BIRDS · ORNITHOLOGY FOR GUIDES

Birds

Anatomy, feathers, breeding, behaviour, migration and identification — a guide's complete study companion to the birds of the Zimbabwean bush.

SERIES **SAFARI NOTES** FORMAT **STUDY & GUIDING NOTES** PUBLISHED BY **THE SAFARI SHOW**

> Birds are warm-blooded vertebrates of the class Aves ("ay-veez"), and one feature sets every one of them apart: feathers. Like mammals, reptiles, amphibians and fish, they have a skeleton, a skull and two pairs of limbs — in birds, one pair became wings. These notes gather what a professional guide or hunter needs to tell a confident, accurate story about the birds we meet every day in the bush.

WHAT A GUIDE SHOULD BE ABLE TO DO

- Identify at least **100 birds by sight** (in the field and from photos), and at least **50 by call** (hunters: at least 20).
- Use the correct terms for bird anatomy and feather tracts when describing an ID.
- Explain the oddities of particular birds in relation to their diet, habitat and habits.
- Talk confidently about preening, siblicide ("Cainism") and migration.
- Explain brood parasitism, monogamy and polygamy, polygyny and polyandry, and precocial and altricial young.
- Answer questions on "high-profile" species — size, diet, unique features — and separate similar species.

01 What is a bird?
02 How birds are grouped
03 Built for flight
04 Feathers
05 Describing a bird
06 Feet
07 Bills
08 Digestion & feeding
09 Mating systems
10 Courtship & sexual selection
11 Nests
12 Eggs & incubation
13 Brood parasitism
14 Calls & communication
15 Feather care
16 Keeping cool
17 Defence
18 Migration
19 Species notes
20 Raptor breeding

21 Big birds & quick facts
22 Partnerships
23 Separating similar species
24 Conservation

01 What is a bird?

~11,000
SPECIES WORLDWIDE
The IOC World Bird List (version 15.2) recognises about 11,000 living species. Totals vary a little between checklists.

2,100+
SUB-SAHARAN AFRICA
More than 2,100 species occur in Africa south of the Sahara.

950+
SOUTHERN AFRICA
Roughly a tenth of the world's species.

~109 / ~62
ENDEMICS / NEAR-ENDEMICS
Figures used in regional field guides; exact counts depend on the checklist and the boundary used.

Endemic species have their whole range — breeding and non-breeding — restricted to one region, e.g. African Penguin, South African Shelduck, Cape Vulture, Blue Crane, Greater Striped Swallow, White-throated Robin-chat, Southern Boubou and Bokmakierie. **Near-endemics** are largely restricted to the region but spill slightly beyond it, e.g. Double-banded Sandgrouse, Burchell's Coucal, Acacia Pied Barbet, Natal Spurfowl, Sabota Lark and Burchell's Starling.

02 How birds are grouped

ORDER PASSERIFORMES
Passerines
"Perching birds" or "songbirds" — the largest order. Four unwebbed toes on one level, three forward and one back. When the bird lands and bends its legs, tendons tighten and draw the toes closed around the perch. All have **altricial** young (hatched naked and helpless). Mostly small to medium-sized; crows are the giants.

ALL OTHER ORDERS
Non-passerines
Birds whose feet and bodies are adapted to particular jobs. The **near-passerines** are tree-dwelling non-passerines with only modestly modified feet, such as **zygodactyl** feet (toes 2 and 3 forward, 1 and 4 back — woodpeckers, barbets, cuckoos, parrots) and **syndactyl** feet (toes 3 and 4 joined at the base — kingfishers, hornbills).

ORDER	EXAMPLES
Ciconiiformes	Storks
Piciformes	Woodpeckers, barbets, honeyguides
Coraciiformes	Rollers, kingfishers, bee-eaters
Bucerotiformes	Hornbills, hoopoes, wood-hoopoes
Accipitriformes	Hawks, eagles, kites, Old World vultures, Secretarybird, Osprey
Falconiformes	Falcons (including kestrels) and the caracaras of the Americas

Older books put all "diurnal birds of prey" in Falconiformes. DNA studies (e.g. Hackett et al. 2008) have since shown that falcons are not close relatives of hawks and eagles — they are more closely related to parrots and passerines — so falcons

now have their own order and the rest sit in Accipitriformes.

03 Built for flight

Flight demands a light body and a lot of oxygen. Birds save weight in many ways:

Hollow bones

Many bones are hollow and strutted inside, and several connect to the air-sac system.

Feathers

A light, strong body covering.

A keratin bill

No heavy teeth or toothed jaws.

Air sacs

Large internal sacs that also drive breathing.

No bladder

Urine (as uric acid) leaves with the faeces — the white part of a dropping.

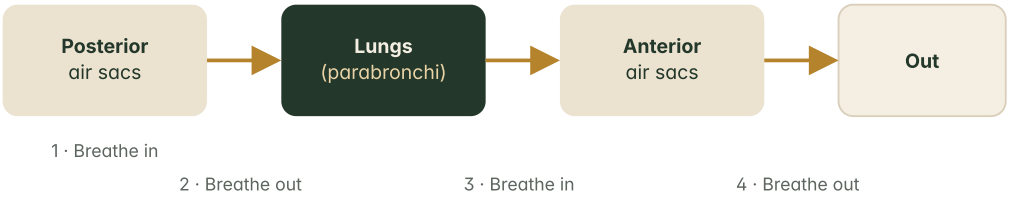
Seasonal gonads

Ovaries and testes shrink outside the breeding season and enlarge only when needed.

HOW A BIRD BREATHES

A bird's lungs are small and rigid; nine or so **air sacs** act as bellows. Air moves through the lungs in **one direction**, and it takes **two full breaths** to move one "packet" of air through the system:

ONE PACKET OF AIR, TWO BREATHS



Gas exchange happens in the lungs; fresh air flows through them in the same direction on both in- and out-breaths.

Air flows one way through the lungs, so the gas-exchange surfaces always meet fresh air.

04 Feathers

Feathers are the defining feature of birds and one of our best identification tools. They are made of **keratin**, the same protein as horn, hair and nails, and different feather types suit different parts of the body. Three groups matter most for flight:

GROUP	WHAT THEY ARE
Tectrices (coverts)	Small contour feathers on the wing and tail that cover the bases of the larger feathers.
Remiges	The large flight feathers of the wing: **primaries** on the "hand" (outermost) and **secondaries** on the "forearm" (nearest the body).
Rectrices	The large tail feathers, used for steering and balance.

WHERE THE COLOUR COMES FROM

PIGMENT

Melanins

The commonest pigments, giving blacks, greys, browns and rufous-buffs. Hence "melanistic" for an unusually dark form. A bird with abnormally white feathers but normal eyes is **leucistic**; an **albino** has no melanin at all, including in the eyes.

PIGMENT

Carotenoids

Bright reds, oranges and yellows, which birds must get from their food. Flamingos turn pink from carotenoids in the algae and small crustaceans they eat.

PIGMENT

Turacin & turacoverdin

Unique to turacos: a copper-based red (turacin) and a green (turacoverdin).

STRUCTURE

Structural colour

Blues and metallic sheens come from microscopic structures of keratin, melanin and air in the feather that interfere with light. That is why starlings, rollers, kingfishers and sunbirds can look dull out of direct sun.

BREEDING AND ECLIPSE PLUMAGE

In some species — often the males of polygynous species such as widowbirds and bishops — plumage changes for the breeding season. This **breeding plumage** may include long tail streamers. Out of season the male moults into a drab **eclipse plumage** that looks much like the female. Bright colours and long feathers make males more conspicuous to predators, but females favour the showiest males, so the trait persists.

MOULT

All birds replace worn feathers. Most moult gradually, a few feathers at a time, so they can keep flying. Some waterbirds (ducks, geese and others) drop all their flight feathers at once and are flightless for a few weeks, so they need a safe place to wait it out. Female hornbills of many species moult their flight feathers while sealed in the nest.

SPECIAL FEATHERS

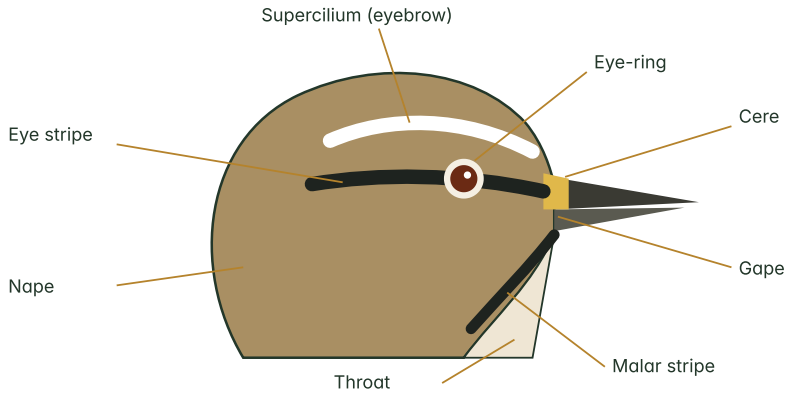
- **Rictal bristles** — stiff, hair-like feathers at the base of the bill in many insect-eaters. In nightjars they are thought to help funnel flying insects and may have a sensory role. In the Southern White-faced Owl they have been suggested to protect the eyes from struggling prey.
- **Powder down** — special feathers that crumble into a fine powder. Herons use it to help clean slime and dirt from their plumage.

