall from June to September less than 4 mm) but contains significant dry season refugia for a number of frog species hitherto recorded only from more mesic habitats. Seven of these refuge sites are recommended for habitat conservation.

Many of the regeneration sites provide suitable habitat for the frogs and reptiles characteristic of the pre-mined open forest but some species are apparently excluded because large, hollow-bearing trees and/or suitable ground cover are lacking.

CAMERON, E.E. & H.G. COGGER, 1992. The herpetofauna of the Weipa region, Cape York Peninsula. Technical Reports of the Australian Museum No. 7: 1–200.

Contents

This report summarises current knowledge of the herpetofauna of the Weipa region in north-western Cape York Peninsula, Queensland, Australia. It is based primarily on a survey conducted by the Australian Museum in response to an invitation by Comalco Mineral Products, the corporation which has been mining bauxite in the region since 1963.

The survey was initiated when an Australian Museum party led by Dr Hal Cogger, made a brief visit to Weipa in July 1977 at the conclusion of a survey of the herpetofauna of Torres Strait Islands, which had been funded by ARGS Grant D1-73/15060. Karl Stewart, then General Manager – Operations at Weipa, was concerned about the potential effects on the local fauna, of the introduced cane toad (*Bufo marinus*) which was invading the Peninsula. Although some data on the vegetation and birds around Weipa had been published, very little was known about the frogs and reptiles. It was agreed that a baseline survey of the indigenous herpetofauna would assist in documenting the impact of the toad on that fauna.

The survey was also designed to fill a gap in the knowledge of the distribution of frogs and reptiles in Australia. Incorporated with existing data on the herpetofauna of the east coast of the Peninsula, Arnhem Land and Torres Strait, it could contribute to an understanding of the evolution and geographic relationships of frogs and reptiles in northern Australia and southern New Guinea.

Comalco Mineral Products funded five visits by Australian Museum herpetologists to Weipa between 1979 and 1982. During this period, the corporation supported two other surveys of fauna in the Weipa region – one by the Queensland National Parks and Wildlife Service, and one by Peter Reeders in the regenerated mine sites. A fourth fauna survey in the region was commissioned in 1981/82 by Aurukun Associates for their bauxite lease SBML9 north of Aurukun. Further information on these surveys is provided below in the section on Previous Studies of the Region. Data from all these surveys, as well as that in the literature, and information and specimens supplied by individuals, have been incorporated in this account of the herpetofauna of the Weipa region.

Methods

Field visits were scheduled to sample a range of seasons but due to other commitments of the Museum herpetologists, the majority of visits occurred in the middle of the dry season, between June and September (Appendix 1). Survey sites were selected to include the major habitats and to encompass the boundaries of the Comalco Mineral Products bauxite lease (Appendix 3;

Figs 1, 2). Most sites were visited in 4WD vehicles; some coastal and estuarine sites were reached by motorboat, canoe or barge, and during the wet season in February 1979, a helicopter was used to gain access to Mapoon and the coast north of Duyfken Point. Excursions were also made to the eastern side of the Peninsula at Iron Range and Portland Roads and further north, to Heathlands and Captain Billy Beach; these sites are not described in this report, but the species recorded there have been discussed in relation to the Weipa fauna.

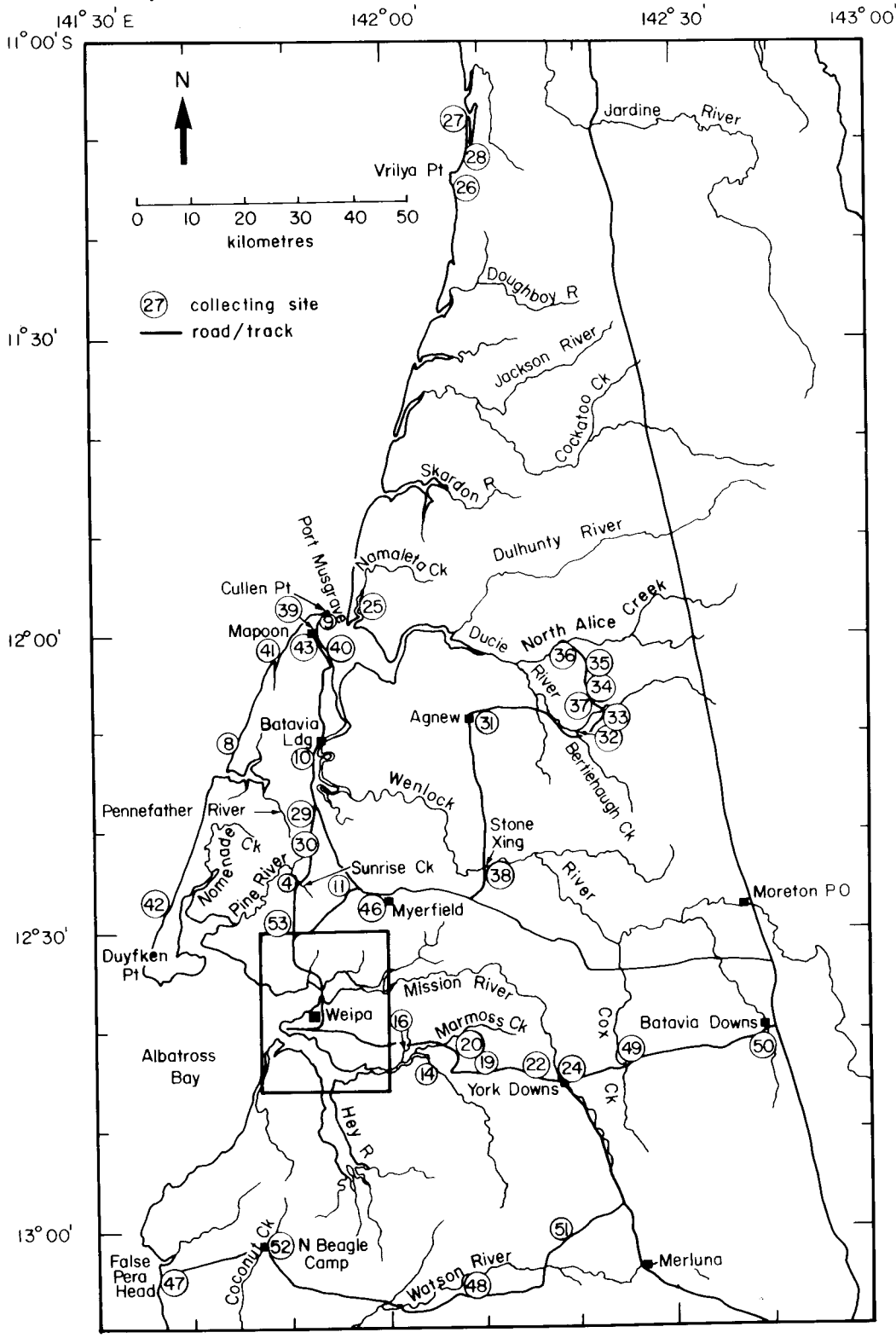


Fig.1. Map of the Weipa region. Collecting sites identified by encircled numbers are described in Appendix 3. The rectangle enclosing Weipa is enlarged in Figure 2.

Frogs and reptiles were surveyed by qualitative methods - hand-collecting, pitfall-trapping with drift fences, dip-netting (sea snakes) and drum-netting (freshwater turtles). Roads and tracks were driven in the morning and at night, and spotlighting on foot was also undertaken. Hand-collecting techniques included turning logs and ground debris, raking leaf litter and peeling bark. Some arboreal and fast-running terrestrial lizards were stunned with rubber bands or shot with dust-shot.

Museum records were also consulted for records of frogs and reptiles from the Weipa region. The earliest record in the Australian Museum is 60-odd specimens collected by Charles Hedley in May 1903; a year or so later the Reverend J.N. Hey donated a frill-necked lizard from Mapoon. Small collections by R. Bustard, H. Foley, G. Webster and D. Wilhoft (who made the significant donation of a gravid snake, *Simoselaps warro*) were registered in the early nineteen sixties. The University of New England donated a collection of frogs and reptiles made in August and September 1972 along the Peninsula Development Road and the Telegraph Road east and north of the present survey area. In the mid-seventies, specimens donated by H. Heatwole and J. Redfield contributed greatly to our knowledge of the sea snake fauna in the vicinity of Weipa. The only other significant collections in the Australian Museum derive from the present survey. Specimens collected by the Queensland National Parks and Wildlife Service (1980-1981) and Biological Environmental Research Services

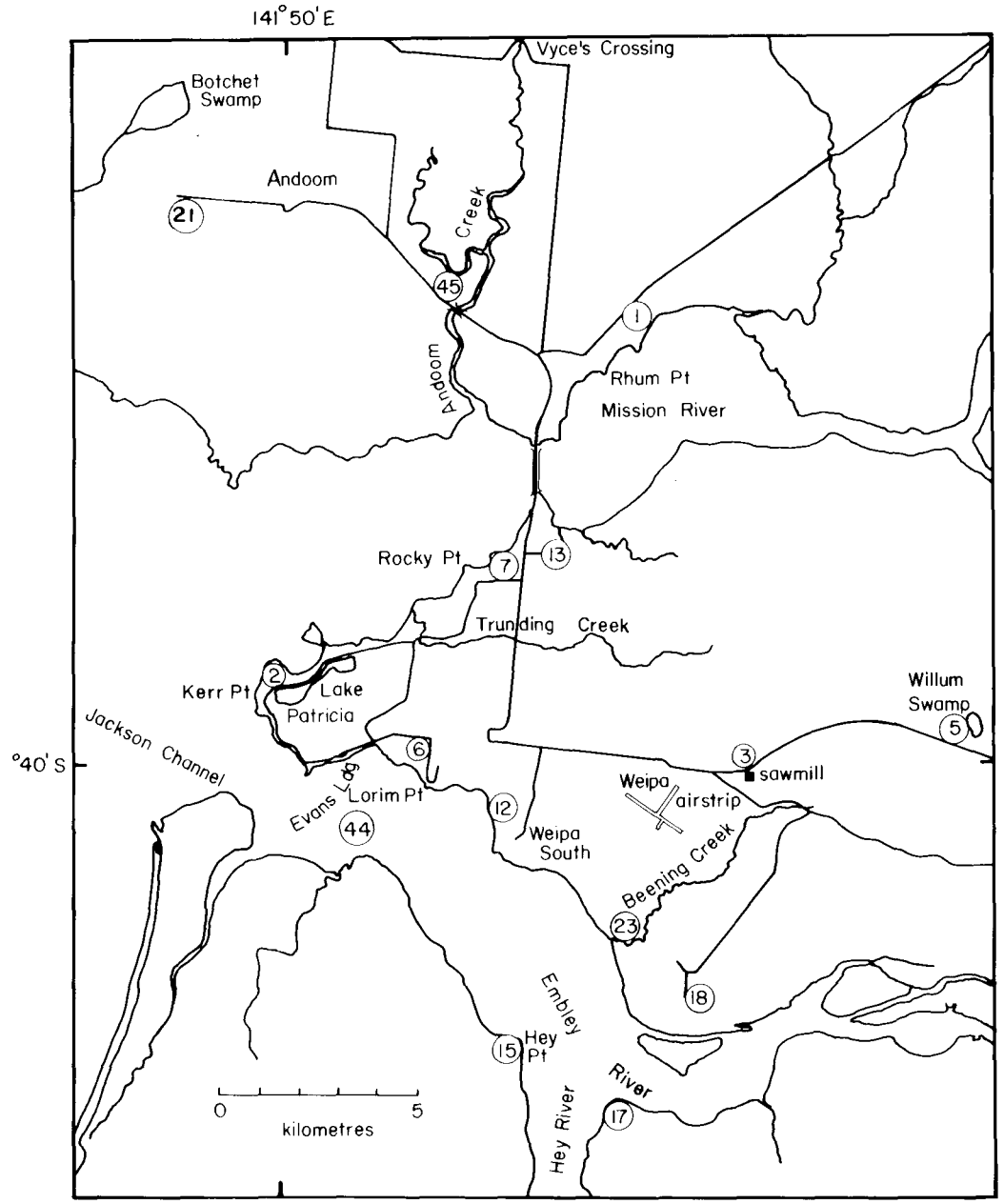


Fig.2. Map of environs of Andoom and Weipa settlement. Symbols as for Figure 1.

(1981-1982) are lodged in the Queensland Museum, which has supplied us with a computer listing of its holdings from the Weipa region.

Description of the Weipa Region

The survey area extended from 11°08' to 13°07' latitude south and 141°37' to 142°40' longitude east, on Cape York Peninsula, Queensland. It lies within the Carpentaria Basin and is of low relief, rarely exceeding 50 m in altitude. The Weipa region can be classified according to three major physiographic units (Australia - BMR, 1977) - Weipa Plateau, Merluna Plain and Mapoon Plain (Fig.3, after Australia - BMR, 1977).

Most of the survey sites were on the Weipa Plateau physiographic unit which is a dissected plateau capped by aluminous laterite overlying the sedimentary Bulimba Formation. This aluminous laterite is the source of the commercial bauxite pisolites on the north-western Cape and has an ironstone (or ferricrete) layer below it. Soils are generally loamy red and yellow earths.

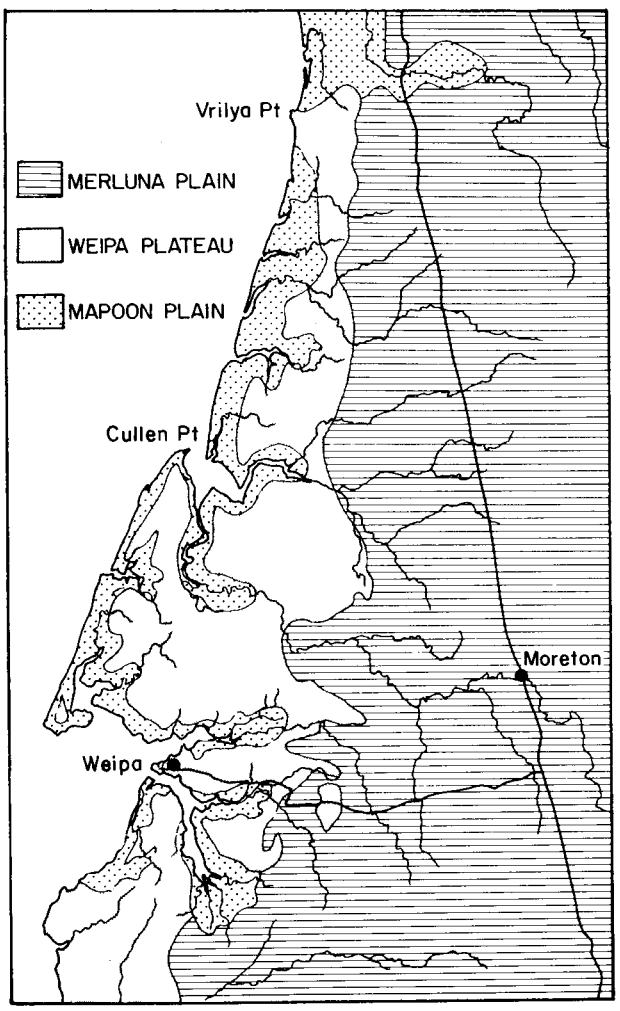


Fig.3. Major physiographic units in the Weipa region.

They are deep (up to 1 m) and well-drained; very little surface run-off occurs. The water enters aquifer sands which lie close to the surface in the vicinity of Marmoss Creek.

The predominant habitat on the Weipa Plateau is open forest with small patches of notophyll vine forest and thicket. The plateau is drained in a dendritic pattern by wide shallow streams which empty into the Gulf of Carpentaria, principally at Albatross Bay (on which the Weipa settlement is located) and Port Musgrave (at 12°00'S 141°56'E). The latter receives the only large perennial river in the district, the Wenlock, which flows north-west from its source close to the east coast. On interfluve areas, especially north of Albatross Bay, there are circular depressions up to 1.5 km in diameter with floors of grey clay less than 1 m deep, where drainage is impeded. Here the topography is smooth plain lands with relief generally less than 6 m. These depressions support paperbark woodland.

The Merluna Plain has resulted from erosion of the laterite of the Weipa Plateau to expose sedimentary rocks such as quartzose sandstone interbedded with sandy siltstones and claystones. Thin ferricrete cappings are exposed at Bertiehaugh and Ducie River crossings. The soils tend to acidic loamy yellow earths, which typically support eucalypt woodland. Grey and brown clays occur on lower sites such as the gilgais or 'melon holes' which are common in this unit. The aquifer sands of the Weipa Plateau apparently do not extend eastward into this eroded 'breakaway' country which has much run-off and marked seasonal water-logging. The topography is undulating plain lands with a relief of 6 to 20 m.

Along the coast north of Albatross Bay, the narrow Mapoon Plain has developed from the deposition of erosion materials. Soils are composed of silt, clay and sand and include saline plastic clays. Beach sand-ridges up to 10 m high are backed by black soil plains (especially around Big Swamp on the Mapoon Peninsula), clay flats and occasional salt pans, which may all be inundated by fresh to brackish water. Mangroves are well developed but restricted to the lower reaches and the mouths of the rivers. Permanent freshwater soakages form swales behind the beach ridges and behind mangroves at the base of cliffs; the Mapoon Plain supports an extensive system of freshwater swamps which fill during the wet season but gradually dry out during the dry season.

Weipa has a tropical monsoonal climate, with an average monthly temperature range of 25°C (July) to 30°C (November) (Anonymous, 1981) and a daily fluctuation of 8°C to 10°C (Specht *et al.*, 1977). The average rainfall is close to 1600 mm, of which 96% falls between November and April, so the months May to October are very dry (Fig.4). Total solar radiation is high for most of the year and peaks in October or November, before the onset of the wet season. During the monsoon season the prevailing westerly winds rarely exceed 30 knots but occasional cyclones may cause localised damage to trees. Between May and October the prevailing winds are easterlies and south-easterlies.

Habitats

The habitats identified for the purposes of the survey are almost identical to the vegetation types listed in the QNPWS survey of vertebrates in the Weipa region (Winter & Atherton, 1985a). They are:

1. Open forest (OF) Plate 1. This is the most widespread habitat on the Weipa Plateau within the survey area. It occurs on deep well-drained loamy or sandy soils, including loamy red earths; ironstone nodules and surface bauxite pisolites are often present. The dominant tree species is the Darwin Stringybark (*Eucalyptus tetrodonta*) with Long-fruited Bloodwood (*E. polycarpa*), Melville Island Bloodwood (*E. nesophila*) and the Cooktown Ironwood (*Erythrophleum chlorostachys*) also well represented in the tree stratum which averages 30 m in height on richer soils. Understorey species include wattle, *Acacia* sp. aff. *rothii*, Cocky Apple (*Planchonia careya*), Nonda Plum (*Parinari nonda*), and two grevilleas - Bushman's Clothes Peg (*Grevillea glauca*) and the Silver Oak (*G. parallela*) - and the Milky Pine (*Alstonia actinophylla*).

In open forest around Weipa and Andoom the shrub layer is poorly developed and the ground is well grassed, but north of the Dulhunty River, for example at Vrilya

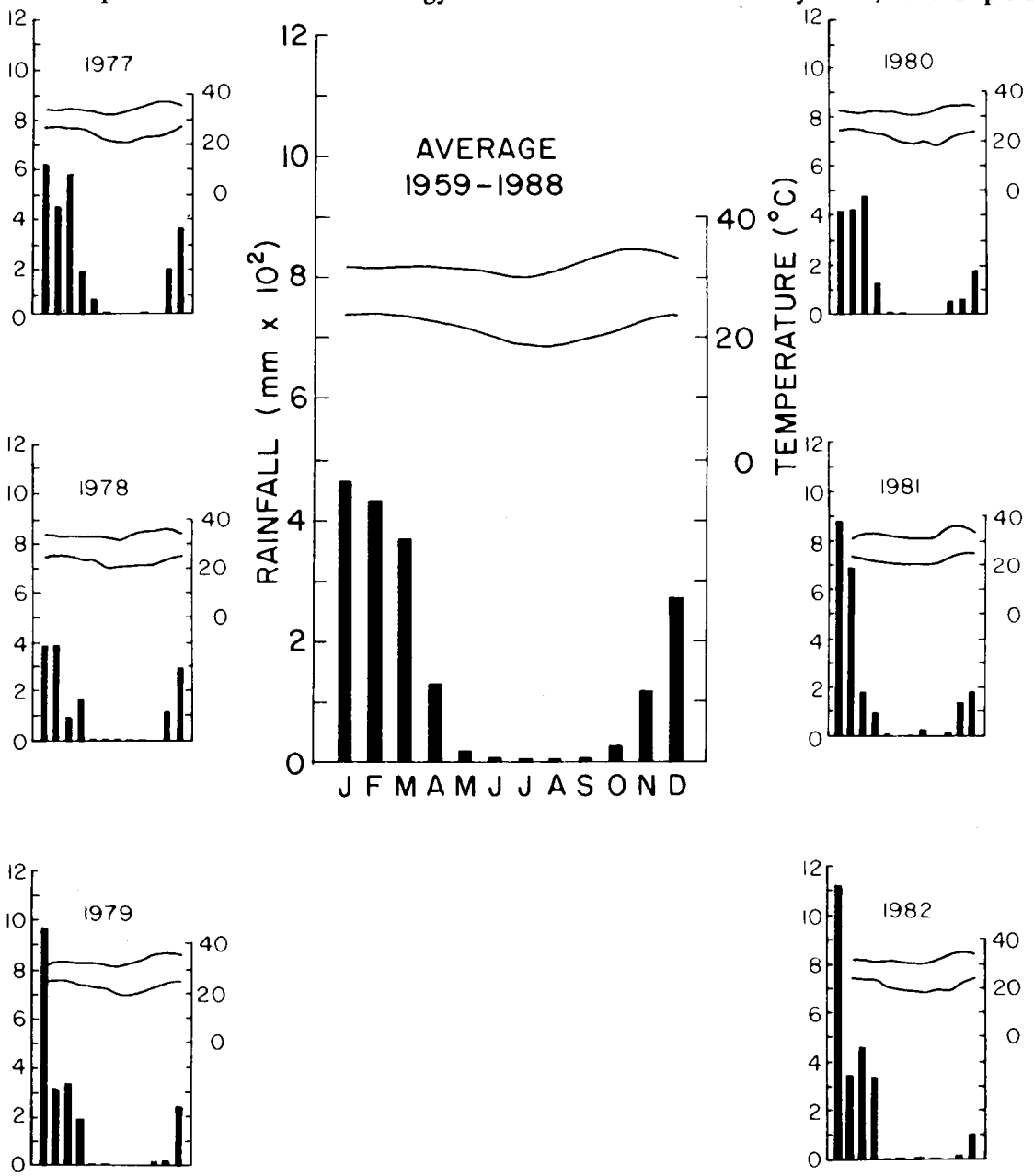


Fig.4. Average monthly maximum (upper curve) and minimum (lower curve) temperatures and monthly rainfall (bar charts) recorded at Weipa over a 30 year period, 1959 to 1988 (central graph). Small graphs show the monthly measurements during the six years over which the survey was conducted. (Data from Bureau of Meteorology, Sydney).

Point, a dense shrub layer 1 to 2 m tall, is present in which the Cabbage Tree Palm (*Livistona benthamii*) is common. The composition of shrub and ground strata is influenced by the frequency of fires.

Open forest was sampled at the following sites in the vicinity of Weipa township - Kerr Point, the sawmill, Number One Camp and Sunrise Creek. Elsewhere it was sampled between Andoom and Sunrise Creek, at Red Beach, Batavia Outstation Landing, Stone Crossing, Myerfield airstrip, vicinity of Ducie River, Hey Point, shell mounds on Oilrig Road, the jump-up on the Coen road and Vrilya Point.

2. Eucalypt woodland (EW) Plate 1. Eucalypt woodland is the common habitat on the Merluna Plain, which consists primarily of sedimentary-derived soils, usually mottled yellow earths and yellow podzolics. It is characterised by a tree stratum of myrtaceous species (but the absence of Darwin Stringybark), a low canopy height (about 15 m), poorly developed understorey and grassy ground stratum.

An ironbark (*Eucalyptus cullenii*) is the dominant tree on gravel ridges; it is replaced on well-drained soils by the Broad-leafed Carbeen (*E. confertiflora*) with an understorey of Quinine Bush (*Petalostigma* sp.). On grassy gilgai flats the Ghost Gum (*Eucalyptus papuana*) occurs, and on seasonally waterlogged soils the Weeping Tea-tree (*Melaleuca leucadendron*) and Swamp Mahogany (*Lophostemon suaveolens*) replace eucalypts in the tree stratum and sedges replace grasses on the ground. Eucalypt woodland was sampled at York Downs, Old Weipa Mission, Agnew airstrip and north of the Ducie River.

3. Dunefield woodland (DW) Plate 1. This occurs on the Mapoon Plain on deep Quaternary siliceous sands with shallow freshwater aquifers, on parallel foredunes and old beach ridges. Trees form a fairly continuous canopy, lower than 15 m, with few shrubs and an open ground stratum of litter and a few herbs. Numerous tree species are present in the canopy, including *Terminalia* spp., Spoon Tree (*Acacia crassicarpa*) and Thancoupie (*A. torulosa*), Scrub Turpentine (*Canarium australianium*), Nonda Plum (*Parinari nonda*) and Peanut Tree (*Sterculia quadrifida*); common understorey species are the Red Ash (*Alphitonia excelsa*), Lady Apple (*Syzigium suborbiculare*), Cottonwood (*Hibiscus tiliaceus*) and the Beach Tamarind (*Cupaniopsis anacardioides*). On gently sloping shelly sand between the dunes and the high tide mark grow Coastal She-oak (*Casuarina equisitifolia*) sometimes clumped into small groves, and occasionally a Native Almond (*Terminalia catappa*); ground species are prostrate creeping vines and grasses including the Goat's Foot Morning Glory (*Ipomoea pescaprae*), Beach Pea (*Canavalia maritima*) and Beach Spinifex (*Spinifex hirsutus*). Beach-washed logs and the shells of dugout canoes (apparently washed down from Papua New Guinea) are common on the strandline. Dunefield woodland was sampled at Old Mapoon Settlement, site 8 north of the Pennefather River, Namaleta Creek and Vrilya Point.

4. Paperbark woodland (PW) Plate 2. This occurs mostly on the Weipa Plateau and Mapoon Plain. Paperbarks (*Melaleuca* spp.) form almost pure stands of woodland with canopy height 12 to 15 m on heavy, poorly drained clay soils on flood plains and around freshwater swamps and sinkholes. Epiphytes such as orchids and ant plants (*Myrmecodia beccarii*) are common on the trunks of the paperbarks.

Around seasonally flooded sinkholes the dominant melaleucas include *M. leucadendron*, Swamp Paperbark (*M. viridiflora*), Panja (*M. symphiocarpa*) and *M. stenostachya*, and *Calycopeplus cauarinoides* is often present; the ground is usually bare of living plants but covered by a layer of black-stained leaf litter. Around permanent swamps there is a ring of paperbarks (including *Melaleuca quinquenervia*), with ground cover of sedges such as *Gahnia sieberana* and grasses, and usually an inner zone of dense reeds.

On floodplains the low paperbark woodland is composed of Swamp Paperbark (*M. viridiflora*) or a narrow-leafed species (*M. cajuputi* or *M. quinquenervia*) with ground cover usually of sedges. The paperbark woodland on poorly-drained soils at Vrilya Point has a tall, more diverse ground stratum including Pitcher Plant (*Nepenthes mirabilis*) and monocotyledon swamp herbs as well as rank sedges, for example, *Gahnia sieberana*. Trees other than paperbarks include Swamp Banksia (*B. dentata*) and Screw Pine (*Pandanus* sp.).

Paperbark woodland was sampled at Willum Swamp, Rocky Point, site 29 (12 km north of Sunrise on the road to Mapoon), site 37 (3 km north of Ducie River crossing on the road to Mapoon) and Vrilya Point.

5. Vine forest (VF) Plates 2, 3. This category includes a variety of closed forest formations. On well-drained deep red earths on the Weipa Plateau and Merluna Plain there are discrete pockets of simple notophyll vine forest, sharply demarcated from the surrounding open forest or eucalypt woodland. The canopy (10-45 m in height) is composed characteristically of evergreen tree species including Pink Mahogany (*Dysoxylum oppositifolium*), Scrub Turpentine (*Canarium australianum*), Native Mango (*Buchanania arborescens*) and Scaly Ash (*Ganophyllum falcatum*). Vines are common and the ground stratum is very open and covered in leaf litter. Most of these vine forest pockets are less than 50 ha in extent. Some patches of notophyll vine thicket, with a canopy height of only 3 to 6 m and composed largely of deciduous species, occur on very well-drained soils (see Pl.2).

On humus-enriched calcareous hind-dunes of the Mapoon Plain there are patches of notophyll vine forest ranging from a low wind-pruned canopy height of 5 m up to 20 m in the more sheltered situations. The tree species include figs (*Ficus* spp.), Scaly Ash (*Ganophyllum falcatum*), Damson (*Terminalia sericocarpa*) and a number of species with restricted range, for example the Wongai Plum (*Manilkara kauki*) and a feather-leafed palm (*Ptychosperma macarthurii*) in the vicinity of Vrilya Point. Tall emergent eucalypts and paperbarks are present in the middle of some patches.

Vine forest also occurs in a narrow zone, often on

steep lateritic slopes between mangroves and open forest, along the lower reaches of large rivers, for example at Batavia Outstation Landing on the Wenlock River (see Pl.3).

Vine forest was sampled at Rhum Point, Possum Scrub, mouth of the Pennefather River, Batavia Outstation Landing, Vrilya Point, Stone Crossing, Teardrop Scrub and Flying Fox Scrub north-north-west of Ducie River crossing and False Pera Head.

6. Gallery forest (GF) Plate 3. This describes the narrow belt of mesophyllous vegetation bordering freshwater streams. Characteristic trees growing on well-drained levee banks of siliceous sands and alluvial soils along the major watercourses are tall paperbarks (*Melaleuca leucadendron* and *M. argentea*). In swampy areas the Red Beech (*Dillenia alata*), Swamp Mahogany (*Lophostemon suaveolens*), *Livistona* palms and *Pandanus* grow. The understorey often includes vine forest species and ferns, and sedges and grasses occurs in the ground stratum. Gallery forest was sampled at Stone Crossing, Sunrise, Marmoss and Running Creeks, at Vrilya Point and also at Lydia Creek beside Batavia Downs homestead.

7. Grassland/sedgeland (G/S). This habitat was not sampled comprehensively in the survey. The occurrence of sedgeland is most extensive on the Mapoon Plain at Big Swamp, on cracking grey clays and duplex soils. *Pandanus* palms are usually scattered through natural grasslands on the Mapoon Plain. Grassland has been artificially created by the clearing of land for airstrips at several localities including Agnew and False Pera Head. One of the common grass species on better-drained soils subject to disturbance (for example, burning) is Blady Grass (*Imperata cylindrica*).

Grassland/sedgeland was sampled at Kerr Point, Cool Pool, Shell Point, Vrilya Point, Big Swamp on the Mapoon Plains, False Pera Head, Batavia Downs Station homestead and Beagle North Camp airstrip.

8. Mangroves (M) Plate 3. These are closed shrubland or tree communities growing on saline muds exposed to frequent tidal inundation. There is a marked zonation of species, with stilt-rooted mangroves (*Rhizophora* spp.) on the seaward side, growing to heights of 15 m, and a succession of shorter species, such as *Bruguiera* sp., Club Mangrove (*Aegialitis annulata*), and Milky Mangrove (*Excoecaria agallocha*) growing further inland.

Mangroves were sampled at Batavia Outstation Landing, Cool Pool, Beening Creek, mouth of Namaleta Creek,

9. Saltwater (S). Some species of reptiles were recorded only in saltwater, either near the mouths of the Hey, Embley and Mission Rivers which flow into Albatross Bay, the Bay itself, or close to the beaches and river mouths on the coast north and south of Albatross Bay. The water in Albatross Bay and the river mouths is generally turbid, with an increase in suspended matter during the wet season.

10. Urban (U). The environs of Rocky Point, Evans Landing and Lorim Point were included in this category. Most buildings are constructed of concrete, brick or aluminium cladding. Extensive parks and gardens with year-round irrigation provide a moist refuge during the dry season. Artificial lighting around many of the buildings at night attracts insects which provide a concentrated food source for geckos and frogs.

11. Regeneration (R). This category includes young mixed species forest and woodland, sometimes alternating with strips of pasture, and pine and mahogany plantations. Regeneration areas have been described in some detail in Reeders & Morton (1983).

History of the Weipa Region

Aborigines have lived on the Peninsula for the past 20,000 to 30,000 years and were probably dispersed throughout the area until Europeans settled there. The early European history of Cape York Peninsula has been reviewed by Robert Logan Jack (1921). The earliest recorded sighting of Australia by a European was by the Dutch explorer, William Janz in 1606, at the Pennefather River. However, the first permanent European settlement on the northern Peninsula was not established until 250 years later - at Somerset, in 1863. On the north-eastern tip of the Peninsula, Somerset was established to provide a supply depot and a port for shipping using the Torres Strait and Great Barrier Reef routes. In the early 1860s the Jardine brothers drove cattle and horses up to the new settlement from Rockhampton.

The Cape York Telegraph Line, linking Laura with the tip of the Cape, was constructed between 1884 and 1886 and about that time a number of pastoral holdings were taken up on the northern Peninsula. The first was Batavia Downs (12°40'S 142°40'E) in 1882, followed by York Downs (12°45'S 142°19'E) in 1884 and Bertiehaugh (12°12'S 142°30'E) in 1888 (Wharton, 1988a). Mission stations were founded at Mapoon on Cullen Point in 1891, and at Weipa (on Spring Creek near the Embley River junction) in 1898. Between 1895 and 1908 large tracts of north-western Cape York Peninsula were gazetted as Aboriginal Reserves (Stanton, 1976) and the remaining Aborigines of the Peninsula moved into these areas and gradually relinquished their traditional life styles (Moore, 1972). In 1932 the Weipa Mission Station was translocated from Spring Creek to Jessica Point on the Embley River.

The most recent phase of the history of the north-western Peninsula began in 1955, when H.J. Evans discovered and investigated a large outcrop of bauxite near Weipa. Exploration headquarters were established at Top Camp, followed by the development of a township at Rocky Point when the Commonwealth Aluminium Corporation Ltd (Comalco) commenced mining the deposit in 1963. The combined population of Weipa North, Napranum (the Weipa South community at Jessica Point) and Evans Landing, was over 3,000 in

1988. Weipa has become a regular stopover for the rapidly growing number of tourists who drive up the Peninsula Development Road to Cape York, and Albatross Bay is a major port which services the Gulf prawn trawlers and other fishing vessels as well as coastal freighters and international ore carriers.

Impact of Humans and Feral Animals

Probably the first major impact of humans on the Peninsula environment was the Aboriginal custom of annual burning (Jack, 1921) although Pedley & Isbell (1971) point out that fire-adaptation of much of the vegetation indicates it "...must have been a feature of the environment for much longer than the period of occupation...". It has been suggested the fires ultimately reduced the extent of vine forest and facilitated the spread of sclerophyllous communities (Wace, 1972; Stanton, 1976). Most of the country round Weipa is still burnt annually in the dry season of May to November, and there is a paucity of shrubs in the forest and woodland communities.

As well as domesticated stock, feral horses, cattle and pigs have probably existed on the Peninsula as long as European occupation (Stanton, 1976). Feral horses were rarely seen during the survey, and they tended to congregate on the grassy plains and dunefield woodlands of Mapoon Peninsula. Cattle are common in the eucalypt woodlands of the Merluna Plain and to a lesser extent in paperbark and dunefield woodlands; horses and cattle are uncommon in Darwin stringybark open forest (Winter & Atherton, 1985a). Signs of pigs were seen in practically every habitat; their rooting had disturbed large areas of litter on the floor of vine forest and was conspicuous along most of the watercourses.

Wetlands were probably the habitats most severely disturbed by hoofed mammals - the grey clay soils around the Pennefather swamps were observed during the AM and QNPWS surveys to be severely puddled and compacted by pigs, cattle and horses in a band 10 m wide; Biological Environmental Research Services (1982) noted that isolated waterholes near Aurukun were damaged by trampling, particularly in the dry season. Stanton blamed pigs and cattle for the erosion of steep banks beside watering places. Pedley & Isbell (1971) considered some changes in herb species composition had occurred in a few areas of heavier stocking on the Peninsula.

Feral animals also prey directly on native fauna. Peter Reeders recorded 95% predation of sea turtle nests by pigs on a strip census of 13 km of beach south of Vrilya Point (Winter & Atherton, 1985a) and this is apparently typical - "...on the west coast of Cape York Peninsula all reports of examined turtle nesting are of near total clutch destruction by feral pigs..." (Limpus & Fleay, 1983). Cats are probably the most significant feral predators; they were recorded as common in the QNPWS, BERS and Regeneration surveys, and were most often observed in the open forest and regeneration. Although recorded from all parts of the survey area, most cats observed by the QNPWS were less than 15 km from Weipa, suggesting the township was serving as the main source of recruitment. The stomach contents of six cats that were shot contained numerous lizards as well as some mammal, bird and spider remains (Winter & Atherton, 1985a; Biological Environmental Research Services, 1982). Dingoes were recorded in small numbers in all surveys; they were seen in vine forest, mangroves, open forest, eucalypt woodland, dunefield woodland and grassland (Winter & Atherton, 1985a) and in 34% of regeneration sites (Reeders & Morton, 1983). BERS noted the population of dingoes was periodically decimated by Aurukun residents. The occurrence of the cane toad, the only introduced amphibian in the area, is discussed elsewhere in this report.

Some areas of open forest in the Weipa region have been modified by bauxite mining. Since 1966, 4183 ha of mined land has been regenerated (Geoff Wharton, personal communication, 1991); the vertebrate fauna of regenerated mines was surveyed by Reeders & Morton (1983). Although the major component of the current regeneration program is establishment of native species, exotic plants have been used to create a variety of new habitats which include pastures, conifer and hardwood plantations, and parks and gardens. Irrigation has created an artificially continuous growing season for lawns and gardens in the town. Permanent water bodies have been supplemented by artificial lakes and tailings dams and Kikkawa (1975) suggested these new habitats might be significant to birds, in providing additional wetland habitat.

The construction of exploration and service roads, and 'bush-bashing' by recreational vehicles (an annual two-day motor-bike endurance race has been instituted in recent years) has made much of the region accessible during the dry season. This access is likely to increase disturbance to native fauna and flora through more frequent fires, the spread of feral animals and exotic plants, soil erosion and water pollution, and shooting, fishing and illegal trapping.

Previous Studies of the Region

The earliest scientific investigation of the area was by geologists and its geological history has been documented and mapped (Australia, BMR, 1977). The Weipa district was included in papers which described the Peninsula soils (Isbell *et al.*, 1968; Isbell, 1980) and the plant communities (Pedley & Isbell, 1971). The latter authors commented briefly on the factors influencing the distribution of communities and Stanton (1976) in a recommendation for national parks on Cape York Peninsula, provided further information on floristics from his extensive field surveys of the vegetation. Stanton emphasised the importance of swamp communities in the vegetation composition of the Peninsula and the concomitant diversification and prominence of the genus

Melaleuca.

On a finer scale, Specht *et al.* (1977) mapped the vegetation in the vicinity of Weipa and discussed the floristics, biogeography and ecology of the plant communities, with particular emphasis on the *Eucalyptus tetrodonta* open forest and its conservation status. The research program of the Regeneration Section of Comalco at Weipa includes the systematic collection and identification of plant species in the region (Comalco Aluminium Limited, 1988) and this will be a valuable addition to knowledge of the Weipa flora.

Although expeditions to the vine forests of eastern Cape York Peninsula and the tip of Cape York (e.g., Covacevich, 1987) have yielded much information on the fauna of those areas, little has been written on the fauna of the north-west coast (see summary in Winter & Atherton, 1985: 1-4). Until the commencement of the present survey, none of the faunal groups in the Weipa district had been systematically surveyed although species lists and notes had been published on the butterflies (McCubbin, 1972), birds (Kikkawa, 1975; Beruldsen, 1979) and dung beetles, fruit flies and butterflies (Monteith, 1975). Research papers were published subsequently on an aerial survey of *Crocodylus porosus* nesting areas (Magnusson *et al.*, 1980) and recolonisation by ants of rehabilitated mines (Majer, 1984). In 1988 the Uningan Nature Reserve was established on the south bank of the Mission River near Awonga Point and a guide to the natural environment and the traditional Aboriginal use of the resources was published (Wharton, 1988b); the Uningan Guide includes information on the habitats and fauna of the Reserve.

In 1980 the Queensland National Parks and Wildlife Service commenced a survey of mammals of the region which also encompassed observations on birds, reptiles and amphibians, and a description of the habitats/ vegetation types. Their results appeared in an unpublished report to Comalco Mineral Products (Winter & Atherton, 1985a) and were presented at the 9th North Australian Mine Rehabilitation Workshop (Winter & Atherton, 1985b; Godwin, 1985). Further valuable information on the vertebrate fauna of the regenerated mines at Weipa and Andoom is contained in reports to Comalco and to the Mine Rehabilitation Workshop (Reeders & Morton, 1983; Reeders, 1985). An environmental assessment study of the Aurukun area was conducted for the Shell Company of Australia between November 1981 and March 1982 (unpublished report by Biological Environmental Research Services, 1982; Clarkson, 1982). It yielded data on the terrestrial vertebrates at the southern limit of the Weipa region. The dates of all the faunal surveys conducted between 1977 and 1982 appear in Appendix 2.

Annotated List of the Herpetofauna

A list of species of frogs and reptiles recorded from the Weipa region appears in Appendix 4. Appendix 6 is a dichotomous key which, used in conjunction with the written descriptions and the plates at the end of the report, should enable users to identify a reptile or frog to species. However, readers should not overlook the possibility they may have found a species not previously recorded in the region.

If you cannot identify a species, please send preserved specimens, written descriptions and/or photographs to a museum for identification. Dead animals should be preserved in 75% alcohol or methylated spirits, and the body cavity of large snakes and lizards should be slit open to allow the preservative to penetrate internal organs. Specimens should be stored in watertight glass or plastic containers (beware of rusting lids) with labels written in pencil or indelible ink, listing as much of the following information as possible: precise locality, plant community, date, collector, colour and behaviour (if observed alive). For mailing, specimens should be removed from preservative, wrapped in cheesecloth, Chux or other undyed absorbent fabric, sealed in plastic bags (use a series of sealed bags inside each other to avoid any risk of leakage) and packed in a sturdy padded container.

Species Accounts - explanatory notes

Scientific name is generally followed by a common name but many species have no common names and the same common name may be applied to different species in different regions; to avoid confusion, scientific names should always be used (with or without common names).

Description commences with an italicised one-sentence summary of the distinctive features of the species.

Size is recorded in millimetres for frogs, turtles and lizards, and in metres for crocodiles and snakes. The size of frogs and lizards is expressed as snout-vent length, while the size of crocodiles and snakes is expressed as total length, from tip of snout to tip of tail. Size of turtles is expressed as carapace length. The range and/or maximum size of Weipa specimens is listed first, followed by the average or maximum size recorded for the species (based on the literature).

Distribution at Weipa includes the percentage of survey sites in which species was recorded (100% = 53 sites) and the physiographic units (Mapoon Plain, Weipa Plateau and Merluna Plain). Distribution maps for each species are based on Australian Museum records but in the case of species which were not recorded by the Museum, localities from other sources (Winter & Atherton, 1985; BERS, 1982) have been included.

Geographic range encompasses total range of the species.

Habitats in which a species was recorded during the Museum's survey may be followed after a semi colon by information on habitat usage elsewhere and/or by a list of additional habitats in which it was recorded

in other Weipa surveys.

Survey abundance refers to the Museum's survey. Categories are defined in Kirkpatrick & Lavery (1979):
Abundant: usually present in large numbers
Common: nearly always present, but not in large numbers
Uncommon: not present each visit but more than twice during the survey
Scarce: not present more than twice during the survey

Species with pronounced seasonality (particularly frogs), have been categorised only for the seasons when they are active; their abundance is qualified by the word 'seasonal'.

Overall abundance incorporates data from all surveys and incidental observations.

Seasonality lists the number of Museum visits on which a species was recorded and may also include information from other surveys or incidental observations.

Reproduction information is drawn from all sources, including literature.

Notes may include information on sex ratio of preserved specimens, behaviour, microhabitat, diet and predation, and are based on personal observations and literature.

References are intended only to be an introduction to the literature on a species; in general, references have been selected which refer to natural history.

FROGS

Family MYOBATRACHIDAE (Southern Frogs)

Crinia remota (Tyler & Parker, 1974)
Plate 4

[Also appears in the literature as *Ranidella remota*]

Description. *Very small cryptic terrestrial brown frog.* Colour pattern very variable but back predominantly brown or grey. Generally there is a dark triangular patch on top of the head and dark triangular markings on the upper lips and fairly definite darker crossbands on hindlimbs. Belly whitish with fine stippling. Throat grey, but may be black in some breeding males. Skin covered with very small tubercles above, slightly granular below. Fingers and toes relatively long and unwebbed. Eardrum not visible.

Size (snout-vent). 10-17 mm (Weipa); maximum recorded for species = 20 mm.

Distribution at Weipa (sites; physiographic units). 34% of sites, throughout survey area in suitable habitat; all three physiographic units.

Geographic range. North-east Cape York Peninsula; also south New Guinea.

Habitat. Paperbark woodland, gallery forest, grassland/sedgeland; seasonally inundated or permanent freshwater habitats; also open forest (QNPWS).

Survey abundance. Abundant.

Overall abundance. One of the most abundant frogs in the Weipa area. One hundred and thirty four records in three surveys and one additional record. Not recorded in the survey of regenerated mine sites. Due to its small size and secretive habits it may be overlooked in casual searches.

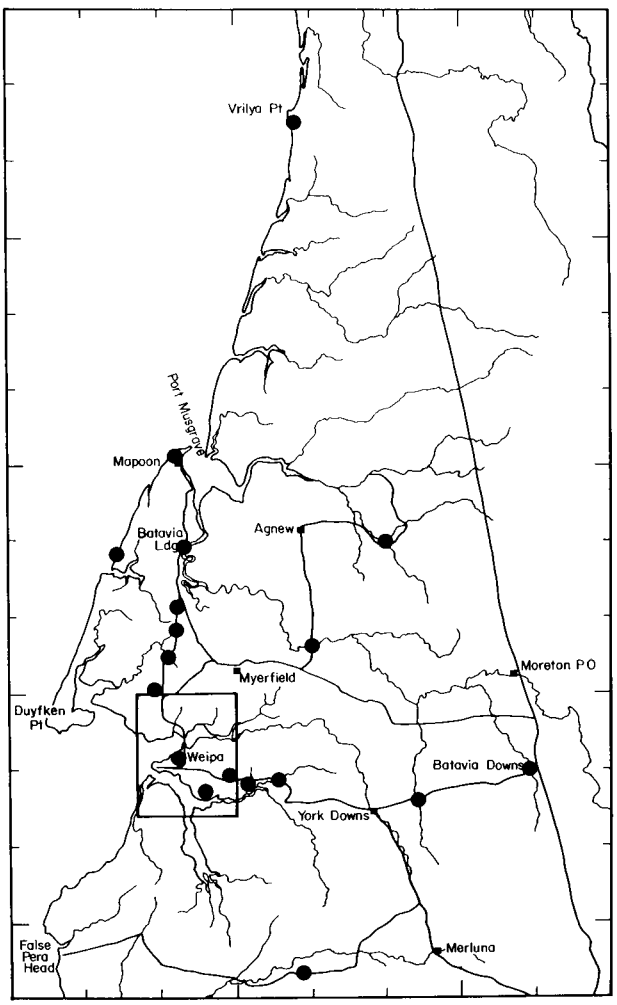
Seasonality. Recorded five out of six visits; not July 1980.

Reproduction. Males calling in February 1979, August 1981 and June 1982. Eggs laid in fresh wheel rut beside Willum Swamp, February 1979. Very small individuals (10 mm) abundant at Vrilya Point in August 1981. Breeds in flooded low-lying sites and roadside pools during the wet.

Notes. Sometimes occurs in same microhabitat as *Litoria dorsalis* - amongst tanin-stained leaf litter on mud at the edge of water.

Recorded in the diet of the Keelback Snake (*Tropidonophis mairii*).

Call a high-pitched 'peep'; males call from under leaves and amongst grass stems close to water, often



Crinia remota

during the day.

References. Tyler & Parker, 1974.

Limnodynastes convexiusculus (Macleay, 1877)
Plate 4

Marbled Frog

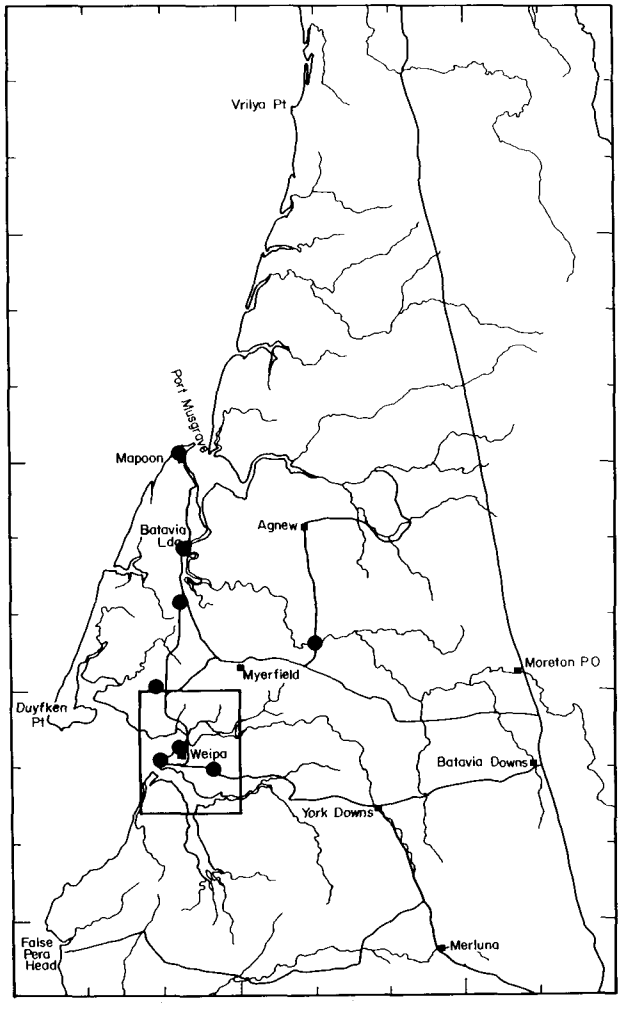
Description. *Moderately large burrowing frog with a stout body.* Grey to dark olive above with large darker blotches, including a streak along the snout, through the eye and eardrum, to the base of the forelimb. Skin on back with numerous low flat glands. Fingers and toes virtually unwebbed. Eardrum indistinct. Eyes prominent.

Size (snout-vent). 24-65 mm (Weipa); average recorded for species = 55 mm.

Distribution at Weipa (sites; physiographic units). 15% of sites, in coastal sector of survey area; with exception of Stone Crossing, absent from Merluna Plain.

Geographic range. Coastal and near-coastal areas of north and north-east Australia; also lowlands of south New Guinea.

Habitat. Paperbark woodland, gallery forest, grassland/sedgeland and urban habitats; seasonally inundated or permanent freshwater habitats; also regeneration (Reeders & Morton, 1983) and open forest and eucalypt woodland adjacent to gallery forest (QNPWS).



Limnodynastes convexiusculus

Survey abundance. Common.

Overall abundance. Common in the wet season. Seventy five records in three surveys and two additional records. Despite its comparatively large size, may be overlooked because of its burrowing habits and because males call from concealed chambers.

Seasonality. Recorded four out of six visits; not November 1979 or July 1980.

Reproduction. Males calling and egg mass seen, February 1979. Small individual (24 mm) collected June 1982. Breeds October to March. Eggs deposited in a foamy nest.

Notes. Secretive burrowing species. Call a continuous series of single, short, high-pitched 'plonks'; males call from within chambers amongst grass and debris at edge of swamp.

References. Cogger & Lindner, 1974; Tyler *et al.*, 1983.

Limnodynastes ornatus (Gray, 1842)
Plate 4

Ornate Burrowing Frog

Description. *Moderate-sized, stout burrowing frog with short blunt snout.* Very variable in colour from pale to dark grey or brown, usually with irregular darker markings, and a pale U-shaped patch on the nape behind the eyes, which may extend along the back to form an hourglass shape. Several broad dark bands on upper lip and broad or narrow dark bands on limbs. Fingers unwebbed; toes with little webbing. Eardrum very indistinct. Eyes prominent.

Size (snout-vent). 12-38 mm (Weipa); average recorded for species = 45 mm.

Distribution at Weipa (sites; physiographic units). 23% of sites, found throughout survey area in suitable habitat; all three physiographic units.

Geographic range. North and east Australia.

Habitat. All terrestrial and freshwater habitats except vine forest/thicket; often found some distance from water in dry sandy situations; also regeneration (Reeders & Morton, 1983).

Survey abundance. Common.

Overall abundance. Abundant. 158 records in four surveys and two additional records.

Seasonality. Recorded five out of six visits; not July 1980. Also collected December 1980.

Reproduction. Calling males and very small froglets present in February 1979. Breeds only after heavy rain between November and February; 150 to 1550 eggs are deposited in small floating foam masses, sometimes in small transient pools not much deeper than 2 cm. Metamorphosis may occur within 25 days.

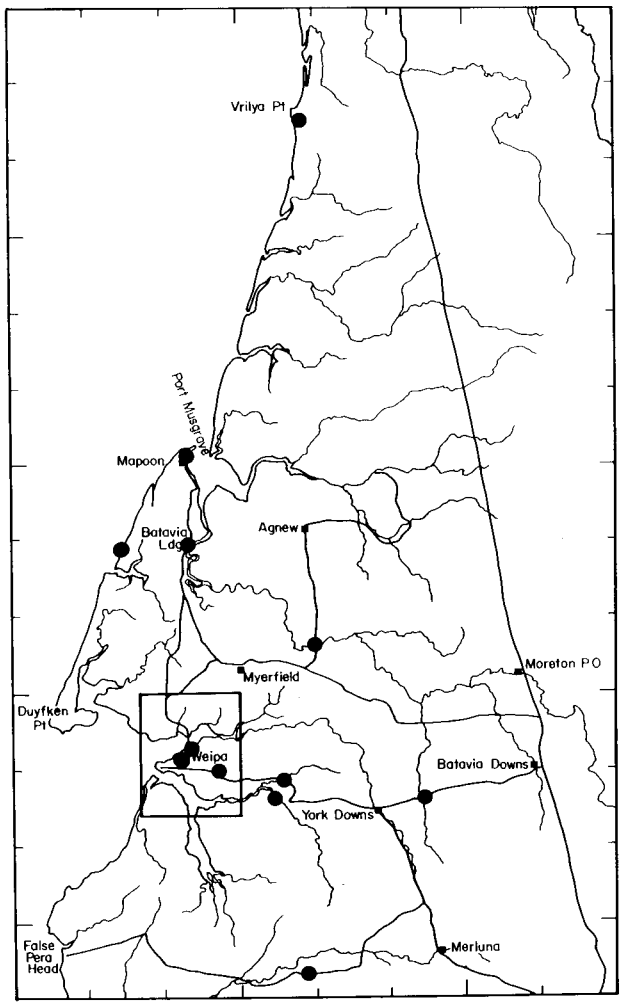
Notes. Burrower. Usually found active after rain and

on warm humid nights, but young froglets often active during the day in hot dry conditions.

Recorded in the diet of the Keelback Snake (*Tropidonophis mairii*) and the Common Tree Snake (*Dendrelaphis punctulata*).

Call is a very short nasal 'unk', repeated rapidly; males call while floating in the water.

References. Moore, 1961; Tyler *et al.*, 1983; Tyler, 1989.



Limnodynastes ornatus

Uperoleia mimula Davies, McDonald & Corben, 1986
Plate 5

Description. *Small, stout, short-limbed frog with warty skin on the back and a pair of moderately large parotoid glands on sides of neck above the forelimbs.* Dull brown above with darker patches on head and narrow transverse bands across the limbs. Bright red patches in the groin and at back of thigh. Fingers and toes unwebbed. Eardrum not visible.

Size (snout-vent). 16-28 mm (Weipa); maximum recorded for species = 28.4 mm.

Distribution at Weipa (sites; physiographic units). 11% of sites, in vicinity of Weipa town, Sunrise Creek, and Batavia Landing; not on Merluna Plain.

Geographic range. Cape York Peninsula as far south as Townsville, Torres Strait Islands; also south New Guinea.

Habitat. Open forest, paperbark woodland, gallery forest; also urban (QNPWS) and regeneration (Reeders & Morton, 1983).

Survey abundance. Common; seasonal.

Overall abundance. Common in the wet season. 158 records in four surveys and one additional record.

Seasonality. Recorded three out of six visits - in June 1977, February 1979 and November 1979; predominantly a wet season species. QM holds specimens collected in September, February and March.

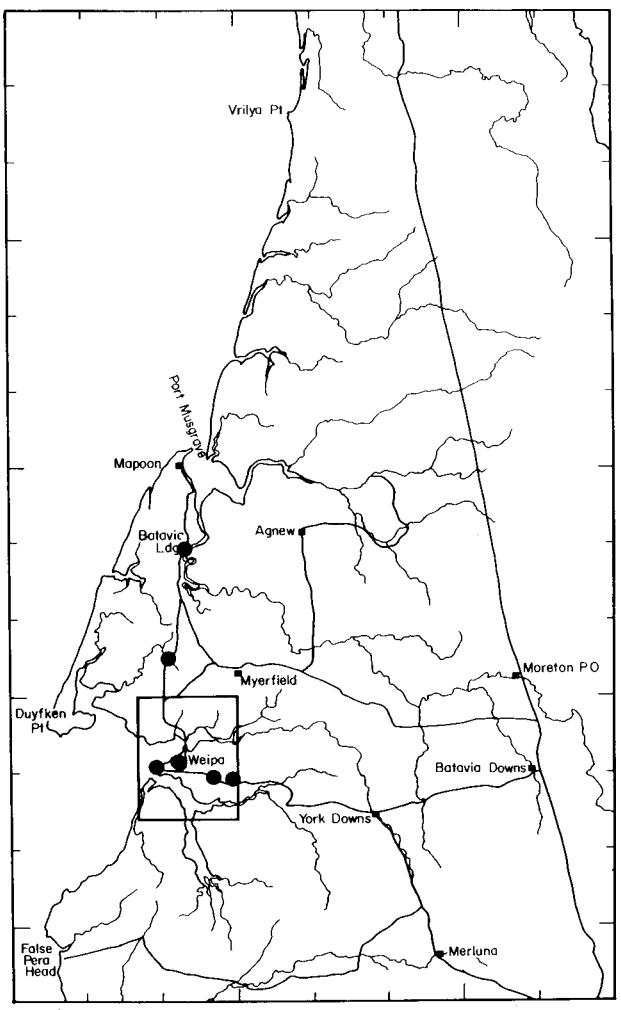
Reproduction. Males calling and amplexus (mating) observed in February 1979; eggs laid in small clumps at the edge of pools.

Notes. Burrower.

Three paratypes collected in the Weipa survey (AM R62684-85, R62687).

Call is a short, three to five pulsed explosive 'tick'; calling males often shelter beneath leaf and stick litter, sometimes a little distance from water, and are difficult to locate.

References. Davies, McDonald & Corben, 1986.



Uperoleia mimula

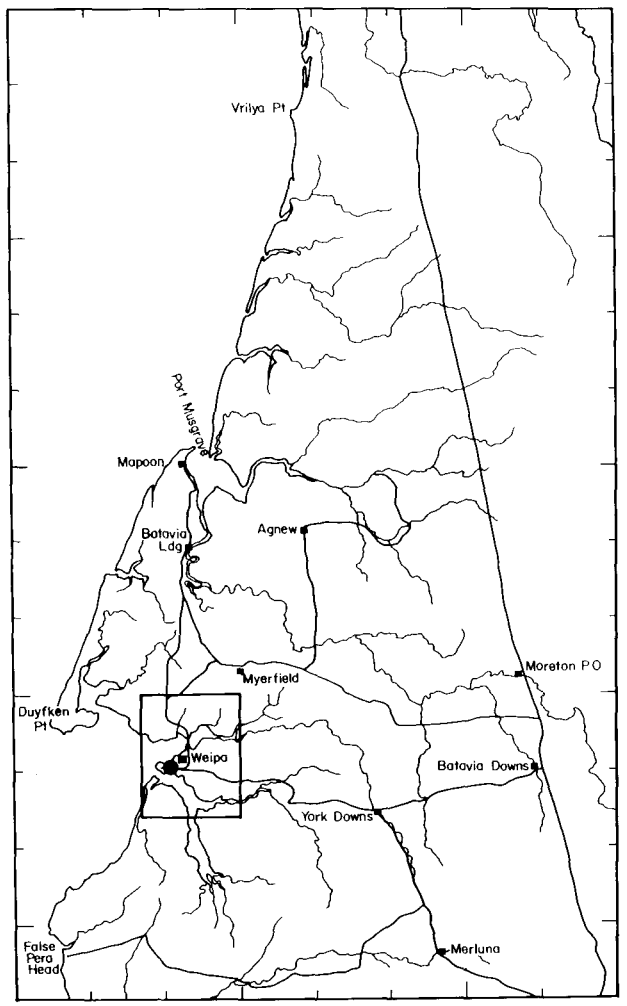
Family HYLIDAE (Tree Frogs)

Cyclorana maculosa Tyler & Martin, 1977
Plate 5

[Appears as *Cyclorana brevipes* in QNPWS report and as *C. manya* in BERS report but see discussion below]

Description. *Moderate-sized, stout burrowing frog with short hind limbs.* Pale grey-brown above with small dark patches. Pale broad bar across the back of the head. Very thin pale vertebral stripe usually extending from head to vent. Head rather flattened and broad. Skin on back smooth to slightly granular. Ventral surfaces smooth anteriorly, finely granular posteriorly. Fingers unwebbed; toes half webbed. Eardrum distinct. Pupil of eye horizontal when contracted.

The single specimen (AM R97098) collected during the survey was found in regenerated bauxite mine areas and presented by Mr Peter Reeders. It was submitted for identification to Mr M.J. Tyler, as the most recent reviser of the northern Australian members of this group. Mr Tyler tentatively identified the specimen as *Cyclorana longipes* Tyler & Martin, 1977, a species otherwise known only from the Kimberley region of Western Australia. The snout-vent length of 52 mm is greater than that published by Tyler & Martin (1977) for males of either *C. brevipes* or *C. longipes*; the tarsal length/snout-vent length ratio of 0.35 falls within the range recorded for three species of *Cyclorana* while the eye-naris length/internarial distance ratio of 1.2 falls within the published ranges for *C. brevipes* and *C. maculosa*. On the basis of S-V length and relative proportions of head and hind limbs, we have assigned the specimen to *Cyclorana maculosa* Tyler & Martin, 1977, a species known elsewhere from north-east Northern Territory and the Gulf of Carpentaria. No calls were recorded. Additional specimens in QM were also examined and considered to be consistent with *C. maculosa*.



Cyclorana maculosa

Size (snout-vent). Maximum 52 mm (male) (Weipa); maximum recorded for species = 49.5 mm (male), 50.6 mm (female).

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey but found by others in regenerated bauxite mine area (Peter Reeders), near Cool Pool (Paul Harvey) and on the Upper Watson River at approx. 13°07'S 142°00'E (BERS).

Geographic range. North-east Northern Territory to east Queensland.

Habitat. Regenerated bauxite mine sites; the Upper Watson River site was described as vine forest with an abrupt transition to open forest 30 m from the river.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce in the wet season, not recorded in the dry season. Four records in one survey and two additional records. Paucity of records and uncertainty of its identity warrant careful searching for this frog; most likely to be found on Weipa Plateau immediately following early wet season rains.

Seasonality. Specimens recorded in mid-November 1981, December 1980, January 1980 and 1981 but none later in the year. Usually only seen after rain.

Reproduction. Nothing published.

Notes. Burrower.

Conclusive identification of this species depends on a recording of the call, characterised by Tyler & Martin as having a duration of 1.81 seconds dominant frequency of 1767 Hz and pulse repetition rate of 108 pulses/sec.

References. Tyler & Martin, 1977.

Cyclorana novaehollandiae Steindachner, 1867
Plate 5

Description. *Very large burrowing frog with large head, long curved snout and very wide gape.* Pale brown, grey or yellowish above, with whitish belly. Dark brown stripe on side of head and a dark bar beneath the eye, usually extending to the mouth. Juveniles often bright green. Distinct dorsolateral skin fold from shoulder to above the groin. Fingers not webbed; toes webbed. Eardrum distinct.

Size (snout-vent). Maximum 89 mm (female) (Weipa); average recorded for species = 100 mm.

Distribution at Weipa (sites; physiographic units). 6% of sites, only in vicinity of Weipa town; not on Merluna Plain. Three specimens in the AM registered from "Mapoon" in 1903.

Geographic range. North-east Australia from Cape York Peninsula to the New South Wales border.

Habitat. Paperbark woodland, gallery forest; also open forest, dunefield woodland and urban (QNPWS) and regeneration (Reeders & Morton, 1983).

Survey abundance. Uncommon; seasonal.

Overall abundance. Common to abundant in the wet season. One hundred and ten records in four surveys and one additional record.

Seasonality. AM recorded it only in February 1979. However large numbers recorded in December and April and one in September (Reeders & Morton, 1983) and one in May, beside a freshwater spring (QNPWS). "After showers at the end of the dry season [November 1981] *Cyclorana nova[e]hollandiae* emerged from underground in large numbers near creeks, rivers and swamps ... During the wet season study period [March 1982] even though exhaustive searches were made, no specimens were found" (BERS, 1982).

Reproduction. Gravid female collected in February 1979. Breeding in late November (BERS, 1982); eggs laid in large irregular clump in the water. Calls from, and breeds in, temporarily inundated areas.

Notes. Burrower. Eats arthropods and frogs including *Litoria nasuta*; there are reports of cannibalism.

Although green juveniles may feed close to water after metamorphosis, adult brown frogs usually feed some distance from water and are almost entirely nocturnal in their activity. Adopts an upright stance supporting body on forelimbs to scan for prey (Robinson & Cappo, 1990).

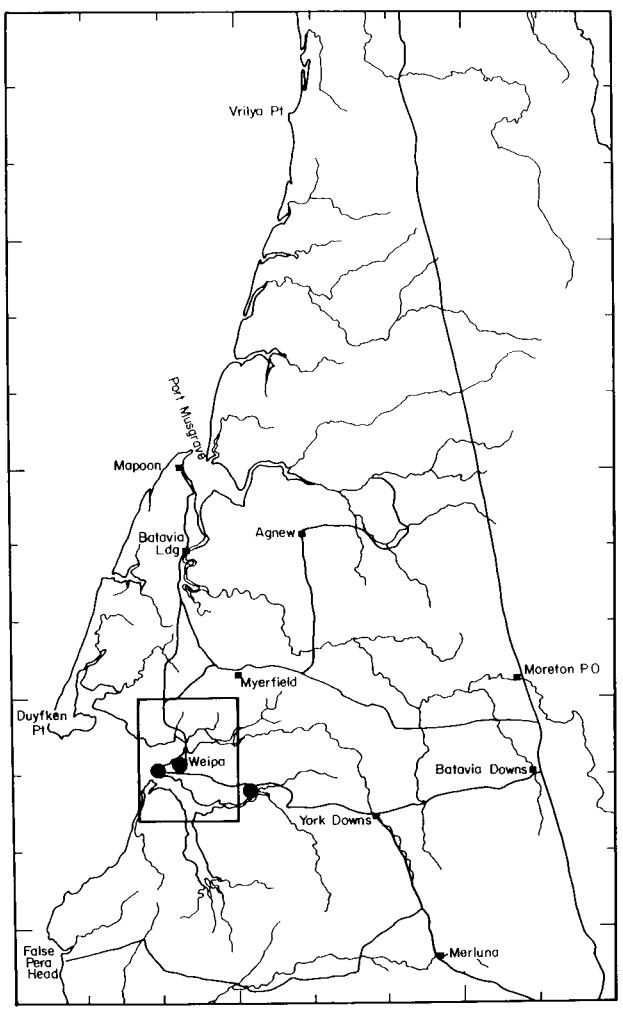
Call is a deep short 'honk'.

References. Robinson & Cappo, 1990; Tyler & Martin, 1975; Tyler, 1989.

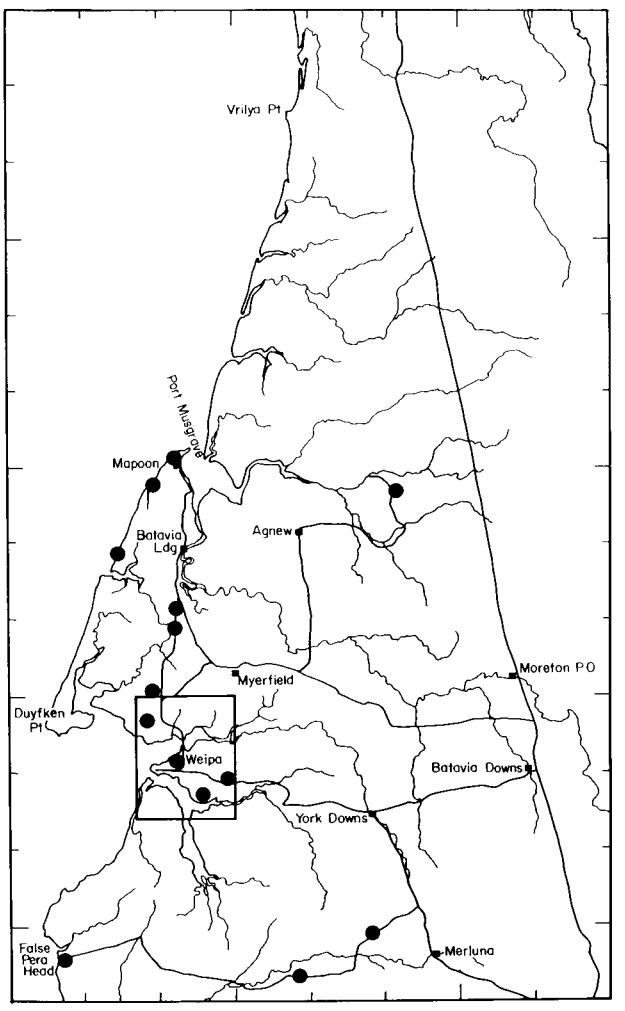
Litoria bicolor (Gray, 1842)
Plate 6

Northern Dwarf Tree Frog

Description. *Small slim green arboreal frog.* Broad bronze vertebral band from snout to vent, bordered on both sides by green. Dark stripe running from snout backwards through eye to groin. Narrow white stripe along upper lip. Groin and hindside of thigh pale



Cyclorana novaehollandiae



Litoria bicolor

yellow. Cream or yellowish below. Skin smooth. Fingers with trace of webbing; toes half to three quarters webbed. Eardrum distinct.

Size (snout-vent). Maximum 29 mm (Weipa); average recorded for species = 30 mm.

Distribution at Weipa (sites; physiographic units). 26% of sites, found at sites scattered over survey area, except for the northern end of survey area around Vrilya Point; all three physiographic units.

Geographic range. Coast and adjacent areas of north and north-east Australia; also south New Guinea.

Habitat. All terrestrial and freshwater habitats except vine forest/thicket; sometimes long distances from freshwater, for example beach north of Pennefather River (site 8) and 12 km south-west of turnoff to Aurukun from the Weipa-Coen road (site 51); also in mangrove trees beside brackish water lagoon (QNPWS) and in regeneration (Reeders & Morton, 1983).

Survey abundance. Common.

Overall abundance. Abundant in the wet season, common in the dry season. One hundred and eleven records in four surveys.

Seasonality. Recorded five out of six visits, not July 1977.

Reproduction. Males calling in February 1979 (calling begins with summer rains in December), clustered on the tips of tall reeds and occasionally on lily pads, in paperbark woodland; males often call during the day. Breeding congregations are found in aquatic vegetation and vegetation bordering permanent or freshwater lagoons and swamps. Clumps of ten to 20 small pigmented eggs are laid attached to submerged vegetation. Metamorphosis may occur within 70 days in a water temperature of 30°C.

Notes. Arboreal.

Commonly found on reeds and other vegetation in standing water, but also on exposed leaves on dunefield woodland during the day, in air temperatures of about 30°C. Apparently able to withstand high water temperatures - in February 1979 frogs when disturbed dived into water of approximately 35°C and swam off. In June and July (dry season), several frogs found under bark of trees in open forest and eucalypt woodland.

Call has two phases - a high-pitched, long drawn out 'wree-e-eek' followed by a rattling 'pippip'.

References. Cogger & Lindner, 1974; Straughan, 1968; Tyler, 1989.

Litoria caerulea (White, 1790)
Plate 6

Green Tree Frog

Description. *Large stout green or pale brown arboreal frog with large finger and toe discs.* Dull brown to pale green above, sometimes with scattered small white spots on the back and sides. Hindside of thigh dull pinkish or reddish brown. White stripe along hind edge of lower leg and outer edge of fifth toe. White below. Skin smooth above, coarsely granular on sides and below. Thick glandular ridge above eardrum, which is distinct. Fingers one third webbed; toes three quarters webbed.

Size (snout-vent). Maximum 71 mm (female) (Weipa); average recorded for species = 100 mm.

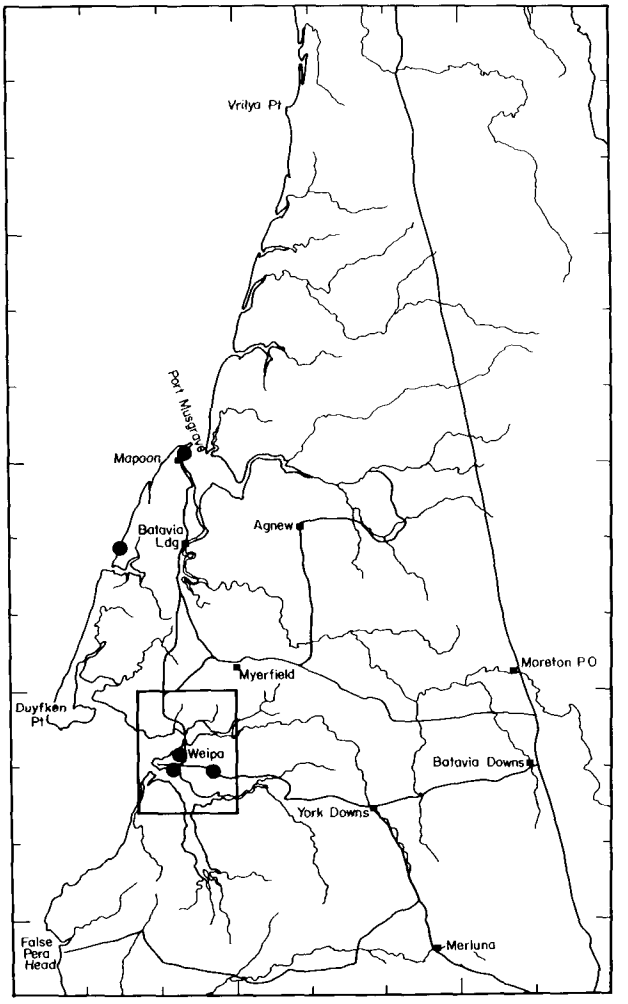
Distribution at Weipa (sites; physiographic units). 9% of sites, only seen in vicinity of Weipa town, and on coast between Cullen Point and Pennefather River; not seen on Merluna Plain.

Geographic range. North-eastern half of Australia; also south New Guinea.

Habitat. Open forest, dunefield woodland, paperbark woodland and urban habitats; also eucalypt woodland and grassland (QNPWS) and regeneration (Reeders & Morton, 1983). Often found long distances from water.

Survey abundance. Uncommon; seasonal.

Overall abundance. Abundant in the wet season, uncommon in the dry season (when it retreats to moist refugia). Eighty four records in four surveys and one additional record.



Litoria caerulea

Seasonality. Recorded three out of six visits - in July 1977, February 1979 and July 1980.

Reproduction. Males calling in February 1979 and July 1980; froglets active in February 1979. Breeding congregations occur in grassy rain-filled temporary marshes. Large clumps of 200 to 2,000 brown eggs laid from November to February in shallow still bodies of water. Metamorphosis may occur within 38 days in a water temperature of 30°C.

Notes. Arboreal.

One of the species commonly encountered in bathrooms and toilets of houses in north Australia.

An individual of approximate snout-vent length 60 mm found in the stomach of a Keelback Snake (*Tropidonophis mairii*).

Call is a deep 'wark-wark-wark'. In the dry season individuals often call during the day from cavities in large trees.

Mid-afternoon in February, *caerulea* froglets were found under logs and in other moist refugia whilst at the same time juvenile *Limnodynastes ornatus* were active on the ground in dunefield woodland.

References. Cogger & Lindner, 1974; Tyler *et al.*, 1983; Tyler, 1989.

