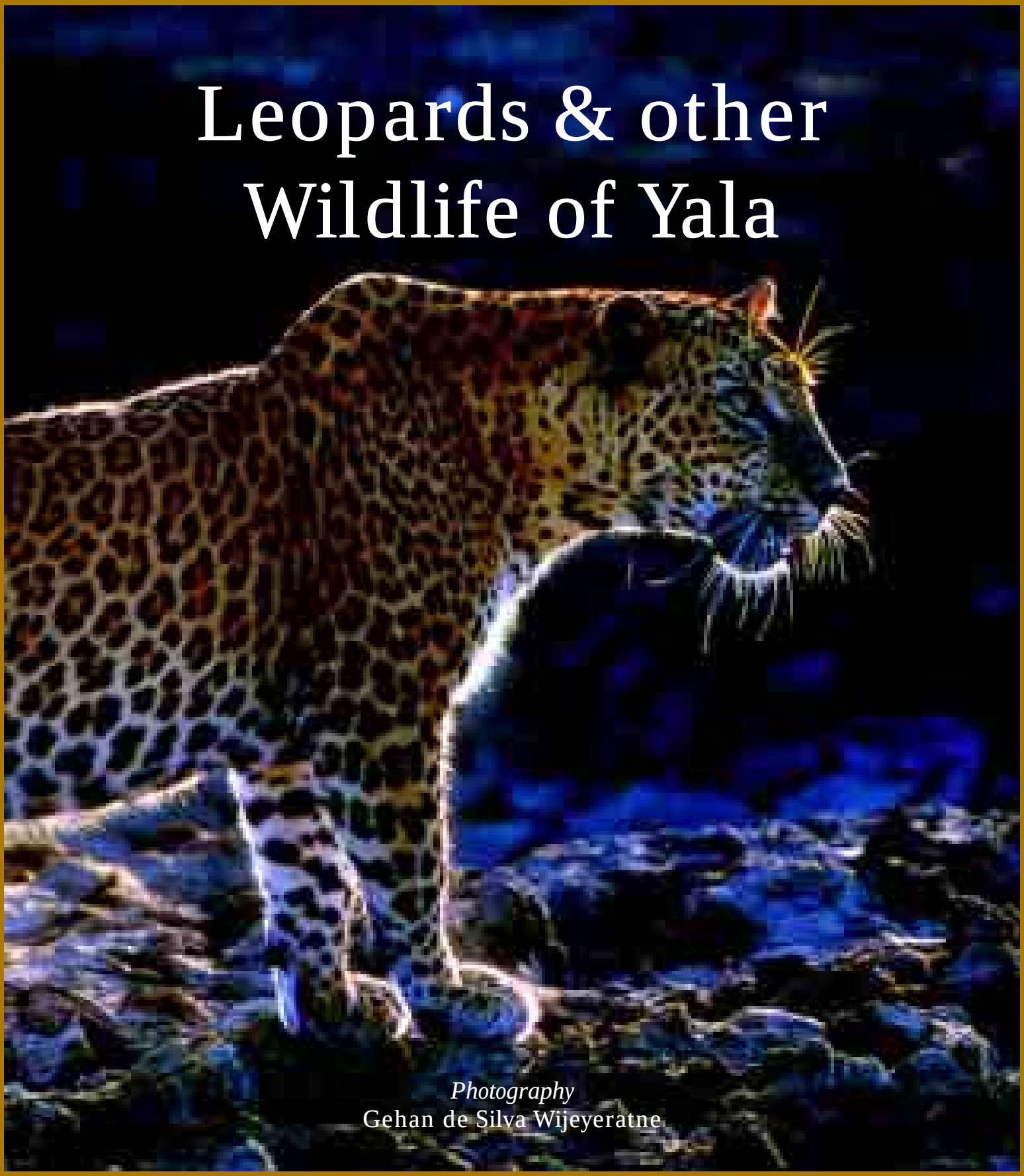
Leopards & other Wildlife of Yala



Photography
Gehan de Silva Wijeyeratne

Leopards & other Wildlife of Yala

Articles and Images on the Wildlife of Yala

Compiled & edited by
Gehan de Silva Wijeyeratne

with contributions from
(alphabetically listed)
Lal Anthonis
Karen Conniff
Chandra Jayawardana
Namal Kamalgoda
Andrew Kittle & Anjali Watson
Chandrika Maelge
Sriyanie Miththapala
Adrian Neville
Shyamala Ratnayeke
Ravi Samarasinha
Charles Santiapillai, Rajnish Vandercone & S. Wijeyamohan
Gehan de Silva Wijeyeratne

Data Sheets designed by
Chandra Jayawardana, Nadeera Weerasinghe, Nilantha Kodituwakku
& Gehan de Silva Wijeyeratne

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Photography

Gehan de Silva Wijeyeratne

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Design and Layout

Design Consultant
Chandrika Maelge
(Jetwing Eco Holidays)

