Fieldcraft

Nature Interpretation Guide for wildlife, Ecology and Behaviour Students with comments on Field safety

By

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Cover Page

Track of a leopard on the sea shore, Yala National Park
It is easy to determine the size when there is a reference object.

Photographs of this e-Book

In addition to the photographs taken by my students and me during field workshops, there are many photographs in this book provided by courtesy of the Herpetologist/ Wildlife Photographer Mr. Mendis Wickramasinghe and Mr. Dinal Samarasinghe.

Preface

This guide is an educational resource that provides the basic knowledge required for students and enthusiasts who work in the field.

Firsthand information given will be helpful to those who work among wetlands, forests, srcubland in the wet, intermediate and dry zones of Sri Lanka.

This guide will provide you with the fundamental knowledge to assess these environments which would be helpful to collect accurate information without changing the behaviour of animals and facing serious risks in the field. Information provided will ensure minimal disturbance to the animals while ensuring their welfare.

This guide has summarized crucial information that would be necessary to interpret nature accurately. All photographs are from habitats of Sri Lanka collected during field work in the past. We have shared our experience in the field with as many facts as possible to allow you to practice relevantly while you are in the field.

The information will help you minimize instances of field crisis during field work as the guidelines have been tested with students and researchers during the past 18 years without inflicting any damages on the participants except during few occasions where participants were affected by minor injuries

due to bruises and cuts, one snake bite, one wasp attack and one occasion of eye allergy due to contact with caterpillar bristles. Above injuries were mainly due to the negligence of participants and could have been avoided if they were more vigilant and adhered to the fundamentals.

Fieldcraft has helped us to avoid danger associated with the wild at all other times and has also helped us collect important information useful for wildlife conservation.

Fieldcraft means field skills, however, certain basic field skills such as measuring distance or estimating distance or height, finding directions which are integrated components of fieldcraft will not be discussed in this guide. Basic Field Techniques will be considered separately. Only the interpretation of nature, based on signs and symptoms of animals will be discussed using descriptions, illustrations and photographs. This guide describes the major signs and symptoms produced by wildlife species in Sri Lanka.

I am extremely grateful to Mendis Wickramasinghe, Dinal Samarasinghe and D S Lelwala for providing me some of the important photographs that I have used in this this guide.

Happy Nature Watching!

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What is fieldcraft?

In simple terms, fieldcraft can be defined as the skills necessary to be adopted if one needs to successfully interact with the environment while remaining undetected. It is a skill which enables people to study nature with maximum safety and accuracy of observations.

Fieldcraft is the key to successful field work. Being armored with field craft is more important than being armored with field equipment. Thus, it is of great importance to those who study wildlife, photography wildlife as well as to those who engage in forest hiking.

The 3L's of field craft are Listen, Look and Learn. Thus it teaches the observer to look around, become engrossed in nature and not merely become dependent on other devices that may do the job for you. It teaches you patience and requires common sense in order to be put into practice.

Fieldcraft is a tool that safeguards you by making you aware of what is happening around you. As humans we need to understand that in the wilderness, we inhabit an area unfamiliar to us. However, to the animals, it is their home ground and they will know when there are intruders. They will avoid you as much as possible and will never attack you in vain. Your duty is to minimize interfering with their normal behaviour and not to become a serious stimulus that would make them react.

Who is this guide for?

This e-book will be equally important for students and enthusiasts who work with nature. Fieldcraft is a key skill for people who work with nature and is a must skill for those dealing with nature based studies, enthusiasts who visit natural habitats collecting information or for those who simply enjoy nature. The information will help you to interpret nature and safeguard yourself, both at the same time.

Although nature appears to be calm and quiet, a slight disturbance caused by you could change this tranquil. For instance, until you do not disturb, a hive of wasps would be harmless and interesting to observe. However if you disturb the hive, this could seriously affect your survival as well as that of your team due to stinging (attack). It would be pleasant to watch a bear from a distance; however, if you encounter one in the wild due to your negligence and without expectation, it could be really bad experience. If you do not read nature well, you will end up with unsuccessful findings. You will tend to take a large footpath inside a forest; however, it could be a regular path of a wild elephant.

Thus as someone having a close relationship with the wilderness, knowledge on fieldcraft will definitely come in handy.

Some animals have mastered the sense of hearing, while certain other animals have mastered sense of taste as chemical receptors and touch the feel as a pressure difference to understand the surrounding. An owl will see or hear you at a distance while a snake will detect your presence as vibrations well in advance. Humans, being animals that came out of the wild and converted the forests to villages and towns, have almost lost their devotion of the senses as well as the knowledge and experience they had of the wild several generations ago. However, we human beings have mastered the sense of vision over others. Unfortunately, though the willingness to experience wilderness still remains among all of us it is being suppressed by learned fear and uncertainty of the wild. This guide will attempt to highlight such hidden aspects and let you practice some of the traits that still remain in our soul but not utilized by us often due to unawareness to help us deal with the uncertainty.

