30th Anniversary Paperback Edition

FOR A RELATIVELY tiny island, with such a high ratio of urban development, Singapore contains a surprisingly large number of birds – native species as well as seasonal visitors – due to its strategic position on a migration route between temperate Asia and the eastern tropics.

In this classic guide, Dr Christopher Hails leads the reader to the major birdwatching locations in Singapore, identifying the various species to be found, their appearance, behaviour and habitats. His scholarly insights into ecology and avian migration, simplified for the lay reader, are enthralling and illuminating.

The beautiful full-colour illustrations, painted by artist Frank Jarvis from field sketches and, where essential, from studying skins and nests in the Raffles' Collection, offer the highest level of detail and accuracy.

Filled with a wealth of information, *Birds of Singapore* is the ideal introductory field guide to the island's fascinating birdlife.

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Christopher Hails
Frank Jarvis

BIRDS *of* SINGAPORE

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by
Christopher Hails

Illustrated by
Frank Jarvis

Marshall Cavendish Editions

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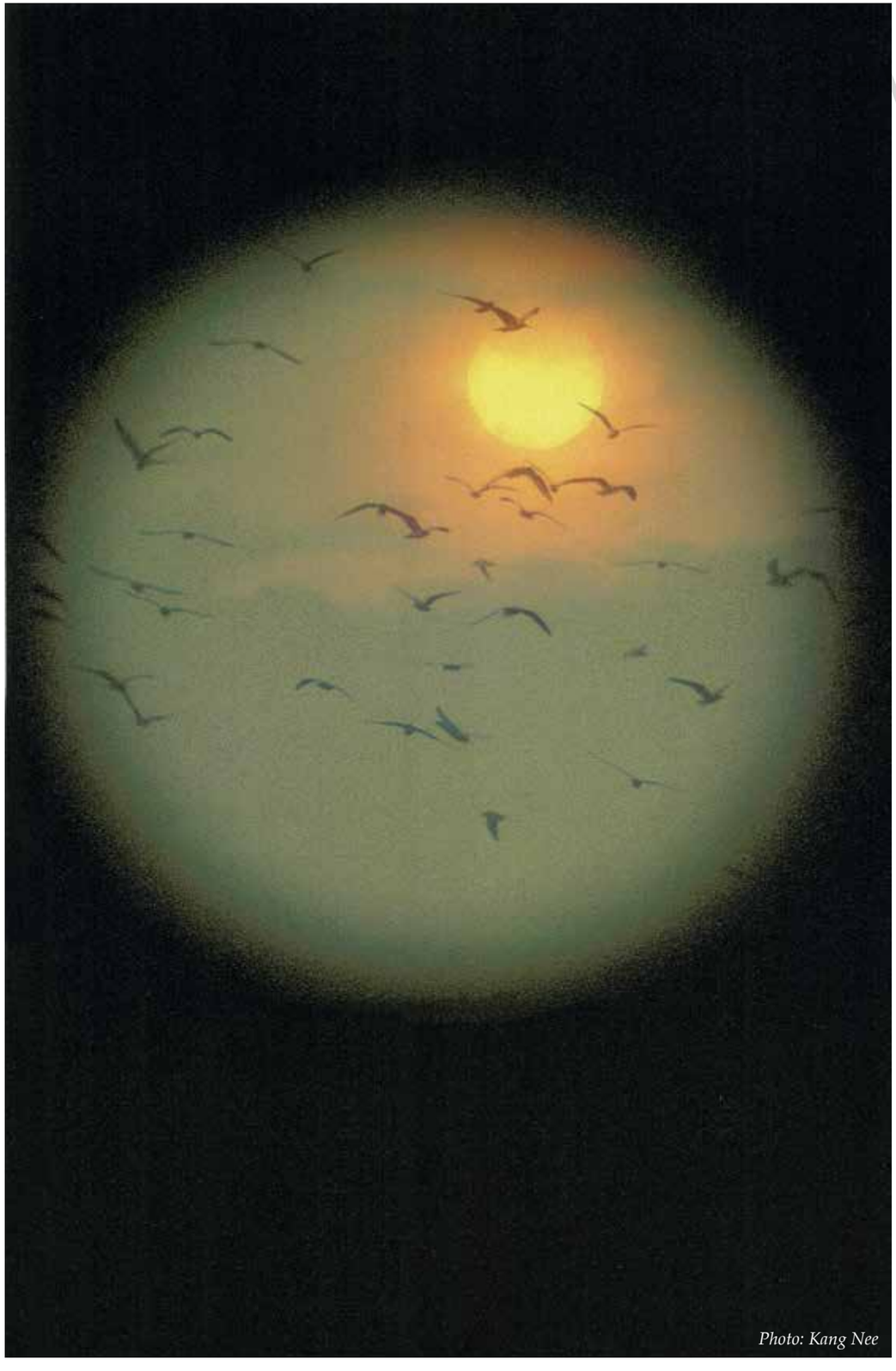


Photo: Kang Nee

FOREWORD

It has been said that a mark of civilisation is the importance which its people give to wild creatures. Development which shows no regard for them cannot be considered civilised development. Our planet is a living world and we are simply a small, but disproportionally destructive, part of it. Unless man can learn to live in harmony with his environment, the destruction of his natural heritage will demean his material achievements.

Developing the resources of a country without destroying the environment is not an impossible achievement for those who are motivated, but it requires a willingness to make minor sacrifices and above all a great deal of knowledge, not only of the techniques of development but of the functioning of the environment and the requirements of wild organisms. Once sufficient experience in both areas of knowledge has been acquired, then the two must be moulded skilfully together.

This book marks a first step in the process, by advancing and disseminating knowledge about an important group of wild animals. In safeguarding and conserving our environment, education is of prime importance. Environmental awareness by the general public and the cultivation of a taste in the natural world must be given high priority: the more people who learn and understand the beauty and wonder of nature, the more there will be who wish to protect rather than destroy it.