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Copyline (Pvt) Ltd

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A medley of styles

It is inevitable that in a compilation of writings from a dozen or so authors, there will be a multiplicity of styles. This is even more pronounced as the style of writings vary from a light, ‘magazine’ style (notably by Gehan) to a style which is semi-technical. Rather than homegenise the writing into one style, the different tones of the articles have been maintained to cater to the tastes of a wide audience. In a few cases, the more technical articles have been toned down to make it more intelligible to a popular audience. The use of or abscence of the scientifc or Latin name has also been dictated by the style of the writing. In the more technical articles, the scientific names have been retained. n

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This book would not have been possible without the support of my colleagues at Jetwing. I extend special thanks to Hiran Cooray and Lalin de Mel of Jetwing Hotels for their encouragement. Chandrika Maelge's efficiency as Team Leader of Jetwing Eco Holidays created room for me to undertake such a venture. The contributors responded graciously to my invitation for articles and were most prompt with their texts in a matter of a few weeks. Thanks to the design team at Copyline for turning the book around in a record six months from initiation to completion! Dr Sriyanie Miththapala helped greatly by undertaking the final round of copy editing and proof reading. Vijita de Silva, Ravi Samarasinha and the enigmatic US also assisted by reviewing the text. Any errors which remain are mine.

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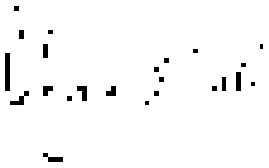
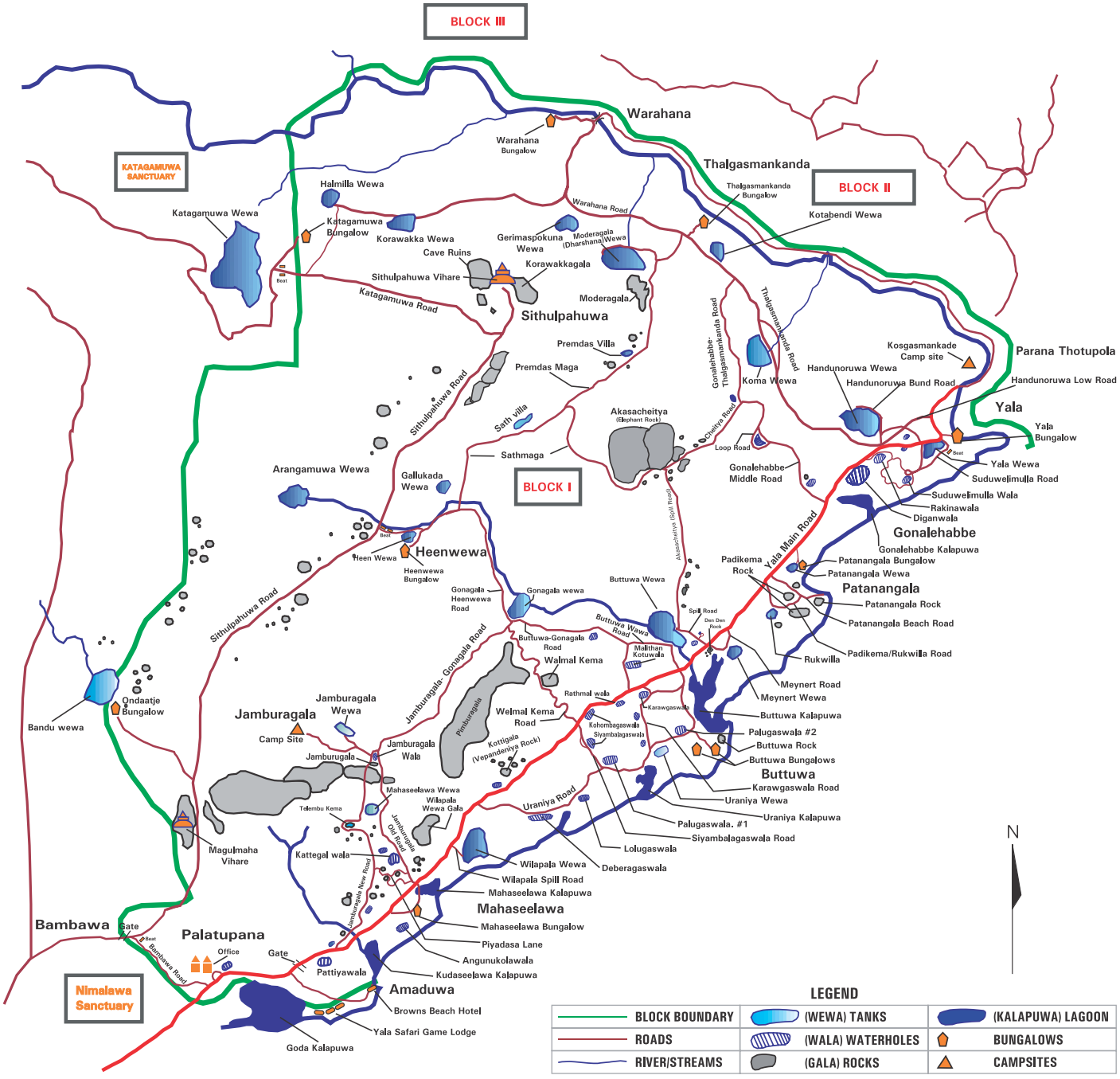
Finally, I wish to thank my wife Nirma and my two daughters Maya and Amali who have always given me 'space' to pursue my publishing efforts.