Why is fieldcraft important?

Just stand still for a few minutes and observe what you can see, hear and smell. You will find that you are not alone. You will feel that there are many things around you, many happenings etc. depending on the environment you stay. However, keep in mind that there are more that you have not detected or encountered. Since you are part of the environment of your home garden you will not face many problems to detect those. Also, since the animals are habituated to some extent to your presence you will be more successful in collecting information.

If you make a checklist of things you see, smell and hear while you are in your home garden; you would have heard birds chirping & singing, squirrels squeaking, bees humming, people chatting, winds gushing etc. You might have smelt excreta of cats, urine of dogs, burning of dead leaves, cooking in kitchens, etc. You may have seen feathers of birds on the lawn, droppings of geckos, shredded skin of snakes, nest of birds, etc. What do all these things tell you? There is life around you in the home garden.

Fieldcraft will provide you with information about the presence or absence of animals in the field.

If you were asked to make a checklist of things you see, smell and hear while you are in a forest patch, you will be more vigilant because you are novel to the environment. You have

curiosity, fear or uncertainty associated with the exercise. Likewise the animals will be vigilant and alert much more than you. Thus, minimizing you becoming a stimulus to them is important to collect precise and sufficient information. Slight disturbance might permanently make a shy and rare animal evade from you and not recording.

Knowing how to blend with the environment is an important fieldcraft.

Present-absent data about wildlife will be very useful to avoid danger. Fieldcraft will successfully generate this information. For instance presence of elephant dung will indicate that you should take extra care and be alert at the location. Presence of a hive of a wasp means you should take precautions to avoid disturbing them as unnecessary disturbances could make them attack you. Touching beautiful hairy bristles of a moth caterpillar might be tempting but could irritate your skin too. If you are in a mangrove ecosystem if you happen to see *Exocaria* (Thela Keeriya), make sure you do not trample the plant as latex of the plant could irritate your skin. When you are in a marine environment you should not contact the floating jelly fish (*Physalia* sp. Portuguese Man o' War) and sea urchin bristles as the venom may be poisonous to you.

Fieldcraft will assure you safety in the field.

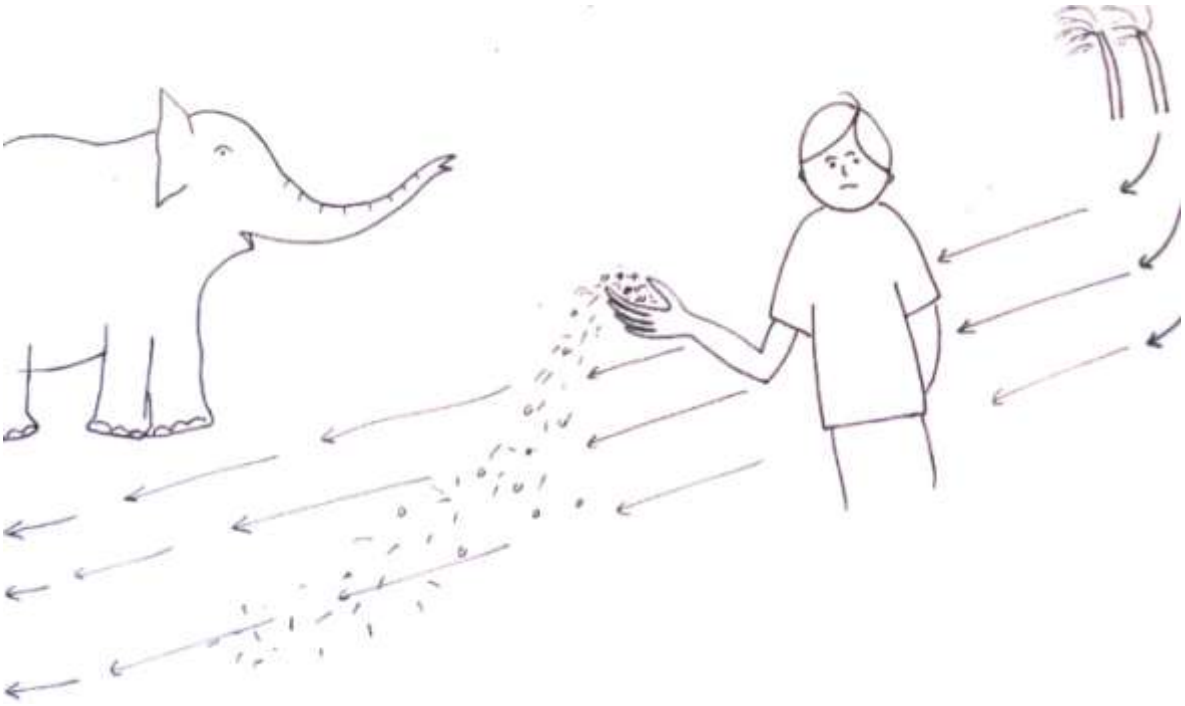
More facts….

