



ABOVE The Yellow vented Bulbul (Photo: Mendis Tan).

Special Ecology Feature

Conserving Our Native Birds

Text by Geoffrey Davison and Subaraj Rajathurai
Photography as credited



Introduction

Approximately 404 species of birds have ever been recorded in Singapore (Lim 1992; Wang and Hails 2007), the biggest uncertainty being which species occurred prior to the founding of Singapore in 1819 (Lim 2009). Approximately 346 species have been recorded within the past 50 years, and by convention these are considered “extant” (Wang and Hails 2007; Lim 2007). Some 121 species are residents and another 21 are presumed residents. Because Singapore is small, populations of most species are small and therefore vulnerable. The increasing human population of Singapore and the consequent demands for housing and infrastructure inevitably place greater pressures on birds and other wildlife, including through the loss of habitat.

Birds, however, are pretty, colourful, active, and tuneful, and generally benign. Birds eat a significant number of garden pests such as ants, wasps, and slugs. Birds have interesting habits and are engaging topics for children to learn about. Birds pollinate some flowers, helping plants produce fruits and seeds, and disperse some seeds to help propagation in different places. These are essential ecological services that help to sustain the vegetation. A forest without birds cannot continue to function indefinitely and will degrade through time.

It has therefore been necessary for Singapore to “work smart” in facilitating the multiple uses of land that can function both for people as well as nature. Many steps are being taken to improve the quality of habitats for birds in nature reserves, parks, and roadsides, and these can be complemented by efforts within gardens, private land, and even on balconies and rooftops.

Birds in the Environment

A typical row of roadside trees within the Singapore business district forms a permanent home for at least five species of birds—House Crow, Javan Myna, Eurasian Tree Sparrow, Asian Koel, and Feral Pigeon. In fact, it would be very difficult to find a place in Singapore with fewer bird species than this—even a green rooftop attracts more birds. Within a manicured park, there might be 20 to 50 species, including orioles, flycatchers, tailorbirds, sunbirds, waterhens, swallows, and swifts overhead, and the occasional parakeets, pink-necked green pigeons, and others. Not all of these will necessarily breed within the site or be present there all the time; some will be migrants or only occasional visitors. In Singapore Botanic Gardens—a big area with forest, flowerbeds, and open lawns, as well as lakes and some forest, more than 150 species have been recorded. In the Central Nature Reserves, the

list grows to 202 species, but this is a cumulative total rather than the number present at any one time.

These numbers roughly indicate the relationship between area and bird numbers. A park manager cannot aim for a huge total, as quality is just as important as quantity. Since a park has limited capacity, having more bird species means there are fewer of each kind. Parks allow scope for some degree of specialisation in what birds can be attracted and how visitors can be encouraged to enjoy them.

Fruit

Figs are a key resource for birds and other animals in Singapore, in parks, untended areas, and the nature reserves, because they produce abundant edible food throughout the year. There are many species of figs, and they do not all bear fruit at the same time, so there are likely to be at least some figs available at any season. Birds are specially attracted by *Ficus kerkhovenii*, *Ficus microcarpa*, *Ficus pisocarpa*, *Ficus sundaica*, and in particular, *Ficus benjamina*. Figs attract green pigeons, bulbuls, orioles, and a variety of other birds. There has not been much effort to plant figs specifically for birds; typically, small cultivars of *Ficus benjamina* are planted for topiary and as ornamentals, but these are trimmed to small stature and are not an important food source. Big, untrimmed specimens mostly occur on state land with low management intervention, but much more can be done in using big strangling figs to attract birds to parks.

Bulbuls like the small, rounded, hard fruits of plants such as *Macaranga*, *Trema*, and *Gironniera*. These are small trees of the forest edge, suitable for parks where the retention or creation of tall forest is not possible. The Cherry Tree (*Muntingia cadamba*) is popular with birds such as bulbuls and magpie-robins, although it is not a native plant in Singapore.