It is a sad fact of life that those who have the power to control the fate of the living world, are often the least well informed about it. With this book it will be possible for even the busiest of people to achieve a useful level of expertise, by devoting a small amount of time to its pages. The tropical regions of the world are badly in need of such texts, since they are the areas which contain the greatest wealth of wildlife and stand to benefit most by having a public which is fully aware of the importance of conserving its natural heritage.

We must set our goals to ensure that an appreciation of nature will grow alongside all other aspects of human development.

Sir Peter Scott
Gloucester England

Honorary Chairman of the World Wildlife Fund
International Council

July, 1986

PREFACE TO THE PAPERBACK EDITION

When this book was written, 30 years ago, Singapore was taking its first tentative steps towards integrating nature with the rapid urbanisation of the island. The original "Garden City Campaign" was more than a decade old, and I had been hired as an ornithologist to "bring back the birds" to the city, thanks to the personal interest of Prime Minister Lee Kuan Yew. He well understood that a modern, vibrant, industrious city could only thrive if its populace had an environment that was clean, green and uplifting. At the end of my project I was able to make recommendations which, thanks to the support of the then Minister of National Development, Mr. S. Dhanabalan, were adopted, implemented and are still being maintained today.

The survival of nature in the city-state was championed by the formation of the National Parks Board (NParks), under the initial leadership of Dr Tan Wee Kiat, which gave rise to a new culture of valuing Singapore's natural heritage. NParks later created a National Biodiversity Centre, which means Singapore today is a world leader in understanding the role of urban biodiversity – a unique contribution from a tropical country. So, the luxuriance of places like Bukit Timah, Sungei Buloh, MacRitchie forest and others are a normal and accepted part of the lives of most Singaporeans. What were simply my "ecological corridors" for bird movements evolved into Park Connectors, and these are now a thriving network of recreational routes across the island. They are also a network for wildlife: cicadas sing in East Coast Park where they didn't exist before; Pied Hornbills can be seen along Alexandra Canal; and in the Botanic Gardens, Magpie Robins and Red-crowned Barbets can be found when only a few existed in the Central Catchment area. Protecting the "source" of nature, and connecting them to the "sinks" of naturally-designed urban plantings, has worked beyond my wildest dreams.

As these efforts have matured and grown over the decades, so has the interest from the general public. Nature photography took off when digital cameras became affordable; the Singapore Nature Society grew into a professional organisation catalysing people's interest, and it has a Bird Ecology Study Group where observers report their sightings and findings online.

When this book was written, it was the first one dedicated to Singapore birds since 1927. I intended it to supplement the practical conservation work and make nature more easily accessible to the layperson. Since then, many new bird guides have followed. Alas, we could not update the places, numbers and checklist in this edition – they reflect the situation in the 1980s. The more recent texts on the avifauna of Singapore, or the Bird Ecology Study Group website, will have the most up-to-date bird lists and places to visit. Nonetheless, the paintings of the late Frank Jarvis are still a delight to admire, and the descriptions of bird behaviour and song are without a shelf-life. Thank you to Marshall Cavendish for their initiative to give "The Birds of Singapore" new wings and bring out a paperback edition all these years later.

Chris Hails
Switzerland
November 2017

ABOUT THE AUTHOR AND ILLUSTRATOR

Christopher Hails grew up in the north of England, and received his doctorate in ecology from the University of Stirling, Scotland.

In 1977 he moved to Kuala Lumpur, where he lectured in zoology and ecology at the University of Malaya. In addition to teaching he researched and published works on the ecology of tropical birds. From 1983 he was an advisor to the Ministry of National Development in Singapore, where he conducted research on a variety of applied conservation and other environmental issues.

He moved to Switzerland in 1988, where he worked as part of the senior management of WWF International until retirement in 2016. He still writes about birds in between short-term environmental consultancies, and still maintains strong links with Singapore.

Frank Jarvis (1939–2001) was born in London at the outbreak of World War II. From a very early age, he not only demonstrated an unusual deftness and skill with brush and pencil, he was also passionate about wildlife. By the age of 11, he was keeping meticulous records and illustrating his own notebooks, recording the nature around him, especially birds.

Upon leaving Hornsey College of Art in the 1960s, his response to his concern for nature and its conservation led him to become well known in the world of illustration and bird art. His work is to be found in the far corners of the world.

PREFACE

The aim of this book is to act as a stimulus for those people who have a new or casual interest in birds, and wish to learn more or simply satisfy a passing curiosity. We hope that it will also serve the newcomer or visitor, both as an introduction to the more common birds and a guide to where they are most likely to be found.

The biggest problem confronting any newcomer to the art of birdwatching is how to correctly identify the species they have seen. To this end there is nothing which can compare with an accurate colour illustration showing the bird's important characteristics.

Having made an attempt at an identification the next objective is to try and find out a little more about what it is, what it does, and perhaps why. The answer to some of these questions can also help to confirm or refute an identification, by checking if the habitat in which the bird was seen is common and appropriate or if its behaviour fits the characteristic pattern of the species.

So our objective in this book is to combine colour illustrations of the birds, in postures which reflect their behaviour in the wild, with a text which conveys something of what is known of their habits and distribution in Singapore. The latter is increasingly important because the face of Singapore has changed dramatically over the last two decades and bird distributions have been found to have altered accordingly.

Not all the species found in Singapore are covered. To have done so would have left little space for the text, resulting in a field guide containing a thorough coverage of species but conveying considerably less information.

In our experience the people with only a casual interest, or those new to the world of birds, are more often confused and deterred when confronted by the apparent range of species to be recognised. Thus, by limiting the coverage to those species most likely to be seen, we hope the book will serve as an introduction for the newcomer, and thereby stimulate more people to join the ever-growing band of serious birdwatchers in Singapore.

The choice of species will undoubtedly invite criticism. We have included all those species which the casual observer has a good chance of encountering. On some occasions less common species are included because they are related to more common species in some interesting way, or because their status is undergoing some sort of change. For many of them our knowledge is still very scant. Hopefully we are laying the foundation for more systematic observations, resulting in more substantial books in the future.