Litoria dorsalis Macleay, 1877
Plate 6

Dwarf Rocket Frog

[Also appears in the literature as *Litoria microbelos*]

Description. *Very small slim cryptic brown frog with a sharply-pointed snout.* Light to dark brown above, often flecked or mottled darker. Usually a broad dark band from behind eye to groin and an almost black stripe along snout and through the eye. Skin above slightly warty with a few small but distinctive tubercles over each eye, fairly smooth below. Finger and toe discs moderate, distinct. Fingers without webbing; toes less than half webbed. Eardrum usually distinct.

Size (snout-vent). Maximum 17 mm (Weipa); maximum recorded for species = 20 mm.

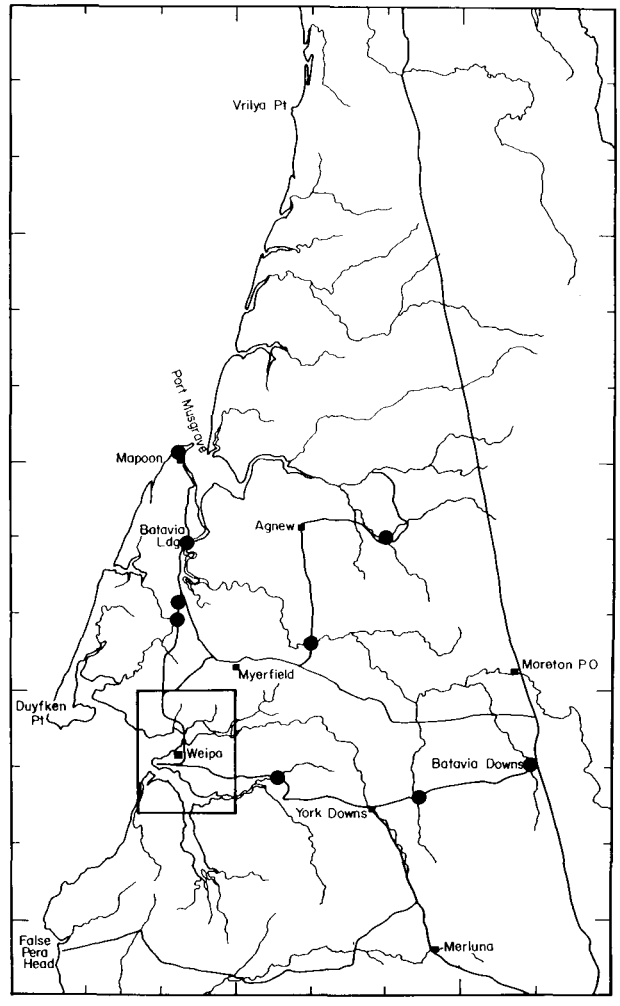
Distribution at Weipa (sites; physiographic units). 17% of sites; not seen near Weipa town or at northern sites, around Vrilya Point; all three physiographic units.

Geographic range. Kimberleys, north Northern Territory and Cape York Peninsula; also south New Guinea.

Habitat. Paperbark woodland, vine forest (behind mangroves at Batavia Landing), gallery forest, grassland/sedgeland; also regeneration (Reeders & Morton, 1983). Associated with streams or swamps.

Survey abundance. Uncommon.

Overall abundance. Common. Thirty eight records in four surveys and one additional record. May be overlooked in casual searches because of its small size and secretive habits.



Litoria dorsalis

Seasonality. Recorded four out of six visits, not recorded in July 1977 or February 1979.

Reproduction. Males call from the ground or from grass stems at the edge of water. Small clumps of about 60 very small eggs are laid in flooded grassland.

Notes. Terrestrial, cryptic.

Often active during the day. Usually found in tanin-stained thick leaf litter beside still, often stagnant, water. Occurs in same microhabitat as another small brown frog (*Crinia remota*) but its escape reaction when disturbed is to leap away, whilst *Crinia* attempts to burrow deeper into the litter.

Call is a high-pitched penetrating buzz.

References. Cogger, 1966; Cogger & Lindner, 1974; Tyler & Davies, 1986.

Litoria genimaculata (Horst, 1883)
Plate 7

[Also appears in the literature as *L. eucnemis* and *L. serrata*]

Description. *Moderate-sized cryptically patterned*

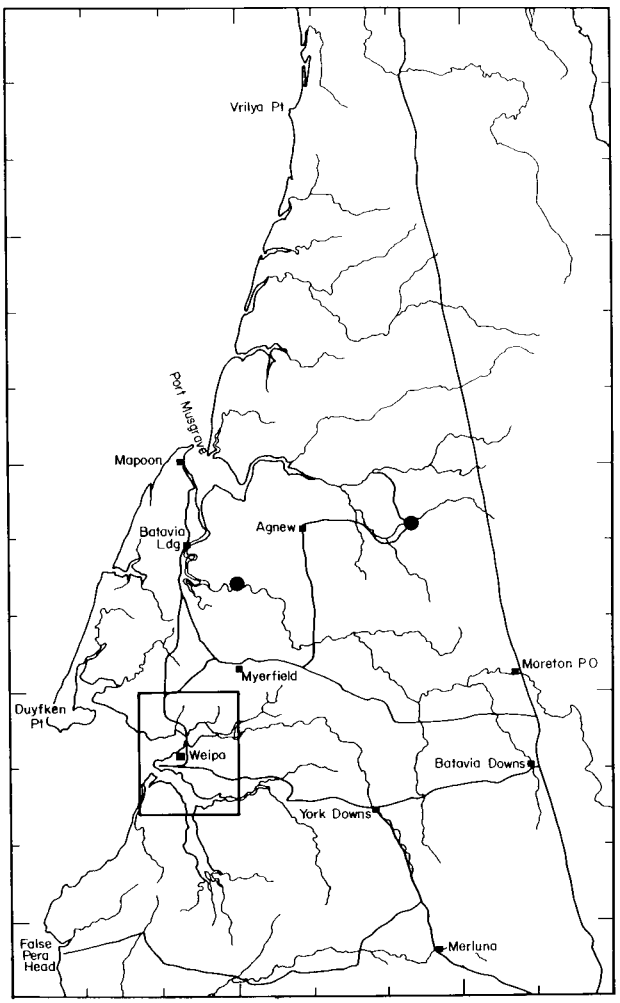
brown arboreal frog with large finger and toe discs. Rich grey-brown, silvery or reddish-brown above, with irregular dark brown or olive green mottling which tends to form longitudinal lines. Often a darker patch between the eyes. Hindlimbs have broad irregular crossbands. Groin finely mottled with black and cream. Below creamy-white, densely peppered with brown on the throat. Skin above smoothly shagreened or with scattered very small tubercles; coarsely granular below. Pale serrated ridge along hind-edge of forearm and along outer edge of each foot, and a small flap on each heel. Fingers half webbed, toes nearly fully webbed. Eardrum very distinct. Iris rich silvery-grey, except for upper quarter which is rich blue-green.

Size (snout-vent). Average recorded for species = 75 mm.

Distribution at Weipa (sites; physiographic units). None recorded in AM survey. QNPWS recorded this species at the Ducie River crossing and at the Wenlock Islands.

Geographic range. In suitable habitat throughout north-east Queensland, from the Atherton Tableland northwards; also south New Guinea.

Habitat. Paperbark woodland and gallery forest (QNPWS). Throughout its range found in rainforest, usually among streamside vegetation or on mossy seepages.



Litoria genimaculata

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. Two records in one survey. May be overlooked in casual searches because of narrow habitat preferences, camouflage and its soft mating call.

Seasonality. QNPWS recorded it only in the dry season, in September and August.

Reproduction. Not recorded.

Notes. Arboreal.

This species lacks vocal sacs and the call is a series of six to seven low soft biphasic notes resembling knocking or chuckling. Capable of excellent camouflage; the mottled colour pattern blends with lichen and mosses on the branches or trunks this frog selects for perches, and the flaps of skin along the limbs disrupt the resting frog's outline and reduce shadows along the sides of its body.

References. Barker & Grigg, 1977; Tyler & Watson, 1986.

Litoria gracilenta (Peters, 1869)
Plate 7

Dainty Green Tree Frog

Description. *Moderate-sized bright green arboreal frog.* Bright leaf green above with yellowish-green stripe along snout and over the eye and eardrum, which is distinct. Upper arm and fingers and toes bright lemon yellow. Hindside of thigh rich purplish brown, often with iridescent blue sheen. Skin finely granular above, sometimes with a few small tubercles on the sides; granular below. Finger and toe discs large. Fingers three quarters webbed; toes fully webbed. Iris gold or reddish.

Size (snout-vent). Maximum 47 mm (female) (Weipa); average recorded for species = 45 mm.

Distribution at Weipa (sites; physiographic units). 4% of sites, only seen in vicinity of Weipa town and the Ducie River; not on Mapoon Plain. BERS recorded it near Beagle North Camp (AM site 52).

Geographic range. Coastal and near-coastal areas of east Australia from Cape York to Sydney; also south-west Papua New Guinea.

Habitat. Paperbark woodland, gallery forest, regenerated grassland; also open forest and urban (QNPWS).

Survey abundance. Uncommon; seasonal.

Overall abundance. Common in the wet season, uncommon in the dry season. Fifty nine records in four surveys.

Seasonality. Recorded two out of six visits - in February 1979 and September 1981. Recorded by BERS in November 1981.

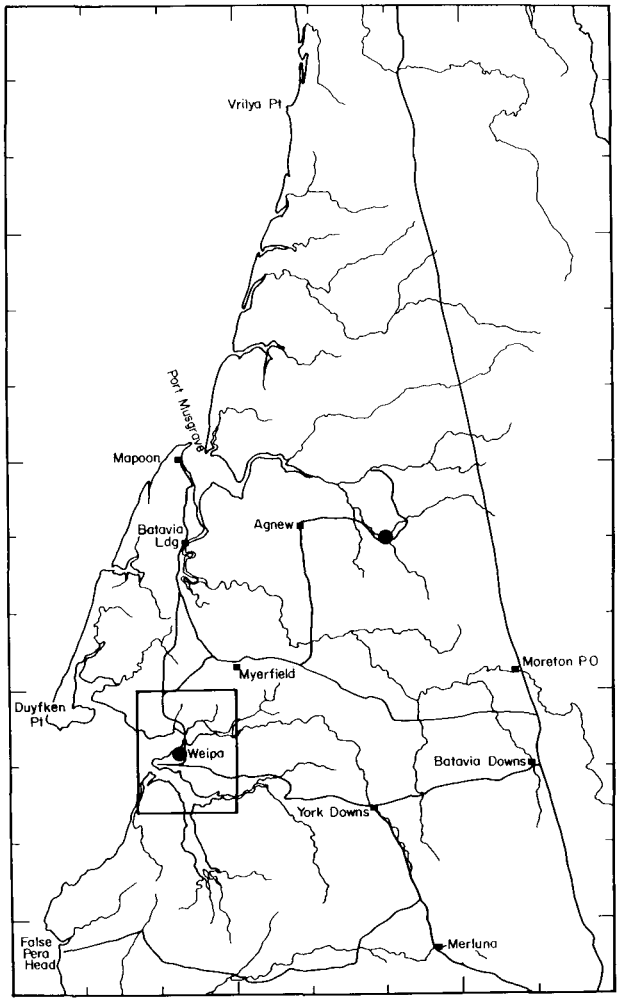
Reproduction. Males calling February 1979. Eggs laid in still water and metamorphosis may occur within 112 days in a water temperature of 20°C.

Notes. Arboreal and terrestrial.

Usually encountered on the ground or in low vegetation after rain, but at other times may be found resting on leaves of streamside trees and shrubs. When resting, adopts a cryptic, water-saving posture flattened against a leaf; the limbs are held tightly against the body and the eyes are closed and retracted so that only the green surfaces of the body are exposed.

Call is a long drawn out 'waaaa'.

References. Frith & Frith, 1987; Moore, 1961; Tyler, 1989.



Litoria gracilenta

Litoria inermis (Peters, 1867)
Plate 7

Description. *Small slim grey-brown terrestrial frog with warty back.* Grey-brown above with darker and lighter blotches and flecks. White below. Hindside of thigh mottled or blotched with white or yellow, and dark brown. Skin with numerous small tubercles above, slightly granular below. Finger and toe discs small. Fingers unwebbed; toes three quarters webbed. Eardrum distinct.

Size (snout-vent). Maximum 32 mm (Weipa); average recorded for species = 35 mm.

Distribution at Weipa (sites; physiographic units). 8% of sites, scattered over southern section of survey area, always near permanent water; not on Mapoon Plain. However, a specimen was registered from "Mapoon" in 1903 (AM R3530).

Geographic range. North and north-east Australia, from Kimberleys in Western Australia to Rockhampton, Queensland.

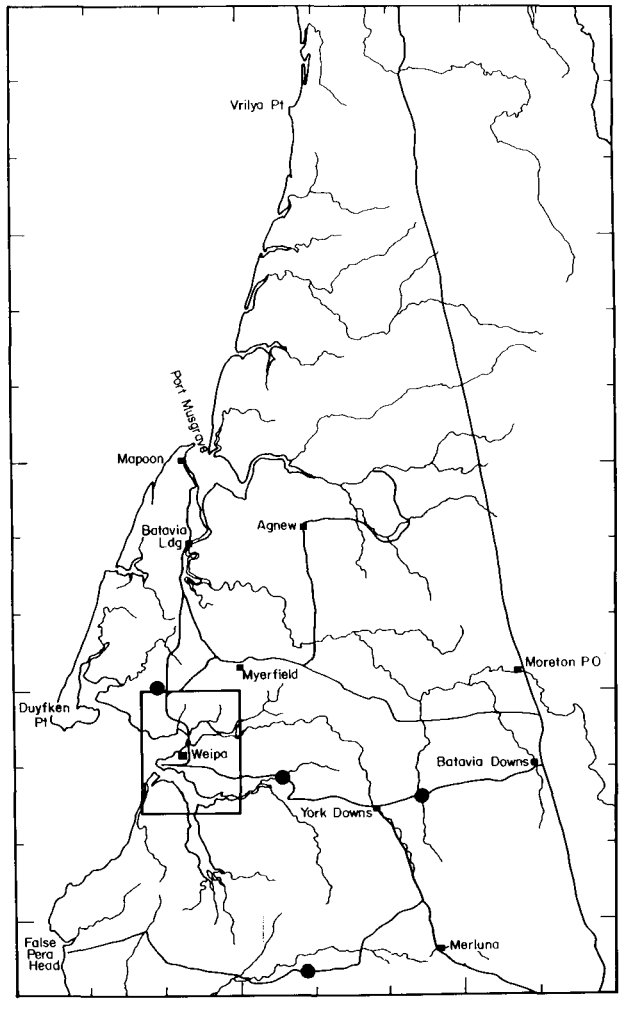
Habitat. Paperbark woodland and gallery forest; also eucalypt woodland (QNPWS). Open forest dweller that tends to avoid thick grass, preferring open areas of sparse, low vegetation (Davies *et al.*, 1983).

Survey abundance. Uncommon; seasonal.

Overall abundance. Scarce in the wet season, uncommon in the dry season. Thirty three records in three surveys and one additional record. Care must be taken in distinguishing between this species and *Litoria pallida*.

Seasonality. Recorded four out of six visits, not recorded in July 1977 or February 1979. QNPWS did not record it in the wet season either.

Reproduction. Males calling and small frog caught in February 1979. At Jabiru NT, males heard calling between mid-November and mid-March (Davies *et al.*, 1983). Breeds in temporary pools in open areas; spawn laid in free-floating surface clumps of 100 to 350 eggs;



Litoria inermis

metamorphosis may occur within 74 days in a water temperature of 30°C.

Notes. Terrestrial.

Usually seen on warm humid evenings, especially after rain. During the day found under logs and leaves near water.

Distinguished from *Litoria pallida* by warty back, poorly developed pattern on hindside of thigh, and absence of well-developed head stripe.

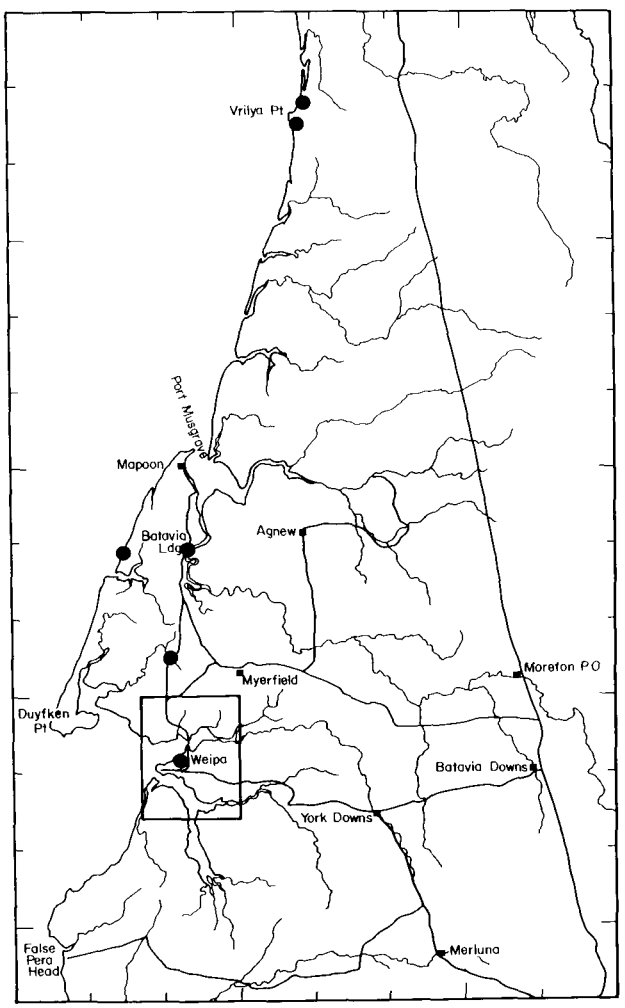
Call is a rapid staccato duck-like quacking.

References. Davies *et al.*, 1983; Tyler *et al.*, 1983; Tyler, 1989.

Litoria infrafrenata (Günther, 1867)
Plate 8

Giant Tree Frog

Description. *Very large green or brown arboreal frog with white lower lip and large finger and toe discs.* Uniform bright green or brown above, with conspicuous white stripe running along lower lip and below eardrum, which is very distinct. White or pink stripe running down hindside of hindlimb to toes. Skin finely granular above, very coarsely granular on the sides and coarsely granular below. No thick glandular ridge over eardrum. Fingers half webbed; toes almost fully webbed.



Litoria infrafrenata

Size (snout-vent). Maximum 102 mm (female), 85 mm (male) (Weipa); maximum recorded for species = 140 mm.

Distribution at Weipa (sites; physiographic units). 11% of sites, coastal and near coastal sites between Weipa and Vrilya Point; not on Merluna Plain.

Geographic range. North-east Queensland including Cape York Peninsula; also east Indonesia and widely distributed in New Guinea and its island archipelagoes.

Habitat. Paperbark woodland, gallery forest, mangroves (in trees on edge of freshwater soak at Batavia Landing); QNPWS also regularly recorded it in mangroves, and in open forest.

Survey abundance. Common.

Overall abundance. Common. Twenty four records in two surveys and one additional record.

Seasonality. Recorded on all six visits, present in all seasons.

Reproduction. Males calling and juveniles present in February 1979. Small masses of up to 400 eggs are deposited in still, rather deep water, from November to February. Metamorphosis may occur after 58 days in water temperatures between 24°C and 28°C.

Notes. Arboreal.

Frequently inhabits houses and sheds where it may snatch insects attracted to lights at night. Most activity occurs on warm humid nights. Five or six individuals were spotlit at night in the vine forest north of Vrilya Point (site 28); they were sitting on branches at heights of between 40 cm and 10 m.

Gut contents of AM R99833 - large wingless cockroach (about 30 mm long) and a spider.

Distinguished from *Litoria caerulea* by white lip, more slender build and proportionally longer legs; lacks a thick glandular ridge over the eardrum.

Unique amongst Australian tree frogs in having a karyotype of 2n = 24 (compared with 2n = 26 for all other species).

Call is a loud harsh double note, not unlike the bark of a dog; uttered when males perched in trees 3 to 4 m above the ground, or floating in water. At Rocky Point calling males were found in fairly exposed positions on or near the ground as well as on the fronds of cabbage tree palms.

References. Barker & Grigg, 1977; Hutchinson & Maxson, 1987; Menzies, 1975; Tyler, 1989.

Litoria nasuta (Gray, 1842)
Plate 8

Rocket Frog

Description. *Moderate-sized slim striped terrestrial*

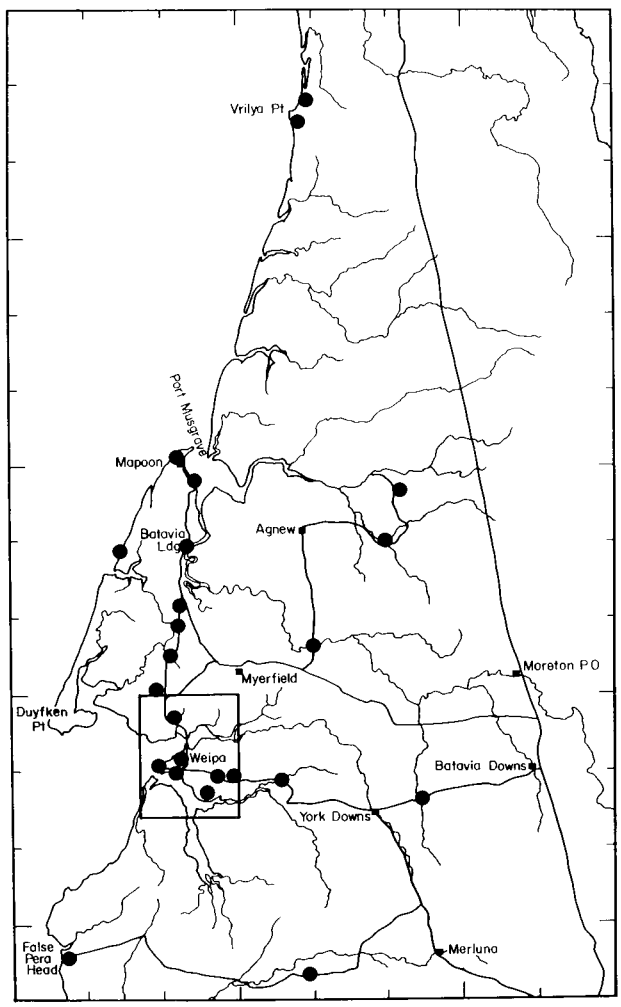
frog with long pointed snout and very long hind legs. Colour and pattern very variable; usually a broad pale brown vertebral band from tip of snout to vent which may enclose a series of dark brown patches, bordered on either side by broad darker bands. Dark stripe from nostril to base of forelimb, broken by pale band in front of eye and enclosing the eardrum, which is distinct. Pale glandular stripe from below eye to base of forelimb. Limbs variegated with darker patches and broken bands. Below whitish. Back has numerous low tubercles and longitudinal folds of skin; granular below. Hindside of thigh with lines and spots of dark brown on yellow, tending to form horizontal stripes. Finger and toe discs small. Fingers without webbing; toes about half webbed.

Size (snout-vent). 18-48 mm (Weipa); average recorded for species = 55 mm.

Distribution at Weipa (sites; physiographic units). 47% of sites, scattered over survey area; all three physiographic units.

Geographic range. Coast and adjacent areas of north and east Australia; also south New Guinea.

Habitat. Open forest, dunefield woodland, paperbark woodland, gallery forest, grassland/sedgeland; also regeneration (Reeders & Morton, 1983).



Litoria nasuta

Survey abundance. Abundant.

Overall abundance. One of most abundant frog species in the Weipa area. Two hundred and thirty records in four surveys and one additional record.

Seasonality. Recorded on all six visits; also recorded in December 1980.

Reproduction. Males calling February 1979, June 1980 and June 1982; tadpoles and froglets present in February 1979. In north Australia breeds in temporary soaks and waterholes in the wet season. Spawn laid as surface film of 50 to 100 small eggs which clump when disturbed.

Notes. Terrestrial.

Usually encountered foraging amongst litter on floor of open forests or around forested or grassy edges of permanent swamps, and in reed beds. Two individuals found under debris on beach beside freshwater spring at Red Beach.

A very long-legged frog which leaps long distances when disturbed, hence its common name.

Recorded in the diet of the Keelback Snake (*Tropidonophis mairii*).

Call "...commences slowly and irregularly and builds up to a rapid [mocking] duck-like quacking..." (Barker & Grigg, 1977).

References. Moore, 1961; Peile, 1978.

Litoria nigrofrenata (Günther, 1867)
Plate 8

Description. *Moderate-sized plain brown terrestrial frog with black stripe through the eye and long hind legs.* Pale fawn or brown above without markings. Conspicuous black stripe running from snout through eye to midflank, broken in several places by pale vertical bars. Dark brown stripe along front edge of lower leg. Skin above smooth, granular below. Finger and toe discs small. Fingers unwebbed, toes moderately webbed. Eardrum distinct.

Size (snout-vent). Maximum 42 mm (female) (Weipa); average recorded for species = 50 mm.

Distribution at Weipa (sites; physiographic units). 26% of sites, scattered over survey area; all three physiographic units.

Geographic range. Upper Cape York Peninsula and Torres Strait islands; also south New Guinea.

Habitat. Open forest, dunefield woodland (living in a freshwater well at Jack Callope's house, Mapoon), paperbark woodland, gallery forest; also eucalypt woodland and urban areas (QNPWS) and regeneration (Reeders & Morton, 1983).

Survey abundance. Abundant.

Overall abundance. Abundant. One hundred and twenty three records in four surveys and one additional record.

Seasonality. Recorded on all six visits.

Reproduction. Males calling in February 1979.

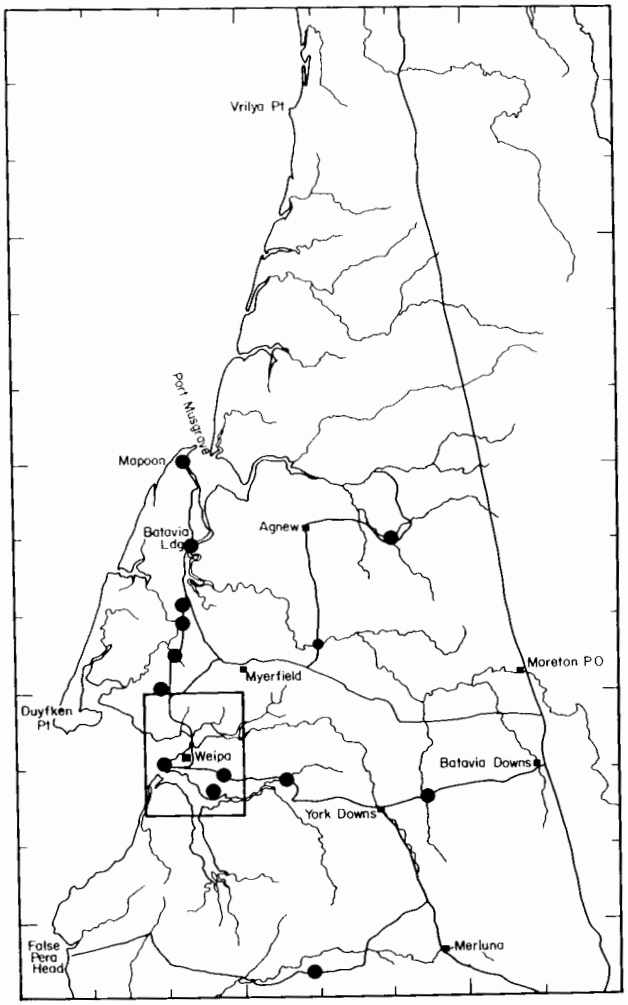
Breeds in streams.

Notes. Terrestrial.

Active on ground at night around seasonal creeks where there is ground cover.

Call is a loud three-syllable quacking similar to that of *Litoria pallida* and *Litoria nasuta*. Calling males often sit in exposed positions on bare soil or amongst sparse leaf litter a little distance from water.

References. Tyler, 1968; Tyler & Davies, 1978.



Litoria nigrofrenata

Litoria pallida Davies, Martin & Watson, 1983
Plate 9

[Appears as *Litoria latopalmata* in QNPWS report, which was printed before the revision of the species-group]

Description. *Small greyish terrestrial frog with dark stripe through eye.* Above grey, hindlimbs brown. Conspicuous very dark stripe extending from nose through eye and eardrum, which is distinct, to level of forelimb; stripe disrupted in front of eye by pale vertical bar. Hindside of thigh with dark markings on pale yellow background. Skin above smooth to faintly tubercular; below coarsely granular. Finger and toe discs small. Fingers unwebbed, toes half to three quarters webbed.

Size (snout-vent). Maximum 38 mm (female) (Weipa); maximum recorded for species = 38 mm (female), 34 mm (male).

Distribution at Weipa (sites; physiographic units). 23% of sites; not collected at any coastal or near-coastal sites on Mapoon Plain, but otherwise scattered over survey area.

Geographic range. North Australia, from Dampier Land, Western Australia, to north-east Queensland.

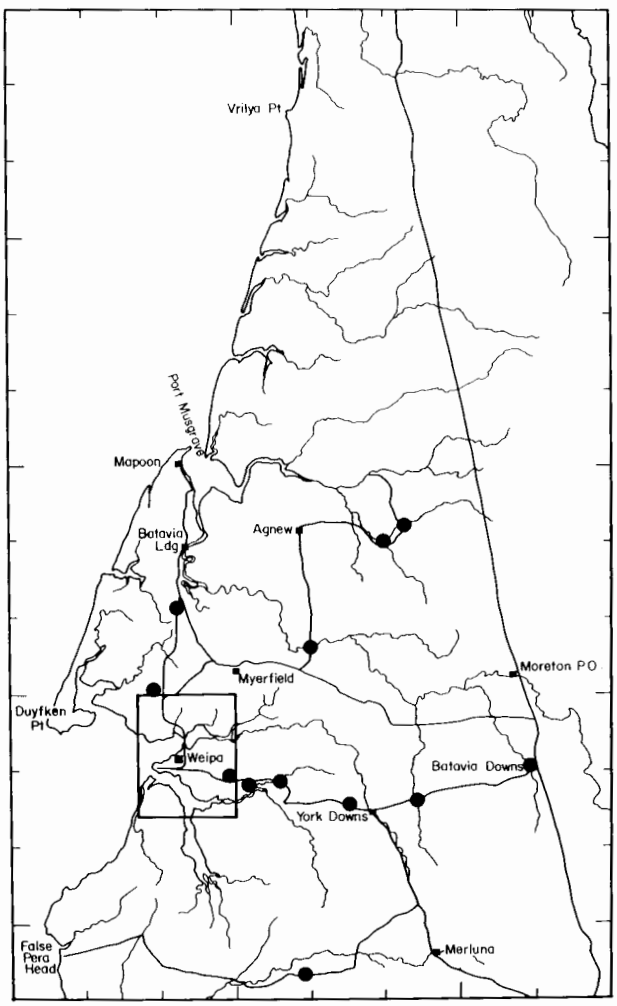
Habitat. Open forest, eucalypt woodland, paperbark woodland, gallery forest.

Survey abundance. Common; seasonal.

Overall abundance. Uncommon in the wet season, common in the dry season. Ninety two records in three surveys. Care must be taken in distinguishing between this species and *Litoria inermis*.

Seasonality. Recorded on five out of six visits; not recorded in July 1977.

Reproduction. Males calling in February 1979. Males call in open area within 1 m of water; at Jabiru in Northern Territory calling lasted from early November to early March (Davies *et al.*, 1983). Spawn deposited in temporary pools as a surface layer of 50



Litoria pallida

to 350 small eggs which clump together when disturbed. Metamorphosis has been recorded after 54 days.

Notes. Terrestrial.

Recorded in the diet of the Wood Frog (*Rana daemeli*).

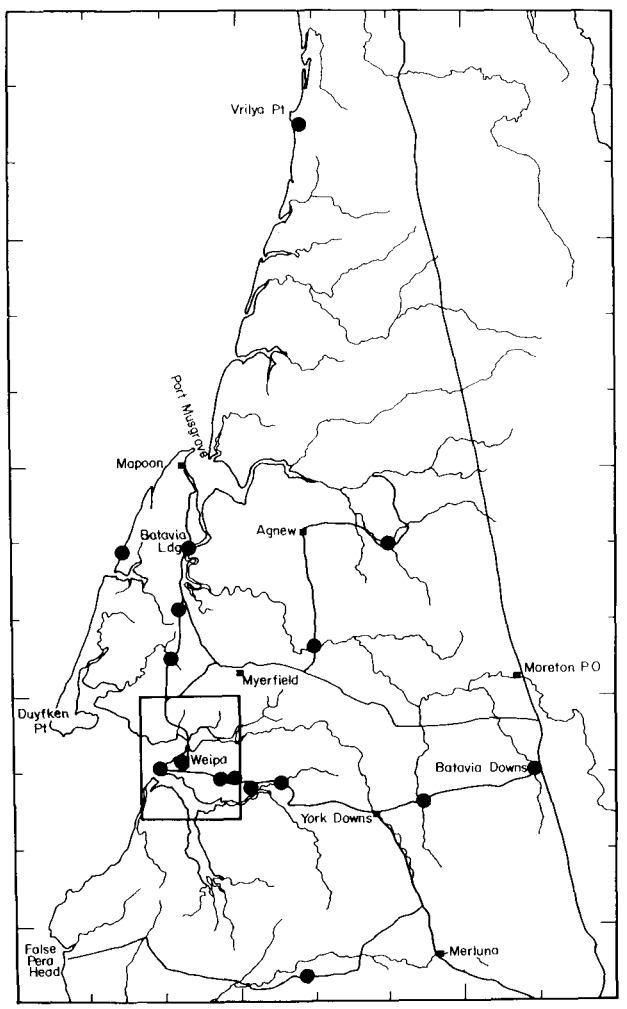
Distinguished from *Litoria inermis* by the well-developed head stripe, strongly-marked thighs and relatively smooth skin on the back.

Call is a rapid duck-like quacking.

References. Davies *et al.*, 1983; Tyler, 1989.

Litoria rothii (de Vis, 1884)
Plate 9

Description. *Moderately large greyish-brown arboreal frog with prominent black and yellow pattern on hindside of thigh.* Grey or brown above with irregular faint mottling. Hindside of thigh bright yellow with a dark bar above; similar pattern in groin. Skin rough above with numerous low rounded tubercles; granular below. Prominent skin fold over eardrum, which is distinct, and above arm. Finger and toe discs very large. Fingers half webbed; toes fully webbed. Upper half of iris bright rusty red.



Litoria rothii

Size (snout-vent). Maximum 47 mm (male) (Weipa); maximum recorded for species = 55 mm.

Distribution at Weipa (sites; physiographic units). 30% of sites, but restricted to a few habitats with permanent water; all three physiographic units.

Geographic range. Coast and near coastal areas from north-west Western Australia to central east Queensland; also south New Guinea.

Habitat. Paperbark woodland, gallery forest, urban; also open forest and eucalypt woodland (QNPWS) and regeneration (Reeders & Morton, 1983).

Survey abundance. Common.

Overall abundance. Common. Seventy two records in four surveys and two additional records.

Seasonality. Recorded on five out of six visits; not recorded in July 1980.

Reproduction. Males calling in February 1979. Breeding occurs from November to March. Spawn deposited in small clumps of up to 500 small eggs, in temporary pools; metamorphosis may occur within 65 days.

Notes. Arboreal.

One of the frogs encountered in bathrooms and other damp sites around buildings.

Capable of marked colour change from dark at night to very pale in daylight.

Call is a loud 'maniacal' chuckle of ten to 15 descending notes. Males call from elevated perches as high as 8 m on trunks and branches of paperbarks growing in swamps.

References. Cogger & Lindner, 1974; Martin *et al.*, 1979; Tyler, 1989.

Litoria rubella (Gray, 1842)
Plate 9

Desert Tree Frog

Description. *Small pear-shaped brown arboreal frog.* Grey to brown above with broad dark stripe running through eye, over base of forelimb and forming irregular band along side of body almost as far as groin. Back and limbs flecked with dark brown. Hindside of thigh brown with fine white spots. Skin smooth or finely granular above, coarsely granular below. Prominent skin fold over eardrum, which is very distinct. Finger and toe discs large. Fingers virtually unwebbed; toes two thirds webbed.

Size (snout-vent). Maximum 35 mm (female) (Weipa); average recorded for species = 35 mm.

Distribution at Weipa (sites; physiographic units). 23% of sites, scattered throughout survey area; all three physiographic units.

Geographic range. Throughout Australia except for southern regions; also south New Guinea. One of the

most widespread of all Australian frogs.

Habitat. Open forest, eucalypt woodland, paperbark woodland, gallery forest, grassland/ sedgeland, urban; also vine forest (QNPWS) and regeneration (Reeders & Morton, 1983). Wide habitat tolerance.

Survey abundance. Common.

Overall abundance. Abundant (the most abundant and widespread frog in regenerated mine sites). One hundred and forty four records in four surveys and one additional record.

Seasonality. Recorded on all six visits; also recorded in December 1980 and sometime between December 1979 and June 1980 (specimen donated by Regeneration).

Reproduction. Males calling and gravid female collected in February 1979; very small froglets active in grassland on 13 February 1979. Three hundred to 700 small eggs laid as a film floating on the surface of running water; metamorphosis may occur within 37 days.

Notes. Arboreal.

One of the few species of tree frogs occurring in arid parts of Australia, it is capable of finding moist refugia in dry habitats.

Very young froglets active at 1030 hours in February.

Together with *Litoria rothii*, the frog most likely to be encountered in dwellings - showers, toilets etc. round Weipa.

Call is a very loud, rather harsh, high-pitched pulsed note. One male heard calling mid-afternoon during a shower of rain (February).

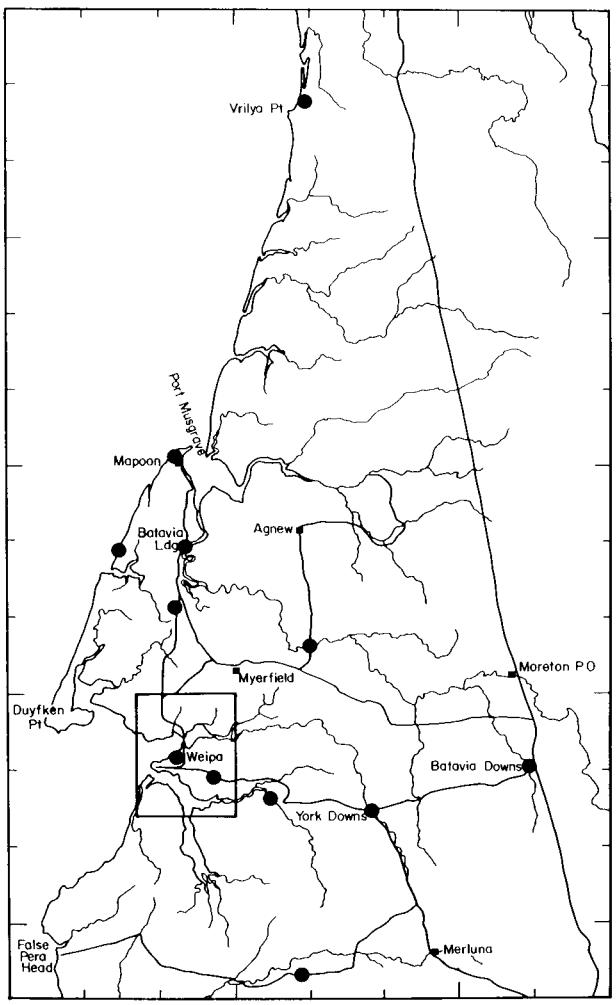
References. Tyler *et al.*, 1983; Tyler, 1989.

Family MICROHYLIDAE (Microhylid Frogs)

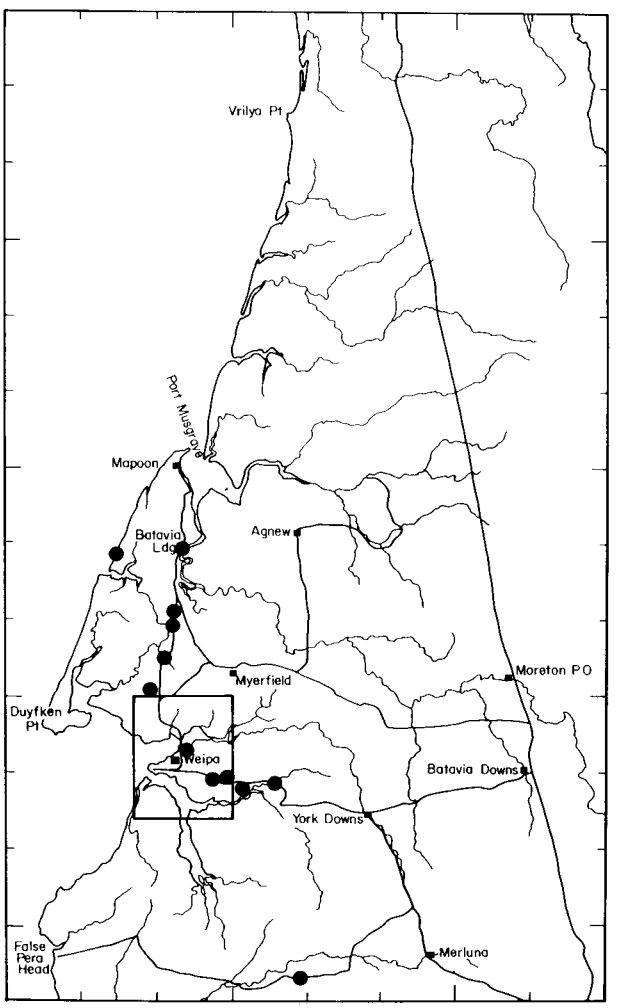
Sphenophryne gracilipes (Fry, 1912)
Plate 10

[May also appear in the literature prior to 1985, as *Sphenophryne robusta*]

Description. *Very small plump terrestrial frog with small narrow head.* Grey-brown to rich reddish brown above with dark brown speckling. Usually a narrow pale vertebral stripe down posterior two thirds of back. Indefinite dark streak from snout



Litoria rubella



Sphenophryne gracilipes

through eye continues as a broken dorsolateral dark band separating dark back from paler sides. Chest and anterior abdomen grey, flecked and spotted with white; undersurface of thighs and posterior abdomen cream or flesh-coloured; hidden surfaces of thighs, groin, upper arm and axilla, bright russet-red. Skin smooth. Eardrum indistinct. Finger and toe discs small. Fingers and toes unwebbed. Upper half of iris copper, lower half brown.

Size (snout-vent). 14-21 mm (female) (Weipa); maximum recorded for species = 22.8 mm. Females attain larger sizes than males.

Distribution at Weipa (sites; physiographic units). 23% of sites, but found in restricted range of habitats; all three physiographic units.

Geographic range. North Cape York Peninsula; also southern part of Western Province, Papua New Guinea. This is by far the largest range for any Australian microhylid frog.

Habitat. Open forest, paperbark woodland, vine forest (behind mangroves at Batavia Landing), gallery forest; also regeneration (Reeders & Morton, 1983). Occurs in drier habitats than most other Australian and New Guinean microhylid frogs.

Survey abundance. Abundant.

Overall abundance. One of the most abundant frogs in the Weipa area. Two hundred and twenty eight records in four surveys and one additional record. May be overlooked in casual searches because of its small size and secretive habits in the dry season.

Seasonality. Recorded on all six visits; also recorded in December 1980.

Reproduction. Males call from grass blades or leaves of shrubs 5 to 45 cm above the ground. Of large numbers found in moist litter in July 1977, only a few were juveniles. Nothing yet published on breeding habits, but all other Australian microhylids whose breeding has been recorded, lay large eggs in sheltered terrestrial situations and the eggs undergo direct development into froglets, without a tadpole stage.

Notes. Terrestrial.

Recorded in the diet of the Keelback Snake (*Tropidonophis mairii*).

Generally restricted in dry season to moist litter but one individual collected in July while active on road east of Weipa. May occur in very dense concentrations in dry season refugia - in July 1979, 61 frogs were collected from a 1.5 square metre patch of deep wet black leaf litter in gallery forest beside Sunrise Creek. Also found under logs, beneath dry rubble at the base of a termitarium and under artificial cover (stacks of timber, oily cloths and metal sheets) at the sawmill.

Call is a "...drawn-out series of high-pitched peeps uttered at an average rate of about 88 per minute..." (Zweifel, 1985).

References. Zweifel, 1985.

Family RANIDAE (True Frogs)

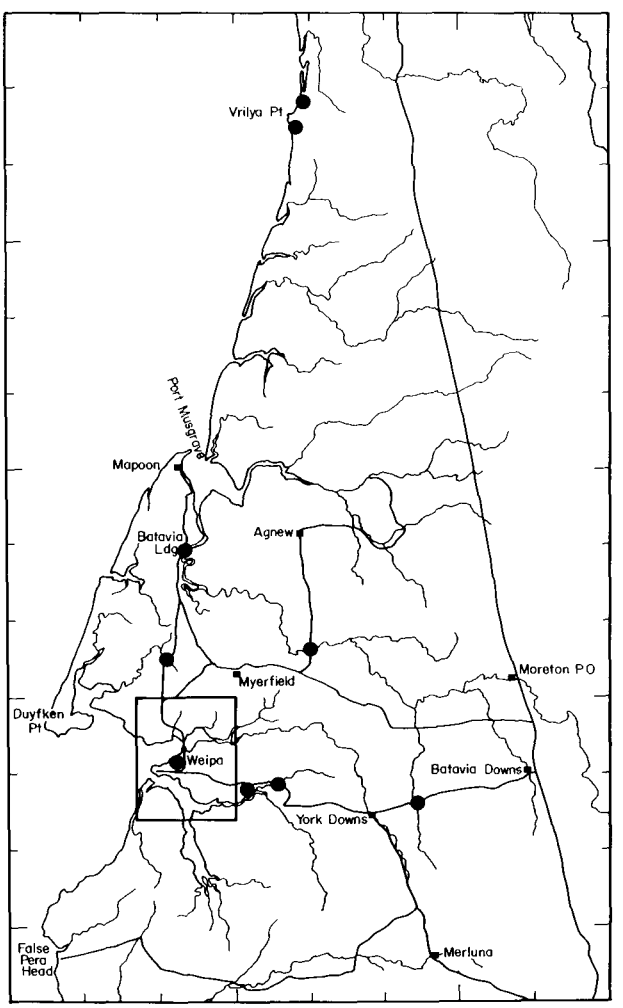
Rana daemeli (Steindachner, 1868)
Plate 10

Wood Frog

Description. *Large terrestrial and semi-aquatic frog with fully webbed toes.* Olive to brown above with irregular dark flecks and blotches. Dark stripe from snout to eye, continuing as a broad band enclosing the eardrum, which is distinct, and merging above the forelimb with a lateral zone which is darker than the back. Lower arms and hindlimbs with dark crossbars. Whitish below, usually heavily speckled with brown. Skin smooth above with scattered low tubercles and a distinctive dorsolateral skin fold extending from the eye, above the black stripe around the eardrum, to the groin. Finger and toe discs very small. Fingers unwebbed, toes fully webbed.

Size (snout-vent). Maximum 82 mm (Weipa); average recorded for species = 80 mm.

Distribution at Weipa (sites; physiographic units).



Rana daemeli

17% of sites, only in vicinity of permanent water; all three physiographic units.

Geographic range. North-east Queensland, including north and east Cape York Peninsula.

Habitat. Paperbark woodland, vine forest (behind mangroves at Batavia Landing), gallery forest. Also open forest (QNPWS). Generally restricted to habitats with deep, usually running, permanent fresh water, but quite common around springs on edge of vine forest abutting mangroves at Batavia Landing.

Survey abundance. Common.

Overall abundance. Common. One hundred and fifteen records in three surveys and two additional records.

Seasonality. Recorded on five out of six visits; not recorded in July 1980.

Reproduction. Males calling in February 1979, August 1981 and June 1982. Most individuals seen at Sunrise Creek in July 1977 were juveniles or subadults. Small froglets present in November 1979 and August 1981. Eggs laid in large, loosely attached clumps; egg clumps seen in creeks at Iron Range (Gordon Creek) and Heathlands (Bertie Creek) in July 1980.

Notes. Semi-aquatic.

Adults often found during the day sheltering under leaf litter and fallen timber, or in the base of tussocky sedges, at the edge of streams into which they leapt when disturbed, and remained submerged. At night they were found sitting still on prominent perches above the water.

Preys on arthropods and frogs. Stomach contents of nine *Rana daemeli* included spiders, a shrimp, cockroaches, grasshoppers, a beetle and a moth as well as the legs of two unidentified frogs, and one *Litoria pallida*.

Gut parasites identified by Professor J.F.A. Sprent (Dept of Parasitology, University of Queensland) include acanthocephalans and species of three orders of nematodes.

Call is a low reedy quacking of up to eight notes. Males call from perches over or in water.

References. Zweifel, 1980.

Family BUFONIDAE (True Toads)

Bufo marinus (Linnaeus, 1758)
Plate 10

Cane Toad

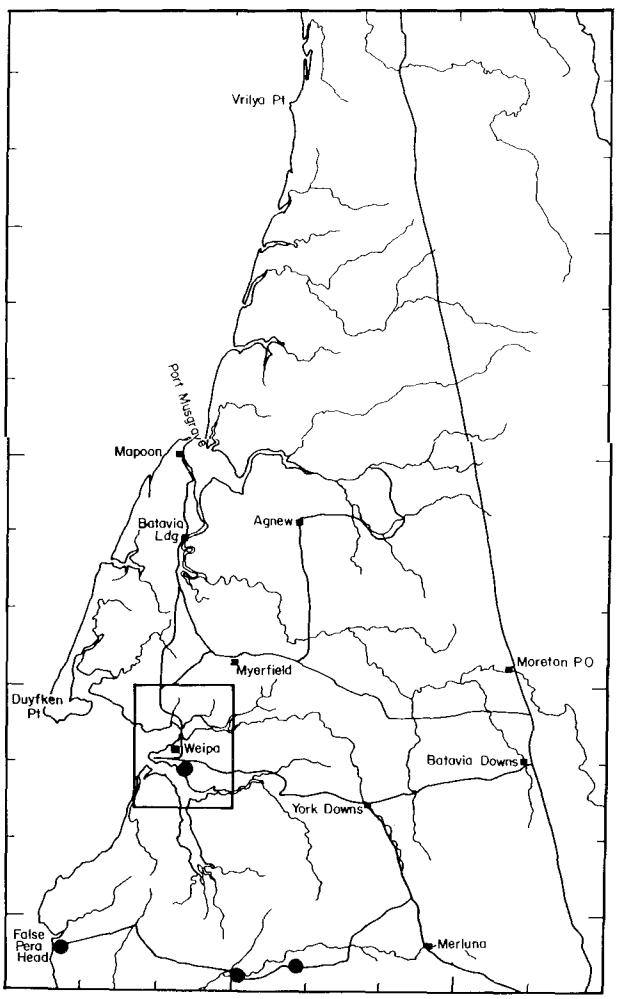
[TOXIC; parotoid glands on sides of neck above the forelimbs produce toxic secretions and flesh is also poisonous]

Description. *Very large grey to olive-green toad with very warty back and bony ridges on head.* Grey, brown, olive-brown or reddish-brown above, rarely with any marked pattern other than dark brown caps to the warts. Whitish or yellowish below, usually mottled or speckled with dark brown. Skin very warty above, granular below. A grossly enlarged pair of paratoid glands. The region above the eyes is warty and is separated from the ridged top of the head by a high bony ridge, the ridge on each side continuing forward to meet on the snout between the nostrils. Fingers free, toes with a tough leathery webbing.

Size (snout-vent). Maximum 143 mm (male), 160 mm (female) (Weipa); average recorded for species = 150 mm, maximum for species = 240 mm. Females attain larger body sizes than males.

Distribution at Weipa (sites; physiographic units). The localities where toads were initially found in the Weipa district are mapped in Figure 5; Weipa Plateau and Merluna Plain.

Geographic range. Occurs naturally in Mexico and Central and tropical South America, and has been introduced to Florida, USA and many Caribbean islands as well as Pacific islands and Papua New Guinea. Introduced to Australia in 1935 and now occurs on the coast and hinterland of east and north Queensland, extending into east Northern Territory and the northern



Bufo marinus

rivers region of coastal New South Wales.

Habitat. Occupies an extremely wide range of habitats from beach dunes and acidic coastal wallum, to grassland, open forest and closed forest. In the dry season shelters in shallow moist refuges beneath logs and rocks and piles of debris.

Abundance. The increasing abundance of toads up to April 1983 is discussed in the section on the arrival of the Cane Toad in the Weipa region, and illustrated in Figure 6A.

Seasonality. See Figure 6 for months in which toads recorded.

Reproduction. Males call at the edge of shallow water. Breeding occurs from September to February or March and females may breed more than once in a season. Between 10,000 and 25,000 eggs are laid in long spaghetti-like strings which become entangled in aquatic plants in stagnant or slow-flowing water (including brackish water). Tolerant of a much wider range of water conditions for breeding than are most native species of frogs. The shiny black tadpoles form dense schools and in as short a period as 25 days, may metamorphose as toadlets with a snout-vent length of 10 to 15 mm.

Notes. Terrestrial, nocturnal. Most activity occurs one to two hours after dusk, but only a small proportion of a population is active at any one time (Zug & Zug, 1979). Activity is very restricted during the dry season. Although toads can withstand water loss of about 40% of standard body weight, dehydration may be a major cause of mortality, together with predation on young toads.

Eats predominantly terrestrial arthropods but will also take small vertebrates and inanimate objects. Size and variety of prey taken at Weipa is summarised in Figure 8 and Table 6.

Predation is probably a major cause of mortality, and is probably highest on recently metamorphosed toadlets which lack the toxicity of adults or tadpoles. Successful predators of the Cane Toad include the Freshwater Snake (*Tropidonophis mairii*), birds such as Ibis (*Threskiornis* spp.), and Water Rats (*Hydromys chrysogaster*), but the Mangrove Monitor (*Varanus indicus*) and a number of frog-eating snakes (including *Stegonotus cucullatus*, *Boiga irregularis*, *Acanthophis praelongus* and *Pseudonaja textilis*) have been observed to die after eating whole toads.

Call is a prolonged loud purring trill.

References. Covacevich & Archer, 1975; Bailey, 1976; Easteal *et al.*, 1985; Freeland *et al.*, 1986; Sabath *et al.*, 1981; Straughan, 1966; Zug & Zug, 1979; Tyler, 1989.

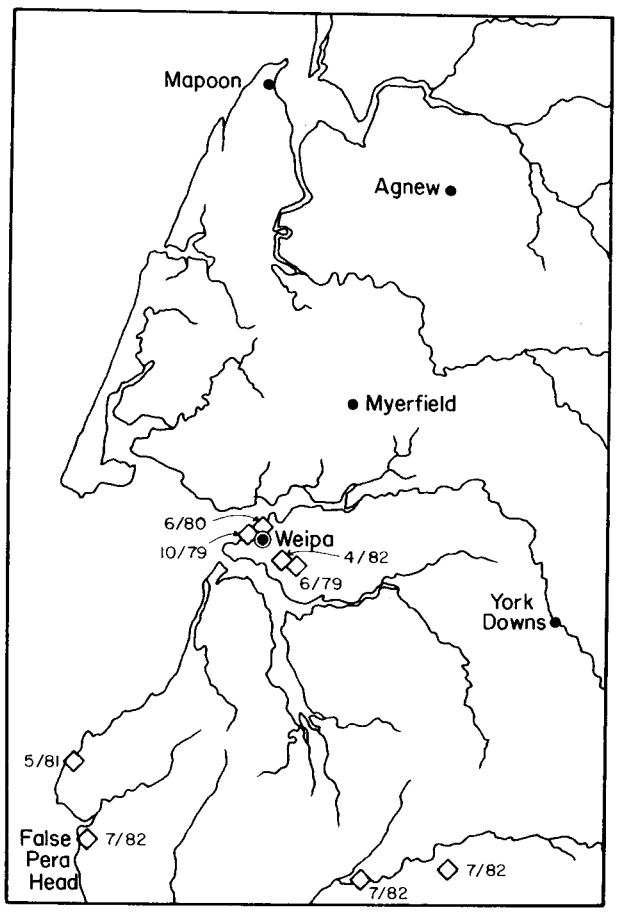


Fig.5. Map of localities where sightings of Cane Toads were made during the early stages of their invasion of the Weipa region. 6/79 = month/year.

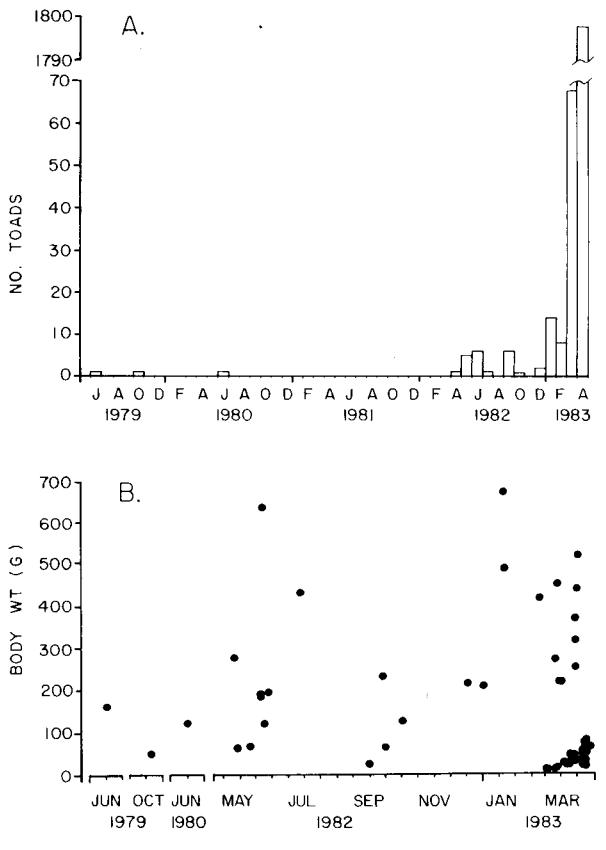


Fig.6. Monthly numbers (A) and body weights (B) of Cane Toads recorded in the Weipa region between the first sighting in June 1979 and the first evidence of breeding in March-April 1983.

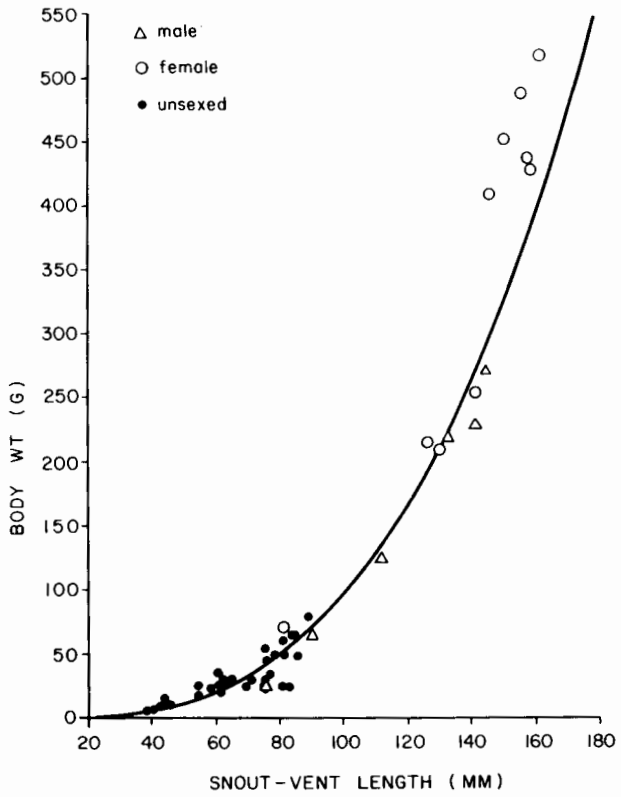


Fig.7. Regression of body weight on snout-vent length of a sample of 52 toads. Power regression $y = 0.00010x^{2.98776}$; correlation coefficient = 0.97.

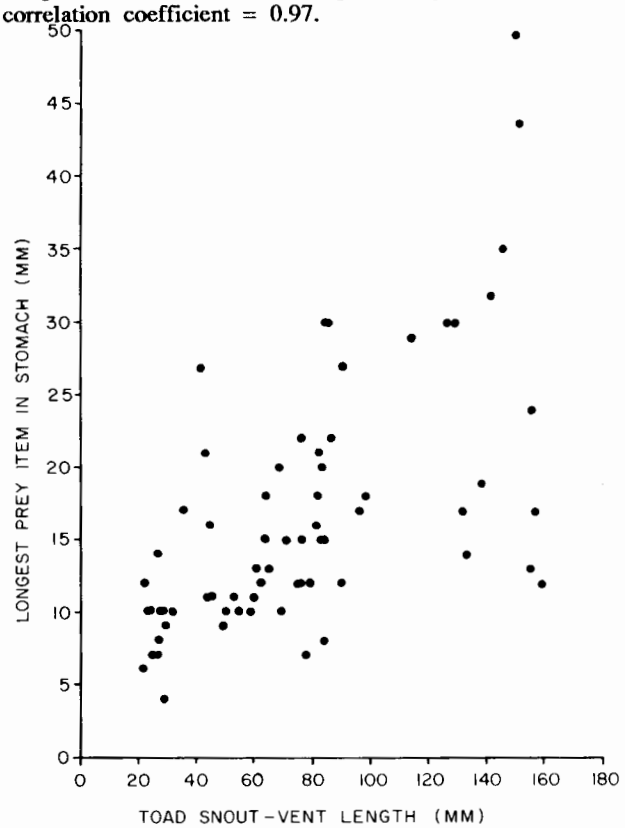


Fig.8. Comparison of prey size in stomachs with snout-vent lengths of Cane Toads; data from 77 toads.

CROCODILES

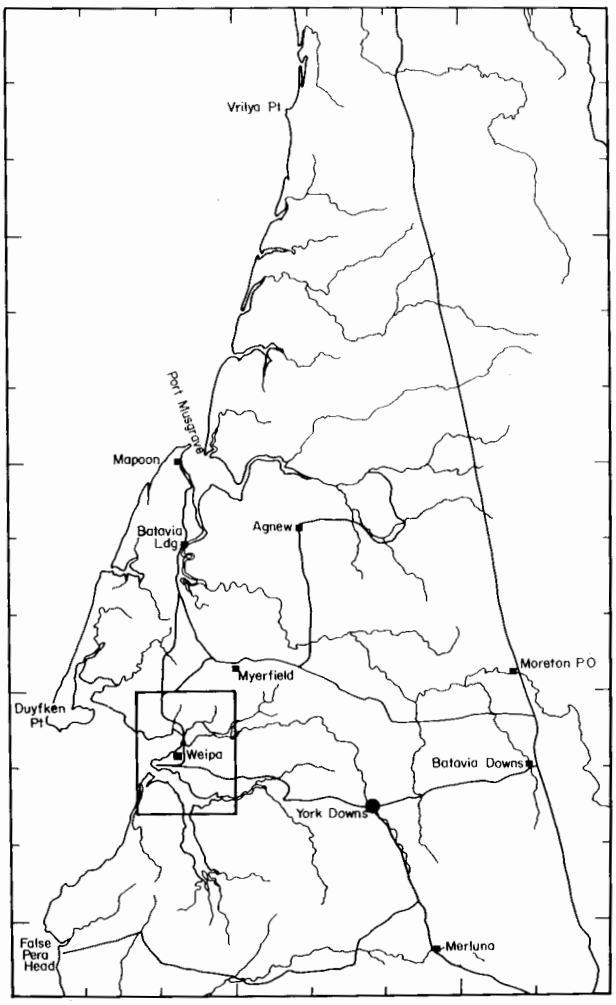
Family CROCODYLIDAE (Crocodiles)

Crocodylus johnstoni Krefft, 1873
Plate 11

Freshwater Crocodile

Description. *Small crocodile with slender snout and fine sharp curved teeth.* Grey or olive-brown above, with irregular darker mottling especially on the flanks. Whitish below. Snout smooth long and slender. Single row of enlarged scales (nuchal shields) on back of neck, separated from the transverse ridge at the back of the head (which marks the hind edge of the bony roof of skull) by fewer than eight rows of small granular scales. Teeth finer, more curved and needle-like than those of the Saltwater Crocodile.

Size (total length). Average recorded for species 1.7 m (males), 1.5 m (females); maximum recorded for species about 3 m. QNPWS reported a single individual between 1.5 and 2 m in their Weipa survey.



Crocodylus johnstoni

Distribution at Weipa (sites; physiographic units). QNPWS recorded a single individual in Myall Creek at York Downs; Merluna Plain only.

Geographic range. Coast and hinterland of north and north-east Australia.

Habitat. At York Downs, in seasonally flowing stream with permanent stagnant water holes, lined by gallery forest (QNPWS). Typically occurs in non-tidal, freshwater wetlands - rivers, creeks, billabongs and swamps.

Survey abundance. Not recorded in AM survey. Crocodiles were not consistently searched for during the survey.

Overall abundance. Scarce, but a separate survey would be required to accurately estimate the population of this species in the Weipa area. One record in one survey.

Seasonality. QNPWS recorded it in May 1981.

Reproduction. Nests in the dry season, in August and September. Average of 13 eggs laid in a hole dug in a sandbank, usually within 10 m of water. Eggs are hard shelled and measure an average of 65 x 40 mm. Average incubation period is 75 days. Females remain in the water near the nest but rarely defend it.

Notes. Diet consists largely of freshwater crustaceans, small fish, insects and spiders; large individuals may also take frogs, lizards, snakes, rodents, bats and birds.

Not considered dangerous to humans, but can inflict a painful lacerating bite.

References. Webb & Manolis, 1988a.

Crocodylus porosus Schneider, 1801
Plate 11

Estuarine or Saltwater Crocodile

[DANGEROUS]

Description. *Large crocodile with broad snout and massive conical teeth.* Grey, brown or almost black above with irregular darker mottling. Whitish below. Snout relatively broad, granular. Two rows of enlarged scales (nuchal shields) on back of neck, separated from bony roof of skull by ten or more rows of small granular scales. Teeth massive and conical.

Size (total length). Estimated length of largest individual seen by QNPWS was 3 m. Maximum recorded for species is about 7 m but total length rarely exceeds 5 m.

Distribution at Weipa (sites; physiographic units). 9% of sites, all coastal - Embley River, Vrilya Point, Namaleta Creek and Janie Creek; Mapoon Plain only. See QNPWS report for data on numerous sightings.

On 17 April 1982 Mick Godwin saw a 5 m crocodile just off the beach south of mouth of Skardon River, during canoe trip from Cape York to Weipa (*in litt.*).

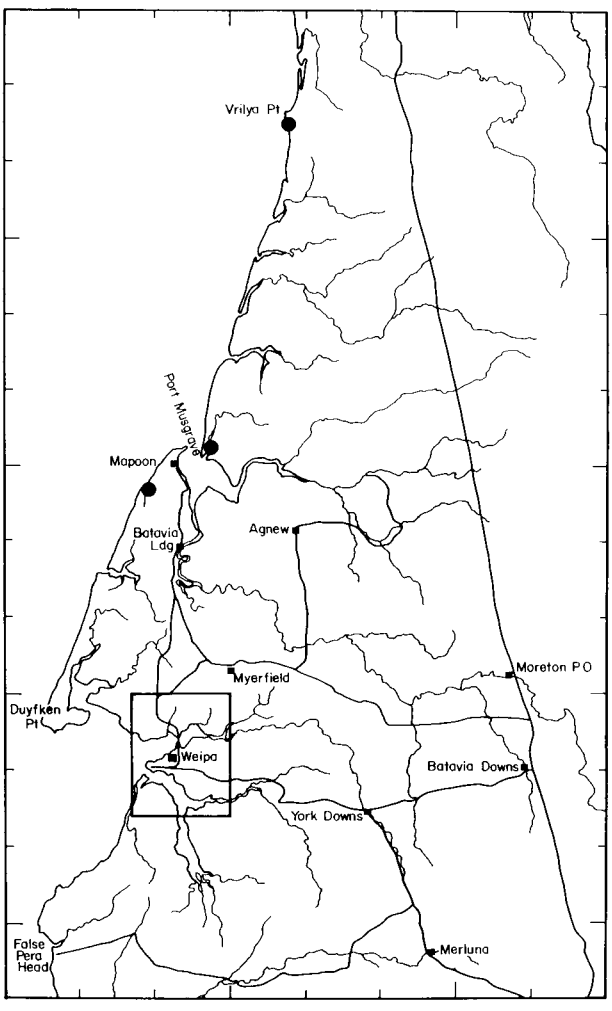
Geographic range. Coastal regions of north and north-east Australia; also west Pacific and Indo-Malaysian regions.

Habitat. Mangroves (Namaleta Creek) and sandy beaches (Vrilya Point and Janie Creek); also open water, mud flats and freshwater lagoon (QNPWS). In north Australia, occupies most coastal wetlands within 100 km of the sea; most abundant in mangrove-lined, tidal rivers, and freshwater billabongs and swamps on the floodplain.

An aerial survey of west Cape York Peninsula in February 1979 (Magnusson *et al.*, 1980) identified much good habitat for *Crocodylus porosus* nests around the Wenlock and Ducie Rivers. The area also had a large variety of habitats suitable for adult crocodiles. 'Good' nest habitat was defined as that containing freshwater swamp vegetation under a canopy of *Melaleuca*, mangroves or monsoon forest trees, which had close access to open water and possessed sufficient physical relief to reduce the chances of flooding (embryos in eggs are killed if nest is inundated). Along the west coast of Cape York, the higher relief of the Weipa Plateau provided such conditions.

"Overall the Weipa Plateau undoubtedly contains the best *C. porosus* habitat and the largest breeding population known in the State [of Queensland]..." (Taplin, 1987).

"Extensive bauxite mining around Weipa appears to



Crocodylus porosus

have little direct impact on *C. porosus* habitat but the impact of mining and subsequent reafforestation on the aquifers draining into fresh water swamps should be examined. Aquifer draw down and subsequent saline intrusion into swamplands could result in significant losses of crocodile nesting habitat..." (Taplin, 1987).

Survey abundance. Scarce. Crocodiles were not consistently searched for during the survey. Only five individuals seen on Australian Museum survey, as well as fresh slides in the Embley River (site 14).

Overall abundance. Common. Thirty one records in three surveys. Taplin (1987) quotes spotlight surveys of the Wenlock and Ducie Rivers in 1979 which recorded 1.76 non-hatchlings/km and 112 hatchlings in 241 km of waterway. In 1985, a survey of the same area recorded a 60% increase in the relative density of crocodiles - 588 crocodiles, including 185 hatchlings, were seen in 145 km of waterway.

Seasonality. Only recorded on one visit - August 1981. Estuarine Crocodiles are more often observed during the cooler months when they bask on exposed banks; during the hot months they often lie in deep shade and are hard to observe.

Reproduction. Nests during the wet season. Female constructs a mound of vegetation and soil next to permanent water and lays an average of 50 eggs which are covered over in the mound. Eggs are hard shelled and measure on average 80 x 50 mm. Incubation period 75 to 105 days, depending on nest temperature. Females remain near nest during incubation and will defend nest from predators and intruders.

Notes. Young crocodiles eat predominantly crustaceans and insects and as they grow, take an increasing proportion of larger items - mostly small vertebrates such as fish, frogs, reptiles, rodents and birds. Large crocodiles also eat dogs, wallabies and cattle, and carrion which they locate by smell. Humans are occasionally taken - 11 people are definitely known to have been killed by Estuarine Crocodiles in Australia in the past 20 years; most were swimming at the time of attack.

References. Magnusson *et al.*, 1980; Messel *et al.*, 1981; Taplin, 1987; Webb & Manolis, 1988b.

TURTLES

Family CHELONIIDAE (Sea Turtles)

Chelonia mydas (Linnaeus, 1758)
Plate 11

Green Turtle

Description. *Sea turtle (adult) with four costal shields and with a smooth heart-shaped vaulted carapace (dorsal shell).* Olive-green above, usually variegated with brown, reddish-brown and black, whitish or cream below. Shields on side of head with distinctive pale-edged sutures. Hatchlings shiny black above, white below. Head moderate in proportion to body. Shell more or less circular to heart shaped, lateral edges not upturned.

Size (carapace length, measured along curvature of shell). Average recorded for species = 1 m.

Distribution at Weipa (sites; physiographic units). Seen at one site only - False Pera Head on the Weipa Plateau. Two eggs registered from a nest at "Mapoon" in 1903 (AM R3543). BERS also recorded it near False Pera Head.

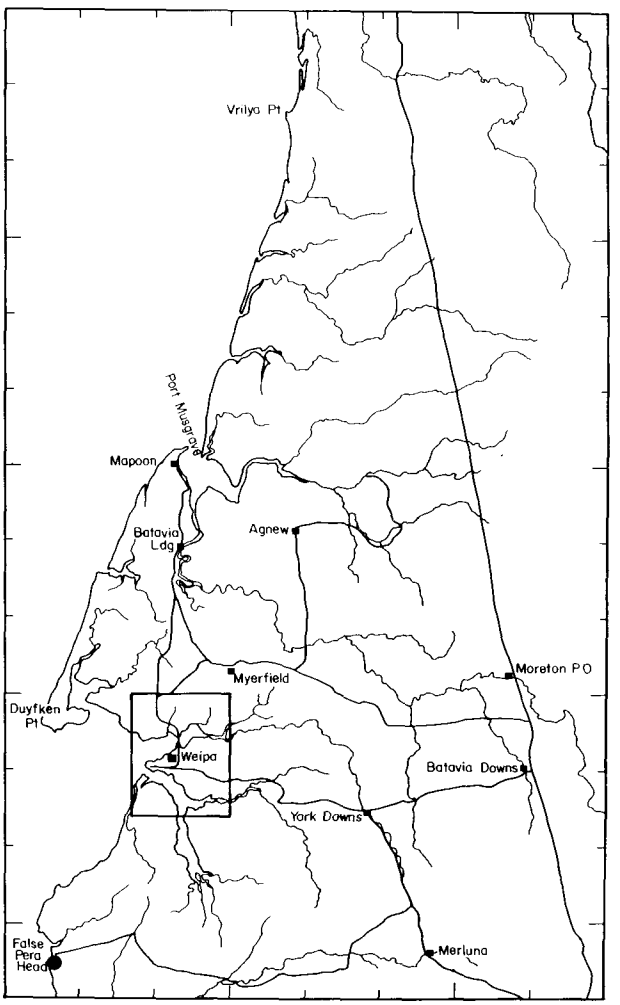
Geographic range. Tropical coasts of Australia, and the Great Barrier Reef; beyond Australia this species is widely distributed in tropical and subtropical waters close to continents and islands.

Habitat. Nesting on sandy beach immediately below low cliff.

Survey abundance. Scarce, only one female observed, laying eggs. Sea turtles were not consistently searched for during the survey.

Overall abundance. Scarce, but a separate survey would be required to accurately estimate the population of this species in the Weipa area. One record in one survey.

Seasonality. Recorded on only one visit, in July 1982.



Chelonia mydas

Mick Godwin (*in litt.*) saw four fresh sea turtle nests between Vrilya Point and Duyfken Point, between 16 and 19 April 1982. BERS recorded it in November 1981, on the beach. Main breeding season in north and north-east Australia extends from November to February.

Reproduction. Female laid 40 eggs on 2 July 1982 (four eggs preserved as AM R107058). Average clutch size is 100 round smallish parchment-shelled eggs. Breeds throughout its range in Australia.

Notes. Young turtles carnivorous but adults almost entirely herbivorous.

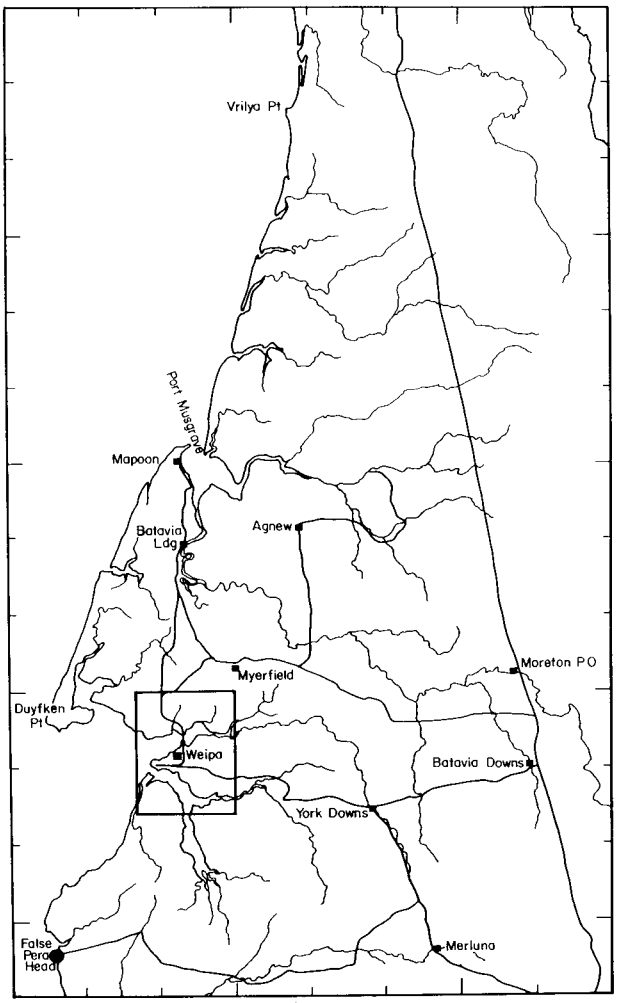
Nests on the west coast of Cape York are heavily predated by pigs.