In the wilderness we expect to see wildlife since we have trained our sense of vision. However, what you see in the wild could be a very small portion of the actual picture of wild things you could experience. You will see trees of different nature, water bodies, streams flowing, large mammals, crocodiles and some large birds. But you will lose the taste and the coldness of the breeze, whisper of the water, songs of birds and flutter of the dove, since you are used to relying merely on the sense of vision.

To see greater arenas of wildlife you will have to spend a great deal of time in the wild, which is not practical at present especially if you have not dedicated your time for this. However, certain facts are important if you hope to do so.

Most animals are always vigilant about their surroundings. They will smell you before they see you. Hide from you before you see them. Their senses have been trained and have evolved over time to sense danger and uncertainty before they actually see it. This is why we need to be more cautious. For instance, it is necessary for one to be familiar with the wind direction so that by staying against the direction of the wind, we can prevent our scent from being carried towards any wild animal as our odour could make them avoid our presence.

To determine the wind direction you don't need an anemometer. Just throw some dry debris in the air and observe the direction in which they fly.



Checking the wind direction

If your study requires you getting close to wildlife, you should make sure that you wear appropriate clothing, know the wind direction, stay low, observe silence, avoid artificial scents, and be familiar with the noises made by other animals. Knowledge on these small wild things will enhance and enrich the experience you get in the wild, while you see more evidence of the presence of animals and their behaviour.

Fieldcraft will help a field biologist to work in the environment with minimal disturbance.

Fieldcraft provides useful information for field biologists

- Grey languors chattering nervously in the trees above may indicate that a leopard is in the vicinity. Red Wattle lapwings making ‘Did you do it’ call means that there is an intruder in the environment. Barking or the Alarm call of a deer signs that a predator is around.
- Claw marks on tree trunks indicate that it is a habitat inhabited by bears while claw marks at a few places on large trees could be due to clawing by a leopard.
- Large domelike area cleared or trampled within the forest may indicate that a wild elephant has rested in the area. Further, dung will make sure that it is an elephant. Thus it will indicate that the observer needs to be cautious when approaching such areas.
- Used bullets on the ground states that hunters are around or it could be due to training activities of military troops.
- A stage formed by sticks to dry flesh indicates that poaching is going on in the area. A hide close to a waterhole indicates that hunters can be expected during dusk and dawn looking for animals visiting the waterhole.
- Different sizes of footpaths inside the forest may indicate regular paths of wildlife and the size of the path and nature will give you information about the species.

- Small burrows dug on the ground indicates the presence of rats or bandicoots.
- Numerous small borrows close to a waterway or stream will indicate the presence of crabs.
- Deep digging by claws and bitten roots and tubers indicate that there are porcupines around.
- Claw marks around clayey soil or anthills indicates that Pangolins inhabit the area.
- Area devoid of grass and ground cover and pellets of Axis deer droppings will indicate a regular resting area of a herd of deer.
- Many faecal droppings of porcupine may indicate that their dens are around.
- Latrine sites could belong to Toque monkey or Grey Langur.
- Latrine sites along waterways may belong to Otter. Characteristic stale milk odour will confirm the identity of otter faecal matter.

Empty Bullets fallen on the ground indicates military exercises in the vicinity.

Ecological Field Techniques and Fieldcraft

Fieldcraft can be considered as a tool that can be used to make research, collection of data or making other observations easy.

- Territorial Mapping is a technique that depends on fieldcraft where identification of the call or song, identification of urination signs are necessary.
- Pugmark Census relies on fieldcraft. Male and female pug marks of large cats can be differentiated.
- Pellet group counts, a technique we often use to determine density of ungulates such as Axis deer, Mouse deer and Sambur needs accurate identification of pellets produced by them.
- Pellet group counts are used to determine habitat utilization of ungulates. Again, identification is the key word.
- Circular Plot Counts of birds need accurate identification of calls and songs which comes under fieldcraft.
- Abundance of footprints or faecal matter will be used to determine the relative abundance of wildlife species of a habitat.
- Inventorying of species richness is facilitated by direct evidence such as calls of birds, dung, tracks, pug marks etc.
- Fieldcraft will facilitate abundance and behaviour studies.