For the serious birdwatcher, who has already achieved a certain level of competence, a very thorough field guide (King, Woodcock and Dickinson) already exists which will help identify all the species found in South-east Asia. For this group we have included chapters on the ecology of birds in Singapore and as much detail of their behaviour and habits as space will permit. In this way we hope to encourage people to learn more about the birds rather than just collecting the names of species seen.

We also include a checklist of those species found in Singapore and their status. By using this list any reader can go to more comprehensive texts to check on species not covered in this book.

ACKNOWLEDGEMENTS

We would not have been able to complete this work without the help and advice of many people. Chris Hails would especially like to thank David Wells, for his expert guidance and help rendered at every stage of the project. Also David Bradford, Hugh Buck and Richard Ollington, who provided his first introduction to birding in Singapore. Substantial parts of the text were read and improved by David Bryant, Hugh Buck, David Waugh and David Wells. Richard Corlett and Jon Sigurdsson provided expert opinions on aspects of Singapore's ecology. Ching Kok Ann helped with numerous tasks.

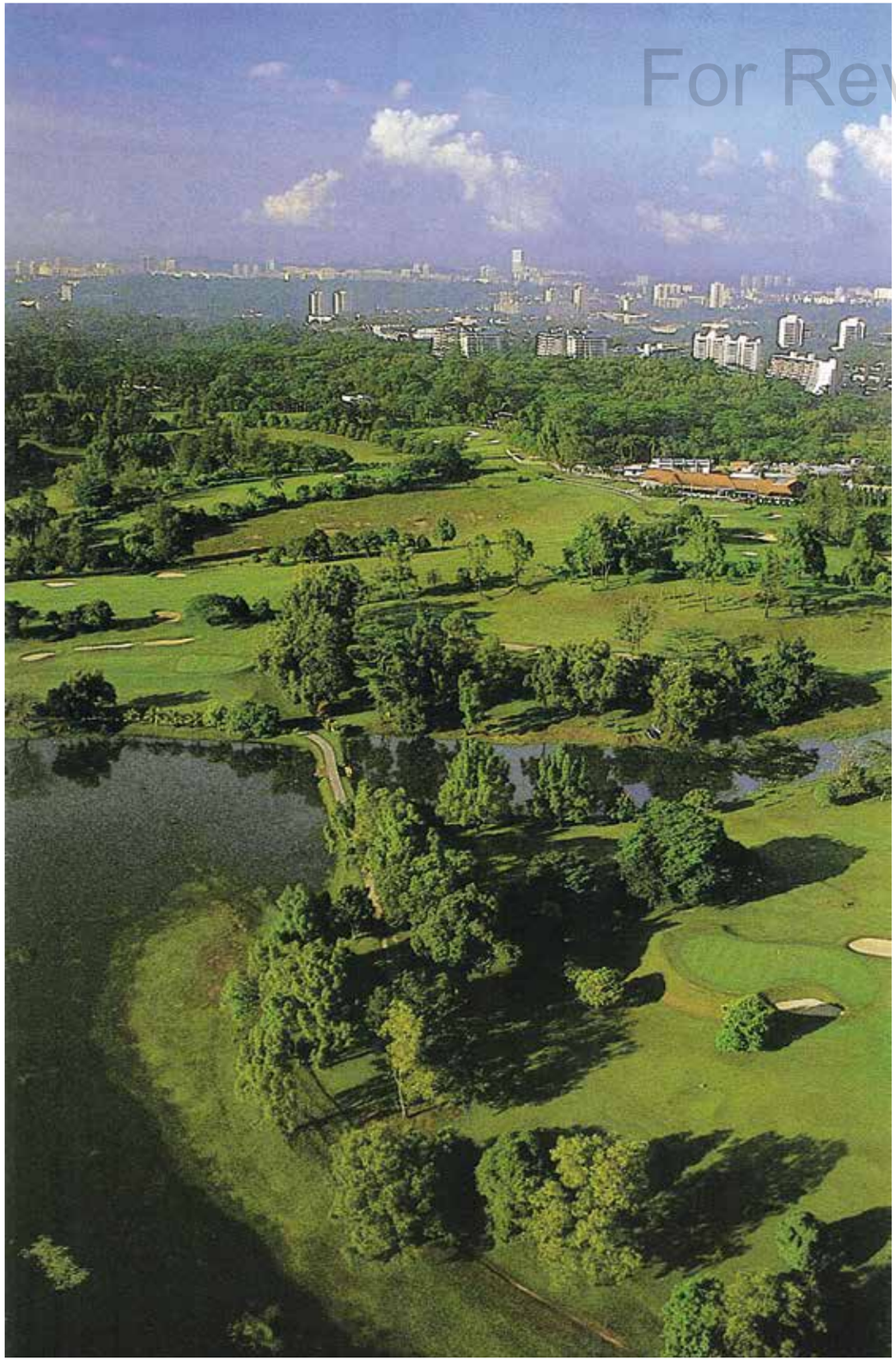
Frank Jarvis wishes to make special thanks to J.R.C. Ironside for both moral and material support throughout the project. To Victor Mason for first stimulating his interest in South-east Asian birds; and to Leo Haks and Duncan Parrish for help in other ways.

We both thank Mrs Yang Chang Man for her help whilst working with the National University of Singapore Zoological Reference Collection, and Kang Nee and Morten Strange for the use of photographs.

Most important of all was the patience, support and self-sacrifice provided by our wives. In particular Jane Jarvis provided her own botanical artwork as reference material for plants in the plates, and Sandra Hails read and greatly improved the entire text and provided numerous valuable opinions throughout the project.

To all these people we give our unreserved thanks, fully realising that the errors and shortcomings of the final version are entirely of our own making.

C.J. Hails, Singapore
F. Jarvis, Scotland June 1986



WHEN SMALL IS RICH

At first sight the Republic's statistics would not suggest an island with much to offer the wildlife enthusiast. Singapore consists of one main island and about 30 smaller ones, the latter being found mostly to the south. In total the land area is only about 620 km^2. The main island is 40 km at its widest point and 22 km at its greatest depth. At the time of writing it is home to slightly more than 2.5 million people and consequently has large housing and industrial estates scattered around it in a series of small towns.

