BBC

HERE BE DRAGONS MEET THE MONSTERS OF KOMODO ISLAND

# Wildlife

September 2011 £3.80 US $8.25 CAN $10.95
Volume 29 Number 9

THE BIG DEBATE

## THE MAGPIE: FRIEND OR FOE?

Why the case may not be black and white

INSECT INSIGHTS

## SECRETS OF THE BEEHIVE

How killer queens reign: the private life of honeybees

## SWIMMING WITH GIANTS

Experience the world's ultimate underwater encounters: whale sharks, manta rays, humpbacks and turtles

## DINGO DRAMA

On the frontline in the fight to save

## MUSHROOM MAGIC

Breathtaking images reveal the delicate

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Is Africa's great wildebeest migration

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Stephen Dunleavy

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COVER Jürgen Freund/naturepl.com
INSETS Laurent Geslin/NPL; Edwin Giesbers

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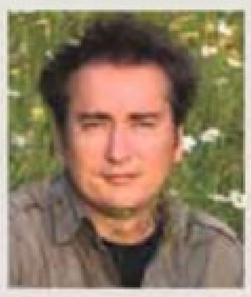
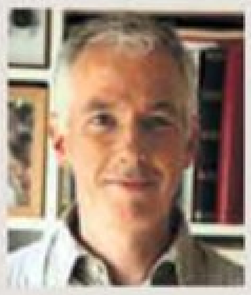
## THIS MONTH'S CONTRIBUTORS



**EDWIN GIESBERS**
**Mushroom magic, p18**
Edwin has photographed a host of animals in many beautiful countries but, come autumn, he simply can't be dragged away from the woodlands of his native Netherlands. "I'm in my element, crawling around in search of fungi," he says. "There's something so magical about the way they suddenly appear."



**STEPHEN DUNLEAVY**
**Dingo drama, p40**
A wildlife film producer, Stephen became fascinated by dingos while filming in Australia with expert Brad Purcell. "I honestly thought that tracking them would be easy, but Brad's packs are not habituated," he says. "It took us six days to spot our first dingo. That made me appreciate how truly wild they are."

**NICK BAKER**
**Here be dragons, p58**
Nick is a lifelong lover of lizards – big ones being no exception. He was lucky enough to visit Komodo Island several years ago. "Dragons transform from lounge lizards to velociraptors in seconds," he remembers. "I felt a deep unease at being stalked by such cold-blooded killers."

**TUI DE ROY**
**Swimming with giants, p72**
Tui grew up in the Galápagos Islands, where nature was her classroom and animals became her childhood friends. The playful cavorting of sealions underwater still tops her list of wildlife highlights. "It was an exhilarating experience," she says, "yet very challenging to photograph."

# A colossal thrill

**TRAUMATISED BY** watching *Jaws* when far too young and impressionable, the nearest I have come to swimming with anything remotely large or dangerous is snorkelling with a barracuda off Dominica.

Yet the rational part of me recognises that sharing sea space with any leviathan is one of the most exhilarating wildlife experiences the natural world has to offer.

So we asked 10 of our most intrepid adventurers – writers, photographers and naturalists – to share their top underwater encounters. What emerged, as well as jaw-dropping images of humpbacks, manta rays, hammerhead sharks and manatees, was the sense of awe and elation that such moments inspire.

Read their stories and you, too, may be inspired to take the plunge. Because these extraordinary experiences are not the exclusive preserve of wildlife photographers and film-makers – you can enjoy them yourself.

Even if, like me, you are not quite ready to plunge into shark-infested waters, there are many friendlier, less toothy and more playful animals to swim with – a sealion or manatee, perhaps. Read our special feature to learn how and where you can follow in our experts' wakes (**p72**).

**"There are many friendlier, less toothy animals you can swim with."**

Also this month, we track down Australia's controversial canid – the dingo – and find out why conserving the dog from Down Under is so difficult (**p40**). Richard 'Bugman' Jones reveals the secret of immortality in the honeybee hive (**p52**), and Nick Baker discovers why the Komodo dragon is even more deadly than experts believed (**p58**). Plus, we find out if the magpie deserves its terrible reputation (**p66**), and congratulate our Nature Writer of the Year (**p80**).