LOOK CLOSER

The Pearl-spotted Owlet has two dark "false eyes" on the back of its head — a pattern that may deter attack from behind or confuse mobbing birds.

05 Describing a bird

Using the right words makes an ID precise. These terms describe the head:



Simplified head showing the main markings used in descriptions.

Cere ("seer")	Bare, often coloured skin at the base of the upper bill (raptors, doves, parrots).
Gape	The corner where the upper and lower mandibles meet; it sets how wide the bill opens.
Nape	The back of the neck.
Eye-ring	A ring of bare skin or feathers around the eye.
Wattle	Bare, fleshy skin hanging from the head or bill; may brighten in the breeding season.
"Ear" tufts	Erectile feathers on some owls' heads. They have nothing to do with hearing and probably help with camouflage and display.
Facial disc	The flat, round face of many owls, which funnels sound towards the ears.
Supercilium	A stripe running *above* the eye (often white).
Eye stripe	A stripe running *through* the eye, like a mask.
Malar stripe	A stripe from the base of the lower bill down the side of the throat.
Moustachial stripe	A stripe from the gape down the side of the face, like a moustache.

PUT IT INTO PRACTICE

A Bearded Scrub-robin, described properly: "a white supercilium with a black eye stripe and black malar stripe; rufous-orange flanks and upper breast."

06 Feet

Beyond the standard passerine perching foot, many birds have feet shaped by how and where they feed:

FOOT TYPE	DESIGN	EXAMPLES
Grasping	Powerful toes with sharp, curved claws (talons)	Raptors
Running	Long legs; the three forward toes do most of the work	Francolins, guineafowl, lapwings
Swimming	Toes joined by skin (webbed)	Ducks, cormorants, darters
Climbing (zygodactyl)	Two toes forward, two back, for bracing	Woodpeckers, barbets, parrots
Spreading	Very long toes to spread weight on mud or floating plants	Jacanas

FOOT TYPE	DESIGN	EXAMPLES
Reduced	Tiny feet in birds that rarely walk	Swifts

Owls can swing their outer toe forward or back, so they can perch two-and-two or three-and-one.

07 Bills

Like the foot, the keratin-covered bill is shaped by diet:

BILL TYPE	SHAPE & USE	EXAMPLES
Probing — recurved	Long, thin, curving upwards	Pied Avocet, Terek Sandpiper
Probing — decurved	Long, thin, curving downwards	Sunbirds, ibises, hoopoes
Probing — straight	Long and straight	Snipes, many sandpipers
Stabbing	Long, straight and sharp	Herons, kingfishers, African Darter
Conical	Short and stout, for husking seeds	Finches, weavers
Raptorial	Strongly hooked, for tearing meat	Birds of prey
Pointed	Short, tweezer-like; a good all-rounder	Flycatchers, cisticolas, warblers, bulbuls
Hooked	Slimmer than a raptor's, with a small hook	Shrikes, rollers, drongos
Chisel	Strong, straight, broad-based, for excavating	Woodpeckers
Flattened	Broad and flat, for dabbling	Ducks
Filter	Water is pumped through fine plates (lamellae) that trap food	Flamingos
Spatulate	Spoon-shaped; swept through water, with nerve endings that sense prey	African Spoonbill
Skimmer	Lower mandible longer than the upper; trawled through the water in flight and snapped shut on fish	African Skimmer
Pouch	Huge throat pouch used like a scoop net	Pelicans

Bills do more than feed. They weave (weavers), excavate (woodpeckers, barbets, kingfishers) and plaster (hornbills). They communicate — storks clatter their bills — and the casques of some hornbills may help amplify calls. Many probing and wading birds have touch-sensitive bill tips that let them find prey they cannot see.

08 Digestion & feeding

1. **Bill and mouth.** Birds have no teeth. The bill tears, cracks or picks up food, which is swallowed down the oesophagus.
2. **Crop.** In many birds, a stretchy pouch in the oesophagus stores food so the bird can gorge quickly and then move somewhere safer to digest. A full crop shows as a bulge on the upper breast.

3. **Stomach and gizzard.** The muscular gizzard grinds food, often helped by swallowed grit and stones (ostriches are famous for it).

4. **Cloaca.** The single opening used for droppings, mating and egg-laying. With no bladder, the white uric acid comes out with the faeces.

AT A VULTURE ROOST — HOW TO SAY IT

"See the bulge on that vulture's chest? That's its crop — a storage pouch in the throat. A griffon like a White-backed Vulture can fill it in a few minutes at a carcass, then fly off and digest at leisure. If the birds in the tree all have full crops, the carcass is probably finished. Empty crops mean they could still be waiting for the predators to leave."

- **Feeding chicks.** Parents regurgitate food or bring whole prey. Many seed- and fruit-eaters switch to soft, protein-rich insects for their chicks.
- **Crop milk.** Doves and pigeons (both parents) feed their newly hatched chicks "pigeon milk". It is not digested seed: it is made of fat- and protein-rich cells shed from the lining of the crop, and also carries antibodies. Flamingos produce a similar crop secretion.
- **Pellets.** Owls usually swallow prey whole and have no crop. Indigestible bones, fur and insect parts are coughed up as a **pellet**. Many other birds also cast pellets, including hawks, herons and kingfishers.
- **Mistletoe and tinkerbirds.** Tinkerbirds eat mistletoe berries, then pass or regurgitate the sticky seeds and wipe them onto branches, where they germinate. They are important dispersers of these parasitic plants, though other birds disperse mistletoe too.
- **Larders.** Shrikes impale prey on thorns or barbed wire. This holds large prey while they tear it apart, and may also store food or serve as a display.

09 Mating systems

Fertilisation is internal, usually by a brief "cloacal kiss". Only a few groups have an intromittent organ (phallus) — notably ostriches and other ratites, and ducks and geese.

MORE THAN 90% OF SPECIES

Monogamy

A pair shares parental duties — useful because birds can't nurse their young. The bond may last one season (many migrants), one year (some owls) or life (some ducks, geese and African Fish Eagles). Monogamous species are more often **monomorphic** — males and females looking alike — than polygamous ones.

MORE THAN ONE MATE PER SEASON

Polygamy

Polygyny: one male, several females; the female raises the young (weavers, widowbirds, bishops, whydahs). **Polyandry**: one female, several males; the male raises the young (African Jacana, Greater Painted-snipe, buttonquails). Polyandrous species often show *reversed* dimorphism, the female being brighter. The Lesser Jacana is monogamous.

PRECOCIAL OR ALTRICIAL?

	PRECOCIAL (NIDIFUGOUS)	ALTRICIAL (NIDICOLOUS)
At hatching	Well developed, covered in down, eyes open	Naked, blind and helpless
Mobility	Mobile almost at once; leave the nest soon after hatching	Stay in the nest
Feeding	Feed themselves early, with parental guidance	Fed by the parents, who respond to begging

	PRECOCIAL (NIDIFUGOUS)	ALTRICIAL (NIDICOLOUS)
Nest	Usually on the ground; chicks camouflaged	Usually raised up for safety

CO-OPERATIVE BREEDING

In some species a breeding pair is helped by **helpers**, often their grown offspring from earlier broods. Examples: Southern Ground Hornbill, White-crested Helmet-shrike, Arrow-marked Babbler, Red-billed Oxpecker and Green Wood-hoopoe. These birds live in small family groups, and their movements are often accompanied by **allelomimetic behaviour**: bursts of loud group calling and display that seem to keep the flock together and advertise the territory — listen for babblers and wood-hoopoes.

10 Courtship & sexual selection

VISUAL

Plumage & display

Breeding plumage (widowbirds); aerial displays and dances (the Red-crested Korhaan's "suicide" display flight). Birds see colour well, so plumage matters.

VISUAL

Nest building

Male weavers build nests to impress females. A rejected nest is torn down and rebuilt.

GROUP DISPLAY

Leks

Males gather at a communal display ground (lek), where females come to choose.

VOCAL

Song

Often most elaborate in secretive birds of thick cover, sometimes including mimicry (Red-capped Robin-chat).

GIFTS

Courtship feeding

Males present food to females (Southern Ground Hornbill; many raptors).