References. Cogger & Lindner, 1969; Limpus *et al.*, 1983; Marquez, 1990.

Eretmochelys imbricata (Linnaeus, 1766)
Plate 12

Hawksbill Turtle

Description. *Sea turtle (adult) with four costal shields and the dorsal scutes strongly overlapping; upper jaw forming a parrot-like beak.* Olive-green or brown above, richly variegated with reddish-brown, dark brown and black. Scales of head and face often dark with pale contrasting sutures. Whitish below. Hatchlings blackish above, dark below. Head rather small. Shell distinctly and rather narrowly heart shaped.



Eretmochelys imbricata

Size (carapace length, measured along curvature of shell). Average recorded for species = 1 m.

Distribution at Weipa (sites; physiographic units). BERS recorded this species near False Pera Head in November 1981 on the Weipa Plateau.

Geographic range. Tropical coasts of north and east Australia, from midwest Western Australia to south Queensland; beyond Australia, distributed throughout the central Atlantic and Indo-Pacific regions.

Habitat. Nesting on sandy beach below low cliffs.

Survey abundance. Not recorded in AM survey. Sea turtles were not consistently searched for during the survey.

Overall abundance. Scarce, but a separate survey would be required to accurately estimate the population of this species in the Weipa area. One record in one survey.

Seasonality. BERS recorded it in November. In north Australia the peak laying season extends from December to February but low-density nesting occurs on Crab Island throughout the year (Limpus *et al.*, 1983).

Reproduction. Clutch size is highly variable but the mean is about 150 eggs.

Notes. Carnivorous, diet includes corals, algae and sponges.

References. Cogger & Lindner, 1969; Limpus *et al.*, 1983; Marquez, 1990.

Lepidochelys olivacea (Eschscholtz, 1829)
Plate 12

Olive Ridley Turtle

Description. *Sea turtle (adult) with six or more costal shields and a broad heart-shaped vaulted carapace.* Grey or olive-grey above, usually without any conspicuous markings. Whitish below. hatchlings blackish above, dark brown below. Head large and massive. Shell broad and heart shaped.

Size (carapace length, measured along curvature of shell). Average recorded for species = 1.5 m.

Distribution at Weipa (sites; physiographic units). Offshore from Weipa (Baker *in* Limpus *et al.*, 1983).

Geographic range. North coast of Australia; beyond Australia it is a pantropical species, occurring principally in the northern hemisphere.

Habitat. Waters of the Gulf of Carpentaria.

Survey abundance. Not recorded in AM survey. Sea turtles were not consistently searched for during the survey.

Overall abundance. Scarce, but a separate survey would be required to accurately estimate the population

of this species in the Weipa area. Adults and immatures are commonly caught in prawn trawls offshore from Weipa (Baker *in* Limpus *et al.*, 1983). Two nesting records in the Gulf of Carpentaria - Crab Island and near Edward River.

Seasonality. The Crab Island nesting occurred between April and May and generally the nesting season is in summer and autumn.

Reproduction. Average clutch size is about 100.

Notes. Carnivorous, eats a wide variety of marine invertebrates and occasionally fishes.

References. Cogger & Lindner, 1969; Limpus *et al.*, 1983; Marquez, 1990.

Natator depressus (Garman, 1880)
Plate 12

Flatback Turtle

Description. *Sea turtle (adult) with four costal shields and with upturned margins on the flattish carapace.* Grey or pale grey-green above, the plates of the carapace covered by a thin, fleshy skin in adults. Creamy-yellow below, the ventral colour extending onto the sides of the neck and face. Hatchlings olive-green, the margins of the dorsal scutes broadly outlined in black. Head moderate. Shell broadly oval, more or less heart shaped, and with upturned lateral edges in adults.

Size (carapace length, measured along curvature of shell). Average recorded for species = 1.2 m.

Distribution at Weipa (sites; physiographic units). Not known; there are two specimens registered from Weipa in the Queensland Museum.

Geographic range. Endemic to Australia. Occurs in coastal waters of north-west, north and north-east Australia.

Habitat. Not known for the Weipa specimens.

Survey abundance. Not recorded in AM survey. Sea turtles were not consistently searched for during the survey.

Overall abundance. Crab Island south-west of Bamaga supports the largest known breeding colony of this species (Limpus *et al.*, 1983). A separate survey would be required to accurately estimate the population of this species in the Weipa area.

Seasonality. On Crab Island nesting occurs year-round but in south-east Australia it is restricted to the summer months.

Reproduction. Average clutch size is about 50, only half that of other sea turtles, but eggs are generally larger.

Notes. Carnivorous, eats a wide variety of marine invertebrates including sea cucumbers, soft corals and molluscs.

References. Cogger & Lindner, 1969; Limpus *et al.*, 1988; Marquez, 1990.

Caretta caretta (Linnaeus, 1758)
Plate 13

Loggerhead Turtle

Description. *Sea turtle (adult) with five costal shields; old individuals have massive heads.* Dark brown above, sometimes irregularly specked and variegated with darker brown; top of head dark brown, becoming pale on the sides with irregular darker blotches. White, cream or yellowish below. Hatchlings rich reddish-brown above, dark blackish-brown below. The head of old adults is large and massive. Shell somewhat elongate and more or less heart shaped.

Size (carapace length, measured along curvature of shell). Average recorded for species = 1.5 m.

Distribution at Weipa. There are no reliable records of this species nesting in the region but it almost certainly occurs there.

Geographic range. Tropical and warm temperate waters off the Australian coast, including the Great Barrier Reef; beyond Australia widely distributed in coastal tropical and subtropical waters around the world.

Survey abundance. Not recorded in AM survey. Sea turtles were not consistently searched for during the survey.

Overall abundance. A separate survey would be required to accurately estimate the population of this species in the Weipa area.

Seasonality. Australian nesting season extends from October to April, with a peak between November and January.

Reproduction. Not yet recorded nesting in the region. Average clutch size about 100.

Notes. Carnivorous, eats a wide variety of marine invertebrates.

References. Cogger & Lindner, 1974; Limpus & Reed, 1985; Marquez, 1990.

Family CHELIDAE (Side-necked Turtles)

Chelodina rugosa Ogilby, 1890
Plate 13

Northern Snake-necked Turtle

Description. *Freshwater turtle with long neck and four claws on each forelimb; plastron (lower shell) narrow, about twice as long as broad.* Dark brown to black above, may have darker flecks, blotches or marbling. Whitish below. Carapace (upper shell) broadly oval, usually expanded posteriorly. Plastron (lower shell) moderate, at most twice as long as its width immediately in front of the bridge linking upper and lower halves of shell. Head rather broad and

depressed.

Size (carapace length, measured along curvature of shell). 275 mm (Weipa); average recorded for species = 400 mm.

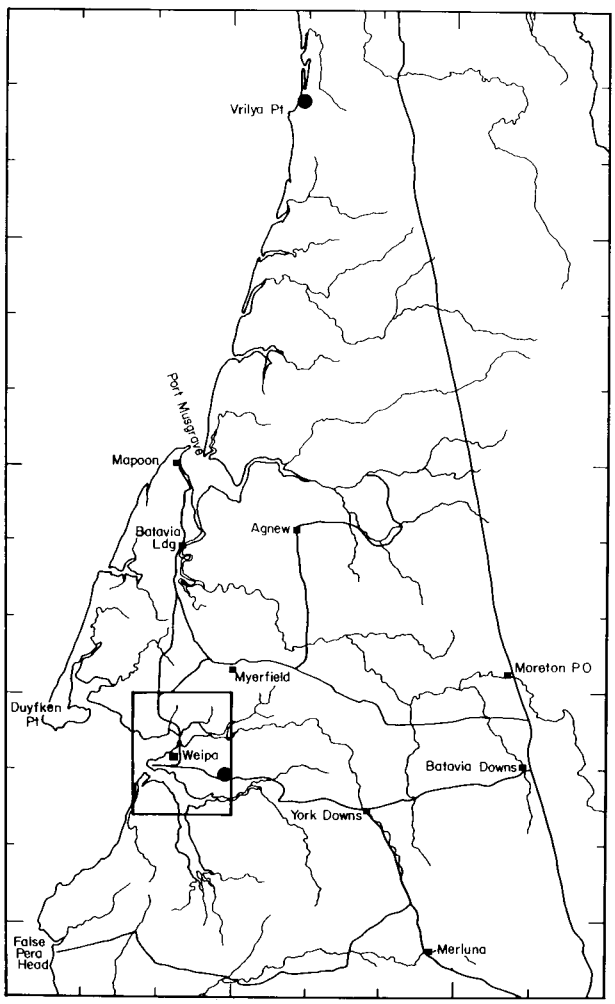
Distribution at Weipa (sites; physiographic units). 4% of sites, only recorded from Willum Swamp and swale 2.5 km north of Vrilya Point, although traps set in Sunrise Creek, in creek at Vrilya Point and in billabong at Stone Crossing; Weipa Plateau and Mapoon Plain. Unidentified desiccated freshwater turtle eggs were found at Top Camp Swamp in June 1982.

Geographic range. North Australia, from Cape York Peninsula to the Kimberley district, Western Australia.

Habitat. Paperbark woodland, gallery forest. Inhabits swamps, billabongs, waterholes and slow-flowing rivers. During the wet season in Cobourg Peninsula, Northern Territory, this species was regularly observed walking through grass more than 1 km from the nearest swamp (Cogger & Lindner, 1974).

Survey abundance. Scarce; one adult in turtle trap, Willum Swamp; one empty shell (AM R101319).

Overall abundance. Scarce. Two records in two surveys.



Chelodina rugosa

Seasonality. Recorded on only one visit, February 1979; second specimen was an empty shell (collected 24 August 1981 at Vrilya Point) with no indication of when turtle had died.

Reproduction. Egg-laying recorded in March and September, so breeding may be aseasonal. Clutch size about 12 to 14; eggs elongate, brittle shelled, average dimensions 35 x 26 mm. Incubation takes approximately six months at temperatures between 27°C and 30°C.

Notes. Aquatic. Diurnal.

The narrow plastron and elongate flattened head are specialisations for feeding on fish.

References. Cann, 1980; Cogger & Lindner, 1974.

LIZARDS

Family GEKKONIDAE (Geckoes)

Gehyra dubia (Macleay, 1877)
Plate 13

A Dtella

Description. *Moderate-sized, rather plump arboreal gecko often seen on walls of buildings at night.* Greyish-brown or pale grey above, sometimes with obscure darker blotches, variegations or irregular bands and usually a series of pale spots, across the back. Whitish to yellowish below. Body above covered by small homogeneous smooth scales. Relatively slender tail distinctly depressed at the base. Toes moderately long, depressed, greatly expanded at the tips to form large subcircular pads; all toes except the inner one on each foot, clawed.

Size (snout-vent). 28 mm (unsexed) - 65 mm (male) and 63 mm (female) (Weipa); maximum recorded for species = 67.3 mm.

Distribution at Weipa (sites; physiographic units). 57% of sites, common around Rocky Point; all three physiographic units.

Geographic range. North-east Australia, extending south to central New South Wales.

Habitat. In all terrestrial habitats (including mangroves) sampled by the Australian Museum survey with exception of grassland/sedgeland.

Survey abundance. Abundant.

Overall abundance. Abundant. Ninety nine records in three surveys. Not recorded in regenerated mine sites.

Seasonality. Recorded on all six visits.

Reproduction. Egg-layer; clutch size two. Eggs are calcareous, brittle-shelled, with average dimensions of 9 x 11 mm. Gravid females collected in July 1977 and August 1981. Several clutches may be laid during the extended breeding season.

Notes. Sex ratio of collected adults - 33 males:40 females. AM R107572-75 karyotyped by Max King.

Numerous mites on individuals collected at Namaleta Creek in August 1981.

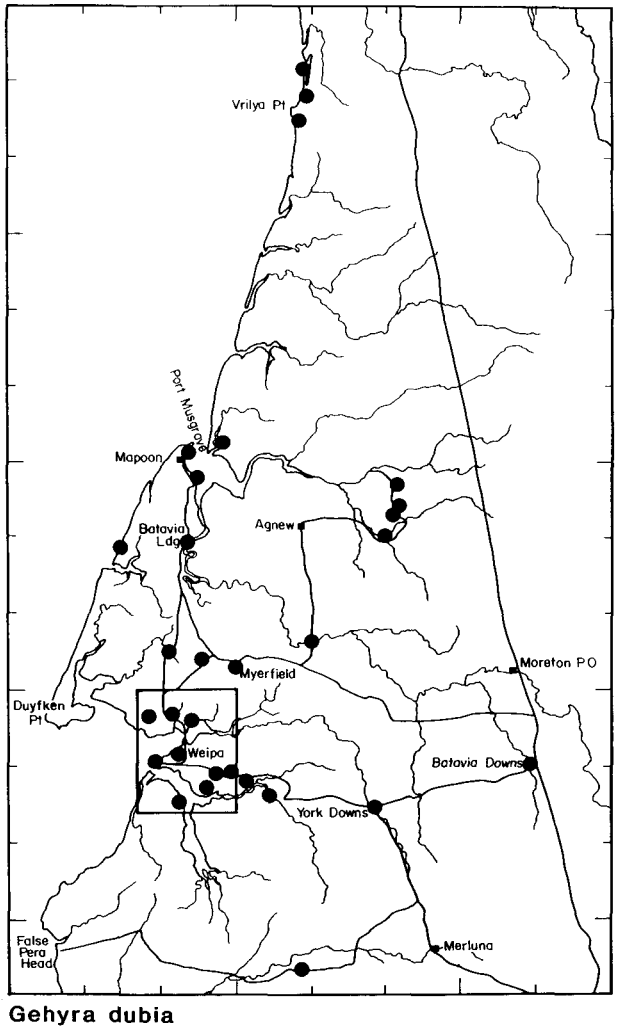
Predominantly arboreal, nocturnal. This is the species most likely to be seen chasing insects on walls and ceilings at night. Capable of voluntarily breaking off its tail (autotomy), like all Australian geckoes.

Found in rock outcrops, beneath logs and loose bark of trees (such as melaleucas), and on buildings.

Recorded in the guts of two feral cats shot near Beagle North Camp (BERS, 1982).

Specimens collected in the mangroves at Batavia Outstation Landing were noticeably larger and more brightly coloured than specimens from other habitats; these may represent an undescribed species (King, *in litt.*).

References. Bustard, 1969a; King, 1983.



Gehyra dubia

Heteronotia binoei (Gray, 1845)
Plate 14

Bynoe's Gecko

Description. *Small terrestrial gecko with long tapering tail.* Very variable in colour, ranging from dull greyish-brown to almost black, usually with scattered darker and paler flecks and blotches which usually form a pattern of obscure broken bands along the back and are sometimes more pronounced as narrow dark and light rings around the tail. Whitish below, finely peppered with dark brown. Skin above finely granular with numerous scattered asymmetrical tubercles pointing backwards like tiny blunt teeth of a saw. Tubercles sometimes arranged in longitudinal rows on the back and may form regular rings around the tail. Tail long, and round in cross-section. Toes long and narrow without enlarged pads on the tips; all clawed, and bird-like.

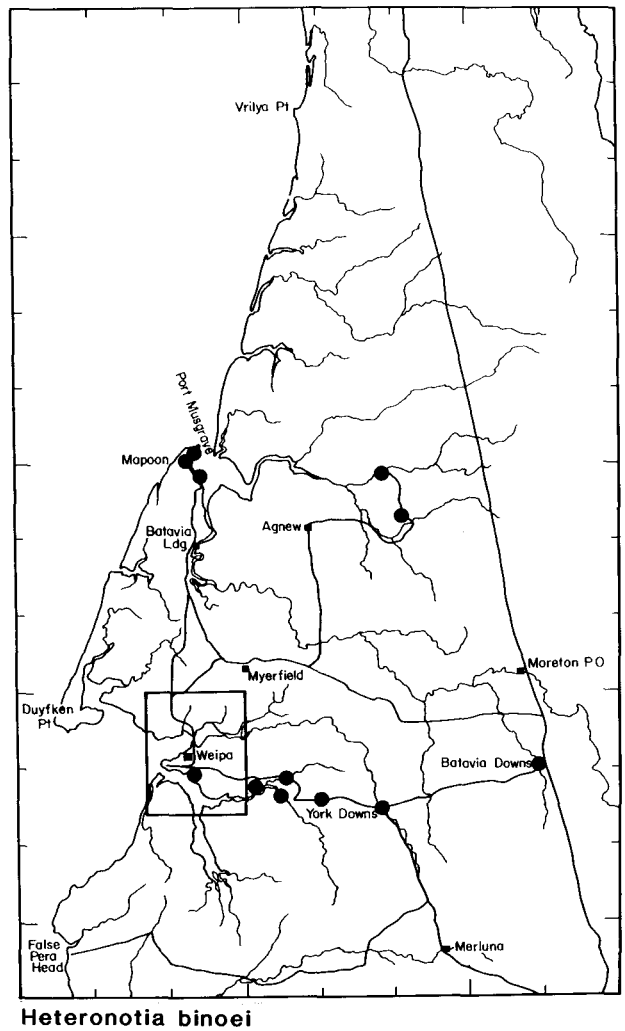
Size (snout-vent). Maximum 43 mm (male), 45 mm (female) (Weipa); average recorded for species = 50 mm.

Distribution at Weipa (sites; physiographic units). 23% of sites, only one record from vicinity of Weipa settlement, at Number One Camp; all three physiographic units but rarely found on the Weipa Plateau.

Geographic range. Found throughout most parts of continental Australia except for more humid areas of the south-west and south-east.

Habitat. Open forest, eucalypt woodland, dunefield woodland and one specimen in gallery forest at Running Creek; also regeneration (Reeders & Morton, 1983).

Survey abundance. Common in a narrow range of habitats.



Heteronotia binoei

Overall abundance. Uncommon. Thirty seven records in three surveys.

Seasonality. Recorded on five out of six visits, not recorded in July 1977.

Reproduction. Egg-layer; clutch size two. Eggs round and brittle-shelled. Gravid females collected in November 1979, July 1980 and June 1982. Hatchling collected 21 November 1979. Parthenogenic populations exist, but animals karyotyped by Moritz & King (1985) indicate the Weipa population is one of diploid, bisexual individuals.

Notes. Sex ratio of collected adults - 12 males:16 females. Terrestrial; nocturnal.

Occasionally found co-existing with *Nactus pelagicus*, for example under the same rock at the jump-up on Coen Road, 45 km east of Weipa. Distinguished from *Nactus pelagicus* principally by the larger, asymmetrical tubercles on the back, which are arranged in less regular rows, and the bolder, more irregular markings on the back.

References. Bustard, 1968; Moritz & King, 1985.

Lepidodactylus lugubris (Duméril & Bibron, 1836)
Plate 14

Mourning Gecko

Description. *Small slim pale arboreal gecko with depressed tail.* Usually pale creamy-fawn above with darker flecks and mottling. Series of shadowy W-shaped markings running down the centre of the back and tail, usually with a blackish spot at the base of each angle of the 'W'. Narrow dark brown stripe running along side of snout through the eye to the level of the forearm. Body covered in small smooth homogeneous scales. Tail relatively long, flattened with a flange on either side, so that in cross section it resembles a flattened triangle. Toes moderately long, rather depressed and expanded at tips to form oval pads; all toes clawed.

Size (snout-vent). 35-40 mm (all females, this is a parthenogenic species) (Weipa); average recorded for species = 40 mm.

Distribution at Weipa (sites; physiographic units). One site only - Vrilya Point on the Weipa Plateau; also collected at the same time and place by QNPWS.

Geographic range. In Australia known only from several coastal localities between Innisfail and Port Douglas, north-east Queensland and many islands in Torres Strait; also occurs throughout the islands in the Pacific and Indian Oceans and in New Guinea and Indo-Malaysia.

Habitat. Vine forest, under bark of dead trees (*Ficus* sp.) and logs. Two specimens were found on the same tree as an *Oedura rhombifer*. Typically lives in coastal areas, in crowns of palms, mangoes and other low trees; also a common inhabitant of buildings.

Survey abundance. Scarce, only recorded in one locality in the Weipa survey, despite extensive collecting in apparently suitable habitat elsewhere.

Overall abundance. Scarce. Four records in two surveys.

Seasonality. Recorded on only one visit - August 1981.

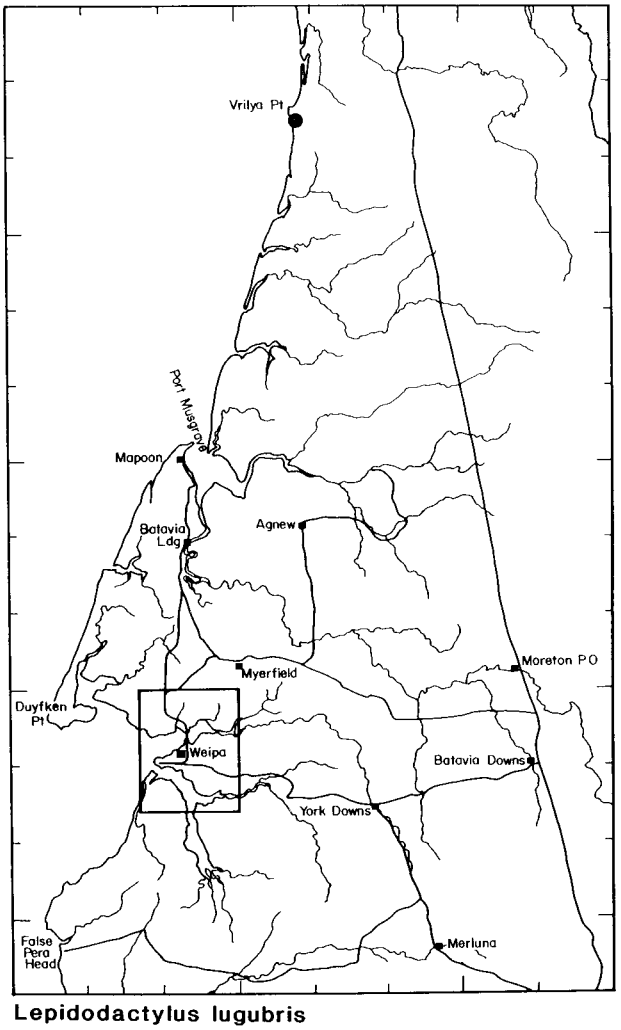
Reproduction. Egg-layer; clutch size two. Eggs are ellipsoidal with average dimensions of 7 x 9 mm. They are soft and adherent when laid, hardening soon after to become attached to each other and to the substrate.

Reproduction may be aseasonal - one gravid female recorded in August 1981 and Torres Strait individuals gravid in June 1977.

This is a parthenogenic species in which very few males have ever been recorded. In Australia females lay unfertilised eggs which develop into reproductive females.

Notes. The population at Vrilya Point was probably introduced by human agency, as have been the other populations in Australia; a World War II army camp is believed to have been located near Vrilya Point and may have been the source of these geckoes. As a parthenogenic species, only one individual is required to establish a colonising population at a new site of introduction.

Superficially similar to *Oedura rhombifer* which may occur in same microhabitat but differs in colour pattern



Lepidodactylus lugubris

and tail shape.

Opportunistic feeder, diet includes spiders, slaters and insects, particularly flies.

Arboreal; nocturnal. Vocalises at night.

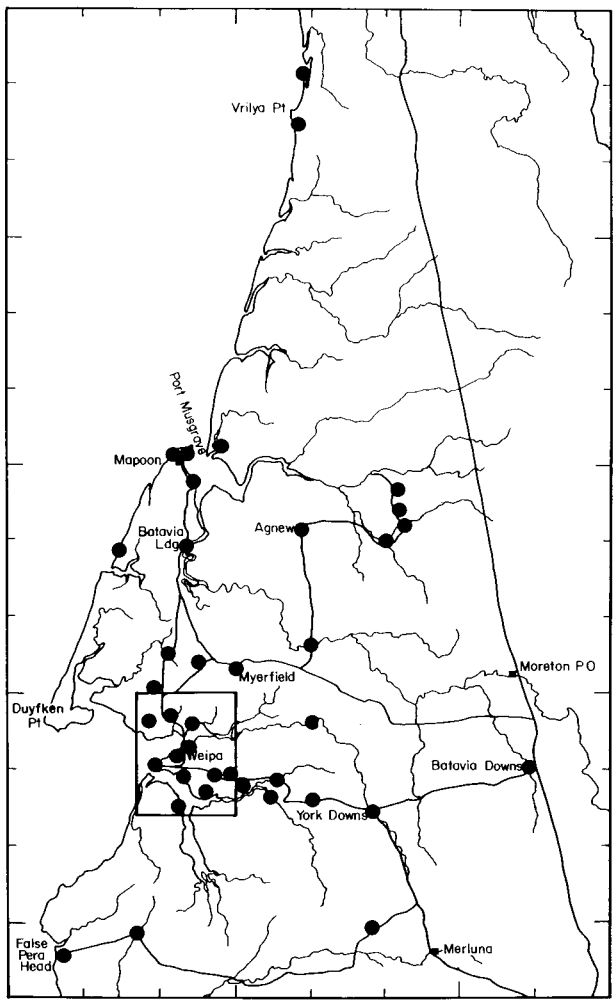
References. Kluge, 1972; Cogger *et al.*, 1983.

Nactus pelagicus (Girard, 1858)
Plate 14

Pelagic Gecko

[Also appears in the literature as *Nactus arnouxii* and *Cyrtodactylus pelagicus*]

Description. *Moderate-sized dark terrestrial gecko with long tapering tail.* Brown to blackish above, sometimes with a series of dark-edged paler blotches which tend to form broken transverse bands, especially on the tail. Juveniles usually have a bright mustard- or orange-coloured tail in strong contrast to the dark body. Body scales small and granular with small conical tubercles arranged in 12 or more regular longitudinal rows. Tail long and slender. Toes long and narrow without enlarged pads on the tips; toes all clawed, and bird-like.



Nactus pelagicus

Size (snout-vent). 21 mm (unsexed) - 56 mm (male) and 58 mm (female) (Weipa); average recorded for species in Australia = 60 mm.

Distribution at Weipa (sites; physiographic units). 72% of sites, scattered throughout the survey area, abundant around Weipa town; all three physiographic units.

Geographic range. Cape York Peninsula; also throughout New Guinea and the islands of the west Pacific Ocean.

Habitat. All terrestrial habitats (excluding mangroves).

Survey abundance. Abundant.

Overall abundance. One of the most abundant lizards in the survey. Three hundred and forty one records in four surveys and one additional record.

Seasonality. Recorded on all six visits; also collected some time between December 1979 and June 1980 (donation from Regeneration staff).

Reproduction. Egg-layer; clutch size two. Eggs round, brittle-shelled. Gravid females recorded in July 1977, February and November 1979, July 1980, August 1981 and June 1982, which suggests aseasonal breeding. A large collection of eggs and adults found in a rotten log in a grove of casuarinas on the beach, November 1979.

Notes. Sex ratio of collected adults - 102 males:72 females. Parthenogenic populations occur in the eastern part of this species' range but animals karyotyped by Moritz & King (1985) indicate the Weipa population is one of diploid bisexual individuals.

Nocturnally active on the ground and occasionally on tree trunks; one individual spotlighted in a crack in a tree trunk 1 m above the ground. Often seen on the road at night. During the day shelters under and in logs and debris on the ground.

Distinguished from *Heteronotia binoei* principally by the smaller, symmetrical, conical tubercles on the back which are arranged in regular rows, generally darker colouration, and brightly-coloured tails of the juveniles.

Recorded in the gut of a feral cat shot at Beagle North Camp (BERS, 1982).

References. Ingram, 1978; Kluge, 1983; Moritz & King, 1985.

Nephrurus asper Günther, 1876
Plate 15

Rough Knob-tailed Gecko

Description. *Large-headed, long-legged terrestrial gecko with clusters of spiny tubercles on the upper surface and a short tail ending in a knob.* Reddish-brown above, with narrow irregular blackish crossbands alternating with broad conspicuous creamy-white bands across the back. Top and sides of head covered with a fine dark brown or black reticulations. Limbs above the same colour as the back, mottled with darker and

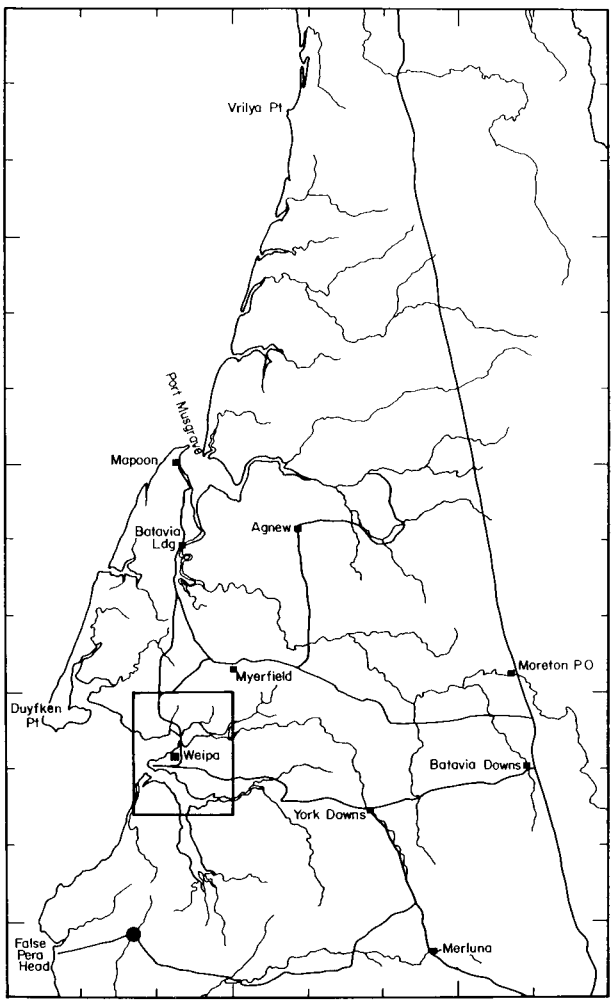
paler brown. Whitish below. Head very large and massive, with more than eight interorbital scales. Body above and on the sides covered with small flat scales through which are scattered numerous rosettes of enlarged scales, each rosette consisting of a ring of rounded tubercular scales enclosing one (on the back) or more (on the sides and throat) larger and higher conical tubercular rosettes. Tail very short, only a little longer than broad, with about eight or nine transverse rows of enlarged tubercular scales or rosettes, and ending in a fairly large knob.

Size (snout-vent). Average recorded for species = 100 mm; maximum for species = 136 mm.

Distribution at Weipa (sites; physiographic units). Occurrence based on a photo taken in the Weipa district by Mike O'Reilly and on specimens collected near Beagle North Camp (AM site 52) in faunal survey undertaken for Shell Australia by Biological Environmental Research Services (BERS) in 1981/82.

Geographic range. North-west Australia, through north and central Australia to drier parts of Queensland, almost to the east coast near Townsville.

Habitat. Usually found in rocky habitats; may occupy more heavily timbered habitats than do other species of knob-tailed geckoes. The two animals from Aurukun were seen within Darwin Stringybark open forest, one on a roadway at night and the other under a 'witch's hat' on a grassy airstrip.



Nephrurus asper

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. Two records in one survey and one additional record.

Seasonality. Not recorded in Weipa survey. BERS (1982) recorded two individuals in November 1981 but none in the following March.

Reproduction. Egg-layer; clutch size two. Eggs parchment-shelled, measuring approximately 30 x 16 mm. Egg-laying in early December recorded for a specimen from Katherine, Northern Territory (Gow, 1979).

Notes. Terrestrial; nocturnal. By day shelters in burrows and depressions beneath rocks and logs.

The characteristic knob on the tip of the tail may detect mechanical stimuli and may also play a role in thermo-regulation (Russell & Bauer, 1987). This is the only gecko which is not capable of voluntarily dropping (autotomising) its tail.

This gecko performs a defence display in which the body is repeatedly raised high on all four legs, then lowered to the ground (forepart first, like a cow). Further defence behaviour includes a low rasping vocalisation, mouth gaping and biting; although the jaws are strong the teeth are not capable of a severe bite to a human. Usually moves with a slow swaying gait.

Diet includes insects, spiders and small lizards.

References. Bustard, 1967a; Gow, 1979; Russell & Bauer, 1987.

Oedura castelnaui (Thominot, 1889)
Plate 15

Northern Velvet Gecko

Description. *Large dark arboreal gecko with crescentic or V-shaped pale bands across back and fat, rather flattened tail of moderate length.* Deep purplish-brown above, usually with a series of pale white or yellowish transverse bands between snout and vent. Bands strongly marked in juveniles, which are striped dark grey and white at hatching, but in old adults the dark ground colour may contain numerous yellow scales which render the pattern paler and more diffuse, like a tapestry. Snout and crown pale; lips pale, continuous with the first pale crossband. First dark crossband forms a collar across nape, from eye to eye. Limbs speckled and mottled with yellow and brown. Whitish below. Scales on back flat, round, juxtaposed and smooth, giving rise to the common name of Velvet Gecko. Tail moderately depressed, fat. Toes moderately long, depressed and moderately expanded at the tips to form a distinct pad; all toes with small retractile claws so the toes lie flat on the substrate when viewed

laterally.

Size (snout-vent). 44 mm (unsexed) - 83 mm (male) and 91 mm (female) (Weipa); average recorded for species = 90 mm.

Distribution at Weipa (sites; physiographic units). 26% of sites, rare on Mapoon Plain and not recorded on the coast but collected at scattered localities in the other two physiographic units.

Geographic range. Cape York Peninsula and islands of Torres Strait.

Habitat. Open forest, eucalypt woodland, vine forest; also paperbark woodland (QNPWS) and regeneration (Reeders & Morton, 1983).

Survey abundance. Common.

Overall abundance. Common. Forty four records in four surveys and one additional record.

Seasonality. Recorded on all six visits; also recorded in December 1977 (M. O'Reilly, personal communication).

Reproduction. Egg-layer; clutch size two. Eggs elongate, parchment-shelled, with average dimensions of 11 x 22 mm. Gravid females recorded in November 1979, July 1980 and September 1981, which suggests aseasonal breeding. Egg-laying recorded in December (Bustard, 1967b) with an incubation period of 60 days at 30°C.

Notes. Sex ratio of collected adults - 12 males:16 females.

Arboreal; nocturnal. Often forages on the ground at night and collected on the road during spotlighting. During the day found under loose bark of dead trees (particularly bloodwoods) and logs and occasionally under exfoliating rock.

One large adult found under old wooden crate at the nursery (M. O'Reilly, personal communication).

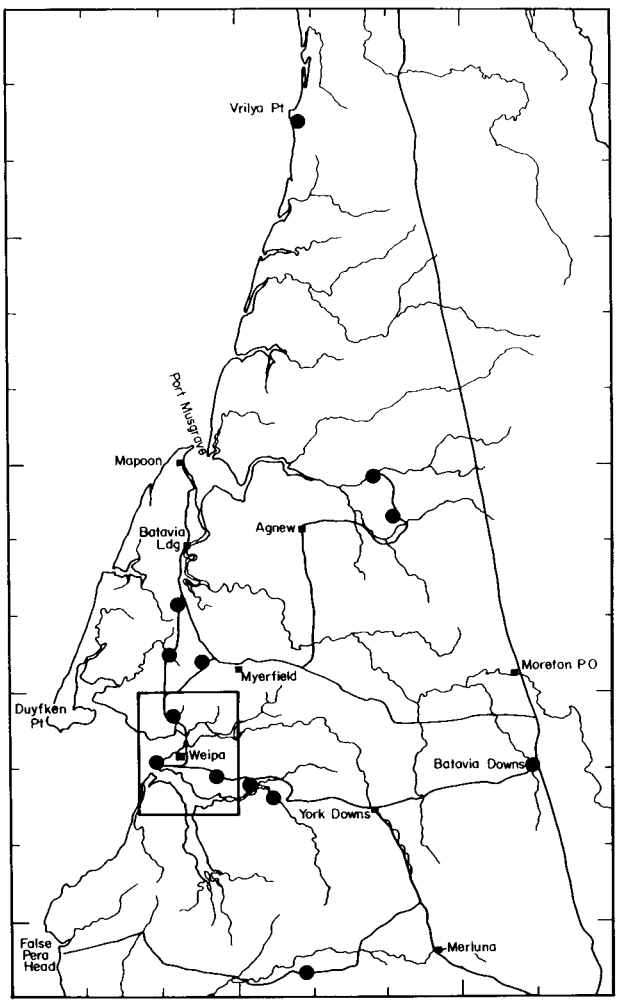
Often found co-existing with *Oedura rhombifer* but not as abundant or widespread as the latter.

Diet typically consists of insects living under bark but also recorded as eating small skinks and juvenile geckoes of other species. QNPWS and BERS both recorded this species in the guts of a feral cats.

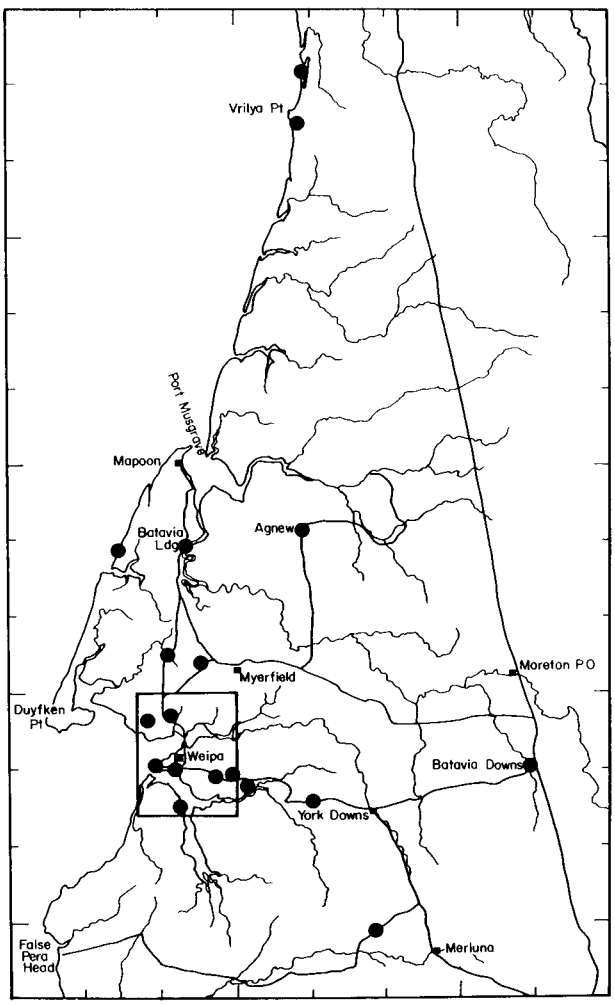
References. Bustard, 1967b; Bustard, 1970; Cogger, 1957.

Oedura rhombifer Gray, 1845
Plate 15

Description. *Small dark brown arboreal gecko with moderately long tail which is round in cross-section.* Rich brown above with sides speckled with darker and



Oedura castelnaui



Oedura rhombifer

paler brown. Broad pale brown or cream vertebral band with ragged zig-zag margin and sometimes dark-edged; this band divides at the nape and continues forward as a pale temporal stripe on either side of the head, enclosing a darker brown patch on the crown. Skin finely granular above, dorsal scales minute and homogeneous, much smaller than ventral scales. Tail long and slender, more or less round in cross-section. Toes moderately long, depressed and moderately expanded at the tips to form a distinct pad; all toes with small retractile claws so toes lie flat on substrate when viewed laterally.

Size (snout-vent). 22 mm (unsexed) - 47 mm (male) and 50 mm (female) (Weipa); average recorded for species = 55 mm.

Distribution at Weipa (sites; physiographic units). 32% of sites, including some on the coast (unlike *O. castelnaui*); all three physiographic units.

Geographic range. Northern half of Australia, excluding most of the drier interior, and islands of Torres Strait.

Habitat. Open forest, eucalypt woodland, dunefield woodland, vine forest, gallery forest and regeneration.

Survey abundance. Common.

Overall abundance. Common to abundant. Eighty five records in four surveys.

Seasonality. Recorded on five out of six visits, not recorded in June 1982.

Reproduction. Egg-layer; clutch size two. Eggs parchment-shelled. Gravid females recorded in July 1977, February and November 1979, July 1980 and August 1981, which suggests aseasonal breeding.

Notes. Sex ratio of collected adults - 30 males:33 females.

Nocturnal; often forages on the ground at night and collected on the road during spotlighting. During the day found under loose bark of dead trees and logs, sometimes in association with *Oedura castelnaui*. Especially common under bark of dead standing bloodwoods. Also occurs under rocks and around buildings. Superficially similar to small individuals of *Lepidodactylus* which may occur in the same microhabitat, but colour pattern and tail shape differ.

References. Cogger, 1957.

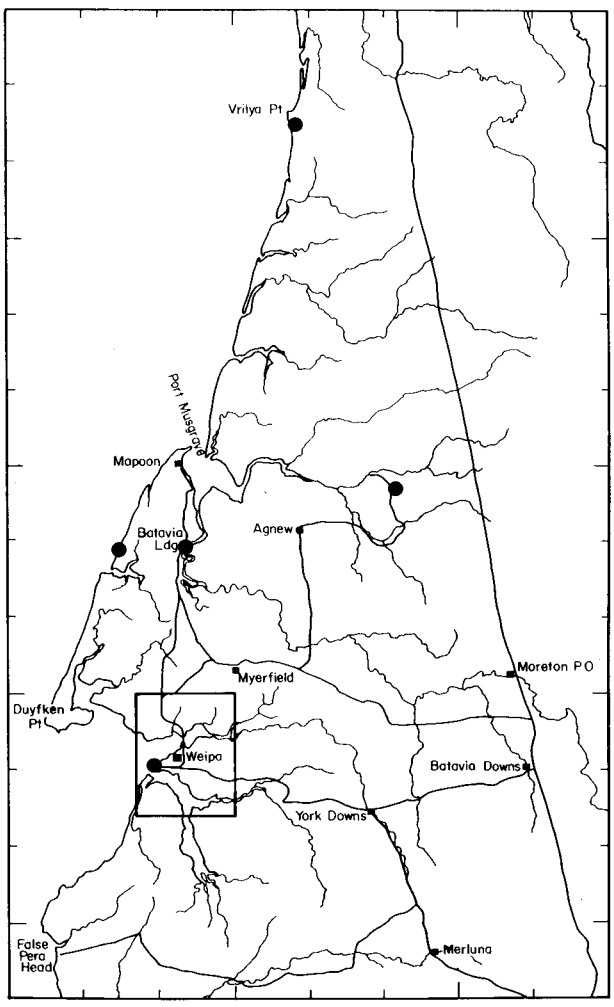
Pseudothecadactylus australis (Günther, 1877)
Plate 16

Description. *Large slender arboreal gecko with large head and long slender, more or less cylindrical tail.* Brown above, finely peppered or mottled with darker purplish brown; series of about six pale, dark-edged transverse blotches between snout and vent which may be divided by an obscure darker irregular vertebral stripe. Poorly defined dark purplish-brown bar along side of snout continued behind the eye to about level of the forearm; this dark area bounded below by a contrasting white or cream area which starts at the scales of the upper lip and extends back along the side of the neck (enclosing the ear-opening) to about level of the forearm. Scales on the lower lip white with dark sutures. Whitish below, speckled and flecked with dark brown, especially on the throat. Scales on back small, smooth, juxtaposed and homogeneous. Distinct lateral skin fold between axilla and groin. Tail long, slender, more or less cylindrical. Tail more or less prehensile, the terminal scales under the tail modified to form adhesive lamellae, rather like those on the toe pads. Toes long, depressed, strongly expanded at the tips to form large oval pads. All toes have small retractile claws and toes lie flat on the substrate when viewed laterally. Lining of mouth a deep purplish brown.

Size (snout-vent). 65 mm (unsexed) - 105 mm (male) and 103 mm (female) (Weipa); maximum recorded for species = 120 mm. Snout-vent length of one hatchling was 43 mm (tail = 40 mm) (BERS, 1982).

Distribution at Weipa (sites; physiographic units). 9% of sites, more common close to coast and rivers - North Alice River, Batavia Landing, Flinder's Camp north of Pennefather River, and Weipa; all three physiographic units.

Geographic range. North and north-east coast and ranges of Cape York Peninsula and islands of Torres Strait.



Pseudothecadactylus australis

Habitat. Open forest, dunefield woodland, vine forest; also deciduous vine thicket (QNPWS).

Survey abundance. Uncommon.

Overall abundance. Common. Forty one records in three surveys. QNPWS recorded 30 sightings of this species, most being detected by strong spotlights at night, in the canopy of open forest and paperbark woodland.

Seasonality. Recorded on three out of six visits, not recorded in July 1977, July 1980 or June 1982. QNPWS recorded it in all seasons.

Reproduction. A female collected by the AM (in November 1979) was not gravid, but a second female collected by BERS in November 1981, laid two eggs in mid-January the following year. Incubation period at 25°C was 70 days.

Notes. Sex ratio of collected adults - 6 males:1 female.

Only one animal contained food in the gut - two heavily chitinised insect jaws, possibly orthopteran, plus an entire *Pseudothecadactylus* slough. Circumstantial evidence suggests that a gecko of this species collected near Lake Patricia in November 1979 was in pursuit of a *Nactus pelagicus* which was collected at the same time.

Arboreal; nocturnal. At Weipa these geckoes were usually located with a spotlight at night when they were foraging high in the crowns of trees (up to 10 m); the eyeshine is bright red. One male found in hollow standing dead sapling during the day. Elsewhere on Cape York Peninsula and on south islands of Torres Strait this species was encountered in paperbarks (*Melaleuca* spp.) in swampy woodland; four or five individuals were located during the day because they vocalised when disturbed by passers-by. On investigation the geckoes were found secreted in small hollow limbs and trunks of the paperbarks.

Threat display includes opening the mouth widely to display the purple lining which contrasts strongly with the white lips. This species can grip and hang on strongly with its jaws.

Bauer (1990) believes the genus is so closely related to the New Caledonian genus *Rhacodactylus* that he has given it subgeneric rank within *Rhacodactylus*. He suggests the ancestor of *Rhacodactylus* (*Pseudothecadactylus*) *australis* crossed the sea from New Caledonia to colonise north Australia but was prevented from moving into New Guinea (then connected to Australia by a land-bridge) because of habitat restrictions.

References. Cogger, 1975b.

Family PYGOPODIDAE (Snake-lizards)

Delma tincta de Vis, 1888
Plate 16

Description. *Slender, elongate grey-brown legless lizard with small head banded with several broad dark bars.* Fairly uniform grey or grey-brown above, plain white below. Usually several broad dark to black bands across top of head with narrow cream or yellow interspaces. Scale rows around body (including ventral scales) 12 to 16, usually 14 at midbody. Ventral scales paired. Small hindlimb flaps on either side of the vent. Conspicuous ear opening.

Size (snout-vent). 63 mm (Weipa); average recorded for species = 80 mm. Length of original tail three times the snout-vent length.

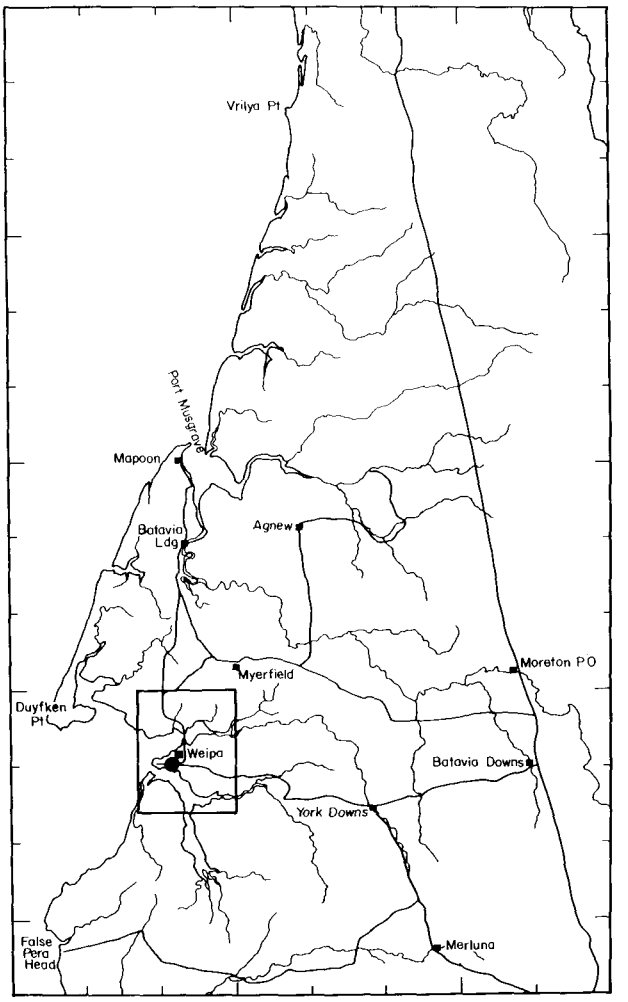
Distribution at Weipa (sites; physiographic units). Not recorded in AM or QNPWS surveys. See Reeders & Morton (1983) for location of specimens recorded in regenerated mine areas; Weipa Plateau.

Geographic range. Northern two thirds of Australia.

Habitat. Specimen from Weipa 'found in areas with grassy ground cover and in a Caribbean pine plantation'. This species is found in a wide variety of habitats from wet coastal forests to the arid interior.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. Nine records in one survey. Only recorded in regenerated mine sites and Reeders & Morton (1983) considered it uncommon



Delma tincta

there.

Seasonality. Recorded by Peter Reeders in April, June and September 1982, but not in December 1981.

Reproduction. Egg-layer; clutch size two. Parchment-shelled eggs with average dimensions of 6 x 13.5 mm. Egg-laying recorded at Townsville in early September.

Notes. Terrestrial. Usually found under rocks and ground debris. Tendency to burrow in sand or loose gravel; one specimen collected by Peter Reeders was found 8 to 10 cm below the surface in loose soil. When disturbed this species may throw its body into a series of springing contortions.

Diet not recorded but other species of *Delma* eat a variety of surface-dwelling invertebrates, particularly insects.

Capable of voluntarily breaking off its tail (autotomy) like all other snake-lizards.

References. Kluge, 1974; Shea, 1987.

Lialis burtonis Gray, 1835
Plate 16

Burton's Snake-lizard

Description. *Moderately large robust legless lizard, very variable in colour and pattern but with a distinctive long, wedge-shaped head ending in a sharply-pointed snout.* Ground colour ranges from pale grey or cream through shades of brown or russet to almost black. Pattern if present, may be one of overall spotting or continuous or interrupted stripes. Often a dark zone along side of head which may be bordered below by narrow white or cream stripe. Below usually heavily pigmented. Scale rows around the body (including the ventrals) 18 to 22. Ventral scales paired. Very small hindlimb flaps. Conspicuous external ear opening.

Size (snout-vent). Maximum 205 mm (male), 266 mm (female) (Weipa); average recorded for species = 170 mm (males), 215 mm (females). Length of original tail 130% of snout-vent length.

Distribution at Weipa (sites; physiographic units). 9% of sites; mainly Weipa Plateau and one site on Mapoon Plain, not recorded by AM on Merluna Plain. QNPWS recorded it on Merluna Plain and specimen collected by Charles Hedley at Mapoon in 1903.

Geographic range. Throughout mainland Australia (with exception of extreme south-west and south-east), and Torres Strait islands; also New Guinea.

Habitat. Open forest, dunefield woodland; also edge of gallery forest (QNPWS) and regeneration (Reeders & Morton, 1983). Occupies wide range of habitats from wet coastal forests to deserts of the interior.

Survey abundance. Common.

Overall abundance. Common. Twenty two records in three surveys and two additional records.

Seasonality. Recorded on five out of six visits, not recorded in February 1979; also recorded in June 1980 and between December 1979 and June 1980, and between July 1977 and January 1978 (M. O'Reilly, *in litt.*).

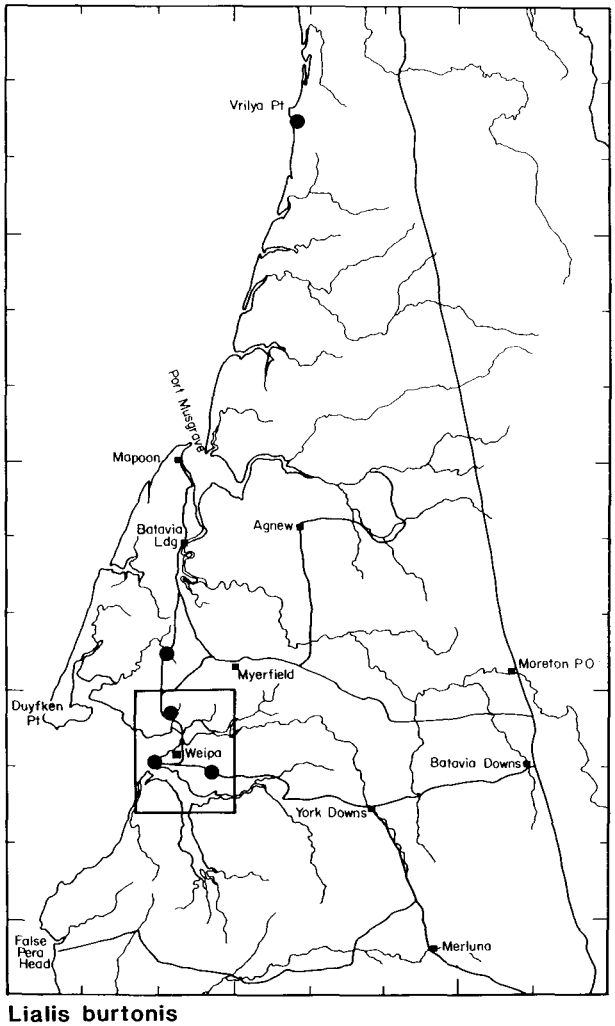
Reproduction. Egg-layer; clutch size two. Eggs elongate and parchment-shelled with average dimensions of 10 x 31 mm. Gravid female recorded in July 1977; egg-laying in southern populations recorded between September and February.

Notes. Sex ratio in a sub-sample of collected adults - 5 males:1 female.

Both diurnal and nocturnal, with peak activity at dusk; three specimens were collected while spotlighting along roads between 1900 and 2100 hours in November 1979. One specimen seen in long dry grass of open forest at Andoom (M. O'Reilly, *in litt.*); usually found in low vegetation or in ground debris.

Diet consists entirely of reptiles, mostly surface-dwelling skink lizards. Very large skinks may be taken and their ingestion is assisted by several snake-like modifications of the head of *Lialis*; these include pointed, recurved, hinged teeth, highly mobile joints between bones of the skull, and a very long skull. *Lialis* is an ambush predator which "...lies motionless under cover and darts out to ambush passing lizards..." (Patchell & Shine, 1986a).

References. Patchell & Shine, 1986a, 1986b.



Lialis burtonis

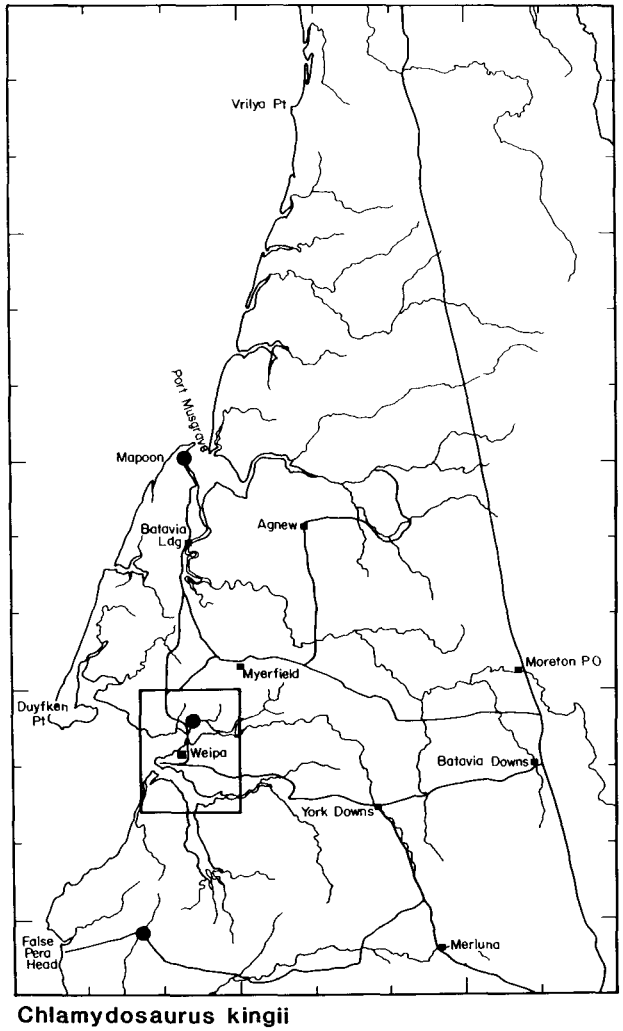
Family AGAMIDAE (Dragon Lizards)

Chlamydosaurus kingii Gray, 1825
Plate 17

Frilled Lizard

Description. *Large greyish arboreal lizard with a large loose 'ruff' of skin around the neck.* Grey to brown or orange-brown or nearly black above, usually with obscure darker brown variegations or mottling on the dorsum and flanks which, when it reaches the tail, often forms irregular crossbands. Sometimes a broad blackish dorsolateral band between forelimbs and hindlimbs, in which individual white or yellow scales form obscure vertical bars. Pattern on lower flanks sometimes a series of large pale ocelli or rhombs. Lips and lower jaw dark brown with numerous pale flecks. Frill yellow to black, often variegated with orange. Off-white or yellowish below, male with pale upper chest but black belly. Terminal portion of tail sometimes blackish. A row of slightly enlarged scales on the neck, but no dorsal crest.

Size (snout-vent). Average recorded for Queensland males = 228 mm, for Queensland females = 197 mm; maximum recorded for species = 300 mm. Tail about twice the length of the snout-vent length.



Chlamydosaurus kingii

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey. QNPWS sighting was in Mission River Scrub (AM site 1); Weipa Plateau only. A specimen from Mapoon donated to the AM by Rev. N. Hey in 1904 and QM holds a specimen from vicinity of North Beagle Camp (AM site 52).

Geographic range. Kimberley district of Western Australia through north Northern Territory to Cape York Peninsula and east Queensland; also south New Guinea.

Habitat. Open forest (QNPWS). Typically occurs in open forest and woodland.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce in the wet season, inactive in the dry season. Two records in two surveys and one additional record.

Seasonality. QNPWS record in February. Inactive in drier (and cooler) months of the year - April to August (Shine & Lambeck, 1989). In Kakadu National Park large numbers of frilled lizards appear within a few hours of the first heavy storms preceding the wet season, and during the wet season, the species is more conspicuous immediately following rainfall than in the intervening drier spells.

Reproduction. Egg-layer; clutch size four to 13 (mean nine) (Shine & Lambeck). Eggs parchment-shelled, about 26 mm long by 16 mm wide. Egg-laying occurs in the wet season between December and February.

Notes. Arboreal, diurnal. Frilled lizards are 'sit and wait' predators which spend 90% of their time clinging to branches of tree but descend to the ground to forage, interact with other lizards, and move to new trees. Insects (primarily caterpillars, ants, termites and beetles) are the major food although a variety of other invertebrates occur in the diet. Plant material and vertebrate fragments occasionally found in stomachs may have been accidentally ingested.

Has impressive threat display in which the ruff or frill is erected and the yellow mouth opened wide. Bipedal locomotion is frequently adopted, both in foraging and when fleeing from disturbance or danger.

References. Shine & Lambeck, 1989.

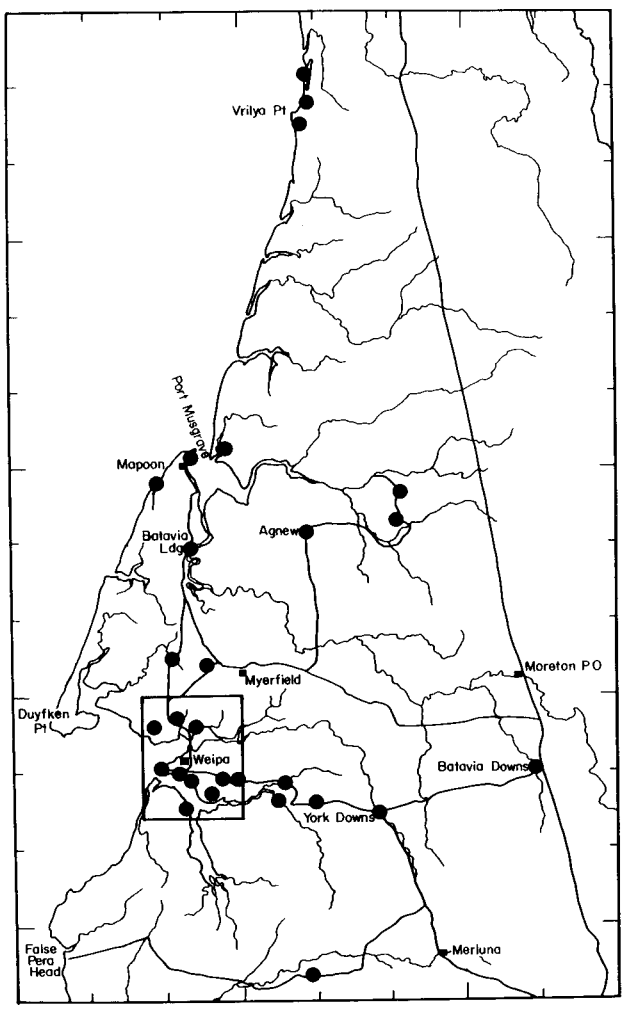
Diporiphora species A
Plates 17,18

A Two-lined Dragon or Tommy Roundhead

[Also referred to in the literature as *Diporiphora bilineata*]

Description. *Small semi-arboreal dragon, rich brown to tan or greyish brown above, uniform or with a more or less conspicuous pattern.* Pattern consists of a grey or pale brown vertebral stripe and a narrow cream to lemon yellow dorsolateral stripe on either side running from nape to one quarter or one third of the way along

the tail. Between dorsolateral and vertebral stripes there may be a series of dark brown to blackish angular blotches which are sometimes confluent across the vertebral stripe but more often slightly displaced on either side of the stripe; these extend onto the basal third of the tail. Dorsal blotches merge on the tail to eventually become a series of obscure bands. Flanks pale brown to blackish with scattered whitish scales. May be a faint cream or grey midlateral stripe running from axilla to groin. Head above grey brown and may have transverse brown markings, especially over the eyes; head of breeding males may be bright brick-red. Adult males with conspicuous black throat and sides of the neck; the pigmented area ends abruptly at level of forelimbs but gular and scapular folds are absent. A less strongly marked dark throat may be present in females. Below greyish or yellowish-white; juveniles and some females with five to six faint narrow grey or brown longitudinal stripes on the venter. Dorsal and ventral scales both strongly keeled, usually one row of more strongly keeled scales within each dorsolateral stripe. Three to five median scales on back of neck with high narrow keels, forming small nuchal crest. Adpressed hindlimb reaches to eye. Hindlimb about 80%, tail about 250% (males), 230% (females) of snout-vent length.



Diporiphora sp. A

Usually two preanal pores on each side but obscure on small individuals.

In the QNPWS and regeneration reports this common Two-lined Dragon has been listed as *Diporiphora bilineata*, a species described from Cobourg Peninsula, Northern Territory. A number of species of *Diporiphora* have been described from Cape York Peninsula, but most of their types have been lost, and most of the descriptions are inadequate; it is difficult therefore to assign names to the two species recorded in our survey until a formal taxonomic revision, involving the designation of appropriate neotypes, has been carried out.

Size (snout-vent). Maximum 73 mm (male); 66 mm (female) (Weipa). Tail length about 250% of snout-vent length.

Distribution at Weipa (sites; physiographic units). 53% of sites; all physiographic units but especially common on Weipa Plateau.

Geographic range. Coast and adjacent hinterland of north and north-east Australia.

Habitat. Open forest, eucalypt woodland, dunefield woodland, paperbark woodland and regeneration.

Survey abundance. Abundant.

Overall abundance. One of the most abundant lizards in the Weipa area. Three hundred and twenty seven records in four surveys.

Seasonality. Recorded on all six visits; also recorded in December 1980.

Reproduction. Egg-layer; clutches of four to five eggs recorded in Weipa specimens. Gravid females recorded in February and November 1979 and December 1980.

Notes. Sex ratio of collected adults - 40 males:28 females.

Diurnal, usually terrestrial but often found basking or displaying on logs or trunks and branches of saplings up to 2 m above the ground in the early morning and late afternoon. Also uses elevated perches to scan for small insects on which it feeds.

An individual of approximate snout-vent length 45 mm was found in the stomach of a Black Whip Snake (*Demansia atra*).

References. Cogger & Lindner, 1974; Frith & Frith, 1987.

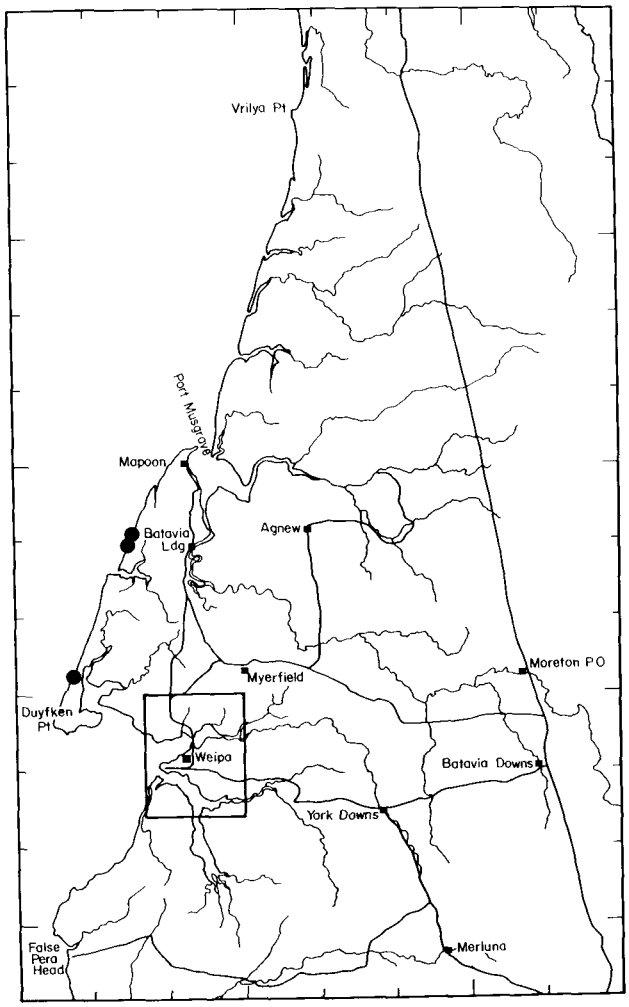
Diporiphora species B
Plates 17,18

A Two-lined Dragon or Tommy Roundhead

Description. *Small terrestrial dragon, pale grey to fawn above, males faintly patterned above, females with a conspicuous pattern.* Pattern consists of a pale grey vertebral stripe and a narrow cream dorsolateral stripe on either side running from nape to one quarter or one third of the way along the tail. Between the dorsolateral and vertebral stripes there is a series of dark brown angular blotches which are sometimes

confluent across the vertebral stripe but more often slightly displaced on either side of the stripe; these extend onto the basal third of the tail. Dorsal blotches merge on the tail to eventually become a series of obscure bands. Flanks pale brown with scattered, sometimes enlarged cream or whitish scales. May be a faint pale midlateral stripe running from axilla to groin which separates the darker flank from the pale unmarked venter. Head above may have transverse brown markings, especially over the eyes. Adult males with conspicuous black patch on the side of the body, commencing immediately behind the scapular fold and extending from axilla up to the level of the dorsolateral stripe; some females with a faint patch. Below immaculate white or pale cream. Dorsal scales faintly keeled, those within the vertebral and dorsolateral stripes slightly larger than the adjacent scales. All ventral scales faintly keeled. Sometimes a few median scales on the back of the neck slightly enlarged but no distinct nuchal or vertebral crest. Gular fold present. Adpressed hindlimb reaches to between ear and eye. Hindlimb about 70%, tail about 230% (males), 200% (females) of snout-vent length. Usually two preanal pores on each side.

Size (snout-vent). 26 mm (unsexed) - 51 mm (male) and 50 mm (female) (Weipa). Tail length of males 2.2 times the snout-vent length, tails of females proportionally shorter.



Diporiphora sp. B

Distribution at Weipa (sites; physiographic units). Only recorded at two sites - beach opposite mouth of Nomenade Creek, 12 km north-north-east of Duyfken Point, and along a 2 km stretch of beach in the vicinity of Flinder's Camp on the coast between Duyfken Point and Cullen Point (about 8 to 10 km north of mouth of Pennefather River); Mapoon Plain only.

Geographic range. Not known.

Habitat. Grassy coastal foredunes.

Survey abundance. Scarce.

Overall abundance. Uncommon. Twenty one specimens in one survey. Its superficial resemblance to *Diporiphora* sp. A may mask the true distribution of this species and explain its apparent absence from other surveys in the Weipa area.

Seasonality. Recorded on two out of six visits, only recorded in February and November 1979, which were the only visits on which that part of the coastline was visited.

Reproduction. Females gravid in February and November 1979. Clutch size two to four. Hatchling present on 5 February 1979.

Notes. Sex ratio of collected adults - 8 males:12 females.

Terrestrial; diurnal. Generally in strand vegetation, amongst prostrate grasses and fallen branches around the base of shrubs and Casuarinas, often just above high-tide mark.

Lophognathus temporalis (Günther, 1867)
Plate 18

Description. *Moderate-sized brown arboreal dragon with distinct crest on neck and very long tail.* Fawn to reddish-brown above, with a broad pale (sometimes lemon-yellow), dorsolateral stripe from nape to base of tail, more distinct anteriorly. This stripe more or less continuous with a broad pale stripe from tip of snout along upper jaw to side of neck. Usually a dark bar between the eye and the ear. Centre of back between stripes, rich brown with a series of blackish bars which become more obscure posteriorly. Top of head flecked and spotted with dark brown. Flanks mottled with paler and darker spots and flecks. Limbs faintly mottled or barred. Throat white to grey. Below whitish, speckled with grey. Scales on the back homogeneous, keeled, with keels forming lines running obliquely to the vertebral ridge. Juveniles and females have a low crest on the necks and males have a very high neck crest plus a vertebral crest posterior to that. Old adults develop characteristically massive jowls. Hindlimb length equal to snout-vent length, tail three times as long as snout-vent length.

Size (snout-vent). Maximum 99 mm (male), 92 mm (female) (Weipa). Average recorded for species = 100

mm; maximum for species about 130 mm. Tail length three times the snout-vent length.

Distribution at Weipa (sites; physiographic units). 19% of sites; all physiographic units, but mostly Mapoon Plain.

Geographic range. Coastal areas of north Australia from east Kimberleys to west Gulf of Carpentaria, and north Cape York Peninsula; also south New Guinea.

Habitat. Open forest, eucalypt woodland, dunefield woodland, paperbark woodland, gallery forest, i.e., all forest and woodland habitats, especially in vegetation bordering swamps and creeks; also deciduous vine thicket (QNPWS).

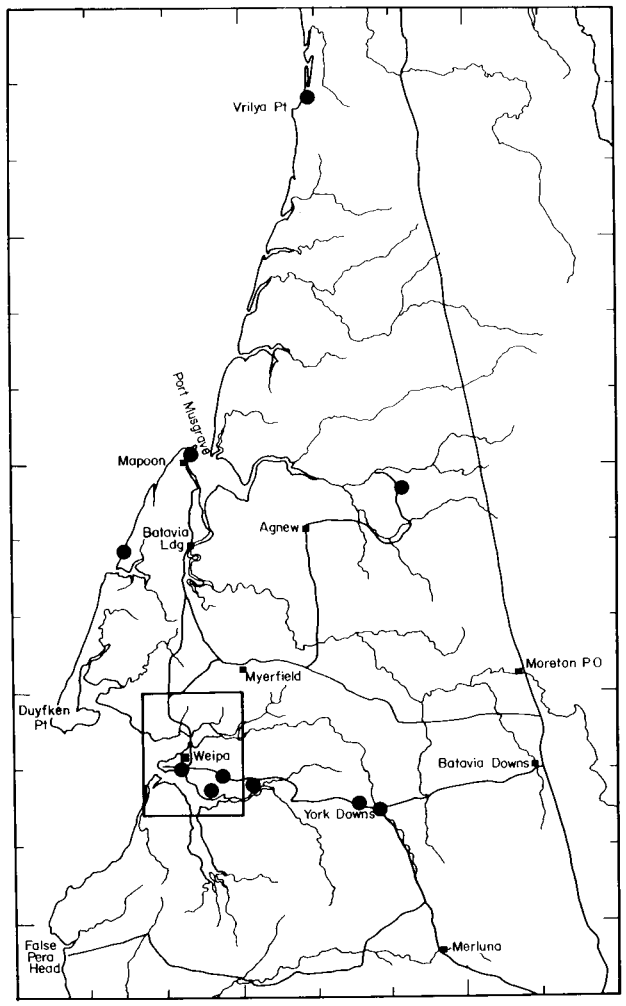
Survey abundance. Common.

Overall abundance. Common. Eighteen records in two surveys and one additional record.

Seasonality. Recorded on all six visits; also recorded in December 1980 and in October 1977 (photographed by Peter Reeders in swamp woodland near Pennefather River).

Reproduction. Very small individual recorded in February 1979.

Breeding season of this species has not been determined but it is probably the wet season because reproductive males have been recorded in September and a female with oviducal eggs in October, whilst non-reproductive males have been recorded in April, July and August.



Lophognathus temporalis

Notes. Sex ratio of collected adults - 3 males:2 females.

Swift-running arboreal diurnal lizard usually found in trees or shrubs or among rocks or ground debris along watercourses. If disturbed on the ground usually seeks refuge by climbing a tree. North of Vrilya Point, at site 28, several juveniles found at night sleeping on low branches in swamp woodland.

Green tree ants (*Oecophylla smaragdina*) are recorded in the diet of this species. It has been observed feeding on dry mud-flats exposed by receding water towards the end of the dry season.

References. Cogger & Lindner, 1974; James & Shine, 1985.

Family VARANIDAE (Goannas or Monitor Lizards)

Varanus indicus (Daudin, 1802)
Plate 19

Mangrove Monitor

Description. *Moderate-sized very dark goanna with small pale flecks and spots, usually encountered in mangroves.* Dark purplish-brown to black above with numerous scattered small flecks and spots of cream, yellow or yellow-green. White or cream below. Tail strongly compressed with a moderate median dorsal keel. Tail length 1.4 to 1.8 times the snout-vent length.

Size (snout-vent). Maximum recorded for species = 1 m. Tail 1.4 to 1.8 times the snout-vent length.

Distribution at Weipa (sites; physiographic units). None recorded in AM surveys, one individual caught in headwaters of Pennefather River and kept for a month by Peter Reeders, between 1979 and 1980. Also Pine River Bay, Embley River and Vrilya Point (QNPWS). Described by employee at Comalco power house as inhabiting mangroves round Albatross Bay; Mapoon Plain only.

Geographic range. Rainforest and coastal mangrove habitats of Arnhem Land, east Cape York Peninsula and islands of Torres Strait; also New Guinea and other parts of Indo-Papuan Archipelago.

Habitat. Mangroves and vine forest beside watercourse fringed with sword grass (QNPWS). Typically found in rain forest, gallery forest and coastal mangroves.

Survey abundance. Not recorded in AM survey.

Overall abundance. Uncommon. Four records in one survey and two additional records.

Seasonality. Recorded by QNPWS in February and August 1981.