Field craft: A skill to be gained and practiced

Fieldcraft is not a skill that can be just taught in the classroom. It should be practiced. This guide will assist you to practice this *in situ*. You will also find that there are many facts that cannot be learnt from a guide as words could not be strong enough to explain those; however a slight experience in the field will help you to understand the facts well. Also, experienced persons and local folk will give you important information related to fieldcraft. You should be humble enough to get it from a local person but make sure that you double check the validity as certain local names of wildlife may confuse you and influence the accuracy of the information. For instance, local people may use synonyms to describe two or more different species.

- Foot prints and fecal matter are the commonest signs of the presence of an animal.
- If you carefully observe, you will see a termite hill breached by a pangolin although you have never seen a pangolin in the wild.
- You will see fallen spines or debarked trees by porcupine during the day since they are nocturnal in behavior.
- You will hear the ‘crick’ or ‘whistle’ of a Slender Loris at night and you will be able follow its vocalization to see it.

Interpreting signs and symptoms

Certain ecological or wildlife study techniques completely depend on the interpretation of signs which are left behind in the habitats by animals.

- Fecal matter

  Fecal matter of different species is different from each other in their smell, shape, size, and composition. Scat of cats has its own hair and unique odour. Some undigested particles such as claws, nails, hair, scales and bones can be seen in fecal matter if you carefully study them which may give evidence of its food preference and food availability in the area. For example, during the fruiting season of certain tree species, seeds of it become the major part of feces of the sloth bear.

Barking Deer Pellets x 0.8

Note the polished appearance: Axis deer pellets are less elongated and slightly larger in size.

Bear Scat

Bears have a sweet tooth. They often feed on seasonal berries or pods that are abundant in the area, thus, often composed of seeds of such vegetation

Porcupine Droppings: Faecal matter of the porcupine is very characteristic as it is composed of very fibrous, dry material arranged as piles of several parts.

- **Elephant dung**

  Freshness of elephant dung could be determined by feeling its warmth by foot. Age of the dung could indicate the presence of elephants in the vicinity. (Details related to detecting elephants will be discussed in detail later, in this guide)

An old dung pile of an elephant: The amount of decay and presence of germinating seeds would indicate the age of dung.

- Foot prints

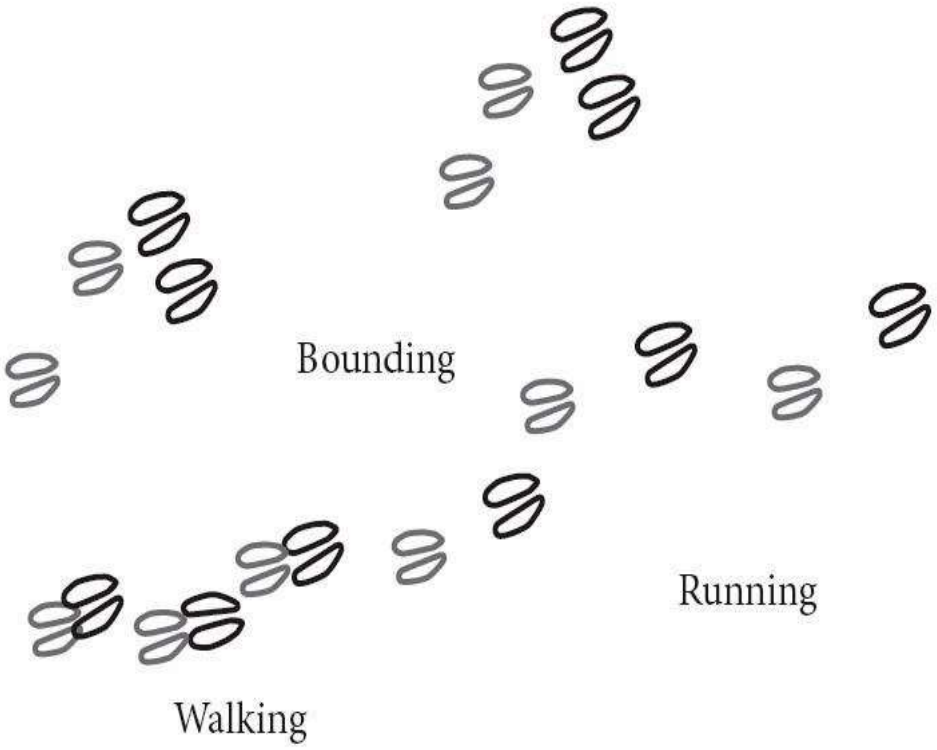
  Foot prints of different species vary from one another. Ungulates have hoof marks and the relative size of the foot print can be used to identify the species. Artiodactyls such as Mouse Deer have the smallest hoof marks, while Spotted Deer has medium and Sambur has larger hoof marks. Buffalo and cattle foot prints are comparatively wider than the deer thus can be easily differentiated. Wild Boar has two smaller marks behind hoofs made by projections in its foot print.