TOUCH

Allopreening

Mutual preening, especially in monogamous pairs.

WHY ARE SOME MALES SO SHOWY?

Two classic ideas, often confused:

- **Runaway selection** (R.A. Fisher): if females prefer, say, longer tails, their sons inherit long tails and their daughters inherit the preference, so the trait can become ever more exaggerated. It is held in check by its costs — at some point a longer tail makes a male too easy to catch or too clumsy to feed.
- **The handicap principle** (Amotz Zahavi, 1975): a costly ornament is an *honest* advertisement — only a male in top condition can afford to carry it, so the cost itself proves his quality. This idea remains debated.

SEXUAL DIMORPHISM — TELLING MALES FROM FEMALES

SPECIES	MALE	FEMALE
Giant Kingfisher	Rufous breast, barred belly	Barred breast, rufous belly
Pied Kingfisher	Two breast bands ("belt and bow-tie")	One broken band

SPECIES	MALE	FEMALE
Saddle-billed Stork	Dark eye; yellow wattles at the base of the bill	Yellow eye; no wattles
Bateleur	Broad black trailing edge to wing in flight; evenly dark at rest	Narrow black trailing edge; grey panel on the closed wing
Swainson's Spurfowl	Spurs on the legs	No spurs
Black-bellied Bustard	Black belly and black line up the neck	White belly, no black neck line
Greater Painted-snipe	Duller, grey neck and breast (reversed dimorphism)	Brighter: chestnut neck and breast, bold eye-patch
Southern Ground Hornbill	All-red throat	Blue patch on the red throat
Green Wood-hoopoe	Longer, more curved bill	Shorter, less curved bill
Golden-tailed Woodpecker	Red crown and red moustachial stripe	Red only on the nape
Bennett's Woodpecker	Red crown and red moustachial stripe	Brown throat and brown stripe below the eye
Bearded Woodpecker	Red hind-crown	Black hind-crown
Cardinal Woodpecker	Red nape	Black nape
Black Cuckooshrike	Black, often with yellow shoulder; orange-yellow gape	Barred below, yellow in tail and wings
Chinspot Batis	Black breast band, no chin spot	Rufous chin spot and rufous breast band
Violet-backed Starling	Iridescent violet above, white below	Brown above, streaked below
Collared Sunbird	Green throat; thin purple breast band	No green throat or band; yellow up to the bill

11 Nests

Most birds build nests only to breed in, not to sleep in. Exceptions include the Sociable Weaver, which uses its giant communal nest all year, and some hole-nesters such as barbets that roost in holes. Altricial species usually build more complex nests; many ground-nesters make little more than a scrape. Most species build afresh each season, but large raptors, Secretarybirds and Sociable Weavers repair and reuse nests (Hamerkops and Red-billed Buffalo-weavers sometimes).

NEST TYPE	EXAMPLES
Cup, bound with spider web and decorated with lichen	Flycatchers (e.g. African Paradise Flycatcher)
Stick platform — size hints at the builder	From ~7 cm (Emerald-spotted Wood Dove) to ~1.8 m (Martial Eagle)
Woven dome or basket	Weavers, cisticolas
Hole — dug by the bird or a natural cavity	Woodpeckers, barbets, bee-eaters, kingfishers, starlings, hornbills
Mud and saliva	Swallows and martins
Felted bag with a false entrance	Penduline-tits
Giant domed stick nest	Hamerkop

NEST TYPE	EXAMPLES
Floating (anchored or free) and ground nests	Grebes, jacanas; lapwings, nightjars

REMARKABLE NESTS

- **Sociable Weaver** — the largest nests: the biggest are over 6 m across and nearly 3 m tall, with up to about 100 chambers and up to 400 birds, and some weigh several tonnes. African Pygmy Falcons live in them alongside the weavers.
- **Hamerkop** — a huge domed stick nest up to about 2 m across and high, with a side entrance and a mud-plastered chamber. Western Barn Owls, bees and others take over the inside; Verreaux's Eagle-owls and Egyptian Geese may breed on top.
- **Bee Hummingbird** (Cuba) — one of the smallest nests of any bird, about the size of a thimble.
- **Gabar Goshawk** — regularly adds the webs of social spiders (*Stegodyphus*), which spread over the nest. No explanation has been confirmed.
- **African Palm Swift** — glues feathers and plant fluff with saliva to the underside of a palm frond, and glues its eggs in too.
- **Red-billed Buffalo-weaver** — nests are often said to be built on the north-western side of trees for afternoon warmth. Treat this as an observation, not a reliable compass.
- **Wattled Starling** — breeds in colonies, often timed to outbreaks of insects such as locusts.

TENANT NESTERS

Many species borrow nests rather than build: Pygmy Falcons (Sociable Weaver nests), Mocking Cliff Chat (old swallow nests), Verreaux's Eagle-owl (tops of Hamerkop and other large nests), Woodland Kingfisher and Pearl-spotted Owlet (woodpecker and barbet holes). Most owls build no nest at all — the Marsh and African Grass Owls, which make a pad or tunnel in grass on the ground, are the local exceptions. Brood parasites take borrowing to the extreme (section 13).

12 Eggs & incubation

Clutch	The set of eggs laid in one nesting attempt.
Incubation	Keeping eggs at the right temperature — warming them, or shading them in heat.
Incubation period	The time from incubation to hatching: roughly 12–14 days in weavers and doves, about 3 weeks in francolins and spurfowl, about 24 days in the smaller hornbills (around 40 in the Southern Ground Hornbill), and 45–55+ days in large eagles and vultures.
Brood patch	A bare patch of skin, rich in blood vessels, that develops for incubating.
Fledging period	Time from hatching to leaving the nest. A **fledgling** has left the nest but still depends on its parents.

EGG SHAPE AND COLOUR MATCH THE NEST

- Egg colour and pattern are laid down by pigment glands in the oviduct and are typical of each species — which helps hosts spot a parasite's egg.
- Eggs laid on open ledges or flat ground tend to be **pyriform** (pear-shaped), which lessens the chance of them rolling away.
- Hole-nesters usually lay round, **white** eggs, perhaps easier for the parents to see in the dark.

- Clutch size ranges from one egg to 16 or more.

STRATEGY

Early leavers

Plovers and lapwings: cryptic eggs, small clutches. Parents slip away at the first sign of danger and may feign injury. Some lapwings, such as the Blacksmith Lapwing, have a sharp spur on the wing used against intruders.

STRATEGY

Close sitters

Francolins and spurfowl: cryptic parents sit tight until the last moment, then burst away. Eggs are paler and clutches larger.

STRATEGY

Egg dumpers

Ostriches and guineafowl: subordinate females lay in a dominant female's nest. Young hens of many species also "dump" eggs.

"CAINISM" — SIBLICIDE

Some birds lay two eggs a few days apart, but normally raise only one chick: the older, larger chick attacks the younger until it dies. This is known in many eagles (it is classic in Verreaux's Eagle); in the Southern Ground Hornbill, too, the second chick usually starves. The second egg is thought to act as an insurance policy in case the first fails.

SHARING THE WORK

Many pairs share incubation and feeding; often the female incubates while the male feeds her. Ostriches split the job by camouflage: the brown female sits by day, the black male by night. Some birds cover unattended eggs — the African Black Duck with down, the Little Grebe with water plants. Many birds will lay a replacement clutch if one is lost.

~1.35 kg

LARGEST EGG

Ostrich — an egg weighs about 1.35 kg.

Pea-sized

SMALLEST EGG

Bee Hummingbird.

13 Brood parasitism

About **1% of the world's bird species** — roughly 100 — are **obligate brood parasites**: they lay their eggs in other species' nests and leave the host to do all the parenting. In southern Africa they fall into two groups: **residents** (honeyguides, whydahs, indigobirds and the Cuckoo Finch) and mostly **migratory** cuckoos.

TRICKS OF THE TRADE

- Eggs that match the host's in colour (except in species that use dark holes).
- Thick, strong eggshells.
- Breeding timed to the host's season.
- Short incubation, so the parasite hatches first. Cuckoos give their eggs a head start by keeping them in the oviduct longer — about a day of extra "internal incubation" at body temperature.
- Chicks that mimic the host chicks' begging calls and postures — and in whydahs and indigobirds, the colourful mouth markings.

WHAT THE PARASITE CHICK DOES TO THE HOST'S BROOD

1. **Evicts** eggs or chicks over the nest rim (most cuckoos, in their first few days).

2. **Outcompetes** them, which can starve or smother them.
3. **Grows up alongside** them (the crested cuckoos such as the Great Spotted Cuckoo; whydahs and indigobirds).
4. **Kills** them with sharp hooks on its bill tips, which are not shed but grow into the bill and can no longer be seen about a week before fledging (honeyguides).

