

BIRDS *of the*
DARWIN
REGION



Niven McCrie
and Richard Noske

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PUBLISHING

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Preface

Cities change more quickly in physical characteristics than natural environments. For this reason, in part, their wildlife is constantly changing. In the older, larger cities of Australia, where natural bushland tends to be confined to small remnants, the avifauna has been dramatically altered to one dominated by introduced species and a handful of adaptable natives.

Darwin is different. Firstly, there have been virtually no successful introductions or invasions of exotic birds. Secondly, despite its relatively small size by city standards, Darwin supports a diverse array of habitats, including a large corridor of woodland and riparian forest adjacent to Darwin International Airport and defence airbase, which virtually bisects the metropolitan area. Drainage has not been altered substantially, and the mangals (mangrove communities) that fringe the huge harbour and dissect the suburbs are still largely intact despite repeated attempts to reclaim them. This variety of habitats within Darwin and in its immediate surrounds explains, to a large extent, why the avifauna of the region is so rich.

Located in the north-west Top End, Darwin also differs profoundly from other Australian capital cities in having a monsoon-tropical climate in which the annual cycle of seasons is driven by rainfall, rather than temperature. The climatic extremes of the Wet and Dry seasons have been likened to those that characterise wet tropical rainforests and deserts, respectively, and the annual alternation of these seasons has a dramatic effect on the lives of the birds residing in the region, by altering the physical characteristics of their habitats and the food available to them. Additionally the warm conditions of the Dry season make a favourable environment for many birds that vacate their breeding grounds in southern parts of Australia for the winter. It is this combination of residents and visitors from myriad sources over the course of a year that makes the avifauna of the Top End so interesting, and worthy of study.

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The beginnings of this book

In the early 1990s the authors instigated a three-year bird atlas project to map the distribution and determine the seasonality of birds of the Darwin region. Preliminary distribution maps were produced, but over the ensuing period both authors became preoccupied with other related projects, including the production of other books: one on the birds of Groote Eylandt¹ and the other a guide to bird watching in Darwin and the Top End.² Meanwhile, bird records of the Darwin region continued to accumulate, both from the authors and from numerous other sources, including data resources of the Northern Territory government, Eremaea and eBird. Two decades after the initial Darwin bird atlas project, almost 120 000 bird records had been amassed. These data form the basis for the maps, charts and text in this book.

But this book is more than a summary of bird distribution and seasonality. It is an account of what is known about birds of the region, from the authors' own field research, an extensive reading of the literature, and personal communications with numerous birdwatchers and ornithologists living in, and visiting, the region. We have deliberately minimised scientific jargon in the book, yet at the same time present an accurate portrayal of as many aspects of the ecology of the region's birds as currently available. Our aim was to provide information for birdwatchers at any level of experience, including students and other young people, while presenting material that will also be of value to ornithologists, ecologists, environmental and town planners, teachers and other professionals with an interest in our bird life.

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This book could not have been written without an enormous amount of help from a great many people and we are most grateful to all who contributed to it, in whatever way. Our requests for assistance met with an exceedingly generous response, and for that we are indebted. If we have inadvertently omitted the names of any who provided assistance we tender our sincere apologies.

We have been fortunate in being allowed the use of several comprehensive datasets, the inclusion of which greatly enhanced the accuracy and value of the seasonality charts and distribution maps appearing in this book. Data from the NT Fauna Atlas was kindly supplied by Alaric Fisher and Ralf Koberstein from the Biodiversity Conservation Division and Natural Resources Division, respectively, of the NT Department of Natural Resources, Environment, the Arts and Sport, in Darwin. We are also very grateful to Richard and Margaret Alcorn for extracting an immense amount of data for us from Eremaea.

Hilary Thompson generously gave access to his large bank of personal records as well as providing a copy of his unpublished 'Annotated List of the Birds of the Top End', prepared jointly with Denise Goodfellow. For providing their personal survey data we are also grateful to Tony Hertog, Chris Healey, Ashley Carlson, Arthur and Sheryl Keates, Roger Jaensch, Mohd-Azlan J. Azad, and Heather Ryan. Gavin and Meg O'Brien kindly supplied shorebird count data and nesting records for the Darwin region.

The NT Birds newsgroup, courtesy of Yahoo, has proved to be an important source of information, going well beyond expectations when the first author set it up in 2002. The contributions of local birdwatchers in recording the details of sightings of particular species have been invaluable, particularly for the rarer species.