Narrow hoof marks belong to Axis deer while broad ones are of cattle. In addition, a foot print of a peacock appears on the picture.

Hoof Mark of a Wild Boar: Note the larger gap between hooves in front and two marks on the rear.

Elephant and Buffalo tracks: Muddy substrate is often good for tracks and worthy is worthy to be examined.

Study of the gait will tell us whether the animal has rested, walked, or fled. It is worth to note the distance between tracks to get this information.



Foot prints of cat family or pug marks can be easily differentiated from foot prints of the members of dog family as claws will not be visible in pug marks. In the foot prints of cats, claws are hidden when walking but retracted during a pouncing gait. In dogs, jackals, mongoose and civets, claw marks are visible on the foot print.

Foot print of Mongoose: Note the claw marks

Pug Mark of a Leopard: No claw marks visible

Pug Marks of a fishing cat

In order to conduct pug mark census of cats you should be able to differentiate pug marks of the Leopard, Fishing Cat, Jungle Cat, etc. In Sri Lanka, it is easy to differentiate leopard pug marks as other members of cat family of are remarkably smaller in size.

Foot prints of large cats can be used to identify the individual using some specific measurements and ratios. Male and female foot prints too are different. Therefore, foot prints of large cats can be used to estimate the population sizes and home range etc.

Pug Marks- Leopard (Yala National Park Sea Shore- Buttawa)

Difficult to judge the size since a reference is not there, however, human foot print at one corner will help us to understand the size. When making photographs it is always necessary use a reference object.

The cover page has the same pug mark track with a reference object.

Track of a mongoose

- **Latrine sites**

Latrine sites are sites which are dedicated sites for defecation and are used to defecate in a regular manner thus resulting in faecal matter of different ages.

There are few animals that use latrine sites. Otter is a good example. Such latrine sites could be located along streams and rivers. It is easy to identify the latrine sites of the otter due to residuals of crabs and fish which they feed on and especially due to the characteristic smell similar to stale milk.

Otter Faecal matter

- **Mud rubbing**

Elephants, wild boar and buffalos love mud baths to reduce their body temperature and once they come out of the mud and while on their way to some other place, they rub their bodies against large trees. Mud on the tree trunks and height of mud from the ground may indicate what animal it is.

- **Wallowing signs**

Buffaloes, wild boars and sometimes samburs wallow creating good signs for their presence.

A wild buffalo wallowing

An old wallow of a buffalo

Tracks of elephants are quite often important if you are working in the dry zone and intermediate zone. Size will indicate whether it was a herd with infants or not.

Carcasses, Skulls, Bones

Dead bodies of animals intact or remnants will provide good evidence for the presence of them. The nature of damage might allow additional information for example presence of predators etc.

Deer fawn eaten by a leopard at Maduru Oya National Park.

Type of attack will indicate the type of predator.

Dead shrew: Shrews are nocturnal animals, cryptic in nature, thus carcasses provide valuable information about them.

Wild Boar Skull: Very long Mastoid processes, dental structure with large canines and dentitions will confirm the identification. Zygomatic arch is not as developed as of carnivores and turbinal bones are not complex as of carnivores.

Lower Jaw of cattle: Presence of diastema and structure of teeth will indicate that it is of a herbivore. The size and weight of the bone is useful to identify the animal as cattle.

- **Bird Songs/ Calls**

  Territorial mapping of birds require identification of birds by their song. It is interesting to know that the endemic territorial Brown Capped Babbler will make ‘Pretty Dear” call while local people will call it ‘Ridee Diyan’. The migrant Indian Pitta will make ‘Aevith Giyaa’ call particularly at dusk and dawn. Red wattle lapwing will make the “Did you do it’ call while the endemic Jungle fowl makes ‘George Joice’. If you hear two birds calling within or around a rainforest or monsoon forest it could be the endemic Spur fowl which has an adaptation called bubbling while vocalization. This vocal adaptation will ensure that the exact location of the bird will not be detected by predators. In monsoon forests, dawn and dusk is filled with the song of White Rump Shama and in a Rainforest this would be the call of a Spotted wing Thrush. If you are around a wetland, the characteristic calls of Redshank, Curlew and Stone Plover are unmistaken.

  Calls made by Owls are extremely useful when locating them. Brown Hawk Owl, Fish Owl, Scops Owls, Forest Eagle Owl, Barn Owl and Wood Owl can be easily identified by just listening to their call. Brown Hawk owl and Scops owls are garden birds. Scops owl makes a cough like ‘Humf..Humf…Humf…call. Wood owl will make a very deep Hooom…Hoom…Hoom…call that can be differentiated from the hawk owl. Barn owls make a very characteristic screeching call specially while they land and are on flight.