CUCKOOS

- Males may perform near a host nest to draw the owners away.
- The female may remove or eat a host egg when laying her own.
- Female lineages lay eggs matched to the host species that raised them — the Diederik Cuckoo is known for close matches. Whether matching is needed depends on how fussy the host is.
- Hosts keep feeding a begging cuckoo chick even when it dwarfs them.
- Adult cuckoos eat many caterpillars, including hairy ones most birds avoid.

CUCKOO	MAIN HOSTS
Common Cuckoo	Reed warblers and others in Eurasia — it does not breed in Africa and is silent here
African Cuckoo	Fork-tailed Drongo
Red-chested Cuckoo	Robin-chats and scrub-robins
Black Cuckoo	Southern Boubou and other bushshrikes
Levaillant's Cuckoo	Arrow-marked Babbler
Jacobin Cuckoo	Bulbuls, Fork-tailed Drongo
Thick-billed Cuckoo	Retz's Helmet-shrike
Great Spotted Cuckoo	Pied Crow, starlings (Burchell's, glossy)
Diederik Cuckoo	Weavers and bishops especially; many other hosts recorded
Klaas's Cuckoo	Batises, sunbirds and small warblers (e.g. eremomelas, crombecs)
African Emerald Cuckoo	Green-backed Camaroptera, Black-backed Puffback

HONEYGUIDES

- The family Indicatoridae is entirely parasitic. (So is the family Viduidae — whydahs, indigobirds and the Cuckoo Finch.)
- They mostly use hole-nesters, so they lay white eggs; egg-mimicry would be pointless in the dark.
- The honeybirds (*Prodotiscus*) parasitise open or domed nests of small birds: the Brown-backed Honeybird uses cisticolas, and the Green-backed Honeybird white-eyes.
- Chicks hatch with bill hooks and kill the host's young.
- Honeyguides can digest beeswax — unusual among birds.
- Only the **Greater Honeyguide** leads people to bees' nests (see Safari Notes 15). Claims that it also leads honey badgers are unconfirmed.

HONEYGUIDE	MAIN HOSTS
Greater Honeyguide	Hole-nesters: hoopoes, wood-hoopoes, kingfishers, bee-eaters, barbets — many species recorded

HONEYGUIDE	MAIN HOSTS
Scaly-throated Honeyguide	Woodpeckers and barbets
Lesser Honeyguide	Barbets especially; also Little Bee-eater, Violet-backed Starling
Brown-backed Honeybird	Cisticolas and Neddicky (domed nests)

WHYDAHS, INDIGOBIRDS & THE CUCKOO FINCH

These parasitise waxbills and their relatives, usually one host species each, so where they live depends on where the host lives. Their chicks are raised with the host's chicks, mimicking their mouth markings, and males learn and copy the host's song. A female may lay 20+ eggs a season, one or two per host nest.

PARASITE	HOST
Pin-tailed Whydah	Common Waxbill and others — the least host-specific
Shaft-tailed Whydah	Violet-eared Waxbill
Long-tailed Paradise Whydah	Green-winged Pytilia
Broad-tailed Paradise Whydah	Orange-winged Pytilia
Village Indigobird (Steelblue Widowfinch)	Red-billed Firefinch
Dusky Indigobird (Black Widowfinch)	African Firefinch
Purple Indigobird	Jameson's Firefinch
Twinspot Indigobird (Green Widowfinch)	Twinspots
Cuckoo Finch	Cisticolas and prinias

14 Calls & communication

Birds communicate by sound and sight — for courtship, contact, alarm, aggression, begging and territory.

SOUND

Beyond the voice

Drumming (woodpeckers), wing-clapping (some larks), bill-clattering (storks).

SIGHT

Displays

Breeding plumage, raised feathers, nest building, aerial displays, courtship feeding, dancing and bobbing.

- **The syrinx.** Birds make sound with a syrinx where the windpipe divides into the two bronchi — not with a larynx as we do. Many songbirds can control the two sides separately, producing two notes at once.
- **Duetting.** Some pairs call in such precise alternation that it sounds like one bird — Black-collared Barbet, Southern Boubou and other bushshrikes. It helps pairs keep in touch and hold territory in thick bush.
- **Sonograms** plot pitch against time and are used in bioacoustics; some field guides print them.

15 Feather care

Preening keeps feathers in condition. Most birds collect oil from the **preen (uropygial) gland** at the base of the tail and work it through the plumage with the bill. The oil is thought to help with waterproofing and to

inhibit bacteria and fungi. Damaged feathers are removed in the process. **Allopreening** reaches places a bird cannot reach itself and strengthens bonds.

WHY DO CORMORANTS AND DARTERS SPREAD THEIR WINGS?

Cormorants do have a well-developed preen gland (ostriches are among the birds that lack one). Their plumage is only partly waterproof because of feather structure — the outer parts of the feathers are built to let water in. That reduces buoyancy and makes diving after fish easier, but leaves the bird waterlogged. Sitting with wings spread lets water evaporate from the plumage in sun and wind.

BEHAVIOUR	WHAT IT INVOLVES
Dust bathing	Thought to help remove parasites and excess oil.
Water bathing	A Woodland Kingfisher plunging into a pool is usually bathing, not fishing. Swallows and swifts plunge-bathe in flight. Vultures gather at water to bathe after feeding.
Sunning	Often after bathing; may help condition feathers and discourage parasites. Not the same as a raptor spreading its wings on a cold morning, which is probably warming up.
Anting	Letting ants crawl through the feathers (passive) or rubbing them on (active). The ants' formic acid is believed to help control parasites.
Rousing	Fluffing up and shaking the feathers back into place.

A **pectinate claw** — a comb-like edge on the middle claw — helps some birds groom. Nightjars use it on their plumage and rictal bristles; herons, bitterns and egrets have one too.

16 Keeping cool

Birds have no sweat glands, so they cool down in other ways:

- **Gular flutter** — sitting with the bill open and vibrating the throat skin, which evaporates water (like panting).
- **Urohydrosis** — excreting onto the bare legs so that evaporation cools them, leaving them whitewashed. Seen in storks, notably the Marabou.
- **Wing-drooping** — holding the wings slightly away from the body to let air flow.
- **Standing in water** — unfeathered legs lose heat well.
- **Bathing and plunging**, and resting in shade or denser woodland through the hottest hours.

Activity peaks around dawn and dusk. A few species are truly **crepuscular** — active mainly at those times — such as the Bat Hawk, which hunts bats leaving their roosts at dusk.

17 Defence

Hiding

Retreating to cover, helped by cryptic plumage. Bitterns "sky-point", freezing with the bill straight up among reeds.

Feigning injury

The "broken-wing" display of lapwings, plovers and some ducks lures a predator from eggs or chicks; the parent then "recovers" and flies off.

Alarm calls

Harsh chattering or hissing that alerts other birds, often of several species.

Mobbing

Birds gang up on a snake, owl or mongoose to drive it off. The Fork-tailed Drongo is a famous mobber, and lapwings dive-bomb intruders.

BIRD PARTIES — HOW TO USE THEM

"Hear all that scolding? When puffbacks, batises, bulbuls and crombecs start shouting together, they've usually found a predator — very often a snake or an owl. Let's go quietly and see what they're mobbing."

Mixed-species bird parties also form around good food sources, and are some of the best birding moments in the bush.

18 Migration

Migration is a regular, seasonal round trip between a breeding area and a non-breeding area. Southern Africa has well over 100 migrant species. Most are insect-eaters following the summer flush of food, which also gives good conditions for breeding. Weather, competition, predation and parasites play a part too. Day length triggers hormonal changes, fat storage and the urge to leave, so departure dates are predictable.

Watch the wording in older field guides: a "summer resident" is a migrant that breeds here; a "summer visitor" is a migrant that does not.

TYPE 1

Palearctic–African

Breed in Europe and Asia, spend the northern winter here (non-breeding): Amur Falcon, Steppe Eagle, Lesser Spotted Eagle, Red-backed and Lesser Grey Shrikes, European Nightjar.

TYPE 2

Intra-African

Move within Africa, many breeding here in summer: Woodland Kingfisher, Wahlberg's Eagle, Southern Carmine Bee-eater, Rufous-cheeked Nightjar, Yellow-billed Kite.

TYPE 3

Altitudinal

Move between higher ground in summer and lower, milder areas in winter: African Stonechat, Malachite Sunbird.

Nomadic movements in response to rain or food, with no fixed pattern, are not true migration.

FUEL AND ROUTES

Big soaring birds such as eagles and storks follow land routes and ride thermals, feeding and resting along the way. Birds that cross seas or deserts non-stop must fatten up beforehand (**hyperphagia**), some increasing their weight by up to half.

13,560 km

LONGEST NON-STOP FLIGHT

A juvenile Bar-tailed Godwit flew from Alaska to Tasmania without landing in 11 days and 1 hour (October 2022).