Yala National Park



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Yala National Park

An introduction to the yala national park

CHANDRA JAYAWARDANA

The Ruhunu National Park, popularly known as Yala National Park is located in the South-east of Sri Lanka lying between longitudes and latitudes of 60^0 16'- 60^0 25'N and 81^0 22' - 81^0 32' E respectively, along the coastal belt, east of Tissamaharama, in the Hambantota District. It is situated about 300 km from Colombo, and is the premier national park of the 15 national parks in the country. 'Yala' is in fact a complex of National Reserves comprising five Blocks (97,881.3 hectares), including a Strict Nature Reserve and three Sanctuaries covering an area of 151,778.8 hectares. Of the five Blocks, only Block I is set aside for game viewing, at present, an area of 14,100.6 hectares in extent.

The recorded history of the Yala area dates back to about 500 BC. A young prince, named Rohana from neighboring India, established the city and kingdom of 'Rohana' in the 'revenue division' of Magama Pattu, thus recording the beginning of the Rohana dynasty. History further records that in 307 BC a fugitive prince Mahanaga, established an independent sovereignty, making Magama, a small hamlet near the Kirindi Oya mouth, his capital. The remnants of dagabas (stupas) and ancient artificial reservoirs (tanks or 'wewas') with a cascading system of water flowing from one tank to another, are present in the area. These, built by competent civil engineers, indicate the existence of an advanced agricultural civilization in the area, encompassing the area of the Yala protected areas. There are over 40 well documented archeological sites and hundreds of ancient, cascading type 'wewas'. However, after about the 10th century AD there seemed to have occurred a sudden de-population bringing the golden era to an end. Wars among minor kings, famine and disease may have contributed to this event. But no one really knows for certain what factor or combination of factors triggered this relatively rapid abandonment of the area. Subsequently, the jungle took over this once populated area which is now a sanctuary for wildlife.

The area remained a free hunting area for 'sportsmen' until 1900, when it was declared a Game Reserve for controlled hunting. Mr. H.H. Englebrecht, a Boer prisoner of war, was appointed as the first Warden. The British did not release him to return to his native South Africa on account of his refusal to swear allegiance to the British Crown. The area remained a Game Reserve till 1938, when a section of it was declared a National Park, the present day, Yala Block I.

Yala lies in the Arid Zone of the country, where the annual rainfall is less than 1,000 mm. The area experiences the North-east monsoon from about November to January and a spell of short inter-monsoon rains again in March and April. The rest of the year is dry with a severe drought

from July to mid October. The annual mean temperature is about 27^0 C and occasionally could rise up to about 37^0 C.

The Yala Protected Area Complex can be thought of as comprising broadly of seven major habitat types.

- Â Sand dunes dominated by *Spinifex littoreus*, *Ipomoea pescapre* and *Launea sarmentosa*.
- Â Scrub forest, chiefly thorn scrub, dominated by Maliththan, Kukulkatu, Kukurumana, Lunuwaraniya, Ranawara, etc.
- Â Forest cover with dominant trees such as Palu, Weera, Satin, Kon, Milla and Wood Apple.
- Â Herbaceous cover dominated by Thora, Katupila and grass species.
- Â Riverine forest dominated by Kumbuk, Mee, Helamba, Thimbiri and Epiththa.
- Â Fresh water bodies (artificial) and lagoons fringed with mangroves species of *Avecennia marina*, *Luminitzera racemosa*, *Rhizophora mucronata*, etc.
- Â Rocky outcrops with several rock pools.

There are 280 species of trees and plants including many medicinal plants in these different vegetation types.. There are 24 fresh water holes of which the Buttuwa Wewa, Mahaseelawa Wewa, Palatupana Wewa, Wilapala Wewa, Koma Wewa and Gonagala Wewa retain a little water during the drought for the thirst-stricken animals of the park.

The Park is a refuge for 32 species of mammals. The elephant is the largest herbivore and an estimated 400 to 500 elephants inhabit all five Blocks of the Park. The elephants are also believed to engage in seasonal movements in and out of the Park to areas of Lunugamvehera, Uda Walawe, Bundala, Kumana, Lahugala and Gal Oya.

The Park is dominated by Spotted Deer, which can be seen in large numbers especially after the monsoon rains. Spotted Deer can be seen also in large numbers during dawn and dusk in the open plains. During the hot afternoons, they seek the shade of the forest to avoid the severe heat. The Spotted Deer form the major food resource for the leopard. Sambhar, the largest member of the deer family, can be seen in the dune areas or in the vicinity of lagoons in small numbers. The Barking Deer is rather difficult to view, being a shy animal. Mouse Deer too can be seen occasionally. The Wild Pig, which helps to keep the area clear of dead carcasses, and the Wild Buffalo, together hold their own at the numerous water holes and in open areas (plains) of the Park.