However, as far as birds are concerned, we have a list of almost 300 species which have been seen here in recent years (see Checklist). This degree of richness in such a small island is due to a mixture of circumstances.

The major factor is the location of Singapore at latitude 1°20″ north, only 135 km north of the equator. This position, in the heart of the tropical belt, means that the temperature is hot throughout the year with a daily average of 26.6°C, the difference between the hottest and coolest month of the year is only 2°C whilst the daily fluctuation is 7°C. It is also wet with 2,400 mm of rain spread fairly evenly thoughout the year. As if to reinforce the constancy of the climate annual changes in day-length are limited to only nine minutes. Buffering Singapore against any small climatic changes which may occur under these conditions is the sea, which totally surrounds the island. The sea temperature is a constant 28°C and there are no cold currents to bring any changes in the temperature.

These continuous hot, moist conditions give rise to luxuriant natural vegetation. Until the hand of man altered things drastically Singapore was cloaked in a layer of tropical rainforest with mangroves around the coastline. Tropical rainforest is biologically the most diverse habitat in the world. In it we can find more species of plants and animals per unit area than in any other habitat. In this respect the forests of Singapore would have had much in common with those in neighbouring Malaysia and Indonesia.

However, being a small island the variety of forest habitats, and therefore the variety of bird species, has always been less than in these adjacent countries. For ex-

The island which forms the main landmass of Singapore is a mosaic of green areas and urban development (photo: Ian Lloyd).

ample the highest point in Singapore is Bukit Timah Nature Reserve which is only 165m above sea level. Thus there are no montane bird species. It is also an established ecological phenomenon that small islands hold fewer species of animals than equivalent areas of nearby mainlands (partly for the reason cited above), and that the physical constraints mean that wildlife populations are more unstable and species extinction is likely to occur more quickly. For these reasons Singapore has never had as rich an avifauna as that found in the lowland forests on the nearby large land masses.

Another feature contributing to the number of bird species found in Singapore is the annual influx of migrants which arrive each year from the north. These are birds which live the middle months of the year in the subtropical and temperate regions of central and northern Asia. There they exploit the brief explosion of food which occurs in the summer.

However, once summer is over, many plants and animals enter a dormant state to survive the cold conditions of winter, food becomes scarce for the birds and so many of them move south before this happens to be assured of a food supply. Starting about September we find an influx of these visitors from the north who stay until March or April when they return north to breed again.

So nature dictated the initial characteristics of the Singapore avifauna in terms of those resident birds of the forests and returning migrants. These characteristics were soon modified by man.

Raffles established the first trading post in 1819 and soon after there followed a period of forest removal to establish crops and settlements. As parcels of land were worked out, new areas were opened up. So systematic was this destruction of natural habitats that by 1859 there were 18,000 ha of abandoned land on the island, mostly covered in grass. At this time most of the forest birds must have retreated into any small remaining pockets, and we have no real idea how many became extinct. The only area to avoid this was the hill at Bukit Timah, our only remnant of those original forests.

In the meantime water storage reservoirs were built for the rapidly-expanding population. They were located in the centre of the island and the land surrounding them was defined as a water catchment area. In 1951 the Nature Reserves Ordinance joined the water catchment area and Bukit Timah Hill as a Nature Reserve. Since that time the 2,000 ha central catchment area has re-established itself as tall secondary forest and the surviving forest birds have spread into the regenerating forest.

So the forest, which was the major natural bird habitat, was greatly modified by man. Another important bird habitat, again soon to be modified, was the coastline, the interface of the land and the sea. In Singapore we can divide coastlines into those on sandy shores and those on muddy shores. Mangrove formed the bulk of the vegetation on muddy shores; these were worked for charcoal and construction timbers and large areas of them cleared for prawn farming. More recently the trend has been to reclaim all the shallow water coastal areas for development purposes. The sandy areas from Changi peninsula southwards have all been formed by reclamation works.

Between the coasts and the remaining forest most of the land can be classed as open country, a mosaic comprising the city and its conurbations in the south, and parks, gardens and agricultural land in the north. Of these the agricultural land is the richest in bird life. Unfortunately agriculture is being phased out in Singapore as it occupies much land more urgently required for housing and industrial development.

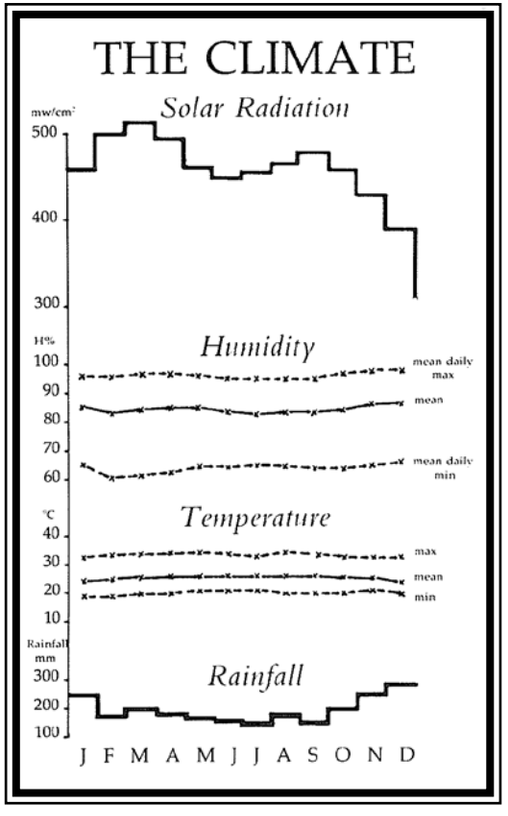
Not surprisingly these alterations to the physiography of Singapore have brought with them changes in the avifauna. Since records began we have recorded 394 species of birds in Singapore. But so dynamic has been the situation that, at any one point in time, the "currently occurring" list has probably never exceeded 300. Extinction of species due to habitat removal has almost been balanced by invasions of new species and establishment of feral (escaped) species. So the total number of species found in Singapore has only declined by about 13 per cent over the last 80 years or so.