70,000+ km

LONGEST MIGRATION

Arctic Terns tracked by geolocator flew more than 70,000 km a year, pole to pole and back (Egevang et al. 2010).

HOW DO THEY FIND THEIR WAY?

- **Sun and stars** — many day-migrants use a sun compass; night-migrants learn star patterns.
- **The Earth's magnetic field** — many species tested have a magnetic compass. It appears to sense the angle of the field lines, not north and south.
- **Landmarks** — coastlines, rivers and mountains, especially for experienced birds.
- **Smell** — important for some seabirds; its role in other species is unclear.

How these cues combine — and how young birds find wintering grounds they have never seen — is still not fully understood.

MIGRANTS VS RESIDENTS

Similar species can make different choices. The African Pygmy Kingfisher (insects) migrates, the Malachite Kingfisher (fish) stays. The European Bee-eater migrates, the White-fronted Bee-eater stays. Migrants tend to have longer, more pointed wings. Non-breeding Palearctic visitors such as the Common Cuckoo and European Nightjar are largely silent here — they have no territories to defend.

SPECIES	NON-BREEDING ("WINTERING") AREA	BREEDING AREA
Woodland Kingfisher	Equatorial and central Africa	Southern Africa
Wahlberg's Eagle	Central/tropical Africa	Southern Africa
Diederik Cuckoo	Tropical Africa	Southern and sub-Saharan Africa
Southern Carmine Bee-eater	Further south and towards equatorial Africa	Zambezi Valley and parts of Botswana
European Roller	Africa	Europe, Middle East, western Asia
European Bee-eater	Tropical and southern Africa	Southern Europe
Lesser Spotted Eagle	Africa	Eastern Europe and western Asia
Steppe Eagle	Africa and southern Asia	Russian and Central Asian steppes
Barn Swallow	Africa, southern Asia, Australasia, South America	Northern hemisphere
Red-backed Shrike	Southern Africa	Europe and western Asia
Wood Sandpiper	Africa, southern Asia, Australia	Northern Europe and Asia
White Stork	Africa south of the Sahara	Europe and north-west Africa (rarely South Africa)

Zoogeographic regions: **Palearctic** — Europe, northern Asia and North Africa including the Sahara; **Nearctic** — North America and Greenland; **Holarctic** — both together; **Afrotropical** — Africa south of the Sahara, southern Arabia, Madagascar and the western Indian Ocean islands.

19 Species notes

Owls

Mostly nocturnal hunters whose hearing is as remarkable as their sight.

- **Silent flight** — large wings for their weight (low wing-loading), plus comb-like fringes on the leading edge and soft trailing edges on the flight feathers, damp the noise of airflow. Silence keeps prey unaware and lets the owl keep listening. Pel's Fishing Owl, which hunts fish, lacks these fringes.

- **Asymmetrical ears** — in several species one ear opening sits higher than the other, so tiny differences in the timing and loudness of sounds pinpoint prey in three dimensions.
- **Facial disc** — funnels sound to the ears like a satellite dish.
- **Head-turning** — owls' tube-shaped eyes barely move in their sockets, so they turn the whole head, up to about 270°, and bob it to judge distance.
- They swallow prey whole where they can, cast pellets, and can lift food to the bill with one foot.

Woodpeckers

- **Tongue** — very long. Its supporting hyoid bones wrap right around the skull and are anchored in the nostril area at the base of the upper bill. Depending on the species, the tip is barbed for spearing grubs or sticky for ants.
- **Hammering** — a 2022 high-speed filming study (Van Wassenbergh et al., *Current Biology*) found woodpecker heads act like stiff hammers rather than shock absorbers. Their small size, not a cushioning skull, keeps them below concussion levels.
- **Tapping** (foraging) listens for hollow tunnels made by borers or termites; **drumming** advertises territory.
- **Stiff tail** — a prop when clinging to trunks.

SPECIES	FEEDING NICHE
Bennett's	Mostly on the ground, lapping up ants and termites
Golden-tailed	Ants and termites on branches; mainly a gleaner but will excavate
Cardinal	Taps thin dead branches and digs out borer larvae
Bearded	Like the Cardinal, but on bigger branches and taking bigger prey

Hornbills

In most hornbills the female seals herself into a tree hole with mud, droppings and food remains, leaving a narrow slit through which the male feeds her. In many species she moults all her flight feathers while inside. She lays one to a few eggs and incubates for about 24 days (smaller species). Once the chicks are part-grown, she breaks out; the chicks re-seal the entrance and both parents feed them through the slit until they are ready to leave.

The slit fits the parents' bills and is thought to keep out most predators, such as snakes, small mammals and the probing foot of an African Harrier-Hawk; predation on sealed nests appears to be low.

The **Southern Ground Hornbill** is different. It nests in large natural tree cavities (or rock holes) and is the only hornbill that does not seal the entrance. It is an obligate co-operative breeder: each group has one breeding pair, and helpers bring food. Usually two eggs are laid a few days apart; incubation is about 37–43 days and the surviving chick fledges at about 86 days — the second chick usually starves. Loss of large nesting trees, through logging and other damage, is a major threat; the species is globally Vulnerable.

AT A HORNBILL NEST — HOW TO SAY IT

"That mud-plastered slit in the tree is a hornbill nest. Inside is the female — she walled herself in, and while she sits on the eggs she drops all her flight feathers. For weeks she depends entirely on her mate, who passes food through that tiny gap. It's a big gamble: if he's killed, the family is in serious trouble."

The Ostrich

The largest living bird: males can weigh more than 150 kg, and ostriches are long-lived. Wild ostriches are now scarce in much of Zimbabwe, where most are farmed for meat, leather and eggs.

- **Breeding** — a male mates with a dominant **major hen** and often several **minor hens**. In dry areas like Hwange, breeding peaks with the first rains. Breeding males' necks and legs flush red, and they display by squatting, waving their wings and twisting the neck.
- **The nest** — a scrape. The major hen lays about one egg every other day; minor hens add theirs. She can cover only about 20, so she pushes surplus eggs — usually other hens' — out of the nest.
- **Incubation** — about 6 weeks; the brown female sits by day, the black male by night. A threatened bird lays its neck flat on the ground and looks like a rock or bush — probably the origin of the "head in the sand" myth.
- **Chicks** — camouflaged, guarded by both parents, who may perform a distraction display. Losses to jackals, hyenas and big eagles are high.

Vultures

- There are 7 New World vultures (Americas) and around 16 Old World vultures (Europe, Africa, Asia); about 11 occur in Africa.
- **Two separate origins** — the two groups look alike because they evolved for the same job (convergent evolution). Old World vultures are hawks and eagles (family Accipitridae). New World vultures were once thought to be related to storks, but genetic studies have since refuted that; they are now placed with or beside the hawks and eagles.
- **Bare heads** — vultures that feed inside carcasses have bald or sparsely feathered heads and necks, which are easier to keep clean. A ruff of feathers at the base of the neck can cover it when they are cold, like a scarf.
- **Feet** — built more for walking and hopping than for killing.
- **Altitude record** — a Rüppell's Vulture hit an airliner at **11,300 m** over Abidjan, Côte d'Ivoire, on 29 November 1973 — higher than Everest (8,849 m).
- **Finding food** — African vultures hunt by sight. When one bird drops to a carcass, others watching from far away follow, creating a chain reaction across the sky. They also watch lower-flying Bateleurs and Tawny Eagles. Some New World vultures, such as the Turkey Vulture, find food by smell.
- **Feeding guilds** — griffons (White-backed, Cape, Rüppell's) are fast "gulpers" working inside the carcass, with backward-pointing spines on their tongues to speed swallowing. Lappet-faced Vultures tear tough skin and tendons. Hooded and White-headed Vultures pick scraps around the edges.
- **Telling sexes apart** — the White-headed Vulture is the only African vulture in which males and females look different (the female has white inner secondaries).