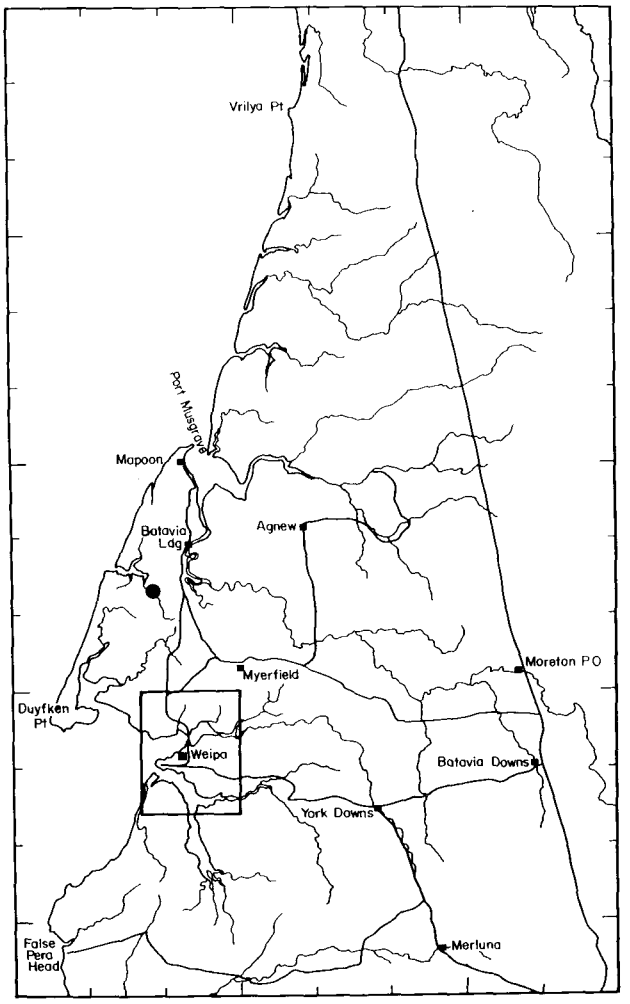
Reproduction. Lays parchment-shelled eggs; a clutch

of eight eggs has been recorded.

Notes. Forages for insects, fishes, lizards (particularly skinks) and birds and mammals, around forest streams and mangroves. In Guam was recorded feeding on giant snails, slugs, hermit crabs and earthworms as well as arthropods, skinks, geckoes, worm snakes and reptile and bird eggs (Dryden, 1965). Dryden recorded *V. indicus* eating *Bufo marinus* with the subsequent death of prey and predator. Three individuals were caught by QNPWS in baited mammal traps.

Diurnally active; semi-arboreal and semi-aquatic. Usually takes to the water when alarmed. Has been observed exploring cracks in a rock-face 1 m beneath the water's surface, and may remain submerged for several minutes at least.

References. Dryden, 1965; Losos & Greene, 1988.



Varanus indicus

Varanus panoptes panoptes Storr, 1980
Plate 19

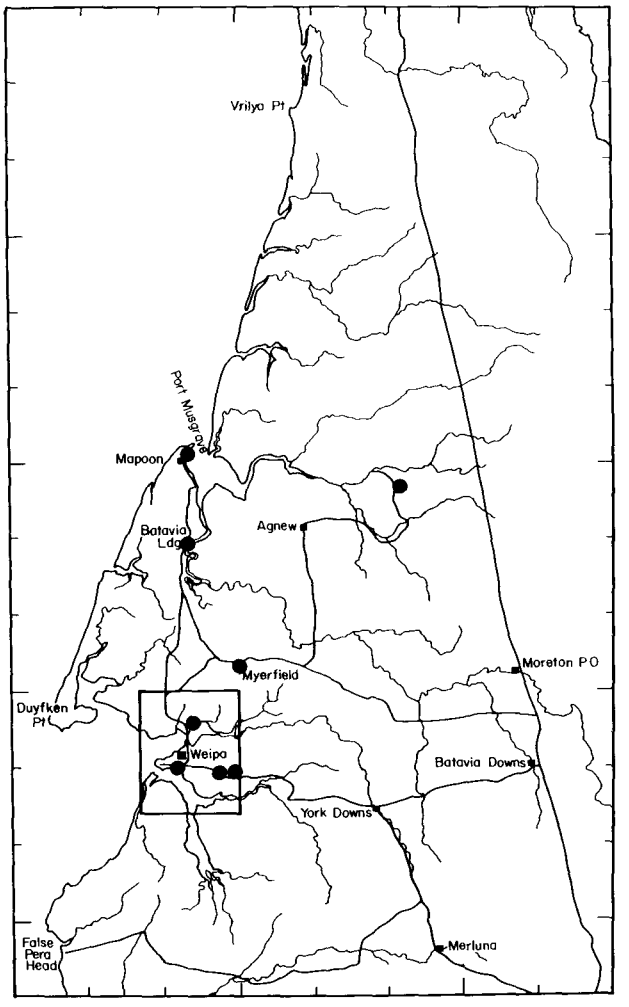
Description. *Large cream and dark brown terrestrial goanna with two dark streaks running along side of head, tail tip pale with dark bands, and rows of dark spots on throat and venter.* Dark brown to reddish-brown above, usually with a dorsal pattern consisting of alternating transverse rows of pale, small spots and large, dark spots, this pattern extending onto the basal portion of the tail. Limbs above with numerous pale spots. A white-edged, dark temporal stripe and another pale-edged dark streak along the upper lip. End of tail pale, with darker bands. White or cream below with small dark spots in transverse rows aligned with the dark spots on the back. Tail strongly laterally compressed, 1.5 to 1.8 times the snout-vent length. Similar in general size and build to *Varanus gouldii* from which it differs conspicuously only by having transverse rows of dark spots on the venter and alternating dark and pale bands on the tail tip (tail tip plain cream or yellow in *V. gouldii*).

Size (snout-vent). 178-220 mm (male) (Weipa). Maximum recorded for species in north Australia (Shine, 1986) = 670 mm (males), 430 mm (females). Males average three times the body weight of females.

Distribution at Weipa (sites; physiographic units). 15% of sites; all physiographic units.

Geographic range. North Australia from Kimberleys to Cape York Peninsula and arid interior of Queensland; also south New Guinea.

Habitat. Open forest, dunefield woodland and grassy foredunes, vine forest, urban (generation shed at Lorim



Varanus panoptes

Point); also eucalypt woodland, paperbark woodland and gallery forest (QNPWS) and regeneration (Reeders & Morton, 1983). In the vicinity of Jabiru, NT, this species was most commonly recorded on the flood plains along the banks of billabongs, and less commonly, in woodland close to bodies of water (Shine 1986).

Survey abundance. Common.

Overall abundance. Common. Thirty two records in four surveys and three additional records.

Seasonality. Recorded on all six visits; also recorded between July and October 1977 (juvenile about 250 mm brought in by cat - M. O'Reilly, photo).

Reproduction. Egg-layer; clutch size three to 11. Eggs parchment-shelled. Females in north Australia lay eggs in the wet season, sometimes in termite mounds.

Notes. Both specimens collected were males.

This species is superficially very similar in appearance to *Varanus gouldii*, which is also recorded from Cape York Peninsula; sightings of large terrestrial *Varanus* during the Weipa survey may have included the latter species, because *panoptes* was only recognised as a separate species in 1980. In future surveys, care should be taken when identifying *Varanus* from sight records, to check the diagnostic features.

Terrestrial diurnal species with a very large home range. Shelters in hollow logs or burrows which it may excavate itself.

Large specimens raise themselves on a 'tripod' formed by hind legs and tail to obtain a view of their surroundings or when on the defensive. This posture may change to an aggressive one in which the back is arched, the neck inflated and air is expelled rapidly in a loud 'hiss'.

Capable of inflicting painful bite with sharp teeth and the wound is susceptible to infection because of the carrion-eating habits of this species. May also lash out in defence with its long heavy tail.

Diet includes arthropods (particularly orthopterans and caterpillars) frogs, reptiles, birds, mammals and carrion; reptiles taken include *Ctenotus*, *Carlia* and *Glaphyromorphus* species of skinks and *Diporiphora* dragons and Frilled Lizards. Mammal prey includes *Mus musculus* and *Isoodon* sp. The eggs of reptiles and birds are also eaten. Large individual found in fruit bat colony near north Alice River (site 35) with blood around its mouth; it was almost certainly preying on bats.

Obtains some food by digging. Often forages on beaches; two *Varanus panoptes* were seen feeding on flotsam at high tide mark between Janie Creek and Pennefather River on 18 April 1982 (M. Godwin, *in litt.*).

References. Shine, 1986a; Storr, 1980.

Varanus semiremex Peters, 1869
Plate 19

Rusty Monitor

Description. *Moderate-sized dark greyish-brown goanna with well-defined pattern of spots.* Dark grey-brown above with numerous blackish and reddish spots circled with white to form ocelli arranged more or less in rows around the body. Tail round in section at the base but the distal two thirds laterally compressed. Tail about 1.4 to 1.6 times the snout-vent length.

Size (snout-vent). 215-270 mm (male), -250 mm (female) (Weipa); tail length 1.4 to 1.6 times the snout-vent length. Average total length recorded for species = 600 mm.

Distribution at Weipa (sites; physiographic units). 6% of sites - Andoom Top Camp, Beening Creek and Rocky Point - semi-aquatic habitats; Mapoon Plain and Weipa Plateau. QNPWS also recorded this species at York Downs on the Merluna Plain and in the Embley River.

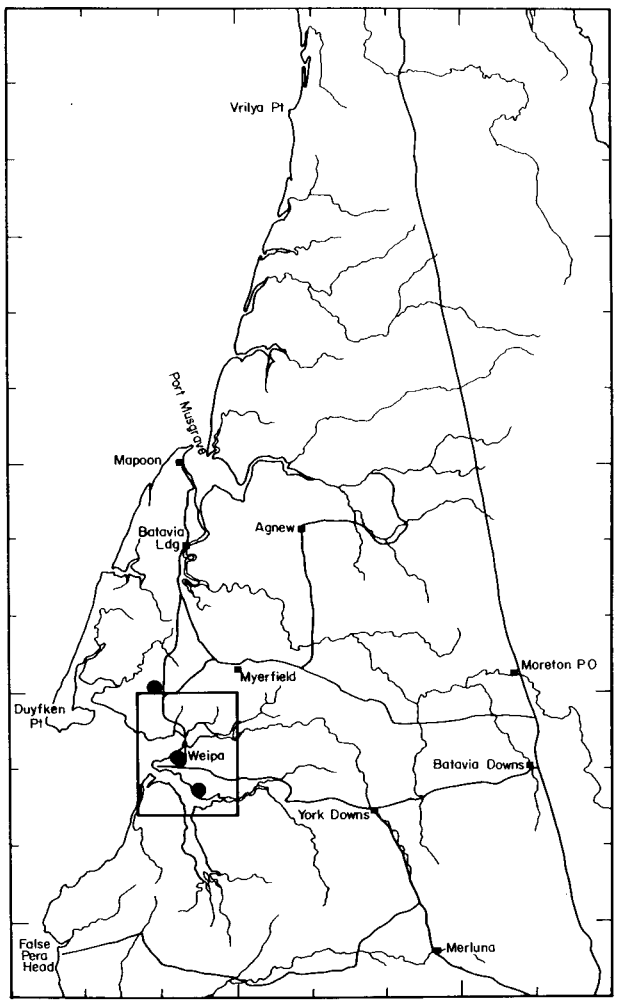
Geographic range. North Cape York Peninsula and east coast of Queensland as far south as Fraser Island.

Habitat. Paperbark woodland and mangroves (Peter Reeders); also open forest and gallery forest (QNPWS).

Survey abundance. Scarce.

Overall abundance. Scarce; recorded only in the wet and early dry season. Two records in one survey and eight additional records.

Seasonality. Seasonal, seen and collected by Peter Reeders only between 21 and 28 March 1981, in early



Varanus semiremex

April 1980 and June 1980. Searched for, but not seen, at Andoom Top Camp Swamp in July 1980 and July 1982. One specimen found dead on road near Single Persons' Quarters in June 1980, by Paul Harvey. QNPWS recorded it in February and May.

Reproduction. No gravid females collected.

Notes. Sex ratio of collected adults - 4 males:2 females.

Commonly lives in holes in trees in mangroves and around freshwater swamps and streams. In March 1981 six Rusty Monitors were caught by Peter Reeders in two hours at Andoom Top Camp; they were all basking on Melaleucas in a swamp.

Feeds on fishes, crabs, insects frogs and lizards (including geckos).

Ritual combat between adult males of this species has been observed between August and early October.

Distinguished from *Varanus timorensis* by shape of tail which distally, is laterally compressed.

References. Dunson, 1974; Horn, 1985; Polleck, 1982.

Varanus timorensis (Gray, 1831)
Plate 20

Spotted Tree Monitor

[Also appears in the literature as *Varanus scalaris*]

Description. *Moderate-sized greyish goanna with strong pattern of dark-centred pale spots, and a round tail.* Colour pattern very variable, but usually grey to black above with a series of white or yellowish flecks and spots, often forming dark-centred ocelli which may form a network or transverse rows. Usually a black temporal stripe edged below with white. Limbs spotted with white or cream. Tail grey to black with rings of white scales. Tail more or less circular in cross-section, about 1.5 times the snout-vent length.

Size (snout-vent). 150 mm (unsexed) - 240 mm (male) and 185 mm (female) (Weipa); tail length about 1.5 times the snout-vent length. Average total length recorded for species = 600 mm.

Distribution at Weipa (sites; physiographic units). 9% of sites, mostly close to coast or along watercourses; Weipa Plateau and Mapoon Plain.

Geographic range. North Australia, from Kimberleys to central Queensland coast; also in Timor and south New Guinea.

Habitat. Open forest, paperbark woodland; also eucalypt woodland and dunefield woodland (QNPWS) and regeneration (Reeders & Morton, 1983).

Survey abundance. Common.

Overall abundance. Common. Twenty seven records in four surveys.

Seasonality. Recorded on four out of six visits, not recorded in July 1977 or July 1980.

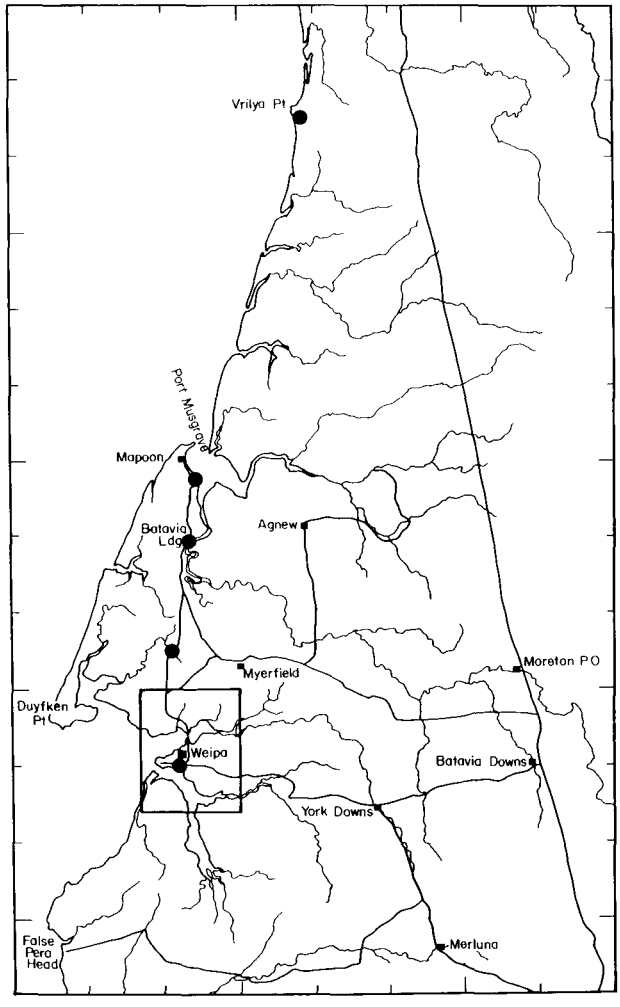
Reproduction. Clutch size five to seven; parchment-shelled eggs.

Notes. Sex ratio of collected adults - 3 males:1 female.

Arboreal, usually seen basking or foraging high up on trunks and branches of trees, from which it may descend to feed on insects (including orthopterans) and lizards (including skinks) on the ground. QNPWS collected one in a baited break-back trap on the ground at the edge of a swamp, and Reeders & Morton (1983) collected one in an Elliott trap in regeneration. QNPWS and BERS recorded this species in the guts of four feral cats.

Fairly elaborate courtships behaviour has been observed, and males have a ritualised threat display.

References. Horn, 1985; Losos & Greene, 1988.



Varanus timorensis

Family SCINCIDAE (Skinks)

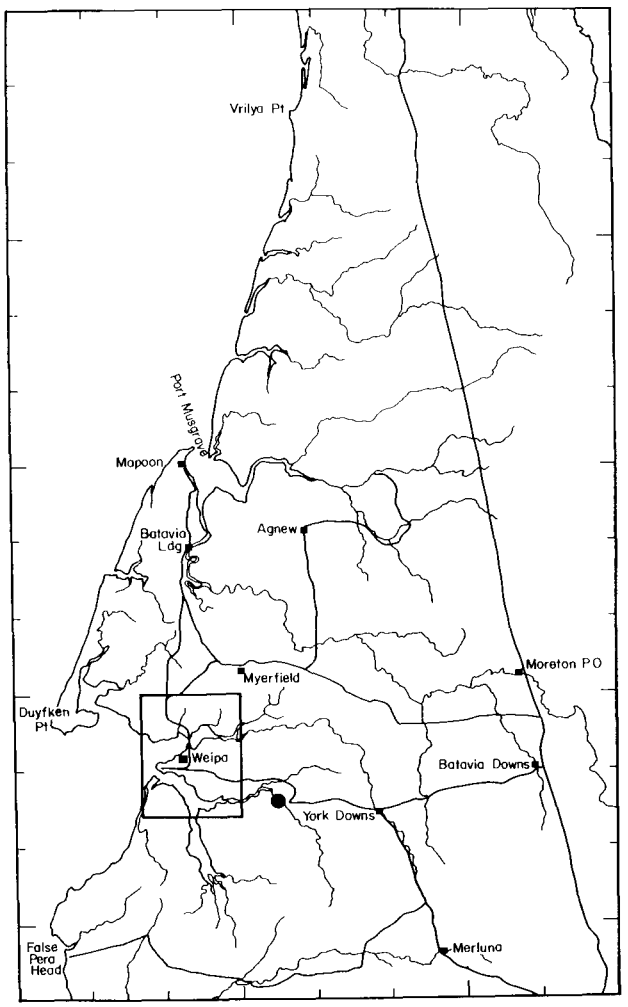
Carlia jarnoldae Covacevich & Ingram, 1975
Plate 20

Description. *Small terrestrial skink with strong sexual dimorphism - breeding males with a striking colour pattern.* Breeding males brown above with four to six narrow black stripes (sometimes broken)

from nape to base of tail; broad black upper lateral zone commencing in front of eye and continuing back to base of tail. On the body this zone contains scattered small blue spots and is bordered below by a broad reddish-orange midlateral stripe. Lips and throat pale green with a series of black striations on the side of the throat. Limbs reddish-brown speckled with dark brown. Cream below. Females dark brown above, pale coppery-brown on the head; back uniform with scattered black and white flecks tending to form longitudinal series. Brilliant white midlateral stripe running from the lips to the groin, bordered above by a broad black stripe and below by an indefinite black stripe. Limbs above same colour as back, below whitish. Ear-opening horizontally elliptic, smaller than clear disc in lower eyelid and usually with a small pointed lobule anteriorly. Scales on back six-sided, moderately ridged by three longitudinal keels.

Size (snout-vent). Average recorded for species = 40 mm; maximum for species = 49 mm.

Distribution at Weipa (sites; physiographic units). Recorded at only one site - near landing site for Old Weipa Mission on Embley River; Mapoon Plain. This species was common east of the Peninsula Road, on the track to Iron Range, particularly at the Pascoe River crossing, in July 1980.



Carlia jarnoldae

Geographic range. North-east Queensland (Weipa is at the northern limit of its range).

Habitat. Eucalypt woodland; "...grassy areas in woodland, open forest and rock ridges. Also rocky dry beds and banks of creeks..." (Ingram & Covacevich, 1989).

Survey abundance. Scarce.

Overall abundance. Scarce. One record in one survey. However, this species was not uncommon east of the Peninsula Road (see above).

Seasonality. Recorded on only one visit - February 1979.

Reproduction. Egg-layer; clutch size two. Male recorded in February was in breeding colours, which are evident between July and April and may persist longer. Hatchlings recorded in May (Wilson & Knowles, 1988).

Notes. Single record was a male.

Terrestrial; diurnal species that basks in sun.

References. Ingram & Covacevich, 1989; Wilson & Knowles, 1988.

Carlia longipes (Macleay, 1877)
Plate 21

[Some data previously published under this name may apply to *Carlia rostralis* (for example, Wilhoft & Reiter, 1965)]

Description. *Moderate-sized brown terrestrial skink with reddish sides.* Pale to rich brown above, sometimes with broad blackish lateral zone enclosing series of white or yellow spots, at least anteriorly. Head usually paler and more bronzy than the body; usually some scattered darker and paler flecks on back. Flanks reddish-brown in adults. In juveniles and subadults, typically a broad blackish upper zone from eye to groin, bordered above by an obscure narrow pale dorsolateral stripe and below by a white midlateral stripe from below the eye to the groin. Lower flanks with white dots or flecks. Whitish below. Tail pale brown. Ear-opening circular or vertically elliptic, about same size as clear disc in lower eyelid, with one or more pointed lobules, sometimes surrounding the ear. Scales on the back four-sided, smooth or faintly keeled.

Size (snout-vent). 22 mm (unsexed) - 58 mm (male) and 62 mm (female) (Weipa); average recorded for species = 50 mm; maximum for species = 65 mm.

Distribution at Weipa (sites; physiographic units). 81% of sites; all physiographic units, occurring throughout the survey area.

Geographic range. North-east Northern Territory and north-east Queensland and islands of Torres Strait; also south New Guinea.

Habitat. All terrestrial habitats but not mangroves. This was the only *Carlia* species common in vine

thicket.

Survey abundance. Abundant.

Overall abundance. The most abundant and widespread lizard in the Weipa area. Four hundred and seventy one records in four surveys and one additional record.

Seasonality. Recorded on all six visits; also recorded in December 1980.

Reproduction. Egg-layer; clutch size two (rarely one) and eggs with average length of 10.5 mm. Breeds in the wet season, reaching peak of activity in December to January; gravid females recorded in February and November 1979 and males with large testes recorded in July 1977 and November 1979.

Notes. Sex ratio of subsample of collected adults - 12 males:13 females.

Terrestrial; diurnal species that basks in sun. Forages amongst leaf litter and active in the littoral zone at Red Beach.

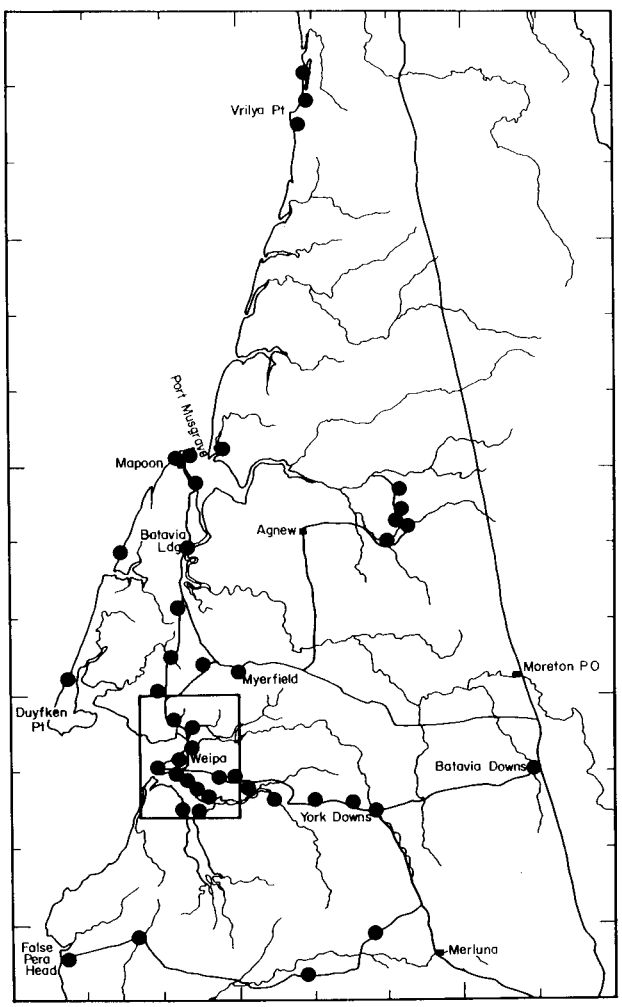
Guts of 22 animals examined; identifiable prey included small snails, grasshopper and beetles as well as one lizard egg 14.5 mm long, and the tail and legs of a skink. (A specimen collected in Torres Strait in July 1977 regurgitated a *Cryptoblepharus virgatus*).

References. Ingram & Covacevich, 1989.

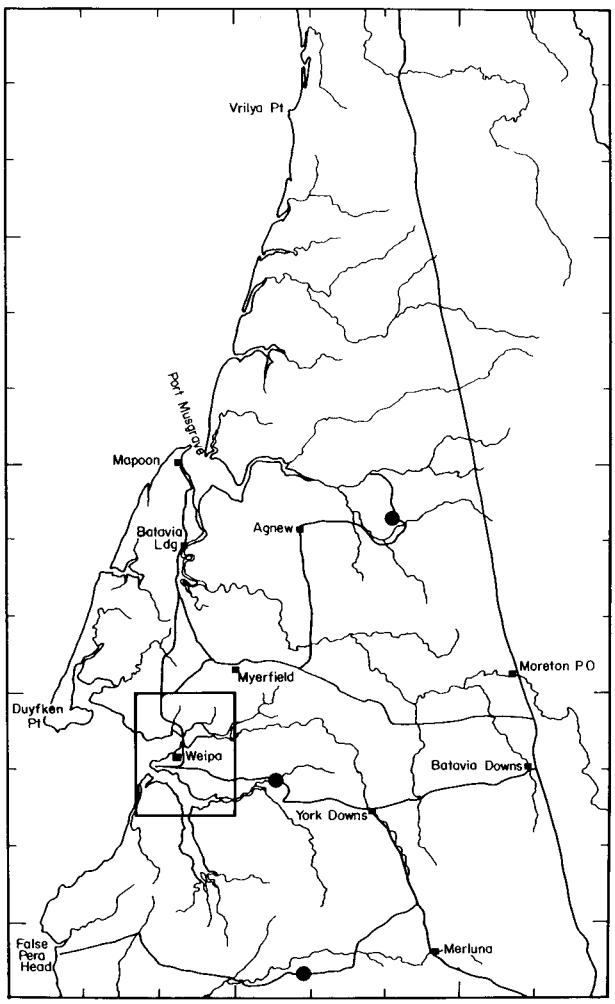
Carlia munda (de Vis, 1885)
Plate 21

[Also appears in the literature as *Carlia foliorum* and *Carlia melanopogon*]

Description. *Small brown terrestrial skink with dark and light flecks on the back, fairly smooth scales and a white stripe along side of body.* Very variable in colour, from pale grey to olive or dark grey-brown above, dotted or flecked with black and pale brown or white. Narrow white stripe from below eye to the top of the ear, continued from bottom of the ear to form a midlateral stripe which may extend to the groin but usually ends on the anterior part of the body. This stripe usually bordered above by a broader blackish upper lateral zone, at least anteriorly, and sometimes a faint pale dorsolateral stripe occurs above the dark stripe. Whitish below; breeding males have a bluish-grey to blackish throat and chest (the scales often with black margins) and a red upper lateral zone. Ear opening horizontally elliptic, much smaller than clear disc in lower eyelid, and with one or two small lobules anteriorly. Scales on the back four-sided, smooth to faintly ridged by three slightly raised



Carlia longipes



Carlia munda

longitudinal keels.

Size (snout-vent). 28-37 mm (male) (Weipa); average recorded for species = 35 mm; maximum for species = 44 mm.

Distribution at Weipa (sites; physiographic units). 6% of sites - near Ducie River crossing, at Marmoss Creek and east of Watson River crossing; only Merluna Plain.

Geographic range. Northern half of Western Australia and the Northern Territory, and north and east Queensland (Weipa is at the northern limit of its range in Queensland).

Habitat. Eucalypt woodland only, very restricted distribution; appears to be associated in particular with woodland on yellow earths, which was also the most common habitat of *Cryptoblepharus plagiocephalus* in the survey. In Arnhem Land recorded in woodland, open forest and monsoon forest (James *et al.*, 1984); Storr *in* Ingram & Covacevich (1989) noted that it was "...also a dry site/dry country species..." in Western Australia.

Survey abundance. Scarce.

Overall abundance. Uncommon. Eight records in three surveys.

Seasonality. Recorded only on two visits - September 1981 and June 1982.

Reproduction. Egg-layer; clutch size two and females may lay more than one clutch per season. Egg-laying recorded in Arnhem Land in March and April and males were reproductive from November to March (James & Shine, 1985).

Notes. Sex ratio of collected adults - 4 males:1 female.

Terrestrial; diurnally active species that is most common in open and grassy sites such as hilltops and clearings in woodland. Basks in the morning on the ground or occasionally on tree trunks up to 30 cm above the ground. May run long distances when disturbed, to shelter under logs, leaf litter and broken termitaria. Has also been found in grass along the foreshore in the Gulf of Carpentaria (Greer, 1975).

References. Edgar, 1987; Greer, 1975; Ingram & Covacevich, 1989; James *et al.*, 1984; James & Shine, 1985.

Carlia storri Ingram & Covacevich, 1989
Plate 21

[Also appears in the literature as *Carlia bicarinata*, a species restricted to south-east Papua New Guinea by Ingram & Covacevich, 1989]

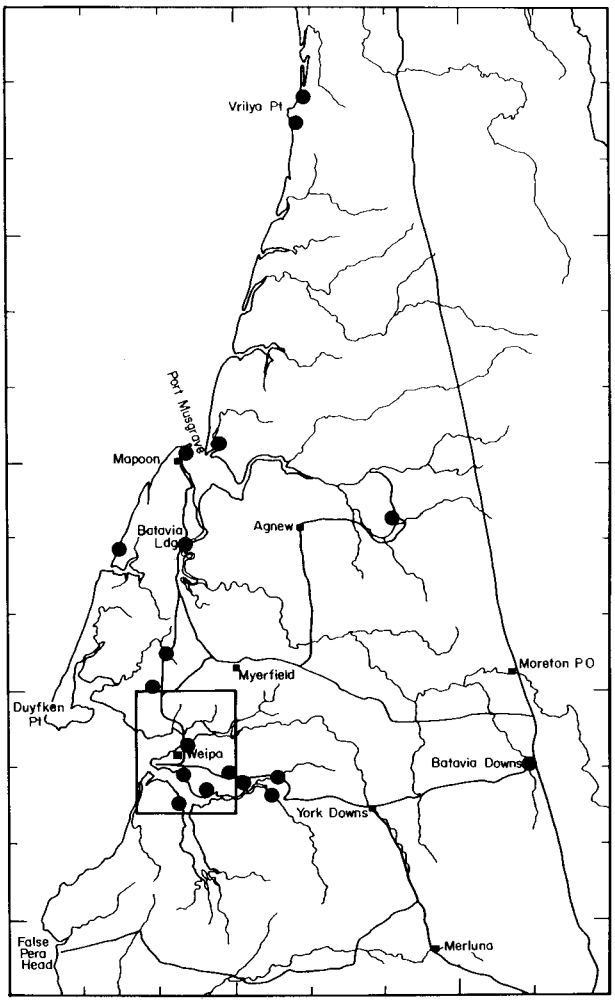
Description. *Small brown terrestrial skink with strongly keeled scales which make the back look dull and rather rough.* Brown or pale olive-brown above. Males uniform or dotted above with dark brown, sometimes with a narrow whitish dorsolateral stripe from above the eye to the tail. Females with a narrow pale brown vertebral stripe, a white or cream dorsolateral stripe and a white or cream midlateral stripe from ear to groin. Lower flanks, neck, lips and ventral surfaces white or cream. Limbs above pale brown flecked with dark brown. Breeding males flushed with dull orange. Ear-opening circular or vertically elliptic, about same size as clear disc in lower eyelid, and surrounded by small pointed lobules. Scales on back six-sided, strongly ridged by two longitudinal keels.

Size (snout-vent). 20 mm (unsexed) - 46 mm (male) and 43 mm (female) (Weipa); average recorded for species = 40 mm; maximum for species = 46 mm.

Distribution at Weipa (sites; physiographic units). 36% of sites; all three physiographic units.

Geographic range. North-east Queensland, including islands of Torres Strait; also south-west Papua New Guinea.

Habitat. Open forest, eucalypt woodland, dunefield woodland, paperbark woodland, grassland/sedgeland; also on the edge of vine forest and vine thicket (QNPWS) and regeneration (Reeders & Morton, 1983). On Weipa Plateau and Merluna Plain, appears to be restricted to vicinity of watercourses or swamps (ie seasonally inundated areas). Ingram & Covacevich (1989) noted it occurs in "...lowlands, grassy areas in open-forest, woodland and



Carlia storri

sea shores...".

Survey abundance. Common.

Overall abundance. Common. Eighty records in four surveys and three additional records.

Seasonality. Recorded on all six visits; also recorded in December 1980.

Reproduction. Egg-layer. Clutch size two, eggs about 9.5 mm long. Breeds in the wet season and early dry; gravid females recorded in February and November 1979 and December 1980, and male with large testes in February 1979.

Notes. Sex ratio of sub-sample of adults - 13 males:8 females.

Terrestrial; diurnal species that basks in sun; active until dusk in the wet season.

Usually found amongst grass clumps rather than in leaf litter; at Sunrise Creek it was more or less confined to the grassy creek bed and banks, while *Carlia longipes* occurred also in forest and woodland habitats.

An individual found in the stomach of a Freshwater Snake (*Tropidonophis mairii*).

AM R94579-82, R94583-84, R95888-91, R97095-96 karyotyped by Steve Donnellan *et al.*

References. Ingram & Covacevich, 1989.

Carlia vivax (de Vis, 1884)

Description. *Small brown terrestrial skink with strongly keeled scales which make the back look dull and rather rough.* Brown above, head paler bronzy-brown. Series of pale brown spots or flecks on the back, sometimes black-edged, sometimes tending to form longitudinal series. Usually a pale dorsolateral stripe from shoulder to base of tail. Narrow cream or white midlateral stripe from in front of eye through ear to tail. Whitish to pale bluish below. Breeding males uniform brown or with black flecks above, flanks with a poorly to well-defined pinkish stripe. Ear-opening vertically elliptic, smaller than clear disc in lower eyelid, and with one to two lobules anteriorly. Scales on back six-sided and strongly-ridged by two longitudinal keels.

Size (snout-vent). 33-36 mm (subadult male) (Weipa); average recorded for species = 40 mm; maximum for species = 47 mm.

Distribution at Weipa (sites; physiographic units). Only collected at one site - near Watson River crossing on track to False Pera Head; Merluna Plain only.

Geographic range. North and east Queensland including southern islands of Torres Strait, south to Hunter River valley, New South Wales.

Habitat. Eucalypt woodland; "...grassy areas in open forest, woodland, and agricultural areas. Mostly lowlands..." (Ingram & Covacevich, 1989).

Survey abundance. Scarce.

Overall abundance. Scarce. Four records in two surveys.

Seasonality. Recorded on only one visit - July 1982.

Reproduction. Egg-layer; clutch size two.

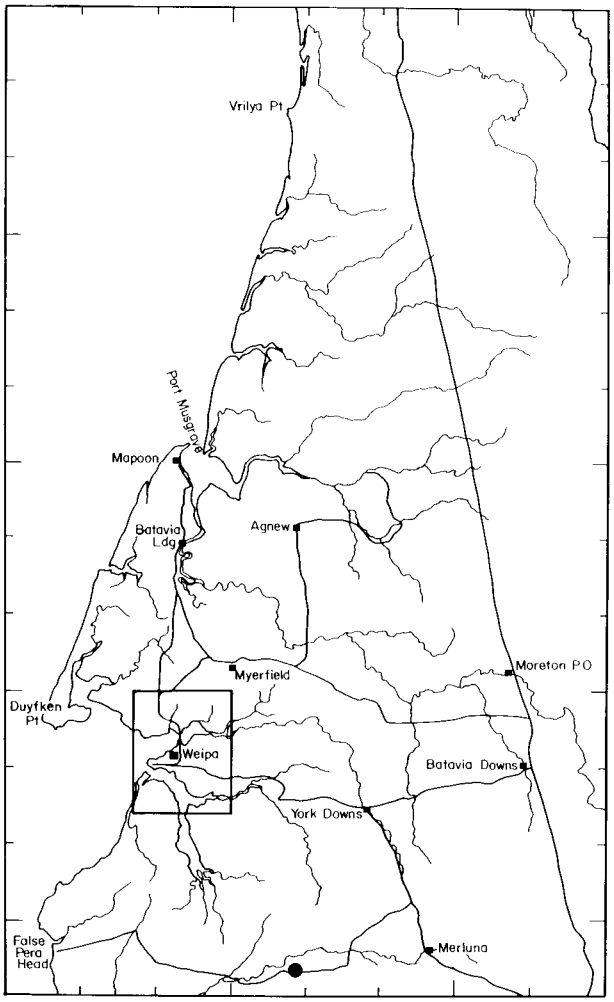
Notes. The two specimens collected were both subadult males.

Syntopic with *Carlia munda* and *C. longipes*.

Terrestrial; diurnal species that basks in sun.

Feeds on insects which it may catch by climbing grass and other low vegetation.

References. Dale, 1973; Ingram & Covacevich, 1989.



Carlia vivax

Cryptoblepharus plagiocephalus (Cocteau, 1836)

Plate 22

Description. *Small greyish-brown arboreal skink.* Brownish or greyish above, usually with some indication of a narrow, ragged-edged pale dorsolateral stripe or zone from above eye to tail; this stripe usually bordered above by an irregular series of dark spots or blotches which rarely coalesce to form a very ragged dark stripe; mid-dorsal region and limbs flecked, spotted or striated with white and dark brown; a dark upper lateral zone with scattered paler and darker dots and spots; ventral surfaces whitish or pale metallic blue; lower surfaces of hands and feet brownish.

Size (snout-vent). Maximum = 43 mm (male), 43 mm (female) (Weipa); average recorded for species = 45 mm.

Distribution at Weipa (sites; physiographic units).

6% of sites - at Ducie River crossing, Marmoss Creek and Running Creek; Merluna Plain and Mapoon Plain.

Geographic range. Throughout continental Australia, with exception of south and east coasts and their hinterlands.

Habitat. Eucalypt woodland, gallery forest; in Weipa district appears to be associated in particular with eucalypt woodland on yellow earths and ferruginous laterites, which was also the principal habitat for *Carlia munda*. In the Alligator Rivers Region of the Northern Territory this species was collected in woodland and in open, gallery and closed forests; it was common on the trunks of *Melaleuca viridiflora* along creek channels and forests fringing billabongs (James *et al.*, 1984).

Survey abundance. Scarce.

Overall abundance. Scarce. Three records in two surveys.

Seasonality. Recorded on three out of six visits, not recorded in July 1977, November 1979 or July 1980.

Reproduction. Egg-layer; clutch size two (rarely one). Gravid female collected in June 1982. In Alligator Rivers Region reproductive males and females were recorded at most times of the year (James & Shine, 1985).

Notes. Arboreal and terrestrial, diurnal. Most abundant on trees with fissured bark, such as bloodwoods, in which the lizards can seek shelter.

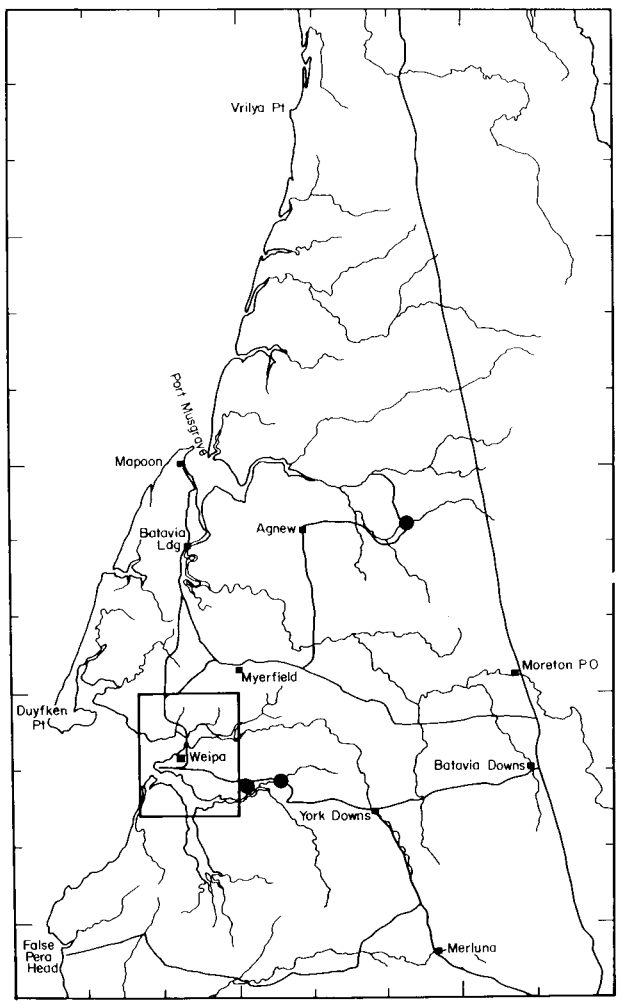
The diet of lizards in the Alligator Rivers Region contained up to 13% of insects of aquatic origin, including mosquitoes, midges, mayflies and water bugs (James *et al.*, 1984).

References. Edgar, 1987; James *et al.*, 1984; James & Shine, 1985.

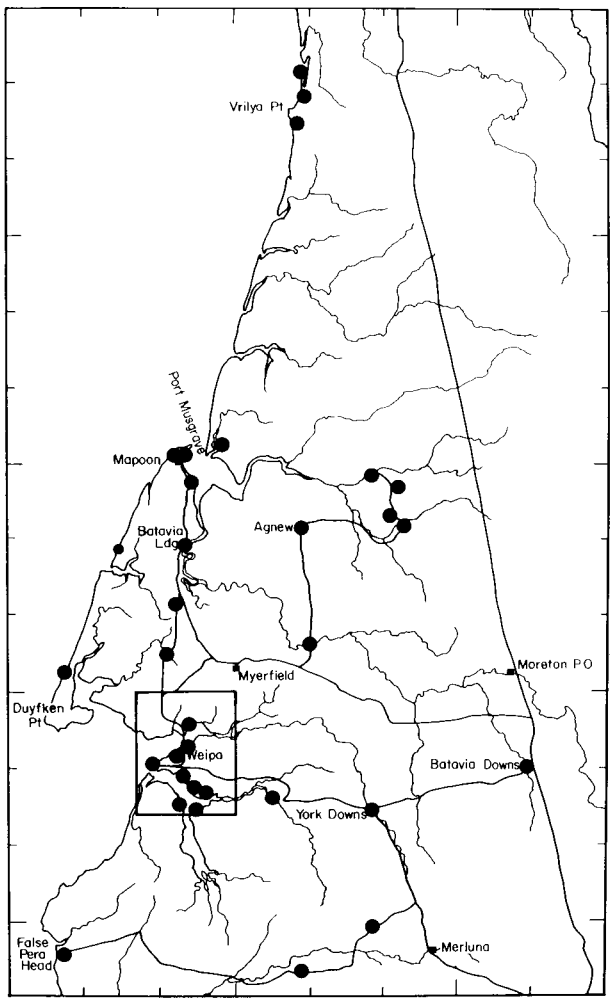
Cryptoblepharus virgatus (Garman, 1901)
Plate 22

Fence Skink

Description. *Small silvery-grey arboreal skink.* Silver-grey to pale brown above, with a conspicuous white, cream or silvery dorsolateral stripe from above eye to base of tail; this stripe is bordered above by a distinctive black stripe and below by a broad dark-grey or brown upper lateral zone (becoming paler ventrally) which commences as a stripe from the nostril and contains numerous pale dots and spots. Top of head coppery. Ventral surfaces white or pale metallic blue;



Cryptoblepharus plagiocephalus



Cryptoblepharus virgatus

lower surfaces of hands and feet whitish.

Size (snout-vent). Maximum = 38 mm (male), 40 mm (female) (Weipa); average recorded for species = 40 mm.

Distribution at Weipa (sites; physiographic units). 64% of sites, distributed throughout the survey area, common around Weipa; all physiographic units.

Geographic range. Far south and east Australia and islands of Torres Strait.

Habitat. Open forest, eucalypt woodland, dunefield woodland and grassy foredunes, paperbark woodland, gallery forest, mangroves, urban (i.e., absent only from vine forest and grass/sedgeland); also regeneration (Reeders & Morton, 1983).

Survey abundance. Abundant.

Overall abundance. Abundant. One hundred and eight records in four surveys.

Seasonality. Recorded on all six visits.

Reproduction. Egg-layer; clutch size two and eggs with average length of 10 mm. Gravid females recorded in July 1977, February and November 1979, July 1980 and September 1981, suggesting it is an aseasonal breeder similar to *C. plagiocephalus*.

Notes. Sex ratio of 37 adults examined - 25 males:12 females.

Diurnal, arboreal; active on tree trunks and logs and seeks shelter under bark and in cracks. This species is a skilful climber which has adapted well to living on walls and fences in urban areas.

Guts of 20 animals examined; 13 empty and remainder mostly contained only traces of insect prey. Identifiable remains found of spiders, crickets, beetle larvae, caterpillars and a bug. R91495 regurgitated a cricket when caught. A gravid female's stomach contained a skink tail, almost certainly her own.

References. Cook, 1973; Covacevich & Ingram, 1978.

Ctenotus robustus Storr, 1970
Plate 22

Description. *Moderately large brown, swift-running diurnal and terrestrial lizard.* Fawn-brown or olive-brown above, with a conspicuous broad black vertebral stripe from nape to base of tail, narrowly edged on either side by a narrow white or cream stripe. A conspicuous pale dorsolateral stripe from above the eye to about halfway along the tail, bordered above by a blackish-brown stripe and below by a broad dark brown upper lateral zone, commencing behind the eye and enclosing one or two series of small pale spots or blotches. A pale midlateral stripe extending forward from the groin; it usually breaks up before reaching the forelimb but in some specimens it is distinctly continuous to the loreal region. This stripe continues behind the groin as a lower lateral stripe along the tail. Below the pale midlateral stripe is a region of obscure brown variegations. Lip scales narrowly margined with brown. Ventral surfaces whitish. Four broad scales above the eye (supraoculars).

Size (snout-vent). Average recorded for species = 110 mm.

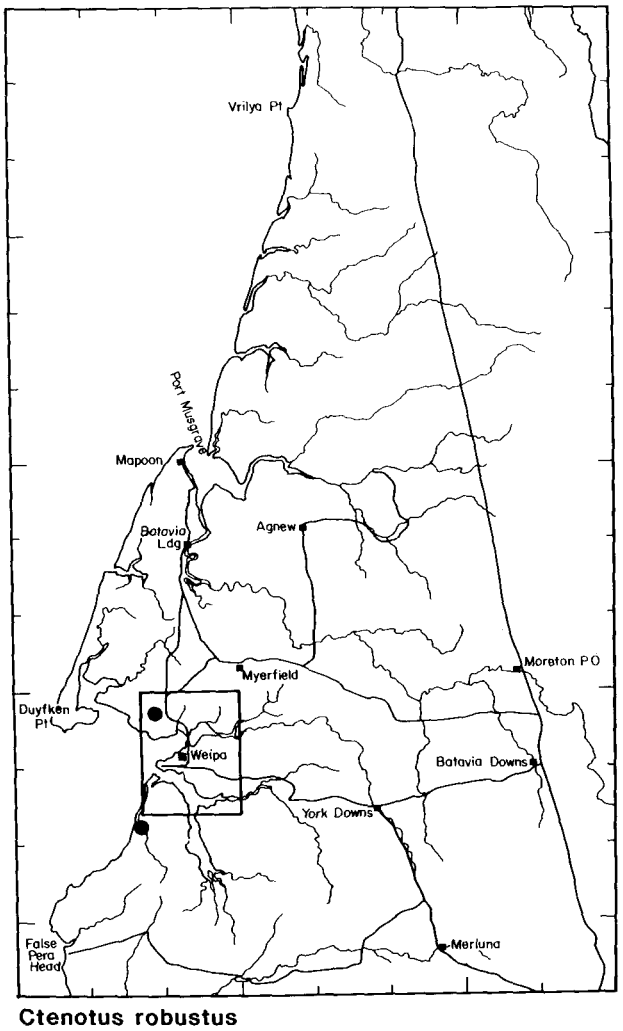
Distribution at Weipa (sites; physiographic units). Not positively identified in AM survey but a large dark swift-running diurnal skink seen in teak and mahogany plantations in regeneration areas Y and E may have been this species. Winda Winda Creek, 16.5 km south-south-west of Hey Point (QNPWS) and Andoom (Reeders & Morton, 1983); Weipa Plateau only.

Geographic range. South-east South Australia through Victoria to east New South Wales and Queensland and the upper Northern Territory to north-west Western Australia.

Habitat. Open forest (QNPWS) and regeneration (Reeders & Morton, 1983). Across its range, found in a wide variety of habitats, from coastal beach dunes and heaths through wet and dry sclerophyll forests and rocky situations to savannah woodlands of the more mesic interior. In the Alligator Rivers Region of the Northern Territory, Sadlier *et al.* (1986) recorded this species in riparian woodland on sand/silt bordering seasonally dry creek channels and paperbark riverine systems.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. Five records in two surveys. In all surveys, care was taken to distinguish between this species and the very similar *Ctenotus spaldingi* which was present in much greater numbers.



Ctenotus robustus

Seasonality. May 1981 (QNPWS specimen QM J39826) and April 1982 (Reeders & Morton, 1983).

Reproduction. Egg-layer; clutch size four to seven. Mating and egg-laying occur in spring, young hatch about January.

Notes. Diurnally active, terrestrial species. Often takes refuge when disturbed, in short shallow burrows under ground debris.

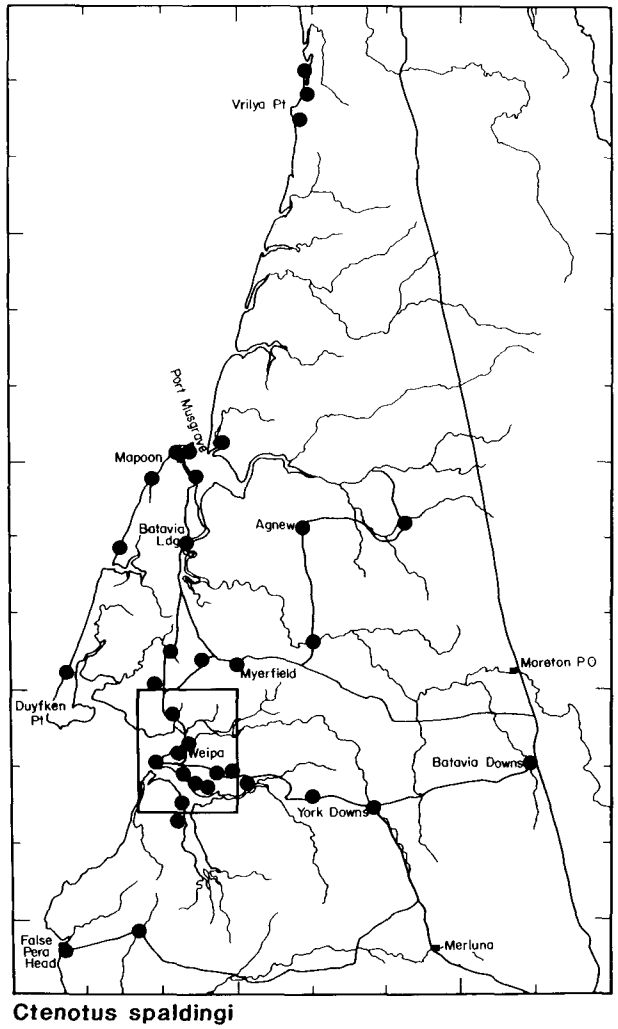
Very similar to *Ctenotus spaldingi* from which it can be distinguished by the presence of four supraocular scales above the eye, compared with three in *C. spaldingi*.

References. Edgar, 1987; Sadlier *et al.*, 1986; Taylor, 1985.

Ctenotus spaldingi (Macleay, 1877)
Plate 23

A Striped Skink

Description. *Moderately large pale brown, swift-running diurnal lizard.* Fawn-brown or olive-brown above, with a narrow black vertebral stripe from nape to base of tail, narrowly edged on either side by a narrow white or cream stripe. A pale dorsolateral stripe from above the eye to about halfway along the tail, bordered above by a blackish-brown stripe and below by a broad dark brown upper lateral zone, commencing behind the eye and enclosing one or two series of small pale spots or blotches. A pale midlateral stripe extending forward from the groin; it usually breaks up before reaching the forelimb but in some specimens it is continuous to the loreal region. This stripe continues behind the groin as a lower lateral stripe along the tail. Below the pale midlateral stripe is a region of obscure brown variegations. Lip scales narrowly margined with brown. Ventral surfaces whitish. Three broad scales above the eye (supraoculars).



Ctenotus spaldingi

Specimens in coastal habitats (dunefield woodland and amongst casuarinas above high tide line) may be separate species - cf Glen Ingram's "blue venter" coastal species. Mature adults much smaller, paler dorsum, bluish venter.

Ctenotus spaldingi collected at Hey Point (13 November 1979) in gallery forest were "...particularly robust, brownish animals compared with the *C. spaldingi* we collect on the beaches, which appear more streamlined and [more] distinctly marked and paler, more yellowish..." (notes in field diary). Fifteen readily discernible 'pale' animals all came from sandy coastal habitats (Old Mapoon, and three sites on the west coast of Cape York Peninsula - Vrilya Point, mouth of Namaleta Creek and coast about 8 km north of Pennefather River).

Size (snout-vent). 29 mm (unsexed) - 96 mm (male) and 109 mm (female) (Weipa); average recorded for species = 100 mm.

Coastal 'pale' specimens = maximum 70 mm (male), 62 mm (female); both adults in reproductive condition.

Distribution at Weipa (sites; physiographic units). 64% of sites, scattered throughout survey area; all physiographic units.

Geographic range. Upper Northern Territory and Cape York Peninsula and islands of Torres Strait; also south New Guinea.

Habitat. Open forest, eucalypt woodland, dunefield woodland and grassy foredunes, grass/sedgeland, urban and regeneration; also on the edge of vine thicket (QNPWS).

Survey abundance. Abundant.

Overall abundance. Abundant. 179 records in four surveys and one additional record.

Seasonality. Recorded on all six visits; also recorded in December 1980.

Reproduction. Egg-layer; clutch size three to eight and largest oviducal eggs were 15 mm long. Gravid females collected in November 1979 and July 1980, and males in reproductive condition collected in July 1980 and August 1981.

Mating behaviour (?) observed in February 1979 - one animal smelling and biting the hindquarters of a second animal while both animals aligned side by side; first animal followed second animal closely when it moved away.

Notes. Sex ratio of subsample of collected adults -

13 males:22 females.

Diurnal, swift-moving terrestrial lizard, usually seen foraging among grasses and other low vegetation; frequently takes cover in ground litter and under debris when disturbed.

Guts of 46 animals examined; seven empty but remainder contained numerous arthropod remains. Major prey items were crickets and grasshoppers (46% of stomachs), beetles including weevils (33%), bugs (23%), spiders including jumping spiders (18%), ants (18%) and termites (13%); cockroaches, beetle larvae and a moth, wasp and scutigeromorph centipede were also recorded. One female's stomach contained a skink tail which matched the proportions and pattern of the stump of her own tail.

An individual of approximate snout-vent length 80 mm was found in the stomach of an Orange-naped Snake (*Furina ornata*) and another in the stomach of a Black Whip Snake (*Demansia atra*); present in the gut of a feral cat shot at Beagle North Camp (BERS, 1982).

References. Storr, 1978.

Egernia frerei Günther, 1897
Plate 23

Major Skink

Description. *Large robust terrestrial brown lizard.* Pale fawn to rich chocolate-brown above, darker individuals have a darker brown median streak in each of the scales on the back which together form a series of narrow, longitudinal lines or stripes from the neck to the base of the tail. The dorsolateral, and sometimes the dorsal, scales may be finely peppered with yellow. Top of head with irregular blackish flecks and blotches. Usually a dark upper lateral zone becoming paler on the flanks, and enclosing a few scattered pale dots or, more often, a series of pale black-edged spots. Lips white to rich yellow in colour, sometimes speckled or barred with brown. Ear lobules white or cream. Ventral surfaces white to yellow, often with contrasting creamy colour on the throat and tail. Throat sometimes flecked with brown. Palmar surfaces flesh-coloured. Tail round, tapering, about 130% of snout-vent length.

Size (snout-vent). 184 mm (female) (Weipa); average recorded for species = 180 mm.

Distribution at Weipa (sites; physiographic units). One site only - Vrilya Point; Mapoon Plain.

Geographic range. North-east New South Wales to Cape York Peninsula and the islands of Torres Strait; also south New Guinea.

Habitat. Vine forest (with emergent *Melaleuca dealbata*), in rotten log lying on floor of forest.

Survey abundance. Scarce.

Overall abundance. Scarce. One record in one survey.

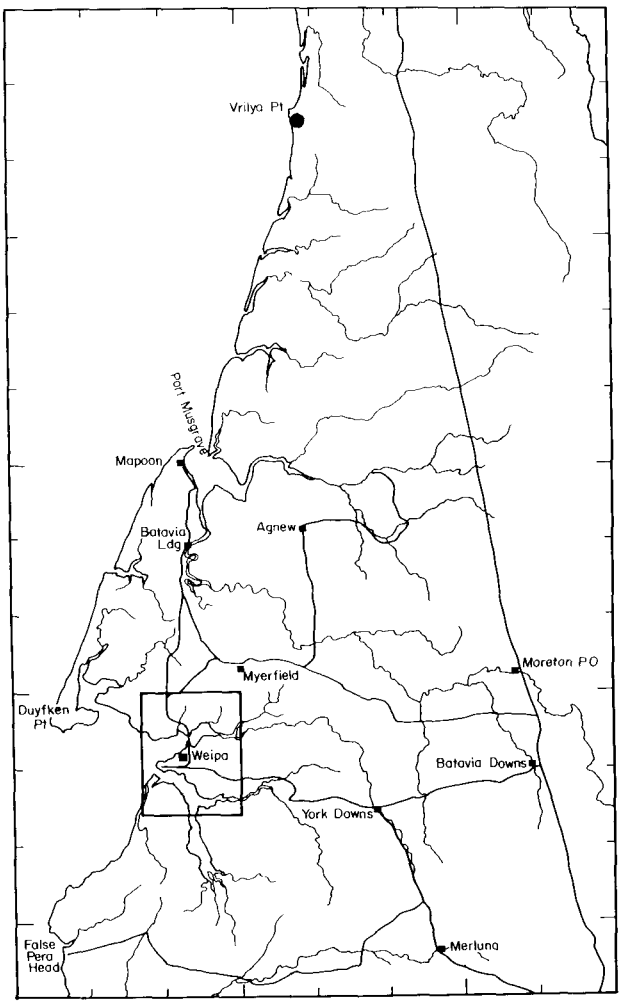
Seasonality. Recorded on only one visit - August 1981.

Reproduction. Live-bearer; litter size two to three. Birth in captivity (Melbourne Zoo) recorded in late November and early December. Single adult female collected at Weipa in July was not in breeding condition.

Notes. Diurnal, cryptic lizard usually found basking or foraging within or at edge of thick ground cover such as vines, grass and fallen timber, and around the buttresses of larger trees in well-watered forest country. Shelters in hollow logs.

Diet omnivorous.

References. Banks, 1988; Sadlier, 1990.



Egernia frerei

Glaphyromorphus nigricaudis (Macleay, 1877)
Plate 23

[Also appears in the literature as *Sphenomorphus nigricaudis*]

Description. *Moderate-sized cryptic dark shiny lizard with short legs.* Rich brown above and on the sides, immaculate or with irregular small dark brown flecks or spots on the anterior half of the body, sometimes aligned transversely across the shoulders. No indication of a dark dorsolateral zone. Lips barred with dark brown. White or cream ventral surfaces, sometimes

with a few dark brown flecks or streaks on the throat. Juveniles may have quite bright yellowish venters. Terminal portion of tail sometimes heavily spotted with black. Ear-opening conspicuous, at least as large as the nasal scale.

Size (snout-vent). 29 mm (unsexed) - 77 mm (male) and 75 mm (female) (Weipa); average recorded for species = 75 mm.

Distribution at Weipa (sites; physiographic units). 38% of sites, distributed throughout the survey area wherever suitable habitat occurred; all physiographic units.

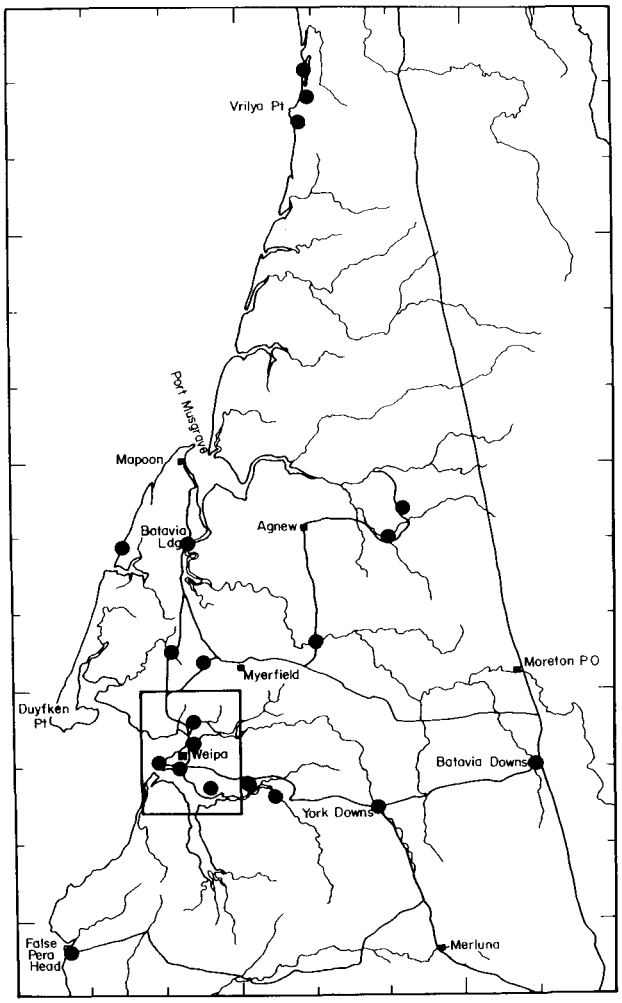
Geographic range. North-east Queensland and the islands of Torres Strait; also New Guinea.

Habitat. Broad habitat range - open forest, eucalypt woodland, dunefield woodland, paperbark woodland, vine forest and gallery forest, but most abundant in closed habitats, especially vine forest; also deciduous vine thicket adjacent to mangroves (QNPWS).

Survey abundance. Common.

Overall abundance. Common. Ninety four records in three surveys and one additional record. Not recorded in regenerated mine sites.

Seasonality. Recorded on all six visits.



Glaphyromorphus nigricaudis

Reproduction. ?Egg-layer; two females collected in February had two to three large (10-11 mm long) thin-shelled oviducal eggs, suggesting eggs may be retained until embryos are well developed, and be laid only a few days prior to hatching, which is the case in *Glaphyromorphus fragilis* (Greer & Parker, 1974). Males in reproductive condition recorded in February and November 1979 and August 1981.

Notes. Terrestrial; crepuscular to nocturnal, usually found sheltering in piles of forest litter and under and in rotten logs and under rocks in shady moist situations. Four individuals were active at 2030 hours in a creek bed in November and another individual caught in a pitfall trap later that night.

Guts of 38 animals examined; 15 empty but remainder contained arthropods. Major prey were spiders, cockroaches, crickets and grasshoppers, and caterpillars; bugs, beetles and beetle larvae, ants and a mantid, snail and centipede were also recorded. One individual (AM R82507) contained the remains of two gecko tails and another (AM R94168) collected just outside the survey area on the road to Iron Range, contained the remains of a *Lygisaurus macfarlani*.

AM R94562-63 karyotyped by Steve Donnellan *et al.*

References. Greer, 1979.

Glaphyromorphus pumilus (Boulenger, 1887)
Plate 24

[Also appears in the literature as *Sphenomorphus pumilus*]

Description. *Small slim dark burrowing lizard with very short legs.* Pale fawn or brown above, many of the individual scales with a dark brown or blackish dot; the dots on the two mid-dorsal scale rows largest, and usually forming two fine longitudinal lines along the back and tail. Lips and head flecked and speckled with dark brown. Flanks and sides of neck and tail speckled and dotted with dark brown, tending to form an indefinite dark upper lateral zone. Ventral surfaces cream or yellowish. Ear-opening minute, scarcely or not larger than the nostril.

Size (snout-vent). 25 mm (unsexed) - 43 mm (male) and 47 mm (female) (Weipa); average recorded for species = 50 mm.

Distribution at Weipa (sites; physiographic units). 4% of sites - only at site 42 (beach opposite Nomenade Creek, 12 km north of Duyfken Point) and at Vrilya Point; on Mapoon Plain and Weipa Plateau.

Geographic range. Coastal Cape York Peninsula.

Habitat. Dunefield woodland; also open forest (QNPWS).

Survey abundance. Scarce.

Overall abundance. Uncommon but may be locally abundant in suitable habitat. Twenty records in two

surveys. Almost all individuals located by laying pitfall traps in dunefield woodland.

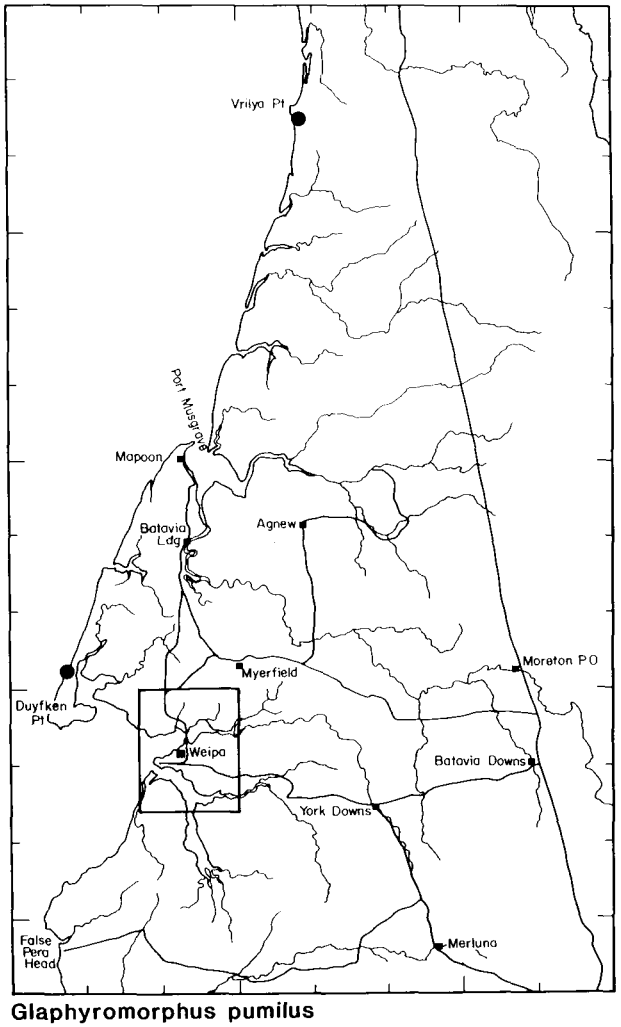
Seasonality. Recorded on two out of six visits - in February 1979 and August 1981.

Reproduction. Egg-layer, a clutch of three has been recorded.

Notes. Burrowing lizard; 18 individuals collected at Vrilya Point were all caught in pitfall traps laid in soft fine humus-rich sand beneath a more or less complete canopy; lizard collected near Duyfken Point was under a rotten log.

This species is diurnally active as well as nocturnal; some lizards entered pitfall traps after 0730 hours.

References. Wilson & Knowles, 1988.



Glaphyromorphus pumilus

Lygisaurus macfarlani Günther, 1877
Plate 24

[In literature as *Carlia novaeguineae* Meyer, 1874]

Description. *Very small slender short-limbed brown terrestrial skink.* Rich brown above, darker on the head. Usually some indication of a paler brown dorsolateral stripe on each side, sometimes black-edged. Many dorsal scales, especially on the tail, flecked or dotted with black, often resulting in longitudinal lines of dots on the back and flanks. Limbs brown, dotted with pale brown and black. Tail sometimes bright reddish-brown. Lips pale brown, spotted or flecked with dark brown. Occasionally a faint, pale midlateral stripe. Whitish below, sometimes flecked with dark brown.

Size (snout-vent). 17-36 mm (male) (specimens from east of Peninsula Road, Weipa region, between 12° and 13°S). Average recorded for species = 35 mm.

Distribution at Weipa (sites; physiographic units). Not recorded in AM or QNPWS surveys of Weipa district but Reeders & Morton (1983) recorded it in 26% of sites in their study of regeneration fauna, which highlights the importance in faunal surveys, of intensive searching and sampling for small cryptic species. AM collected this species outside the survey area, between Captain Billy Beach and Bramwell.

Geographic range. North-east Queensland including islands of Torres Strait; also south-west Papua New Guinea.

Habitat. In leaf litter and ground cover debris in regenerated mine sites (Reeders & Morton, 1983); specimens collected by AM east of the Peninsula Road (outside the survey area) were in deep leaf litter in vine forest.

Survey abundance. Not recorded in AM survey.

Overall abundance. Uncommon. Fourteen records in one survey, all in regenerated mine sites.

Seasonality. April and September but not December (Reeders & Morton, 1983); collected east of the survey area in July 1980.

Reproduction. Egg-layer. Specimens collected in July 1980 were not in breeding condition.

Notes. Terrestrial, diurnal, rather cryptozoic; prefers heavily shaded situations.

Gut contents included many springtails (Collembola), bugs, beetles, moths, psocids and a wasp, and snails, slaters, spiders, mites and a pseudoscorpion, all in the size range of 1 to 4 mm.

References. Ingram & Covacevich, 1988; Wilson & Knowles, 1988.

Morethia taeniopleura (Peters, 1874)
Plate 24

Fire-tailed Skink

Description. *Small terrestrial lizard with vivid cream and black lateral stripes and a reddish tail.* Dorsal ground colour rich grey-brown to glossy black, lighter specimens flecked with darker brown; a brilliant narrow cream, light brown or white dorsolateral streak on either side from the canthus, above the eye and along the body to the level of the hindlimbs or beyond; this white stripe is bordered below by a broad, glossy black upper lateral stripe from the snout, through the eye, to the level of the hindlimb, while this black stripe is, in its turn, bordered below by a broad white stripe from the labials

to the groin. Below this is yet another narrow, black stripe. In some populations there is a conspicuous whitish, vertebral stripe. Ventral surfaces white. The tail varies from dull russet to orange or brilliant red. Ear-opening usually without obvious lobules, sometimes with a few small inconspicuous ones.

Size (snout-vent). Maximum 38 mm (male), 42 mm (female) (Weipa); average recorded for species = 35 mm.

Distribution at Weipa (sites; physiographic units). 9% of sites, not recorded by AM north of Andoom but QNPWS collected it at Mapoon; all three physiographic units but mainly Weipa Plateau.

Geographic range. Coast and hinterland of east Queensland.

Habitat. Open forest, eucalypt woodland, dunefield woodland; also regeneration (Reeders & Morton, 1983). Elsewhere also occurs in large artificial grass clearings and heath (Greer, 1980).

Survey abundance. Uncommon.

Overall abundance. Uncommon. Twenty two records in four surveys.

Seasonality. Recorded on three out of six visits, not recorded in July 1977, November 1979 or August 1981; also September 1980 (QNPWS), December 1981 and April 1982 (Reeders & Morton, 1983).

Reproduction. Egg-layer; clutch size two to four. Gravid females recorded in July 1980 and July 1982; very small juvenile collected in early July 1980.

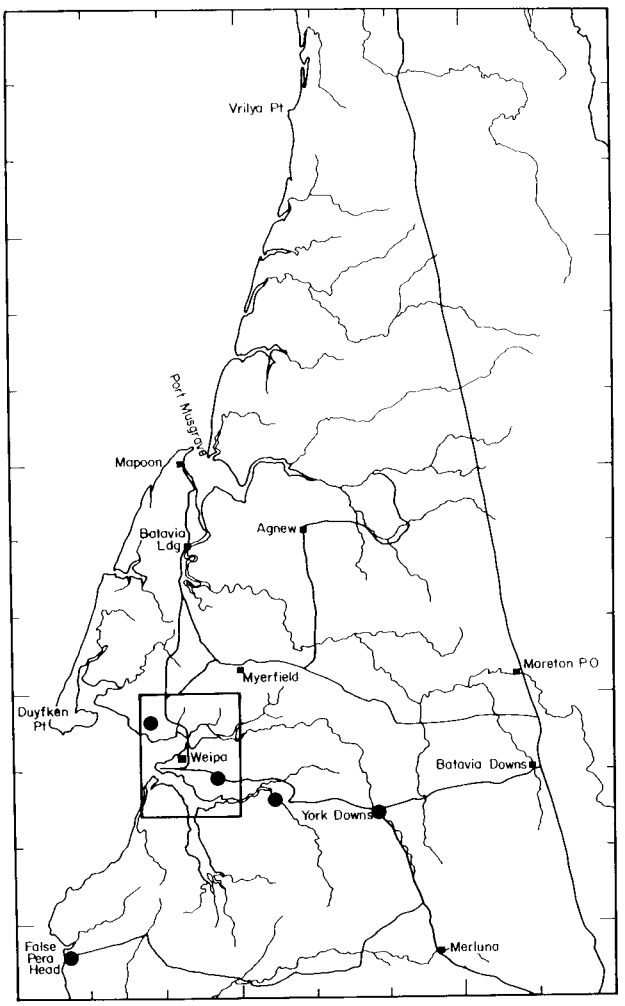
Notes. Diurnal, cryptic, terrestrial lizard which may employ sand-swimming to escape predators or seek shelter. A juvenile found under a log.

References. Greer, 1980.

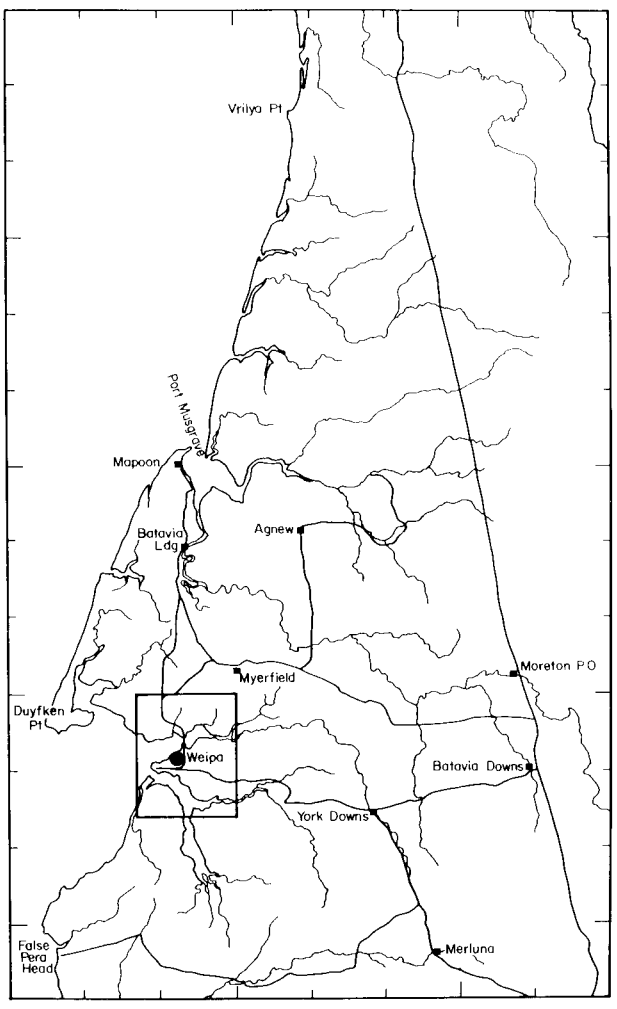
Tiliqua scincoides (White, 1790)
Plate 25

Eastern Blue-tongued Lizard

Description. *Very large grey terrestrial lizard with dark bands across the body and tail, and short legs and tail.* Pale silvery-grey to brown above, usually with a series of seven to nine irregular darker brown transverse crossbands on the body, and seven to ten on the tail, often displaced on the midline, oblique on the flanks. The scales on the paler interspaces usually with dark lateral edges resulting in a series of narrow, longitudinal dark brown lines. The darker crossbands often contain some small, white dark-edged spots or paler brown centres. The broad dark brown or black streak extending



Morethia taeniopleura



Tiliqua scincoides

from the eye to above the ear in south-eastern Australian individuals is absent in Cape York animals but there is a short dark bar on the side of the neck. Ventral surfaces white, grey or pale yellow. Ear opening conspicuous, with two to three large anterior lobules.

Size (snout-vent). 160 (female) - 299 mm (unsexed) (Weipa); average recorded for species = 300 mm.

Distribution at Weipa (sites; physiographic units). 2% of sites, in vicinity of Weipa settlement (the only specimen collected by AM was in vicinity of Single Persons' Quarters at Rocky Point), other records from "Weipa district" and Regeneration Nursery; Weipa Plateau only.