Turnover has been much greater than this, however, and we have lost about 30 percent of those species which occurred here at the turn of the century. Of the 106 species which have been lost, 87 (82 percent) were associated with forest or heavily wooded areas. Total losses include pheasants and hornbills, with considerable reductions in the numbers of species of babblers, woodpeckers, cuckoo-shrikes and bulbuls.

Most of the species which have been lost have not been replaced ecologically by new ones, i.e. the incoming species have not taken over the role of those which became extinct. Of the "new" species 78 percent are of migrant or vagrant status and so their life in Singapore is only transient. Of the permanent additions all are birds which live in the newly-created open country habitats; none have entered the forest.

Comparisons with old lists are complicated by improvement in observer skills and equipment; some of the very rare or vagrant species we now record for the "first" time may have been here before, but escaped notice.

Compared with the past the Singapore of today contains a greater variety of habitats than at any time in history. But most of the habitats that we now have are severely depleted or are far inferior to that which existed before man took a hand in matters.



HOW, WHAT AND WHERE

As I hope that this book will stimulate the interest of beginners I will address the problem of actually finding and identifying birds. Anyone who wishes to partake in the absorbing and increasingly popular pastime of birdwatching should seek others with the same interest. Learning the ropes from someone with experience is far better than trying to learn fieldcraft from a book.

The previous chapter showed that one could expect to find different species of birds according to the habitat visited. With the exception of finding and watching shorebirds, the principles to be followed are the same for any habitat.

WHEN

At night most day-active (diurnal) birds are resting. They are unable to see to feed in the dark and therefore seek a safe place to shelter. In the tropics our night-time is virtually 12 hours. Thus for half the day most birds must sit still and conserve their energy. This means that come the dawn these birds are hungry and must move around searching for food. Also, in the breeding season they may use this time to re-establish their territorial boundaries or re-affirm their bond with their mate, situations which may have temporarily broken down during darkness. Both these activities involve singing or calling and so we have the dawn chorus.

The big upsurge of feeding and singing activity which occurs at dawn makes it the best time of the day for birdwatching. The noise and movements reveal the presence of the birds and therefore enable the birdwatcher to find them. For the birdwatcher it is cooler and more comfortable.

Bird activity seems to reach a peak about an hour after dawn. After this it declines steadily and the period from 1100h to 1600h becomes rather dull. From about 1600h there is a resurgence of activity which goes on until dark as the birds get in their last feed of the day. However, this evening peak of activity never seems to have the same urgency as the morning period and birdwatching is usually not as good.

The breeding season, starting in February and lasting through until about July, is the best time of year to find the resident species. But in September/October we have

Agriculture is still found in Singapore and the fringes of these fields, invaded by wild plants, are rich in birdlife (photo: Ian Lloyd).

an influx of migrants from the north and so this is the best time to visit the coastlines and reservoirs looking for migrants.

HOW

A pair of binoculars is essential. For birdwatchers 8×40 or 10×40 are the preferred sizes. Telescopes are likely to discourage the beginner and are better left for the more experienced birdwatcher. Binoculars should always be kept clean and also properly focussed and aligned.

A birdwatcher's walking pace is painfully slow. Sudden movements will scare away the objects of your attention and, in addition, it is impossible to walk quickly and search the vegetation carefully. Always try to walk with the sun behind you so that the light will be reflected back at you, thus avoiding frustrating silhouettes. You should also try to be elevated: it is much easier on the neck to look down into the crown of a tree than up at it. This will also avoid the difficulties of trying to discern plumage colours against a light sky.

Although many birdwatchers prefer to dress in browns and greens, the actual colours you wear seem irrelevant. Birds will see you from a long way off, whether you are dressed all in white or all in brown. Remember that they are used to looking for carefully camouflaged predators which can hide themselves far better than we ever can. What is more important is that your behaviour should not alarm the bird.

If you want to get close to a bird do not approach it directly but walk at an oblique angle as though you had not seen it: if the bird suspects that it is the object of your attention it will tend to become more alarmed.

Cars can make very useful mobile hides and you can often get much nearer to a bird in a car than you could on foot. But do not try to look through windows without winding them down: the dirt and distortion caused by the glass will be magnified by your binoculars and will be a handicap.

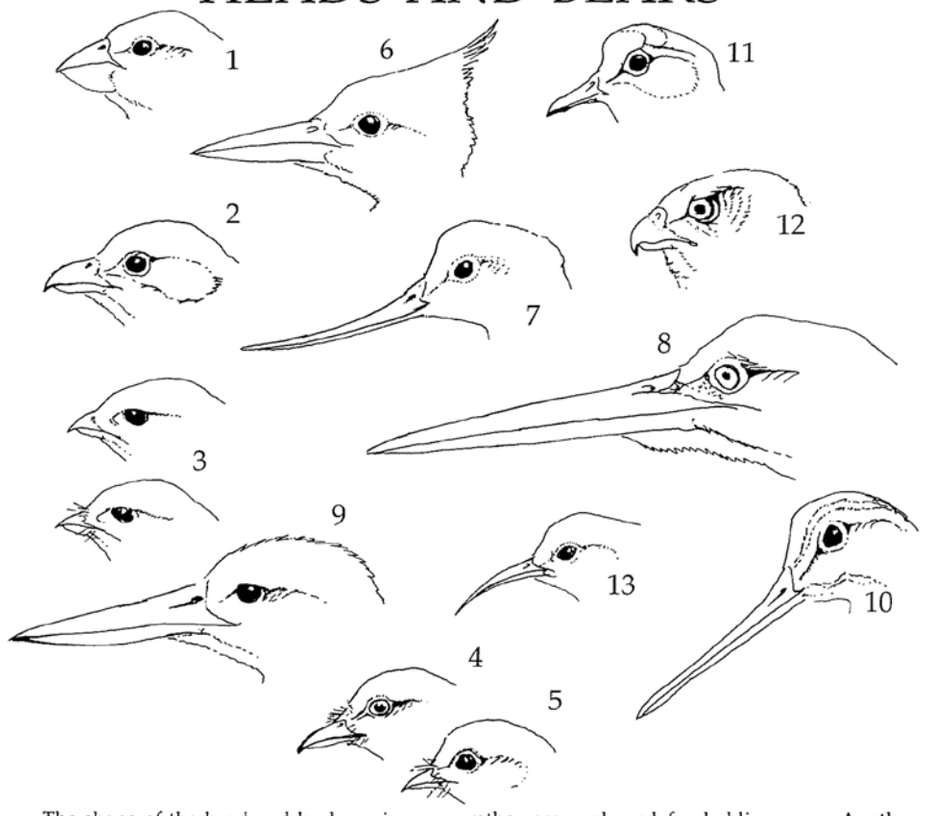
Often we can get frustratingly close to a bird which stubbornly refuses to show itself. Under these circumstances the bird's curiosity can sometimes be aroused by kissing the back of one's hand to make a squeaking sound, or by pursing the lips and making a "shushing" noise — a pastime affectionately known as "pishing". These noises are crude approximations of the noises by young birds or those in distress and are often investigated by a bird which would otherwise be hidden.