**YOUR FAVOURITE** magazine gets an exciting new look next month. You've told us what you want and we've listened: the new, improved *BBC Wildlife* is cleaner, fresher and even more packed with British wildlife, conservation stories and tips for understanding and enjoying nature. There's even more eye-catching photography and our experts – now including the inimitable Bill Oddie – will be working harder than ever to inspire and amaze you. It's the *BBC Wildlife* you know and love, but even more gorgeous. Don't miss it!

Sophie

**Sophie Stafford**, Editor

Enjoy exclusive image galleries and enter our photo contests at www.discoverwildlife.com

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# HIGHLIGHTS SEPTEMBER

Our pick of the wildlife spectacles to enjoy in Britain this month

WITH PAUL EVANS
Nature writer and BBC radio presenter

JAY

## Bounty hunter

With a wicked cackle and a screech of brakes, a jay announces its presence in a September oak tree. Its powder-pink back, blue wing flashes, fancy crest and white backside make this our showiest corvid. You will sometimes see a jay being followed by a wake of small birds – like a mob of angry villagers trying to chase off a dandy pirate – because, though the species feeds on nuts and seeds, it is also partial to baby birds. This month, however, the tail-flicking, never-settle-in-one-place jay has something else on its mind. It's harvest time. As autumn approaches, it snaffles up acorns to cache for winter. It bodges them into the ground, up to 3,000 a month, forgets where most of them are and "great oaks from little acorns grow".

**ON OUR WEBSITE**

To learn how to identify food caches left by animals, visit www.discoverwildlife.com/british-wildlife/how-identify-animal-food-stores

Arto Juvonen

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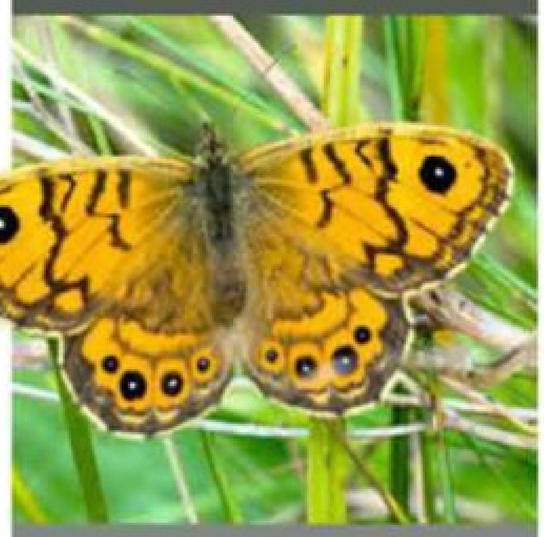
# HIGHLIGHTS SEPTEMBER

## THREE TO SPOT LATE BUTTERFLIES



David Kjaer

▲ On sunny days this month look out for the WALL BROWN in rough grassland. If the butterfly pauses to bask, its open wings reveal a tawny-orange mosaic over dark brown, decorated with white 'eye spots' (one on the forewings and four smaller ones on the hindwings). The caterpillars feed on cocksfoot and other grasses, and adults on the wing in September may belong to the third brood of the year.

Danny Green

▲ One of our most spectacular butterflies, the WHITE ADMIRAL is night-dark with chalk-white insignia. Found mainly in the south, it is a true woodland spirit. This year there's likely to be a second brood, whose larvae will have fed on honeysuckle. The resulting adults love bramble – and some less savoury substances (white admiral enthusiasts pee on the ground to coax the insects from the treetops).

Simon Booth

▼ The year's second generation of HOLLY BLUES is also on the wing in September, searching for the nectar of late-blooming plants in open woods and gardens and along hedgerows. These beauties have pretty sky-blue wings edged in black, with grey-blue, black-dotted undersides. Unlike the first generation of adults, which laid their eggs on holly in spring, these adults will deposit their little white eggs on ivy.

Laurie Campbell

Hedgehogs binge this month to lay down fat, but will lose about a quarter of their body weight over the winter.

HEDGEHOG

## The big sleepover

**PREPARING FOR** the 'Big Sleep' is a serious business for the hedgehog: getting it wrong spells disaster. Now is the time our favourite nocturnal spiny mammal must build up fat stores, bulking up for the coming winter. To this end it hoovers up huge numbers of earthworms, beetles and caterpillars – even carrion is on the menu – but to achieve its target 'safe' weight it requires a landscape full of food-rich habitats.