Among the carnivores, the leopard is the major attraction. It is estimated that there are about 35 of them in Block I. Becouse leopards are top predators, the can be seen relatively easily during daylight in Yala, one of the few places in the world where one can do so. The scrub jungle, open areas and the rocky outcrops offer an excellent habitat for the leopard. Other predators found here include the Fishing cat, Rusty-spotted cat and the Jungle cat. The Ruddy mongoose, Stripe necked mongoose and the Grey mongoose along with the Ring-tailed Civet (Small civet), Common palm cat (Toddy cat) and the endemic Golden palm civet are other smaller carnivores found here. The Jackal is the only wild member of the order Canidea, found in Sri Lanka. The Sloth bear is the only species of bear found in the Country. It is best seen during the Palu season (June and July), on Palu trees feeding on the sweet yellow berries. Among the monkeys, the Grey Langur and the endemic Toque Monkey can be seen. The Slender loris, being mostly nocturnal, is hardly ever seen. The Indian porcupine and the Pangolin are two other nocturnal mammals which are rarely seen.

Around 230 species of birds, including indigenous, endemic and migrant species, have been recorded. The raptors are well represented and visitors are likely to see the Changeable Hawk Eagle and Serpent Eagle.

Basking crocodiles are a common sight at water holes. The two threatened species, the Marsh and the Estuarine crocodiles are found here, although it is mainly the Marsh crocodile which is encountered here. All five of the threatened species of sea turtles visit the shore for nesting. All five of the fatally poisonous snakes of the country and non poisonous snakes such as the Python are present, but difficult to see. Three endemic geckos and five species of skinks are also found in the Park. The Park also harbors two species of fresh water terrapins and the elegant Star tortoise. Among the other tetrapod (four legged) reptiles there

are the Land monitor and a few lizards.

The butterfly fauna is well represented by about 40 species. Common amongst them are the members of the family Danaidae (crows, tigers and leopards). thirteen species of amphibians have been recorded.

A varied matrix of eco systems has resulted in a high diversity of fauna and flora. The evenings and mornings are the best times to visit the Park. Valuing the advice of the wildlife guides, avoiding noise and keeping to the roads are mandatory when viewing wildlife. No litter please. Help to keep the Park clean. n

One evening in yala.....

GEHAN DE SILVA WIJEYERATNE

(This article was first published in the 2004 first quarter issue of Ayubowan, the newsletter of Jetwing)

It was noon and the Goda Kalapuwa shimmered and glinted like a silver mirror under the hot noon day sun, which bakes the sand dune-ridden southern coastal strip of Sri Lanka. It was the 31st of December 2003 and less than half a day was left of the old year. I turned, just before the gates of the Yala National Park, into the final kilometer leading to the Yala Safari Game Lodge. On my left was the national park and on my right, a plain interspersed with scrub and salt tolerant Maliththan trees. A large bird, flying against the glare of the sun caught my eye. I pulled over wondering what bird could present so large a silhouette. A Black-necked Stork, one of the rarest and largest birds in Sri Lanka, flew over, purposefully. A few minutes later my wife Nirma pointed out to our children, an elephant, on our left. The year 2003 was going to end on a strong note and 2004 was going to get off to a good start. Instinct told me that I was going to have another good visit to the Game Lodge. A safe prediction, as I have never had a disappointing visit. Set with the country's premier national park on one side, the sea on another and the Goda Kalapuwa, lagoon on the other, the location of the Game Lodge is unmatched. Friendly staff, dining under the stars with backlighting from the swimming pool, game drives and nature walks - all these made visits to the Game Lode ever invigorating.

The naturalists joined us for lunch and I picked their brains. A Sloth bear had been visiting Welmal Kema, a water hole set in granitic gneiss. On our evening game drive we headed off to Welmal Kema with Priyantha, one of the local jeep drivers at the wheel, and Lionel, an experienced tracker. Lionel examined the tracks on the sand near Welmal Kema and announced that a Sloth bear mother and cub had crossed the road. A few minutes later he announced that another Sloth bear had passed through recently. We slowed down and proceeded cautiously. It was going to be another, "If only we had come a few minutes earlier". Wrong. Straight out of a script, the male was on the road, but moved in and vanished into the scrub. We moved on and waited at the water hole. The Sloth bear ambled in, in no hurry, drank, and sauntered over the rocks and disappeared from view into the scrub under a large Palu tree.