Trees like rukam (*Flacourtia rukam*), tampoi kera (*Baccaurea bracteata*), and rambai burung (*Baccaurea brevipes*) attract some birds, as well as bats and squirrels. The langsung (*Lansium domesticum*) would attract big birds such as hornbills, as well as small mammals. These trees are predominantly attractive to forest-living or forest-edge wildlife; the potential to attract civets, macaques, and squirrels to sites where they may conflict with members of the public needs to be considered carefully. Such trees, and the figs, should be planted away from visitors’ paths so that any mess from fallen fruits will be manageable. The MacArthur Palm produces fruits that birds, especially orioles,



TOP TO BOTTOM The male Brown-throated Sunbird (Photo: Cai Yixiong); The Oriental Magpie Robin (Photo: Mendis Tan); The Orange-bellied Flowerpecker (Photo: Cai Yixiong); The Little Spiderhunter (Photo: Cai Yixiong).

mynas, and green pigeons like. They add variety to the vegetation and the fruits last for some time, but the fruit crops are small compared with those of big fig trees.

In Singapore, among the well-known trees whose fruits are liked by birds are tembusu (*Fagraea fragrans*) and various species of *Syzygium* (Eugenia), including *S. polyanthus*, *S. polita*, and *S. microcalyx*. All these have small, juicy, orange or red fruits liked by bulbuls, parakeets, pigeons, koels, and migratory Chinese starlings. Flowerpeckers are fond of the small sticky fruits of mistletoe, and mistletoe flowers attract sunbirds. The mistletoe is a parasitic plant on tree branches (especially on the smaller fruit trees), where they do relatively little damage. No attempt has been made to deliberately grow mistletoes here, but allowing a cover of ferns, creepers, and other vegetation to grow on tree branches would help to encourage the total diversity of plants and animals, including birds.

Flowers

Out of all the birds found in Singapore, sunbirds and their allies the spiderhunters are the most effectively designed for pollination of flowers. There are five resident sunbird species and one resident spiderhunter species in Singapore. The Olive-backed Sunbird (*Nectarinia jugularis*) and the Brown-throated Sunbird (*Anthreptes malacensis*) are common and widespread in various habitats, including in urban areas.

The Crimson Sunbird (*Aethopyga siparaja*) and the Purple-throated Sunbird (*Nectarinia sperata*) prefer wooded habitats, ranging from abandoned plantations and woodlands to lowland rainforest areas. However, they will visit suburban residential estates and parks fringing their wooded habitat. Both species are common. Their relative, the Little Spiderhunter (*Arachnothera longirostra*), is a true forest bird specialising on nectar from banana flowers. The Copper-throated Sunbird (*Nectarinia calcostetha*) is a mangrove specialist that is confined to a few coastal and offshore mangrove areas. This rare species is also known to visit non-mangrove habitats that fringe their mangrove areas.

Sunbirds are primarily nectar feeders, though they will prey on insects occasionally, particularly to feed their young. They feed on a wide variety of blossoms and play an important role in the pollination of many local plants. An ample and continuous supply of food is achieved through a careful selection of plants; species such as the Fountain Plant *Russelia juncea* and *Brunfelsia calycina*, suitable for planting within skyrise and rooftop gardens, attract these beautiful birds to buildings. These sunbirds construct their nests in hedges, shrubs, and even potted plants. The nest of the Olive-backed Sunbird can also be found on fences, under porches, and on the roof eaves of many a high-rise apartment. Providing hanging vegetation and suitable potted plants allows the sunbirds to construct their nests within the urban environment.

Sunbirds source nectar from plants in a wide variety of habitats. Plants employed in Singapore include the jambus (*Syzygium*) and tembusu (*Fagraea fragrans*) in wooded habitats, and the bakaus (*Rhizophora*) and mengkudu besar (*Morinda citrifolia*) of the coastal areas. Even the flowers of the widespread Coconut Palm (*Cocos nucifera*) are popular with these birds. Other favourites include canna lilies, Butterfly Tree (*Bauhinia x blakeana*), Bottlebrush (*Callistemon citrinus*), Torch Ginger (*Etilingera elatior*), and Coral Tree (*Erythrina* spp. that also attract

starlings, parakeets, and hanging parrots). The naturalised *Albizia* (*Paraserianthes falcataria*), which dominates many woodland sites around Singapore, is also popular with many species of sunbirds.