For their valuable comments on draft texts and additional data for specific groups of birds, we are especially grateful to Roger Jaensch (waterbirds), Arthur and Sheryl Keates (shorebirds), and Tony Hertog (raptors). Emails requesting information on one bird species or another were met with helpful responses from many people, including (in alphabetical order): Nigel Adlam, Gillian Ainsworth, Bryan Baker, Darryel Binns, Deb Bisa, Mike Carter, Rohan Clark, Stephen Debus, David Donato, Fiona Douglas, Lunar Eclipse, Johnny Estbergs, Keith and Lindsay Fisher, Sally Forsstrum, Dominic Funnell, Marc Gardner, Clive Garland, Stephen Garnett, Bastiaan Hensen, Mick Jerram, Ron Johnstone, Arthur and Sheryl Keates, Helen Larson, Tom McCrie, Clive Minton, Heather Moorcroft, Will Riddell, Danny Rogers, Andrew Spiers, Penny Steele, Colin Trainor, Fred van Gessel and David Webb. We are grateful to them all.

In this 'internet age', online data are becoming more readily available. We acknowledge access to the Australian Bureau of Meteorology website (www.bom.gov.au) from which we drew climate data, used both in writing the text and creating the climate chart used in the book's introduction. The maps used in this book include GIS data obtained from Open Street Map, Geoscience Australia, Australian Bureau of Statistics and the Collaborative Australian Protected Area Database (CAPAD).

Without photographs, this book would be less informative and much less attractive. Photographs are individually credited, but the authors expressly wish to thank the following for their generosity in contributing images: Anand Arya, Tony Ashton, Adrian Boyle, Ian and Jill Brown, Vince Bugeja, Nolan Caldwell, Ashley Carlson, Rohan Clarke, David Fisher, Marc Gardner, Mat and Cathy Gilfedder, Kirri Hardy, Bastiaan Hensen, Micha V. Jackson, Peter Kyne, Dr Chan Ah Lak, Judy Leitch, Tom McCrie, Scott McGregor, Ross Monks, Glenn Newton, Jon Norling, Tony Palliser, Belinda Rafton, Mike Reed, Will Riddell, Danny Rogers, Laurie Ross, Julie Sarna, Jim Sneddon, Brian Thistleton, Colin Trainor, Aiden Webb and David Webb.

We also express our gratitude to CSIRO Publishing. We are especially grateful to John Manger and Lauren Webb for accepting the immense amount of time the book took to complete and the frequently postponed deadlines, while continuing to provide encouragement and support throughout what has at times seemed an almost Herculean task. If, as is almost inevitable, errors have crept into the book, the responsibility for them is entirely ours. We are grateful to those who helped keep them to a minimum.

This book demanded a lot of hard work and cooperation from each author, but one or other of us did the lion's share of most of its components. Niven compiled and processed the database, constructed the maps and charts, collated the photos (and took many of them) and wrote the species texts for the non-passerines from Emus to Jaegers, as well as the vagrants and unconfirmed species. Richard wrote the Introduction, and the species accounts from the Pigeons and Doves onwards, including the passerines, except for the vagrants. The Preface and About this book sections were jointly written.

Niven would personally like to give his warmest thanks to his partner Judy Evans, for her unremitting support throughout the writing of the book. Her understanding and acceptance of the countless hours that he has been at the computer, neglecting chores and putting important things second, have been the single most crucial factor in completing much of his work.

Richard thanks his wonderful wife Rosalinda Isorena for her moral and gastronomic support during the many hours he was preoccupied with this book. He is also very grateful to Richard Luxton, owner of Coomalie Farm, for his tireless hospitality and interest in wildlife. Lastly, he pays tribute to the pioneers of Top End ornithology from the early explorers to the first chroniclers of Darwin's birds, especially David Crawford and Hilary Thompson.

Niven McCrie and Richard Noske

May 2015

Introduction

Text by Richard Noske

History of ornithology in the Darwin region

Under the watchful eye of the Larrakia indigenous people, Port Darwin was settled in 1869 by the British, 30 years after they first sighted the region. Originally christened Palmerston, the settlement was renamed 42 years later in honour of the most celebrated biologist of all time, although Sir Charles Darwin himself never came closer than Sydney. Although Northern Territory (NT) ornithology had begun three decades earlier with the extensive zoological exploration of the Port Essington district, it would be another century before the birds of Darwin received attention, with the month-long visit of Herbert Deignan in 1948, during the American–Australian Scientific Expedition to Arnhem Land.