Surely it could not get any better? But it did. We came across leopard pugs on the Akasa Chaitiya Road. The tracks were very fresh, and were

superimposed on jeeps tracks made recently. It was probably a sub adult who had begun an early evening patrol. It had retreated into the jungle, perhaps on hearing our approach. We decided to run the length of the road again and were interrupted by a family of elephants who crossed the road. Elephant families are female-dominated. The adult females were jealously guarding two young, who may have been only a few years old. Two adults stood side by side with a calf in the middle and stared at us defiantly. Sand was kicked and sprayed over their body in a show of force. 'Come no closer' was the message. The two adults rumbled like thunder. They then clasped their trunks and in a very unusual display joined the tips of their trunks, as if communicating in hushed whispers. A loud trumpet from the other side of the road explained their unusual anxiety. More elephants were on the other side. We moved away, allowing the rest of the family to merge together without obstruction.

Over dinner, I chatted with guests. The stars shone brightly overhead. A wild pig visited the buffet and was chased away. A Common palm civet, a nocturnal hunter, slunk through the grounds. An Indian nightjar churred and a Collared scops owl hooted from the Bahunia trees. The year 2003 ended on a wild note.

Over the next few days, we had four leopard sightings, amongst a clutch of thrilling wildlife encounters. The year 2004 will see me back at the Yala Safari Game Lodge, as many times as I can find reasons to keep going back. n

Yala, a photographer's paradise

NAMAL KAMALGODA

Ruhunu National Park or Yala as it is fondly known, is a wildlife photographer's paradise. Yala is home to a wide variety of photographic subjects. For instance, Yala is home to elephants, leopards, bears, buffalos, deer, plenty of birds, butterflies, etc. What is even better is that most of these subjects are, to some degree, habituated to vehicles. Yala has had a long history of human visitation and protection. Thus animals and birds have developed a degree of tolerance to vehicles. Landscape photographers need not feel left out, Yala has some stunning beaches, awe inspiring rocky outcrops, scenic water holes, open plains, lagoons, shrub jungle and riverine forests. Yala is also home to over two hundred species of birds, migratory and resident. This national park has also got a good road network, with water holes within easy viewing from the road. This is an ideal recipe to make Yala a true wildlife photographer's paradise.

Getting an early start will help. Leopards, in particular, are seen early morning or in the evening. Bring some water and snacks, as one never knows how long you will have a willing subject. Bring plenty of film, the middle of the jungle is not a practical place to run out of film. Freedom Cafe near the park entrance and the wildlife shop at the Yala Safari Game Lodge are your last chance. If you use professional film, buy it in Colombo. Wear earth coloured clothes, greens and browns are preferable. If you are driving yourself, drive at a slow steady pace, and you will see a lot more. Approach animals and birds slowly and they are less likely to be frightened by you.

The next factor is noise. This has to be kept at a minimum. Sudden braking or engines revving, and chatter from within the vehicle are all sure-fire ways of disturbing your potential subject. If you have to talk, whisper. Keep noise down to the level of the sound of the camera shutter.

I noted earlier that animals and birds are habituated to vehicles, but I did not mention humans. Most animals seem to tolerate vehicles better then humans. Pointing hands, sticking heads out of windows and popping out of sunroofs will not help. The latter is not only a good way to chase an animal or bird away but it is also against the park rules. All creatures have a comfort zone for vehicles and humans. Usually the comfort zone for vehicles is less than for humans. As long as all body parts are inside the vehicle, noise is it at a minimum and you approach slowly, you are likely to have longer and closer sightings. Basically, if the quality of your sightings are better, it will lead to better photos. If your subject is on the wrong side of the photographer, drive past, turn at a safe distance and come back prepared for the photo session.

Camera-shake is the wildlife photographer's worst enemy. Because photography is permitted only from within the vehicle, it prevents the use of tripods (unless you are in one of the safari jeeps) . So steady your camera with a beanbag or rest your hands on the window. What is a beanbag, you may ask? It is a small pillow-shaped bag full of, what else but dried beans, although rice is a common substitute.

This bag, when draped across the vehicle windowsill and the camera rested on it, offers remarkable stability. In Yala, you may often see seasoned wildlife photographers driving around with platforms attached to their windows. This is not to rest their elbows on, but to hold the beanbag.

Lighting in Yala can be tricky. Throughout most of the year, the lighting is good, but light fades fast in Yala, so be prepared to use fast film, assuming your lens is not fast. Fast film has more grain, but is more useful in low light conditions. Modern fast films such as 400 ISO are relatively low in grain. This is fine, if you are not planning to publish your images. For most photographers a slightly grainy image is better then no image at all. In the dry season dust can also be a problem in Yala, so remember to cover up your equipment with a soft cloth. Remember that in the dry season life is concentrated around the waterholes, so be prepared to spend sometime at these water holes. Keep yourself informed of the latest animal movements by asking either the Wildlife Department guide or the naturalists at the Yala Safari Game Lodge. (There is a useful wildlife sightings news board at the Game Lodge). This will give you a head start in your search.

One single factor will determine your long-term ability as a wildlife photographer and that is patience. You can not expect to be lucky all the time nor can you hurry wild animals. I had to wait hours in the hot sun for my best leopard sighting. Never alter the behaviour of your subject. Don't disturb nesting birds or provoke elephants to charge for a photo. Use common sense when you intrude into their lives.