Geographic range. South-east South Australia through Victoria, east New South Wales and most of Queensland, to north Northern Territory and north-west Western Australia.

Habitat. Urban; also open forest, eucalypt woodland and dunefield woodland (QNPWS) and regeneration (Reeders & Morton, 1983). This species occurs in a wide range of habitats in Australia, from coastal heaths, forests and woodlands, to the woodlands and grasslands of the semi-arid interior.

Survey abundance. Scarce.

Overall abundance. Uncommon. Thirteen records in three surveys and two additional records.

Seasonality. Recorded only on one visit - February 1979; additional records from 1979 (presented Barry Middleton) and January 1978 (photo by M. O'Reilly), September 1980 and May 1981 (QNPWS), July 1982 (pet kept by Cathryn Radeck).

Reproduction. Live-bearer; litter sizes recorded up to 18. Young born between December and March with a peak in January.

Notes. Diurnal terrestrial lizard. Shelters at night in hollow logs and ground debris.

Diet includes insects, snails, carrion and flowers, native fruits and berries. Sometimes trapped in cages baited with meat (Reeders & Morton, 1983).

References. Shea, 1981.

SNAKES

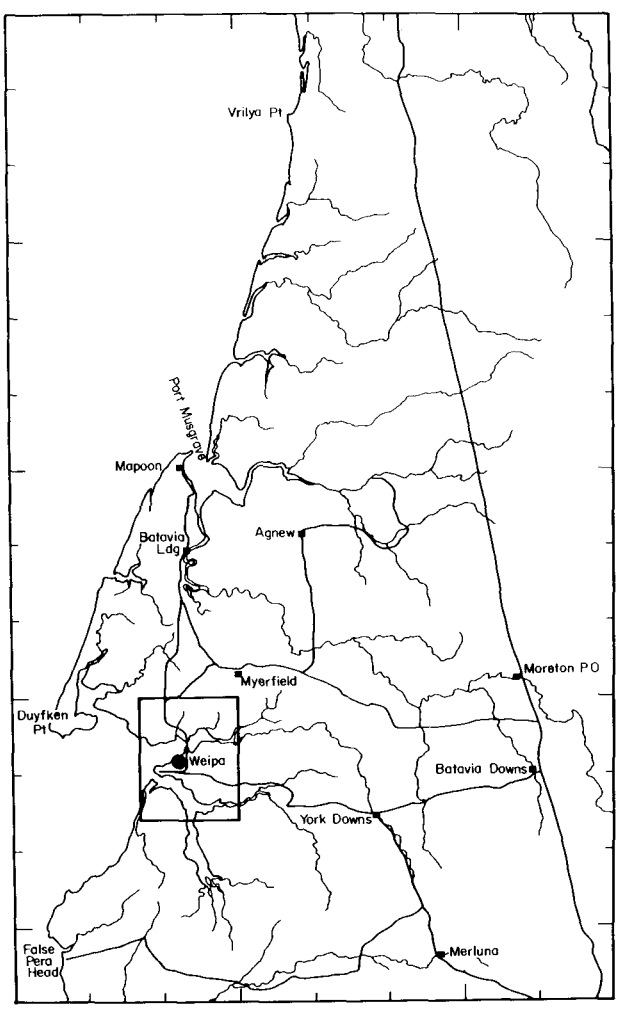
Family TYPHLOPIDAE (Blind or Worm Snakes)

Ramphotyphlops sp.
Plate 25

[Referred to *Ramphotyphlops wiedii* in QNPWS report and to *Typhlina broomi* in BERS report. NON-VENOMOUS]

Description. *Very small striped worm-like snake.* Cream to light brown above and whitish to cream below. Narrow bands of pigment in the lateral margins of the scales form a series of 18 longitudinal reddish-brown to dark-brown stripes running the length of the body and tail; these are darker and wider on the dorsum than below. Top of head dark brown and tail blackish-brown. Chin scales and upper lip unpigmented, whitish to cream. Snout bluntly rounded from above and in profile. Nasal cleft meeting the second upper lip scale, and extending forward through the nostril for a short distance but not dividing the nasal scale; not visible from above. Rostral broadly oval from above, scarcely longer than broad. Scales in 18 rows at midbody. Body diameter 60 to 85 times its length.

Glen Ingram has pointed out the close resemblance of this species to *Ramphotyphlops minimus* which was described from Groote Eylandt. They share the following characters: nasal cleft meets the second upper lip scale and extends forward from the nostril for a short distance but does not divide the nasal scale; body length is 60 to 85 times the diameter of the body; colour pattern of narrow dark longitudinal stripes. However, *R. minimus* has 16 scale rows around the midbody while the Weipa specimens all have 18 MBRs, and in profile the snout is evenly rounded in *R. minimus* but slopes down to a very blunt point in the Weipa specimens. Given these constant differences we have opted not to



Ramphotyphlops sp.

assign this animal to any existing described species.

Size (total length). 0.112-0.213 m, average of five specimens = 0.156 m (Weipa).

Distribution at Weipa (sites; physiographic units). One site only - vicinity of Rocky Point, Weipa settlement; Weipa Plateau only. BERS (1982) also recorded this species near site 52 (airstrip near Beagle North Camp).

Geographic range. Unknown.

Habitat. Urban (found in lawns and tussocky grassland); also open forest at Beagle North Camp (BERS).

Survey abundance. Not recorded in AM survey.

Overall abundance. Uncommon. One record in one survey and five additional records. "I see about a dozen per year" (F. Hawkings, *in litt.*).

Seasonality. Not recorded in AM survey; one collected in October 1978, two in November (1978, 1981) and one in March 1982. Specimens donated by Fred Hawkings and Paul Harvey.

Reproduction. Egg-layer.

Notes. Nocturnal, burrowing. The diet of blind snakes is principally the larvae and pupae of ants and termites. "They appear to live in the tussocks of spear grass and lawns, from which they get flooded out on watering" (F. Hawkings, *in litt.*).

References. McDowell, 1974.

Ramphotyphlops polygrammicus (Schlegel, 1839)
Plate 25

[NON-VENOMOUS]

Description. *Small brownish worm-like snake.* Pinkish-brown above, yellowish below, the rostral shield, mouth and tail tip yellowish. Snout rounded from above and in profile. Nasal cleft joining the second upper lip scale or the suture between the first and second upper lip scales, projecting forward and upward to partially divide the nasal, visible from above. Rostral large, oval or elliptical, much longer than broad. Scales in 22 rows at midbody. Body diameter 35 to 60 times its length.

Size (total length). 0.215-0.32 m (Weipa); average recorded for species = 0.37 (female), 0.29 m (male); maximum for species = 0.46 m (female), 0.36 m (male). Sexually dimorphic - females grow larger than males but have proportionally shorter tails.

Distribution at Weipa (sites; physiographic units). 4% of sites - near Flinders Camp north of Pennefather River, and 6 km north of Batavia Outstation Landing; Weipa Plateau and Mapoon Plain. QNPWS also recorded this species in Pine River Bay, on the Mapoon Plain.

Geographic range. North-east Queensland and islands of Torres Strait; also New Guinea, Timor and Indonesia.

Habitat. Open forest (under sheets of iron and wooden posts lying on the ground) and vine forest (inside rotten log); also in a drift fence on "grassy marine plains" (QNPWS).

Survey abundance. Scarce.

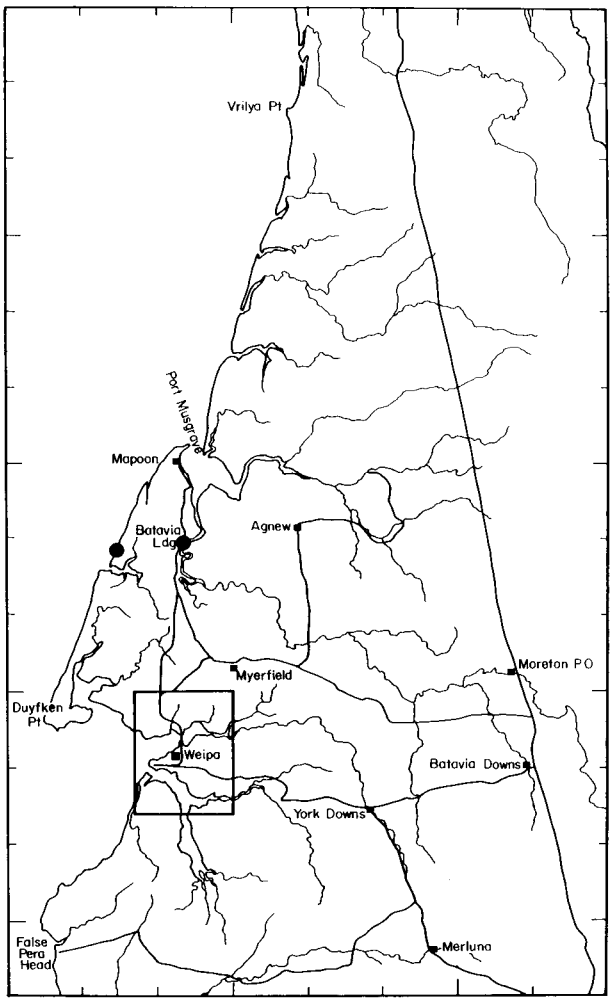
Overall abundance. Scarce. Three records in two surveys.

Seasonality. Recorded on two out of six visits - in February 1979 and June 1982. QNPWS record also in February.

Reproduction. Egg-layer; a clutch of seven eggs has been recorded.

Notes. Nocturnal, burrowing. Diet principally the larvae and pupae of ants and termites.

References. McDowell, 1974; Shine & Webb, 1990.



Ramphotyphlops polygrammicus

Ramphotyphlops unguirostris (Peters, 1867)

[NON-VENOMOUS]

Description. *Small, pinkish brown worm-like snake.* Brownish above, creamish-white below. Snout bluntly trilobed from above, sharply angular in profile. Nasal cleft not, or scarcely, visible from above, contacting the first upper lip scale below and sometimes completely dividing the nasal. Rostral

oval from above, longer than broad. Scales in 24 rows at midbody. Body diameter 40 to 70 times its length.

Size (total length). 0.31-0.395 m (Weipa); average recorded for species = 0.4 m; maximum for species = 0.7 m.

Distribution at Weipa (sites; physiographic units). One specimen from regeneration, the other from "Weipa district"; ? Weipa Plateau only.

Geographic range. Known from widely scattered localities throughout east and north Australia.

Habitat. Open forest (dug up at depth of 60 cm by dozer on a stony ridge); also regeneration (Reeders & Morton, 1983).

Survey abundance. Not recorded in AM survey.

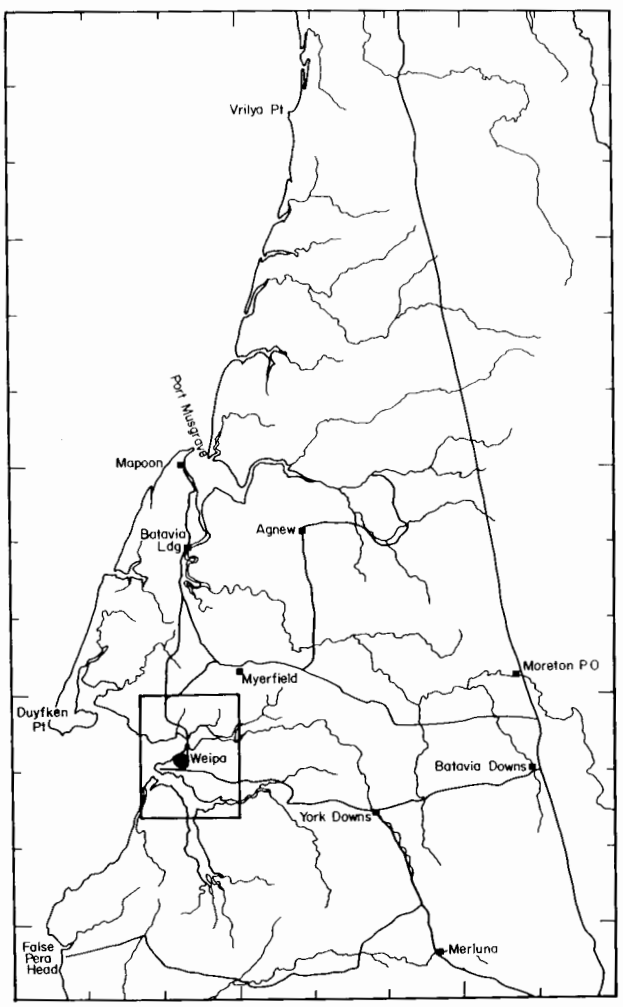
Overall abundance. Scarce. One specimen in one survey and two additional records.

Seasonality. One specimen collected June 1976, the other in a pitfall trap in December 1982 (Reeders & Morton, 1983).

Reproduction. Egg-layer.

Notes. Nocturnal, burrower. Diet principally the larvae and pupae of ants and termites.

References. Waite, 1918.



Ramphotyphlops unguirostris

Family BOIDAE (Pythons)

Aspidites melanocephalus (Krefft, 1864)
Plate 26

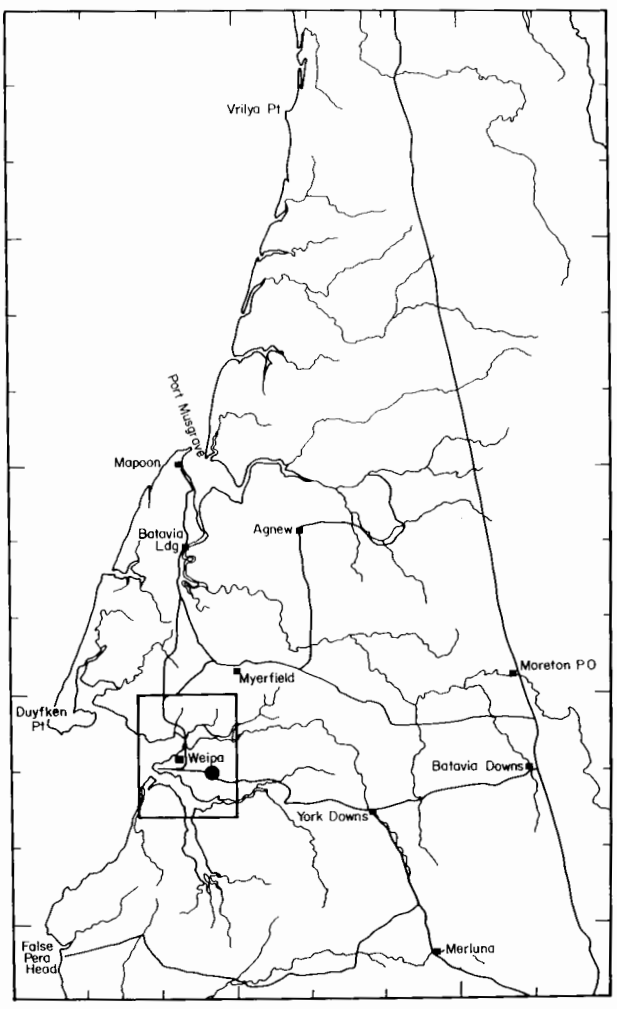
Black-headed Python

[NON-VENOMOUS]

Description. *Large robust brown terrestrial snake with black head and neck.* Light to dark brown above, often lighter on the sides, with numerous darker brown, reddish-brown or blackish crossbands which are usually narrower than the lighter interspaces. Head, neck and throat shiny jet black. Belly cream to yellow, sometimes with darker blotches. Scales smooth, in 50 to 65 rows at midbody. Anal scale single. Subcaudals mostly single, but posterior ones divided, often irregularly. Tail 15% of total length.

Size (total length). Average recorded for species = 1.5 m; maximum for species = 3 m.

Distribution at Weipa (sites; physiographic units). Two specimens seen - sawmill 2 km east of Weipa on road to Coen, and on road to airport; Weipa Plateau.



Aspidites melanocephalus

Geographic range. Northern half of Australia except for extremely arid regions.

Habitat. Open forest (Peter Reeders, Maggie Goudie); within its geographic range this species may be found in habitats ranging from wet coastal forests to the arid interior.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. None recorded in survey, two independent records.

Seasonality. Not recorded on AM visits; two sightings - August 1979 (Maggie Goudie) and June 1980 (Peter Reeders). Latter specimen photographed by Hal Cogger and released near Wenlock River.

Reproduction. Egg-layer, clutch size five to 12. Female coils around eggs during incubation and, within a certain temperature range, can maintain temperature of eggs by muscular shivering of her body (thermogenesis). Egg-laying occurs in October-November, incubation period 66 days at 30°C (Charles *et al.*, 1985).

Notes. Primarily nocturnal. Feeds on small vertebrates including lizards and venomous snakes. Constricts prey.

References. Charles *et al.*, 1985; Storr *et al.*, 1986; Smith, 1981a.

Liasis fuscus Peter, 1873

Water Python

[Sometimes referred to *Liasis mackloti* Duméril & Bibron, 1844 which has the type locality of Timor. NON-VENOMOUS]

Description. *Large dark iridescent semi-aquatic snake.* Uniform, iridescent dark, blackish-brown above, bright to dull yellow below, the latter colour extending onto the lower three or four rows of lateral body scales. Underside of tail, dark blackish-brown. Cloacal spurs yellow on the base, dark brown distally. Throat creamy white. Upper lip scales a lighter grey-brown finely peppered with dark brown or black. Anterior upper lip scales pitted. Parietal scales normal, undivided. Single loreal scale on each side. Scales smooth, in 40 to 55 rows at midbody. Anal scale single. Subcaudal scales divided. Tail 17 to 24% of total length.

Size (total length). Average recorded for species = 1.5 m; maximum for species = 3 m.

Distribution at Weipa (sites; physiographic units). One site only - Rocky Point, Weipa settlement; Weipa Plateau.

Geographic range. Coast and hinterland of north and north-east Australia from Kimberleys to east Queensland.

Habitat. Urban (killed in a garden) (Peter Reeders); usually found close to streams, lagoons and billabongs.

Survey abundance. Not recorded in AM survey.

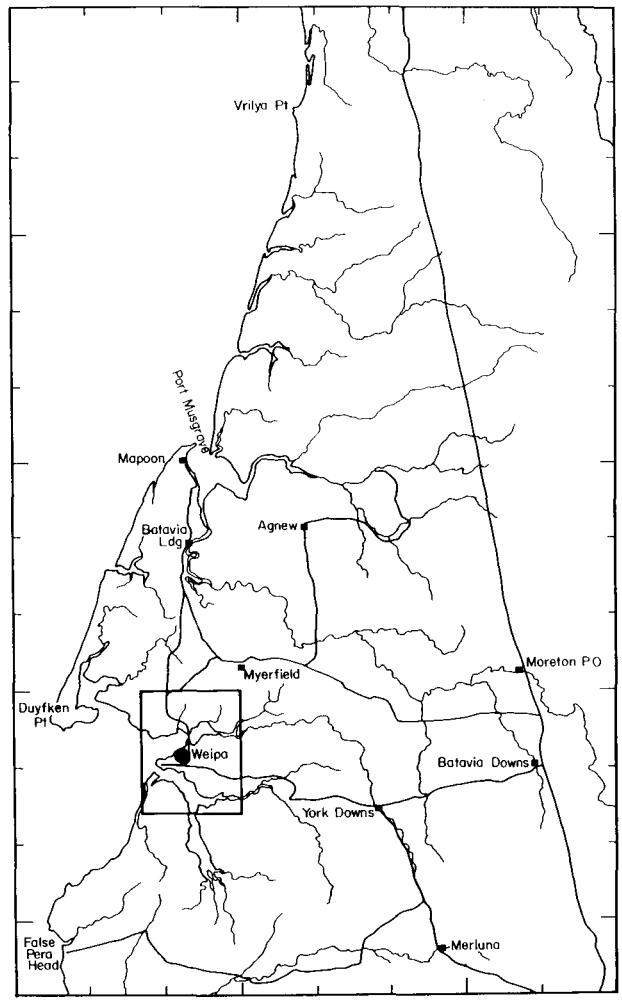
Overall abundance. Scarce. None recorded in surveys, two independent records. Head and tail of one snake killed by a resident, donated by Peter Reeders; one damaged road-kill seen in vicinity of Weipa in 1980/81 (Paul Harvey).

Seasonality. Single specimen collected in June 1982.

Reproduction. Egg-layer; clutch size six to 23 (larger females lay more eggs). Incubation period 60 to 70 days at about 30°C. Egg-laying usually occurs in November and the female coils around eggs and practices shivering thermogenesis during incubation.

Notes. Nocturnal, semi-aquatic and seeks refuge in water when alarmed. Feeds on a variety of vertebrates including bandicoots and rats. Constricts prey.

References. Churchill, 1971; Charles *et al.*, 1985; Smith, 1981b.



Liasis fuscus

Liasis maculosus Peters, 1873
Plate 26

[This and closely-related species were previously grouped under the name *Liasis childreni* and called Children's Pythons. NON-VENOMOUS]

Description. *Moderate-sized greyish-brown semi-arboreal snake with darker mottling.* Fawn or whitish with dorsal pattern of chocolate-brown, ragged-edged blotches which tend to coalesce anteriorly and posteriorly

to form a wavy stripe. Head brownish with small darker chocolate-brown blotches on crown and a similarly-coloured streak on the side of the head, running from the snout under the eye to the neck. Anterior upper lip scales not deeply pitted. Parietal shields normal, undivided. Two or more loreals on each side. Scales smooth, in 37 to 49 rows at midbody. Anal scale single. Subcaudals mostly divided but usually with a few single ones anteriorly. Tail 8.5 to 12.2% of snout-vent length.

Size (total length). 0.777 m (male) - 1.005 m (female) (Weipa); maximum recorded for species = 1.05 m.

Distribution at Weipa (sites; physiographic units). 8% of sites - Kerr Point, road between Andoom and Sunrise Creek, Mapoon and Possum Scrub; Mapoon Plain and Weipa Plateau.

Geographic range. East Queensland from Torres Strait islands to the vicinity of the New South Wales border.

Habitat. Open forest, dunefield woodland, vine forest.

Survey abundance. Uncommon.

Overall abundance. Uncommon. Five records in one survey.

Seasonality. Recorded on three out of six visits, not recorded in July 1977, July 1980 or August 1981.

Reproduction. Egg-layer; one female donated by Regeneration staff and collected some time between November 1979 and the following June, had 14 ovarian eggs about 6 mm in length.

Notes. Nocturnal, mainly terrestrial but occasionally arboreal. Feeds on small vertebrates, including insectivorous bats in caves. Constricts prey.

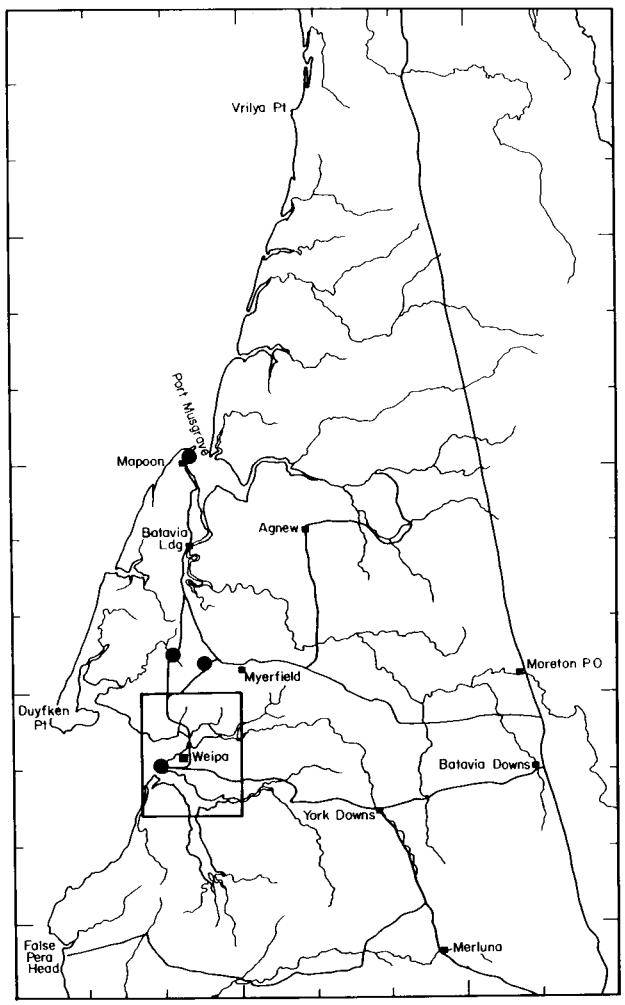
References. Smith, 1985.

Morelia amethistina (Schneider, 1801)
Plate 26

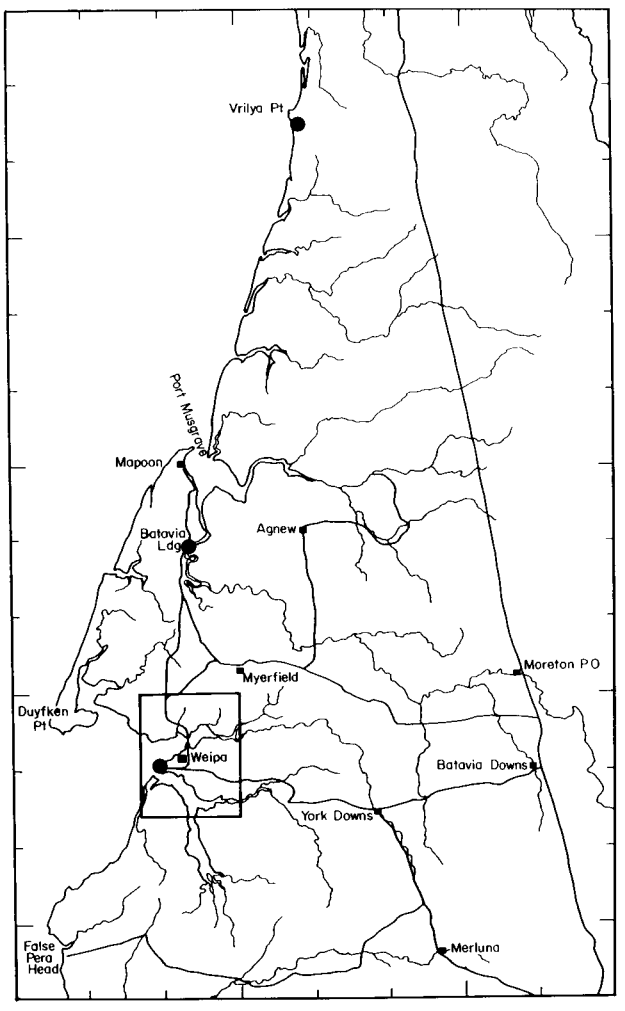
Amethystine Python

[NON-VENOMOUS]

Description. *Very large arboreal snake with iridescent sheen and elaborate pattern on body.* Shagreened, iridescent olive-yellow or olive-brown above, with numerous dark brown or black irregular and broken transverse bands, sometimes forming a reticulum, and usually connected along the lower flanks to form one or more longitudinal lower lateral 'stripes'. Head uniform or spotted and



Liasis maculosus



Morelia amethistina

streaked with dark brown. The dorsal pattern is often more pronounced anteriorly, becoming obscure posteriorly. White or cream on the ventral surface. Anterior upper lip scales deeply pitted. Two or more loreals on each side. Parietal shields divided into four squarish shields. Scales smooth in 35 to 50 rows at midbody. Anal scale single. Subcaudals mostly divided.

Size (total length). 2.42 m (male) (1.4 kg) (Weipa); one individual seen by QNPWS estimated to be 5 m long. Average recorded for species = 3.5 m; maximum for species = ? 8.5 m.

Distribution at Weipa (sites; physiographic units). 6% of sites, all close to coast or a major river - Rocky Point, Batavia Landing, Vrilya Point; Mapoon Plain and Weipa Plateau. Also Stone Crossing (QNPWS).

Geographic range. North-east Queensland and islands of Torres Strait; also New Guinea and east Indonesian islands.

Habitat. Gallery forest; also deciduous vine thicket (QNPWS) and dunefield woodland (Peter Reeders) and vine forest (Karl Stewart).

Survey abundance. Scarce.

Overall abundance. Scarce. Two records in two surveys and two additional records.

Seasonality. Recorded on only one visit - August 1981; other sightings by Karl Stewart (some time in 1976) and Peter Reeders (photo, no date) and September 1980 (QNPWS).

Reproduction. Egg-layer; clutch size seven to 12. Female practices shivering thermogenesis during incubation of eggs. Incubation period 80 to 110 days at 28°C to 30°C.

Notes. Arboreal and terrestrial, nocturnal. Individual at Vrilya Point was found at night in gallery forest on a log overhanging a creek.

Feeds on birds, rodents, bandicoots and other vertebrates. Constricts prey.

References. Charles *et al.*, 1985; McDowell, 1975.

Morelia spilota variegata Gray, 1842
Plate 27

Carpet Python

[NON-VENOMOUS]

Description. *Large olive-brown arboreal snake with blackish markings.* Pale to dark brown with blackish (sometimes paler-centred) blotches or variegations which may form obscure crossbands or even longitudinal markings enclosing blotches of the ground colour. Ventral surfaces cream or yellow, variegated with dark grey. Anterior upper lip scales with shallow pits. Parietal shields and most other shields of the head fragmented, small and irregular.

Size (total length). Average recorded for species = 2 m; maximum for species = 4 m.

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey; QNPWS recorded one individual at Pine River Bay; Mapoon Plain.

Geographic range. Continental Australia with exception of south Victoria and the arid centre and west; also New Guinea.

Habitat. Dunefield woodland (QNPWS); throughout its range found in an enormous variety of habitats, from rainforest to deserts.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. One record in one survey.

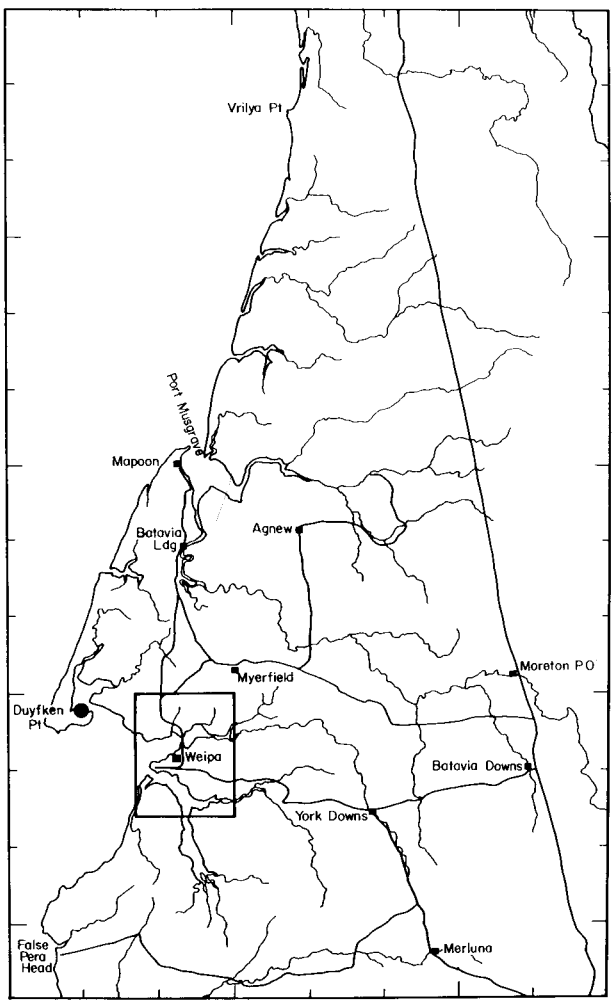
Seasonality. Single sighting in February 1981.

Reproduction. Egg-layer; clutch size nine to 52. Female practises shivering thermogenesis during incubation of eggs. Incubation period approximately 60 days at 30°C. Hatching usually occurs in late January to mid-February.

Notes. Often arboreal (QNPWS individual was curled amongst fronds of a pandanus 3 m above the ground) but may live in burrows excavated by other animals. Mostly nocturnal to crepuscular.

Feeds on a variety of terrestrial vertebrates including rabbits, magpie larks.

References. Charles *et al.*, 1985.



Morelia spilota variegata

Family ACROCHORDIDAE (File Snakes)

Acrochordus arafurae McDowell, 1979
Plate 27

Arafura File Snake

[Prior to 1979, referred to *Acrochordus javanicus*. NON-VENOMOUS]

Description. *Large loose-skinned dark freshwater snake with small head and rough-textured skin composed of very small pointed scales.* Grey to dark brown above with broad darker brown to black reticulations extending from a broad vertebral band, to form either vague crossbands or a series of circular or oblong blotches along the upper surface of the body. Whitish below, the dark reticulations of the dorsal surface extending onto the belly. Skin very loose and flabby. Scales small, granular, but strongly keeled and coarsely file-like in appearance and to the touch. Scales in 120 to 180 rows at midbody. No conspicuous midventral fold and no enlarged ventral, anal or subcaudal scales. Tail prehensile.

Size (total length). Average recorded for species = 1.5 m (female), 1.2 m (male); maximum for species = 1.85 m (female), 1.35 m (male).

Sexually dimorphic - females are larger and heavier, with shorter tails and larger heads than males.

Distribution at Weipa (sites; physiographic units). Upper freshwater reaches of the Wenlock River, caught on fishing lines (Karl Stewart, personal communication).

Geographic range. Coastal and adjacent areas of north Australia; also north to South-east Asia.

Habitat. In the dry season largely restricted to freshwater streams and billabongs where it usually shelters below *Pandanus* trees on overhanging banks; in the wet season this species moves into grassland covered by shallow floodwaters and amongst flooded freshwater mangroves (*Barringtonia* sp.). May also occur in estuaries (Shine, 1986b, 1986c).

Survey abundance. Not recorded in AM survey. Freshwater snakes were not consistently searched for during the survey.

Overall abundance. Scarce. Occurrence in Weipa area based on one record from Karl Stewart and reported occasional sightings by fishermen.

Seasonality. Not recorded in AM survey.

Reproduction. Live-bearer; litter size 11 to 25 (average 17). Mating occurs in July-August and may involve aggregations of many males around one female. The gestation period is approximately six months, with young being born in February-April. However, individual females probably breed only once in two to three years.

Notes. Largely nocturnal and entirely aquatic. Feeds exclusively on fish of many species including rainbow fish (*Melanotaenia* spp.), Long-toms (*Strongylurus kreffti*), Eel-tail Catfish, Barramundi and Sleepy Cod, which it immobilises by constriction. The species itself is a major prey item of the White-breasted Sea-eagle.

This species has a very low metabolic rate and feeds and breeds infrequently.

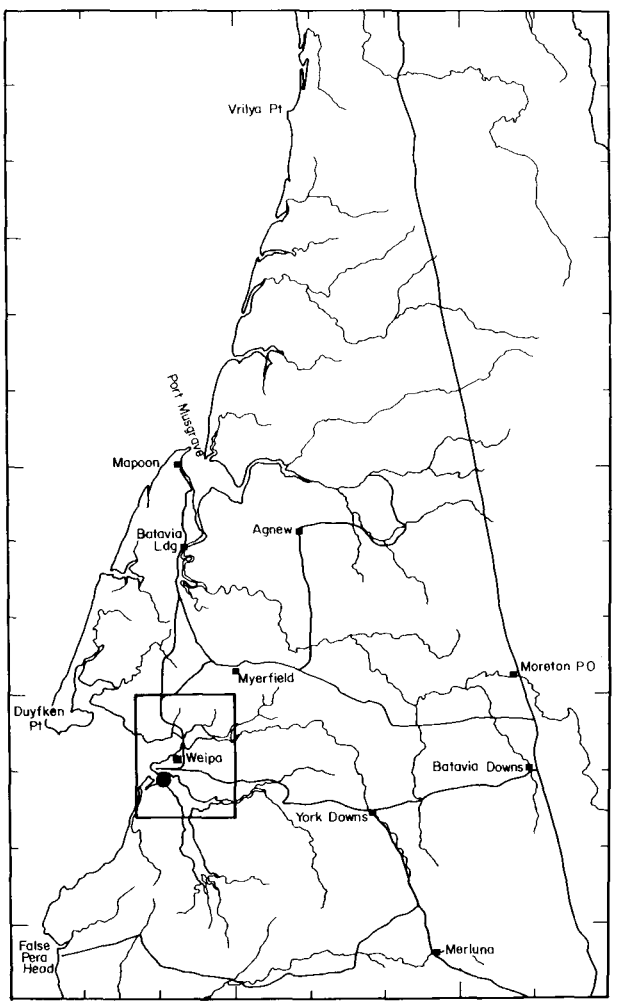
References. McDowell, 1979; Shine, 1986b, 1986c; Shine & Lambeck, 1985.

Acrochordus granulatus (Schneider, 1799)
Plate 27

Little File Snake

[NON-VENOMOUS]

Description. *Large dark marine snake with small head and rough-textured skin composed of very small pointed scales.* Grey, brown or almost black with numerous narrow, indefinite whitish or fawn-coloured crossbands, fading gradually on the belly. Scales of the skin are small, granular and keeled and the skin is coarsely file-like in appearance and to touch. Scales in 90 to 160 rows at midbody. A distinct midventral fold



Acrochordus granulatus

but no enlarged ventral, anal or subcaudal scales. Tail prehensile.

Size (total length). 0.79 m, 0.82 m (females), 0.745 m (male) (Weipa); average recorded for species = 0.6 m; maximum for species = 1.2 m.

Distribution at Weipa (sites; physiographic units). One site only - Albatross Bay.

Geographic range. Coast of north-east and north Australia; also New Guinea and South-east Asia.

Habitat. Saltwater bay. Occupies a variety of marine habitats in different geographic regions, ranging from muddy bottoms to reef flats, and from high to low salinities.

Survey abundance. Scarce. Marine snakes not searched for consistently during survey.

Overall abundance. Uncommon. Four records in one survey and one additional record. Occasionally caught by fishermen netting for bait near Lorim Point (Peter Reeders, personal communication).

Seasonality. Recorded on only one visit - June to July 1982.

Reproduction. Live-bearer; litter size one to 12 (Voris & Glodek, 1980). Gravid females collected in June 1982; one contained six embryos. Reproduction aseasonal.

Notes. Two individuals dip-netted from surface of water at night, with aid of spotlight directed from runabout.

Feeds predominantly on fishes, particularly small bottom-dwelling gobies which it subdues by constriction.

References. McDowell, 1979; Voris & Glodek, 1980.

Family COLUBRIDAE (Colubrid Snakes)

Boiga irregularis (Merrem, 1802)
Plate 28

Brown Tree Snake

[REAR-FANGED, MILDLY VENOMOUS]

Description. *Slender brown arboreal and terrestrial snake with broad head and vertical 'cat's eye' pupils.* Brown to bright reddish-brown above with numerous narrow irregular dark crossbands. Many of the scales slightly edged with black or patches of black skin between the scales. Belly cream to salmon-coloured. In some specimens there is a distinct dark bar through the eye and along the side of the head. Scales smooth, in 19 to 23 rows at midbody. Anal scale single. Subcaudal scales all divided.

Size (total length). 0.99 m (unsexed) -1.385 m (male) and 1.165 m (female) (Weipa). Average recorded for species = 1.4 m; maximum for species = 2 m.

Distribution at Weipa (sites; physiographic units). 6% of sites - north-east of Vrilya Point, Lorim Point, and road between Andoom Creek Bridge and the Zero Drill Line; Mapoon Plain and Weipa Plateau. QNPWS also recorded this species from the "Jump-up" on the Merluna Plain.

Geographic range. Coast and adjacent areas of north and east Australia; also New Guinea and Indonesia.

Habitat. Open forest, vine forest, gallery forest; also regeneration (Reeders & Morton, 1983).

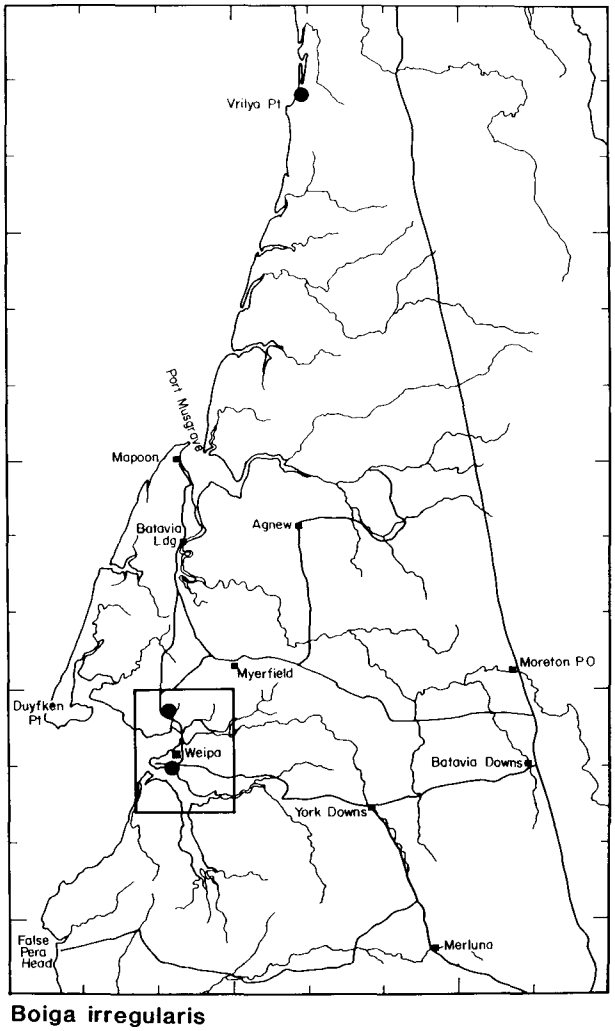
Survey abundance. Uncommon.

Overall abundance. Common in the post-wet season. Fourteen records in three surveys and four additional records.

Seasonality. Recorded on four out of six visits, not recorded in July 1977 or February 1979; also April 1980, between November 1979 and June 1980, and January 1984. Appears to be most abundant and/or most active in the post-wet - in April 1980 Peter Reeders reported seeing four individuals in three weeks in the vicinity of Trunding Creek, and four individuals were recorded in April 1982 but not in the December or September sampling periods (Reeders & Morton, 1983). QNPWS recorded two individuals in May 1981.

Reproduction. Egg-layer. A gravid female collected in June 1982 had eight large oviducal eggs, measuring 31 mm in length.

Notes. Sex ratio of collected adults - 3 males:1



Boiga irregularis

female.

Most individuals collected were foraging at night on the forest floor or on the roadway near Andoom.

Arboreal as well as terrestrial, nocturnal; has been observed to constrict rodent prey. Feeds predominantly on birds and mammals but also takes some lizards; remains of *Diporiphora* dragons were found in two Brown Tree Snakes collected in the Northern Territory. QNPWS recorded an unbroken bird's egg, about 4 cm long, in the gut of one individual.

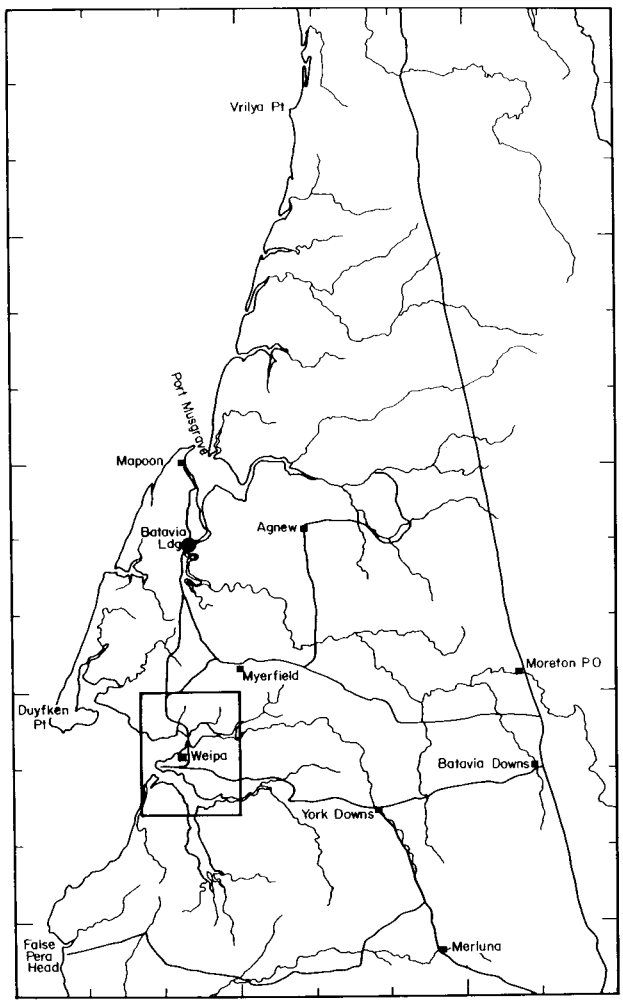
References. Irvine, 1954; Covacevich & Limpus, 1973.

Dendrelaphis calligastra (Günther, 1867)
Plate 28

Northern Tree Snake

[SOLID-TOOTHED, NON-VENOMOUS]

Description. *Slender agile tree-climbing snake with dark streak along the side of the head and neck.* Similar in most respects (including scalation) to *Dendrelaphis*



Dendrelaphis calligastra

punctulata, though less variable in colour. Differs from the latter in its larger eye (distance from snout to anterior edge of eye much less than twice the diameter of the eye) and in the presence of a dark streak from the snout, through the eye, to the side of the neck. This streak contrasts sharply with the bright yellow lip scales. Olive to rich brown above, the belly (and sometimes the lateral scales) yellow, often flecked with darker colour. Scales smooth in 13 (rarely 15) rows at midbody. Anal divided. Subcaudals all divided.

Size (total length). 1.185 m (male) (Weipa); average recorded for species = 0.8 m; maximum for species = 1.2 m.

Distribution at Weipa (sites; physiographic units). One site only - Batavia Outstation Landing; Mapoon Plain only.

Geographic range. North and east Cape York Peninsula and islands of Torres Strait; also New Guinea. McDowell (1984) considered this species might be confined to coastal lowlands, at least in Papua New Guinea.

Habitat. Gallery forest; also in vine forest (Peter Reeders, personal communication).

Survey abundance. Scarce.

Overall abundance. Scarce. One record in one survey and one additional record. Unidentified species of *Dendrelaphis* recorded in the BERS survey.

Seasonality. Recorded on only one AM visit - February 1979; also April 1980 (Peter Reeders).

Reproduction. Egg-layer; a clutch of 11 eggs has been recorded.

Notes. Diurnal, arboreal.

Often basks on end of a leafy branch, but drops to the ground to escape danger. Several individuals at Lae, PNG were collected in pools of water and in marshes.

Feeds on small vertebrates including skinks and frogs (McDowell, 1984).

References. Loveridge, 1948; McDowell, 1984; Thomson, 1935.

Dendrelaphis punctulata (Gray, 1826)
Plate 28

Common Tree Snake

[SOLID-TOOTHED, NON-VENOMOUS]

Description. *Slender agile tree-climbing snake which lacks a dark streak along the side of the head.* Colour subject to considerable geographic variation. Varies from grey and olive-green through various shades of brown to almost black or even blue above, the skin between the scales (displayed when the snake is aroused and vertically flattens the neck and body) light blue. The head of light-coloured specimens is often grey or brown, contrasting strongly with the body colour. Belly usually lemon-yellow, more intense in colour under the throat, but varies from white to olive, yellow, green or even bluish. Weipa individuals have dark back,

blackish head and golden venter. No dark streak from the snout and through the eye. Distance from snout to anterior edge of eye about twice the diameter of the eye. Scales smooth, in 13 (rarely 15) rows at midbody. Anal scale divided. Subcaudals divided.

Size (total length). 0.298 m (unsexed) - 1.135 m (male) and 1.395 m (female) (Weipa); average recorded for species = 1.2 m; maximum for species = 2 m.

Distribution at Weipa (sites; physiographic units). 9% of sites, mostly coastal or riverine; Weipa Plateau and Mapoon Plain.

Geographic range. Coast and adjacent areas of north and east Australia; also New Guinea.

Habitat. Open forest, dunefield woodland, paperbark woodland, vine forest, gallery forest, urban; also regeneration (Reeders & Morton, 1983).

Survey abundance. Uncommon.

Overall abundance. Uncommon. Ten records in two surveys. Unidentified *Dendrelaphis* species recorded in BERS survey.

Seasonality. Recorded on four out of six visits, not recorded in July 1980, August 1981.

Reproduction. Egg layer; clutch size five to 14. Gravid female collected in November 1979, with nine eggs averaging 17 mm in length. Hatchling collected in June 1982.

Notes. Sex ratio of collected adults - 3 males:2 females.

Arboreal, diurnal (one female active at 0730 hours on 15 November 1979).

Diet consists typically of skinks and frogs; stomach contents of one Weipa individual included two frogs - a *Litoria ?bicolor* and possibly *Limnodynastes ornatus*. A Common Tree Snake collected in the Northern Territory contained the remains of a Fence Skink (*Cryptoblepharus ?plagiocephalus*).

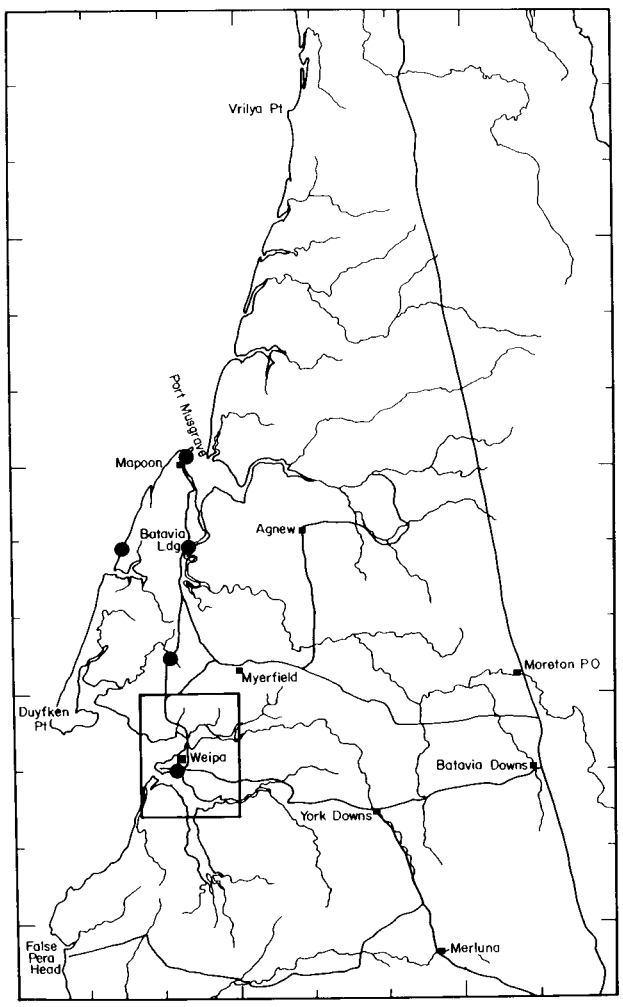
References. Cogger & Lindner, 1974.

Enhydris polylepis (Fischer, 1886)
Plate 29

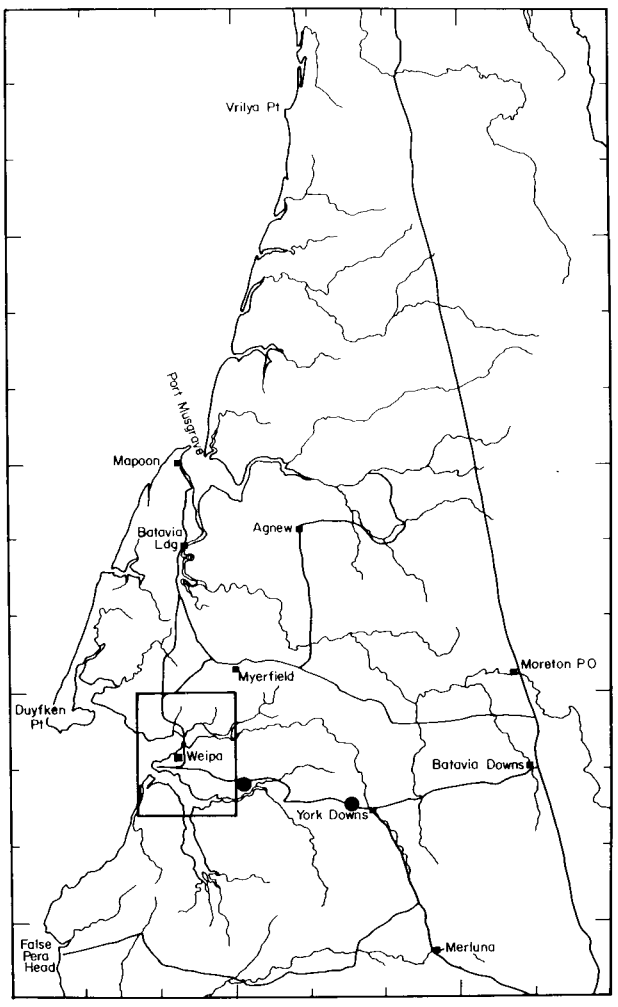
Macleay's Water Snake

[REAR-FANGED, MILDLY VENOMOUS]

Description. *Moderate-sized freshwater snake with very small eyes.* Dark olive-brown to olive-black above, this colour extending about halfway down the flanks to



Dendrelaphis punctulata



Enhydris polylepis

within three or four scale rows of the ventrals. The lower flanks sometimes spotted or speckled with black and cream, but more often the lower flanks are whitish, with a pale grey stripe along the lowest body scale row on each side (i.e., the scale row adjacent to the ventrals). Sometimes a pale grey midventral stripe on the body but almost invariably a dark grey or black stripe under the centre of the tail. Lips pale cream or brown. Scales smooth, in 21 to 23 rows at midbody. Anal scale divided. Subcaudal scales divided.

Size (total length). 0.69-0.744 m (male) (Weipa); average recorded for species = 0.6 m; maximum for species = 0.8 m.

Distribution at Weipa (sites; physiographic units). 4% of sites, recorded only from Running Creek and site 22, 6 km west of York Downs; Mapoon Plain and Merluna Plain.

Geographic range. North-east Queensland, north Northern Territory; also New Guinea.

Habitat. Both snakes collected in clear pools of small streams flowing through gallery forest. Typically occurs in freshwater lagoons, swamps and rivers.

Survey abundance. Scarce. Freshwater snakes were not consistently searched for during the survey.

Overall abundance. Scarce. Two records in one survey.

Seasonality. Recorded on two out of six visits - November 1979 and June 1982.

Reproduction. Live-bearer; litter size 10. Young born in January (Thomson, 1935).

Notes. Both specimens were males.

Active both at night and by day. Aquatic, rarely leaves the water. May anchor itself by the tail to a submerged root and wait motionless for passing prey, also forages slowly over the bottom of pools.

Feeds on small frogs including *Litoria* species, and fish. (The individual collected in June 1982 was feeding on chicken bones which had been discarded in the water).

No symptoms of envenomation followed three known instances of bites to humans.

References. Griffiths, 1981; Thomson, 1935.

Stegonotus cucullatus (Duméril, Bibron & Duméril, 1854)
Plate 29

Slaty-grey Snake

[SOLID-TOOTHED, NON-VENOMOUS]

Description. *Moderate-sized, dark-coloured terrestrial snake.* Uniform brown to leaden-grey or black above, belly white or cream, sometimes with black flecks and blotches, especially on lateral edges of ventrals, and more marked posteriorly. Scales smooth, in 17 (occasionally 19) rows at midbody. Anal scale single. Subcaudal scales all divided.

Size (total length). 1.115 m (male) (Weipa); maximum recorded for species = 1.3 m.

Distribution at Weipa (sites; physiographic units). 4% of sites, both close to freshwater - at Vrilya Point, and near the Albatross Hotel in Weipa; Weipa Plateau only. QNPWS also recorded this species at York Downs, Merluna Plain.

Geographic range. Coast and adjacent areas of north and north-east Australia; also New Guinea.

Habitat. Open forest, paperbark woodland; also eucalypt woodland (QNPWS) and regeneration (Reeders & Morton, 1983). Often closely associated with streams, lagoons or water tanks near buildings.

Survey abundance. Scarce.

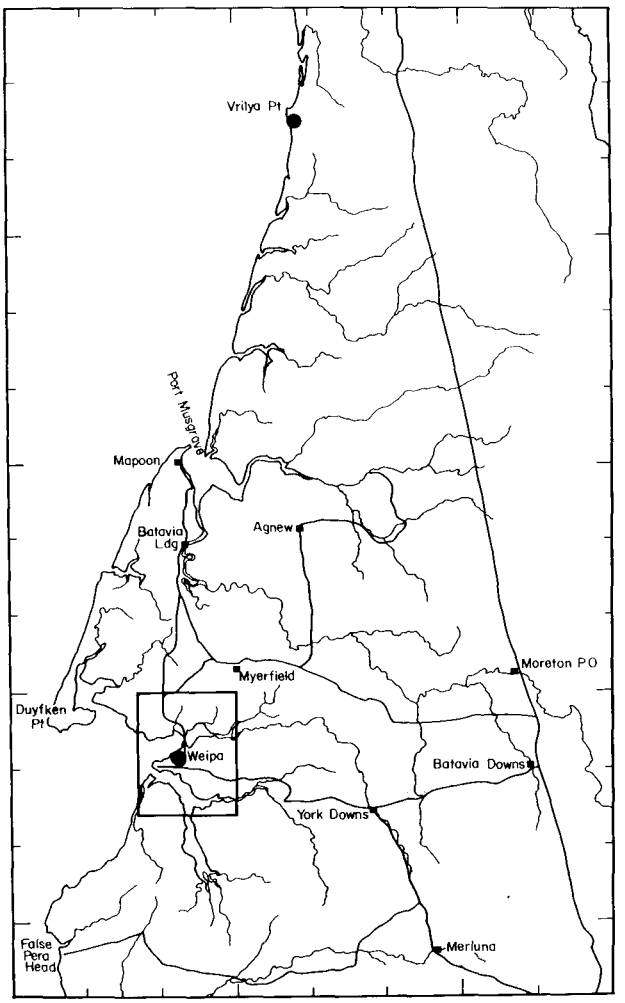
Overall abundance. Uncommon. Six records in four surveys.

Seasonality. Recorded on two out of six visits - in February 1979 and August 1981. Also May 1981 (QNPWS), March 1982 (BERS) and September 1982 (Reeders & Morton, 1983).

Reproduction. Egg-layer.

Notes. Nocturnal; one male collected while it was foraging on the ground at night.

Diet includes squamate (lizard and snake) eggs, frogs, lizards, grasshoppers and crickets, and mice; in captivity individuals have been observed to constrict



Stegonotus cucullatus

mice.

Aggressive when aroused, exuding a strong odour from anal glands.

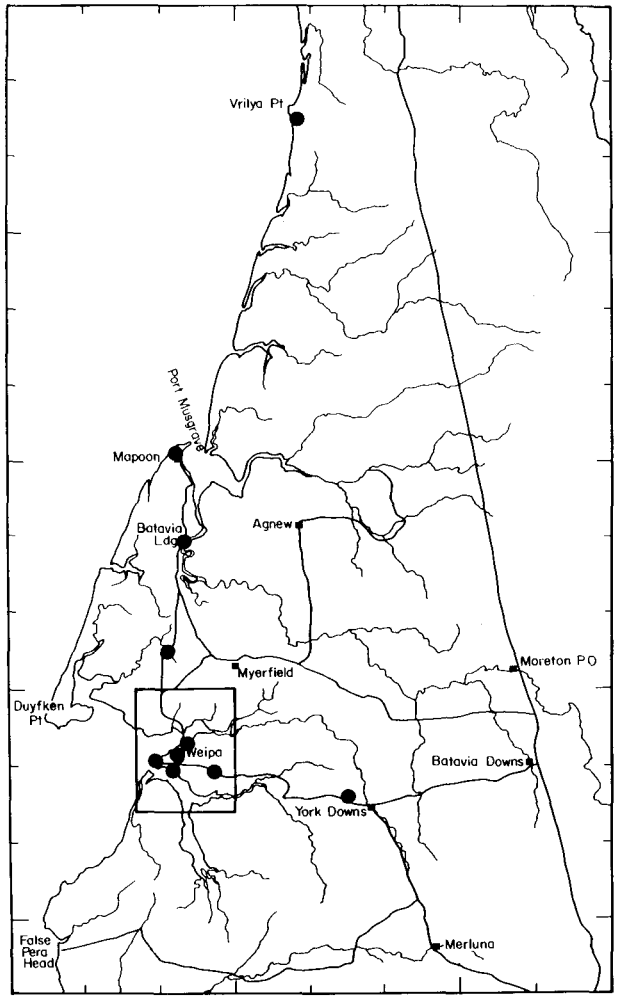
References. McDowell, 1972; Shine & Schwaner, 1985.

Tropidonophis mairii (Gray, 1841)
Plate 29

Keelback or Freshwater Snake

[Also appears in the literature in genera *Amphiesma* and *Styporhynchus*. SOLID-TOOTHED, NON-VENOMOUS]

Description. *Moderate-sized semi-aquatic snake with pattern of darker irregular bands or flecks, and keeled scales.* Various shades of grey, brown, olive, reddish to black above, often with numerous narrow, irregular darker crossbands formed by dark-tipped scales or patches of dark skin between the scales. These bands may at times be reduced to scattered dark flecks. Belly cream, olive-green, brown or even salmon-coloured. Scales strongly keeled, in 15 (rarely 17) rows at midbody. Anal scale divided. Subcaudal scales all divided.



Tropidonophis mairii

Size (total length). 0.189-0.810 m (male), 0.515-0.729 m (female) (Weipa); average recorded for species = 0.5 m; maximum for species = 1 m.

Distribution at Weipa (sites; physiographic units). 19% of sites; all three physiographic units, but mainly Weipa Plateau and Mapoon Plain.

Geographic range. Coastal areas of north and north-east Australia, from north-west Australia to Clarence River, New South Wales; also south-east New Guinea.

Habitat. Open forest (deserted sawmill on Coen Road), eucalypt woodland (dry creek bed), paperbark woodland, gallery forest, grass/sedgeland, urban; also in freshwater lagoon (QNPWS) and regeneration (Reeders & Morton, 1983). Usually encountered close to water.

Survey abundance. Common.

Overall abundance. Common, the most abundant snake recorded in the Weipa area. Thirty nine records in three surveys. QNPWS observed ten swimming in a lagoon on an overcast day in February.

Seasonality. Recorded on five out of six visits, not recorded in June 1982.

Reproduction. Egg-layer; clutch size five to 12. Egg-laying has been recorded in June. A female collected in July 1977 had eight ovarian follicles averaging 16 mm in length.

Notes. Sex ratio of collected adults - 5 males:3 females.

Active both in the day and at night. Semi-aquatic. Sometimes encountered foraging along the banks of streams; usually takes to the water when disturbed.

Diet principally frogs; it is one of the successful native predators of the Cane Toad. Stomach contents of collected specimens included *Crinia remota*, *Limnodynastes ornatus*, *Litoria caerulea*, *Litoria nasuta*, *Sphenophryne gracilipes* and a *Carlia* species, probably *C. storri*.

References. Covacevich, 1974; Covacevich & Archer, 1975; Malnate & Underwood, 1988.

Family ELAPIDAE (Elapid Snakes)

Acanthophis praelongus Ramsay, 1877
Plate 30

Northern Death Adder

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Short stout snake with broad, somewhat triangular head, narrow neck and thin rat-like tail ending in a curved soft spine.* Variable in colour, ranging from pale grey to rich reddish-brown, usually with

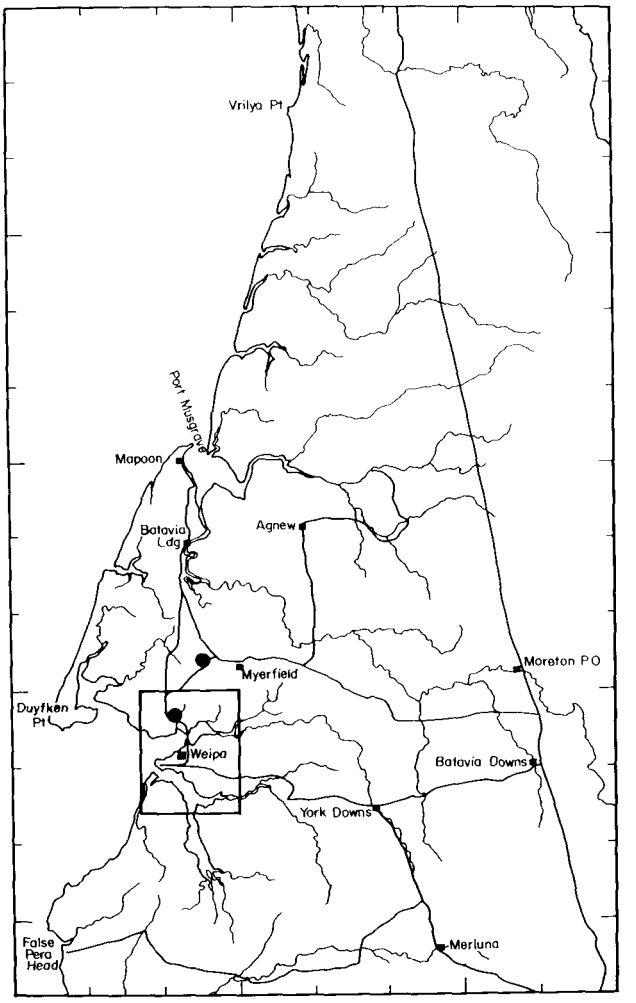
somewhat irregular crossbands, often dark-edged, which depending on their colour and width may appear to be either dark or light in relation to the ground colour. Belly cream or greyish with numerous dark brown or grey flecks and spots. Tail tip usually white or cream. Lips usually strongly barred with dark brown. Head shields rugose (often with a raised outer edge on each scale above the eye), and strongly keeled scales on the neck and anterior part of the body.

Size (total length). 0.305 m (unsexed) - 0.435 m (male) and 0.38 m (female) (Weipa); average recorded for species = 0.4 m; maximum for species = 0.7 m. Females grow significantly larger than males.

Distribution at Weipa (sites; physiographic units). 4% of sites - road between Andoom Creek Bridge and Zero Drill Line, and Possum Scrub; Weipa Plateau only. QNPWS also recorded this species at Red Beach, and there are four specimens in the Queensland Museum, from Beagle North Camp (AM site 52).

Geographic range. North Australia, from the Kimberleys, to Cape York Peninsula; also New Guinea.

Habitat. Open forest; also regeneration (Reeders & Morton, 1983).



Acanthophis praelongus

Survey abundance. Scarce.

Overall abundance. Uncommon. Ten records in three surveys and two additional records. The most common of the potentially lethal land snakes in the Weipa area.

Seasonality. Recorded on two out of six visits - November 1979 and July 1980; also August 1980 (QNPWS).

Reproduction. Live-bearer; litter size up to 20. Young born between December and March; individual females probably reproduce only every second year (Shine, 1980a). Male with large testes collected in November 1979.

Notes. Sex ratio of collected adults - 1 male:1 female.

Nocturnal, collected on the roads at night. During the day usually found half-buried under litter, soil or sand; a juvenile was found in a loose concertina-shaped position under a log resting lightly on the ground.

Employs caudal luring to catch food - the pale tail tip is wriggled like a worm to attract prey; small mammals and birds are the most common food of adults, while juvenile snakes feed mainly on lizards.

Unlike other Australian elapids, Death Adders tend to rely on cryptic colouration to avoid detection; they normally remain where they are when disturbed and resort to flight only when strongly provoked and when their normal defence reaction - a tense, flattened, coiled position from which lightning-fast strikes are made - fails to deter an aggressor (Cogger, 1986).

References. Cogger, 1986; Shine, 1980a; Storr, 1981b.

Demansia atra (Macleay, 1884)
Plate 30

Black Whip Snake

[Also appears in the literature as *Demansia vestigiata*. VENOMOUS, LARGE INDIVIDUALS MAY PRODUCE POTENTIALLY SEVERE SYMPTOMS IN HUMANS]

Description. *Moderately large, slender blackish terrestrial snake with long deep narrow head and thin, whip-like tail.* Light to dark olive-brown or black above, lighter laterally, each body scale edged with darker to form a network pattern in lighter specimens, while dark pigment is often more pronounced posteriorly. Top of head usually without dark brown spots and flecks. No light-edged dark bar around front of snout. Side of face with at most a trace of strongly contrasting light and dark markings. Belly yellowish-grey to greenish-grey, underside of tail reddish. Scales smooth, in 15 rows at midbody. Anterior ventral scales dark-edged. Anal scale divided. Subcaudal scales all divided.

All specimens from Weipa survey had 15 scale rows at midbody and typical colouring of *Demansia atra*; no *Demansia papuensis* recorded in survey.

Size (total length). 0.895-1.07 m (male), 0.455 m (female) (Weipa); average recorded for species = 1 m; maximum for species = 1.78 m. Males grow larger than females.

Distribution at Weipa (sites; physiographic units). 13% of sites, including vicinity of Weipa settlement; Mapoon Plain and Weipa Plateau. QNPWS also recorded this species on the Merluna Plain.

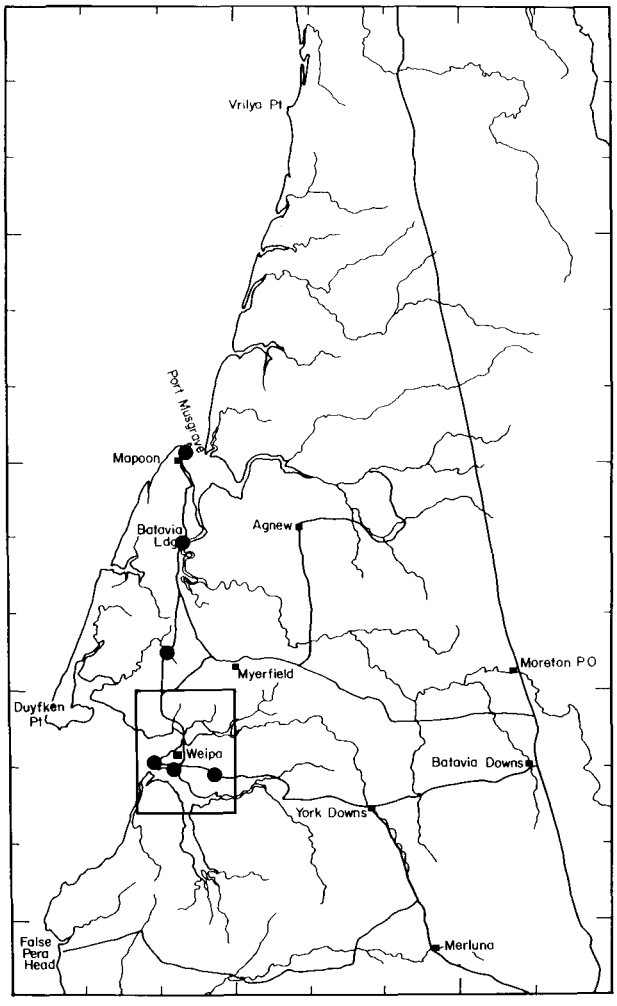
Geographic range. Coast and adjacent areas of north and north-east Australia, from the Kimberleys to central east Queensland.

Habitat. Open forest, dunefield woodland, urban; also gallery forest (QNPWS) and regeneration (Reeders & Morton, 1983). Most common in dry habitats.

Survey abundance. Common.

Overall abundance. Common, the most abundant venomous land snake in the Weipa area. Twenty five records in four surveys. The majority were found dead on the road (DOR).

Seasonality. Recorded on four out of six visits, not recorded in July 1980 or August 1981. Reeders & Morton (1983) found it was most common in the post-wet season (April) but it was recorded in almost all months - December 1981, April and September 1982 (Reeders & Morton, 1983); February, May 1981 (QNPWS); November 1981 and March 1982 (BERS).



Demansia atra

Reproduction. Egg-layer; clutch size four to 13. Appears to be reproductively aseasonal. Male collected in February 1979 had large testes. The single female collected in June 1982 appeared never to have bred.

Notes. Sex ratio of collected adults - 7 males:1 female.

Primarily diurnal but may be crepuscular in hot weather. Individuals seen basking on the road between 0900 and 1000 hours in June 1982. In February 1979 a male was found under sheets of tin at 1100 hours when the air temperature was about 32°C.

Feeds mainly on lizards and also takes frogs. Stomach contents of two individuals contained the tail, feet and two large eggs of a gravid *Ctenotus spaldingi*, and the remains of a *Diporiphora* species, respectively. Of three Black Whip Snakes collected on Torres Strait Islands, one contained a *Ctenotus* skink, one a *Ctenotus* and a gravid *Uperoleia* frog, and the third, a small skink (*Lygisaurus* sp.).

References. Shine, 1980c.

Furina ornata Gray, 1842
Plate 30

Orange-naped Snake

[VENOMOUS BUT BITES ARE MILD OR ASYMPTOMATIC IN HUMANS]

Description. *Small slender reddish-brown terrestrial snake with dark head and reddish-orange bar across the back of the head.* Pale to dark orange or reddish-brown above, each body scale edged with darker brown to form dark reticulations over the body. Head dark brown or blackish (somewhat paler on the snout) except for the lips which are pale cream; a broad yellow, orange or reddish bar across the nape separating the dark brown of the head from a similar dark brown area on the neck. Belly cream. Scales smooth, in 15 rows at midbody. Anal scale divided. Subcaudal scales all divided.

Size (total length). 0.334 m (unsexed) - 0.411 m (male) and 0.539 m (female) (Weipa); average recorded for species = 0.372 m (male), 0.456 m (female); maximum for species = 0.726 m. Females grow significantly larger than males.

Distribution at Weipa (sites; physiographic units). 6% of sites, all close to Weipa; Mapoon Plain and Weipa Plateau. Also recorded by BERS near Beagle North Camp (AM site 52).

Geographic range. North and north-west Australia.

Habitat. Open forest (most records), paperbark woodland; also regeneration (Reeders & Morton, 1983).

Survey abundance. Uncommon.

Overall abundance. Uncommon. Twelve records in

four surveys.

Seasonality. Recorded on three out of six visits, not recorded in February 1979, July 1980 or August 1981; additional record for 1979 from Barry Middleton, Regeneration. Also May and August 1981 (QNPWS); September 1982 (Reeders & Morton, 1983); November 1981 (BERS).

Reproduction. Egg-layer; clutch size three to six (Shine, 1981). Gravid female with six oviducal eggs 23 mm long, collected in June 1982. Male with enlarged testes collected in July 1977. No obvious seasonal pattern of reproduction has been detected in this species.

Notes. Sex ratio of collected adults - 5 males:3 females.

Nocturnal; usually collected on roads or paths at night. Adopts aggressive posture when aroused, but usually strikes with its mouth closed.

Diet consists largely of small diurnal skinks of the genera *Carlia*, *Cryptoblepharus* and *Ctenotus* (Shine, 1981). Stomach contents of an adult female in the Weipa survey included an adult *Ctenotus* and insect remains (probably the gut contents of the *Ctenotus*).

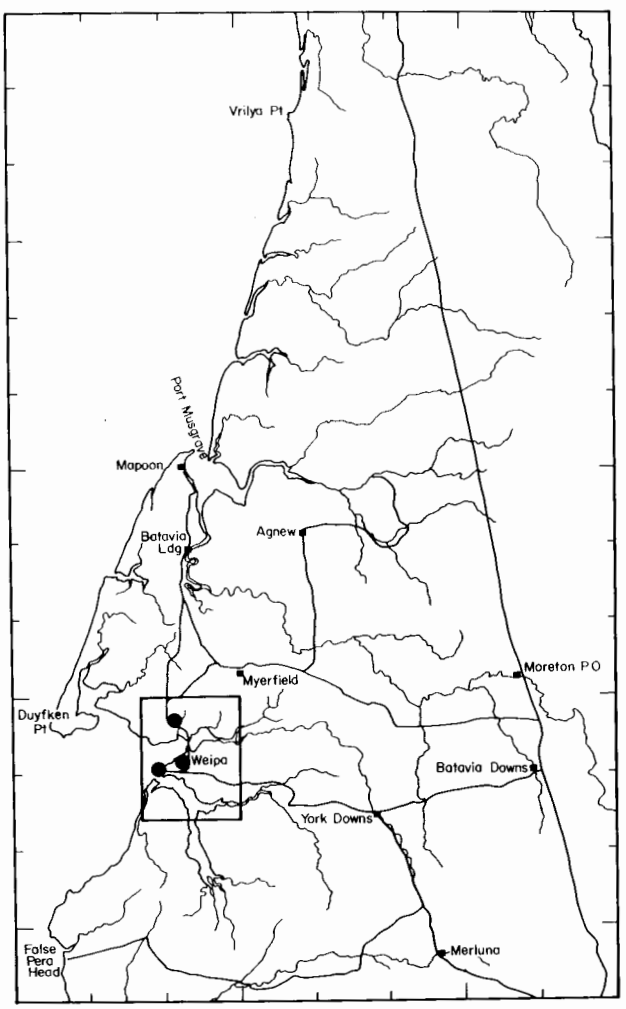
References. Shine, 1981; Storr, 1981a.