The publication in 1967 of Storr's *List of Northern Territory Birds*³ provided the first summary on the status and distribution of the birds of the NT, including the Top End, but it was not until 1972 that a detailed, annotated list of birds of the Darwin area was published.⁴ This paper, covering the Humpty Doo and Murrumbidgee regions as well as Darwin, provides a baseline for this book. Its author, David Crawford, was stationed at the Coastal Plains Research Station near Fogg Dam from April 1967 to January 1972. Crawford wrote nearly a dozen other papers on birds of the region, mostly concerning waterbirds, and including the first Australian records of Common Redshank and Asian Dowitcher.^{5,6}

The early 1970s also saw the arrival of Hilary Thompson and John McKean, who were able to witness first-hand the devastating damage caused by tropical cyclone Tracy on Christmas Eve 1974, not only to the lives of Darwin's human inhabitants, but also to the vegetation, with its consequent effects on the birdlife.⁷ Realising the significance of the newly built Sanderson (Leanyer) Sewage Ponds as a permanent, albeit artificial, wetland refuge for waterbirds and waders, McKean and Thompson embarked on monthly surveys of the ponds and their environs from 1974 to 1984. The data from these surveys later formed the basis for a series of important papers concerning the status and seasonality of gulls and terns,⁸ cuckoos,⁹ kingfishers,¹⁰ cuckooshrikes,¹¹ ducks¹² and waders¹³ in the Darwin region. Thompson's paper entitled 'Common birds of the Darwin suburbs'⁷ was followed by *Common Birds of the Darwin Area*,¹⁴ a guide to the identification and habits of 91 species, with brief descriptions of an additional 61 species.

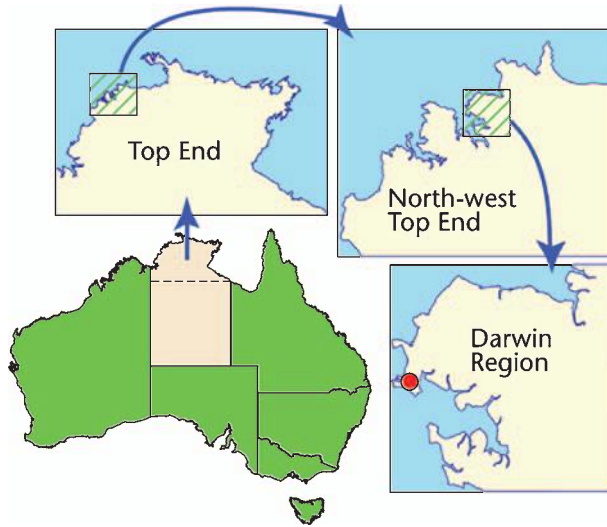


Fig. 1. Overview map showing the Northern Territory in Australia, with inset maps of the Top End, north-west Top End and Darwin region. Darwin city is indicated by a red dot.