WHAT IS IT?

Having located a bird the next challenge is to try and identify it. The big temptation is to immediately try and match the bird in front of you with a name in the book. The usual result of this is lots of fumbling during which the bird flies away and the book ends up in the mud! The first thing you should try to do is to take in as many details of the behaviour and appearance of the bird as possible. Most of these will be difficult to remember until you have built up some experience.

A notebook and pencil are essential to note down all the characteristics. Start with a crude sketch of the bird's outline and then mark in the relevant features of its colouration. Note also the beak and tail shape and length of legs and neck. Writing down these things helps to focus the attention and allows the mind to

HEADS AND BEAKS



The shape of the head and beak are important identification features and also offer clues to the type of food or feeding method of the bird.

Seed-eaters such as the finches and munias have strong deep bills for crushing seeds (1). Shrikes catch and crush large insects, the beak is strong with a hook on the end to stop the prey escaping (2), their head and eyes also appear quite large. Swallows and swifts catch insects on the wing, the beak is weak and wide (3) and acts as a scoop in the air. Many insectivorous species have undistinguished beaks but inevitably with a small hook at the end (4), this includes babblers, bulbuls, warblers, ioras etc. Flycatchers take most of their prey in the air and their beaks are weak and wide rather like swifts and swallows (5). Many insectivorous birds have rictal bristles at the base of the beak to direct the prey into the mouth (2, 4, 5). The upper and lower mandible of a woodpecker are pointed so that the closed beak forms a chisel shape (6). A kingfisher's beak is also pointed (9) but the lower mandible is often rather scoop-shaped for holding prey. Another pointed beak is found in the herons and egrets (8) which use it for stabbing, the eyes are set well forward so that binocular vision may be employed to judge the distance to prey items. The beaks of waders which probe in the mud may be straight as in the snipe (10), may curve down, or even up as in the Terek Sandpiper (7). Some, like the snipe, are slightly swollen at the tip as they contain sense organs to help probe for the food. In most waders the eyes are set at the side of the head to allow almost 360° vision as a guard against predators. Plovers are waders which probe less deeply or even pick off the surface of the mud, their beaks are quite short (11). Birds of prey have strong hooked beaks for tearing and cutting flesh (12), some have small notches which are used when crushing bones. A very slender decurved bill (13) belongs to a sunbird or spiderhunter, it is designed for probing inside flowers to extract nectar. Bee-eaters also have a decurved bill but heavier than a sunbird's.

19. WHITE-BREASTED WATERHEN *(Amaurornis phoenicurus)* (13"/33cm)

The contrast between the white face and breast and the dark wings and back are distinctive. Confusion could only arise with the Pheasant-tailed Jacana which is a more colourful bird, shows more white, especially on the wings in flight, has a very long tail in breeding plumage and is a rare winter visitor to Singapore. The White-breasted Waterhen is very common anywhere near dense undergrowth, especially if water is nearby. It can be found in gardens and will often "commute" through suburban areas by sneaking along monsoon drains. It tends to be very shy and secretive and is easily overlooked. When driving through the farming areas of Mandai and Seletar it can often be seen on the road, diving into the long grass at the edge as you approach. When relaxed it will strut along with the tail cocked up, giving it an occasional flick; when alarmed the head will go down and it will make a headlong charge for cover, sometimes running up and down in a most panic-stricken manner. Whilst feeding it will strut with the feet lifted high, pecking at the ground like a chicken, so that it is sometimes called "*ayam-ayam*". It is usually seen on the ground but will also clamber around clumsily in bushes. If caught by surprise it may sometimes leap into water where it swims poorly. Or it may be forced into a tree where the long toes become a distinct handicap. It has a remarkable vocal repertoire: the traditional Malay name of "*uwak-uwak*" is a rendering of a monotonous call given at dawn and dusk. A whole host of churrs, grunts and groans are also made and it will sometimes call after dark. Other members of the rail family have been shown to have very interesting courtship displays when calling, but this bird only calls from the most dense cover and it is almost impossible to observe its activities. Juvenile birds are grey-brown all over. A different sub-species occurs on migration but cannot be separated in the field. Breeding may occur in any month of the year.