Traditionally, typical hedgehog territory included hedgerows, woodland edge, meadows and pasture. But intensively farmed land provides much less invertebrate food: this could be one reason why so many hogs have moved to the suburbs. Another theory (far from proved) is that depleted rural hedgehog populations are more vulnerable to the impact of predation by badgers. Either way, despite the hedgehog's shift in habits, its British population has dropped by a quarter over the past decade.

A hedgehog snuffles and grunts more than 1.5km each night in search of food – a journey fraught with difficulties such as garden fences, ponds, roads and dogs. And to hibernate, it needs a dry, sheltered spot where it can sleep undisturbed, not a bonfire.

But Hedgehog Street, a national campaign to help us help hedgehogs, aims to make amends. By checking before we mow our lawns, linking up our gardens, making ponds safe, creating log piles and leaving wild patches, we can all create a little bit of hedgie heaven in our back yards.

**GET INVOLVED**

**To find out how you can become a 'hedgehog champion', visit www.hedgehogstreet.org**

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# Best of British
# WAXCAP GRASSLANDS

**In September our rough, grassy places come alive with an array of fabulous fungi.**

**WAXCAPS ARE** magical mushrooms that look more at home in fairytales than rough grass. These elfin toadstools come in a startling colour palette – white, green, yellow, ochre, red, pink – and many glisten gorgeously like little candles.

In a country that values the neatness of its lawns and the tidiness of its countryside, the very idea of rough grass became anathema after World War II – a symbol of not just physical but moral dereliction. Agriculture was all about improving pasture: fertilisers, herbicides and monocultures of productive grass strains civilised the 'weedy wastes'. Almost too late we realised that the rough end of the countryside is where barn owls hunt, butterflies and moths thrive, and fantastic fungi flourish.

Crimson waxcaps *Hygrocybe punicea* paint the corner of a field red.

Nigel Bean/naturepl.com

## NINE TOP SPOTS

Britain is good for grass. From meadows to dunes and fens, here are some of our best green and pleasant places for fungi, plants and wildlife.

**1 MAR LODGE, BRAEMAR, ABERDEENSHIRE**
Upland grassland in the Cairngorms National Park.

**2 GARRON PLATEAU, COUNTY ANTRIM, N IRELAND**
The largest area of blanket bog in Northern Ireland.

**3 KILLYKEEGHAN & CROSSMURRIN, COUNTY FERMANAGH, N IRELAND**
Limestone grassland, with patches of hazel scrub.

**4 AUGILL PASTURE, BROUGH, CUMBRIA**
Unimproved upland grassland; a Plantlife reserve.
www.plantlife.org.uk/nature_reserves/augill_pasture

**5 CAEAU TAN Y BWLCH NR, LLYN PENINSULA, NORTH WALES**
Traditional pasture managed by North Wales Wildlife Trust.

**6 WICKEN FEN, CAMBRIDGESHIRE**
Better known for its birds and dragonflies, this reserve is also great for grassland fungi.
www.wicken.org.uk

Parrot waxcap *Hygrocybe psittacina.*

Richard Becker/FLPA

**7 WINKS MEADOW, METFIELD, SUFFOLK**
Unimproved grassland, managed by Plantlife.
www.plantlife.org.uk/nature_reserves/winks_meadow

**8 THE CHASE, DAGENHAM, LONDON**
Hunt for waxcaps in the capital.

**9 TYNTESFIELD, NEAR BRISTOL, SOMERSET**
This National Trust estate is a waxcap haven.
www.nationaltrust.org.uk/tyntesfield

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ID PARADE

# Wild fruits

**ALL THAT SPRING** sunshine, which made 2011 one of the most splendid for hedgerow and woodland-edge blossom that I can remember, is now fastened inside fruit. Several months' worth of growth, photosynthesis and pollination have finally come together. Hips, haws, berries, arils, drupes, achenes, samaras, nuts and legumes: these represent the future of the plants and the ecosystem to which they belong.