Forest eagle owl which is known as the Devil bird makes a deep screaming call from the throat which is unmistakable. Two sympatric Nightjars in the dry zone the Jeordons Nightjar and Indian Nightjar make characteristic calls which allow us to identify them without seeing them: Marble dropper is the Common Indian Night Jar which makes a sound similar to dropping of a marble onto a cement floor. The presence of Scaly Thrush in Sinharaja forest is possible by its characteristic call that could be heard early in the morning.

An audio guide should be used to become familiar with bird calls which are very useful for species identification. For instance, presence of Legg's Flowerpecker and Small Flowerpecker could be easily identified using the call. Yellow browed bulbul and Black capped bulbul can be identified by the call. The Only confusing species is the Drongo which can imitate calls of many birds and sometimes other animals. Crested drongo in Sinharaja is known to imitate more than 40 calls of other birds.

Presence of Shikra or Serpent Eagle could be determined by just listing to the call. If you happen to see a flock of wild fowl Whistling while flying, it would be the Whistling duck and it is the wings that make the whistling noise.

Soaring of birds such as pelicans or storks during noon hours indicate that there is a wetland.

Audio Guide prepared by Deepal Warakagoda for Sri Lankan species would be an appropriate guide for calls and songs.

V Shaped flight of Ibis

- **Calls of other wildlife Species**

Birdlike calls you may hear from rocky and moist areas in the wet and intermediate zone will indicate the presence of the Rock Frog Nannophrys species.”Roooo rooooo…rooo…”noises coming from a wet and intermediate zone marsh indicates the presence of the endemic Corrugated Frog. Such calls also indicate that the area is rather unpolluted.

Also, the characteristic bird like call of *Nanophrys ceylonensis* will allow you to locate the animal without doubt. This is very

useful as such rock frogs camouflage themselves hence could be very difficult to be located by the naked eye.

Feathers, Spines, Scales and Hair

Feathers, spines, scales and hair are evidence of the presence of certain species and can be used to identify them. Having clusters of them is evidence of predator attack or hunting pressure. Pangolin scales and spines of porcupine are good examples.

Spine of a porcupine

Important points

In addition to the signs and symptoms mentioned previously, there are certain characteristic features that you may observe in the field that will be important indicators of the presence of certain forms of wildlife.

Presence of elephants

Special emphasis is given to elephants as they could be a potential threat throughout the dry zone and some parts of the wet zone. Signs of elephants are not difficult to find if you follow basic rules in the field.

Noises

Usually it is very difficult to detect a lonely elephant as you cannot hear it breaking branches because they maybe patiently waiting for you to disappear from the site, but if you are vigilant you would hear them flapping ears to emit heat from their body. However, elephants can control ear flapping thus you could miss this as well however; noises made by their stomach cannot be controlled by them and thus with extra care, a lonely elephant too may be detected. I learnt this from one of the trackers of the department of Wildlife Conservation (Mr. Siyaneris, Wasgamuwa National Park, 1997) who made me aware of detecting the presence of elephants while searching for elephants during mid day.

Dung

This is the best sign for the presence of elephants. Once you reach ‘Sri pada’ during the season via the Kuruvita path, you may notice elephant dung soon after you pass Seetha Gangula

indicating that elephants have inhabited the area during out of season.

Size of the boluses of dung will roughly indicate the size of animals as infants and juveniles produce much smaller boluses than sub adults and adults. Presence of many dung piles indicates that the location was occupied by a herd of elephants while isolated dung will indicate the presence of lonely elephants. You should be more cautions when you happen to see such isolated dung piles as lonely elephants are often males and they have a tendency to attack people.

The dryness of the boluses will indicate the time those were produced. If those are associated with the dung beetle and other fauna it indicates that the dung was produced few days before however there is a probability that you might see them. Presence of germinating seeds will indicate that the elephants have inhabited the site some time ago.

Debarking

Barks of trees provide elephants a good source of calcium and other minerals which help to maintain their teeth, bones and especially tusks. A tuskers demand for calcium is much higher than that of tusk-less elephants thus they tend to debark more often than others. Certain tree species are more vulnerable for debarking.

Tusk Marks

Tuskers attempt to debark often leaving tusk marks on tree trunks. In addition, while feeding, tusks may damage the bark autonomously creating tusk marks.

Urine patches

Elephants make many signs of their presence. Fresh urinated areas often associated with boluses of dung are a good indication for the presence of them around you at that moment.