Furina tristis Günther, 1858
Plate 31

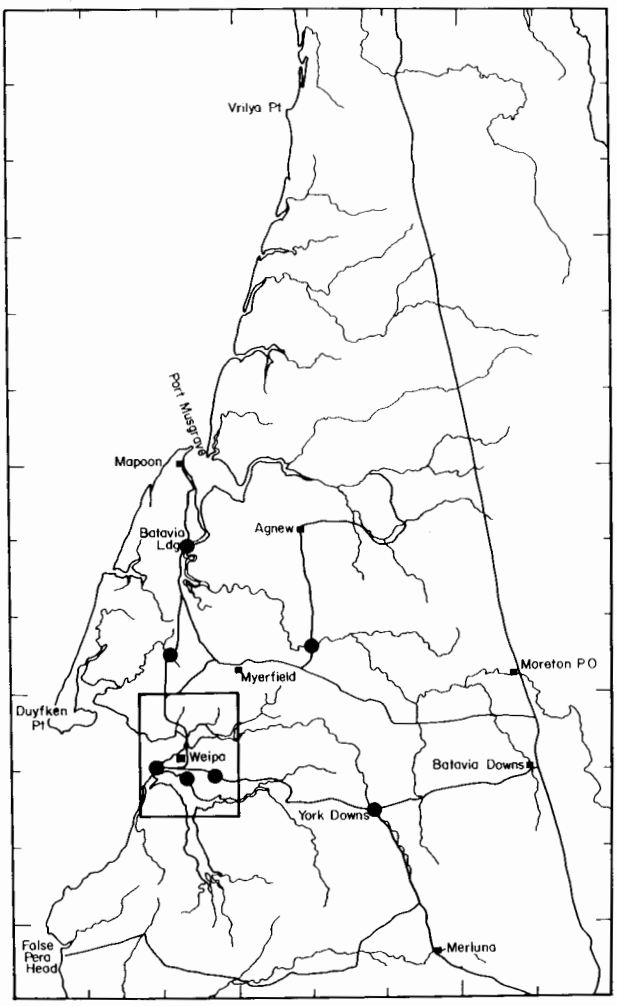
Brown-headed Snake

[Also appears in the literature as *Glyphodon tristis*. VENOMOUS, LARGE INDIVIDUALS MAY PRODUCE POTENTIALLY SEVERE SYMPTOMS IN HUMANS]

Description. *Moderate-sized iridescent blackish snake with broad pale yellowish-brown collar.* Iridescent blackish-brown above, somewhat paler on the head, and with a distinct pale brown or yellowish collar, its edges merging with the ground colour. Lower lip scales and side of neck creamish. Most of the body scales with white hind edges becoming more conspicuous on the sides; outer edges of ventral scales with a brown patch, but the remainder of the ventral surface of the body white, or cream. Usually some dark brown markings on the chin shields, while the margins of the subcaudals are strongly edged with brown. Scales smooth, in 17 rows at midbody. Anal scale divided. Subcaudal scales all divided.



Furina ornata



Furina tristis

Size (total length). 0.343 m (unsexed) - 0.535 m (male) and 0.81 m (female) (Weipa); average recorded for species = 0.7 m; maximum for species = 1 m.

Distribution at Weipa (sites; physiographic units). 13% of sites, usually close to watercourses; all three physiographic units.

Geographic range. Cape York Peninsula and islands of Torres Strait; also New Guinea.

Habitat. Open forest, eucalypt woodland, deciduous vine thicket, gallery forest; also grassy foredune and grassy regrowth on disused airstrip (QNPWS).

Survey abundance. Uncommon.

Overall abundance. Uncommon. Ten records in three surveys.

Seasonality. Recorded on four out of six visits, not recorded in November 1979 and August 1981. Also May and August 1981 (QNPWS); March 1982 (BERS).

Reproduction. Presumably an egg-layer (Shine, 1981). A very small individual (?hatchling) was collected in July 1977. A female with snout-vent length of 0.68 m, collected in February 1979, appeared to have not yet bred.

Notes. Sex ratio of collected adults - 1 male:1 female.

Nocturnal; one collected on the road at night. During the day usually found under logs and sheets of tin and other ground debris.

Diet includes skinks of the genus *Sphenomorphus* (now split into several genera including *Glaphyromorphus*) (Shine, 1981).

References. Shine, 1981.

Oxyuranus scutellatus (Peters, 1867)
Plate 31

Taipan

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Very large, uniformly brown snake with an elongate, often paler, head.* Uniform light to dark brown above, paling on the sides to creamy brown. Head is often pale yellowish cream, especially in juveniles, or pale colour may be confined to an indefinite nuchal bar and tip of snout. Belly cream to yellow, usually with irregular orange spots and flecks. Scales keeled (especially on the neck and vertebral region) to smooth, in 21 to 23 rows at midbody. Anal scale single. Subcaudal scales all divided.

Size (total length). 1.878 m (male) (Weipa); average recorded for species = 2 m; maximum for species = 2.7 m.

Distribution at Weipa (sites; physiographic units). One site only - road north of Andoom Creek bridge; Weipa Plateau.

Geographic range. North Australia, from Kimberleys to east Arnhem Land and east Queensland, as far south as the Clarence River in New South Wales; also New Guinea.

Habitat. Open forest (Maggie Goudie); Thomson (1935) reported that in Cape York Peninsula, taipans were most numerous along the shores of the Gulf of Carpentaria where there were extensive colonies of a *Rattus* species (probably *Rattus sordidus*).

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. None recorded in surveys, one independent record.

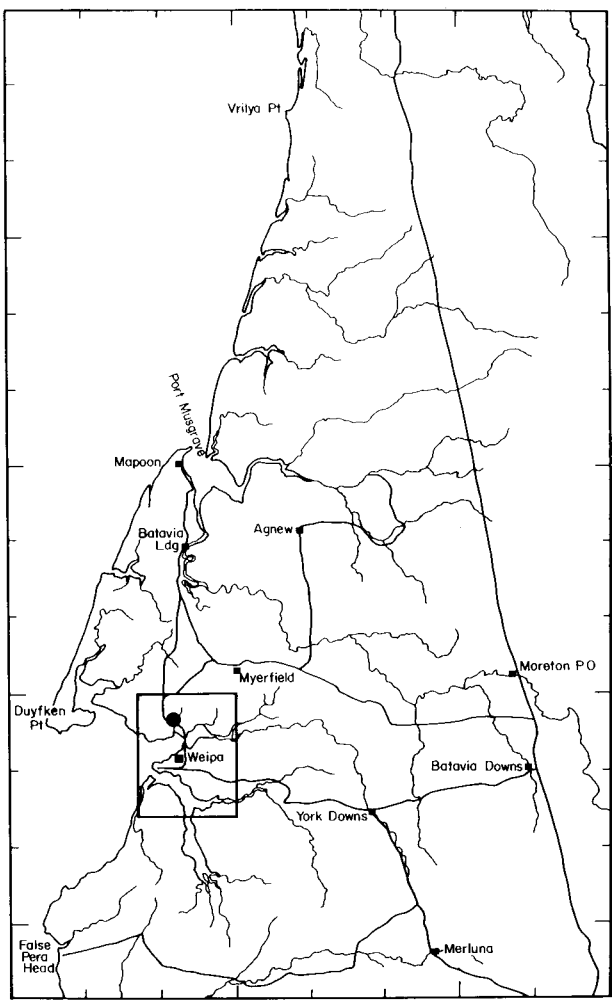
Seasonality. Not recorded by AM staff during survey; single freshly dead specimen was collected by Maggie Goudie in May 1982.

Reproduction. Egg-layer; clutch size seven to 20. Mating and egg-laying occur between August and December (Shine & Covacevich, 1983).

Notes. A fast-moving snake which employs a "strike and release" biting strategy.

Diurnal but more active in the morning and early evening than in the hottest part of the day.

Gut of Weipa specimen contained mammal fur and bones; elsewhere, *Melomys* sp., *Mus musculus*, *Perameles nasuta* and *Rattus* species have been recorded in the diet. This is one of only two Australian elapid snakes that feed exclusively on warm-blooded (endothermic) prey,



Oxyuranus scutellatus

i.e., birds and mammals (Shine & Covacevich, 1983); because the taipan does not eat cane toads, unlike most other large elapids which occur in toad-infested areas, it has been hypothesised that they may become relatively more common than the other elapids (which continue to die from ingesting poisonous toads) (Shine & Covacevich, 1983).

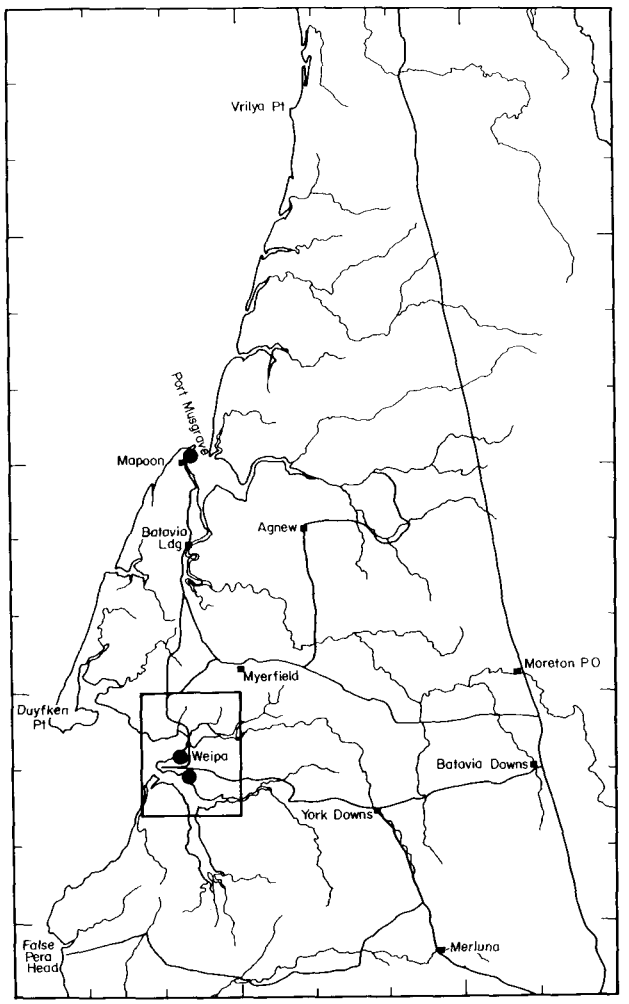
References. Shine & Covacevich, 1983; Thomson, 1935.

Pseudechis australis (Gray, 1842)
Plate 31

Mulga or King Brown Snake

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Large robust brown terrestrial snake with a heavy blunt head.* Rich copper-coloured or reddish-brown to dark olive brown above, the individual scales often with darker edges or tips forming an overall reticulated pattern. Belly cream to salmon-coloured, often with scattered orange blotches. Scales smooth, in 17 rows at midbody. Anal scale divided. Subcaudal scales single anteriorly, divided posteriorly (occasionally all single).



Pseudechis australis

Size (total length). 0.435-1.275 m (Weipa); average recorded for species = 1.5 m; maximum for species = 2.07 m.

Distribution at Weipa (sites; physiographic units). 6% of sites, vicinity of Weipa settlement, and Mapoon; Weipa Plateau and Mapoon Plain.

Geographic range. Australia-wide except for coast, ranges and west slopes of south-east and south-west Australia.

Habitat. Open forest, dunefield woodland, paperbark woodland; also regeneration (Reeders & Morton, 1983).

Survey abundance. Scarce.

Overall abundance. Uncommon. Nine records in three surveys.

Seasonality. Recorded on only one visit - February 1979. Also May 1980 and some time in 1979 (Regeneration staff); December 1981 and April 1982 (Reeders & Morton, 1983); November 1981 (BERS). Slough found in June 1982. Appears to be active mainly in the wet season.

Reproduction. Egg-layer (average size of eggs 45 x 27 mm); clutch size four to 19, mean clutch size nine (Shine, 1987). Gravid females recorded in August and April as well as January.

Notes. In hot weather and in the north of its range, most active in the early evening and in the morning between 0800 and 1000 hours. The juvenile collected by the AM was found under sheets of tin at 1100 hours in February.

Diet very diverse, includes frogs, dragon lizards, skinks, legless lizards, snakes, birds, rodents and bandicoots.

References. Fitzgerald & Pollitt, 1981; Shine, 1987; Thomson, 1935.

Pseudonaja textilis (Duméril, Bibron & Duméril, 1854)
Plate 32

Eastern Brown Snake

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Large slender brown terrestrial snake with a rather narrow head.* Variable in colour and pattern. Adults usually uniform in colour, ranging from light tan, through dark brown, russet and orange to almost black. Belly cream, yellow or orange with scattered blotches of orange or dark grey. Hatchling patterns vary enormously with locality; they generally include a black head (except for the snout) and black nuchal band; the body may be uniform brown, or there may be a series of 50 or more black crossbands along the length of the body; in others the body may be more indefinitely banded with alternate narrow and wide darker grey or black bands, or the dark-tipped scales may

give a reticulated appearance. All of these patterns gradually disappear with age. Scales smooth, in 17 rows at midbody. Anal scale divided. Subcaudal scales all divided (rarely several anterior subcaudals single).

Size (total length). 0.905 m (slough) (Weipa); average recorded for species = 1.5 m; maximum for species = 2.2 m.

Distribution at Weipa (sites; physiographic units). 2% of sites - Mapoon only; Mapoon Plain. Reeders & Morton also recorded it in regeneration on the Weipa Plateau.

Geographic range. East Australia, from Cape York to south-east South Australia; also east Papua.

Habitat. Dunefield woodland; also regeneration (Reeders & Morton, 1983). Typically occurs in drier habitats within its range.

Survey abundance. Scarce.

Overall abundance. Scarce. Three records in two surveys.

Seasonality. Not recorded by AM staff during survey; specimen killed and presented by Jack Callope in 1981 and slough collected in June 1982; Reeders & Morton record in September 1982.

Reproduction. Egg-layer; clutch size six to 33. Egg-laying typically occurs in November and December but individuals may produce more than one clutch per year. Incubation period about 48 days at 30°C.

Notes. Diurnally active but may also be encountered on warm nights.

Feeds primarily on small mammals especially rodents, and birds and lizards; may employ constriction to subdue its prey.

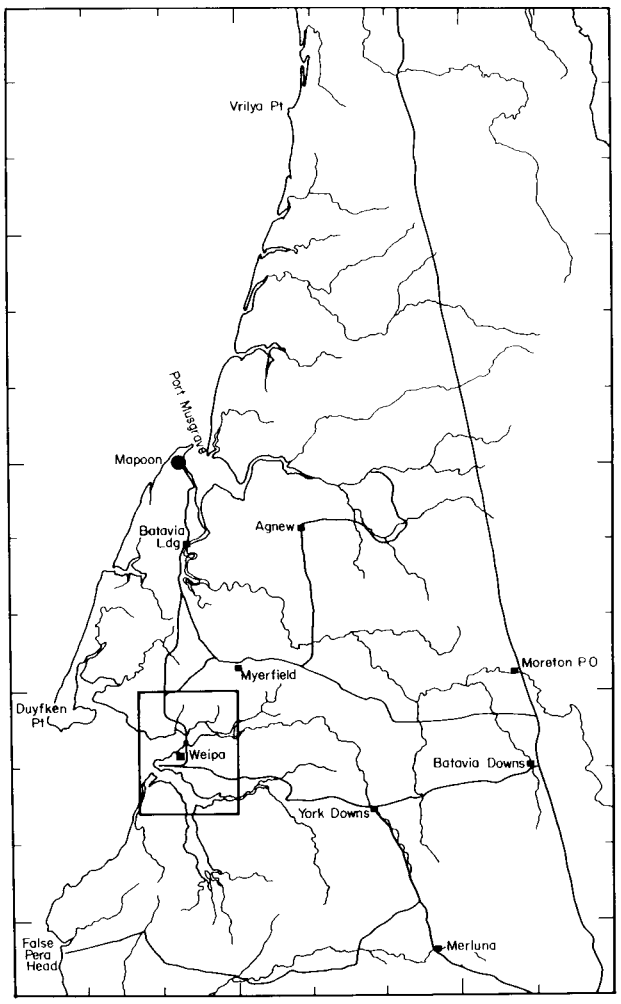
References. Gillam, 1979; Mengden & Fitzgerald, 1987; Shine, 1989.

Rhinoplocephalus nigrostriatus (Krefft, 1864)
Plate 32

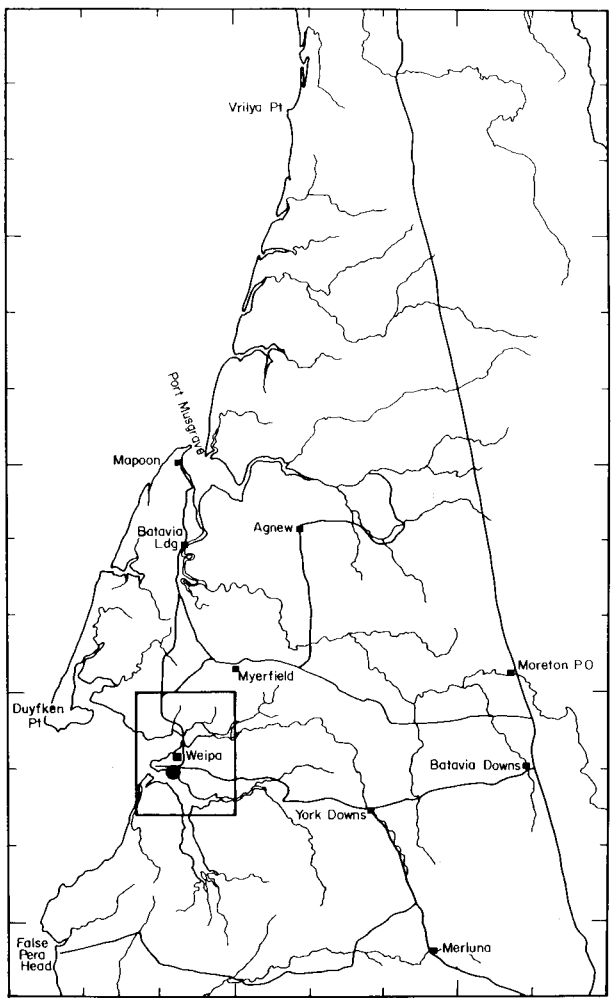
Black-striped Snake

[Also appears in the literature as *Unechis nigrostriatus*. VENOMOUS BUT BITES ARE MILD OR ASYMPTOMATIC IN HUMANS]

Description. *Small slender reddish terrestrial snake with blackish head and vertebral stripe.* Bright reddish-pink to dark brown above, with a dark brown to black vertebral stripe, one to two scales



Pseudonaja textilis



Rhinoplocephalus nigrostriatus

wide, from the head to the tip of the tail. Top of the head is the same colour as the vertebral stripe. The individual body scales may have a black base and light hind edges forming an overall reticulated pattern. Belly creamy-white. Scales smooth, in 15 rows at midbody. Anal scale single. Subcaudal scales all single.

Size (total length). 0.328 m (Weipa); average recorded for species = 0.45 m; maximum for species = 0.6 m.

Distribution at Weipa (sites; physiographic units). One AM site only - Lorim Point wharf area; Weipa Plateau. QNPWS recorded this species from the vicinity of the shell mounds on the Embley River and BERS found specimen near Beagle North Camp (AM site 52).

Geographic range. Coast and adjacent ranges of north-east Australia from Cape York Peninsula to south Queensland.

Habitat. Urban (Peter Reeders); also open forest (QNPWS and BERS). Usually found in sclerophyll forests.

Survey abundance. Scarce.

Overall abundance. Scarce. Two records in two surveys and one additional record.

Seasonality. Not recorded by AM staff during survey; donated AM specimen collected in July 1982, QNPWS specimen in February 1981 and BERS specimen in November 1981.

Reproduction. Live-bearer. Litter size four to nine, mean 5.5. Ovulation occurs in spring and young are born in summer.

Notes. Nocturnal; QNPWS specimen collected on the road at night. Secretive, usually found sheltering under logs or ground litter.

Feeds primarily on small scincid lizards including *Carlia* and *Ctenotus*.

References. Cogger, 1986; Shine, 1988.

Simoselaps semifasciatus campbelli (Kinghorn, 1929)
Plate 32

Half-girdled Snake

[VENOMOUS BUT BITES ARE MILD OR ASYMPTOMATIC IN HUMANS]

Description. *Very small banded burrowing snake.* Pale fawn or olive-brown to rich reddish-brown above, with numerous dark grey, dark brown or blackish crossbands along the length of the body and tail; these crossbands may be much wider than, to about as wide as, the paler interspaces. The paler scales are often dark-edged. Always a blackish bar across the top of the head, enclosing the eyes. Ventral surfaces whitish. Rostral scale with an upturned, sharply angular leading edge. Scales smooth, in 15 or 17 rows at midbody. Anal scale divided.

Size (total length). Average recorded for species = 0.3 m; maximum for species = 0.4 m. Females are slightly larger than males.

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey; QNPWS recorded one specimen at Batavia Landing; Weipa Plateau only.

Geographic range. Most of Western Australia (except the south-east), north-west South Australia and adjacent border regions of the Northern Territory, and north and north-east Australia; subspecies *campbelli* occurs in north-east Queensland.

Habitat. Open forest adjacent to vine forest (QNPWS).

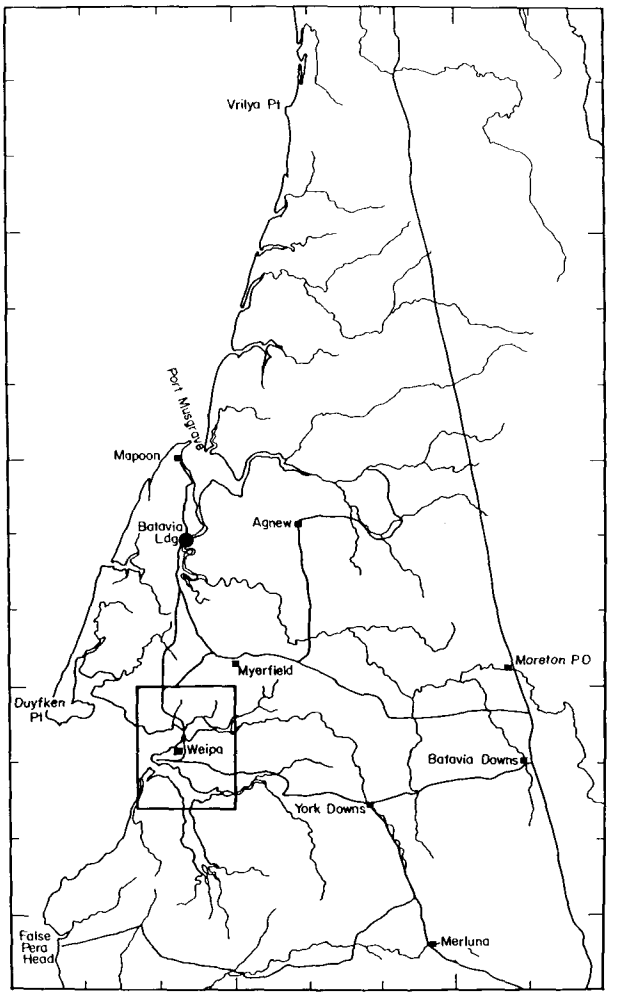
Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. One record in one survey.

Seasonality. QNPWS specimen collected in September 1980. Collection dates of museum specimens indicates this species is active throughout the year (Shine, 1984).

Reproduction. Egg-layer; clutch size two to five. Egg-laying occurs in December-January.

Notes. Nocturnal burrowing species that forages on the surface on warm nights. Feeds exclusively on squamate (lizard and snake) eggs which are apparently eaten soon after they are laid. On the roof of the mouth



Simoselaps semifasciatus

posteriorly there is a paired row of triangular saw-like teeth which presumably puncture the egg before it is swallowed.

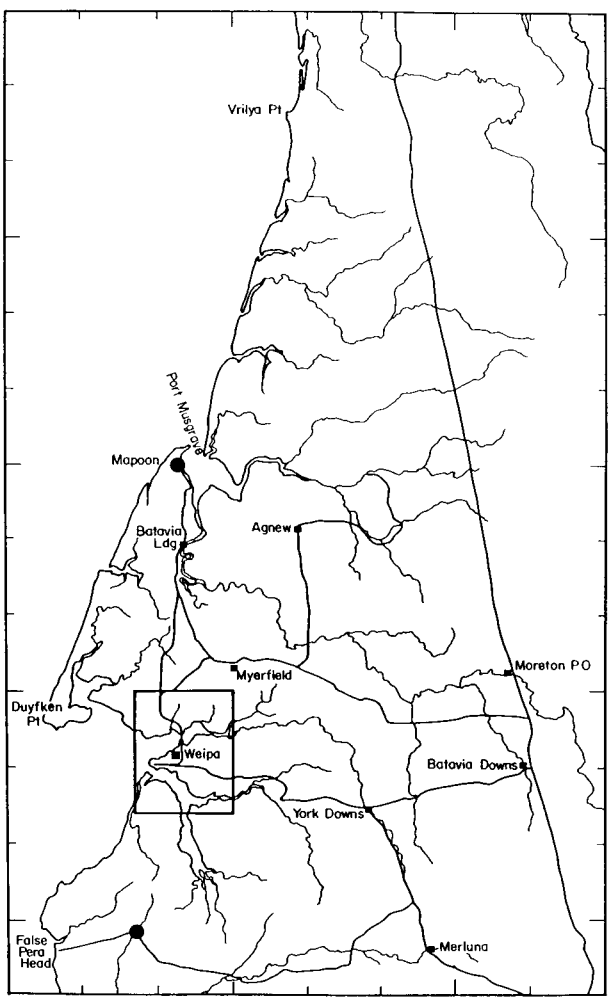
References. Scanlon & Shine, 1988; Shine, 1984.

Simoselaps warro (de Vis, 1884)
Plate 33

[VENOMOUS BUT BITES ARE MILD OR ASYMPTOMATIC IN HUMANS]

Description. *Small, orange to orange-brown burrowing snake with broad dark blotch on back of neck.* Bright orange to orange-brown above, the individual scales edged behind with darker orange or brown to present a distinctly reticulated appearance. Head dark brown, flecked with lighter, and usually separated by a narrow cream-coloured bar from a broad black blotch on back of neck, up to 12 scales long. Sometimes a black, median caudal stripe. Belly creamish-white. Scales smooth, in 15 rows at midbody. Anal scale divided.

Size (total length). 0.280 m (female), 0.352 m (unsexed) (Weipa). Average recorded for species = 0.3 m; maximum for species = 0.43 m. Females attain greater snout-vent lengths than males.



Simoselaps warro

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey. An individual collected by Dan Wilhoft at Mapoon Mission in 1960 and a second specimen from Beagle North Camp (site 52) is in the collection of the QM; Mapoon Plain and Weipa Plateau.

Geographic range. Coast and adjacent ranges of north-east Queensland.

Habitat. Usually found in sclerophyll forest and woodland with a grassy understorey, on sandy soils.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. One record in one survey and one additional record.

Seasonality. Collections dates of specimens not known.

Reproduction. Egg-layer; a clutch of five thick-shelled eggs was recorded in the specimen from Mapoon (Shine, 1984). Egg-laying occurs in December to January.

Notes. Nocturnal burrowing snake. Prey includes scincid lizards.

References. Shine, 1984; Wilson & Knowles, 1988.

Suta suta (Peters, 1863)
Plate 33

Myall or Curl Snake

[VENOMOUS, LARGE INDIVIDUALS MAY PRODUCE POTENTIALLY SEVERE SYMPTOMS IN HUMANS]

Description. *Small brown snake with darker head and nape.* Pale fawn to rich reddish-brown above, paler on the lower sides, the concealed part of each scale sometimes dark brown and resulting in a distinct reticulated pattern. Head and nape with a distinctive darker brown or blackish hood, complete except for a paler brown stripe along the canthus and over and through the eye to the temporal region, separated by an irregular dark brown margin from the white or cream upper lip scales. Sometimes a distinct narrow, black vertebral stripe. Ventral surface creamy-white. Scales smooth, in 19 (or rarely 21) rows at midbody. Ventrals 150 to 170. Anal scale undivided. Subcaudals 20 to 35, all single.

Size (snout-vent length). 0.485 m (female from BERS); (total length): average recorded for species = 0.5 m; maximum for species = 0.8 m. Minimum size at birth = 0.15 m.

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey. BERS (1982) recorded this species near site 52 (airstrip near Beagle North Camp), and a specimen from Rocky Point was donated by Paul Harvey; Weipa Plateau only?

Geographic range. Widely distributed through eastern two thirds of continental Australia, extending into far north-east of Western Australia, but absent from north Northern Territory and the east coast.

Habitat. ? Open forest (BERS) and urban (Paul Harvey). Found in a wide variety of habitats, from savannah woodland to sandy arid scrubs, open saltbush plains and stony hills and ranges.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. Two records in one survey and one additional record.

Seasonality. November 1981, March 1982 (BERS); mid-August 1980 (Paul Harvey specimen).

Reproduction. Live-bearer. Litter size one to seven, mean 4.6. Ovulation occurs in late spring and young are born in summer. The gravid female collected near Beagle North Camp in mid-November gave birth to two young and three infertile eggs on 1 February the following year; this was the first published record of a captive birth (Shine, 1988).

Notes. Nocturnal, often seen on warm nights foraging in open areas. During the day usually found under fallen timber, stones and other ground cover.

Feeds principally on diurnally-active scincid lizards such as *Ctenotus* but also takes dragon lizards, geckoes, frogs and small mammals including the house mouse and *Planigale tenuirostris* (Shine, 1988).

When alarmed, adopts a tense, spring-like curvature of the body, which has given rise to one of its common names.

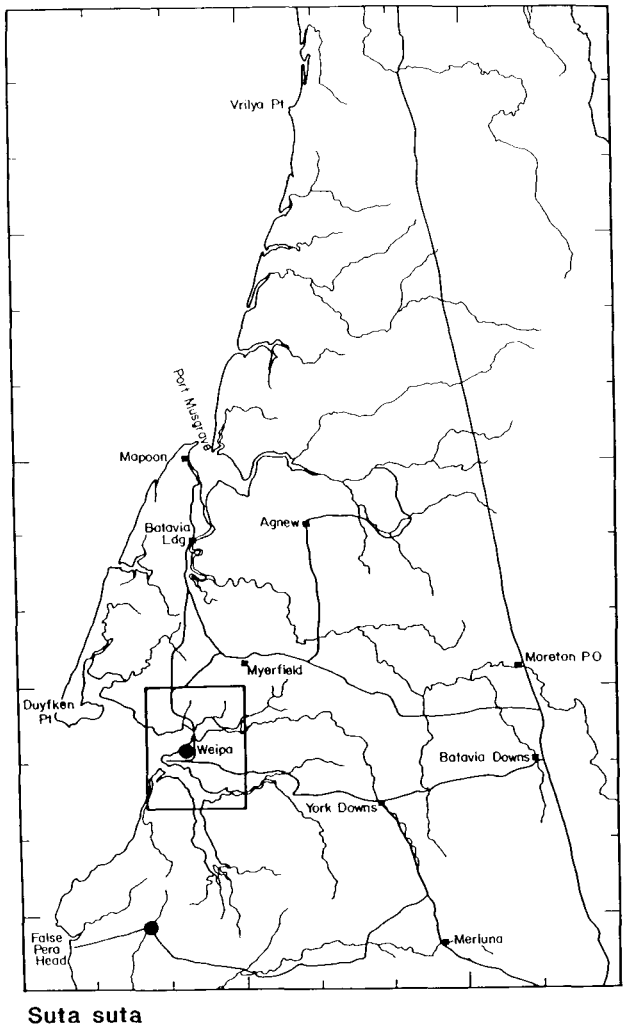
References. Shine, 1988.

Vermicella annulata (Gray, 1841)
Plate 33

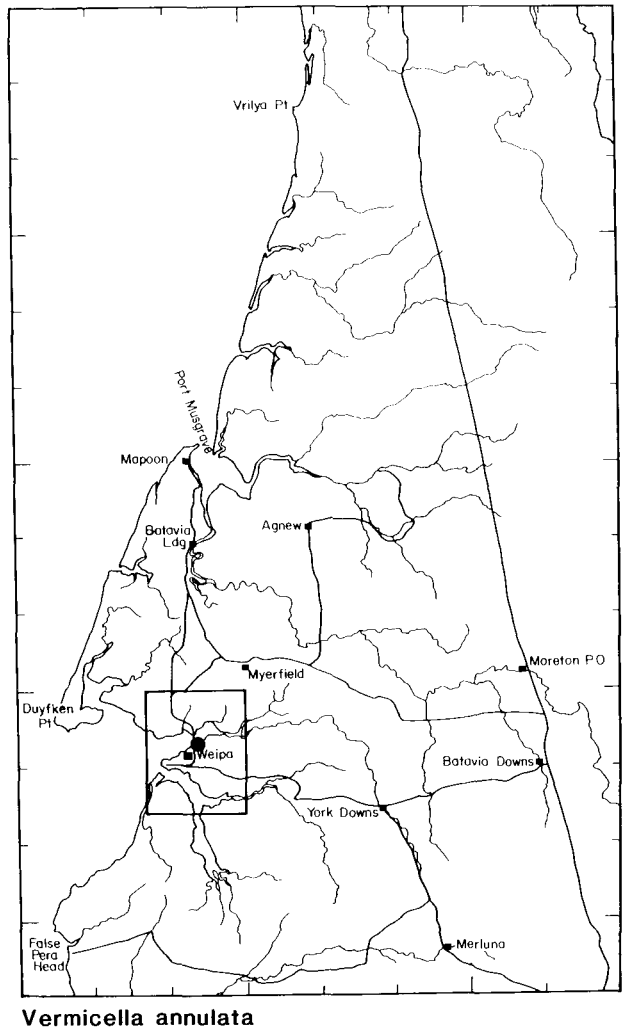
Bandy-Bandy

[VENOMOUS BUT BITES ARE MILD OR ASYMPTOMATIC IN HUMANS]

Description. *Small slender black and white banded burrowing snake.* Has a distinctive pattern of alternate black and white rings, commencing with a black snout, the black rings of the body usually extending well onto, or even right across, the belly. The number and relative width of the black and white rings varies between sexes



Suta suta



Vermicella annulata

and geographically. Scales smooth, in 15 rows at midbody. Anal scale divided. Subcaudal scales all divided.

Size (total length). 0.345 m (immature) (Weipa); average recorded for species = 0.4 m; maximum for species = 0.8 m. Females grow much larger than males (Shine, 1980).

Distribution at Weipa (sites; physiographic units). One site only - Cool Pool, 3 km east of Weipa settlement; Mapoon Plain.

Geographic range. Central Western Australia expanding east through most of mainland Australia except the extreme south-east.

Habitat. ? Paperbark woodland (Paul Harvey) and ? urban (Rob Jenkins). Found in a wide variety of habitats from wet coastal forests to desert sandhills.

Survey abundance. Not recorded in AM survey.

Overall abundance. Scarce. Not recorded in any of the surveys, but two independent records.

Seasonality. Not recorded by AM staff during survey; specimen donated to AM was collected in March 1980.

Reproduction. Egg-layer; clutch size two to 13. Eggs laid February-March.

Notes. Nocturnal, burrowing snake.

When alarmed, throws itself into one or more vertical loops held high off the ground and moved rapidly to produce an optical illusion - flicker fusion - which is presumably baffling to a predator.

Feeds almost exclusively on blind snakes (genus *Ramphotyphlops*).

References. Bustard, 1969b; Shine, 1980b.

Family HYDROPHIIDAE (Sea Snakes)

Acalyptophis peronii (Duméril, 1853)
Plate 34

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Moderate-sized pale sea snake with dark body bands, the scales of the head small and those over the eyes raised to form blunt, backwards-directed spines.* Cream, grey or pale brown above, the body with a series of about 25 to 30 dark brown crossbands which are widest dorsally, (nearly as wide as the paler interspaces), and taper on the flanks. Sometimes a series of secondary incomplete dark bands between the primary ones, while many of the scales on the paler parts of the body are dark-centred. The banding may become pale, while the bands on the tail are more obscure than those on the body. Head shields irregular, fragmented, many (but especially round the eye) raised posteriorly to form projections or spines; this condition is most developed in older adults. Scales moderate, overlapping anteriorly, to almost juxtaposed posteriorly, each with a short central and often darker, keel and in 23 to 31 rows at midbody. Anal scale divided.

Size (total length). Average recorded for species = 1 m.

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey. Australian Museum specimens AM R18253 and R44421 recorded from "Weipa".

Geographic range. Waters of tropical and sub-tropical Australia as well as the coast of the Malay Peninsula.

Habitat. Soft-bottom inshore waters; one specimen "dredged in [5-7 m] of silt".

Survey abundance. Not recorded in AM survey. Sea snakes were not consistently searched for in the survey.

Overall abundance. Uncommon. Not recorded in any of the surveys but 11 individual records.

Seasonality. Recorded in trawls in June, October and December 1976 (Redfield *et al.*, 1978), January 1974 (Heatwole, 1975) and in August 1961.

Reproduction. Live-bearer; litter size about 10.

Notes. Prey includes burrowing goby fishes of the families Trypauchenidae and Gobiidae, which live predominantly in the mud of shallow seas and estuaries (Glodek & Voris, 1982).

References. Glodek & Voris, 1982; Heatwole, 1975; Redfield *et al.*, 1978.

Aipysurus eydouxii (Gray, 1849)
Plate 34

[VENOMOUS, BUT BITES ARE MILD OR ASYMPTOMATIC IN HUMANS]

Description. *Moderate-sized sea snake with large smooth body scales, broad belly scales and a pattern of irregular cream and blackish bands.* Cream or salmon-coloured above, with a series of broad, often very irregular, blackish crossbands which may taper and terminate on the sides or extend to the ventral surface. Scales of the paler interspaces usually with dark margins, while the interspaces may contain secondary darker bars or blotches, especially on the lower flanks. Ventrals range from black to pale cream with a dark median zone. Head uniform brown or flecked with dark brown. A moderately built snake. Head shields enlarged, symmetrical, without any indication of fragmentation; prefrontals present. Scales smooth, overlapping, in 17 rows at midbody. Anal scale divided. Subcaudal scales all single.

Size (total length). 0.471 m (? male) (Weipa); average recorded for species = 1 m.

Distribution at Weipa (sites; physiographic units). One site only - Albatross Bay; Heatwole (1975) recorded a specimen from the junction of the Hey and Embley Rivers.

Geographic range. Seas of north Australia; also Indo-Malaysian Archipelago.

Habitat. Muddy bottom estuaries and bays and can also occur in upper tidal reaches of rivers. Usually trawled in deep (30-50 m), more turbid waters; Heatwole's specimen in 2 to 3 m of water.

Survey abundance. Not recorded in AM survey. Sea snakes were not consistently searched for in the survey.

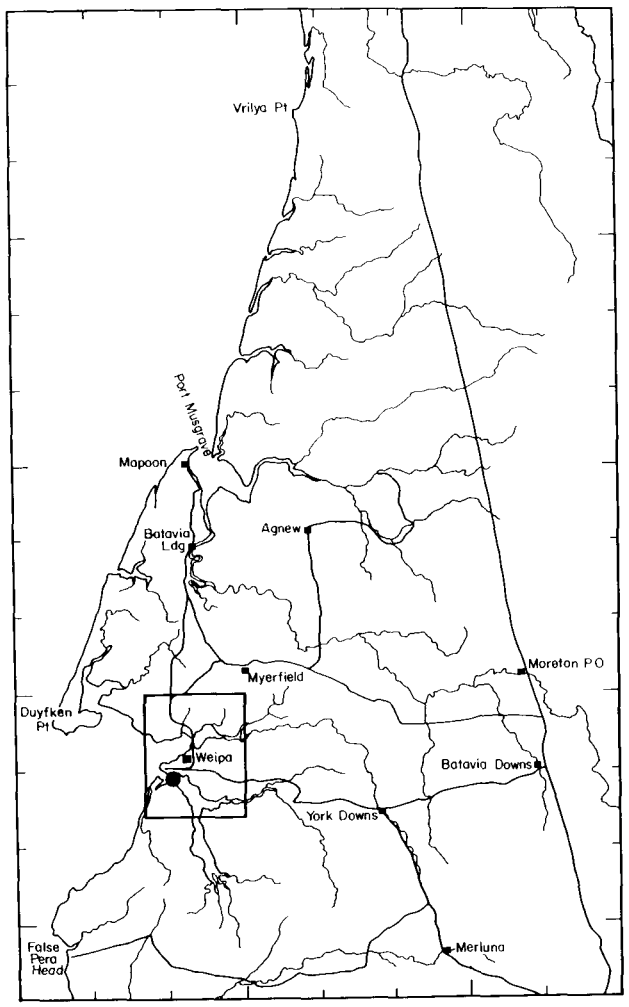
Overall abundance. Uncommon. Not recorded in any of the surveys, but ten individual records.

Seasonality. Not recorded by AM staff during survey; specimen donated by CSIRO collected in 1982. Eight specimens collected in prawn trawls near Weipa by Hal Heatwole in January 1974 and another specimen collected by G. Webster in July 1961.

Reproduction. Live-bearer; litter size two to ten.

Notes. Eats fish eggs (particularly those of blenniid fishes) almost exclusively, a diet shared with two other sea snakes (*Emydocephalus* species). This specialised diet is correlated with the possession of short fangs and a low yield of mild venom.

References. Cogger, 1975a; Glodek & Voris, 1982; Heatwole, 1975; Limpus, 1987.



Aipysurus eydouxii

Aipysurus laevis (Lacépède, 1804)
Plate 34

Olive Sea Snake

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Large, rather heavily built sea snake with smooth scales and uniform or mottled colour pattern.* Highly variable in colour and pattern. Some specimens a uniform rich dark brown or purplish-brown above gradually fading to a paler brown ventral surface; more often there are numerous creamy-white or spotted scales scattered over the body. In some paler specimens the ventral and lateral scales are entirely creamy-white. The brown scales on the body often have darker centres which form faint longitudinal striations. Tail uniform brown to almost pure white, except for a dark brown dorsal ridge. The largest and bulkiest member of the genus *Aipysurus*. Head shields mostly large and regular, with only partial fragmentation of the parietal region. Body scales smooth, overlapping in 21 to 25 rows at midbody. Anal scale divided.

Size (total length). Average recorded for species = 1.2 m; maximum for species about 2 m.

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey; a specimen collected by Redfield close to the coast, north of Janie Creek.

Geographic range. Tropical coastal and reef waters of north Australia; also New Guinea, New Caledonia and the Coral Sea.

Habitat. Typically found around coral reefs but can also occur in upper tidal reaches of rivers. In the Gulf Redfield *et al.* recorded it at depths between 3.8 and 18.5 m. A specimen from Weipa in the Australian Museum collection was "dredged in [5-7 m] of silt".

Survey abundance. Not recorded in AM survey. Sea snakes were not consistently searched for during the survey.

Overall abundance. Scarce. Not recorded in any of the surveys, but four individual records.

Seasonality. More abundant in October and December than earlier in the year (Redfield *et al.*, 1978). A specimen in the AM was collected in August.

Reproduction. Live-bearer; litter size two to five and the young are very large in comparison to the maternal body size.

Notes. Generalist predator which has been recorded feeding on fishes belonging to 12 different families, as well as fish eggs and invertebrates (prawns, crabs and worms). The fishes it takes are free-swimming species rather than burrowers, and it has relatively long fangs for a sea snake.

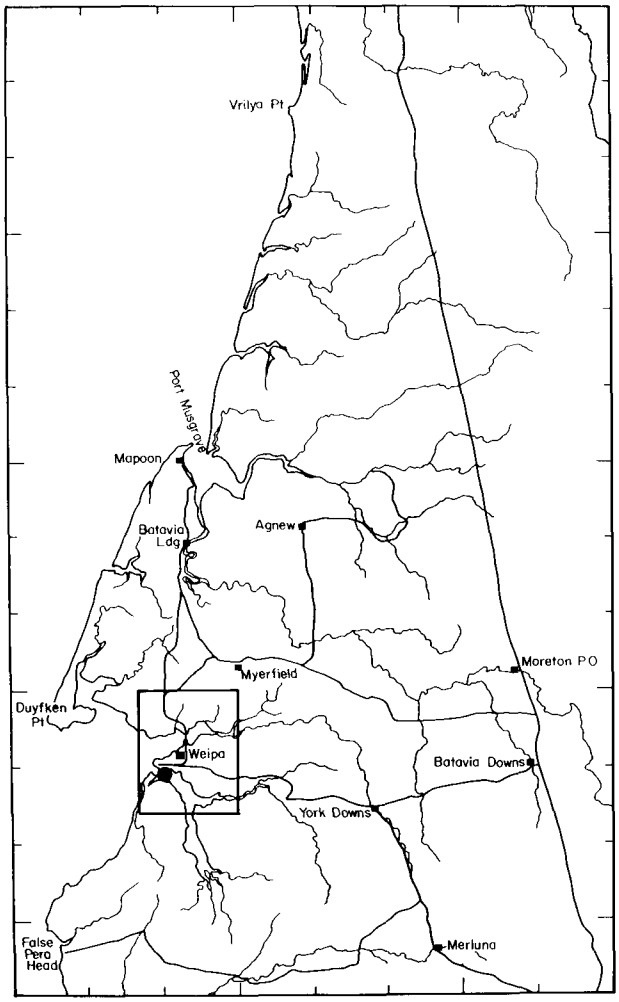
One of the sea snakes most likely to be encountered by divers because it exhibits considerable curiosity; may occasionally be aggressive if provoked.

References. Cogger, 1975a; Redfield *et al.*, 1978; Voris & Voris, 1983.

Enhydrina schistosa (Daudin, 1803)
Plate 35

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Moderate-sized greyish sea snake with small keeled scales, narrow belly scales and a rather swollen, protruding lower jaw.* Dark, more or less uniform grey above, whitish below, sometimes some obscure dark bars along the back, from as wide as, to much wider than, the paler interspaces and rarely extending more than half-way down the flanks. Head dark grey above, pale below. Australian juveniles have 45 to 55 blackish, transverse bars which scarcely extend more than halfway down the flanks. Head shields enlarged, regular. Mental shield beneath chin greatly elongated and dagger-shaped, the posterior part lying partly concealed within the mental groove. Anterior lower chin shields elongate, connected by highly extensile skin, which forms a concertina-like anterior throat region. Body scales each with a short, low keel, overlapping, in 49 to 66 rows at midbody. Ventral scales scarcely wider than adjacent body scales.



Enhydrina schistosa

Size (total length). 0.891 m (male), 0.883 m (female) (Weipa); average recorded for species = 1 m; maximum for species = 1.25 m.

Distribution at Weipa (sites; physiographic units). One site only - Albatross Bay. A second specimen collected outside survey area, 11 km to sea off Cape Speerweer, Gulf of Carpentaria, and Queensland Museum holds a specimen taken off Duyfken Point in 1976.

Geographic range. One of the most widely-distributed and abundant species of sea-snake. North Australian waters; also north through South-east Asia to the Persian Gulf.

Habitat. Usually occurs in water less than 12 m deep, often in turbid estuarine waters.

Survey abundance. Scarce. Seas snakes were not consistently searched for during the survey.

Overall abundance. Scarce. One record in one survey and three additional records. Redfield *et al.* (1978) reported that this species represented 6.2% of 341 sea snakes caught during 307 hours of trawling in the Gulf of Carpentaria.

Seasonality. Recorded on only one visit - June 1982; also April 1984. A specimen donated by Ann Morton had bitten a prawn trawlerman in April 1984.

Reproduction. Live-bearer; litter size five to 30, with average of 16, which is large for a sea-snake.

Notes. Responsible for many bites to South-East Asian fishermen using hand seine nets in muddy estuaries.

Feeds primarily on sea catfish of the families Ariidae and Plotosidae, which often feed in small schools in or near the bottom. Puffer fish (family Tetraodontidae) have also been recorded in the diet.

References. Lemen & Voris, 1981; Redfield *et al.*, 1978; Voris *et al.*, 1978; Voris & Jayne, 1979.

Hydrelaps darwiniensis Boulenger, 1896
Plate 35

[VENOMOUS. NOTHING IS KNOWN OF THE VENOM OF THIS SPECIES AND NO BITES TO HUMANS HAVE BEEN REPORTED]

Description. *Small slender banded sea-snake with fairly broad ventral scales.* Cream or yellowish above, the body with 30 to 45 dark rings or crossbands each about twice as broad as paler interspaces and usually complete on the belly. Sometimes the bands are displaced on the vertebral line. Five to eight complete dark rings on the tail. The subcaudals are occasionally entirely black. Head blackish with yellow or cream variegations. Head shields enlarged, regular. Preocular scales absent, the prefrontal scale bordering the eye. Body scales particularly smooth for a sea snake, overlapping, in 25

to 29 rows at midbody. Ventrals relatively narrow, only about three times as wide as adjacent body scales. Anal scale divided. Subcaudal scales usually single, but occasionally a few divided anteriorly.

Size (total length). 0.48 m (Weipa); average recorded for species = 0.5 m; maximum for species = 0.6 m.

Distribution at Weipa (sites; physiographic units). One site only - banks of the Mission River; Mapoon Plain.

Geographic range. Shallow coastal waters in north Australia; also south New Guinea, west of Torres Strait.

Habitat. Mangroves; typically found on tidal mud flats and in mangroves.

Survey abundance. Not recorded in AM survey. Sea snakes were not consistently searched for during the survey.

Overall abundance. Scarce. Not recorded in any of the surveys. One individual record, a specimen donated by Jack Thornton, Sample Shed, Comalco.

Seasonality. Not recorded by AM staff during survey; specimen collected in 1978.

Reproduction. Live-bearer.

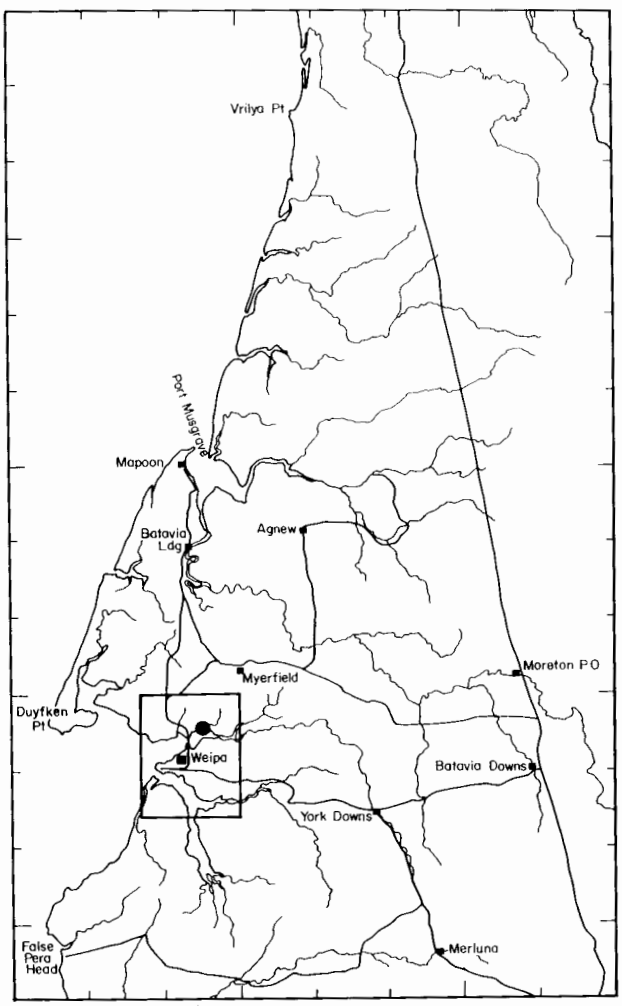
Notes. An individual has been found at low tide sheltering under a stone on the muddy shore of a river in Irian Jaya, so this species spends at least some time out of water.

References. Cogger, 1975a; McDowell, 1972; Sutherland, 1983.

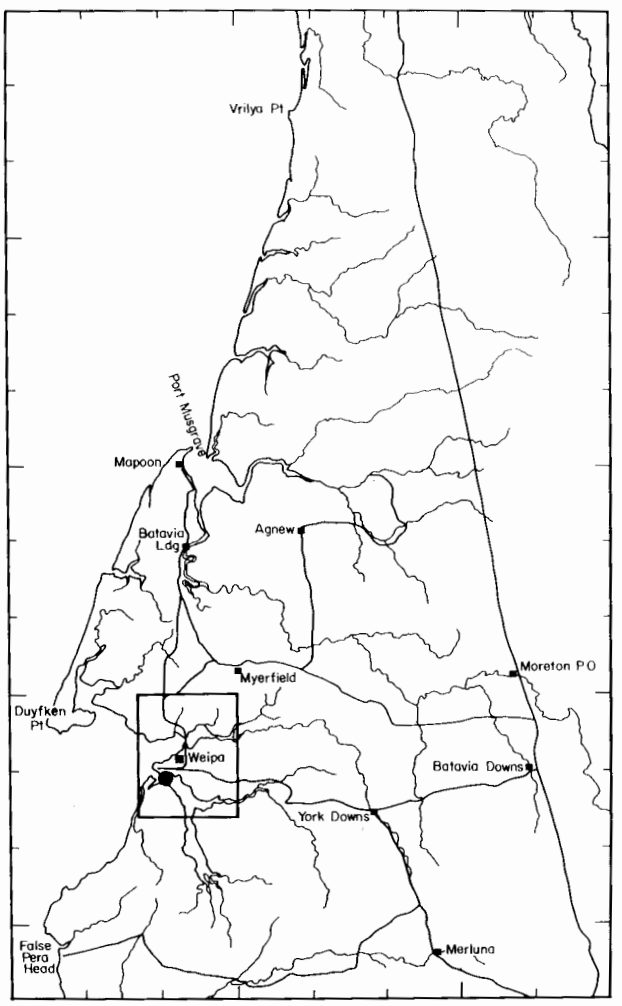
Hydrophis elegans (Gray, 1842)
Plate 36

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Very elongate sea snake with the posterior part of the body deep and compressed.* Highly variable species in which the young may differ markedly from the adults. Juveniles are pale brown with a black head and strongly banded body, the 35 to 55 bands are widest on the mid-dorsal and midventral lines, narrowest laterally where all or some of the bands may be broken. Usually at least some indication of secondary spots or narrow bands in the paler interspaces between the primary bands, at least on the neck and tail. Adults have bands reduced to a series of transverse vertebral bars or blotches, and two series of spots on the flanks; a midlateral series in which each spot lies below a pale interspace, and a lower lateral



Hydrelaps darwiniensis



Hydrophis elegans

series in which each spot lies below a dark dorsal bar. In addition there may be narrow secondary crossbars or rows of dark scales. Ventrals usually blackish on the throat and forepart of the body. Head shields enlarged, regular. Body scales overlapping, in 37 to 49 rows at midbody. Ventral scales scarcely wider than the adjacent body scales (except anteriorly) and mostly undivided.

Size (total length). 1.162 m (male), 1.795 m (? female) (Weipa); average recorded for species = 1.7 m; maximum for species = 2.1 m.

Distribution at Weipa (sites; physiographic units). Two sites only - Albatross Bay and the mouth of the Embley River; Mapoon Plain.

Geographic range. Waters off north coast of Australia, but individuals occur further south in late summer; also south New Guinea. In a survey of sea snakes in the Gulf of Carpentaria, Redfield *et al.* (1978) found this species was significantly more abundant at latitudes 16°S and 17°S than further north.

Habitat. Usually found in reef waters deeper than 30 m, and in the more turbid water of the Gulf of Carpentaria and the Arafura Sea; also occurs in the upper reaches of tidal rivers in the Gulf. One specimen was netted in Albatross Bay at night when it surfaced to breath, and the other specimen was found floating on the surface at the mouth of the Embley River at 1500 hours, apparently moribund.

Survey abundance. Scarce. Sea snakes were not consistently searched for during the survey.

Overall abundance. Uncommon. Two records in one survey and one additional record. This is typically a widespread and abundant species. Heatwole (1975) considered it the most abundant sea snake in the Gulf of Carpentaria.

Seasonality. Recorded on two out of six visits - February 1979 and June 1982.

Reproduction. Live-bearer; litter size up to 25.

Notes. This species has a very long narrow head which it pushes into crannies in search of its food, principally eels.

Has poor vision in comparison with most other sea snakes.

References. Cogger, 1975a; Heatwole, 1975; Redfield *et al.*, 1978.

Hydrophis ornatus (Gray, 1842)
Plate 36

[VENOMOUS, POTENTIALLY LETHAL]

Description. *Moderate to heavily built greyish sea snake with numerous blackish bands and large regular head shields.* Grey or blue-grey above with 30 to 50 broad blackish transverse bars or blotches and a lateral series of dark-edged ocellate markings and smaller dark blotches. Otherwise pale cream or whitish on the lower half of the body. In older specimens the dorsal markings are sometimes obscure or reduced to a uniform blue-grey dorsum. Head shields large, regular. Body scales in 39 to 59 rows at midbody. Ventral scales about twice as broad as adjacent body scales.

Size (total length). Average recorded for species = 1 m.

Distribution at Weipa (sites; physiographic units). Not recorded in AM survey; a specimen collected by CSIRO north of Pera Head.

Geographic range. Widely distributed throughout coastal waters of north Australia and individuals range as far south as Tasmania in late summer; also from Indonesia to the Persian Gulf.

Habitat. Soft bottom inshore waters; has been trawled in waters as deep as 22 m but more common in shallow waters.

Survey abundance. Not recorded in AM survey. Sea snakes were not consistently searched for during the survey.

Overall abundance. Scarce. Not recorded in any of the surveys but one individual record, a specimen donated by CSIRO. Redfield recorded four individuals of this species in a sample of 341 sea snakes from the Gulf of Carpentaria.

Seasonality. Specimen collected by CSIRO in June 1978. Redfield recorded this species in October and December but not earlier in the year.

Reproduction. Live-bearer; a gravid female with eight embryos collected in Malaysian waters in April.

Notes. Recorded prey includes sea catfish (family Plotosidae) and gobies (Gobiidae).

References. Lemen & Voris, 1981; Limpus, 1987; Redfield *et al.*, 1978.

Lapemis hardwickii Gray, 1835
Plate 36

[VENOMOUS AND POTENTIALLY LETHAL]

Description. *Moderately large, thickset sea snake with small ventral scales and hexagonal or squarish body scales which meet but do not overlap.* Pale to dark olive-grey above and uniform cream or pale yellowish below, the two colours meeting along an obscure zig-zag line along the side of the body. In the young and some adults, the pattern is more conspicuous with a series of 30 to 55 dark mid-dorsal blotches usually joined to each other on the midvertebral line. Head shields enlarged, regular. Body scales juxtaposed, hexagonal or squarish, the lower lateral scales much larger than the remainder and with grossly enlarged spiny tubercles in adult males.

Size (total length). 0.87 m (male), 0.845 m (female) (Weipa); average recorded for species = 1 m.

Distribution at Weipa (sites; physiographic units). One site only - Albatross Bay. Redfield *et al.* (1978) found this species more common in the northern Gulf, round the latitude of Weipa, than

further south. Specimens AM R95017 and R60734 collected from Gulf opposite north end of Pine River Bay and north of mouth of Macdonald River, respectively.

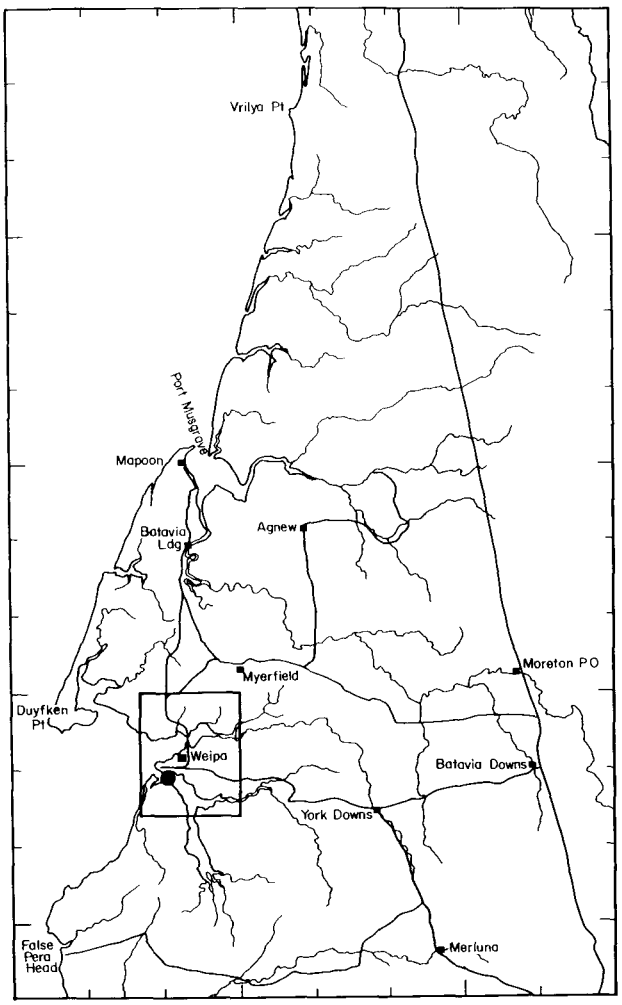
Geographic range. Throughout tropical waters of Australia's continental shelf and its outliers in the Coral Sea; also Asian waters.

Habitat. Found in a wide variety of habitats, ranging from shallow, clear reef waters to more silted waters. Usually in water shallower than 11 m. All 12 specimens collected during the survey were netted on the surface at night when they came up to breathe.

Survey abundance. Common. Sea snakes were not consistently searched for during the survey.

Overall abundance. Common. Twelve records in one survey and 68 additional records. This was the most abundant species of sea snake recorded in Albatross Bay. 61% of 341 sea snakes in a survey of prawn trawls in the Gulf of Carpentaria, belonged to this species (Redfield *et al.*, 1978).

Seasonality. Recorded on only one visit - June 1982. Redfield *et al.* (1978) recorded a significant increase in the abundance of this species in October.



Lapemis hardwickii

Reproduction. Live-bearer; small litter size of one to eight, mean four.

Notes. Aggressive when caught in nets.

Diet is unusually generalist for a sea snake - it has been recorded feeding on fishes belonging to 31 families, as well as on squid and cuttlefish.

References. Cogger, 1975a; Redfield *et al.*, 1978.

Discussion

Composition of the Herpetofauna

Consistent with its seaboard location in the tropics, the Weipa region has a rich and diverse herpetofauna. A total of 96 species of native frogs and reptiles and one introduced toad has been recorded (Appendix 4). Of these, only 12 are not represented to our knowledge by Museum specimens; however they are either large distinctive animals recorded by experienced biologists (*Crocodylus johnstoni*, *Eretmochelys imbricata*, *Lepidochelys olivacea*, *Varanus indicus*, *Morelia spilota variegata*, *Acrochordus arafurae*), species we identified with confidence in the field (*Crocodylus porosus*, *Aspidites melanocephalus*, *Liasis maculosus*, *Liasis amethistina*), or small lizards which we had collected ourselves just outside the limits of the survey area (*Carlia jarnoldae*, *Lygisaurus macfarlani*).

All four families of frogs native to Australia are represented, although 70% of the 20 species belong to just one family - the tree frogs (Hylidae). One ground frog, *Uperoleia mimula* (family Myobatrachidae) was named subsequent to the survey and specimens from Weipa were included in the type series for its description (Davies *et al.*, 1986). A major range extension was recorded for the small microhylid frog *Sphenophryne gracilipes* and contributed to the realisation that this species has a much greater geographic range than any other Australian member of the family Microhylidae (Zweifel, 1985).

Both Freshwater and Saltwater Crocodiles, and four of the six marine turtles that occur in Australian waters, are present. Only one freshwater turtle has been recorded. There are thirty three species of lizards; compared with the proportional representation of lizard families in the continental fauna, geckoes and goannas in the Weipa region are more diverse and skinks are under-represented. Of the two largest scincid genera in Australia, *Ctenotus* is represented in the Weipa region by only two species (possibly three, see below), and to date no *Lerista* has been recorded there. One large distinctive gecko (*Pseudothecadactylus australis*) is restricted to a small area of Cape York Peninsula and the southern islands of Torres Strait.

The most speciose reptile group is the snakes with 36 species representing six of the seven snake families recorded for Australia. Contributing to this richness are

two file snakes, six colubrids and eight sea snakes, three groups that do not occur, or are poorly represented, in southern Australia. Many of the elapid snakes are small, cryptic and non-venomous or only mildly venomous, but four species - the Taipan, Northern Death Adder, Eastern Brown Snake and Mulga or King Brown Snake - and six of the sea snakes, are highly venomous and dangerous to humans. The potential for, and treatment of, snakebite is discussed in Appendix 6.

At least two undescribed species were recorded during the Weipa survey - a small dragon (*Diporiphora* sp.) and a blind snake (*Ramphotyphlops* sp.). In addition, undescribed species closely related to two other taxa may be present. An apparent dimorphism in *Ctenotus spaldingi* specimens suggests a third species of this genus occurs in the region; possibly it is the undescribed species of *Ctenotus* which occurs in coastal heaths on Quaternary sands between Cape Bedford and Cape Flattery on the east coast (G. Ingram, personal observation *in* Kikkawa *et al.*, 1981: 1719) and would be encompassed by the account of *Ctenotus spaldingi*. Similarly an undescribed gecko superficially similar to but chromosomally distinct from *Gehyra baliola* (which does not occur on the mainland of Australia *vide* King *et al.*, 1989) is almost certainly included within our samples of *Gehyra dubia*. Finally, confirmation of the identity of the species here referred to the burrowing frog *Cyclorana ? maculosa* will require a recording of its call.

On the basis of records from far northern Cape York Peninsula (Covacevich, 1987) and recent distribution maps (Cogger, 1986; Wilson & Knowles, 1988; Ingram & Raven, 1991) a further 40-odd species of frogs and reptiles could occur in the Weipa region (Appendix 5). Five species listed by Winter & Atherton (1985: Table 5.1) are no longer considered to range as far north as the Weipa region; they are *Chelodina longicollis*, *Cryptoblepharus carnabyi*, *Sphenomorphus* (= *Glaphyromorphus*) *pardalis*, *Cryptophis nigrescens* and *Demansia psammophis*. Some other reptiles recorded from northern and eastern Cape York Peninsula would not be expected in the Weipa region because the habitats which they occupy (for example, sandstone, granite outcrops, extensive tracts of complex closed forest and heathlands) are not present.

The diversity of frogs and non-marine reptiles in the Weipa region is greater than that in three other localities in similar latitudes in northern Australia (Table 4). Although the disparity in the numbers may be slightly exaggerated by the greater concentration of surveys conducted at Weipa, we believe they reflect a greater species richness in this region. This richness results from several factors including the extent of open forest (which, as the habitat with the longest continuous history in northern Cape York Peninsula (Kikkawa *et al.*, 1981) supports the most diverse fauna - see discussion of habitat preferences), the diversity of habitats present, and the overlap of northern and southern faunas. On current knowledge of distribution, the Weipa region marks the southern limit on the west coast of 12 species, and the northern limit of four, possibly eight species. (For a list of these species, see discussion on biogeography).

The Weipa herpetofauna also represents 44% and 45% respectively of the frog and reptile faunas known for Cape York Peninsula; (species numbers for the Peninsula are those published in Kikkawa *et al.* (1981) which are assumed to exclude marine snakes and marine turtles).

Abundance of the Herpetofauna

The abundance of frogs and reptiles in the Weipa region based on specimen and sight records from all sources, is summarised in Table 1; these data were used in assigning categories of abundance in the individual species accounts (see Annotated List of Herpetofauna). Species meeting the criteria for "scarce" (not recorded in more than two surveys) include two frogs (*Cyclorana ? maculosa*, *Litoria genimaculata*), the Freshwater Crocodile, a freshwater turtle (*Chelodina rugosa*), eleven lizards and fifteen land snakes. These species should be searched for more intensively in future faunal studies. The significance of intensive sampling is highlighted by the fact that two species were recorded only in the quantitative sampling program of the survey of regenerated mines undertaken by Reeders & Morton (1983). Reliable records of marine turtles and sea snakes are also scarce; the endangered status of marine turtles elsewhere in the world makes it especially important to document and accurately identify all turtles laying eggs on beaches in the region.

Nine frogs and seven lizards are considered to be 'abundant', being represented by at least 85 records and recorded in all four independent faunal surveys. They are: frogs - *Crinia remota*, *Limnodynastes ornatus*, *Cyclorana novaehollandiae*, *Litoria bicolor*, *Litoria caerulea*, *Litoria nasuta*, *Litoria nigrofrenata*, *Litoria rubella*, and *Sphenophryne gracilipes*; lizards - *Gehyra dubia*, *Nactus pelagicus*, *Oedura rhombifer*, *Diporiphora* sp. A, *Carlia longipes*, *Cryptoblepharus virgatus*, and *Ctenotus spaldingi*.

In selecting indicator species for environmental impact studies, the relative abundance of individual species of frogs and reptiles must be taken into account. Some species are so abundant and widespread and such ecological generalists (for example the small skink, *Carlia longipes*) that they are unlikely to reflect subtle changes, whilst scarce species are difficult to locate in sufficient numbers to provide comparative data. Species whose abundance in the Weipa region has been estimated as 'common' are probably the most suitable subjects for such studies; these include the following eight frogs, eight lizards and three snakes: frogs - *Limnodynastes convexiusculus*, *Uperoleia mimula*, *Litoria dorsalis*, *Litoria gracilenta*, *Litoria infrafrenata*, *Litoria pallida*, *Litoria rothii*, and *Rana daemeli*; lizards - *Oedura castelnaui*,

Pseudothecadactylus australis, *Lialis burtonis*, *Lophognathus temporalis*, *Varanus panoptes*, *Varanus timorensis*, *Carlia storri*, and *Glaphyromorphus nigricaudis*; snakes - *Boiga irregularis*, *Tropidonophis mairii*, and *Demansia atra*.

Seasonal Activity

More than half the frog species are active in all seasons of the year despite a very dry winter lasting more than six months (Table 2), and two ground-dwelling hylids (*Litoria dorsalis* and *L. inermis*) are more conspicuous (if not more active) during the dry season. The microhylid *Sphenophryne gracilipes* was recorded throughout the year (its unusual tolerance of arid conditions is discussed below under "Habitat Preferences"). The Northern Dwarf Tree Frog (*Litoria bicolor*) also has a high tolerance of the arid conditions of the dry season; individuals were observed basking in full sunlight on the leaves of shrubs in dunefield woodland, when ambient temperatures would have exceeded 30°C. Frogs whose annual activity pattern is closely linked to the wet season include the burrowing frogs of the genus *Cyclorana*; they have been recorded in abundance only between November and April.

The Frill-necked Lizard was recorded only in the wet season (February) which is consistent with observations in the Northern Territory where it is inactive between August and April and is difficult to find even in dry spells during the wet season (Shine & Lambeck, 1989). The Rusty Monitor too, appears to be highly seasonal in its activity, being recorded in the wet and post-wet seasons between February and June, but not later in the dry season. Although individual Brown Tree Snakes were recorded in most months, they appear to be most abundant in the post-wet season (Reeders & Morton, 1983). The small nocturnal Orange-naped Snake and the two species of snake-lizards are more common in the dry season.

Reproductive Seasonality

As is to be expected of animals which require free water or a saturated substrate for larval development to proceed, almost all species of frogs in the Weipa region breed during the wet season. An exception may be the Wood Frog (*Rana daemeli*) whose egg masses were present in streams on the eastern side of the Cape (Gordon Creek, Iron Range and Bertie Creek, Heathlands) in July 1980. Supporting evidence for year-round reproduction by this species was the presence of small froglets in August 1981 and November 1979, and records of males calling in February, June and August. The Cane Toad breeds during the wet season and the reproductive biology of the one microhylid species (*Sphenophryne gracilipes*) has not been recorded.

Of the two crocodiles, the Freshwater Crocodile lays eggs towards the end of the dry season, in August-September, and the Estuarine Crocodile lays in the wet season. In northern Australia nesting by marine turtles takes place throughout the year with peaks in laying occurring at different times in different localities (Limpus *et al.*, 1983). In contrast, the nesting season of Flatback and Green Turtles in south-eastern Queensland is restricted to the summer months. The single freshwater turtle, *Chelodina rugosa*, has been reported laying eggs in March and September, so it may be reproductively aseasonal.

The families of lizards display considerable variation in their reproductive seasons. Most geckos appear to be aseasonal - Australian Museum records of gravid female *Gehyra*, *Heteronotia*, *Lepidodactylus* and *Oedura* are scattered throughout the wet and dry seasons, including the months of July and August. Data on reproduction in the remaining two geckos are scarce - *Nephrurus asper* has been recorded laying eggs in late November and early December (Greer, 1990), and *Pseudothecadactylus australis* in mid-January. Data are also scarce for the two snake lizards; egg-laying by *Delma tincta* has been recorded in early September in north-eastern Queensland and a Weipa specimen of *Lialis burtonis* was gravid in July (populations in southern Australia reproduce between September and February).

The four dragon lizards in the Weipa region reproduce in the wet season. Less is known about the goannas - *Varanus panoptes* lays eggs in the wet season in northern Australia and so presumably does *Varanus semiremex* which was active at Weipa only during the wet and early dry season. Reproductive season of the other two goannas apparently has not been recorded.

Within genera, the skinks appear to have similar reproductive seasons. All species of *Carlia* breed in the wet season, as do the two *Glaphyromorphus* species, and *Egernia frerei* and *Tiliqua scincoides*. *Ctenotus robustus* and *C. spaldingi* reproduce predominantly in the wet but one gravid female *C. spaldingi* was collected in July. Both species of *Cryptoblepharus* breed throughout most of the year and one skink, *Morethia taeniopleura*, appears to lay eggs in the dry season (females gravid in July of 1980 and 1982). The breeding season of the small cryptic *Lygisaurus macfarlani* was not determined.

The reproductive season of the three worm snakes is not known. Pythons recorded from Weipa whose reproduction has been studied, lay eggs in October or November and these hatch two to three months later; this is apparently true for *Aspidites melanocephalus*, *Liasis fuscus* and *Morelia spilota variegata*.

The Arafura File Snake gives birth between February and April after a six-month gestation period, but individuals may breed only once in two to three years; the Little File Snake is reproductively aseasonal.

Not enough data exists to generalise about the reproductive seasons of the colubrid snakes. One female *Boiga* was gravid with large oviducal eggs in June, suggesting an oviposition date of June/July, while a female *Dendrelaphis punctulata* gravid with less well-

developed eggs in November, would probably have laid within two months. Macleay's Water Snake (*Enhydris polylepis*) has been recorded giving birth in January and the Freshwater Snake (*Tropidonophis mairii*) has been recorded laying eggs in June.

Shine (numerous papers, see list of references) has examined the reproductive cycle of elapid snakes based on museum specimens as well as field and captive breeding records; the majority of species found in the Weipa region reproduce between October and March although the Bandy Bandy lays eggs rather later, in February or March. Exceptions include the Black Whip Snake (*Demansia atra*) and the Mulga Snake (*Pseudechis australis*) which appear to reproduce aseasonally (in contrast to their temperate zone congeners which are strongly seasonal, reproducing in spring to early summer). The reproductive season of *Glyphodon tristis* is not known.

In summary, the majority of frogs and reptiles in the Weipa region reproduce in the wet season, between the months of November and March. However some species reproduce in the dry season, have a greatly extended reproductive season or are aseasonal, which contrasts with the strongly spring/summer seasonal reproductive period of their temperate counterparts. Much larger sample sizes drawn from all months of the year, are needed before firm conclusions can be reached about the seasonality of reproduction in all members of the Weipa herpetofauna. The reproductive condition of both sexes should be examined.

James & Shine (1985) have suggested that the best predictor of breeding seasonality may be the biogeographic history of the taxon, although the tolerances of embryos to low moisture regimes may also be important in determining seasonality.

Habitat Preferences

As pointed out by Covacevich (1987), "... open habitats have been and still are predominant on Cape York ... [and the] bulk of the reptiles present ... are species of open forest". In the Weipa survey, 56 (possibly 59) species occurred in open forest and the next most speciose habitats were regeneration (established on ground that was forested prior to mining) and gallery forest, both with 42 species, and paperbark woodland (38 or 39 species) (Table 3). Covacevich *et al.* (1982) recommended that equal attention at least, should be given to the conservation of open forests and of heaths on Quaternary sands, as to the conservation of closed forest habitats on Cape York Peninsula.

Vine forest and vine thicket were comparatively depauperate with only 25 (or 26) species, and this is typical of Cape York Peninsula closed canopy habitats which have had a discontinuous history because of climatic fluctuations during the Quaternary. These habitats in the Weipa region are small and fragmented compared with the extensive tracts present on the eastern side of the Peninsula.

Of the fifteen species almost exclusively recorded in open forest and/or regeneration and urban areas (which habitats were originally vegetated mainly by open forest), eight were inadequately sampled (represented by three or fewer records) and may not be restricted to this habitat. They are the Rough Knob-tailed Gecko (*Nephrurus asper*), Frilled Lizard (*Chlamydosaurus kingii*), blind snake (*Ramphotyphlops unguirostris*), Black-headed Python (*Aspidites melanocephalus*), Taipan (*Oxyuranus scutellatus*), Black-striped Snake (*Rhinoplocephalus nigrostriatus*), Half-girdled Snake (*Simoselaps semifasciatus*) and Curl Snake (*Suta suta*).