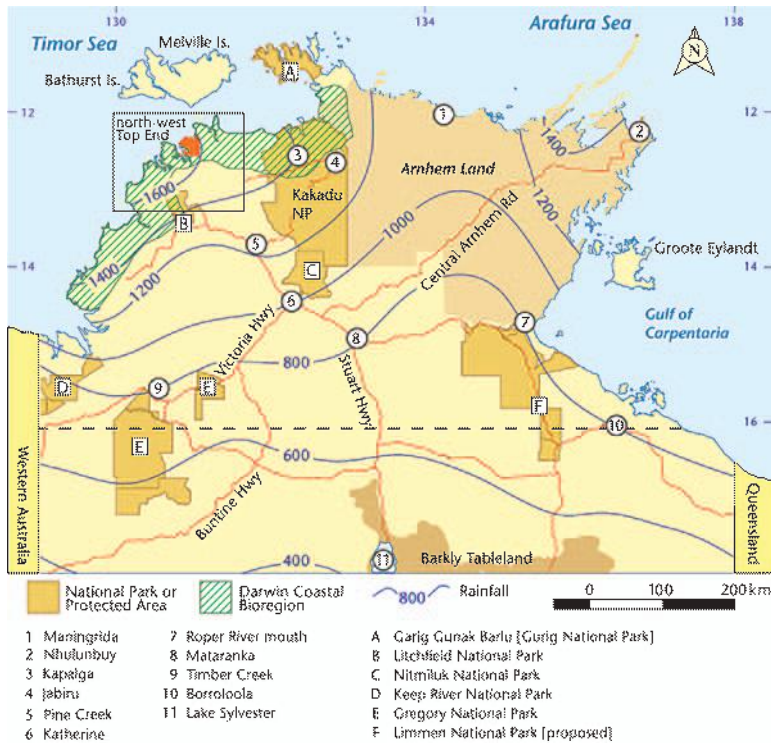


Fig. 2. Map of the Top End, as defined in this book as that area north of 16°07'E (shown as a dashed line). Keep River National Park and Borroloola lie approximately on its south-west and south-east boundaries, respectively. The map extends southward to show the north-western Barkly Tableland IBRA subregion, an important area for waterbirds.

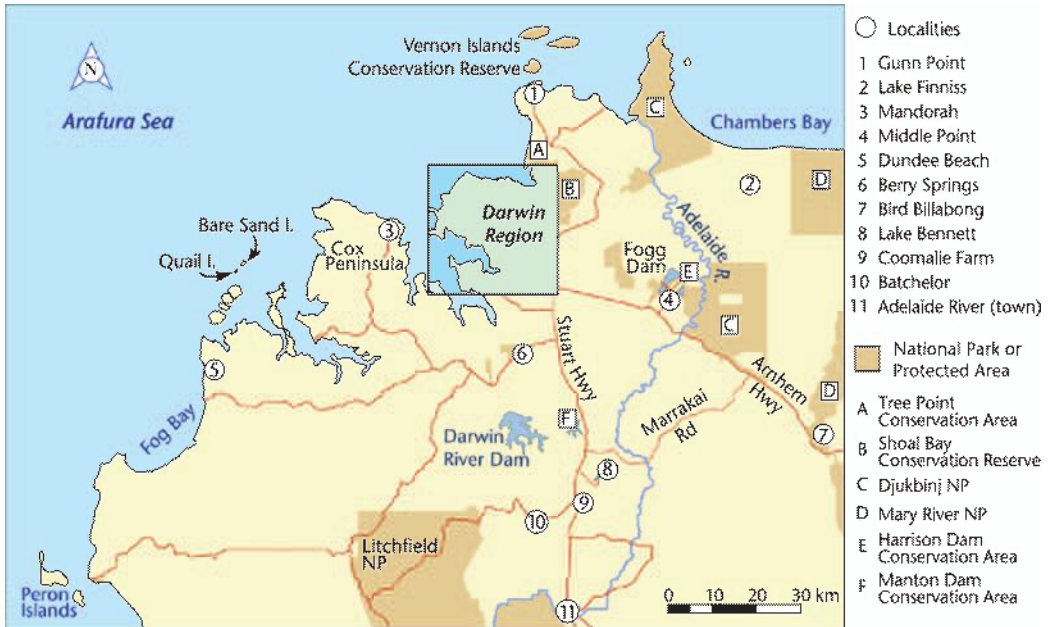


Fig. 3. Map of the north-west Top End.