Many of Britain's wild fruits are surprisingly vividly coloured: take those of spindle, rosehip and rowan, for example. Others, such as those of elderberry, blackberry and black nightshade, are shiny and black. But whatever a fruit's colour, shape, scent and taste, it is an irresistible package that shouts 'eat me' to particular animals.

Blackbirds and thrushes peck at the mustard-yellow puddles of windfall crab-apples. Badgers – immune to thorns – snaffle up juicy blackberries. Dormice climb swags of honeysuckle to pluck the scarlet berries.

We feel the same fruity allure, perhaps because we, too, are mammals that sense the need to put on weight for winter. The jewel-like qualities and luscious promise of fruit have also long had a powerful influence on our aesthetic of natural beauty.

Here are some of the familiar, and less familiar, wild fruits to look out for when in the countryside this month. If you're inspired to go foraging, always obtain the permission of the landowner first and leave plenty of fruit for wildlife – never take all of the crop from the same shrub or tree.

Illustrations by Felicity Rose Cole: not to scale

## Elder

*SAMBUCUS NIGRA*

Small hedgerow tree with flat clusters of edible black berries. Frothy white flowers in May–June.

## Black nightshade

*SOLANUM NIGRIM*

Tiny, tomato-like annual with dull black berries. Not to be confused with poisonous deadly nightshade.

## Burnet rose

*ROSA PIMPINELLIFOLIA*

Low shrub of coastal dunes and chalk grassland. Unlike other wild roses produces purple-black hips.

## Bittersweet

*SOLANUM DULCAMARA*

Woody scrambler with red, oval, bitter-sweet berries. Also known as woody nightshade.

## Spindle

*EUONYMUS EUROPAEUS*

Small hedgerow shrub with garish clusters of coral-pink berries held in orange sheaths.

## Black bryony

*TAMUS COMMUNIS*

Britain's only wild yam. Climbing tendrils twine around hedgerow plants. Red, poisonous berries.

## Dog rose

*ROSA CANINA*

Vigorous hedgerow briar: our most common wild rose. Oval to flask-shaped scarlet rosehips.

## Honeysuckle

*LONICERA PERICLYMENUM*

Vigorous shrub that entwines around trees and hedgerow plants. Clusters of bright red berries.

## Hawthorn

*CRATAEGUS MONOGYNA*

Small or medium-sized thorny tree of hedgerows, rough ground and upland areas. Scarlet oval 'haws'.

## Rowan

*SORBUS AUCUPARIA*

Upland tree with clusters of small, scarlet berries (popular with birds). Also known as mountain ash.

## Wild service tree

*SORBUS TORMINALIS*

Often-overlooked tree of ancient woods. Clusters of brown, spotted fruits (once used to flavour beer).

## Crab-apple

*MALUS SYLVESTRIS*

Thorny tree with small, hard, yellow, apple-shaped fruits that can be used to make jelly.

**ON OUR WEBSITE**

Hedges full of native berry-bearing shrubs look fantastic – and are great for wildlife, too. Find out how to create one at www.discoverwildlife.com/wildlife-gardens/how-make-your-hedge-wildlife-friendly

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A male common lizard among moss. This hardy reptile occurs as far north as the Arctic.

Adri Hoogendijk/Minden/FLPA

COMMON LIZARD

# Sun worshippers

**FOR COMMON LIZARDS,** September is a time for sunbathing. Emerging from the shadows where they've been hiding all summer, these cold-blooded sunseekers seize any chance to soak up some rays. Once warmed up, they engage in a final flurry of hunting, stocking up on insects, spiders and worms ready for the start of their hibernation next month.

You are most likely to encounter common lizards – so called because they occur throughout Britain and are the only reptiles in Ireland – basking beside paths on heaths and rough grassland and along woodland edges. But though largely associated with dry, sandy places, they do live in boggy spots, too.

Waste ground and derelict buildings also suit these lizards perfectly – old tyres and sheets of corrugated iron make excellent warming and hiding places. If you have a garden that backs onto suitable habitat, why not try attracting them by placing stones or a tin sheet in a sunny spot?

The adult lizards vary in colour from olive-brown to chocolate (males tend to be spotty and females stripy), while the young are jet black. But whatever their coloration, these creatures are wonderfully camouflaged – until they decide to scarper. Lizards are either still or gone: there are no half measures.