20. WATERCOCK *(Gallicrex cinerea)* (17"/44cm)

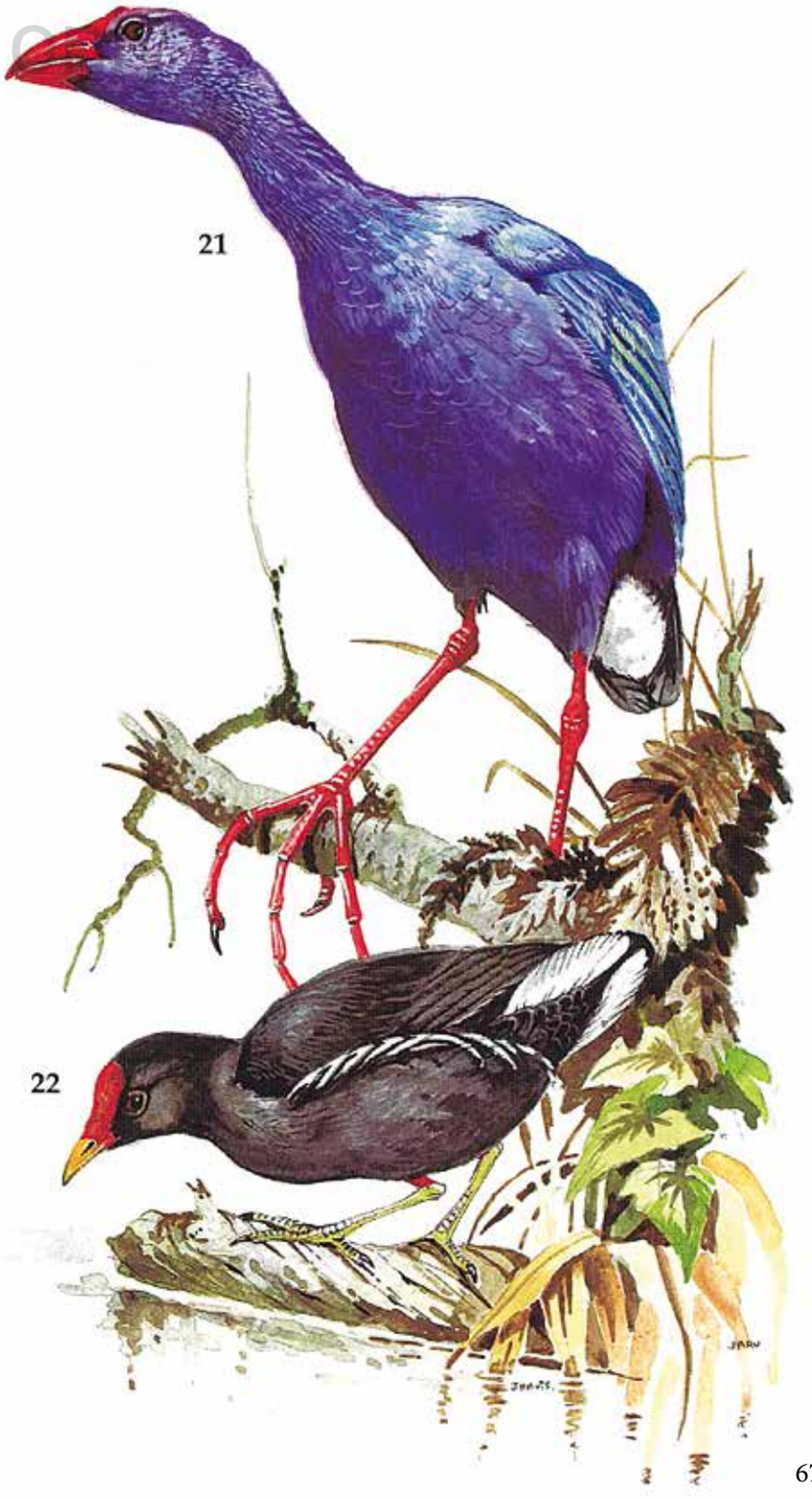
This is a very difficult bird to get good views of due to its habit of staying in dense cover in long grass and swampy areas. It is seldom recorded far from water and the usual view is of a large bird, mottled brown in colour, flying over the top of the marsh with rapidly flapping wings and long legs trailing behind. It appears to be a winter visitor to Singapore but we now have several records from the middle months of the year. The birds we usually see are brown, which could either be winter plumage males or females. In breeding plumage the males turn black and develop a fleshy horn over the beak. I have not seen a male in breeding plumage in Singapore, neither do we have any nesting records. The best place to find it is in the marsh areas around the edge of Kranji reservoir. It is recorded as having a call which is a popping and booming sound, similar in quality to that of a coucal.

21. PURPLE SWAMPHEN *(Porphyrio porphyrio)* (17"/43cm)

Superficially this is like the Moorhen but it is very much larger, the plumage is a glossy greenish-blue, and it has a huge red beak. Numbers seem to have increased in Singapore in recent years but it is very local in its distribution, fairly common at Kranji but recorded from only two or three other locations. Even at Kranji it is not as common as the Moorhen. Again, it is never found far from water and usually prefers to stay in dense cover in rank vegetation and floating weeds. It can hide surprisingly well considering its bulk and is difficult to flush. Unlike the Moorhen it will not swim or walk over open areas. The rafts of Water Hyacinth which cover the reservoirs give it ideal cover: the long toes spread the weight over a large area and allow it to walk on floating vegetation. When in flight it appears as a large bird with ponderous wing movements, the long red legs trailing behind. The diet is mostly water-weeds and other vegetable matter, and it has been known to cause damage to crop seedlings. Observations on captive individuals show that they will hold dead fish under a foot and chop off pieces. It usually feeds whilst on foot. It is recorded as making a range of typical rail-type squawks but the sound I usually associate with it is a nasal trumpeting "waak" which can carry for a long distance over water. The breeding behaviour is not fully understood. In some places it forms monogamous pairs whilst in others apparently co-operative breeding groups have been formed. At a distance its presence is often betrayed by an outstretched wing, but whether this is a display or sunbathing I am not sure.