The last but most important lesson is to enjoy yourself and enjoy the bounty of Yala. n

Leopards

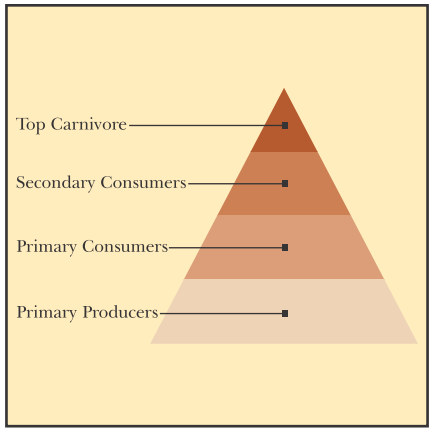
No elephants for me, please, I'll take leopards!

Using the top carnivore as a keystone for conservation

SRIYANIE MITHTHAPALA

The other day, in my continuous and losing battle to keep my bookshelves in order, I found three management plans written for the conservation of elephants in Sri Lanka. I shall not write about their content (which, over three successive decades, was much the same) nor how much of these plans have been implemented (on a scale of 1 to 10, possibly 0). What I shall present in this essay is the point of view that although much attention has been paid to this charismatic species, our focus in Sri Lanka should be directed instead to its top carnivore - the leopard, *Panthera pardus*.

In an ecosystem, all species that eat the same type of food such as herbivores, which eat plants, belong to a single trophic level. Because some energy is always lost in metabolism and waste products, each trophic level can support a smaller number of animals than the previous trophic level. This results in decreasing groups of numbers that form a pyramid, known as the ecological pyramid of numbers. At the lowest and most numerous level, are the primary producers, plants (see Figure). At the next level, lower in numbers but higher on the pyramid, are the primary consumers, herbivores. Next come the secondary consumers, carnivores, still fewer in numbers. At the very apex, very scarce in number, are the top carnivores – a single, 'reigning' species of predator. In 1989,



the late and great mammalogist, John Eisenberg wrote '*The removal of a top carnivore from an ecosystem can have an impact on the relative abundance of herbivore species . . . In the absence of predators, usually one or two herbivore species come to dominate the community. The consequence is often a direct alteration of herbaceous vegetation near to the base of the food web. Top carnivores have an important role to play in the structuring of communities and ultimately of ecosystems. Thus, the preservation of carnivores becomes an important consideration in the discipline of conservation biology.*'

Since Eisenberg's far seeing observation, catch-phrases and terms have been coined to highlight this role of predators. Top carnivores have been called 'keystone species' like keystones in ancient buildings (prior to concrete and the advent of lintels), which, because of their position, held up the wall over the door and with it, the entire room. Top carnivores, like keystones, are believed to 'hold' or 'maintain' the ecosystems in which they exist.

Because they 'maintain' the ecosystems of which they are a part, top carnivores function much like umbrellas, which provide shade, to afford protection to the ecosystem.

In the 1990s, another catch phrase entered the terminology of conservation biology: 'top down conservation' indicating that the processes that maintain ecosystems are exerted from the topmost level of the ecological pyramid to the bottommost level.

I do not believe that it is an issue whether one uses the phrase keystone species or top-down conservation. What is important is that it has been proven that predation, as renowned big cat specialist John Seidensticker says, 'plays a pivotal role in structuring and preserving biodiversity in terrestrial communities' and that 'critically endangered populations of top carnivores are indicators of . . . declining ecosystem[s].'

Notwithstanding their critical role in ecosystems, historically, large carnivores have faced multiple threats from humans. Often, cats such as pumas (*Puma concolor*) in North America, were viewed for several centuries as serious threats to livestock and considered vermin. Bounties were placed on their heads and they were hunted and extirpated in many areas of the US. Other top carnivores, such as tigers in Asia, were threatened because they were considered prized game species during the period of the British Raj. This 'sport' continued into the 1960s and it is reported that from the 1950s to the early 1960s, trophy hunters killed more than 3,000 tigers. Mercifully, these practices were halted and made illegal in the 1960s and 1970s.

More insidious was an ever-burgeoning human population, which stripped forests to make way for its development; fragmented ecosystems so that once contiguous forests lay in bits and pieces; and then degraded most of what was left. Large, vagile (far ranging) carnivores such as tigers who are known to travel 8 –24 kilometres in search of prey and have home ranges in the far East that extend up to 1,000 square kilometres were suddenly 'cabin'd, cribb'd, confin'd' in isolated patches which restricted their movements and exposed them to new and menacing dangers: direct conflict with humans and their livestock that led to poisoning, hunting and killing; exposure to new diseases from livestock; death due to road accidents because highways were built between habitat patches; and increased poaching as a consequence of an ever spiralling demand for skins and for body parts that are used in traditional medicine.

Isolated populations were also at risk of homogenisation of their genetic diversity because they were unable to disperse and breed outside their natal areas.