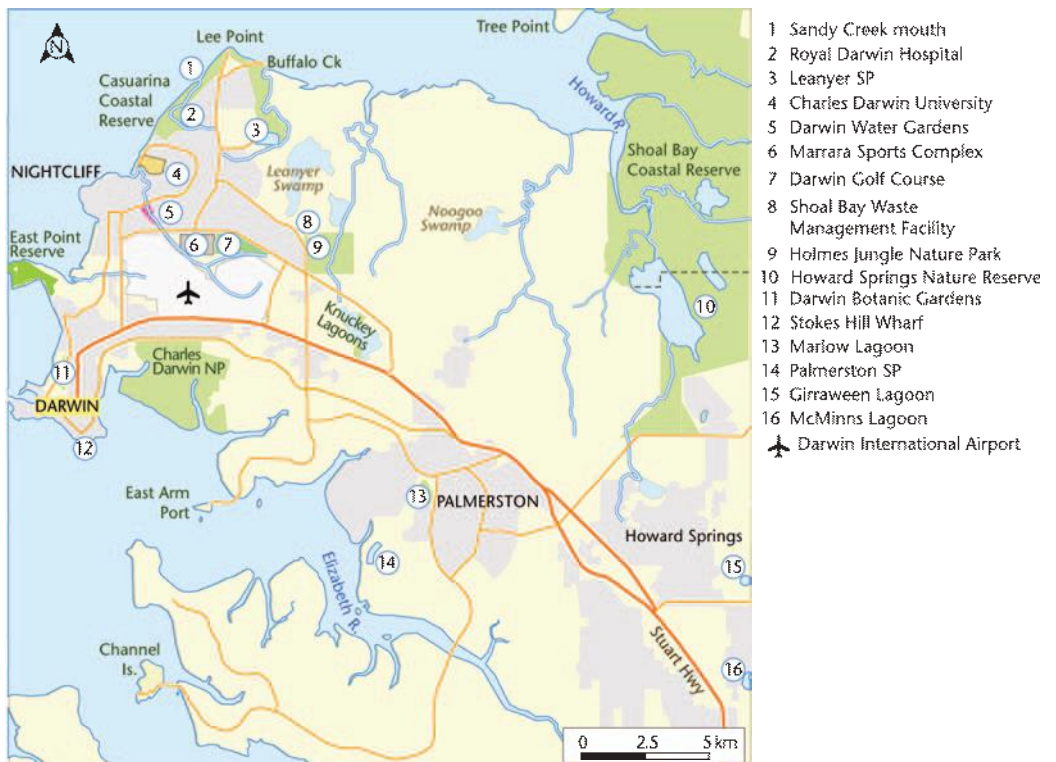


Fig. 4. Map of the Darwin region, showing localities mentioned in the text.

The first scientific survey of the terrestrial avifauna of the Darwin region was undertaken in 1986 by John Woinarski and colleagues from the Conservation Commission of the Northern Territory (CCNT), who conducted more than 1000 censuses over six weeks.¹⁵ They repeatedly sampled 100 sites representing 20 terrestrial habitats, spread over an area of 20 × 20 km, centred on the Howard's Peninsula, most of which is encompassed in the north-eastern quadrant of the Darwin region as defined in this book. This survey provided valuable information on the relative abundance and habitat preferences of many of the species of the region.

Much of the literature concerning birds of the Top End emanates from Kakadu National Park (NP).^{16,17,18,19,20} These studies provide vital comparative information by which to assess the status of Darwin's birds. In 1990, CCNT appointed Ray Chatto to conduct both aerial and ground surveys of waterbirds, seabirds and shorebirds, as well as marine mammals and reptiles, along the entire NT coastline, including the Darwin region. This ambitious project spanned 16 years in all, and led to the discovery of nationally and globally significant numbers of colonial nesting herons and terns,^{21,22} and migratory waders,²³ on the floodplains, offshore islands and intertidal areas, respectively, of the Top End. Some of the breeding rookeries are surprisingly close to Darwin, and doubtless are the source of many waterbirds visiting our region.

Climate

Darwin lies in the monsoon or wet-dry tropics, which cover about 20% of the Australian continent, including the Top End, Kimberley region and much of Cape York. Here, in stark contrast to the temperate south of the continent, which holds most of Australia's human population, the seasons are driven by rainfall, not temperature. This region is uniformly warm to hot all year round. The difference between the mean maximum temperature (32°C) and mean minimum temperature (23°C) for Darwin is only 9°C. As expected, temperatures are lowest in June and July, coincident with the austral winter but, surprisingly, Darwin is hottest during the spring months of October and November, rather than the austral summer. Indeed, in terms of monthly maximum temperatures January and February are among the five coolest months, mainly due to the greater cloud cover of the Wet season. But while Darwin's temperature rarely exceeds 35°C, relative humidity at 9 o'clock in the morning averages 72–83% for six months of the year.²⁴

With an average annual rainfall of 1700 mm, Darwin is easily the wettest Australian capital city.²⁴ More remarkable is the fact that about 90% of this rain falls in the period known as the Wet season, which comprises the six months from November through April, encompassing the Austral summer (see Fig. 5). Thus while the Wet Tropics in north Queensland typically receives some rain in every month, Darwin, like the rest of the Top End, experiences drought-like conditions for four to five months, from May through September. The transition period straddling the end of the Dry and start of the Wet season (September–November) is often known as the 'Build-up', during which the humidity and cloud cover steadily increases while temperatures remain high. Scattered localised, and often violent,