	WHITE-BACKED VULTURE	HOODED VULTURE	LAPPET-FACED VULTURE
Clutch	1 egg	1 egg	1 egg
Incubation	~56 days	~46–51 days	~56 days
Nestling period	~120–125 days	~90–130 days	~130 days; dependent up to 6 months after
Notes	Gregarious; gathers at water to drink, bathe and loaf; noisy at carcasses; dominates by numbers	Also eats scraps, droppings and termites; fond of allopreening	Largest and dominant at a carcass; not sociable; tears skin

	WHITE-BACKED VULTURE	HOODED VULTURE	LAPPET-FACED VULTURE
Global status	Critically Endangered	Critically Endangered	Endangered

Kingfishers

SPECIES	STATUS	DIET
Giant	Resident	Fish, crabs
Pied	Resident	Fish, shrimps, crabs
Half-collared	Resident	Fish, small crabs, insects
Malachite	Resident	Small fish, tadpoles, frogs, shrimps, insects
Woodland	Intra-African migrant	Grasshoppers, mantids, beetles, dragonflies; lizards, young birds
Grey-headed	Intra-African migrant	Insects; lizards
Brown-hooded	Resident	Insects; lizards, mice, small snakes, young birds
Striped	Resident	Insects; small lizards
African Pygmy	Intra-African migrant	Insects and larvae; small frogs, spiders

20 Raptor breeding

VULTURES

- **Hooded** — nests singly and secretively, usually in a main fork below the canopy of a leafy tree. The nest is lined with grass topped with green leaves, renewed through incubation. It sometimes uses other raptors' nests (reported in Hwange). One egg, mainly June–August; both parents incubate and feed the chick, and keep feeding it for months after it flies.
- **White-backed** — loose colonies, nests on the tops of the tallest trees, often reused. One egg, May–August; ~56–58 days' incubation by both parents; ~4 months in the nest and about 4 more months of feeding after.
- **White-headed** — territorial; a large flat stick platform on a treetop. One egg, May–August; ~55 days' incubation; about 110 days in the nest.
- **Lappet-faced** — a huge nest (~2 m across) on top of a tree, often a thorn tree, out of reach of mammals and reused for years. One egg, April–June; ~56 days; ~130 days in the nest.

EAGLES

Most eagles hold territories for years and reuse the same nest, a bulky stick platform lined with green leaves (snake eagles build small, flat nests of thin sticks). Pairs court with soaring and undulating display flights, sometimes touching talons, and bond through mutual preening and the male bringing food. The female does most incubating, fed by the male (in the Bateleur the male takes a larger share). Why eagles keep adding fresh greenery is not known for certain.

SPECIES (HWANGE AREA)	SEASON	EGGS	INCUBATION (DAYS)	NESTLING (DAYS)	DEPENDENCE AFTER
Martial Eagle	Apr–Jun	1	47–51	96–99	3–8 months
African Hawk-Eagle	May–Jul	2 *	42–44	61–71	Up to ~12 months

SPECIES (HWANGE AREA)	SEASON	EGGS	INCUBATION (DAYS)	NESTLING (DAYS)	DEPENDENCE AFTER
Tawny Eagle	May–Jun	2 *	39–44	76–85	~6 weeks
Wahlberg's Eagle †	Sep–Oct	1	44–46	70–75	A few weeks
Brown Snake Eagle	Varies	1	48–50	97–113	~2 months
Black-chested Snake Eagle	Mar–Apr	1	51–52	89–90	~6 months
Bateleur	Dec–Mar	1	52–59	93–115	Several months

* Cainism occurs. † An intra-African breeding migrant. Figures after Steyn (1996) and Maclean (1993); Tawny Eagle nestling period from Animal Diversity Web; Brown Snake Eagle laying dates vary from region to region.

LIZARD BUZZARD

A common resident in Hwange woodland. It builds a small, compact stick nest (~40 cm across) in a main fork, lined with lichen, grass or leaves, and courts with long bouts of calling from a perch. Usually two eggs; the female incubates (~34 days) while the male brings food; chicks leave at about 40 days and depend on the parents for another month or so.

SPARROWHAWKS AND GOSHAWKS

All build stick platforms in trees, sometimes refurbishing another species' nest; pairs stay in the same area even if they change nests. Linings vary: green leaves (Little Sparrowhawk, African Goshawk), bark chips (Shikra), and odd items such as dung, rags or a sunbird's nest (Dark Chanting Goshawk). Courtship involves aerial displays and lots of calling.

SPECIES	SEASON	EGGS	INCUBATION (DAYS)	NESTLING (DAYS)
Little Sparrowhawk	Sep–Dec	1–4 (usually 2)	31–32, both parents	25–27
Shikra (Little Banded Goshawk)	Sep–Nov	2–3	~30, mostly female	~32
African Goshawk	Sep–Nov	2–3	~35, mainly female	32–35 (then ~2 months' dependence)
Gabar Goshawk	Sep–Oct	2–3	33–35, both parents	30–35
Dark Chanting Goshawk	Jul–Nov	1–2	Unrecorded	~50

AFRICAN HARRIER-HAWK (GYMNOGENE)

A specialist raider of holes and crevices. Its ankle (the tibiotarsal joint) can bend backwards through about 70°, so it can reach into tree holes and weaver nests for nestlings, rodents, reptiles and insects. Light-bodied with broad wings, it flies slowly while searching. In courtship the female may roll over and touch talons with the male, and its bare yellow face flushes red when excited. Usually two eggs; incubation 35–38 days, mainly by the female; Cainism is common, though two chicks are sometimes raised. The young leave the nest at about two months.

LANNER FALCON

Like most falcons it builds no nest, using old nests of crows, other raptors or herons, cliff ledges or buildings. Courtship includes loud aerial displays and the male feeding the female. Usually 3–4 eggs;

incubation about 32 days by both sexes; chicks leave at about 6 weeks and stay near the nest for about a month.

VERREAUX'S (BLACK) EAGLE IN THE MATOBO HILLS

A Verreaux's Eagle soaring over granite kopjes is the signature sight of the Matobo Hills, which hold one of the highest densities known for any large eagle — about one pair per 10 km². Valerie Gargett's long-term study there (published 1990) is a classic of African raptor research.

- **Habitat** — cliffs, gorges and rocky hills wherever hyraxes live, from sea level to high mountains.
- **Territory** — only pairs holding a territory with plenty of hyraxes breed. Boundaries are kept with display flights and perching rather than fighting. Unpaired birds wander and replace lost mates.
- **Flight** — a distinctive leaf-shaped wing, broad in the middle and pinched at the body, suited to riding the updrafts over rock faces; they rarely flap. The spectacular **pendulum display** is performed over the nest and territory edges.
- **Food** — hyraxes (dassies) are the main prey. Gargett also recorded hares, monkeys, young klipspringer, mongooses, squirrels, cane rats, guineafowl, francolins and lizards, and estimated kill rates of roughly one dassie per pair per day.
- **Breeding** — nests on rock ledges, reused and topped up each year; eggs April–June, usually two, laid a few days apart. Incubation about 45 days. The older chick kills the younger, and the parents don't intervene — the classic example of Cainism. The chick stays in the nest about 95 days, then is fed for a few more months before the parents drive it off.

21 Big birds & quick facts

SPECIES	WINGSPAN	LENGTH / HEIGHT	WEIGHT
Bateleur	~175 cm	55–70 cm	2–3 kg
Martial Eagle	188–260 cm	78–96 cm	3.1–6.2 kg
Crowned Eagle	150–180 cm	80–99 cm (long tail)	2.5–4.7 kg
African Fish Eagle	~200 cm	~68 cm	~2.2 kg
Verreaux's Eagle	~200 cm	~84 cm	~4.5 kg
Lappet-faced Vulture	250–290 cm	95–115 cm	4.4–9.4 kg
Kori Bustard (male)	~210–275 cm	Up to ~1.5 m tall	11–19 kg
Marabou Stork	240–280 cm	~150 cm	~9 kg
Saddle-billed Stork	~270 cm	~150 cm	~6 kg
Verreaux's Eagle-owl	~140 cm	~62 cm	~2.5 kg
Wandering Albatross	Up to ~350 cm — the widest of any living bird	~120 cm	~7.7 kg
Ostrich	Flightless	Up to ~2.75 m tall	Males over 150 kg

- **Bateleur** — French for a street performer or tightrope acrobat, after its tilting, rocking flight.
- **Sandgrouse** — males soak specialised belly feathers at waterholes and fly water back to their chicks.
- **Green-backed (Striated) Heron** — has been seen using bait to lure fish.
- **Kori Bustard** — the male may be the heaviest living animal capable of flight.
- **Peregrine Falcon** — the fastest animal: the fastest recorded stoop is about 389 km/h.

- **Red-billed Quelea** — with an estimated 1.5 billion birds, the most abundant wild bird on Earth.
- **Herons vs storks in flight** — herons fly with the neck folded into an S; storks fly with it outstretched and often soar in flocks.
- **African Openbill** — feeds mainly on freshwater snails and mussels; the gap in its bill is thought to help it handle them.
- **African Darter** — a hinge in the neck works like a spring to spear fish; cormorants grab fish with a hooked bill instead.
- **African Jacana** — the male can carry chicks under his wings, and also moves eggs.
- An eagle's nest is an **eyrie**.

22 Partnerships

BIRD & BIRD

Small birds nesting near aggressive Fork-tailed Drongos; Pygmy Falcons in Sociable Weaver nests; Carmine Bee-eaters riding Kori Bustards to catch insects they flush.

BIRD & PLANT

Tinkerbirds and mistletoes (*Tapinanthus* and relatives): the bird gets fruit, the plant gets its sticky seed wiped onto a branch.