Musth

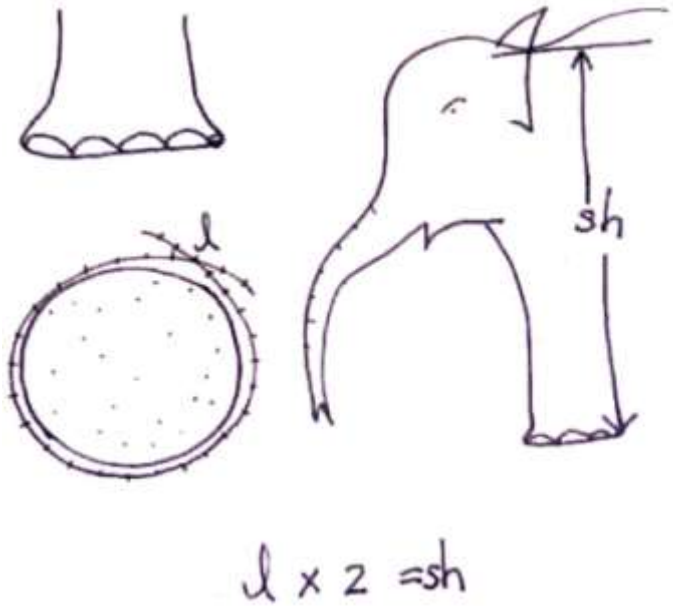
Once, we examined a characteristic pattern of water like material along the surface of the road of Raja Mawatha, Randeigala. The wave like pattern made by droppings of water like material was continuously seen for about 200m along the surface of the road at night. Ultimately we found that it was a urine mark produced by an elephant that fled after sometime due to the presence of another vehicle. It was not due to urination by the elephant but due to urine dribbling from the penis indicating that it was at musth. Dribbling is characteristic while captive elephants are at musth, however, it is not a common phenomenon shown by the wild elephants.

Presence of an elephant at musth could be easily detected by the characteristic odour emitted by musth secreted by its temporal glands. The phenolic substances in the secretion result in the characteristic aroma which helps us to detect the presence of such animals in the wild allowing us to take precautions to avoid any attack. Elephants at musth are known to be more aggressive in the wild similar to the captive animals.

Looking at the location of temporal glands below the ears of the animal will give you a good sign of its musth status as such elephants will possess clear wetness and swollen nature around the musth gland.

Shoulder height of elephant

Relative body size of elephants can be estimated using the measurements of its foot print. Its shoulder height is twice of its fore foot circumference.



- **Presence of Bats**

Day time roosts are the best direct sign of bats. In addition, presence of certain cave dwelling species can be detected by the availability of faecal matter on the ground. For instance, beneath large pictures mounted on a wall of a building you could find faecal droppings produced by microchiropteran bats such as *Pipistrelus* sp.

When you walk along corridors of buildings sometimes you many encounter seeds of fruits bitten and sucked by animals? These are signs of bats occupying the place. If you examine the roof or ceiling of the corridor you might locate a possible hook or crevice or gap that would allow bats to hang and feed on fruits that they have harvested. Legs of both megachiropteran and microchiropteran bats have a special tendon system to catch and hold on to food (fruits) automatically, and this process or catching mechanism does not demand much energy.

- **Presence of Primates**

Quite often we encounter many leaves fallen under certain species of trees, all leaves intact but devoid of the stalk. What could be the reason?

These are often leaves which have been eaten by monkeys. They simply consume the stalk of leaves as those could be rich in some aromatic substances.

- **Presence of Bears**

Presence of bears in the dry zone habitats could be detected by faecal droppings. Unlike scats of leopards and droppings of wild boars, bear droppings will contain many seeds. Especially

during the fruiting season of certain plants such as Ehela or Palu, bear droppings will be abundant of seeds of such species.

Bear droppings are larger in size than the grey langur inhabiting the same habitat. Wild boar droppings will consist of more tubers and fibrous matter than bears. Also the structure of bear droppings is quite characteristic.

- **Presence of Wild Boars**

Presence of wild boars in a habitat could be easily determined by two signs. The hoof marks are characteristic and can be differentiated from Axis deer, which makes a similar hoof mark but without two marks on the rear side.

Also, the presence of a wild boar is often indicated by digging signs. They dig quite deep into the soil looking for tubers and they also feed on any animal that would they encounter. Porcupine digging is shallower than the wild boar thus can be easily differentiated.

- **Presence of Birds**

Birds are good architects. They make unique nests. Some birds have communal nesting sites. Weaver birds make their nests close to each other. Kingfishers make burrows in river banks for nesting. Some birds use tree holes made by other birds such as wood peckers to lay eggs.

Nests are the best signs to predict the presence of a species of bird. Certain nests are very characteristic and can be easily identified. For instance, the nest of Baya Weaver is a complex

dome hanging from trees while the nest of a tailor bird is a composed to leaves stitched neatly together.