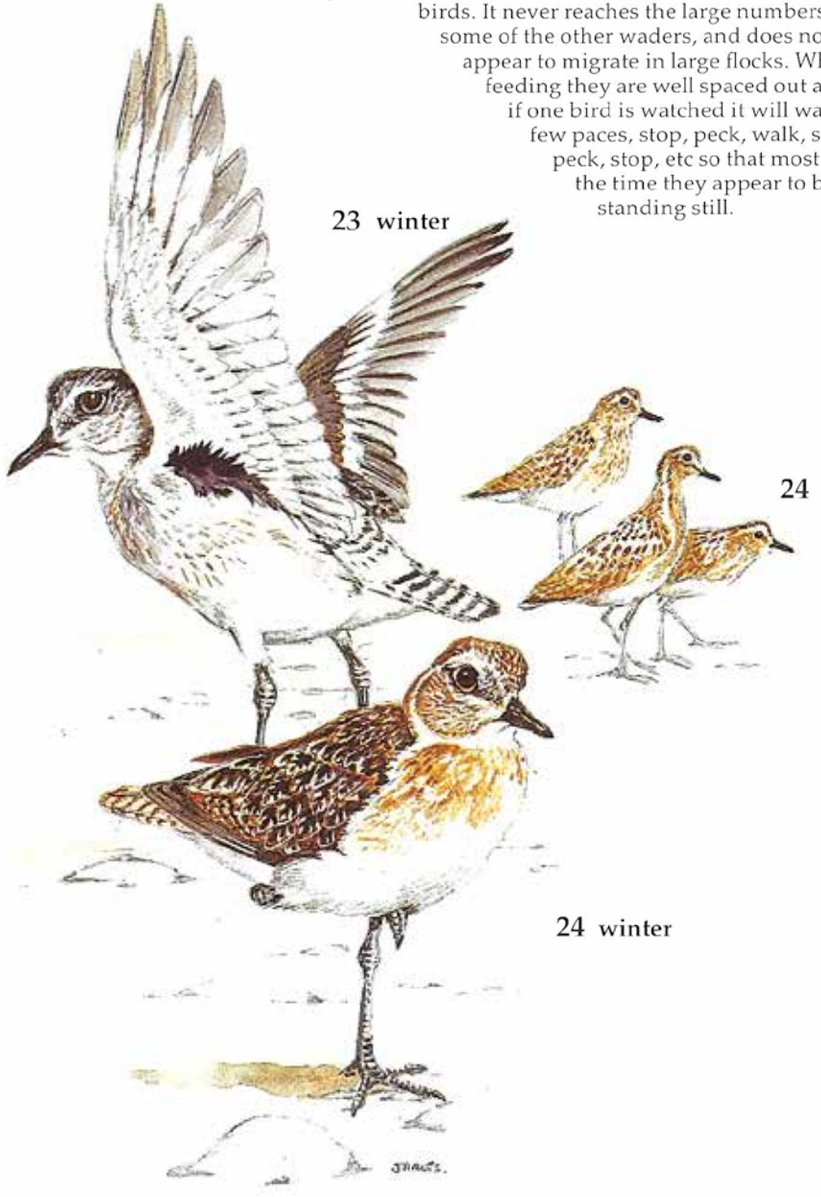
22. COMMON MOORHEN *(Gallinula chloropus)* (13"/33cm)

The generally bronzish appearance with red bill and shield is distinctive. Early in the year they may look quite glossy but as the plumage becomes worn they take on a dusty appearance and the white flank-line may almost disappear. The juvenile plumage is generally dark brown, paler below. They have an olive beak with no shield which gives them a much more pointed appearance than the adults. This is the original "clockwork bird"; when swimming the head jerks with every push of the feet, whilst on land it moves with a very high-stepping gait with the tail held high and constantly flicking. It is never found away from water and in Singapore seems to be fond of those reservoirs formed by damming the mouth of a river, hence such places as Kranji and the west coast area are its favourite haunts. It may also be seen in the catchment area and around the edge of rivers leading into mangroves. They will leave the water to graze on grass but usually keep near to cover. In fact they are probably the easiest of our rails to see and will grow accustomed to human presence. They can occasionally be found in trees and have been known to nest there. They fly well, as is perhaps illustrated by their abilities to colonise new areas. It has a wide distribution in South-east Asia but is only ever locally common. It seems to be increasing in numbers in Singapore. They form territories during the breeding season and have a whole host of interesting displays to defend them. One of the display postures is to flash the white undertail coverts at each other. They are omnivorous and eat a wide variety of plant and animal material. They will feed on land by pecking, or whilst swimming by dipping the head under water. Very occasionally they can be seen up-ending to pick at something deeper in the water. The call is a loud, harsh "kurruk".



23. GREY PLOVER *(Pluvialis squatarola)* (11"/28cm)

Of the two larger plovers in Singapore this is the less common. At a distance in winter plumage is told only with some difficulty from the slightly smaller Pacific Golden Plover. In good light, however, it does appear a definite grey-colour on the back and paler underneath. In flight it is told from all other waders by the black patch where the underside of the wing joins the body (axillaries), and when seen from above has a white (or near white) rump. It appears to favour sandy coastlines and can usually be seen in the Changi area, never inland. Its call is a very mournful "tleeuoo-wee", rather slurred and descending in the middle. It usually occurs in flocks (as do all the winter waders here), but only of around 10–20 birds. It never reaches the large numbers of some of the other waders, and does not appear to migrate in large flocks. When feeding they are well spaced out and if one bird is watched it will walk a few paces, stop, peck, walk, stop, peck, stop, etc so that most of the time they appear to be standing still.



24. PACIFIC GOLDEN PLOVER *(Pluvialis fulva)* (10"/25cm)

Smaller than the Grey Plover, in Singapore it is much more common and is perhaps the most numerous of the waders. In places such as the Serangoon estuary it attains very large numbers. It migrates in large flocks and these flocks seem to stay together for feeding and roosting. They will feed on short grass, as well as the mudflats, and can sometimes be seen a long way from the coast. One such favourite haunt is the rather wet playing fields of the Institute of Education along Bukit Timah Road. They may also be found on the shores of the reservoirs in the catchment area. They feed in the same manner as the Grey but are usually in larger flocks and spaced more closely together. When they first arrive in September/October, and again before departing in April, many may be seen in their breeding plumage. The jet black breast and face give it a splendid appearance. Small numbers may be seen after April and there are records from just about every month; there is no evidence yet to suggest that any individuals spend the whole year here. The call is a disyllabic "klee-eet", less plaintive than the Grey, perhaps better rendered by the Malay name "*keriyut*".