BIRD & MAMMAL

Greater Honeyguide and people; oxpeckers and big herbivores; drongos, Wattled Starlings and Cattle Egrets catching insects disturbed by grazing animals.

BIRD & INSECT

The Blue Waxbill often nests beside an active paper-wasp nest; the aggressive wasps help keep predators away.

23 Separating similar species

PAIR	HOW TO TELL THEM APART
Southern Masked vs Lesser Masked Weaver	Southern: red eye; mask doesn't reach behind the eye on the crown and forms a point on the throat; brown legs. Lesser: pale eye; mask extends further back; no throat point; grey legs.
Village vs Southern Masked Weaver	Village: larger, mottled black-and-yellow back. Southern Masked: smaller, plain greenish back.
Female Spectacled vs female Red-headed Weaver	Spectacled: black stripe through a pale eye, black bill, yellow below. Red-headed: orange-red bill, white belly.
Fork-tailed Drongo vs Southern Black Flycatcher vs Black Cuckooshrike	Drongo: largest, red eye, deeply forked tail, silvery flight feathers. Flycatcher: brown eye, square-ended tail. Cuckooshrike (male): rounded tail, often a yellow shoulder, orange-yellow gape.
Amethyst vs Scarlet-chested Sunbird	Amethyst: black chest, metallic purple throat. Scarlet-chested: scarlet chest, green throat.
Greater Blue-eared vs Cape Starling	Blue-eared: dark blue ear patch, blue belly and flanks. Cape: glossy green, no contrasting ear patch.
Brubru vs Chinspot Batis	Brubru: broad white eyebrow, black crown, rufous flank stripe. Batis: grey crown, black mask, yellow eye, breast band.
Cape vs African Pied Wagtail	Cape: grey-brown and buff, little white in the wing. Pied: bold black-and-white, lots of white in the wing.

PAIR	HOW TO TELL THEM APART
White-browed vs Bearded Scrub-robin	White-browed: streaked breast, white tail tips. Bearded: buff-orange breast and flanks, black malar and crown stripes.
Red-capped vs White-browed Robin-chat	Red-capped: orange face, no eyebrow, blue-grey back. White-browed: black head with broad white eyebrow.
Groundscraper Thrush vs Dusky Lark	Thrush: larger, grey, bold face pattern, spotted from chest to flanks. Lark: smaller, darker, heavy spots on the breast only.
Yellow-bellied vs Sombre Greenbul	Yellow-bellied: yellow below, red eye, pale eyebrow. Sombre: olive, white eye.
Wire-tailed vs White-throated vs Pearl-breasted Swallow	Wire-tailed: chestnut cap, wire-like streamers. White-throated: chestnut forehead, complete dark breast band. Pearl-breasted: no band, no streamers.
Greater vs Lesser Striped Swallow	Greater: larger, fine streaks on buffy underparts. Lesser: smaller, heavy streaks, rufous head.
Red-breasted vs Mosque Swallow	Red-breasted: dark rufous throat and breast, buff underwing coverts. Mosque: white throat, white underwing coverts.
Malachite vs African Pygmy Kingfisher	Malachite: barred turquoise crest reaching the eye. Pygmy: smaller, plain blue crown that doesn't reach the eye, violet wash on the face.
African Palm Swift vs other swifts	Palm: slim, long thin wings, deeply forked tail held closed like a spike, plain grey-brown.
Klaas's vs Diederik Cuckoo	Klaas's: small white patch behind the eye, no wing spots, dark eye. Diederik: white eyebrow stripe, white wing spots, red eye (male).
Levaillant's vs Jacobin Cuckoo	Levaillant's: streaked throat and breast. Jacobin: clean white underparts.
Common vs African Cuckoo	Common: spotted undertail, little yellow on the bill, silent here. African: barred undertail, more yellow on the bill.
Spotted vs Water Thick-knee	Spotted: larger, spotted, no wing bar. Water: streaked, grey wing panel with a white bar.
White-crowned vs African Wattled Lapwing	White-crowned: white crown stripe, long yellow wattles, white below. Wattled: larger, streaked head and neck, small yellow wattles with red at the base, grey-brown breast.
Red-crested Korhaan vs Black-bellied Bustard	Korhaan: smaller, shorter neck and legs, black underwing. Bustard: long neck and legs, male's black line up the front of the neck, white in the primaries.
Black vs Abdim's Stork	Black: larger, black rump, red bill and legs. Abdim's: smaller, white rump, greenish bill, pinkish legs.
Dwarf vs Little Bittern	Dwarf: dark slaty above, dark stripes on throat and breast. Little: paler, buff wing patches.
Grey vs Black-headed Heron	Grey: larger, white head and neck, yellow bill, usually at water. Black-headed: black crown and hind-neck, dark bill, often in grassland.
Goliath vs Purple Heron	Goliath: huge, plain rufous head and neck, dark legs. Purple: smaller, black stripes on the head and neck, yellowish legs.

SMALL HAWKS — LARGEST TO SMALLEST

SPECIES	SIZE (COMPARE)	KEY FEATURES
Dark Chanting Goshawk	43–56 cm (Pied Crow)	Dark grey; finely barred belly; red cere and legs; pale rump; pale secondaries in flight

SPECIES	SIZE (COMPARE)	KEY FEATURES
African Goshawk	36–46 cm (Burchell's Coucal)	Yellow eye and legs, grey cere; barred all down the front; no white rump
Ovambo Sparrowhawk	33–40 cm (Levaillant's Cuckoo)	Finely barred grey below from throat to tail; white flecks on the tail; yellow-orange cere and legs
Lizard Buzzard	35–37 cm (Purple Roller)	White throat with black central stripe; one broad white tail band; white rump
Gabar Goshawk	28–36 cm (Lilac-breasted Roller)	Grey throat and breast; red eye, cere and legs; white rump; watch for the all-black form
Shikra	28–30 cm (Amur Falcon)	Rufous barring; cherry-red eye; no white rump or tail spots
Little Sparrowhawk	23–28 cm (Grey-headed Bushshrike)	Tiny; yellow eye, cere and legs; two white spots on the tail; narrow white rump

Other tricky raptor groups to practise: Dark vs Southern Pale Chanting Goshawk vs African Harrier-Hawk; Pallid vs Montagu's Harrier vs Black-winged Kite; Black-chested Snake Eagle vs Martial Eagle; Osprey vs juvenile African Fish Eagle; Long-crested vs African Hawk-Eagle vs Ayres's Hawk-Eagle.

MEDIUM-SIZED OWLS

SPECIES	STATUS	KEY FEATURES
African Grass Owl	Uncommon to rare resident	Very dark above, whitish below; heart-shaped pale face; dark eyes; tall grassland and marsh
Western Barn Owl	Locally common resident	Golden-buff and white, paler than the Grass Owl; heart-shaped white face; eerie screech
Marsh Owl	Locally common resident	Plain brown; buff round face with dark rim; dark eyes; tiny ear tufts. Flushed birds circle and drop back down. Rasping call
African Wood Owl	Locally fairly common resident	No ear tufts; rich brown; barred below; pale face with large dark eyes and bold white eyebrows; yellow bill; dense woodland and forest. Rhythmic hooting

THREE SANDPIPERS

SPECIES	STATUS	KEY FEATURES
Common Sandpiper	Fairly common Palearctic visitor	White "shoulder" notch in front of the closed wing; clean white below; bobs constantly
Green Sandpiper	Rare Palearctic visitor	Dark above with fine pale speckles; bold dark tail bars; dark breast against white belly; no obvious eyebrow
Wood Sandpiper	Common summer visitor	Boldly spotted above; finely barred tail; clear white eyebrow

THE "BROWN EAGLES"

SPECIES	STATUS	KEY FEATURES
Brown Snake Eagle	Common resident	Dark brown; big yellow eyes; bare grey legs; large rounded head; upright posture; pale flight feathers look translucent in flight
Steppe Eagle	Palearctic visitor	Large; dark brown; long yellow gape reaching behind the eye
Lesser Spotted Eagle	Palearctic visitor	Uniform brown; short gape; tightly feathered "stovepipe" legs; between Wahlberg's and Tawny in size

SPECIES	STATUS	KEY FEATURES
Tawny Eagle	Locally common resident; breeds Apr–Jul	Variable, often light brown; gape reaches below the middle of the eye; baggy “trousers”; rounded tail
Wahlberg’s Eagle	Intra-African breeding migrant; breeds Sep–Oct	Smallish; usually dark brown (pale forms occur); small head with a short crest; long square tail — a cross shape in flight
Booted Eagle	Some breed in the south and west; others Palearctic visitors	Small; pale and dark forms; white “landing lights” at the base of the forewing; feathered legs; pale rump band

24 Conservation

The IUCN Red List places species in categories by their risk of extinction: **Extinct** (no reasonable doubt the last one has died — Dodo, Passenger Pigeon), **Critically Endangered**, **Endangered**, **Vulnerable**, **Near Threatened** and **Least Concern**. Countries also keep their own regional lists. A species can be **regionally extinct** in one country and still survive elsewhere, and its national status may differ from its global one.