Nests of Baya Weaver

Nest of House Swift

Nest holes of birds: Parakeets, Myna, Barbets

Also the contents of nesting material may indicate the habits of a species

Other Nests

In addition to birds, certain ants, wasps and termites produce characteristic nests.

Other signs of birds

Eggs are characteristic to bird species. Size, shape, colour pattern etc. can be used to identify the species.

Egg of a Lark

Important Advise:

Never use tape lure to attract territorial birds as it is unethical. This practice is banned in many protected areas now including the Sinharaja Reserve which is a popular bird watching destination. For instance, in the past certain guides have played back the territorial call of the rare and camouflage bird- Frogmouth to lure them out of their well concealed natural daytime roost and show them to foreign bird watchers. Such exposure could make them vulnerable to predation by abundant daytime raptors. The same tactic has been used towards other territorial species such as the very rare Whistling Thrush.

Foot Prints of some birds could be used to identify the species. For instance, Peacocks, Painted storks, Adjutant having large foot prints might be important to field biologists.

Foot prints of wading birds: Plovers, Sandpipers, Storks are often found among land water interface where the substrate is soft enough to have them.

Snakes

Shredded skin of snakes gives good evidence for the presence of them. By examining the scale pattern it is possible to identify most of them in a reliable manner.

Also, carcasses and road kills will provide information about the presence of snakes.

Butterflies

Eggs, Caterpillars and Pupa are good signs of butterflies.

Characteristic caterpillars, pupa and the host plant will be useful in identifying butterflies.

If you happen to see large granules under a flower pot or a tree in your home garden early in the morning, it could be faecal matter produced by caterpillars infesting the tree. They are often active at night thus you will encounter such material only during the early hours.

Rodent Burrows

Burrows of rats and bandicoots provide good signs of the presence of them.

Burrows of crabs

Good signs for the presence of crabs are burrows. The complexity of the burrow will depend on the species.

Burrows of crabs

Mounds of Mud Lobster

Tracks of Turtles

It is known that different species of turtles produce characteristic tracks while they enter and leave the sea shore for nesting. Such tracks could be used to identify the species without directly observing the animal.

- **Other indicators of nature**

Presence of green algal blooms in water bodies indicate that the water is enriched with nutrients.

Fisk kills during early morning hours indicate the eutrophic nature of water bodies, however, fish kills throughout the day may be due to toxic material in water.

If you happen to locate carcasses of animals around a water body during extreme dry spells, it could be due to botulism. *Clostridium botulinae* is an anaerobic bacteria that thrives in oxygen depleted water during dry spells. The toxic chemical 'botulin' produced by these anaerobic bacteria will cause instant death of animals. If you require water desperately, you should avoid such contaminated waters but rather dig a pit in the bottom of a dry water stream to allow springing of freshwater or freshwater seepage through substrate.

More Animal Signs

Hare Pellets x 1.5

Fruit Bat Scat x 0.5

Axix Deer Pellets x 0.8

Note the pea shape and smooth/ polished appearance of the surface.

Sambur Pellets x 0.3

Note the large size, barrel shape and coarse appearance of the surface.

Bear Foot Print

Crocodile Foot Print

Leopard Scat (Old)

- **How can you be successful as someone with knowledge on fieldcraft?**

When you go to the field you must avoid wearing bright outfits. Always wear earthy or dull coloured garments which will allow you to conceal from the environment by blending with it. Certain colours such as red, orange, bright yellow act as warning colours making animals react by changing their behaviour. Majority of them will flee, escape or hide while few will dare to attack you. If you are a bird watcher wearing bright attire, you will keep birds away from you, and would never be able to approach a shy species. If you are a hiker dressed in bright colours, you will arouse certain species such as wild buffaloes that may attack you.

Avoid using perfumery while you are on a mission in the wild as such chemicals could provoke certain species such as wasps.

Red, orange, bright yellow are warning colours. Certain species get protection from predators by possessing warning colours and advertising to predators that they are dangerous. Often, such colours are associated with a bad taste, noxious odour, etc.

Carrying a field notebook and a pencil to keep accurate notes, calibrating one margin of the outer back cover of the field notebook to assist measuring small distances will be necessary to keep accurate notes, while possessing a digital camera and binoculars will help you to double check the reliability of what you see. Also, carrying some material may help you to duplicate what is present in nature without disturbing the environment.

For instance, a carbon paper to trace patterns, a glass and marker pen to trace tracks and pug marks or carrying some plaster of paris to make a plaster cast will be useful in getting additional information.

Collecting any sort of material from nature, dead or alive, is highly discouraged. Collections should be done only if you have acquired proper permission and mostly if it is necessary to enhance the scientific quality of a study.

Tadpoles in clean water

Happy Nature Watching!