There is no doubt about it - top carnivores are in trouble.

Unlike us Sri Lankans, who have spent decades theorising and focusing on elephants and are now attempting a hodgepodge of projects to conserve biodiversity in Sri Lanka, our neighbour India decided some thirty years ago to focus on their top carnivore, the tiger, *Panthera tigris*.

In 1973, based on the recommendations by a special task force of the Indian Board for Wildlife, the Indian government, then lead by Indira Ghandi, launched Project Tiger at Corbett National Park. Its aims primarily were to maintain a viable population of tigers in India and to preserve for future generations areas that carried tigers as being biologically important. Specifically, the government banned habitat destruction, habitat degradation, poaching of any species including prey species (which contributed to a decrease in the prey base), cattle grazing, and harvesting of forest products in these areas. It relocated entire villages to set aside nine reserves, with extensive buffer zones to ensure the increase of tiger populations. These reserves have since increased in number to 23.

Since its inception, scientific and long-term research has been carried out in many Project Tiger reserves not only to find out details of tiger biology and ecology, but also on the biology and ecology of its prey species. India now has an extensive database of knowledge of its top carnivore, so that solid scientific management plans can be formulated and implemented not at the level of ecosystems, but at the level of landscapes i.e., not working within National Parks but on a national scale and regional scale, to ensure the

conservation of not only its top carnivore, but also a multitude of other native and endemic species.

Project Tiger, like all projects, has its flaws and periods during which it has limped along, faltered, stopped and started again. There are endless debates about the science of research carried out in some national parks and the national estimates of tiger populations which have been obtained by census, not sampling (the latter is the more rigorous, repeatable and scientific method of estimating populations). Project Tiger is by no means a perfect model. Yet at the end of the day, Indian scientists and wildlife managers, have data on which to base their efforts of biodiversity conservation. Because the current trend in conservation biology has shifted from the conservation of ecosystems to the conservation of landscapes that cut across state and national boundaries, Indian scientists and wildlife managers are able to contribute effectively and meaningfully to global efforts of saving the tiger and to global efforts of biodiversity conservation.

We, Sri Lankans, on the other hand, know very little about our top carnivore, the leopard. Except for a seminal study in the 1970s by John Eisenberg and his collaborators on the ecology of leopards in Wilpattu National Park, a study in the 1980s by Charles Santiapillai and others in Yala National Park and ongoing studies in Yala by Andrew Kittle and Anjali Watson, and also by Ravi Samarasinha, we have scant knowledge of the exact distribution, home range size and use, dispersal patterns, habitat use and prey selection in the rest of the country. We have no national picture of the leopard – what we have is piecemeal knowledge.

In the '90s, my doctoral research showed that the Sri Lankan sub-species (*Panthera pardus kotiya*) is unique genetically and morphologically. We know that in other parts of the world, the leopard is a highly adaptable cat, which lives in a variety of habitats from the cold Russian far east, to the humid cloud forests of Malaysia, to the deserts of Namibia. We know that in most parts of the world it eats medium sized hoofed mammals but can also preferentially eat primates or even small mammals when hoofed mammals are scarce. We know that unlike tigers, it can live in close proximity to humans.

With such a diversity of habitats in our island, is our unique subspecies of leopard as adaptable in these different habitats? We know that there are leopards outside national parks, living on the edge of survival, as we have heard of reports from Hantana of leopards coming into villages to prey on dogs. But do we know exactly where else they are, in what kinds of habitats they live and how many of these leopards there are in the whole island? Apart from counts from Yala National Park, do we have scientific estimates of leopard populations in other protected areas? Do we know whether Sri Lankan leopards switch prey in lean times? Apart from Yala National Park, do we know how far and where leopards travel daily? We know their home ranges in Yala National Park, but what are their home ranges in other parks, in other habitats? We know that shooting, spearing, snaring and poisoning leopards is increasing in Sri Lanka, but do we know whether there are specific threats in specific areas?

We need to know these answers, because each bit of research fits like a piece in a jigsaw puzzle to give us the entire picture. We need to learn about this unique sub-species across its entire range in Sri Lanka, so that we can develop the big picture that transcends park boundaries and ecosystems. We need to know these answers because of the reality conveyed in the axiom 'good conservation is based on good science'. Without data, we have no basis for conservation.

It is essential that the conservation of the leopard, our top carnivore does not follow the path of the conservation of the elephant, our flagship species in Sri Lanka. We need to ensure that the road map for the conservation of leopards is not only based on good science, but is results-driven, not activity-driven. We need a goal and a vision for the conservation of leopards which we should all work towards, using a holistic approach that includes all stakeholders. For several decades, Sri Lanka has suffered from the affliction of preparing conservation plans that are rarely implemented. We suffer from the disease of excessive workshops and flurries of activities that are never sustained. We need to break from that stranglehold for the conservation of leopards.