However, the Northern Death Adder (*Acanthophis praelongus*) and the Orange-naped Snake (*Furina ornata*) were both recorded 12 times which suggests that they are largely restricted to open forest, at least in the Weipa region. A further four species were recorded in open forest often enough to suggest it is also their principal habitat - the frog *Cyclorana ? maculosa* was collected only in regenerated mine sites and on a grassy claypan within low, quite open Darwin stringybark open forest (BERS, 1982; M. Robinson, personal communication), and nine specimens of the pygopodid *Delma tincta* were collected in regeneration (Reeders & Morton, 1983) but nowhere else. *Ctenotus robustus* and the undescribed species of *Ramphotyphlops* were also recorded only in open forest, regeneration and urban habitats.

Finally, although the skink *Lygisaurus macfarlani* was recorded 14 times in regeneration but in no other habitat, this small leaf-litter inhabitant was almost certainly overlooked elsewhere because it is typically a species of leaf litter in "...monsoon forest, open forest, woodlands, heath, grasslands, and gardens..." (Ingram & Covacevich, 1988).

Tall open forest is also an important habitat in the Weipa region for two arboreal lizards - the goanna *Varanus timorensis* and the gecko *Pseudothecadactylus australis* - although they are not restricted to it. The former was commonly seen on the trunks of Darwin stringybarks during the day and the latter was frequently located by eyeshine at night in the crowns of tall Darwin stringybarks when QNPWS staff were spotlighting for arboreal mammals. Spotlighting may be the most effective method for locating *Pseudothecadactylus australis* - specimens collected in Cape York by the 1948 Archbold Expedition of the American Museum of Natural History were all found in this way (Cogger, 1975b).

Several other habitats appear to be closely correlated with the distribution of some lizard species. Associated with eucalypt woodland on yellow earths is a group of skinks recorded as uncommon or scarce in the survey; it comprises *Carlia jarnoldae*, *Carlia munda*, *Carlia vivax* and *Cryptoblepharus plagiocephalus*.

The casuarinas and strandline vegetation of coastal foredunes and beaches on Quaternary sands, although occupying only a small area, may provide an important

niche on Cape York Peninsula for some lizards. The undescribed species of *Diporiphora* and the small gracile "blue"-bellied *Ctenotus* were found only in this habitat. The geographic range and natural history of both species of *Diporiphora* and the two (or three) species of *Ctenotus* deserve further investigation. The strandline is also of course, the nesting site for marine turtles, which increases the significance of its role in reptile conservation.

Vine forest, vine thicket, mangroves and gallery forest (the habitats with a closed canopy) were the sole or principal habitats for only six species. The apparent restriction of the lizards *Egernia frerei* and *Lepidodactylus lugubris* to vine forest is probably an artefact based on limited records. Both were found only in coastal vine forest but also only at one site, Vrilya Point; elsewhere in their geographic range they occupy a wider range of habitats including open forest and woodland. However, *Egernia frerei*, a large skink which usually shelters in hollow logs, may be excluded from the forests and woodlands around Weipa because they are burnt so frequently that ground shelters such as logs are destroyed. Of the entire Weipa herpetofauna only the frog *Litoria genimaculata*, the Mangrove Monitor *Varanus indicus* and the snakes *Morelia amethistina* and *Dendrelaphis calligastra* are typical closed forest species, being restricted to vine forest, vine thicket and gallery forest or the ecotone of vine forest with woodland.

The microhylid frog *Sphenophryne gracilipes* has an unusually broad habitat distribution in the region, occurring wherever there is a moist refuge, even in a pile of logs on bare gravel at the disused Weipa sawmill. Microhylids are generally restricted to closed forest because they lay large eggs in which the larvae develop directly into frogs without a free-swimming tadpole stage; the eggs require a very moist substrate for such development and the humid microclimates found within closed forests are ideal for the purpose. Because of its tolerance of the very dry conditions experienced at Weipa (average monthly rainfall less than 4 mm for four months of the year), *Sphenophryne gracilipes* has a much greater geographic range than any other Australian microhylid (Zweifel, 1985). Nothing is yet known of its breeding habits and perhaps some physiological characteristic of its reproduction enables this species to colonise drier habitats than do other microhylids; information about the eggs and larvae of *Sphenophryne gracilipes* may provide clues to its ecological vagility.

Conservation Status of the Herpetofauna

The following species of reptiles are protected by federal legislation in the form of the Wildlife Protection (Regulation of Exports and Imports) Act 1982 and are covered by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):

Schedule 1, Part II –
- *Caretta caretta* (Loggerhead Turtle)
- *Chelonia mydas* (Green Turtle)
- *Eretmochelys imbricata* (Hawksbill Turtle)
- *Lepidochelys olivacea* (Olive Ridley Turtle)
- *Natator depressus* (Flatback Turtle)

Schedule 2, Part II –
- *Crocodylus johnstoni* (Freshwater Crocodile)
- *Crocodylus porosus* (Estuarine Crocodile)
- *Varanus indicus* (Mangrove Monitor)
- *Varanus panoptes*
- *Varanus semiremex* (Rusty Monitor)
- *Varanus timorensis* (Spotted Tree Monitor)
- *Aspidites melanocephalus* (Black-headed Python)
- *Liasis fuscus* (Water Python)
- *Liasis maculosus*
- *Morelia amethistina* (Amethystine Python)
- *Morelia spilota variegata* (Carpet Python)

Five species occurring in the Weipa region have also been assigned to threatened species categories by the International Union for the Conservation of Nature (1990 IUCN Red List of Threatened Animals). They are the Estuarine Crocodile and Loggerhead Turtle (Vulnerable) and the Green, Hawksbill and Olive Ridley Turtles (Endangered). The Flatback Turtle was omitted from the 1982 edition of the IUCN Red Data Book because "...on present information [it] does not fulfil the criteria for inclusion in any of the Red Data Book categories for threatened species...".

A small burrowing snake, *Simoselaps warro* (recorded at Mapoon and Beagle North Camp) has the most restricted geographical range of any of the snakes recorded from Weipa. It was categorised as "rare" by Covacevich *et al.* (1982) and has been proposed for inclusion in the forthcoming Squamata section of the Red Data Book.

The large spectacular gecko *Pseudothecadactylus australis* is endemic to Cape York Peninsula and the southern islands of Torres Strait, and probably has the most restricted distribution of all the described species recorded from the region; a second species of *Pseudothecadactylus* occurs in Arnhem Land and a third in the Kimberleys. Their present total range is believed to be more restricted than it once was and they are ecologically highly specialised (Cogger, 1975b; Bauer, 1990). The latter relegated *Pseudothecadactylus* to a subgenus of the New Caledonian carphodactyline genus *Rhacodactylus*. These characteristics suggest that *Pseudothecadactylus australis* would be particularly vulnerable to environmental changes in Cape York Peninsula, despite its current status of 'common'.

Other lizards whose geographic ranges barely extend south of Cape York Peninsula are *Carlia jarnoldae* and *Glaphyromorphus pumilus*.

No described frogs or reptiles are endemic to the Weipa region, although further research on specimens of *Gehyra*, *Diporiphora*, *Ctenotus* and *Ramphotyphlops*

may result in the description of new species restricted to the region, which would increase its significance as a conservation area.

Sites Recommended for Conservation in the Weipa Region

Several localities in the region were particularly rich in frogs and reptiles and deserve special attention when sites are being considered for habitat protection.

Batavia Outstation Landing (site 10 in Appendix 3), where vine forest, Darwin stringybark open forest and mangroves abut, yielded 30 species (12 frogs, 12 lizards and 6 snakes) over three search periods (February, November and June). The presence of freshwater springs seeping into the mangroves at the base of bauxite cliffs probably contributes significantly to the diversity of frogs and reptiles at the site.

Vrilya Point (site 26) is another rich site, with 15 species of lizards (nearly half the number occurring in the Weipa region) recorded over a 10-day period in the dry season (August) in addition to six frogs, three snakes and the Estuarine Crocodile. The diversity of species would certainly increase in the wet season when more frogs, lizards and snakes became active.

Permanent swamps and the gallery forest bordering freshwater streams which persist at least as chains of waterholes, are important dry season refuges for non-burrowing, ground-dwelling frogs such as *Crinia remota*, *Litoria dorsalis*, *L. inermis*, *L. pallida*, *L. nasuta*, *L. nigrofrenata*, *Sphenophryne gracilipes* and *Rana daemeli* (a fact also noted by Kikkawa *et al.*, 1981). Gallery forest is also an important refuge for arboreal hylids which are usually associated with closed forest on the eastern side of the Peninsula, for example *Litoria genimaculata*, *L. gracilenta* and *L. infrafrenata*. In the Weipa region these refuges include Sunrise Creek (on the dry season track to Mapoon), Willum Swamp and Running Creek on the road to Coen, the freshwater reaches of the Wenlock River and the freshwater lagoons on the Mapoon Plain. In the case of the lagoons, the dunefields west of the lagoons extending to the highwater mark should also be included in reserves because they shelter probably two undescribed species of lizard, and provide nesting sites for marine turtles.

Biogeography

The biogeography of Cape York Peninsula has received considerable attention (symposium edited by Walker, 1972; Specht *et al.*, 1977; Kikkawa *et al.*, 1981) but knowledge of the distribution of many species within the Peninsula continues to be refined. Kikkawa (1975) and Stanton (1976) remarked upon the unexpected occurrence of a number of closed forest mammals and birds in small isolated patches of vine forest near Weipa, and the surveys of vertebrate fauna conducted in the Weipa region between 1977 and 1982 have confirmed the presence of many species known previously only from closed forest habitats on the eastern coast of the Peninsula. They include the frogs *Litoria genimaculata* and *Sphenophryne gracilipes*, and at least six species of mammals (Winter & Atherton, 1985).

The geographic affinities of the Weipa herpetofauna are summarised in Table 5 which lists the proportion of 83 Weipa species (exclusive of the Cane Toad, marine turtles and marine snakes) shared with seven other geographic regions. There is a surprising uniformity in proportion of common taxa, ranging from 41% to 59%. Torres Strait and the remainder of Queensland, adjacent as they are to the Weipa region of Cape York Peninsula, predictably share the greatest number of species, but as many as 44 species (53%) also occur in New Guinea. Of the species shared with New Guinea, only five (*Litoria genimaculata*, *Sphenophryne gracilipes*, *Varanus indicus*, *Morelia amethistina* and *Dendrelaphis calligastra*) are considered to be typical inhabitants of closed forest; these figures reinforce the realisation of recent years, that (between northern Australia and southern New Guinea) "...the shared fauna of non-rainforest habitats is much greater than that of rainforest..." (Kikkawa *et al.*, 1981).

As mentioned above, one species *Pseudothecadactylus australis* (along with two congeners), is considered to be more closely related to the New Caledonian genus *Rhacodactylus* than to any other Australian geckoes (Bauer, 1990).

Twenty members of the Weipa herpetofauna are restricted on the Australian mainland to Cape York Peninsula (as defined by Covacevich *et al.*, 1982 to encompass the area north of a line drawn between Townsville and Normanton). On current knowledge of distribution, the Weipa region marks the southern limit on the west coast of a number of species which may extend further south on the eastern side of the Cape; they are the frogs *Uperoleia mimula*, *Litoria genimaculata*, lizards *Lepidodactylus lugubris*, *Pseudothecadactylus australis*, *Carlia jarnoldae*, *Carlia storri*, *Glaphyromorphus nigricaudis*, *Glaphyromorphus pumilus*, *Lygisaurus macfarlani* and snakes *Morelia amethistina*, *Dendrelaphis calligastra* and *Furina tristis*. Two lizards *Carlia munda* and *Morethia taeniopleura* and two snakes *Suta suta* and *Simoselaps warro*, reach their northern limits in the Weipa region and a further two lizards *Delma tincta* and *Cryptoblepharus plagiocephalus*, and a snake *Simoselaps semifasciatus* may also do so - they have not been recorded in Torres Strait (Cogger & Heatwole, unpublished) nor listed for far northern Cape York Peninsula (Covacevich, 1987; Ingram & Raven, 1991).

No described species of frogs or reptiles are endemic to the Weipa region, in contrast to the herpetofauna of the eastern side of Cape York Peninsula (Covacevich *et al.*, 1982). However, six taxa whose identity (and therefore geographic ranges) have not been conclusively determined (two species of *Diporiphora*, *Ramphotyphlops* sp., *Cyclorana* ? *maculosa*, and possibly

new species of *Ctenotus* and *Gehyra*) may be restricted to north-western Cape York Peninsula.

Arrival of the Cane Toad in the Weipa Region

A major purpose of the Australian Museum's survey of the Weipa herpetofauna was to establish the composition and distribution of the native species before the Cane Toad (*Bufo marinus*) invaded the area. When the survey was commenced in July 1977, the closest toad population was probably in the vicinity of Aurukun; it was present at Christmas Creek 35 km south of Aurukun in 1974 (Boughton & Sabath, 1980).

As far as can be ascertained, the first toad reported in Weipa was found near the airport in June 1979. Two smaller adults were collected in October 1979 and June 1980; the former was on the site of a new house in Embley Street, Neighbourhood 2, and "...may have been brought to Weipa in the timber being used to build new houses as the timber is brought into Weipa overland..." (Mark Cannon, *in litt.*). Easteal *et al.* (1985) published 1980 reports of toads in apparently isolated populations at Weipa, Moreton Telegraph Station and Heathlands, but knew of no records of toads from the west coast of Cape York Peninsula between Edward River and Weipa.

In May 1981 the Queensland National Parks and Wildlife Service team found a "...well-established population of adults..." in the vicinity of Pera Head and up to 20 km inland from there (Winter & Atherton, 1985) and in July 1982 the Australian Museum team found large adult toads at False Pera Head, as well as small toadlets along the Watson River drainage. These records are mapped in Figure 5. Apart from these southern specimens no Cane Toads were collected or seen by the Australian Museum during its survey of the herpetofauna of Weipa between July 1977 and July 1982.

From April 1982, both juvenile and adult toads began to appear regularly in the immediate vicinity of Weipa. Comalco offered a bounty for each toad brought to the Regeneration Section and 1,900 were collected in this way before the bounty was withdrawn on 15 April 1983 when recently metamorphosed toadlets were found at the dry rubbish dump at Evans Landing. Figure 6A illustrates the rapid escalation in numbers of toads taken to Regeneration, and the sudden increase in toadlets in 1983 is represented by the cluster of points in the bottom right-hand corner of Figure 6B.

Data collected by the Regeneration Section were combined with measurements taken by the Australian Museum to produce a profile of the Weipa population of Cane Toads between 1979 and 1983. There was a high correlation between body weight and snout-vent length (Fig.7) which was very similar to the relationship calculated for populations in Panama (Zug & Zug, 1979). Because of this high correlation, the body weights of the first three specimens recorded from Weipa were extrapolated from their lengths and included in Figure 6B, which illustrates the range in size of toads. The heaviest toad weighed 670 g and the largest had a snout-vent length of 160 mm; the lightest toad weighed 5 g. The Cane Toad may have a life span of 16 years (Zug & Zug, 1979). These data suggest the Weipa population was founded by the immigration of adults into the region rather than by the dispersal of juveniles from breeding grounds as the result of competition with adults. Some toads may have been introduced by human agency, for example, the toad at the new house in Neighbourhood 2 in October 1979.

A sub-sample of 102 toads was selected from the specimens collected by Weipa residents and the stomach contents examined; 78 stomachs contained identifiable animal remains. No traces of frogs or reptiles were found in any of the stomachs. Prey size varied from 2 to 50 mm in total length (Fig.8) and there was no clear relationship between prey size and the snout-vent length of the toads; in Panama toads showed no tendency to increase prey size with increase in snout-vent length (Zug & Zug, 1979). Most stomachs also contained considerable amounts of plant material such as grass and broad leaf fragments, and three contained bauxite pisolites, one of which was 15 mm in diameter and weighed 6 g. These latter items may have been ingested accidentally; Zug & Zug (1979) described the frogs as "sloppy eaters" and recorded the frequent accidental ingestion of items such as hair, stones and pieces of glass, usually amounting to less than 5% by weight of total stomach contents.

The taxonomic composition of the invertebrate remains is summarised in Table 6. As in other studies (Bailey, 1976; Freeland *et al.*, 1986) ants, winged termites and beetles were numerically the most important animal items in the diet. The nocturnal jaw-snapping ant, *Odontomachus ruficeps* Smith, was a conspicuous and abundant item; Zug & Zug (1979) quoted studies suggesting toads have an "...utter disregard ... for noxious, biting, or stinging prey...". Food items which reflect the opportunistic and scavenging habits of toads, included 69 sweet corn kernels in one stomach and fragments of mammalian bone and hairs (perhaps from a dog's food bowl) in another. Most food items were recognisable as terrestrial in origin but one toad contained seven marine snails (*Littoraria* sp.) measuring 7 to 13 mm on the longest axis; these snails typically occur in mangroves and may live on wharf piles (I. Loch, personal communication).

Major causes of mortality of Cane Toads may be predation (on immatures which are less toxic than eggs, tadpoles or adults), and dehydration (Zug & Zug, 1979). Cane Toads can tolerate water loss up to about 50% of their body weight but succumb to death through dehydration beyond this level. They are also tolerant of wide temperature extremes; in Queensland Johnson (*in* Zug & Zug, 1979) recorded a minimum temperature of 6°C and a maximum of 38.9°C beyond which limits toads lose the ability to use co-ordinated movements to escape the adverse temperatures. However, populations of toads can acclimatise to local conditions so that these critical temperatures vary with locality. During the dry

season in Papua New Guinea activity is greatly reduced and most toads are restricted to moist refuges. Dehydration during the dry season was considered a major cause of toad deaths on the island of Barro Colorado in Panama (Zug & Zug, 1979). Very dry air temperatures may confine toads to moist shelters and prevent them feeding, so that lack of food may become critical during this time (Zug & Zug, 1979); such conditions may be experienced by toads in the Weipa region between May and October.

It has been suggested that Cane Toads could adversely affect native vertebrate fauna in five ways - through predation, poisoning, competition by adults for food and for shelter, and competition between tadpoles of toads and native frogs in breeding habitats (Freeland, 1985). Instances of predation by toads on native vertebrate species are not common and none were recorded in the present study. However, small snakes, lizards and frogs and a very small carnivorous marsupial were listed in a survey conducted by Covacevich & Archer (1975), and Freeland & Kerin (1988) found the remains of native frogs in the stomachs of three out of a sample of more than 550 toads.

Instances of native predators being poisoned by Cane Toads are much more common (Covacevich & Archer, 1975; Tyler, 1989) although a number of reptiles, birds and mammals have learnt to kill and eat toads without adverse effects. One outcome of toad poisoning has already been mentioned in this report - the hypothesised increase in the abundance of taipans relative to that of other large venomous elapids because taipans eat only birds and mammals whereas death adders, mulga snakes and brown snakes include frogs (and toads) in their diet.

Where toad populations vastly outnumber populations of native frogs in the same locality, it has been assumed that direct competition for food and shelter must occur, but several studies suggest competition is rare (van Beurden *in* Tyler, 1989; Freeland & Kerin, 1988). The latter authors studied habitat utilisation in the dry season in the Gulf of Carpentaria by Cane Toads and small native frogs (including three species recorded at Weipa - *Litoria pallida*, *Litoria rothii* and *Litoria rubella*). (The dry season was considered to be the period when physical conditions would be most stressful for frogs and resources scarcest). The authors concluded that the native frogs "...did not alter their dry season patterns of habitat and/or food utilisation following invasion..." by the Cane Toad, which during the dry season occupies a relatively narrow niche. Population size of individual species, species richness, and equitability of native frog species were also not influenced by the presence of the toad. Although larger native frogs such as *Cyclorana* species and *Limnodynastes convexiusculus* could face competition from toads when they emerge from aestivation at the beginning of the wet season, Freeland & Kerin suggest that competition for food and shelter is low at this time.

It appears from recent research that the deleterious effects of Cane Toads on native vertebrate fauna may not be as drastic as was once thought.

Effects of Habitat Modification

The impact of humans and feral animals on the environment was described briefly in the History of the Weipa Region. The effects on the herpetofauna of most environmental changes can only be guessed but the survey by Reeders & Morton (1983) of vertebrate fauna in regenerated mines, yielded valuable data.

The regeneration program at Weipa appears to be supplying suitable habitat for most of the species which occur in the unmined open forest. All 17 frogs recorded in open forest were found in regenerated sites, as were most of the lizards and snakes (Appendix V in Reeders & Morton (1983) and Table 3 of this report). Four of the lizards missing from regeneration are primarily arboreal - the geckoes *Gehyra dubia* and *Pseudothecadactylus australis*, and the Frilled Lizard and Rusty Monitor; also absent are four burrowing snakes and a burrowing lizard. The remaining open forest species not recorded in regeneration are two pythons and four elapid snakes. (The absence of many snake species is not unexpected, due to their naturally low densities).

The lizards *Delma tincta* and *Lygisaurus macfarlani* were two species recorded only in regenerated mines, in the quantitative sampling program undertaken by Reeders and Morton. This highlights the importance of intensive sampling for the discovery of scarce species but we believe it does not portray the actual habitat specificity of these species which elsewhere in their range occupy a wider variety of habitats.

More significant than the mere presence of a species in regeneration is its status there - whether resident and breeding in a viable population or perhaps only present as a transient individual; Reeders & Morton (1983) categorised only three species of reptiles as "resident, breeding". They observed that few lizards or snakes colonised regenerated habitats even with good tree cover, if they lacked a reasonable ground cover of leaf litter and debris. Substantial ground cover such as logs and sheets of bark, was lacking in the regenerated sites as were (generally) large trees with hollows and dead trees with loose bark (both utilised by arboreal lizards and as dry season refuges by arboreal frogs such as *Litoria caerulea*, *Litoria rubella* and *Litoria bicolor*). The texture and composition of the soil may not be suitable for burrowing lizards and snakes although three species of burrowing frogs are resident. In summary, a number of features of mature open forest are presently lacking in the regenerated mine sites but they may develop as the vegetation matures (in the case of tree hollows, this may take 20 to 30(?) years, and be greatly delayed by inappropriate fire regimes).

The regeneration survey highlighted the importance of ground cover to many species of reptiles. The paucity of substantial ground cover such as hollow logs has

already been suggested as a reason for the absence of the large skink *Egernia frerei* in the vicinity of Weipa where much of the country is burnt annually. The use of fire as a management tool in open forest should be considered carefully because frequent burning considerably reduces ground cover and hence destroys the shelter necessary for many ground-dwelling reptiles.

Some marine species are less vulnerable than others to impacts on the terrestrial environment; for example, the true sea snakes (family Hydrophiidae) and the Little File Snake have entirely aquatic life cycles and give birth to young in the water. The other marine reptiles in the region - crocodiles and marine turtles - lay their eggs on land and thus are vulnerable to many impacts, including predation of eggs by feral pigs, goannas and humans. High levels of pig predation on turtle nests was recorded by P. Reeders (*in* Winter & Atherton, 1985) and Limpus & Fleay (1983) who observed that "...on the west coast of Cape York Peninsula all reports of examined turtle nesting are of near total clutch destruction by feral pigs...". Examples of predation as a significant threat to populations are scarce in comparison to habitat modification and destruction, but the potential for feral animals to be significant predators of native fauna as well as destroyers of their habitat, should not be overlooked.

Contribution to Other Research Projects

Specimens collected during the survey have been used in a number of taxonomic revisions. Three frogs were included in the paratype series for the description of *Uperoleia mimula* Davies, McDonald & Corben, 1986. Six specimens of a legless burrowing skink lizard (*Anomalopus pluto*) unearthed at Heathlands and McDonnell Creek and previously known only from a single individual (Ingram, 1977) were examined for a revision of the genus (Greer & Cogger, 1985). Specimens of the skink *Carlia jarnoldae* collected east of the Wenlock River represented the northernmost record of this species in the revision of the genus by Ingram & Covacevich (1989). Data collected on a microhylid frog (*Sphenophryne gracilipes*) were used in a comprehensive revision of microhylids in Australia which included the resurrection of this species from synonymy (Zweifel, 1985).

Research in the fields of ecology, parasitology and genetics also benefited. Morphological, reproductive and dietary data from Weipa snake specimens were incorporated in a series of papers by R. Shine which reviewed the reproductive biology and ecology of Australian elapids. J.F.A. Sprent examined acanthocephalan and nematode worms in the guts of *Rana daemeli*. Gecko species *Gehyra dubia*, *Heteronotia binoei* and *Nactus pelagicus* were karyotyped by C. Moritz and M. King, and S. Donnellan karyotyped two skinks, *Carlia storri* and *Glaphyromorphus nigricaudis*. N. Tamiya milked and analysed the venom of two sea snakes, *Enhydrina schistosa* and *Lapemis hardwickii*.

Summary

The Weipa region has a rich and diverse herpetofauna. Ninety-seven species have been recorded, comprising 20 native frogs, the introduced cane toad, two crocodiles, five turtles, 33 lizards and 36 snakes. This includes two undescribed species - a small dragon (*Diporiphora* species), and a blind snake (*Ramphotyphlops* sp.). The specific identity of one burrowing frog, *Cyclorana* ? *maculosa*, requires confirmation. Two additional lizards, known previously from other localities but not yet described, were almost certainly collected but not distinguished from their closest congeners, *Gehyra dubia* and *Ctenotus spaldingi*.

Despite its low relief and the virtual absence of rocky terrain, the Weipa region supports a greater diversity of frogs and reptiles than do three other north Australian regions. The Weipa herpetofauna includes approximately half of all the frogs and reptiles recorded for Cape York Peninsula. The presence of extensive stands of tall open forest (a habitat with a long unbroken history in the northern Peninsula), the diversity of habitats, and Weipa's location at the extremities of distribution for some species, all contribute to this diversity.

Species abundance was estimated from specimens and sight records; approximately 30 species are 'scarce' and should receive high priority in future surveys. Nine frogs and seven lizards are 'abundant', being represented by at least 85 records and recorded in all four independent faunal surveys. The survey extended the known distribution of many species previously recorded only from the east coast or from further south on the Peninsula.

Despite the region's very dry winters, more than half the frog species are active in all seasons of the year; the small microhylid frog *Sphenophryne gracilipes* and the Northern Dwarf Tree Frog exhibit surprising tolerance to the arid conditions of the dry season.

The majority of frogs and reptiles reproduce in the wet season between November and March but some reproduce in the dry season, have a greatly extended reproductive season, or are aseasonal. In some cases, this is in contrast to the strongly spring/summer reproductive season of temperate congeners and even southern populations of the same species.

Open forest supports the greatest number of species and six species are largely restricted to this habitat; regeneration, gallery forest and paperbark woodland are the next most speciose habitats. Vine forest and vine thicket are comparatively depauperate (26 species, of which four are typically closed forest species). Four species of small skink were primarily associated with eucalypt woodland.

All crocodiles, marine turtles, goannas and pythons are entitled to international protection under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Estuarine Crocodile and the four marine turtles recorded from Weipa are also listed in the IUCN Red List of

Threatened Animals (IUCN, 1990). No described species of frogs or reptiles are endemic to the Weipa region but as many as 20 described and six undescribed species may be restricted (on the Australian mainland) to Cape York Peninsula. Of these, a small burrowing snake (*Simoselaps warro*) has been proposed for the next edition of the Red Data Book (Squamata), and the gecko *Pseudothecadactylus australis* may be another vulnerable species.

Several localities in the Weipa region are particularly rich in species of frogs and reptiles and warrant consideration as conservation sites. They include Batavia Outstation Landing, Vrilya Point and Willum Swamp, stretches of the permanent and semi-permanent watercourses including the Wenlock River, Sunrise Creek and Running Creek and the freshwater lagoons on the Mapoon Plain incorporating the dunefields extending to the highwater mark.

The closest geographic affinities of the Weipa herpetofauna are with Torres Strait and the remainder of Queensland but as many as 44 species (53%) also occur in New Guinea. Of the species shared with New Guinea, only five are considered to be typical inhabitants of closed forest, supporting the observation of Kikkawa *et al.* (1981) that the shared fauna of the northern Peninsula and southern New Guinea consists predominantly of non-rainforest inhabitants.

The arrival of the Cane Toad in the Weipa region was documented. A few adult toads were recorded in 1979 and were probably introduced by human agency but toads began to appear in isolated populations east and south of Weipa in 1980 and 1981 and by early 1982 they were being sighted regularly in Weipa; successful breeding occurred in the town in the wet season of 1982/83.

Stomach contents of 102 toads were examined and 76% contained identifiable animal remains; many also contained plant material and three contained bauxite pisolites. The most abundant prey items were ants, winged termites and beetles; no native vertebrate remains were found in the stomachs.

All 17 frogs found in open forest were recorded in regeneration, as were most of the lizards and snakes but the residential status of many species is not known. Species absent included four primarily arboreal lizards, four burrowing snakes and a burrowing lizard. Litter was generally sparse, substantial ground cover of logs and bark was lacking and large trees with hollows and dead trees with loose bark were scarce or non-existent. These features of mature open forest may take 20 to 30(?) years to develop in the sites where native forest regeneration has been practised.

The use of fire as a management tool in open forest should be considered carefully because frequent burning drastically reduces ground cover and hence destroys the shelter necessary for many ground-dwelling reptiles. A threat to the endangered crocodiles and marine turtles is predation on their nests by feral pigs, goannas and humans.

Specimens collected during the survey were also used in a number of taxonomic revisions, as well as in research by colleagues in the fields of ecology, parasitology, genetics and venom chemistry.

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PLATES

PLATE 1

Darwin Stringybark open forest, the most widespread plant community on the Weipa Plateau. Shrub layer poorly developed where grass fires are frequent.

Eucalypt woodland growing on sedimentary-derived soils on Merluna Plain. Dominant trees are ironbarks; gums in the background. The ground cover has been burnt recently.

Woodland growing on dunes behind the beach north of the Pennefather River.

PLATE 2

Paperbark woodland inundated in the wet season. A zone of tall rushes and sedges typically grows on the perimeter of the larger swamps.

Paperbark woodland in the early dry season when the ground is still covered in soft green herbage.

Track running through deciduous notophyll vine thicket near Stone Crossing on the Wenlock River.

PLATE 3

Notophyll vine forest at Batavia Outstation Landing, where it occurs between mangroves and open forest.

Gallery forest growing in a narrow belt along Sunrise Creek, a semi-permanent stream. Note the grassy ground cover.

Outer margin of mangroves growing at Red Beach. Note prominent stilt roots protruding from thick, poorly oxygenated mud.

PLATE 4

Crinia remota, a very small cryptic frog found in many habitats; often calls during the day.

Marbled Frog (*Limnodynastes convexiusculus*,) a secretive burrowing species that lays eggs in a foamy nest.

Ornate Burrowing Frog (*Limnodynastes ornatus*) also deposits its eggs in a floating mass of foam. Small froglets may be active during the day in dry litter.

PLATE 5

Uperoleia mimula is a small stout warty frog with bright red patches in the groin and on the back of the thigh.

Cyclorana maculosa, a burrowing frog usually seen only after rain. Differs from Ornate Burrowing Frog in lacking bars on the legs and pale U-shaped patch on back of head.

Cyclorana novaehollandiae is a very large burrowing frog with a huge gape. Young frogs may be all or partly green.

PLATE 6

Litoria bicolor, a very small green frog; during the day often rests on leaves in sunlight. Males call from reeds in swamps and lagoons.

Green Tree Frog (*Litoria caerulea*) is a large stout frog with broad toe pads. Often shelters in holes in trees and in human dwellings.

Dwarf Rocket Frog (*Litoria dorsalis*) is a tiny frog often found with *Crinia remota* in damp leaf litter at the edge of swamps. Unlike *Crinia* which burrows into the litter, it usually leaps away when disturbed.

PLATE 7

Litoria genimaculata is camouflaged for the lichen-covered branches on which it sits in closed and gallery forests. Skin lappets on the forearms further disguise its outline.

Dainty Tree Frog (*Litoria gracilenta*) in a water-conserving position pressed against the surface of a leaf. Differs from other green tree frogs in its bright yellow upper arms, fingers and toes.

Litoria inermis is a nondescript brown terrestrial frog with scattered warty tubercles on its back. Often found active at night in open areas with sparse ground cover.

PLATE 8

Giant Tree Frog (*Litoria infrafrenata*) differs from Green Tree Frog in having a white stripe along its lower lip and a white or pink stripe running along the back of the hindlimbs. Sometimes brown.

Rocket Frog (*Litoria nasuta*) is a streamlined striped frog with long pointed snout, skin ridges along its back, and very long legs. Can leap considerable distances.

Litoria nigrofrenata is rather similar in shape and size to the Rocket Frog but has a smooth, plain brown body and a black stripe through the eye.

PLATE 9

Litoria pallida is a small terrestrial frog like *L. inermis* but it has a distinct dark stripe through the eye and more strongly patterned thighs.

Litoria rothii is an arboreal frog with vivid yellow and black markings on thighs and groin. Males call from perches on trunks and branches of trees.

Desert Tree Frog (*Litoria rubella*) has a plump pear-shaped body; found in moist refuges in quite arid habitats but also widespread in mesic areas.

PLATE 10

Sphenophryne gracilipes, a very small frog belonging to a group of frogs usually restricted to closed forest. At Weipa in the dry season many were found crowded together under moist leaf litter.

Wood Frog (*Rana daemeli*) is a large aquatic frog with fully webbed toes and a thick skin fold along each side of the body.

Cane Toad (*Bufo marinus*) was introduced to Australia in 1935. The very warty back, thickened parotoid glands on the side of the neck and bony ridges on the head are unmistakeable.

PLATE 11

Freshwater Crocodile (*Crocodylus johnstoni*) has a long narrow snout, fine sharp teeth and a single row of enlarged scales on the back of the neck, separated from the bony skull by fewer than eight rows of small granular scales.

Estuarine or Saltwater Crocodile (*Crocodylus porosus)*; much larger than the Freshwater Crocodile. Has a relatively short blunt snout, thick conical teeth and two rows of enlarged neck scales, separated from the skull by more than ten scale rows.

Green Turtle (*Chelonia mydas*), most common turtle in the area; nests north and south of Weipa. Smooth heart-shaped carapace, medium-sized head and four costal shields.

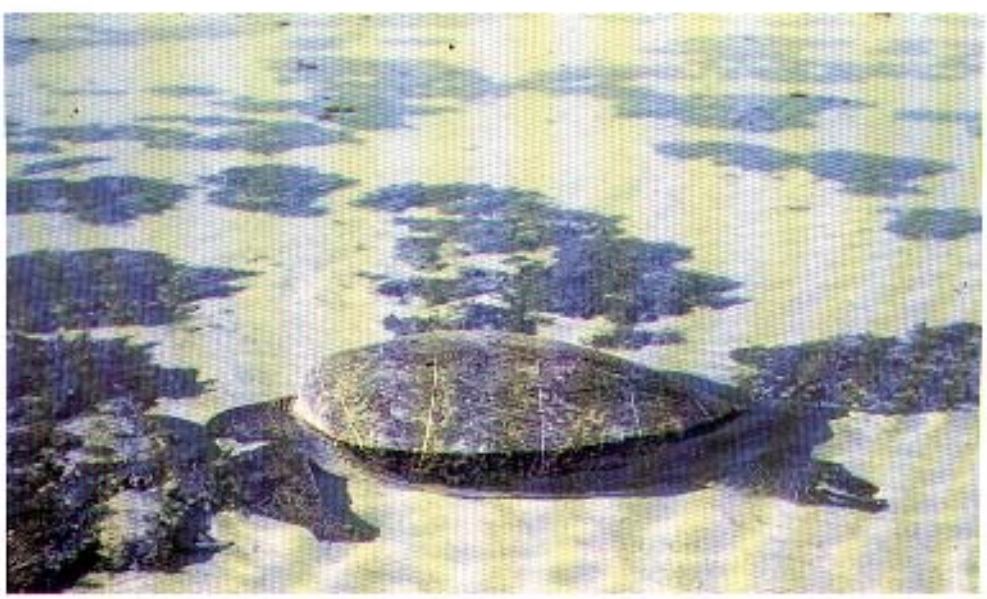


PLATE 12

Hawksbill Turtle (*Eretmochelys imbricata*); the upper jaw forms a parrot-like beak. Four costal shields; in adults the dorsal scutes overlap strongly.

Olive Ridley Turtle (*Lepidochelys olivacea*) has six or more costal shields. Often caught in prawn trawls off Weipa.

Flatback Turtle (*Natator depressus*) is endemic to Australia. In adults the lateral edges of the flattish carapace are upturned.

PLATE 13

Loggerhead Turtle (*Caretta caretta*); old mature adults have very large heads. Differ from other turtles in having five costal shields on each side of the carapace (back shell) inside the small marginal shields.

Northern Snake-necked Turtle (*Chelodina rugosa*) was recorded at Willum Swamp and Vrilya Point. Elongate flat head is specialised for feeding on fish.

A Dtella (*Gehyra dubia*). One of the most common geckoes around Weipa, often seen on ceilings and walls. The toes have large round pads.

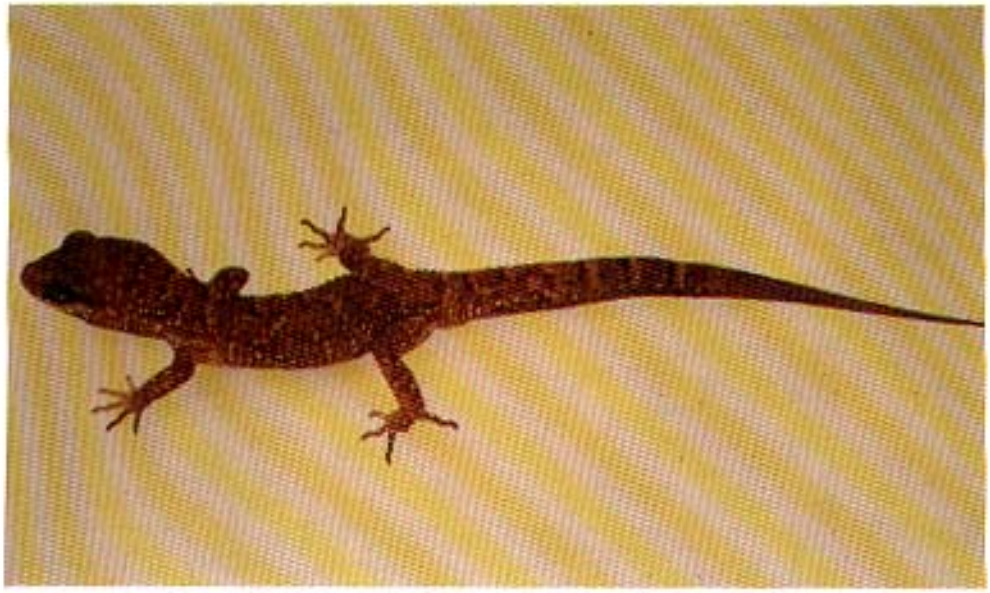


PLATE 14

Bynoe's Gecko (*Heteronotia binoei*), is terrestrial and has narrow toes which lack pads. Differs from Pelagic Gecko in having asymmetrical saw-toothed tubercles scattered on the back and tail, not arranged in regular rows.

Mourning Gecko (*Lepidodactylus lugubris*) was found only at Vrilya Point. Small slender arboreal gecko with oval toe pads and a rather flattened tail with lateral fringes.

Pelagic Gecko (*Nactus pelagicus*) resembles Bynoe's Gecko, but has smaller conical tubercles arranged in regular rows down the back. Young have orange tails in contrast to their dark bodies.

PLATE 15

Knob-tailed Gecko (*Nephrurus asper*) a large terrestrial gecko with a very large head and stubby tail. Cape York animals have a reddish-brown back with broad creamy-white cross-bands between narrow irregular blackish bands.

Northern Velvet Gecko (*Oedura castelnaui*), a large arboreal gecko with a broad flat tail and a dorsal pattern of purplish-brown, cream and dull yellow. The toes have narrow pads on the tips.

Oedura rhombifer is a small brown arboreal gecko with a long round tail and a brown or cream zig-zag stripe running down the middle of the back. Differs from Mourning Gecko in colour pattern and tail shape.

PLATE 16

Pseudothecadactylus australis, a large slender arboreal gecko, has adhesive lamellae under the tip of its tail which resembles those on its oval toe pads. Lining of mouth deep purplish-black.

Delma tincta, one of two snake-lizards recorded at Weipa. Differs from snakes in having an ear opening, a double row of scales along the belly, broad fleshy tongue, and tail (when original) much longer than the rest of the body.

Burton's Legless Lizard (*Lialis burtonis*) is active on the ground during the day and at night. It has a distinctive flattened wedge-shaped head but its colour pattern is very variable.

PLATE 17

Frilled Lizard (*Chlamydosaurus kingii*). In this juvenile the frill is folded along the neck; its colour pattern camouflages the resting animal on a branch or log.

Male Two-lined Dragon or Tommy Roundhead, *Diporiphora* sp. A, which has assumed the black-throated display posture. Dorsal colour pattern is variable in this common arboreal and terrestrial dragon.

A second, smaller species of Two-lined Dragon, *Diporiphora* sp. B, which seems to be restricted to grassy coastal foredunes. The male displays a black patch in the arm pit but not a black throat.

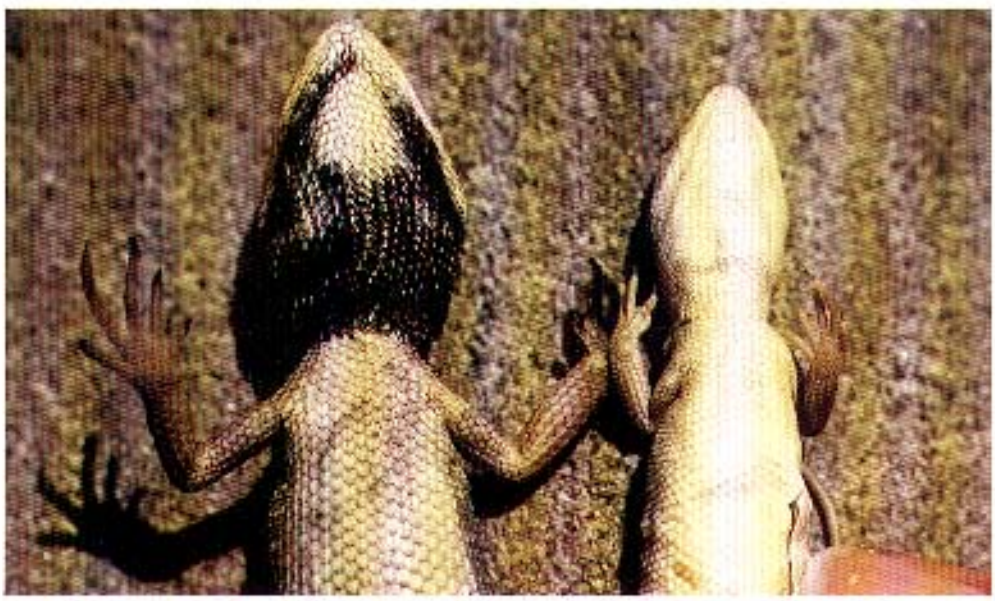


PLATE 18

Side view, heads of *Diporiphora* sp. A (upper) and sp. B (lower). A is larger, has black throat, large overlapping keeled scales on head, no scapular fold. B has small rounded unkeeled scales on head, distinct scapular fold running from chest over shoulder.

Ventral view, same lizards. Sp. A (L) has black throat, large keeled greyish belly scales. Sp. B (R) has immaculate white throat and belly, the scales of which are small and smooth. Scapular fold visible on right side of neck.

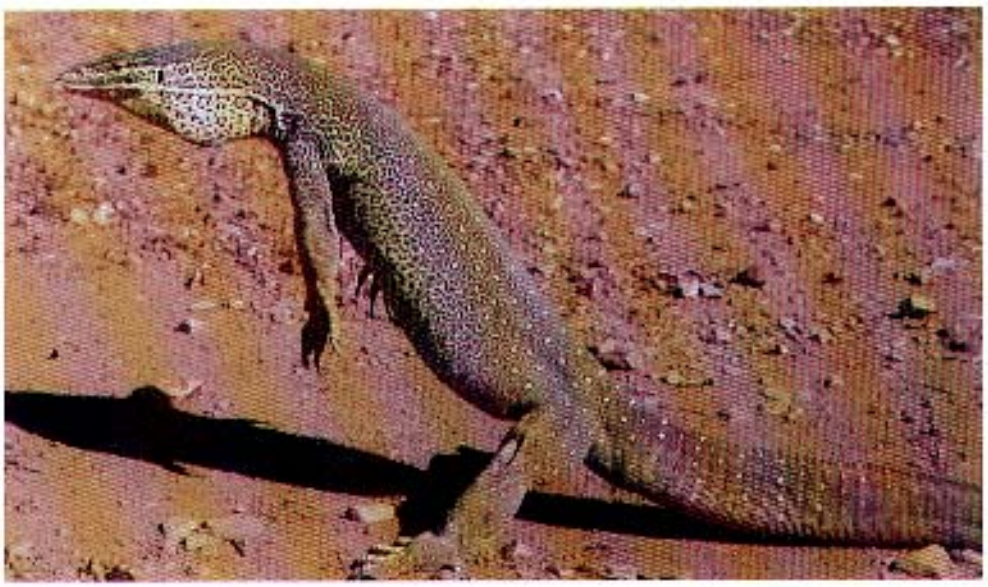
Lophognathus temporalis, an arboreal dragon found beside swamps and creeks. Has a distinctive crest of large scales on back of neck and a broad pale stripe running from tip of snout along upper jaw to side of neck.

PLATE 19

Juvenile Mangrove Monitor (*Varanus indicus*); adults have a duller, more diffuse pattern. It is semi-aquatic and also climbs trees around swamps and mangroves.

Varanus panoptes is a large cream and dark brown terrestrial goanna with two dark stripes running along the side of the head and a cream and black banded tip to the tail. Photo: Magnus Peterson.

Rusty Monitor (*Varanus semiremex*), another semi-aquatic and arboreal goanna. Differs from Mangrove Monitor in shape of the tail which is laterally compressed for most of its length, and in possessing a raised nasal ridge.



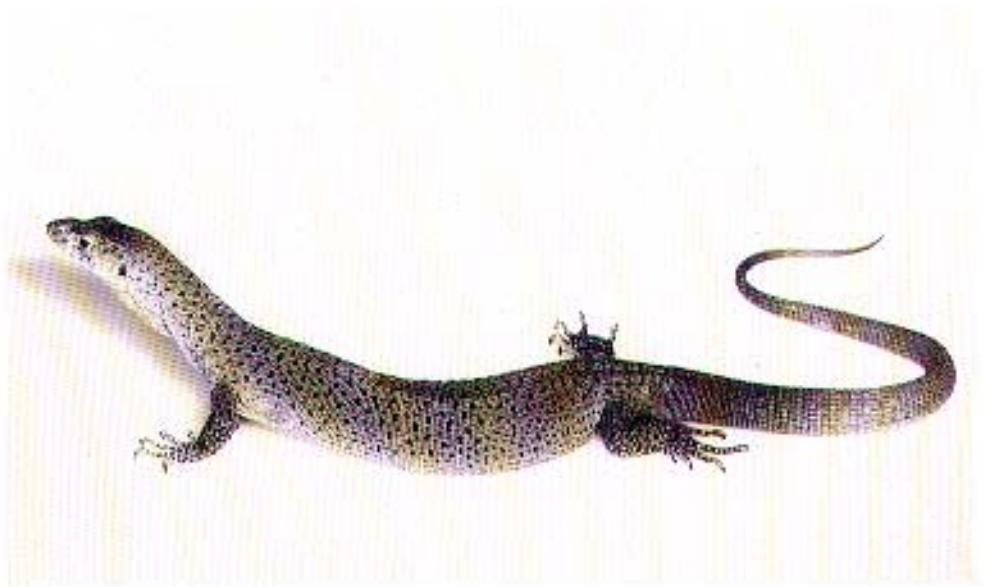


PLATE 20

Spotted Tree Monitor (*Varanus timorensis*) is an arboreal goanna in forest and woodland. It has a strong pattern of eyespots (ocelli) and the tail is round in cross-section for its entire length.

Male *Carlia jarnoldae* in breeding colours; it is the most vivid of the five *Carlia* species found at Weipa. Green lips, blue lateral spots and reddish-orange midlateral stripe may be much brighter in some males.

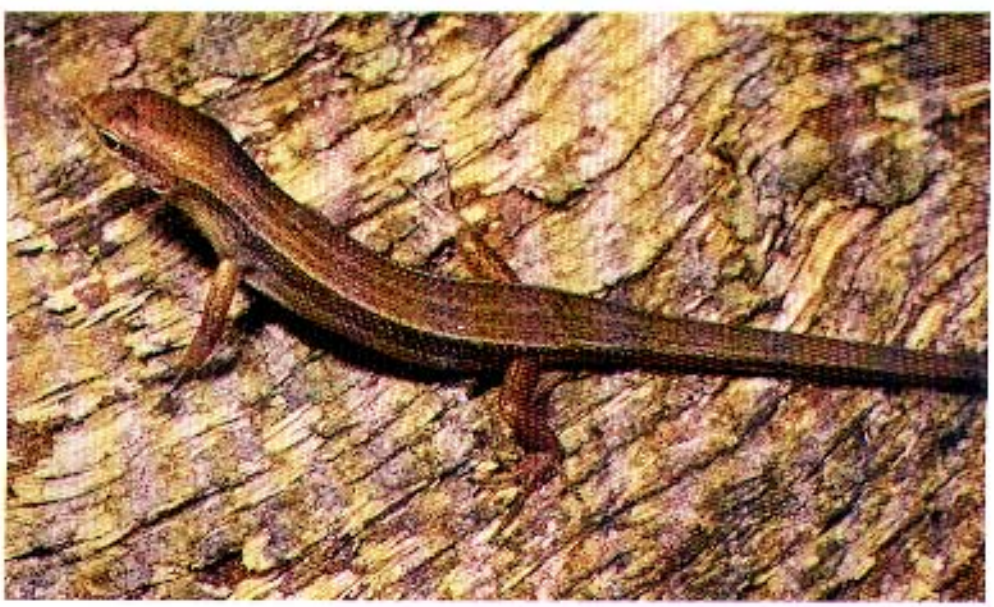
Female *Carlia jarnoldae*, like the male, has moderately keeled scales on the back. White midlateral stripe runs from the lip to the groin.

PLATE 21

Male *Carlia longipes* in breeding colours; throat may turn an intense steel blue. Note smooth shiny unkeeled scales. This is the largest *Carlia* at Weipa.

Male *Carlia munda* in breeding colours. Has smooth to faintly keeled scales and scattered dark and light flecks on back.

Carlia storri has keeled scales which make the back look dull and ridged. It has no obvious white stripe.



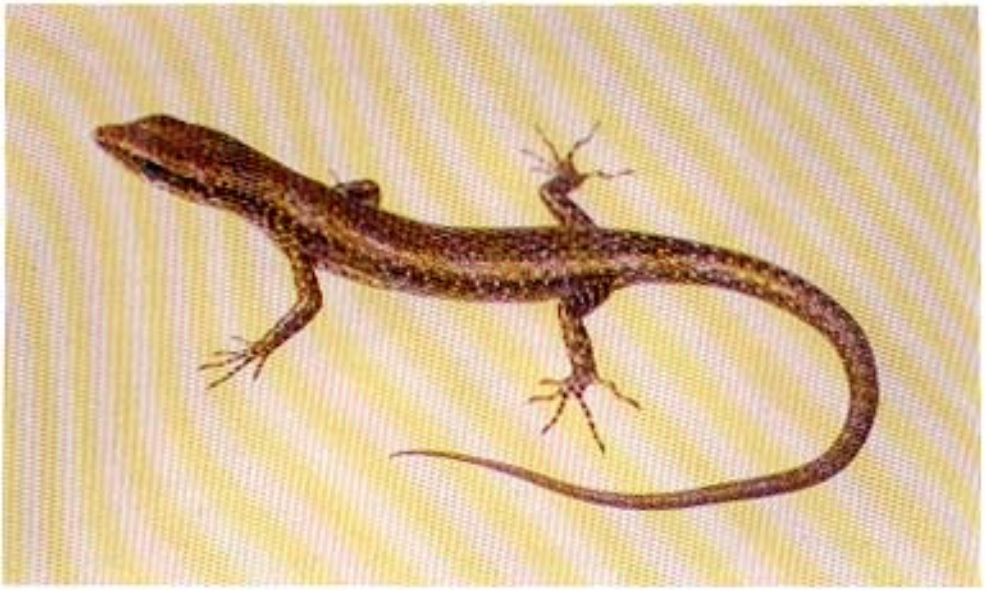


PLATE 22

Cryptoblepharus plagiocephalus is a small arboreal skink with five fingers on each hand. Greyish-brown with scattered dark and light flecks which may form ragged pale and dark lateral stripes.

Fence Skink (*Cryptoblepharus virgatus*) is smaller and more common than *C. plagiocephalus*. Silvery-grey with distinct straight, pale-edged dorsolateral stripe bordered above by a sharply-defined black stripe.

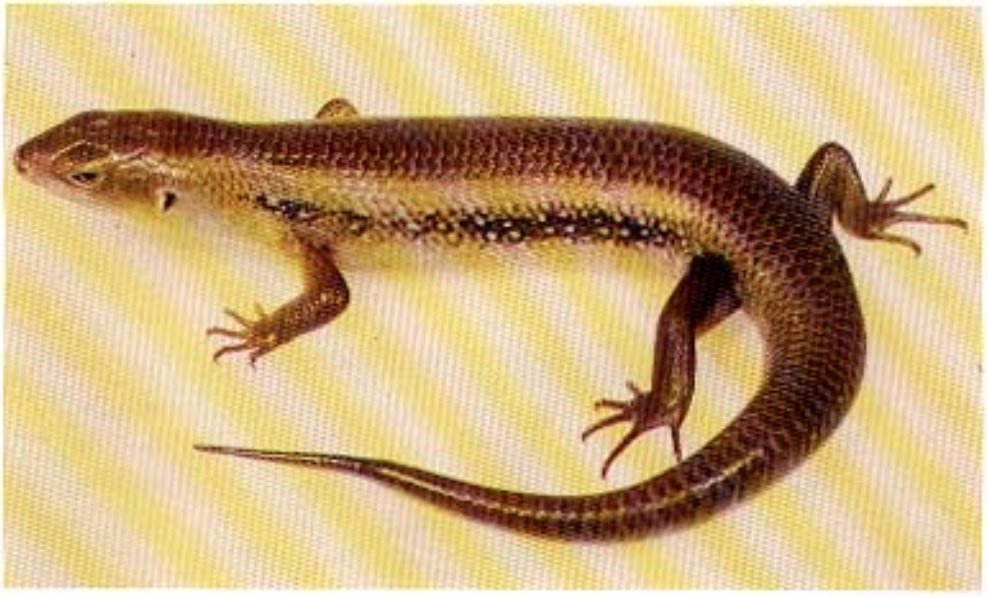
Ctenotus robustus, a swift-running diurnal and terrestrial skink. Brown with series of pale and dark stripes which may enclose pale and dark spots or blotches. Four large scales (supraoculars) above the upper eyelid.

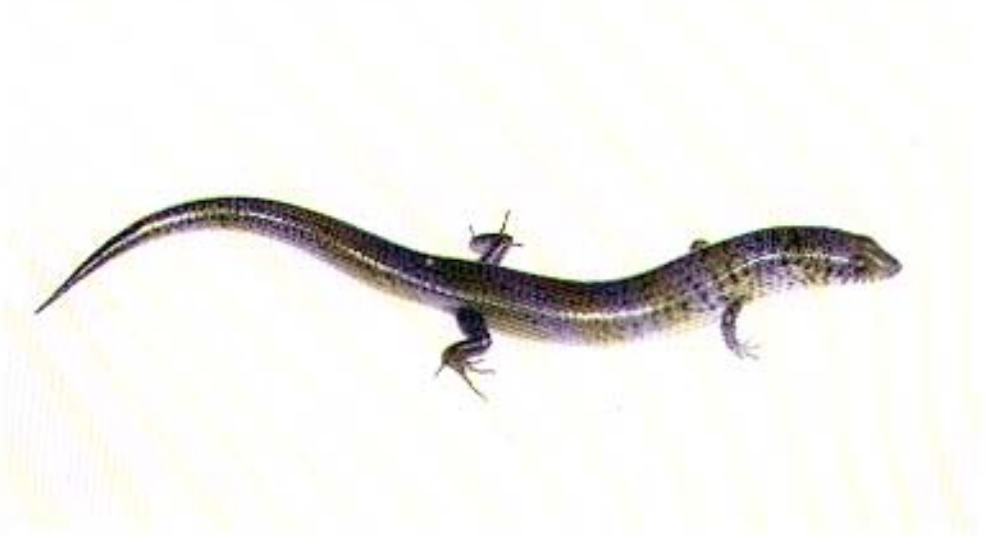
PLATE 23

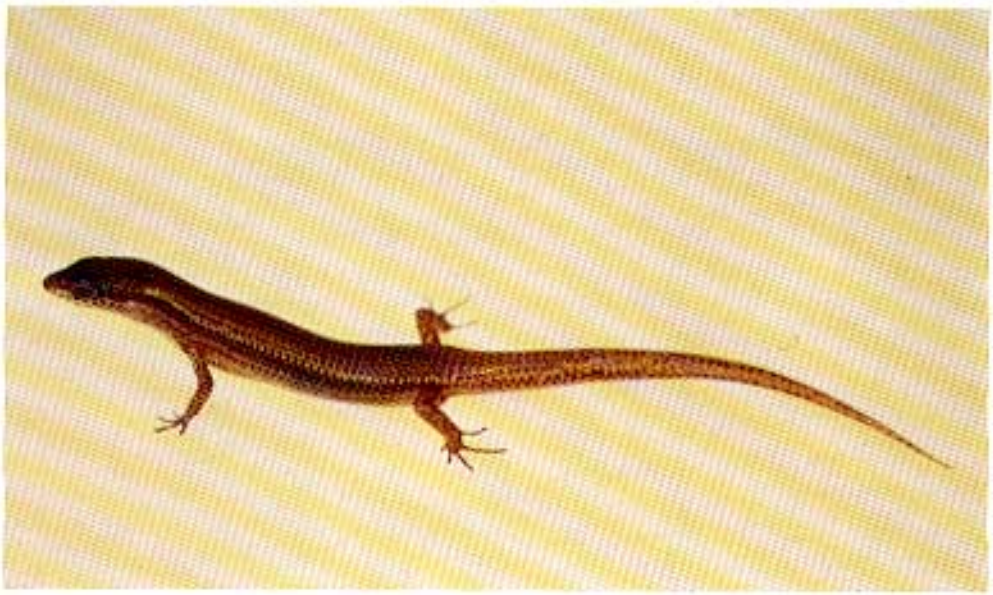
Ctenotus spaldingi, another member of the very large genus of Comb-eared Skinks. Smaller than *C. robustus* and with only three supraoculars, it is much more common in the Weipa area.

Major Skink (*Egernia frerei*), a large robust terrestrial skink; during survey, found only at Vrilya Point. Secretive, diurnal, basks within forest and forages in dense ground cover.

Glaphyromorphus nigricaudis, dark shiny lizard with a thick tail and short legs; wriggles rather like a snake. Common to abundant in debris and under logs and rocks in moist shady habitats.







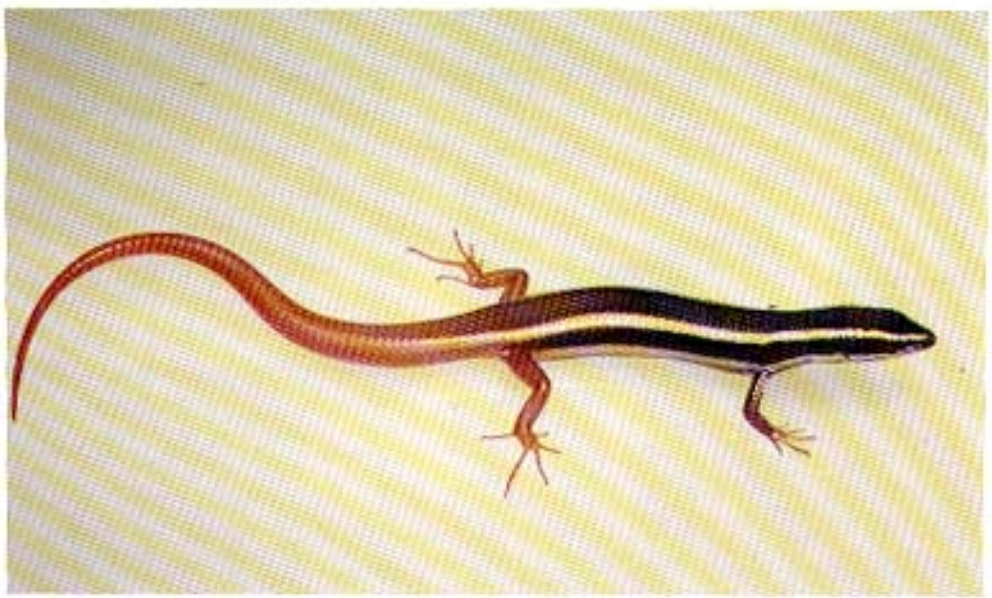


PLATE 24

Glaphyromorphus pumilus, long thin burrowing skink with thick tail and very short legs; wriggles through sand like a snake. Uncommon in survey, found only in dunefield woodland.

Lygisaurus macfarlani, very small cryptic brown skink active by day in leaf litter of heavily shaded habitats. Dark-edged scales on back create a scalloped or netted pattern.

Fire-tailed Skink (*Morethia taeniopleura*) is a small terrestrial skink with vivid cream and black stripes and a bright reddish tail and hind-limbs. Diurnally active but cryptic; usually found under logs or in long grass.

PLATE 25

Eastern Blue-tongued Lizard (*Tiliqua scincoides*), a very large diurnal terrestrial skink. Thrusts out blue tongue and hisses loudly in defence display. Dark stripe along the side of the head of this Sydney individual is absent in Cape York animals.

Ramphotyphlops sp. aff. *minimus*, a very small pale blind snake with narrow dark brown stripes running the length of the body, and a dark head and tail. May emerge from lawns after heavy rain.

Ramphotyphlops polygrammicus, one of two species of large blind snakes known at Weipa. Unpatterned, smooth shiny worm-like snake with soft spine on tip of tail and two small dark eye-spots on head.

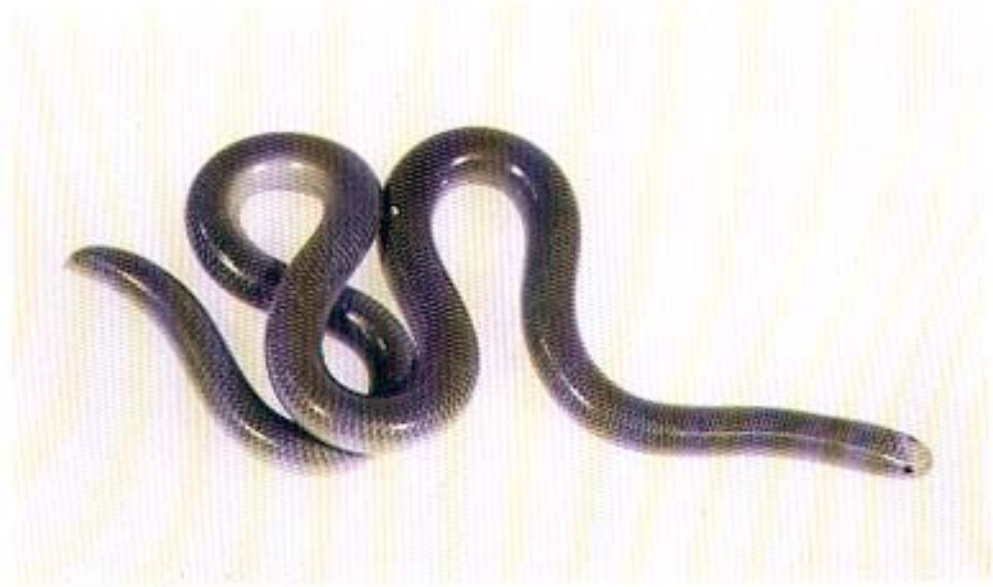


PLATE 26

Black-headed Python (*Aspidites melanocephalus*) a very large terrestrial snake with blackish head and irregular pale and dark brown bands around the body. Fifty to 65 small scales around the body (venomous land snakes in the area have fewer than 25 scale rows).

Liasis maculosus a terrestrial and occasionally arboreal python. Most likely to be seen at night on warm roads. Differs from other local pythons in colour, blotched pattern and small size.

Amethystine Python (*Morelia amethistina*), is the largest Australian python, and arboreal. Broad head is capped with very large scales and body scales have an iridescent sheen.

PLATE 27

Carpet Snake (*Morelia spilota variegata*), very widespread and variable in colour pattern. Like Amethystine Python, has a narrow neck and broad head but scales on top of the head are small and fragmented.

Arafura File Snake (*Acrochordus arafurae*), one of two file-snakes in the area. Freshwater species which has been caught in Wenlock River. Loose flabby skin covered in tiny scales has the rough texture of a file.

Little File Snake (*Acrochordus granulatus*), non-venomous marine snake up to 1.2 m long. Has a small head, tiny eyes and a pattern of cross-bands on the body.

PLATE 28

Brown Tree Snake (*Boiga irregularis*), a slender nocturnal snake with narrow neck and broad head. Eyes are very large and have vertical pupils like those of a cat.

Northern Tree Snake (*Dendrelaphis calligastra*), agile diurnal tree-climbing snake with elongate body. Large eye with round pupil and dark stripe along the side of the head separating olive brown dorsum from pale venter.

Common Tree Snake (*Dendrelaphis punctulata*), is also a slim tree-climbing snake active by day. Differs from Northern Tree Snake in the more robust body, smaller eyes and absence of a dark stripe along the side of the head.

PLATE 29

Macleay's Water Snake (*Enhydris polylepis*), is a small-eyed, thick-bodied freshwater snake which rarely leaves the water. Unlike other freshwater snakes around Weipa, it has very smooth, shiny body scales.

Slatey-grey Snake (*Stegonotus cucullatus*), although not venomous, is aggressive and produces a strong odour from anal glands when disturbed. Nocturnal species often found near streams and lagoons.

Keelback or Freshwater Snake (*Tropidonophis mairii*), is a non-venomous semi-aquatic species which feeds mostly on frogs. Scales on the back are strongly keeled which gives the body a dull, finely ridged appearance.

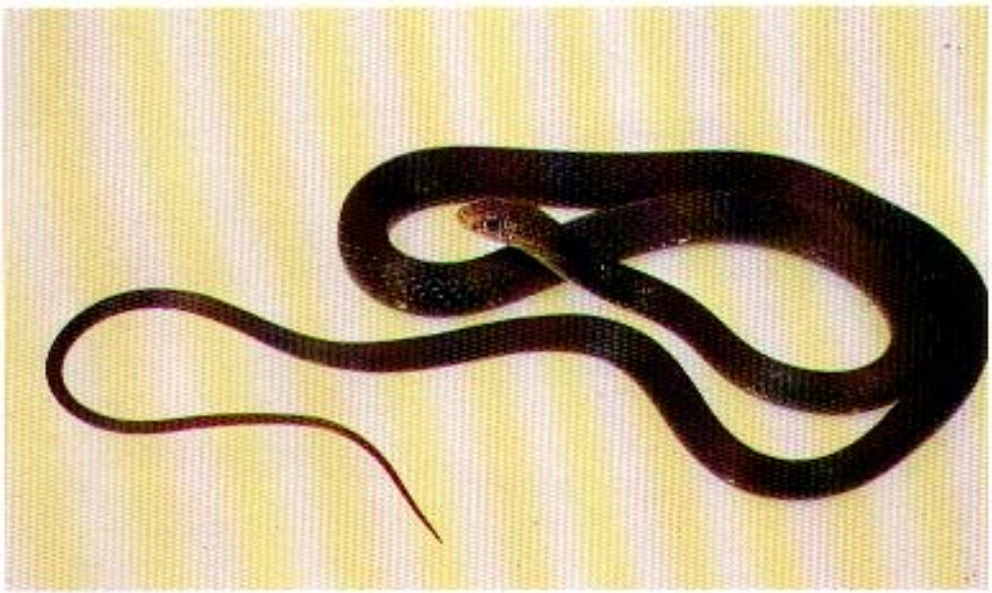


PLATE 30

Northern Death Adder (*Acanthophis praelongus*) is nocturnal and may be seen on roads at night; during the day it often lies concealed in litter in open forest. A short, very broad snake with a thin tip to the tail. Highly venomous.

Black Whip Snake (*Demansia atra*), the most abundant elapid snake in the Weipa survey and moderately venomous. A dark slender, terrestrial and diurnally active snake.

Orange-naped Snake (*Furina ornata*) is a small nocturnal snake harmless to humans. Reddish-brown body with a reddish bar on the back of the head separating the blackish head from the narrow black nape.

PLATE 31

Brown-headed Snake (*Furina tristis*) like the Orange-naped Snake, is also nocturnal and has small eyes. The pale yellowish or brown collar distinguishes this moderately venomous species from the non-venomous Slatey-grey Snake.

Taipan (*Oxyuranus scutellatus*), is the most dangerous land snake in the area. A very large plain brown snake with a long rectangular head often paler than the rest of the body, and keeled scales on the back of its long thin neck.

Mulga or King Brown Snake (*Pseudechis australis*) is another dangerous brown-coloured snake. A large thick snake with a heavy blunt head, most active in early evening and up to mid-morning.

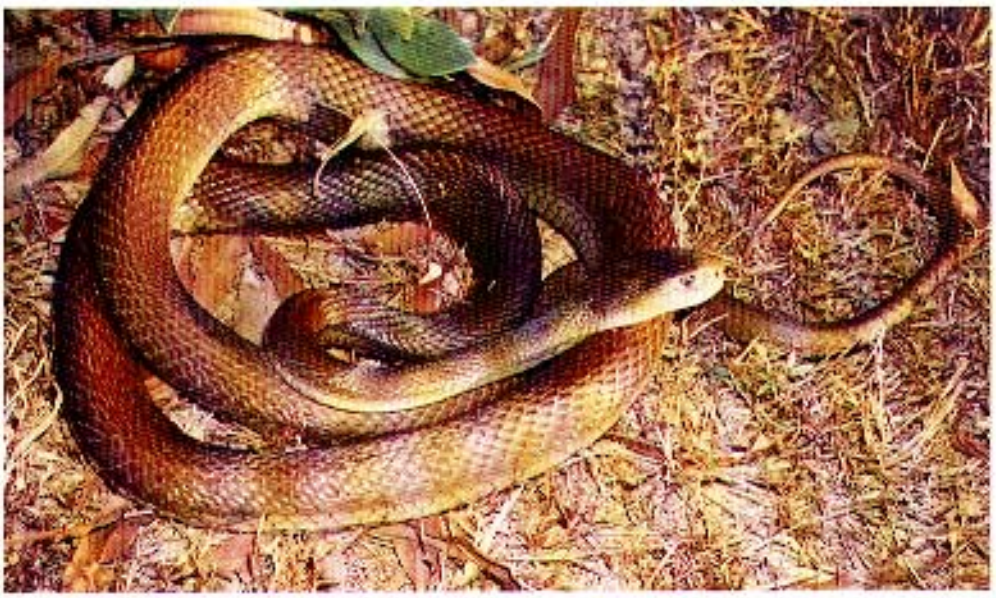


PLATE 32

Eastern Brown Snake (*Pseudonaja textilis*), a dangerous snake. Similar to Mulga Snake but has a more slender body and narrower head; differs in arrangement of scales on the side of the head and under the tail.

Black-striped Snake (*Rhinoplocephalus nigrostriatus*), is a small secretive reddish nocturnal snake with a narrow black stripe running the length of its back.

Half-girdled Snake (*Simoselaps semifasciatus campbelli*) is a very small burrowing snake which is harmless to humans. The tip of the snout ends in an upturned sharply-angled rostral scale, an adaptation for burrowing.

PLATE 33

Simoselaps warro, another small burrowing snake which is harmless to humans. It has an orange to orange-brown body and broad black blotch on the nape of the neck. Shorter and stouter than the Orange-naped Snake.

Myall or Curl Snake (*Suta suta*) is a small thickset brown snake with a darker brown 'hood' on top of the head, separated from the cream lips by a darker margin. Venomous but probably not dangerous to humans.

Bandy-Bandy (*Vermicella annulata*); with spectacular black and white banded pattern, it cannot be mistaken for any other land snake. A small burrowing species which eats worm snakes and is harmless to humans.

PLATE 34

Acalyptophis peronii, moderate-sized sea-snake with a small blunt head and dark cross-bands on the body. Each body scale has a short dark keel in its centre. Fragmented head scales (especially those over the eyes) form projections or spines. Highly venomous.

Aipysurus eydouxii, a sea-snake with large smooth body scales and a pattern of irregular cream and black bands. It eats only fish eggs and has short fangs and produces only small amounts of mild venom.

Olive Sea Snake (*Aipysurus laevis*) is a large heavily built sea snake with smooth scales and a highly variable colour pattern. Highly venomous.

PLATE 35

Enhydrina schistosa is a highly dangerous moderate-sized greyish sea snake with a long head and rather swollen protruding lower jaw. Each body scale has a short low keel. Responsible for many bites incurred by South-East Asian fishermen using hand seine nets.

Ventral view of lower jaw of *Enhydrina schistosa*. Long 'dagger'-shaped mental shield in middle of the chin is characteristic of the species.

Hydrelaps darwiniensis is a small slender-bodied sea snake with fairly broad belly scales. Usually found on tidal flats and in mangroves. Nothing known about its venom and no bites to humans have been recorded.

PLATE 36

Hydrophis elegans is a very elongate sea snake with a narrow head and neck; the posterior half of the body is deep and laterally compressed. Colour pattern very variable. Highly venomous.

Hydrophis ornatus, a moderate to heavily built sea snake with a variable colour pattern. Differs from *Hydrophis elegans* in its shorter more compact build and lacks the long thin neck and head of the latter.

Lapemis hardwickii, a thickset sea snake with hexagonal or squarish body scales which meet but do not overlap. On adult males lower lateral scales bear very large spiny tubercles, probably used in mating. Dangerous.

APPENDIX 1. Summary of Australian Museum visits to Weipa.

DATE	PARTICIPANTS	CATALOGUE NUMBERS OF SPECIMENS
6-12 July 1977 dry season	E. Cameron, H. Cogger, R. Sadlier, P. Webber	R62016-279, R62375, R62440, R62449, R62496-556, R62668, R62684-95, R62714
4-18 February 1979 wet season	E. Cameron, P. Webber, A. Young	R82001-82578, R82593-601
12-23 November 1979 dry season	E. Cameron, H. Cogger, R. Sadlier	R91267-659, R92282
1-20 July 1980 dry season	D. Beechey, E. Cameron, H. Cogger, R. Sadlier, S. von Sturmer	R94001-433, R94484, R94491-96, R94505-22, R94553-65, R94586-89, R95812
18 Aug - 10 Sept 1981 dry season	E. Cameron	R99700-992, R100064-92, R101319-21, R104188
18 June - 7 July 1982 dry season	E. Cameron, H. Cogger, A. Menez, N. Tamiya	R105001-399, R107001-116, R120999

APPENDIX 2. Periods in which herpetofauna surveyed in the Weipa region during 1977 to 1982.

DATE	GROUP CONDUCTING SURVEY
6-12 July 1977	AM
4-18 February 1979	AM
12-23 November 1979	AM
1-20 July 1980	AM
3-27 September 1980	QNPWS
1-27 February 1981	QNPWS
12-31 May 1981	QNPWS
18 August - 14 September 1981	AM, QNPWS
10-24 November 1981	BERS
4-29 December 1981	R & M
8-22 March 1982	BERS
1-21 April 1982	R & M
2-23 September 1982	R & M
18 June - 7 July 1982	AM

AM – Australian Museum; QNPWS – Queensland National Parks & Wildlife Service; BERS – Biological Environmental Research Services; R & M – Reeders & Morton.

APPENDIX 3. Description of survey sites.

SITE 1. Vine forest on the alternative Stone Crossing Road, 6 km east of Andoom Creek Bridge, near Rhum Point (Fig.2).
Map: Weipa 1:100 000; 12°34'S 141°55'E.
Habitats: Vine forest; ecotone of vine forest with open forest.
Period of survey: 7 July 1977: 1130-1230 hrs; 8 July 1977: 1000-1130 hrs.
No. spp. recorded: 7.