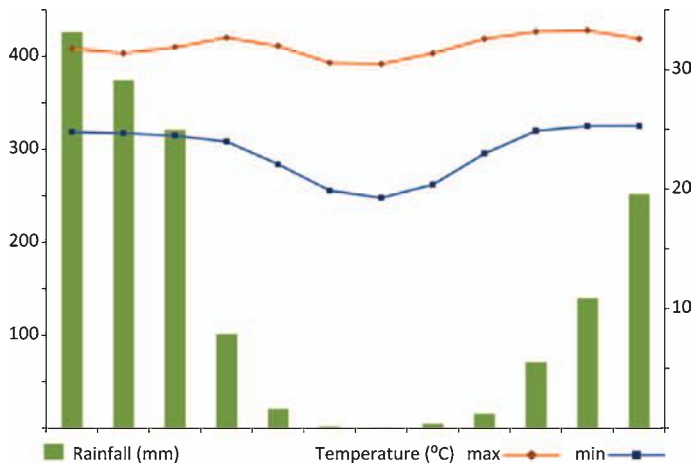


Fig. 5. Mean monthly rainfall and mean maximum and minimum temperatures, 1941–2012. Based on Darwin International Airport data from www.bom.gov.au.

convection thunderstorms, offer the only relief from this hot and humid weather, before the arrival of the Australian summer monsoon, which brings heavy rain across wide areas.²⁵ The timing of the onset of the Wet season, its duration and the total amount of rainfall, vary dramatically from year to year.^{26,27} Over the 114 years from 1870 to 1993 Darwin's rainfall varied from 892 to 2644 mm in 1958 and 1974, respectively.²⁶

Although the Wet season is sometimes considered to start in October, in this book we define it as the period from November to April, partly to enable easy comparisons of two halves of the year, and partly because the long-term average rainfall for October is less than half that of November.²⁶ Where relevant, we further divide the Wet and Dry seasons into three periods of two months: early, mid and late. While these divisions are somewhat arbitrary, and may in fact comprise different calendar periods in different years, they nevertheless provide the most convenient seasonal indicators for bird activity during the year.

Another important feature of the local climate is tropical cyclones. In the century between 1906 and 2006 there were 100 cyclones that passed within 400 km of Darwin, of which 10 passed within 50 km of the city.²⁴ Tropical cyclone Tracy, with its wind gusts of at least 235 km/h, is arguably the most significant tropical cyclone in Australia's history, accounting for 65 lives and the destruction of most of Darwin. While the most recent cyclone affecting Darwin at the time of writing was tropical cyclone Helen in January 2008, with maximum wind gusts of 102 km/h causing many trees to uproot or snap, and widespread disruption to power and communications, it was not nearly as severe as tropical cyclone Monica, which passed to the north of Darwin, but caused widespread damage to the Arnhem Land coast and hinterland in April 2006. While the effect of tropical cyclone Tracy on the vegetation in the region is evident in the even-aged stands of eucalypts in open forest around Darwin, two less intense cyclones that affected Darwin in 1980s appear to have had little effect on the vegetation.²⁸

The avifauna and its responses to extreme seasonality

Darwin's avifauna in the Top End context

A grand total of 323 bird species has been confirmed for the Darwin region, including vagrants and introduced species. Another 11 species have been reported from the region, but remain unconfirmed. Of the confirmed species, 61 (19%) are here considered vagrants, and another four either escaped aviary stock or vagrants. That such a large proportion of the avifauna consists of very rare or unexpected species attests to both the proximity of Darwin to Indonesia and the alertness of the Darwin birdwatching community. Indeed, many species have been seen nowhere else in the NT (for example, Kentish Plover and Little Stint) or even Australia (Tricolored Grebe, Green Sandpiper and Christmas Frigatebird).

Of the 323 species in our region, 19 are largely endemic to the Australian monsoon tropics, including three species that are found only in the Top End and Kimberley regions (Rainbow Pitta, Silver-backed Butcherbird and Yellow-rumped Mannikin). While another 10 species are largely restricted to the monsoon tropics in Australia, they also occur in New Guinea and, in some cases, eastern Indonesia. An additional 33 species have a largely tropical distribution in Australia, but again also occur in New Guinea, Indonesia or even beyond. Although the NT has five endemic bird species, none has been recorded in the Darwin region, which is not surprising given that four of them (Black-banded Fruit Dove, Chestnut-quilled Rock Pigeon, White-throated Grasswren, White-lined Honeyeater) are confined to the sandstone escarpments and plateaux of western Arnhem Land and adjacent parts of Kakadu NP, over 200 km to our east. The fifth species, the Hooded Parrot, is largely restricted to woodland within 100 km of Katherine, but has occasionally been recorded as far north as Coomalie Farm, 45 km south of the Darwin region.