An introduction to the behaviour and ecology of the leopards of yala

ANDREW KITTLE AND ANJALI WATSON

The following information is based on the results of an intensive study that spanned a 20-month period from October 2000 to June 2002. Involving both day and night time fieldwork. This research has provided an insight to a number of important aspects of this arid zone population of leopards. The scope of the study included population size and demography, home range attributes, feeding ecology and behaviour. This information is essential for the development of an efficient and informed conservation strategy – something that will be required in Sri Lanka in the near future if this magnificent feline is to be safeguarded from the combined pressures of habitat fragmentation, encroachment and poaching. This article focuses on the demographic elements of the Yala leopard population. The resident population numbers are specific to the time period of the study. However, it is posited that this population will remain relatively stable with only minor fluctuations if habitat conditions in Block I remain as they are.

We shall continue our study of leopards in other selected sites on the island, in differing habitats. It is only with knowledge of leopard populations in the varying habitats in which they are found, that a conservation strategy can be developed for the Sri Lankan leopard.

Adult Males

Adult male leopards in the study area occupy home ranges, on average, 38 square km. These are considerably larger than adult female home ranges. In Yala National Park, Block I, there are about four (3-5) resident adult male leopards, each one having a home range that overlaps the home ranges of approximately five females. Adult males share portions of their home ranges with other adult males; however, they also possess 'core areas' which are not shared. Males frequently patrol their territories, often repeatedly using certain roads or pathways. They use scented secretions as well as urine and even faeces to mark important areas of their range. This form of non-visual communication allows leopards to 'talk' to each other without actually meeting face to face. It is thought that this reduces the number of meetings and therefore, aggressive interactions between animals. Adult male leopards hunt for themselves, but they are also frequent scavengers, eating the kills made by individual females within their range.

Adult Females

Adult females in Yala National Park, Block I inhabit small home ranges (on average, 15 square km of core area)

due to the relative abundance of prey and year-round access to freshwater. There are approximately 19 adult females resident within this Block each of whose home range is overlapped by at least one adult male. Unlike males, female leopards do not have to search far and wide for new territory after they reach adulthood; instead they settle down either within the range of their mother or in an area adjacent to hers. The most important role that a female leopard plays within the population, is as a provider. Starting with her first litter – usually of two or three cubs – at the age of 33-36 months, a female leopard will spend most of her life providing for her young. She will remain with each set of cubs between 16 and 24 months, at which time she will give birth to the next litter. Females prefer rocky areas with caves and ledges for cub rearing and these outcrops are often included within an individual's home range. Female leopards are generally regarded as better hunters than their male counterparts as they must hone their skills in order to provide continually for their cubs.

Sub-adults

Generally, leopards are considered sub-adults from approximately 18–36 months of age. During this time, they gradually stop relying upon their mother and begin to seek out a home range of their own. For females, this means staying within or next to their natal or birth area. For males, however, this means dispersing from the natal area in search of available land in which to establish himself. Usually, a young male will make several forays from his mother's home-range, during which he effectively scouts out the lay of the land and the structure of the population in the surrounding area. These forays can last for a few days to several weeks, but initially, the young male always returns to the natal area. The young males are, by necessity, entering the home-ranges of established adult males and frequently crossing paths with other young males on a similar search for unoccupied territory. Consequently, the probability of conflict is increased. This is a vitally important time for these sub adult animals and mortality is often high during this age period. The age of dispersal for this age of animal is often dependent on prey abundance and habitat quality. In our study area, dispersal occurred at approximately 26 months of age, with variation between locales.

Cubs

Most leopard cub litters consist of two or three animals born after a 90–105 day gestation period. In Yala National Park, Block I there does not appear to be a particular birth season and young are born throughout the year. During the first couple of months, the cubs are hidden away in a den area, which is usually located in a rocky outcrop in close proximity to water and prey. Leopard cubs are dependent on their mother's milk for the first two months of life before being introduced slowly to meat. It is difficult to determine the mortality rates of young cubs as they are infrequently seen during the early stages of life; however it is estimated

that almost half of the cubs born die within the first year. Cubs rely entirely upon their mothers for food. However, they tend to be very curious creatures and can be seen frequently stalking all manner of animals from peacocks to tortoises, pond herons to land monitors. When first born, leopard cubs are a light grayish colour, only attaining the typical spotted tawny yellow coat after approximately three months. In addition, they have blue-hued eyes, which similarly change to the traditional yellowish hue, as they get older. During our study, 23 cubs in 17 litters were observed. At the very end of the study period, another litter was born in the north west of the park and the two cubs (one male, one female) have been seen by many visitors.

Sightings

The most frequently seen leopards in Yala National Park, Block I are young males, either cubs or sub-adults. They are much less elusive than either adult animals or their female siblings and often appear as interested in observers as observers are of them! With the exception of kill sites or rock sightings, most observations made at close proximity for long periods of time involve this age and sex class. When they get older these animals generally become more secretive, which is a necessary trait for survival. n

Under the Jetwing Research Initiative, Andrew Kittle and Anjali Watson were hosted at the Yala Safari Game Lodge for over a year, during the conduct of their study on the leopards of Yala.