GLOBAL STATUS	SPECIES WE SEE (YEAR OF THE CHANGE WHERE KNOWN)
Critically Endangered	White-backed, Hooded, White-headed and Rüppell’s Vultures (2015); African Penguin (2024)
Endangered	Lappet-faced Vulture (2015); Martial Eagle, Bateleur and Secretarybird (2020)
Vulnerable	Southern Ground Hornbill (2010)
Near Threatened	Kori Bustard (since 2013)

The Southern Ground Hornbill shows how lists differ: it is Vulnerable globally but Endangered in South Africa, Namibia and Eswatini.

— Key terms

Altricial (nidicolous)	Hatching helpless, naked and blind; stays in the nest.
Precocial (nidifugous)	Hatching downy and mobile; leaves the nest soon.
Brood / brood patch	The young of one nesting; bare, blood-rich skin for incubating.
Brood parasite	A bird that lays in other species’ nests and leaves the rearing to them.
Cainism	Siblicide in which the older chick kills the younger.
Cloaca	Single vent for droppings, mating and egg-laying.
Crepuscular	Active mainly at dawn and dusk.
Decurved / recurved	Bill curving down / up.
Dawn chorus	The burst of song at first light.
Eclipse plumage	The drab non-breeding plumage of species with showy breeding dress.
Endemic	Found only in a given region.
Frugivore	Fruit-eater.

Gular flutter (“goo-lar”)	Vibrating the throat to cool by evaporation.
Hyperphagia	Heavy feeding to lay down fat before migration.
Iridescence	Shimmering colour that changes with the angle of view, produced by feather structure.
Keratin	The protein of feathers, bills, claws, hair and horn.
Lek	A communal display ground where males gather to attract females.
Melanism	An unusually dark form, caused by excess melanin.
Passerine	A member of the order Passeriformes — perching birds.
Pectinate claw	A comb-edged claw used in grooming.
Pelagic	Living over the open ocean.
Plumage (“ploo-mij”)	A bird’s covering of feathers.
Polygamy / polygyny / polyandry	More than one mate / one male with several females / one female with several males.
Remiges / rectrices	Wing flight feathers / tail feathers.
Rictal bristles	Stiff hair-like feathers at the base of the bill.
Sexual dimorphism	Males and females looking different.
Spatulate	Spoon-shaped.
Syndactyl / zygodactyl	Toes 3 and 4 joined at the base / two toes forward, two back.
Urohydrosis	Excreting on the legs to cool them.

In summary

- Feathers define birds; flight shapes almost everything else — light bones, a keratin bill, air sacs and one-way airflow through the lungs.
- Bills and feet tell you how a bird makes its living.
- Most birds are monogamous; polygyny brings showy males, polyandry brings showy females.
- About 1% of species are brood parasites — cuckoos, honeyguides, whydahs and indigobirds are our local cast.
- Many African raptors and vultures are now globally threatened; quote current Red List categories.
- Migration timing is set by day length; navigation uses the sun, stars, the magnetic field and landmarks.

SOURCES

Core references: Steyn, P. (1996) *Nesting Birds*; Maclean, G.L. (1993) *Roberts Birds of Southern Africa*; Gargett, V. (1990) *The Black Eagle*; plus Newman's and Roberts field guides. Specific facts and figures were checked against:

- IOC World Bird List, version 15.2 (11,227 species including 164 extinct) — worldbirdnames.org
- Hackett, S.J. et al. (2008) A phylogenomic study of birds reveals their evolutionary history. *Science* 320: 1763–1768. Caracaras: Arizona-Sonora Desert Museum, desertmuseum.org/books/nhsd_caracaras_falcons.php
- Avian respiration: Weber State University ornithology lecture notes — faculty.weber.edu/jcavitt/OrnLect/Lecture%2010.%20Avian%20Respiration.pdf
- Prum, R.O., Torres, R.H., Williamson, S. & Dyck, J. (1998) Coherent light scattering by blue feather barbs. *Nature* 396: 28–29.
- Crop milk: Gillespie, M.J. et al. (2012) *PLoS ONE* 7: e48363, via scientificamerican.com; Maslanka, M. et al. (2023), nagonline.net
- Stangier, N. et al. (2023) The uropygial gland of the Great Cormorant. I. Morphology. *Journal of Ornithology* 164: 591–603 — link.springer.com/article/10.1007/s10336-022-02042-8
- Fisher, R.A. (1930) *The Genetical Theory of Natural Selection*; Zahavi, A. (1975) *J. Theor. Biol.* 53: 205–214; Maynard Smith, J. (1976) *J. Theor. Biol.* 57: 239–242
- Stevens, M. (2013) Bird brood parasitism. *Current Biology* 23: R909–R913 (~1% of species) — via bionumbers.hms.harvard.edu
- Spottiswoode, C.N. & Koorevaar, J. (2012) A stab in the dark: chick killing by brood parasitic honeyguides. *Biology Letters* 8: 241–244.
- Birkhead, T.R. et al. (2011) Internal incubation and early hatching in brood parasitic birds. *Proc. R. Soc. B* 278: 1019–1024 — pmc.ncbi.nlm.nih.gov/articles/PMC3049026
- Honeyguides and honey badgers: see Safari Notes 15 (van der Wal et al. 2023).
- Bar-tailed Godwit record — Guinness World Records (2023): guinnessworldrecords.com (news, Jan 2023)
- Arctic Tern migration (Egevang et al. 2010, *PNAS*) — phys.org (Jan 2010)
- Van Wassenbergh, S. et al. (2022) woodpecker heads as stiff hammers, *Current Biology* — smithsonianmag.com (2022)
- Woodpecker hyoid and tongue tips — American Bird Conservancy, abcbirds.org/blog21/woodpecker-tongues/
- Southern Ground Hornbill breeding — animaldiversity.org/accounts/Bucorvus_leadbeateri; sanbi.org/animal-of-the-week/southern-ground-hornbill/; uplisting from Least Concern to Vulnerable in 2010 — BirdLife consultation (2009) and 2010 Red List, reproduced at a-rocha-kenya.github.io/KenyaBirdsNet
- New World vultures' classification — Remsen, J.V. (2008) SACC Proposal 361 (LSU Museum); species counts — himalayannature.org
- Rüppell's Vulture altitude record — guinnessworldrecords.com/world-records/70927-highest-flying-birds
- African vulture uplistings (2015) — birdwatchingdaily.com (Oct 2015)
- Martial Eagle, Bateleur, Secretarybird Endangered (2020) — birdlife.org (news, Dec 2020)
- African Penguin Critically Endangered (2024) — news.mongabay.com (Nov 2024)
- Kori Bustard (Near Threatened since 2013) — britannica.com/question/Are-kori-bustards-threatened; size — nationalzoo.si.edu/animals/kori-bustard; birminghamzoo.com/animal/kori-bustard/; guinnessworldrecords.com/world-records/70907-heaviest-flying-bird
- Ostrich size, egg weight and incubation — Encyclopædia Britannica, britannica.com/animal/ostrich
- Hamerkop nests — sanbi.org/animal-of-the-week/hamerkop/
- Smallest bird nests — guinnessworldrecords.com/world-records/70937-smallest-bird-nest
- Sociable Weaver nests — animals.sandiegozoo.org/node/229
- Red-billed Quelea abundance — audubon.org/news/what-most-abundant-wild-bird-world
- Peregrine stoop speed — iflscience.com/whats-the-fastest-bird-in-the-world-74811
- Tawny Eagle nestling period — Animal Diversity Web (University of Michigan): animaldiversity.org/accounts/Aquila_rapax/
- Crowned Eagle, Lappet-faced Vulture sizes — The Peregrine Fund, peregrinefund.org/explore-raptors-species; Martial Eagle — animaldiversity.org/accounts/Polemaetus_bellicosus
- Klaas's Cuckoo hosts — Little, R. (2014) *Ornithol. Observations* 5: 369; thebdi.org/?p=35466
- Hornbill nest predation — Beale, C. (2012) *Safari Ecology* blog
- Half-collared Kingfisher status — namibian.org/nature-wildlife/birds/corachformes/half-collared-kingfisher
- African Harrier-Hawk tibiotarsal joint — namibian.org/nature-wildlife/birds/accipitriformes/african-harrier-hawk
- Verreaux's Eagle density, diet and breeding — the-eis.com/atlasing/sites/default/files/Verreaux%27s_Eagle.pdf

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