Waterbirds, shorebirds and seabirds

Almost a quarter of the birds that have been recorded in the Darwin region are associated with freshwater wetlands (Table 1). While the region has little in the way of freshwater wetlands itself, it is neatly wedged between two vast areas of floodplains, one starting around the Adelaide River just 30 km to the east, and the other, the Finnis River, about 60 km to the south-west. These floodplains, and those to their east and south, respectively, hold both nationally and globally significant numbers of colonial nesting waterbirds,²¹ and are probably the source areas for many of the birds visiting Darwin. Indeed the largest of the 27 nationally significant waterbird breeding colonies in the Top End is located on the Adelaide River, only 20 km to the east of the Darwin region. This colony hosts between 20 000 and 30 000 birds belonging to 10 species, and represents the largest egret colony in Australia, with over 6000 Intermediate Egrets alone.²¹ The floodplains and wetlands between here and the mouth of the East Alligator River support over 600 000 waterbirds of more than 50 species, including about 200 000 Magpie Geese.²⁹

Table 1. Broad habitats used by birds recorded in Darwin.

Primary habitat	No. of bird species	%
Terrestrial	184	57.1
Freshwater wetlands	76	23.6
Shoreline	36	11.2
Marine	26	8.1
Total	322	

Similarly, Darwin is situated between the two richest areas for shorebirds in the NT, the most important of which comprises the mudflats, saltflats and wetlands around Fog Bay, only 60 km south-west of the Darwin region, where more than 38 000 shorebirds were counted during a single aerial survey in October 1995.²³ The second area is around the coast of Chambers Bay between the mouth of the Adelaide River and Point Stuart, where over 14 000 birds were counted from the air on one day in September 1993. Much of the coastline around the Darwin region, on the other hand, is lined with mangals rather than wetlands and consequently supports fewer shorebirds, though over 7000 birds were counted during a single survey between Lee Point and Tree Point, in the north-east corner of the region, in November 1995.²³ A total of 36 shorebird species has been reported in the Darwin region, representing 11% of the avifauna.

The Top End also boasts globally significant breeding colonies of terns, but they are concentrated in the north-east, mostly on islands off Arnhem Land and in the Gulf of Carpentaria.²² The closest to Darwin is Seagull Island, just north of Melville Island and about 150 km north-west of Lee Point, which has the largest breeding colony of Greater Crested Terns in Australia, if not the world, while two sandy islands off Cobourg Peninsula, less than 200 km north-east of Lee Point, host colonies of three other tern species. These islands, or those further east, are probably the original source of Silver Gulls and the marine terns that visit, and possibly temporarily reside, in the Darwin region. These and other seabirds comprise about 8% of the confirmed species of the region (Table 1).

Landbirds

The Darwin region lies in the wettest part of the NT mainland, although the Tiwi Islands have the highest rainfall in the NT.²⁴ Progressing inland, mean annual rainfall (MAR) drops steeply from about 1700 mm in Darwin to 1300 mm at Mount Ringwood, about 90 km south-east of Darwin, and to 1100 mm at Pine Creek, a further 90 km south-east. The vegetation also changes along this north-south transect from eucalypt forest dominated by the evergreen Darwin Woollybutt and Darwin Stringybark to woodland dominated by partly or totally deciduous eucalypts like Northern Box, Salmon Gum and various bloodwoods.³⁰

The avifauna also changes along this environmental gradient, but it is not until one reaches Pine Creek that the NT-endemic Hooded Parrot can be found year-round.

Fifty kilometres south-east of Pine Creek lie Yinberrie Hills, one of the most important known breeding areas of the Gouldian Finch.³¹ A year-long study at this site revealed the strong seasonality of the avifauna at this latitude, where bird density increased 10-fold between June and December, and species composition changed demonstrably.³² Thus 12 of the most abundant species in December were scarce or absent in June. Many of these species were nectar-feeders taking advantage of the blossoming eucalypts and other plants in the late Wet season. A further 40 km to the south is Katherine, 270 km inland from Darwin, where Yellow-tinted Honeyeaters and Apostlebirds are main-street birds, while the Australian Magpie reaches its northern limit just south of the town.