SITE 2. Kerr Point and western shores of Lake Patricia (Fig.2).
Map: Weipa 1:100 000; 12°39'S 141°50'E.
Habitats: Dunefield woodland; paperbark woodland; open forest; grassland/sedgeland.
Period of survey: 7 July 1977: 1430-1700 hrs, 2130-2300 hrs; 9 July 1977: 2000-2200 hrs; 18 February 1979: night spotlighting; 12 November 1979: 1930-2100 hrs (spotlighting); 22 June 1982: night spotlighting.
No. spp. recorded: 23.

SITE 3. Main road to Coen north of Weipa airstrip, and vicinity of abandoned sawmill (Fig.2).
Map: Weipa 1:100 000; 12°40'S 141°56'E.
Habitats: Open forest. Sawmill built in large clearing; heavy equipment and piles of logs provided moist refuges.
Period of survey: 8 July 1977: 1630-1800 hrs, 2000-2300 hrs (spotlighting); 8 February 1979: 0930-1000 hrs; 16 November 1979: 1000-1100; 2 July 1980; 20, 21 June 1982: 0730-1000 hrs.
No. spp. recorded: 24.

SITE 4. Sunrise Creek, on dry season track to Mapoon (Fig.1).
Map: Pennefather River 1:100 000; 12°25'S 141°51'E.
Habitats: Gallery forest; open forest.
Period of survey: 9 July 1977: 1400-1700 hrs; 10 July 1977: 1500-2130 hrs; 15 November 1979: 0745-1100 hrs, 1700-2230 hrs (fine warm night, no moon), spotlighting; 16 November 1979: 0700-0800; 19 July 1980: 1600-1630; 21 June 1982: 1300-1400 hrs.
No. spp. recorded: 24.

SITE 5. Willum Swamp, north of Coen Road, about 13 km east-south-east of Rocky Point along telegraph line (Fig.2).
Map: Weipa 1:100 000; 12°39'30"S 142°00'E.
Habitats: Paperbark woodland; open forest.
Period of survey: 6 February 1979: 2000-2330 hrs; 7 February 1979: 1000-1130 hrs; 22 June 1982: 0900-0930 hrs.
No. spp. recorded: 17.

SITE 6. Lorim Point, Evans Landing (Fig.2).
Map: Weipa 1:100 000; 12°40'S 141°52'E.
Habitats: Urban (buildings and gardens).
Period of survey: 10 July 1977; 5, 14, 17 February 1979; 11 July 1980.
No. spp. recorded: 22.

SITE 7. Rocky Point (Fig.2).
Map: Weipa 1:100 000; 12°37'30"S 141°53'E.
Habitats: Urban (buildings and gardens); paperbark woodland.
Period of survey: Opportunistic collecting on all trips; also 4 February 1979: 2100-2130 hrs; 7 February 1979: 2015-1230 hrs; 8 February 1979: 2045-2215 hrs; 21 June 1982: 2030-2120 hrs; 27 June 1982: 2030-2130 hrs.
No. spp. recorded: 26.

SITE 8. Coast 5-8 km north of Pennefather River mouth, in vicinity of Flinder's Camp (Fig.1).
Map: Pennefather River 1:100 000; 12°11'S 141°45'E.
Habitats: Dunefield woodland; paperbark woodland; vine forest.
Period of survey: 5 February 1979: 1500-1700hrs; 6 February 1979: 1330-1700 hrs; 17 November 1979: 1300-2100 hrs; 18 November 1979: 0800-1100.
No. spp. recorded: 24.

SITE 9. Old Mapoon settlement, Cullen Point, Port Musgrave (Fig.1).
Map: Mapoon 1:100 000; 11°58'S 141°53'E.
Habitats: Dunefield woodland.
Period of survey: 6 February 1979: 0900-1200 hrs; 24 June 1982: 1100-1400 hrs.
No. spp. recorded: 17.

SITE 10. Batavia Outstation Landing on the Wenlock River (Fig.1).
Map: Pennefather River 1:100 000; 12°11'S 141°54'E.
Habitats: Open forest; vine forest; gallery forest; paperbark woodland; mangroves.
Period of survey: 10 February 1979: 0900-2130 hrs; 11 February 1979: 0800-1200 hrs; 19-20 November 1979; 23 June 1982: 1330-2130 hrs.
No. spp. recorded: 30.

SITE 11. Possum Scrub, approximately 22 km north-north-east of Weipa on road to Mapoon (Fig.1).
Map: Pennefather River 1:100 000; 12°25'S 141°56'E.
Habitats: Vine forest; open forest.
Period of survey: 11 February 1979: 1600 hrs; 14 November 1979: 0930-1015 hrs.
No. spp. recorded: 12.

SITE 12. Number One Camp, Weipa (Fig.2).
Map: Weipa 1:100 000; 12°40'30"S 141°53'E.
Habitats: Open forest; partially demolished buildings.
Period of survey: 12 February 1979; 1000-1200 hrs.
No. spp. recorded: 11.

SITE 13. Pistol range and Cool Pool, east of road to Andoom (Fig.2).
Map: Weipa 1:100 000; 12°37'S 141°54'E.
Habitats: Vine thicket; mangroves; grassland/sedgeland.
Period of survey: 12 February 1979: 1330-1430 hrs.
No. spp. recorded: 9.

SITE 14. North bank of Embley River at landing for Old Weipa Mission (Fig.2).
Map: York Downs 1:100 000; 12°43'S 142°06'E.
Habitats: Eucalypt woodland.
Period of survey: 13 February 1979: 1030-1430 hrs.
No. spp. recorded: 13.

SITE 15. Hey Point, mouth of Hey River (Fig.2).
Map: Weipa 1:100 000; 12°44'S 141°53'E.
Habitats: Gallery forest; open forest; dunefield woodland.
Period of survey: 14 February 1979: morning; 13 November 1979: 1000-1130 hrs.
No. spp. recorded: 8.

SITE 16. Running Creek, 23 km east of Weipa, on road to York Downs (Fig.1).
Map: York Downs 1:100 000; 12°41'S 142°02'E.
Habitats: Gallery forest; eucalypt woodland.
Period of survey: 16 February 1979: morning; 21 November 1979: 1245-1300 hrs.
No. spp. recorded: 14.

SITE 17. Shell Point, between mouths of Embley and Hey Rivers (Fig.2).
Map: Weipa 1:100 000; 12°45'S 141°55'E.
Habitats: Gallery forest; open forest; grassland/sedgeland.
Period of survey: 13 November 1979: 1200-1300 hrs
No. spp. recorded: 2.

SITE 18. Shell mounds and bore on Oil-rig Road, 20 km south-east of Weipa (Fig.2).
Map: Weipa 1:100 000; 12°43'S 141°56'E.
Habitats: Open forest; paperbark woodland.
Period of survey: 21 November 1979: 0900-1200 hrs; 12 July 1980: 1630-1745 hrs.
No. spp. recorded: 13.

SITE 19. Jump-up on Coen Road, 45 km east of Weipa (Fig.1).
Map: York Downs 1:100 000; 12°44'S 142°11'E.
Habitats: Open forest.
Period of survey: 21 November 1979: 1500-1900 hrs.
No. spp. recorded: 6.

SITE 20. Marmoss Creek crossing on Coen Road 34 km east of Weipa (Fig.1).
Map: York Downs 1:100 000; 12°41'S 142°06'E.
Habitats: Gallery forest; eucalypt woodland.
Period of survey: 21 November 1979: 2100-2200 hrs; 18 July 1980: 1615-1645 hrs; 12 June 1982: 1930-1000 hrs.
No. spp. recorded: 16.

SITE 21. Andoom, west of mined area (Fig.2).
Map: Weipa 1:100 000; 12°32'S 141°48'E.
Habitats: Open forest.
Period of survey: 1 July 1980: 1630-1800 hrs, immediately following the burning of a fire-break.
No. spp. recorded: 6.

SITE 22. Coen Road, 6 km west of York Downs homestead site (Fig.1).
Map: York Downs 1:100 000; 12°44'S 142°16'E.
Habitats: Eucalypt woodland.
Period of survey: 2 July 1980: 1610 hrs; 20 June 1982: 1115-1145 hrs.
No. spp. recorded: 7.

SITE 23. Beening Creek, just behind Weipa South settlement (Fig.2).
Map: Weipa 1:100 000; 12°42'S 142°55'E.
Habitats: Mangroves; gallery forest.
Period of survey: 12 July 1980: 1530-1600 hrs.
No. spp. recorded: 4.

SITE 24. York Downs homestead site, east of Weipa on Coen Road (Fig.1).
Map: York Downs 1:100 000; 12°45'S 142°19'E.
Habitats: Eucalypt woodland; demolished buildings.
Period of survey: 13 July 1980: 1015-1130 hrs; 20 June 1982: 1145-1400 hrs.
No. spp. recorded: 12.

SITE 25. Mouth of Namaleta Creek on Port Musgrave (Fig.1).
Map: Mapoon 1:100 000; 11°58'S 141°57'E.
Habitats: Dunefield woodland; mangroves; paperbark woodland.
Period of survey: 19 July 1981: 1500-1730, 1930-2300 hrs.
No. spp. recorded: 9.

SITE 26. 1.5 km south-south-east of Vrilya Point (Fig.1).
Map: Vrilya Point 1:100 000; 11°15'S 142°07'E.
Habitats: Open forest; dunefield woodland; vine forest; paperbark woodland; gallery forest; grassland/ sedgeland.
Period of survey: 20-29 July 1981.
No. spp. recorded: 25.

SITE 27. Sand spit 12 km north of Vrilya Point (Fig.1).
Map: Vrilya Point 1:100 000; 11°08'S 142°09'E.
Habitats: Dunefield woodland.
Period of survey: 24 July 1981: 0900-1230 hrs.
No. spp. recorded: 8.

SITE 28. Creek mouth north-east of Vrilya Point (Fig.1).
Map: Vrilya Point 1:100 000; 11°13'S 142°08'E.
Habitats: Vine forest; dunefield woodland; gallery forest; paperbark woodland.
Period of survey: 24 July 1981: 1500 hrs.
No. spp. recorded: 14.

SITE 29. Road to Mapoon, 12 km north of Sunrise Creek (Fig.1).
Map: Pennefather River 1:100 000; 12°21'S 141°53'E.
Habitats: Paperbark woodland.
Period of survey: 1 September 1981: 1730-1900 hrs; 21 June 1982: 1500 hrs; 21 June 1982.
No. spp. recorded: 12.

SITE 30. Road to Mapoon, 7 km north of Sunrise Creek (Fig.1).
Map: Pennefather River 1:100 000; 12°23'S 141°53'E.
Habitats: Gallery forest; paperbark woodland.
Period of survey: 1 September 1981: 2100-2130 hrs.
No. spp. recorded: 7.

SITE 31. Agnew airstrip (Fig.1).
Map: Agnew 1:100 000; 12°09'S 142°08'E.
Habitats: Eucalypt woodland.
Period of survey: 3 September 1981: 1400 hrs.
No. spp. recorded: 5.

SITE 32. Ducie River old bridge site (Fig.1).
Map: Agnew 1:100 000; 12°10'S 141°20'E.
Habitats: Gallery forest; open forest.
Period of survey: 3 September 1981: 1800-2100 hrs; 4 September 1981: 0800-0915 hrs.
No. spp. recorded: 10.

SITE 33. Ducie River crossing 6 km north-north-east of junction with Bertiehaugh Creek (Fig.1).
Map: Agnew 1:100 000; 12°08'S 142°23'E.
Habitats: Eucalypt woodland.
Period of survey: 4 September 1981: 1200-1300 hrs.
No. spp. recorded: 6.

SITE 34. "Teardrop Scrub" 6 km north-north-west of Ducie River crossing (Fig.1).
Map: Agnew 1:100 000; 12°06'S 142°21'E.
Habitats: Vine forest.
Period of survey: 4 September 1981: 1600-1630 hrs.
No. spp. recorded: 4.

SITE 35. "Flying Fox Scrub" 11 km north-north-west of Ducie River crossing (Fig.1).
Map: Agnew 1:100 000; 12°03'S 142°21'E.
Habitats: Open forest; vine forest.
Period of survey: 4 September 1981: 0800-1200 hrs; 5 September 1981: 1700-1745, 1900-2200 hrs (spotlighting).
No. spp. recorded: 10.

SITE 36. Crossing on North Alice Creek approximately 18 km north-north-west of Ducie River crossing (Fig.1).
Map: Agnew 1:100 000; 12°01'S 142°18'E.
Habitats: Eucalypt woodland.
Period of survey: 5 September 1981: 1300-1400 hrs.
No. spp. recorded: 3.

SITE 37. Paperbark flats 3 km north-west of Ducie River crossing (Fig.1).
Map: Agnew 1:100 000; 12°07'S 142°21'E.
Habitats: Paperbark woodland; eucalypt woodland.
Period of survey: 6 September 1981: 1100-1200 hrs.
No. spp. recorded: 8.

SITE 38. Stone Crossing, Wenlock River (Fig.1).
Map: Agnew 1:100 000; 12°23'S 142°11'E.
Habitats: Gallery forest; vine forest; open forest.
Period of survey: 6 September 1981: 1900-2100 hrs (spotlighting); 25 June 1982: 1300-2100 hrs.
No. spp. recorded: 16.

SITE 39. Big Swamp, Mapoon Plains (Fig.1).
Map: Mapoon 1:100 000; 11°59'S 141°52'E.
Habitats: Grassland/sedgeland; dunefield woodland; paperbark woodland.
Period of survey: 7 September 1981: 1930-2030 hrs (spotlighting); 8 September 1981: 0730-0900 hrs.
No. spp. recorded: 13.

SITE 40. Red Beach, 8 km south of Cullen Point, Port Musgrave (Fig.1).
Map: Pennefather 1:100 000; 12°01'S 141°54'E.
Habitats: Open forest; dunefield woodland.
Period of survey: 8 September 1981: 1400 hrs; 24-25 June 1982: 1100-2100 hrs.
No. spp. recorded: 9.

SITE 41. Mouth of Janie Creek, Mapoon Peninsula (Fig.1).
Map: Pennefather 1:100 000; 12°02'S 141°50'E.
Habitats: Dunefield woodland.
Period of survey: 8 September 1981: 1630-1800, 2130-2300 hrs (spotlighting).
No. spp. recorded: 4.

SITE 42. Beach opposite mouth of Nomenade Creek, 12 km north-north-east of Duyfken Point (Fig.1).
Map: Pennefather River 1:100 000; 12°28'S 141°38'E.
Habitats: Dunefield woodland.
Period of survey: 5 February 1979: 0930-1000 hrs.
No. spp. recorded: 5.

SITE 43. Jack Callope's house, present Mapoon settlement (Fig.1).
Map: Mapoon 1:100 000; 12°00'S 141°53'E.
Habitats: Dunefield woodland.
Period of survey: 8 September 1981: 1100 hrs.
No. spp. recorded: 3.

SITE 44. Jackson Channel and mouths of Embley and Hey Rivers, Albatross Bay (Fig.2).
Map: Weipa 1:100 000; 12°41'S 141°51'E.
Habitats: Saltwater bay, muddy bottom.
Period of survey: 13 February 1979: 1500 hrs; 22 June 1982: 1900-2130 hrs; 29 June 1982: 2000-2230 hrs.
No. spp. recorded: 5.

SITE 45. Road between north-west end of Andoom Creek Bridge and Zero Drill Line leading to Mapoon (Fig.2).
Map: Weipa 1:100 000; between 12°30'S 141°50'E and 12°34'S 141°52'E.
Habitats: Open forest, sometimes adjacent to paperbark woodland.
Period of survey: 14 November 1979: 1930-2130 hrs (spotlighting); 16 November 1979: 0830-0930; 11 July 1980: 2000-2200 hrs; 12 July 1980: 1930-2230 hrs (spotlighting); 19 June 1982: 1930-2230 hrs; 27 June 1982: 2100-2200 hrs; 28 June 1982: 1930-2200 hrs.
No. spp. recorded: 13.

SITE 46. Myerfield airstrip (Fig.2).
Map: Pennefather River 1:100 000; 12°27'S 142°00'E.
Habitats: Open forest.
Period of survey: 26 June 1982: 1330-1400 hrs.
No. spp. recorded: 5.

SITE 47. False Pera Head (Fig.1).
Map: Aurukun 1:100 000; 13°05'S 141°37'E.
Habitats: Dunefield woodland, grassland, vine forest.
Period of survey: 1-2 July 1982: 1400-1000 hrs the following day.
No. spp. recorded: 10.

SITE 48. 13 km east of Watson River crossing on track to False Pera Head (Fig.1).
Map: Merluna 1:100 000; 13°07'S 142°07'E.
Habitats: Eucalypt woodland, paperbark woodland.
Period of survey: 30 June - 1 July 1982: 1900-0900 the following day.
No. spp. recorded: 17.

SITE 49. Crossing of Cox Creek, 75 km east of Weipa on Sudleigh road to Batavia Downs Station (Fig.1).
Map: York Downs 1:100 000; 12°41'S 142°24'E.
Habitats: Gallery forest.
Period of survey: 4 July 1982.
No. spp. recorded: 9.

SITE 50. Vicinity of homestead and airstrip, Batavia Downs Station (Fig.1).
Map: Batavia Downs 1:100 000; 12°40'S 142°40'E.
Habitats: Gallery forest, grassland, eucalypt woodland.
Period of survey: 14 July 1980: 1400-1500 hrs; 4 July 1982: 1500-1800 hrs.
No. spp. recorded: 17.

SITE 51. 12 km along Aurukun turnoff from Weipa-Coen Road (Fig.1).
Map: Merluna 1:100 000; 12°59'S 142°20'E.
Habitats: Eucalypt woodland.
Period of survey: 3 July 1982: 1300-1500 hrs.
No. spp. recorded: 6.

SITE 52. Airstrip for Beagle North Camp (Fig.1).
Map: Aurukun 1:100 000; 13°00'S 142°48'E.
Habitats: Grassland/sedgeland.
Period of survey: 2 July 1982: 1700 hrs.
No. spp. recorded: 3.

SITE 53. Andoom Top Camp Swamp, 13 km north-west of Andoom Creek Bridge (Fig.1).
Map: Pennefather River 1:100 000; 12°29'S 141°50'E.
Habitats: Paperbark woodland.
Period of survey: 20 July 1980: 0930-1030 hrs; 29 June 1982; 6 July 1982.
No. spp. recorded: 12.

APPENDIX 4. Species of frogs and reptiles recorded from Weipa.

FROGS - Myobatrachidae (Southern Frogs)
Crinia remota (Tyler & Parker, 1974)
Limnodynastes convexiusculus (Macleay, 1877)
Limnodynastes ornatus (Gray, 1842)
Uperoleia mimula Davies, McDonald & Corben, 1986

FROGS - Hylidae (Tree Frogs)
Cyclorana maculosa Tyler & Martin, 1977
Cyclorana novaehollandiae Steindachner, 1867
Litoria bicolor (Gray, 1842) Northern Dwarf Tree Frog
Litoria caerulea (White, 1790) Green Tree Frog
Litoria dorsalis Macleay, 1877 Dwarf Rocket Frog
Litoria genimaculata (Horst, 1883)
Litoria gracilenta (Peters, 1869) Dainty Green Tree Frog
Litoria inermis (Peters, 1867)
Litoria infrafrenata (Günther, 1867) Giant Tree Frog
Litoria nasuta (Gray, 1842) Rocket Frog
Litoria nigrofrenata (Günther, 1867)
Litoria pallida Davies, Martin & Watson, 1983
Litoria rothii (de Vis, 1884)
Litoria rubella (Gray, 1842) Desert Tree Frog

FROGS - Microhylidae (Microhylid Frogs)
Sphenophryne gracilipes (Fry, 1912)

FROGS - Ranidae (True Frogs)
Rana daemeli (Steindachner, 1868) Wood Frog

FROGS - Bufonidae (True Toads)
Bufo marinus (Linnaeus, 1758) Cane Toad

CROCODILES - Crocodylidae (Crocodiles)
Crocodylus johnstoni Krefft, 1873 Freshwater Crocodile
Crocodylus porosus Schneider, 1801 Estuarine Crocodile or Saltwater Crocodile

TURTLES - Cheloniidae (Sea Turtles)
Chelonia mydas (Linnaeus, 1758) Green Turtle
Eretmochelys imbricata (Linnaeus, 1766) Hawksbill Turtle
Lepidochelys olivacea (Eschscholtz, 1829) Olive Ridley
Natator depressus (Garman, 1880) Flatback Turtle

TURTLES - Chelidae (Side-necked Turtles)
Chelodina rugosa Ogilby, 1890 Northern Snake-necked Turtle

LIZARDS - Gekkonidae (Geckoes)
Gehyra dubia (Macleay, 1877) a Dtella
Heteronotia binoei (Gray, 1845) Bynoe's Gecko
Lepidodactylus lugubris (Duméril & Bibron, 1836) Mourning Gecko
Nactus pelagicus (Girard, 1858) Pelagic Gecko
Nephrurus asper Günther, 1876 Rough Knob-tailed Gecko
Oedura castelnaui (Thominot, 1889) Northern Velvet Gecko
Oedura rhombifer Gray, 1845
Pseudothecadactylus australis (Günther, 1877)

LIZARDS - Pygopodidae (Snake-lizards)
Delma tincta de Vis, 1888
Lialis burtonis Gray, 1835 Burton's Legless Lizard

LIZARDS - Agamidae (Dragons)
Chlamydosaurus kingii Gray, 1825 Frilled Lizard
Diporiphora sp. A a Two-lined Dragon or Tommy Roundhead
Diporiphora sp. B another Two-lined Dragon or Tommy Roundhead
Lophognathus temporalis (Günther, 1867)

LIZARDS - Varanidae (Goannas or Monitor Lizards)
Varanus indicus (Daudin, 1802) Mangrove Monitor
Varanus panoptes Storr, 1980
Varanus semiremex Peters, 1869 Rusty Monitor
Varanus timorensis (Gray, 1831) Spotted Tree Monitor

LIZARDS - Scincidae (Skinks)
Carlia jarnoldae Covacevich & Ingram, 1975
Carlia longipes (Macleay, 1877)
Carlia munda (de Vis, 1885)
Carlia storri Ingram & Covacevich, 1989
Carlia vivax (de Vis, 1884)
Cryptoblepharus plagiocephalus (Cocteau, 1836)
Cryptoblepharus virgatus (Garman, 1901) Fence Skink
Ctenotus robustus Storr, 1971
Ctenotus spaldingi (Macleay, 1877)
Egernia frerei Günther, 1897 Major Skink
Glaphyromorphus nigricaudis (Macleay, 1877)
Glaphyromorphus pumilus (Boulenger, 1887)
Lygisaurus macfarlani (Günther, 1877)
Morethia taeniopleura (Peters, 1874) Fire-tailed Skink
Tiliqua scincoides (White, 1790) Eastern Blue-tongued Lizard

SNAKES - Typhlopidae (Blind or Worm Snakes)
Ramphotyphlops sp.
Ramphotyphlops polygrammicus (Schlegel, 1839)
Ramphotyphlops unguirostris (Peters, 1867)

SNAKES - Boidae (Pythons)
Aspidites melanocephalus (Krefft, 1864) Black-headed Python
Liasis fuscus (Peters, 1873) Water Python
Liasis maculosus Peters, 1873
Morelia amethistina (Schneider, 1801) Amethystine Python
Morelia spilota variegata Gray, 1842 Carpet Python

SNAKES - Acrochordidae (File Snakes)
Acrochordus arafurae McDowell, 1979 Arafura File Snake
Acrochordus granulatus (Schneider, 1799) Little File Snake

SNAKES - Colubridae (Colubrid Snakes)
Boiga irregularis (Merrem, 1802) Brown Tree Snake
Dendrelaphis calligastra (Günther, 1867) Northern Tree Snake
Dendrelaphis punctulata (Gray, 1826) Common Tree Snake
Enhydris polylepis (Fischer, 1886) Macleay's Water Snake
Stegonotus cucullatus (Duméril, Bibron & Duméril, 1854) Slaty-grey Snake
Tropidonophis mairii (Gray, 1841) Keelback or Freshwater Snake

SNAKES - Elapidae (Elapid Snakes)
Acanthophis praelongus Ramsay, 1877 Northern Death Adder
Demansia atra (Macleay, 1884) Black Whip Snake
Furina ornata (Gray, 1842) Orange-naped Snake
Furina tristis (Günther, 1858) Brown-headed Snake
Oxyuranus scutellatus (Peters, 1867) Taipan
Pseudechis australis (Gray, 1842) Mulga or King Brown Snake
Pseudonaja textilis (Duméril, Bibron & Duméril, 1854) Eastern Brown Snake
Rhinoplocephalus nigrostriatus (Krefft, 1864) Black-striped Snake
Simoselaps semifasciatus (Günther, 1863) Half-girdled Snake
Simoselaps warro (de Vis, 1884)
Suta suta (Peters, 1863) Myall or Curl Snake
Vermicella annulata (Gray, 1841) Bandy-Bandy

SNAKES - Hydrophiidae (Sea Snakes)
Acalyptophis peronii (Duméril, 1853)
Aipysurus eydouxii (Gray, 1849)
Aipysurus laevis Lacépède, 1804 Olive Sea Snake
Enhydrina schistosa (Daudin, 1803)
Hydrelaps darwiniensis Boulenger, 1896
Hydrophis elegans (Gray, 1842)
Hydrophis ornatus (Gray, 1842)
Lapemis hardwickii Gray, 1835

APPENDIX 5. Additional species of frogs and reptiles which may occur in the Weipa region.

SPECIES	BASIS FOR PREDICTED OCCURRENCE
Myobatrachidae	
Crinia deserticola	Distribution map (5)
Limnodynastes terraereginae	Distribution maps (1), (2)
Uperoleia lithomoda	Distribution map (5)
Hylidae	
Litoria alboguttata	Distribution maps (1), (2)
Cheloniidae	
Caretta caretta	Distribution map (2); see species account
Chelidae	
Chelodina novaeguineae	Distribution map (2)
Elseya latisternum	AM records from Capt. Billy Creek south of Shelburne Bay; north of Jardine River (3)
Emydura krefftii	AM specimens R37566-69, 4 km west of Moreton Post Office
Gekkonidae	
Diplodactylus steindachneri	AM specimen R95612, west of Wenlock River on Iron Range road
Hemidactylus frenatus	Distribution maps (2), (4); north of Jardine River (3)
Oedura marmorata	Distribution map (5)
Pygopodidae	
Pygopus nigriceps	Distribution maps (2), (4)
Agamidae	
Lophognathus gilberti	Distribution maps (2), (4)
Varanidae	
Varanus tristis	Distribution map (5)
Varanus mertensi	Distribution maps (2), (4)
Scincidae	
Anomalopus pluto	AM specimen R94360, McDonnell Creek, 15 km outside boundary of survey area
Carlia schmeltzii	Distribution map (5)
Lygisaurus aeratus	AM specimen R94215, 4 km west Pascoe River on road to Iron Range
Lerista orientalis	Distribution maps (2), (4)
Glaphyromorphus crassicaudus	Distribution maps (2), (4); north of Jardine River (3)
Typhlopidae	
Ramphotyphlops affinis	Distribution maps (2), (4)
Ramphotyphlops broomi	Distribution maps (2), (4)
Ramphotyphlops diversus	Distribution maps (2), (4)
Ramphotyphlops leucoproctus	Distribution maps (2), (4)
Ramphotyphlops wiedii	Distribution maps (2), (4)
Boidae	
Liasis olivaceus	Distribution maps (2), (4)

Colubridae	
Cerberus rhynchops	Distribution maps (2), (4)
Fordonia leucobalia	Distribution maps (2), (4)
Elapidae	
Demansia papuensis	Distribution maps (2), (4); north of Jardine River (3)
Demansia torquata	Distribution maps (2), (4)
Pseudonaja nuchalis	Distribution maps (2), (4)
Hydrophiidae	
Aipysurus duboisii	Distribution maps (2), (5)
Astrotia stokesii	Distribution maps (2), (5)
Disteira kingii	Distribution map (2)
Disteira major	Distribution maps (2), (5)
Hydrophis mcdowelli	Distribution maps (2), (5)
Hydrophis pacificus	Distribution map (2)
Pelamis platurus	Distribution maps (2), (5)

(1) Barker & Grigg, 1977; (2) Cogger, 1986; (3) Covacevich, 1987; (4) Wilson & Knowles, 1988; (5) Ingram & Raven, 1991.

APPENDIX 6. Identification keys to the frogs and reptiles found in the Weipa region.

FROGS:

1. Tips of fingers and toes lacking distinct discs or pads and more or less straight in profile, without a distinct notch before the final joint; first finger not opposed to other fingers 2

—— Tips of fingers and toes usually with distinct discs or pads and usually with a distinct notch on the upper surface at the final joint; if notch is absent, the first finger is opposed to remaining fingers ..... (tree frogs family Hylidae) 8

2. Toes fully webbed 3

—— Toes not or only partly webbed 4

3. Snout and body elongate, skin on back smooth, a thick dorsolateral skin fold running from the eye to the groin; hindlimbs long ..... Wood Frog *Rana daemeli*

—— Snout and body broad and squat, skin on back thick and covered in warts; dorsolateral skin fold absent; region between the eyes hard and bony and separated from the eyes by a thick ridge of skin; hindlimbs short ..... Cane Toad *Bufo marinus*

4. Small smooth-skinned ovoid frog with short legs and small head and eyes ..... *Sphenophryne gracilipes*

—— Not as above ..... (southern frogs family Myobatrachidae) 5

5. Adult size greater than 30 mm and/or tongue large, broadly oval; a pair of prominent vomerine teeth on roof of mouth 7

—— Adult size less than 30 mm and/or tongue small, and/or narrowly oval; vomerine teeth vestigial or absent 6

6. Outer metatarsal tubercle (on sole of foot) if present, much smaller than inner metatarsal tubercle ..... *Crinia remota*

—— Inner and outer metatarsal tubercles more or less equally developed ..... *Uperoleia mimula*

7. Inner metatarsal tubercle on sole of foot, shovel-shaped ..... Ornate Burrowing Frog *Limnodynastes ornatus*

—— Inner metatarsal tubercle not shovel-shaped ..... Marbled Frog *Limnodynastes convexiusculus*

8. Tips of the digits usually with distinct discs or pads, but at least with a distinct notch in profile representing the well-developed intercalary cartilage; first finger not opposed to remaining fingers 10

—— Tips of digits without discs or pads; intercalary cartilage, if present, small and not indicated by a distinct notch in profile; first finger opposed to remaining fingers 9

9. A prominent straight dorsolateral skin fold; adult snout-vent length usually greater than 70 mm; snout very large, curved and beak-like ..... *Cyclorana novaehollandiae*

—— Usually no more than an indefinite dorsolateral skin fold; adult snout-vent length less than 70 mm; snout not as above ..... *Cyclorana* ? *maculosa*

10. Adult size less than 30 mm and/or vomerine teeth absent 11

—— Adult size greater than 30 mm and/or a pair of vomerine teeth present on roof of mouth 12

11. Dorsal colour uniform green or fawn, or mixture of green and bronze; skin smooth above; at least one strong pectoral fold; no tubercles above each eye ..... Northern Dwarf Tree Frog *Litoria bicolor*

—— Variegated dark and light brown dorsally; a row of dorsolateral tubercles and ridges on each side; no pectoral fold; several conspicuous tubercles above each eye ..... Dwarf Rocket Frog *Litoria dorsalis*

12. Fingers with conspicuous webbing, reaching at least as far as the base of the second last joint of the fourth finger 13

—— Fingers free, or webbed only at the base 17

13. Hind edge of the forearm smooth, or with at most a few low discontinuous tubercles 14

—— A conspicuous serrated ridge along the hind edge of the forearm ..... *Litoria genimaculata*

14. Hind side of the thighs with contrasting black and yellow bars or marbling, at least dorsally ..... *Litoria rothii*

—— Hind side of thighs more or less uniform, without black and yellow marbling 15

15. Webbing reaching or nearly reaching the disc of fourth finger, which is yellow ..... Dainty Green Tree Frog *Litoria gracilenta*

—— Webbing reaching no further than the base of the second last joint of the fourth finger, which is green or brown, not yellow 16

16. A distinctive white stripe along the edge of the lower jaw, extending back to the level of the forelimb ..... Giant Tree Frog *Litoria infrafrenata*

—— No white stripe along edge of lower jaw ..... Green Tree Frog *Litoria caerulea*

17. First finger much smaller and shorter than second; when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger ..... Desert Tree Frog *Litoria rubella*

—— First finger longer than, equal to, or slightly shorter than second 18

18. Dorsal surface smooth, or nearly so, with at most a few low, scattered warts; outer metacarpal tubercle (on 'palm' of the hand) smoothly oval, without a notch or division 19

—— Dorsal surface with prominent warts and/or ridges of skin; outer metacarpal tubercle distinctly notched or divided ..... Rocket Frog *Litoria nasuta*

19. Dorsal surface smooth, or with occasional low, small tubercles; dark head stripe usually enclosing whole of eardrum 20

—— Dorsal surface with scattered low, rounded tubercles; dark head stripe, if present not covering whole of eardrum ..... *Litoria inermis*

20. Dorsal surface smooth or with a few low tubercles; adult size small (less than 40 mm); posterior part of head stripe (behind level of forelimb) usually much narrower than the part immediately behind the eye ..... *Litoria pallida*

—— Dorsal surface smooth; adult size large (to 55 mm); posterior part of head stripe (behind level of forearm) usually as wide as that part immediately behind the eye ..... *Litoria nigrofrenata*

CROCODILES:

1. Snout long and slender; in adults the distance from the snout to a point midway between the eyes is more than twice the width of the head at the level of the eyes; enlarged nuchal shields (on back of neck) in a single row, separated from the smooth-skinned parietal region of the skull by fewer than eight granular scales ..... Freshwater Crocodile *Crocodylus johnstoni*

—— Snout relatively short and blunt; in adults the distance from the snout to a point midway between the eyes is less than twice the width of the head at the level of the eyes; enlarged nuchal shields in two rows, separated from the smoothly skinned parietal region by more than eight granular scales ..... Estuarine/Saltwater Crocodile *Crocodylus porosus*

TURTLES:

1. Forelimbs and hindlimbs paddle-shaped, without ankle-joints or webbed, clawed feet. 2

—— Forelimbs and hindlimbs jointed, not paddle-shaped, with distinct ankle joints and four- or five-clawed webbed feet ..... (freshwater turtle family Chelidae) 6

2. Four costal shields on each side of the dorsal shell inside the border of small marginal shields 3

—— Five or more costal shields on each side 4

3. One pair of prefrontal scales on top of snout anterior to unpaired frontal scale; tip of upper jaw not projecting forwards and downwards to form a narrow, prominent beak 5

—— Two pairs of prefrontals; tip of upper jaw projecting forwards and downwards to form a narrow, prominent beak ..... Hawksbill Turtle *Eretmochelys imbricata*

4. Four enlarged inframarginal shields on the bridge linking dorsal and ventral shells, with or without pores; adults olive-grey dorsally, hatchlings almost black; usually six or more costal shields on each side ..... Olive Ridley Turtle *Lepidochelys olivacea*

—— Usually three enlarged inframarginals on the bridge, without pores; adults and hatchlings distinctly reddish-brown dorsally; rarely more than five costals on each side ..... Loggerhead Turtle *Caretta caretta*

5. Usually four or more postocular scales on the side of the head behind the eye; a series of enlarged scales on the upper eyelid, the larger of which are at least half the width of the adjoining prefrontal; distal half of forelimb almost entirely covered by enlarged scales, without distinct areas of smaller irregular scales between the phalanges ..... Green Turtle *Chelonia mydas*

—— Three postoculars; upper eyelid composed of numerous, small, irregular, subequal scales, the larger of which are much less than one quarter the width of the adjoining prefrontal; distal half of forelimb with single rows of enlarged scales extending among phalanges, separated by large areas of smaller irregular scales or wrinkled skin ..... Flatback Turtle *Natator depressus*

6. Forelimbs each with five claws; gular shields at front of ventral shell entirely separated by the intergular 7

—— Forelimbs each with four claws; gular shields meeting in front of the intergular ..... Northern Snake-necked Turtle *Chelodina rugosa*

7. Skin of temporal region on side of head smooth, sometimes broken up into regular, flat scales or tubercles; a narrow nuchal shield usually present in centre front of dorsal shell ..... short-necked turtles, genus *Emydura*

—— Skin of temporal region with prominent, low, rounded scales or tubercles which are distinctly raised above the surface of the head; nuchal shield usually absent ..... short-necked turtles, genus *Elseya*

LIZARDS:

1. Limbs normally present, though often very small; if limbs are entirely absent, then the eyes are very small and have movable lids 2

—— No obvious or normal limbs, though a scaly flap or 'fin' is present on either side of the vent; eyes lidless, snake-like; conspicuous external ear opening present ..... (snake lizards, family Pygopodidae) 12

2. Eyes with or without movable lids; if eyelids are absent then the pupil in daylight is not a narrow, vertical slit and the scales on the dorsum are overlapping 3

—— Eyes snake-like, without movable lids; pupil in daylight a narrow, vertical slit; scales on the dorsum small, meeting but not overlapping ..... (geckos, family Gekkonidae) 5

3. Top of head covered with very small, irregular scales 4

—— Top of head covered with large, regular and usually symmetrical, shield-like scales ..... (skinks, family Scincidae) 19

4. Tongue long, slender, sheathed at its base and deeply forked like that of a snake; tongue frequently flicked in and out when lizard is alert ..... (goannas or monitor lizards, family Varanidae) 16

—— Tongue broad, flat, not sheathed at its base and with only a slight notch in front; tongue not normally protruded except for eating and drinking ..... (agamid or dragon lizards, family Agamidae) 13

5. Digits without any enlarged tubercles or lamellae on the lower surface; tail very short, ending in a knob ..... Rough Knob-tailed Gecko *Nephrurus asper*

—— Digits with at least a pair of enlarged subdigital tubercles or lamellae 6

6. Digits lying flat, entirely on substrate when viewed laterally; terminal claws, if present, small and lying in a groove between distal lamellae or arising from the upper surface of a large digital expansion 7

—— Digits angular when viewed laterally; feet bird-like, their terminal claws conspicuous and free 11

7. A distal pair of enlarged plates on the lower surface of each digit, quite distinct from and discontinuous with the remaining subdigital lamellae or tubercles 8

—— The enlarged subdigital lamellae in a continuous series 9

8. Dorsal scales flat, round, about as large as ventrals ..... Northern Velvet Gecko *Oedura castelnaui*

—— Dorsal scales, minute, granular, usually much smaller than the ventrals ..... *Oedura rhombifer*

9. Claws of digits free, arising from the upper surface of the digital expansion well within the border of the expansion ..... a Dtella *Gehyra dubia*

—— Claws of digits arising from the edge of the digital expansion 10

10. Claws of digits small and retractile in the distal median groove; underside of original tail tip covered in lamellae ..... Pseudothecadactylus *australis*

—— Claws of digits large, not retractile in a distal median groove ..... Mourning Gecko *Lepidodactylus lugubris*

11. Claw between three scales; two rows of lateral scales on digits; tubercles on back pointing backwards like small blunt teeth of a saw, arranged in less regular rows ..... Bynoe's Gecko *Heteronotia binoei*

—— Claw between two scales, the lower deeply notched; three rows of lateral scales on digits; small conical tubercles on back arranged in regular rows ..... Pelagic Gecko *Nactus pelagicus*

12. Head covered with enlarged, symmetrical shields, snout short and blunt ..... *Delma tincta*

—— Head covered with small, irregular shields; head tapers into a long narrow wedge-shaped snout ..... Burton's Snake-lizard *Lialis burtonis*

13. No large skin 'frill' around neck 14

—— A large, loose 'frill ' of skin around neck ..... Frilled Lizard *Chlamydosaurus kingii*

14. A vertebral series of enlarged scales present along the middle of the back, forming low but distinct nuchal (neck) and dorsal crests; eight to twelve pores on each side of belly extending from middle of thigh to centre of body anterior to vent ..... *Lophognathus temporalis*

—— No vertebral series of enlarged scales along the back; one to three pores on each side 15

15. Skin folds absent on neck and throat; adult size large (snout-vent length to 70 mm) ..... *Diporiphora* sp. A

—— Skin fold extending across throat and around side of neck behind each ear; adult size small (snout-vent to 50 mm) ..... *Diporiphora* sp. B

16. Tail strongly laterally compressed except at the base; a distinct median double keel dorsally along the posterior half of the tail 17

—— Tail only moderately laterally compressed or not at all; no obvious median double keel dorsally along the tail 18

17. Scales of tail (caudals) not arranged in regular rings as ventral caudal scales are larger than the dorsal caudals ..... Mangrove Monitor *Varanus indicus*

—— Caudal scales arranged in regular rings, occasionally incomplete on the sides of the tail ..... *Varanus panoptes*

18. Tail round in section or somewhat dorsoventrally compressed, at the most very slightly laterally compressed in the last half ..... Spotted Tree Monitor *Varanus timorensis*

—— Last two-thirds of tail moderately laterally compressed ..... Rusty Monitor *Varanus semiremex*

19. Parietal shields (the large paired scales at the back of the head), if unfragmented, nowhere in contact, being separated behind by a wedge-shaped interparietal scale 20

—— Parietal shields in contact behind the interparietal 21

20. Third and fourth toes subequal or the third slightly longer than the fourth ..... Eastern Blue-tongued Lizard *Tiliqua scincoides*

—— Fourth toe markedly longer than the third ..... Major Skink *Egernia frerei*

21. Lower eyelid either movable with a transparent disc or fused to form a transparent snake-like spectacle 22

—— Lower eyelid movable and scaly or with an opaque disc 30

22. Lower eyelid fused to form a transparent spectacle; the paired prefrontal scales on top of the snout large, in contact or narrowly separated 28

—— Lower eyelid movable, or if fused to form a transparent spectacle, the prefrontals are small and widely separated, or absent 23

23. Twenty seven or more midbody scale rows 24

—— Twenty six or fewer midbody scale rows ..... *Lygisaurus macfarlani*

24. Dorsal scales four-sided, each with a smoothly curved posterior edge; smooth, striated or feebly keeled 25

—— Dorsal scales six-sided, each usually with an angled posterior or free edge and moderately to strongly keeled 26

25. Ear-opening round or vertically elliptic; pale midlateral stripe, if present, not split or displaced by ear-opening ..... *Carlia longipes*

—— Ear-opening horizontally elliptic; pale midlateral stripe, split and displaced by the ear-opening ..... *Carlia munda*

26. Dorsal scales mostly bicarinate, or when occasionally tricarinate, the ear opening is surrounded by acute, pointed lobules 27

—— Dorsal scales mostly tricarinate; ear opening not completely surrounded by long, acute pointed lobules ..... *Carlia jarnoldae*

27. Ear opening surrounded by acute pointed lobules ..... *Carlia storri*

—— Ear opening usually with no more than one or two lobules anteriorly ..... *Carlia vivax*

28. Upper eyelid with three or four scales much larger than granules surrounding remainder of eye; single frontal and paired prefrontal scales subequal 29

—— Eye more or less surrounded by a circle of uniformly small granules; frontal much larger than prefrontals ..... Fire-tailed Skink *Morethia taeniopleura*

29. Pale dorsolateral stripe, if present, not bordered above by a sharp-edged, continuous black stripe; five or six superciliaries; adult snout-vent length up to 45 mm ..... *Cryptoblepharus plagiocephalus*

—— A well-defined pale dorsolateral stripe bordered above by a sharp-edged continuous black stripe; supraciliaries normally five; adult snout-vent length generally less than 40 mm ..... *Cryptoblepharus virgatus*

30. Conspicuous ear lobules present; pattern usually of dorsal and/or lateral longitudinal stripes 31

—— Ear lobules absent; pattern usually transversely aligned or of irregularly scattered spots and variegations 32

31. Three wide supraocular scales on top of head above the eye ..... *Ctenotus spaldingi*

—— Normally four supraoculars ..... *Ctenotus robustus*

32. Limbs when straightened and pressed flat along the side of the body, fail to meet by noticeably more than the length of the forelimb ..... *Glaphyromorphus pumilus*

—— Adpressed limbs longer, overlapping or separated by at most the length of the forelimb ..... *Glaphyromorphus nigricaudis*

SNAKES:

1. Tail more or less cylindrical, not flattened and paddle-shaped 2

—— Tail strongly vertically compressed and paddle-shaped ..... (sea snakes, family Hydrophiidae) 30

2. No enlarged ventral scales, the scales on the belly more or less equal in size to those on the back and sides 3

—— A single row of enlarged ventral scales which are at least three times as wide as those on the back and sides 5

3. More than 80 midbody scale rows; body scales small, rough, strongly keeled; eyes small but fully developed ..... (file snakes, family Acrochordidae) 4

—— Fewer than 40 midbody scale rows; body scales very smooth; eyes vestigial, consisting of dark spots beneath scales of head ..... (blind or worm snakes, family Typhlopidae) 7

4. Eleven to 14 scales between nasal scale and eye; colour pattern of reticulations or blotches; skin very loose and flabby ..... Arafura File Snake *Acrochordus arafurae*

—— Five to seven scales between nasal scale and eye; colour pattern of narrow indefinite bands; skin not flabby ..... Little File Snake *Acrochordus granulatus*

5. Fewer than 30 midbody scale rows 6

—— More than 30 midbody scale rows ..... (pythons, family Boidae) 9

6. One or more loreal scales present between nasal scale and scale in front of eye, or, if absent, 23 or more midbody scale rows and a divided anal shield ..... (colubrid snakes, family Colubridae) 13

—— No loreal scales; anal single if midbody scales in 23 or more rows ..... (elapid snakes, family Elapidae) 18

7. Nasal cleft usually joining first supralabial ..... *Ramphotyphlops unguirostris*

—— Nasal cleft usually joining second supralabial or preocular 8

8. Fewer than 20 midbody scale rows ..... *Ramphotyphlops* sp. aff. *minimus*

—— Twenty two or more midbody scale rows ..... *Ramphotyphlops polygrammicus*

9. Premaxilla with teeth, head considerably wider than the narrow neck; sensory pits present in some lip scales 10

—— Premaxilla without teeth, head not much wider than neck; sensory pits absent ..... Black-headed Python *Aspidites melanocephalus*

10. Scales, at least on rear of body, with one or two apical pits 11

—— Most scales, including those on rear of body, without apical pits 12

11. A single loreal scale between the nasal scale and scale in front of the eye ..... Water Python *Liasis fuscus*

—— Two or more loreals ..... *Liasis maculosus*

12. Central head shields large, regular, with at least a distinct frontal shield ..... Amethystine Python *Morelia amethistina*

—— Central head shields small, fragmented, without a distinct frontal shield ..... Carpet Python *Morelia spilota variegata*

13. Scales strongly keeled ..... Keelback or Freshwater Snake *Tropidonophis mairii*

—— Scales smooth or feebly keeled 14

14. Ventrals fewer than 225 and/or 17 or fewer midbody scale rows 15

—— Ventrals more than 225 and/or 19 or more midbody scale rows 7

15. 17 midbody scale rows ..... Slaty-grey Snake *Stegonotus cucullatus*

—— 13 midbody scale rows 16

16. A dark streak along the side of the head, following the upper edge of the labials to the eye then continuing more or less to the angle of the mouth; eye very large; body very slender and whip-like ..... Northern Tree Snake *Dendrelaphis calligastra*

—— No dark streak along the side of the head; eye moderately large; body slender ..... Common Tree Snake *Dendrelaphis punctulatus*

17. Anal divided ..... Macleay's Water Snake *Enhydris polylepis*

—— Anal single ..... Brown Tree Snake *Boiga irregularis*

18. A row of subocular scales between the eye and the scales on the upper lip; a curved soft spine on the tip of the tail ..... Northern Death Adder *Acanthophis praelongus*

—— No suboculars; no specialised curved soft spine on the tip of the tail 19

19. All subcaudals normally undivided 20

—— At least some subcaudals divided 21

20. Scales in 17 or fewer rows at midbody ..... Black-striped Snake *Rhinoplocephalus nigrostriatus*

—— Scales in 19 or more rows at midbody ..... Myall or Curl Snake *Suta suta*

21. Anal normally single; 21 or more midbody scale row ..... Taipan *Oxyuranus scutellatus*

—— Anal normally divided; 17 or fewer midbody scale rows 22

22. Usually all subcaudals divided 23

—— Usually some anterior subcaudals single, remainder divided 24

23. Subcaudals 35 or more 25

—— Subcaudals fewer than 35 28

24. Sixth upper lip scale (labial) almost twice as long as the anterior labials and separated from the large scale on each side of the head at the back (parietal) by only one narrow anterior temporal scale ..... Eastern Brown Snake *Pseudonaja textilis*

—— Fifth and sixth labial scales subequal and separated from the parietal by two anterior temporal scales, the lower a deep wedge-shaped lower anterior temporal scale ..... Mulga or King Brown Snake *Pseudechis australis*

25. Nasal and preocular scales widely separated 26

—— Nasal and preocular scales in contact 27

26. A bright red or orange patch or bar on the nape; nasal scale undivided ..... Orange-naped Snake *Furina ornata*

—— Pale bar on nape, yellowish or pale brown; nasal divided ..... Brown-headed Snake *Furina tristis*

27. Scales in 15 rows at midbody ..... Black Whip Snake *Demansia atra*

—— Scales in 17 or more rows at midbody ..... Eastern Brown Snake *Pseudonaja textilis*

28. Colour pattern not consisting of alternate black and white bands 29

—— Colour pattern consisting of black and white bands from head to tail ..... Bandy-Bandy *Vermicella annulata*

29. Nasal not in contact with preocular; body without crossbands but with a broad black blotch on the nape ..... *Simoselaps warro*

—— Nasal in contact with preocular; body with numerous diffuse dark cross-bands along the length of the body and tail ..... Half-girdled Snake *Simoselaps semifasciatus*

30. Ventrals large, at least three times as wide as the adjacent body scales 31

—— Ventrals small, at most scarcely more than twice as wide as the adjacent body scales 33

31. Posterior chin shields as large as the anterior chin shields, and separated by a mental groove; portion of rostral scale bearing median valve-like fold continuous with remainder of scale ..... *Hydrelaps darwiniensis*

—— Posterior chin shields usually reduced and separated by one or more small scales; portion of rostral scale bearing median valve-like fold sometimes separated from remainder of scale by a suture 32

32. Ventrals with or without a slight median notch on the hind edge ..... *Aipysurus eydouxii*

—— Ventrals with a deep median notch on the hind edge ..... Olive Sea Snake *Aipysurus laevis*

33. Head scales enlarged, regular, symmetrical; supraoculars without projecting tubercles or spines 34

—— Head scales broken up into small, irregular and asymmetrical scales; supraocular scales above eye with projecting tubercles or spines ..... *Acalyptophis peronii*

34. Mental scales in centre of chin normal, triangular, broader than long and not partially hidden in the shallow mental groove 35

—— Mental narrow, splint- or dagger-shaped, much longer than broad and partially hidden in the deep mental groove ..... *Enhydrina schistosa*

35. Body scales meeting but not overlapping, hexagonal or squarish, the lower lateral body scales much larger than the remainder and with grossly enlarged tubercles in adult males ..... *Lapemis hardwickii*

—— Body scales not as above 36

36. Body greatly elongated and the hind part deep and compressed in adults; 345 to 432 ventral scales ..... *Hydrophis elegans*

—— Body more or less uniformly heavy and thickset along its length; 240 to 340 ventral scales ..... *Hydrophis ornatus*

APPENDIX 7. Snakebite, Toad and Frog Toxins and First Aid.

Four venomous land snakes (elapids) capable of potentially lethal bites to humans have been recorded in the Weipa area. None of the dangerous land snakes are common. In order of decreasing frequency in the Australian Museum's survey, they are: the Northern Death Adder (*Acanthophis praelongus*) – 12 records, Mulga or King Brown Snake (*Pseudechis australis*) – nine records, Eastern Brown Snake (*Pseudonaja textilis*) – three records and Taipan (*Oxyuranus scutellatus*) – one record. A further three elapid snakes could cause potentially severe symptoms. They are: the Black Whip Snake (*Demansia atra*) – 25 records, Brown-headed Snake (*Furina tristis*) – ten records and Myall or Curl Snake (*Suta suta*) – three records. The remaining five elapid snakes in the area are capable of inflicting only mild or asymptomatic bites on the rare occasions they attempt to bite.

Almost all of the sea snakes found in the area have potentially lethal bites, but are only likely to pose a threat if encountered in prawn trawls. However the Beaked Sea Snake (*Enhydrina schistosa*) has been responsible for fatal bites to swimmers in the upper freshwater reaches of the Sepik River of Papua New Guinea. Sea snakes that are not generally considered dangerous are *Aipysurus eydouxii* which eats fish eggs and has short fangs and a low yield of mild venom, and probably *Hydrelaps darwiniensis*, a very small species whose venom toxicity has not been studied.

Two colubrid snakes, the Brown Tree Snake (*Boiga irregularis*) – 14 records, and Macleay's Water Snake (*Enhydris polylepis*) – two records, have fangs at the rear of the mouth, which can inject mild venom, but their bites are mild or asymptomatic. The remaining snakes of the Weipa region – blind snakes, pythons, file snakes and solid-toothed colubrid snakes – are non-venomous.

When snakebite occurs on a limb, the following first-aid treatment is recommended by the Commonwealth Serum Laboratory (Sutherland, 1985):

1. Immediate application of a broad firm bandage (e.g., crepe bandage) around the whole limb, beginning at the site of the bite. Bandage should be as tight as one would bandage a sprained ankle.

2. Immobilisation of the limb, using padded splints etc to keep it still.

3. Speedy admission to hospital or medical centre, bringing transport to the patient whenever possible.

4. Retention of bandages and splint in place until medical care is reached.

Clearly this procedure cannot be applied when the bite is on the trunk or head. If the bite is on the trunk, apply firm pressure over the bitten area if possible but do not restrict chest movement. If the bite is on the head or neck, there is no first aid treatment for the bitten area, and the patient should be transported as quickly as possible to hospital or medical centre.

The bitten area should not be cut, squeezed or washed, and an arterial tourniquet should never be applied. If the snake can be killed without further danger, it should be taken to the hospital with the victim. The major advantage of accurately identifying the snake is that, if envenomation has occurred, a specific antivenom can be administered instead of polyvalent antivenom which contains a large volume of horse serum and may cause unwanted side effects.

Cane Toads (*Bufo marinus*) can secrete large quantities of highly toxic steroid compounds from parotoid glands on the side of the neck. The steroids, mainly bufogenins and bufotoxins, can have a serious effect on many parts of the body, including the heart. Particular care should be taken to avoid contact of the secretions with the eyes or mucous membranes. In addition to the parotoid secretions, toad skin contains other toxic compounds which can be dangerous if the toads are mouthed or eaten.

Many native frogs as well as *Bufo marinus*, produce biologically active compounds in their skin which can be irritable and even toxic, to humans. They include some species of the following genera which occur in the Weipa area: *Crinia*, *Limnodynastes*, *Uperoleia*, *Cyclorana*, *Litoria*, *Rana* and *Sphenophryne*. Simple precautions to avoid irritation are to thoroughly wash hands after handling frogs, and to avoid touching eyes or mouth if one's hands could be contaminated.

APPENDIX 8. Tables 1-6 referred to throughout the text.

Table 1. Summary of specimen and sight records of frogs and reptiles.

	No. specimen records		No. sight records						
SPECIES	AM	QM	AM	QNP	RM	BRS	OTHER	ALL RECS	NO. SVYS
Crinia remota	116	17	*	2	2	*	*UNE	137	4+1
Limnodynastes convexiusculus	41	4	*	4	28		*UNE,CH	77	3+2
Limnodynastes ornatus	63	9	*	7	78	6+	*PH,CH	160	4+2
Uperoleia mimula	52	12	*	*	10	*	*UNE	74	4+1
Cyclorana maculosa	1	5			*	*	*PH	6	2+1
Cyclorana novaehollandiae	10	9	*	4	87	1+	*PH	111	4+2
Litoria bicolor	66	11	*	6	26	4+		111	4
Litoria caerulea	40	2	*	9	27	7+	*CH	85	4+1
Litoria dorsalis	31	5	*	*	3	*	*UNE	39	4+1
Litoria genimaculata		1		1				2	1
Litoria gracilenta	14	1	*	41	2	1+		59	4
Litoria inermis	20	8	*	5		*	*CH	33	3+1
Litoria infrafrenata	13	3	*	8	1		*CH	25	3+1
Litoria nasuta	96	2	*	18	108	6+	*UNE	230	4+1
Litoria nigrofrenata	88	6	*	5	24	*	*UNE	123	4+1
Litoria pallida	84	6	*	2		*		92	3
Litoria rothii	40	5	*	6	21	2+	*CH,UNE	74	4+2
Litoria rubella	24	2	*	5	111	3+	*UNE	145	4+1
Sphenophryne gracilipes	117	13	*	3	96	*	*UNE	229	4+1
Rana daemeli	98	5	*	12		2+	*UNE,RB	117	3+2
Bufo marinus	130	4	*	15	1	22+		172	4
Crocodylus johnstoni				1				1	1
Crocodylus porosus			5	25		1		31	3
Chelonia mydas	2(eggs)		*			1+	4MiG	7	2+1
Eretmochelys imbricata						1+		1	1
Lepidochelys olivacea							1CL	1	+1
Natator depressus		2					*QM	2	+1
Chelodina rugosa	1		1	*				2	2
Gehyra dubia	84	14	*	1	2	*		101	4
Heteronotia binoei	29	1	*	2	5			37	3
Lepidodactylus lugubris	3		*	1				4	2
Nactus pelagicus	254	13	*	13	62	*	*CR	342	4+1
Nephrurus asper		1				1+	1MOR	3	1+1
Oedura castelnaui	28	3	*	4	3	5+	1MOR	44	4+1
Oedura rhombifer	61	2	*	1	16	5+		85	4
Pseudothecadactylus australis	7	4	*	30	1	*		42	4
Delma tincta	1				8			9	1
Lialis burtonis	12	2	*	2	6		1MOR,CH	22	3+2
Chlamydosaurus kingii	1	1	*	1		*	*NH	3	2+1
Diporiphora sp. A	91	3	*	2	222	9+		327	4
Diporiphora sp. B	21		*					21	1
Lophognathus temporalis	8	5	5	1	1			20	3
Varanus indicus				4			2PR,CR	6	1+2
Varanus panoptes	2		6	11	12	1+	3MiG,UNE	35	4+3
Varanus semiremex	6			2			2PR,PH	10	1+2
Varanus timorensis	6	5	5	5	1	5+		27	4
Carlia jarnoldae			1					1	1
Carlia longipes	210	29	*	9	232	*	*CH	471	4+1
Carlia munda	7		*	*		1+		8	3
Carlia storri	66	10	*	*	2	5+	*RB,UNE	83	4+3
Carlia vivax	2		*			2+		4	2
Cryptoblepharus plagiocephalus	2	1	*	*				3	2
Cryptoblepharus virgatus	86	3	*	12	2	5+		108	4
Ctenotus robustus		1	*		4			5	2
Ctenotus spaldingi	58	21	*	*	101	*	*CH	180	4+1
Egernia frerei	1		*					1	1
Glaphyromorphus nigricaudis	87	5	*	1	3	2+	*PH	98	4+1
Glaphyromorphus pumilus	19	1	*	*				20	2
Lygisaurus macfarlani					14			14	1

Table 1 (cont'd).

	No. specimen records		No. sight records						
SPECIES	AM	QM	AM	QNP	RM	BRS	OTHER	ALL RECS	No. SVYS
Morethia taeniopleura	8	2	*	*	7	3+		22	4
Tiliqua scincoides	2		1	3	9		*MOR,CR	15	3+2
Ramphotyphlops sp.	2	3(+1NMV)				*	*FH,PH	6	1+2
Ramphotyphlops polygrammicus	2	1	*	*				3	2
Ramphotyphlops unguirostris	2				*		*FH	2	1+1
Aspidites melanocephalus							2PH,MaG	2	+2
Liasis fuscus	1						1PH,PR	2	+2
Liasis maculosus			5					5	1
Morelia amethistina			1	1			2PR,KS	4	2+2
Morelia spilota variegata				1				1	1
Acrochordus arafurae							1KS	1	+1
Acrochordus granulatus	4		*				1fishermen	5	1+1
Boiga irregularis	5	2	2	1	4		4PR	18	3+1
Dendrelaphis calligastra	1		1			?	*PR	2	1+1
Dendrelaphis punctulata	6	1	1		2	?		10	2
Enhydris polylepis	2		*					2	1
Stegonotus cucullatus	1	1	1	2	1	1		6	4
Tropidonophis mairii	14	1	2	14	8			39	3
Acanthophis praelongus	3	5	*	*	2		2CR	12	3+1
Demansia atra	10	3	1	*	9	2		25	4
Furina ornata	8	3	*	*	1	*		12	4
Furina tristis	6	2	1	1		*		10	3
Oxyuranus scutellatus	1						*MaG	1	+1
Pseudechis australis	5		1		2	1		9	3
Pseudonaja textilis	1		1		1			3	2
Rhinoplocephalus nigrostriatus	1	2		*		*	*PR	3	2+1
Simoselaps semifasciatus		1		*				1	1
Simoselaps warro	1	1				*	*DW	2	1+1
Suta suta		1				1	1PH	3	1+1
Vermicella annulata	1						1RJ,PH	2	+1
Acalyptophis peronii	9						2JR,GW,HH	11	+3
Aipysurus eydouxii	10						*GW	10	+1
Aipysurus laevis	2						2JR,GW	4	+2
Enhydrina schistosa	2	1	*				1JR,CR	4	1+2
Hydrelaps darwiniensis	1						*FH	1	+1
Hydrophis elegans	2		*				*HH,JR	3	1+2
Hydrophis ornatus	1						*JR	1	+1
Lapemis hardwickii	12		*				68JR	80	1+1

SURVEY ACRONYMS: AM – Australian Museum; BRS – Biological Environmental Research Services; QM – Queensland Museum; QNP – Queensland National Parks & Wildlife Service; RM – Reeders & Morton.
SIGHT RECORDS (OTHER): CH – Charles Hedley; CL – Col Limpus; CR – Comalco Regeneration staff; DW – Dan Wilhoft; FH – Fred Hawkings; GW – G Webster; HF – H Foley; HH – Hal Heatwole; JR – Jim Redfield; KS – Karl Stewart; MaG – Maggie Goudie; MiG – Mick Godwin; MOR – Mike O'Reilly; NH – Rev. N. Hey; PH – Paul Harvey; PR – Peter Reeders; RB – Robert Bustard; RJ – Rob Jenkins; UNE – University of New England.
RECS – records; SVYS – surveys.

Sight records for the QNP(WS) = no. sightings + total number of abundance records; e.g., 3, 1S recorded for *Limnodynastes convexiusculus* in the QNPWS report has been scored in the table as 4.
ALL RECS = no. of specimens + no. of additional sightings not represented by specimens in museums.
NO. SVYS = no. of surveys in which species recorded + records from OTHER SOURCES.
* = Sight records represented by museum specimens.

Table 2. Seasonality of frogs and reptiles.

	Australian Museum Visits						
Species	7/77	2/79	11/79	7/80	8/81	6/82	Other
Frogs - Myobatrachidae							
Crinia remota	+	+	+		+	+	
Limnodynastes convexiusculus	+	+			+	+	
Limnodynastes ornatus	+	+	+		+	+	12/80
Uperoleia mimula	+	+	+				9/80,3/82
Frogs - Hylidae							
Cyclorana maculosa							1/80,12/80,1/81,11/81
Cyclorana novaehollandiae		+					5/81,12/81,4/82,9/82
Litoria bicolor		+	+	+	+	+	
Litoria caerulea	+	+		+			
Litoria dorsalis			+	+	+	+	
Litoria genimaculata							9/80,8/81
Litoria gracilenta		+			+		11/81
Litoria inermis			+	+	+	+	
Litoria infrafrenata	+	+	+	+	+	+	
Litoria nasuta	+	+	+	+	+	+	12/80
Litoria nigrofrenata	+	+	+	+	+	+	
Litoria pallida		+	+	+	+	+	
Litoria rothii	+	+	+		+	+	
Litoria rubella	+	+	+	+	+	+	12/79, 12/80
Frogs - Microhylidae							
Sphenophryne gracilipes	+	+	+	+	+	+	12/80
Frogs - Ranidae							
Rana daemeli	+	+	+		+	+	
Frogs - Bufonidae							
Bufo marinus						+	see notes
Crocodiles - Crocodylidae							
Crocodylus johnstoni							5/81
Crocodylus porosus						+	9/80,2/81
Turtles - Cheloniidae							
Chelonia mydas						+	
Turtles - Chelidae							
Chelodina rugosa		+			+		
Lizards - Gekkonidae							
Gehyra dubia	+	+	+	+	+	+	
Heteronotia binoei		+	+	+	+	+	
Lepidodactylus lugubris					+		
Nactus pelagicus	+	+	+	+	+	+	12/79
Nephrurus asper							11/81
Oedura castelnaui	+	+	+	+	+	+	12/77
Oedura rhombifer	+	+	+	+	+		
Pseudothecadactylus australis		+	+		+		9/80,5/81
Lizards - Pygopodidae							
Delma tincta							4/82,6/82,9/82
Lialis burtonis	+		+	+	+	+	6/80
Lizards - Agamidae							
Chlamydosaurus kingii							2/81
Diporiphora sp. A	+	+	+	+	+	+	12/80
Diporiphora sp. B		+	+				
Lophognathus temporalis	+	+	+	+	+	+	10/77,12/80

Table 2 (cont'd).

SPECIES	7/77	2/79	11/79	7/80	8/81	6/82	OTHER
LIZARDS - Varanidae							
Varanus indicus							12/79,2/81,8/81
Varanus panoptes	+	+	+	+	+	+	
Varanus semiremex							4/80,2/81,3/81,5/81
Varanus timorensis		+	+		+	+	12/80
LIZARDS - Scincidae							
Carlia jarnoldae		+					
Carlia longipes	+	+	+	+	+	+	12/80
Carlia munda					+	+	
Carlia storri	+	+	+	+	+	+	12/80
Carlia vivax						+	
Cryptoblepharus plagiocephalus		+			+	+	
Cryptoblepharus virgatus	+	+	+	+	+	+	
Ctenotus robustus							5/81,4/82
Ctenotus spaldingi	+	+	+	+	+	+	12/80
Egernia frerei					+		
Glaphyromorphus nigricaudis	+	+	+	+	+	+	
Glaphyromorphus pumilus		+			+		
Lygisaurus macfarlani							4/82,9/82
Morethia taeniopleura		+		+		+	9/80,12/81,4/82
Tiliqua scincoides		+				+	1/78,9/80,5/81
SNAKES - Typhlopidae							
Ramphotyphlops sp.							10/78,11/78,11/81,3/82
Ramphotyphlops polygrammicus		+				+	
Ramphotyphlops unguirostris							6/76,12/82
SNAKES - Boidae							
Aspidites melanocephalus							8/79, 6/80
Liasis fuscus							6/82
Liasis maculosus		+	+			+	
Morelia amethistina					+		9/80
Morelia spilota variegata							2/81
SNAKES - Acrochordidae							
Acrochordus granulatus						+	
SNAKES - Colubridae							
Boiga irregularis			+	+	+	+	12/79,4/80,5/81,4/82,1/84
Dendrelaphis calligastra		+					4/80
Dendrelaphis punctulata	+	+	+			+	12/81
Enhydris polylepis			+			+	
Stegonotus cucullatus		+			+		5/81,3/82,9/82
Tropidonophis mairii	+	+	+	+	+		5/81,12/81,4/82
SNAKES - Elapidae							
Acanthophis praelongus			+	+			8/80,3/82,4/82,9/82
Demansia atra	+	+	+			+	2/81,5/81,11/81,12/81,3/82, 4/82,9/82
Furina ornata	+		+			+	5/81,8/81,11/81,9/82
Furina tristis	+	+		+		+	5/81,3/82
Oxyuranus scutellatus							5/82
Pseudechis australis		+					5/80,11/81,12/81,4/82
Pseudonaja textilis							1981,9/82
Rhinoplocephalus nigrostriatus						+	2/81,11/81
Vermicella annulata							3/80
SNAKES - Hydrophiidae							
Aipysurus eydouxii							1982
Enhydrina schistosa						+	4/84
Hydrelaps darwiniensis							1978
Hydrophis elegans		+				+	
Lapemis hardwickii						+	

Table 3. Distribution of frogs and reptiles among habitats.

+ AM survey; * additional habitats (QNPWS); @ additional habitats (other, mostly Reeders and Morton).

OF=open forest; EW=eucalypt woodland; DW=dunefield woodland; PW=paperbark woodland; VF=vine forest/thicket; GF=gallery forest; G/S=grassland/sedgeland; M=mangroves; S=open saltwater; U=urban; R=regenerated areas.

SPECIES	OF	EW	DW	PW	VF	GF	G/S	M	S	U	R
FROGS - Myobatrachidae											
Crinia remota	*			+		+	+				
Limnodynastes convexiusculus	*	*		+		+	+			+	@
Limnodynastes ornatus	+	+	+	+		+	+			+	+
Uperoleia mimula	+			+		+				*	@
FROGS - Hylidae											
Cyclorana maculosa	@?				@?						@
Cyclorana novaehollandiae	*		*	+		+				*	@
Litoria bicolor	+	+	+	+		+	+	*		+	@
Litoria caerulea	+	*	+	+			*			+	+
Litoria dorsalis				+	+	+	+				@
Litoria genimaculata				*		*					
Litoria gracilenta	*			+		+	+			*	+
Litoria inermis		*		+		+					
Litoria infrafrenata	*			+		+		+			
Litoria nasuta	+		+	+		+	+				@
Litoria nigrofrenata	+	*	+	+		+				*	@
Litoria pallida	+	+		+		+					
Litoria rothii	*	*		+		+				+	@
Litoria rubella	+	+		+	*	+	+			+	@
FROGS - Microhylidae											
Sphenophryne gracilipes	+	*		+	+	+					@
FROGS - Ranidae											
Rana daemeli	*			+	+	+					
FROGS - Bufonidae											
Bufo marinus				+		+				+	@
CROCODILES - Crocodylidae											
Crocodylus johnstoni						*					
Crocodylus porosus								+	+		
TURTLES - Cheloniidae											
Caretta caretta									@		
Chelonia mydas									+		
Eretmochelys imbricata									@		
Lepidochelys olivacea									@		
Natator depressus									@		
TURTLES - Chelidae											
Chelodina rugosa				+		+					
LIZARDS - Gekkonidae											
Gehyra dubia	+	+	+	+	+	+		+		+	
Heteronotia binoei	+	+	+			+					@
Lepidodactylus lugubris					+						
Nactus pelagicus	+	+	+	+	+	+	+			+	+
Nephrurus asper	@										
Oedura castelnaui	+	+		*	+						@
Oedura rhombifer	+	+	+		+	+					+
Pseudothecadactylus australis	+		+		+						
LIZARDS - Pygopodidae											
Delma tincta											@
Lialis burtonis	+		+			*					@

Table 3 (cont'd).

SPECIES	OF	EW	DW	PW	VF	GF	G/S	M	S	U	R
LIZARDS - Agamidae											
Chlamydosaurus kingii	*										
Diporiphora sp. A	+	+	+	+							+
Diporiphora sp. B			+								
Lophognathus temporalis	+	+	+	+	*	+					
LIZARDS - Varanidae											
Varanus indicus					*			*			
Varanus panoptes	+	*	+	*	+	*				+	@
Varanus semiremex	*			@		*		@			
Varanus timorensis	+	*	*	+							@
LIZARDS - Scincidae											
Carlia jarnoldae		+									
Carlia longipes	+	+	+	+	+	+	+			+	+
Carlia munda		+									
Carlia storri	+	+	+	+	*		+				@
Carlia vivax		+									
Cryptoblepharus plagiocephalus		+				+					
Cryptoblepharus virgatus	+	+	+	+		+		+		+	@
Ctenotus robustus	*										@
Ctenotus spaldingi	+	+	+		*		+			+	+
Egernia frerei					+						
Glaphyromorphus nigricaudis	+	+	+	+	+	+					
Glaphyromorphus pumilus	*		+								
Lygisaurus macfarlani											@
Morethia taeniopleura	+	+	+								@
Tiliqua scincoides	*	*	*							+	@
SNAKES - Typhlopidae											
Ramphotyphlops sp.	@									+	
Ramphotyphlops polygrammicus	+				+		*				
Ramphotyphlops unguirostris	+										@
SNAKES - Boidae											
Aspidites melanocephalus	@										
Liasis fuscus										@	
Liasis maculosus	+		+		+						
Morelia amethistina			@		@	+					
Morelia spilota variegata			*								
SNAKES - Acrochordidae											
Acrochordus arafurae						@					
Acrochordus granulatus									+		
SNAKES - Colubridae											
Boiga irregularis	+				+	+					@
Dendrelaphis calligastra					@	+					
Dendrelaphis punctulata	+		+	+	+	+				+	@
Enhydris polylepis						+					
Stegonotus cucullatus	+	*		+							@
Tropidonophis mairii	+	+		+		+	+			+	@
SNAKES - Elapidae											
Acanthophis praelongus	+										@
Demansia atra	+		+			*				+	@
Furina ornata	+			+							@
Furina tristis	+	+			+	+	*				
Oxyuranus scutellatus	@										
Pseudechis australis	+		+	+							@
Pseudonaja textilis			+								@
Rhinoplocephalus nigrostriatus	*									@	
Simoselaps semifasciatus	*										
Simoselaps warro	@?	@?									
Suta suta	@?									@	
Vermicella annulata				@?						@?	

Table 3 (cont'd).

SPECIES	OF	EW	DW	PW	VF	GF	G/S	M	S	U	R
SNAKES - Hydrophiidae											
Acalyptophis peronii									@		
Aipysurus eydouxii									@		
Aipysurus laevis									@		
Enhydrina schistosa									+		
Hydrelaps darwiniensis								@			
Hydrophis elegans									+		
Hydrophis ornatus									@		
Lapemis hardwickii									+		
TOTAL NO. OF SPECIES	56	33	31	38	25	42	16	8	13	15	42
(including ? records)	(59)	(34)		(39)	(26)						

Table 4. Comparison of the size of some northern Australian herpetofaunas.

	No. of Species in Region							
Taxonomic Group	Weipa		N CYPla[1]		TStr[2]		CbgPla[3]	
Frogs	20	(24)	–	(19)	8	(10)	13	(13)
Crocodiles	2	(2)	2	(2)	2	(2)	1	(2)
Freshwater turtles	1	(4)	2	(5)	1	(1)	1	(1)
Lizards	33	(45)	35	(42)	31	(34)	24	(42)
Snakes (non-marine)	27	(38)	22	(32)	22	(24)	22	(27)
Total reptiles	63	(89)	61	(81)	56	(61)	48	(72)
Total frogs + reptiles	83	(113)	–	(100)	64	(71)	61	(85)
Cane toad	1	(1)	–	(0)	–	(0)	–	(0)
Marine turtles	4	(5)	–	(6)	–	(6)	6	(6)
Marine snakes	9	(16)	–	(15)	–	(17)	–	(18)
Total herpetofauna	97	(135)	–	(121)	–	(94)	–	(109)

First set of figures based on surveys or published lists -

[1] Far northern Cape York Peninsula (Covacevich 1987)

[2] Islands of Torres Strait (Cogger & Heatwole, unpublished)

[3] Port Essington district, Cobourg Peninsula (Cogger & Lindner, 1974).

Figures in parentheses are total species numbers based on extrapolated distribution maps in Cogger (1986), Wilson & Knowles (1988) and Ingram & Raven (1991).

Table 5. Geographic affinities of native frogs and reptiles (excluding marine snakes and marine turtles) found at Weipa.

	Number of Weipa Species Shared with Region							
Taxonomic Group	Weipa	New Guinea	Torres Strait	Cobourg Peninsula	Arnhem Land	Kimberley	Qld sth of York Peninsula	Elsewhere in Australia
Frogs	20	15	10	11	9	11	9	6
Crocodiles	2	1	1	2	2	2	2	0
Freshwater turtles	1	0	1	1	1	1	0	0
Lizards	33	14	21	15	14	13	18	14
Snakes (non-marine)	27	15	16	16	16	12	18	14
Total reptiles	63	30	39	34	33	28	38	28
Total frogs + non-marine reptiles	83	45	49	45	42	39	47	34
% Weipa spp shared with region		54%	59	54	51	47	57	41

Table 6. Stomach contents (invertebrates) of 78 cane toads.

Food item	No. stomachs in which present	% stomachs in which present	Total no. of items	% of total items
Snail	5	6	12	0.4
Spider	7	9	10	0.3
Slater	2	3	5	0.2
Millipede	5	6	15	0.5
Cockroach	12	15	17	0.5
Termite	9	12	539	16.5
Praying mantis	1	1	1	0.03
Earwig	13	17	25	0.8
Cricket	19	24	82	2.5
Grasshopper	4	5	4	0.1
Bug (Heteroptera)	17	22	129	4.0
Beetle	66	85	516	15.8
Fly - adult	10	13	28	0.9
- larva	14	18	102	3.1
Moth - adult	1	1	2	0.06
- caterpillar	11	14	19	0.6
Caddis fly	1	1	1	0.03
Wasp	2	3	2	0.06
Ant	59	76	1749	53.7
TOTAL			3258	