Insects

Many birds living within our residential urban landscape are insectivores. They feed on large quantities of insects and keep many of them from reaching pest proportions. Among the trees and shrubbery, a variety of birds search for insects, including cuckoos, woodpeckers, tailorbirds, the Pied Triller, the Common Iora, and the Golden-bellied Gerygone. The uncommon Oriental Magpie-Robin hunts on lawns and in gardens, while bee-eaters and the Dollarbird hawk for insects from high branches. At night, the Large-tailed Nightjar does the same from lower perches. Swiftlets and swallows catch insects on the wing. During the northern winter, resident insectivores are joined by their migrant counterparts from the north, including flycatchers, warblers, and shrikes.

No specific efforts have been made to increase the numbers of insects for birds in Singapore. Creating a varied habitat with different structures (such as trees, shrubs, weedy areas, long grass, flowers, and open areas), and various plant species, is usually enough to create the conditions for birds to find insect food themselves. Wayside trees like *Samanea saman*, *Peltophorum pterocarpum*, and *Fagraea fragrans* attract many insects, and areas of Singapore that have rows of such trees have a good diversity of bird species. However, areas with stands or rows of trees like *Pterocarpus indicus*, *Swietenia* spp. (mahogany), and various species of palms are less successful, with limited bird species.

Other Resources

Feeding tables for birds are not encouraged in parks, though experiments can be made in private gardens or on balconies where sufficient attention can be given. First, they require regular maintenance. It hardly seems fair to supply food for a while then stop. Second, they need cleaning or they risk being unhygienic. Third, they are likely to attract squirrels and rats. Squirrels are fun but they carry food away. Without food, the bird table cannot attract birds and is useless. Rats are messy and can be unhygienic.

Generally, if the vegetation is dense and well chosen, there will be sufficient food for birds without going to the trouble and expense of providing artificial food sources. Nectar feeders are popular for hummingbirds in the United States and have been tried for sunbirds, though the birds always prefer natural flowers.

Only a few birds in Singapore require natural cavities in trees for nesting. Examples are hornbills and owls. Bigger birds require bigger nesting cavities, and because there are not many such bigger cavities in trees in Singapore, nest boxes have been an effective way of increasing their numbers. Birds that make their own nesting cavities, or enlarge natural ones, such as woodpeckers and barbets, typically refuse to make use of artificial nest boxes.

There is not much experience of using nest boxes in the tropics, where they tend to attract ants, termites, wasps, and other pests. Pied Hornbills have proved to be a special case where nest boxes were useful, but in general it is probably more cost-effective to create lots of natural variety



ABOVE The Crimson Sunbird (Photo: Cai Yixiong).

in the habitat so that birds can find their own homes. Providing artificial nest boxes in wooded areas for owls can be considered. This has been quite successful in oil palm estates in Malaysia, where both the barn and spotted wood owls are successfully helping in the control of the population of the Malaysian Wood Rat, a pest in these estates. Artificial perches, at the tops or sides of buildings, will provide vantage points for predatory raptors and owls, as well as the hawking Bee-eater and Dollarbird.

Munias sometimes nest inside an empty coconut shell, laid on its side with one end cut off and lodged in the cleft of a shrub or tree. But success is not guaranteed. Mynas, Asian Glossy Starlings, barbets, and sometimes kingfishers all nest in holes in trees. Natural nest holes are likely to be in decaying timber and not living trees, so it is useful to keep some dead trees if they are in places where they do not pose a risk to the public.

Some birds (especially mynas, starlings, and sparrows) will find hidden entry points into the spaces under a roof, which can be a nuisance. They bring in nest materials and food for the nestlings, and it can be unhygienic if a baby bird dies in the nest. This can be prevented by blocking such openings with crumpled wire netting, but those who like the birds can provide an alternative nest site such as an open-sided wooden box attached underneath the eaves of the roof.

Almost all birds need to drink some water, albeit in small amounts. A small puddle or pond will provide enough for them to drink, and if it is reasonably clean and shallow, they will bathe there as well. Birdbaths, a shallow basin made of cement and placed on the ground or on a pedestal, can be constructed. These require periodic cleaning and filling with water. Small birdbaths or water-sprinklers can also be attractive landscaping features, if they are placed slightly away from areas or pathways that are heavily used by people. However, a pond will create a more natural-looking environment and benefit other wildlife such as dragonflies and amphibians, increasing the number of attractions for park visitors and diversifying habitats and food supplies. A shallow sloping natural bank is more helpful than a vertical cement wall to a pond, as it allows vegetation to grow along the edge and easy access to and from the water.