However, rainfall declines not only to the south, but also to the east of Darwin. For example, Point Stuart, 100 km east of Darwin, has a mean annual rainfall of 1555 mm, and Gunbalanya (Oenpelli), 140 km further east, 1400 mm.²⁴ On the Marrakai track, 40 km south-east of the Darwin region, four species that have never been reported from the Darwin region occur: the Chestnut-backed Buttonquail, Black-chinned Honeyeater, Jacky Winter, and occasionally Pictorella Mannikin.²⁴ Most of these species are more typical of drier regions, and are generally scarce north of Pine Creek. However, the Jacky Winter is resident on the paperbark-fringed floodplains at Coomalie Farm, 45 km south of the Darwin region, a habitat that also attracts large numbers of Diamond Doves each Dry season.

Movements

Excluding vagrants and introduced or escaped species, 258 bird species have been recorded in the Darwin region. Of this subtotal, 105 species (41%) appear to be predominantly resident, although only 88 of them have been confirmed as breeding in the Darwin region. The remaining 59% of the subtotal are predominantly mobile, being either long-distance migrants (25%) or 'visitors' that undertake small-scale, irregular or irruptive movements (34%; Table 2). That such a large proportion of the avifauna is mobile is testament to the extreme seasonality of the region. Indeed, while each species has been assigned to one category in Table 2, in reality many species in the region have both resident and non-resident populations.

Roughly two-thirds of the 64 migratory species that visit the Darwin region do so mostly during the Wet season or late Dry-early Wet transition period (Table 2). Most are shorebirds or waders that emanate from Siberia and northern China and apart from a handful of species, such as the Little Curlew and Oriental Plover, all can be found in coastal parts of southern Australia during the warm months of the year. However, a few East Asian breeding migrants are land birds (Oriental Cuckoo, Garganey and Eastern Yellow Wagtail) that rarely reach temperate latitudes in Australia. Although a large proportion of the populations of some shorebird species remain during the following Dry season, all of these Northern Hemisphere breeding species are here considered **Wet season migrants**. None of

Table 2. Status designations and seasonality of Darwin's birds according to reporting rates.

	Residents	Visitors	Migrants	Total
No obvious seasonality	77	22		99
Predominantly Wet	10	9	32	51
Predominantly Dry	18	52	21	91
Predominantly Build-up (Oct–Nov)		7	11	18
Total	105	90	64	259

these birds breeds in Australia. In contrast, three other Wet season migrants breed locally, then migrate in a north-easterly direction to New Guinea, where they spend at least part of the Dry season (Pacific Koel, Oriental Dollarbird and Torresian Imperial Pigeon). The increasing abundance of Torresian Imperial Pigeons during the Dry season in Darwin, however, suggests that the local population now consists partly of residents.

Approximately a third of the migratory species visiting the region are **Dry season migrants** (Table 2). Most are species that are known to migrate in a north-westerly direction from breeding grounds in south-east Australia,³³ which appears to be the source of some birds visiting Darwin, although there is no direct evidence for this supposition. Some populations of these species continue on to Indonesia, and their passage through Darwin is revealed by sudden increases in reporting rates during the Wet-Dry transition period. The Australian Pratincole, Sacred Kingfisher and Rainbow Bee-eater are examples of species in which some populations 'overwinter' in the Top End, while others continue further north. Several species that are predominantly Dry season migrants also have small breeding populations in the Darwin region (e.g. Rainbow Bee-eater, Black-faced Cuckooshrike, White-breasted Woodswallow), although it is not clear if these populations are resident. Thus the Bee-eaters of Darwin may comprise three separate populations: passage migrants to Indonesia, migrants that winter locally, and local, possibly sedentary breeders.

Seven additional species are classified as Dry season migrants because of their scarcity during the Wet season, and the lack of breeding records from the northern half of the NT. One exception is the Magpie-lark, which breeds widely in the NT, as well as in Darwin, yet the migratory population is so large and its arrival so predictable that the species warrants classification as both a migrant and resident. Significantly, the majority of Top End birds that feed on aerial insects are Dry season migrants, such as the Bee-eater, Tree Martin, White-breasted Woodswallow and Spotted Nightjar. The partial or complete evacuation of Darwin by these birds before the first rains suggests that aerial insects become scarce during the Wet season, or that they are more abundant elsewhere at this time. Although several aerial insectivores visit the region during the Wet season, they are either passage