Landscaping Recommendations

Efforts to encourage birds that are forest specialists have proven most successful in parks already adjacent to a forested area, such as MacRitchie, Hindhede, and Dairy Farm. There, dense vegetation in the park acts as an extension to the forest. This helps birds by expanding, even if slightly, the area of suitable habitat for them. Dense planting in such cases means the creation of layered vegetation, including tall trees, small to middle or understorey trees, and patches of dense undergrowth. In a public park, such dense planting cannot occupy the whole area. Cluster planting is then an effective compromise, leaving winding trails free from messy vegetation for visitors to use.

It is useful to phase out trees and plants that provide little for local wildlife and replace them with more worthwhile species. In the past, trees were planted for their fast growth, provision of shade, beauty, free flowering, and easy maintenance. Now that the emphasis has shifted to retaining and increasing biodiversity, the flora selected should be valuable not only to humans but to local wildlife too.

Park connectors are not simply shady pathways for human walkers, joggers, and cyclists. Where possible, the planting width is extended, and new connectors incorporate adjacent vegetation that provides food and cover for animals. This strategy is being used by the National Parks Board to encourage the spread of wildlife from pockets of natural habitat into urban landscapes, using programmes to develop nature ways and street gardens.

As Singapore plans for more high-rise development country-wide, urban landscaping has been stepped up to break the monotony of the cityscape. Skyrise and rooftop greenery is being increased. Landscaping does not just seek to beautify the place, provide shade, and help reduce carbon emissions. A further purpose is to create an environment more attractive to a variety of animals.

Streets and roadside gardens are intended to comprise a good mix of flowering trees and shrubs, with well-vegetated green spaces between the buildings. Resembling little woodlands or groves, rather than manicured mini-parks, these habitats will help support the woodland-orientated sunbirds and other species.



ABOVE The male pink-necked Green Pigeon (Photo: Cai Yixiong).

Apart from periodic monitoring and pruning, there is not much maintenance that needs to be done. Reducing the need for constant management is better for wildlife, as there is less disturbance. The reduction in management creates a better ambience for attracting wildlife, as their food is not pruned or fogged out and their nesting activities are not threatened.

Birds and Pest Control

Nine species of owls have been recorded in Singapore, including five residents, three migrants, and one visitor. Only one has adapted to the urban habitat and is truly at home in the city; the Barn Owl (*Tyto alba*) is locally uncommon but fairly widespread. They have also adapted to city areas, where they specialise in hunting rodents at night. They roost and breed in older buildings and expansion gaps of flyovers.

Of the woodland species, the small Collared Scops Owl (*Otus bakkamoena*) is common in nearly all wooded habitats, including rainforest, mangrove and even well-vegetated parks and gardens. It has a varied diet that includes rodents, small birds, reptiles, large insects, and even small bats. The much larger Spotted Wood Owl (*Strix seloputo*) found in woodlands, wooded parks and gardens, as well as forest edges, is uncommon but spreading. It feeds on rodents, birds, reptiles, and bats.

Apart from owls, very few bird species feed on rodents, as rats are mainly active at night. One of the few exceptions is the Black-winged Kite (*Elanus caeruleus*) of grassland habitats, which feeds on rats, small birds, and reptiles. Certain kingfishers will also consume rats as part of their varied diet. The Collared Kingfisher (*Todiramphus chloris*), which feeds on mice and smaller rat species, has also shown signs of adapting by nesting in artificial structures. The migratory Peregrine Falcon occasionally roosts on buildings and telecom towers, playing a role in controlling pigeon numbers during those months of the year when it is present in Singapore.

The Asian Koel (*Eudynamis scolopacea*) parasites House Crows (*Corvus splendens*) by replacing the crows' eggs with their own. The

crows then play foster parents. This provides an ideal biological control to crows. Since Koels require both fruit and insects in their diet, the current mix of roadside trees is quite suitable for them, and their role in controlling the populations of crows is cost free. 

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