Common lizards are fully protected by law, so make sure not to disturb them. But to see them, it's worth knowing that they are not too fussy: even a cloudy day this month will bring them out to lounge around if it's reasonably warm.

**FIND OUT MORE**

Learn more about British reptiles at www.arc-trust.org and www.herpetofauna.co.uk

Philip Dalton/naturepl.com

## HUMMINGBIRD HAWKMOTH

A creature that's a blur yet still unmistakable, the hummingbird hawkmoth lives up to its chimeric name. Like a real hummingbird, its wings beat so fast that it can hover, enabling it to feed at valerian, honeysuckle and tubular garden blooms. Like a hawk, it can fly huge distances (it migrates here from North Africa and the Mediterranean).

September is a great time to see this handsome moth – and sightings are on the increase. Could this be due to climate change? And do British-bred 'hummers' make the return trip south? We don't know, but you can help Butterfly Conservation to find out by taking part in its Migrant Watch survey.

**GET INVOLVED**

Take part in the Migrant Watch survey at www.mothscount.org/text/31/humming_bird_hawk_moth_painted_lady_survey.html

THREE TO SPOT

## PRETTY IN PINK

Dave Bevan

▲ HEMP AGRIMONY's leaves look remarkably like the symbol for marijuana (a coincidence – it is not actually related to hemp). This plant is a tall, rough-looking character of fens, marshes, wet woodland and soggy banks. Its September flowerheads contain tufts of five or six reddish-pink tubular florets with purple bracts, which insects love. Every wildlife gardener should plant some!

Laurie Campbell

▲ Late-flying insects need a late-flowering source of nectar and HIMALAYAN BALSAM provides just that. Even so, this beautiful, fast-growing Asian plant divides opinion. Having jumped the garden fence – it was once prized as a kind of Busy Lizzie on steroids – it has colonised long stretches of Britain's rivers and streams. Its reddish stems grow up to 3m tall and its 'policeman's helmet' flowers are pale, pink-hooded lips with a spur.

David Chapman

▼ ROSEBAY WILLOWHERB is the classic flower of late summer and early autumn. Also known as fireweed for its plucky ability to colonise burnt areas, it creates bold flashes of vivid pink in places that would otherwise be grim. Up close, the four-petalled flowers are really a purple rose carried on spikes. This is the foodplant of the elephant hawkmoth.

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# HIGHLIGHTS
# SEPTEMBER'S MUST-SEE

## Greylag goose

**THE SOUND OF** rushing wings and a thrilling chorus of bugling calls signal that our wild geese are back from their northern breeding grounds. Six migratory species of geese are commonly seen in the British Isles, and biggest of them all are the greylags.

Those that visit us in winter have spent a brief but intense Arctic summer breeding and fattening up on the tundra in Iceland. They roost on our estuaries and lakes and in our reedbeds, flying out at dawn to feed on farmland grasses, crops and spilled grain.

To our ancestors, greylags were the fleshy equivalent of wild fruit and a major food source in winter (a male goose can weigh a substantial 3.5–4kg). As recently as the 19th century, their breeding range in Britain stretched from northern Scotland south as far as the English fens, but excessive hunting drove them to the brink of extinction here.

Today, there are many resident populations of greylags on British reservoirs and gravel pits, which often share their home with Canada geese. They also live year-round in the Highlands and on Orkney and Shetland. Some of these birds will be remnants of our native population, but it is the bugling flocks that visit us from the Arctic in winter that are the most exciting to watch.

### TOP LOCATIONS FOR WILD GREYLAGS

1 **Loch Loyal, Sutherland**
2 **Loch Druidibeg NNR, South Uist, Hebrides**
3 **Vane Farm RSPB, Fife**
4 **Lough Foyle, County Derry, N Ireland**
5 **Mersehead RSPB, Dumfries & Galloway**
6 **Dublin Bay, County Dublin, Ireland**
7 **Slimbridge WWT, Gloucestershire**

**FIND OUT MORE**

Learn more about greylags at http://blx1.bto.org/birdfacts/results/bob1610.htm

**A far cry from the domestic geese that they superficially resemble, wild greylags represent a wild northern spirit. Their skeins come barrelling into our airspace like the first autumn gales.**

Andrew Parkinson

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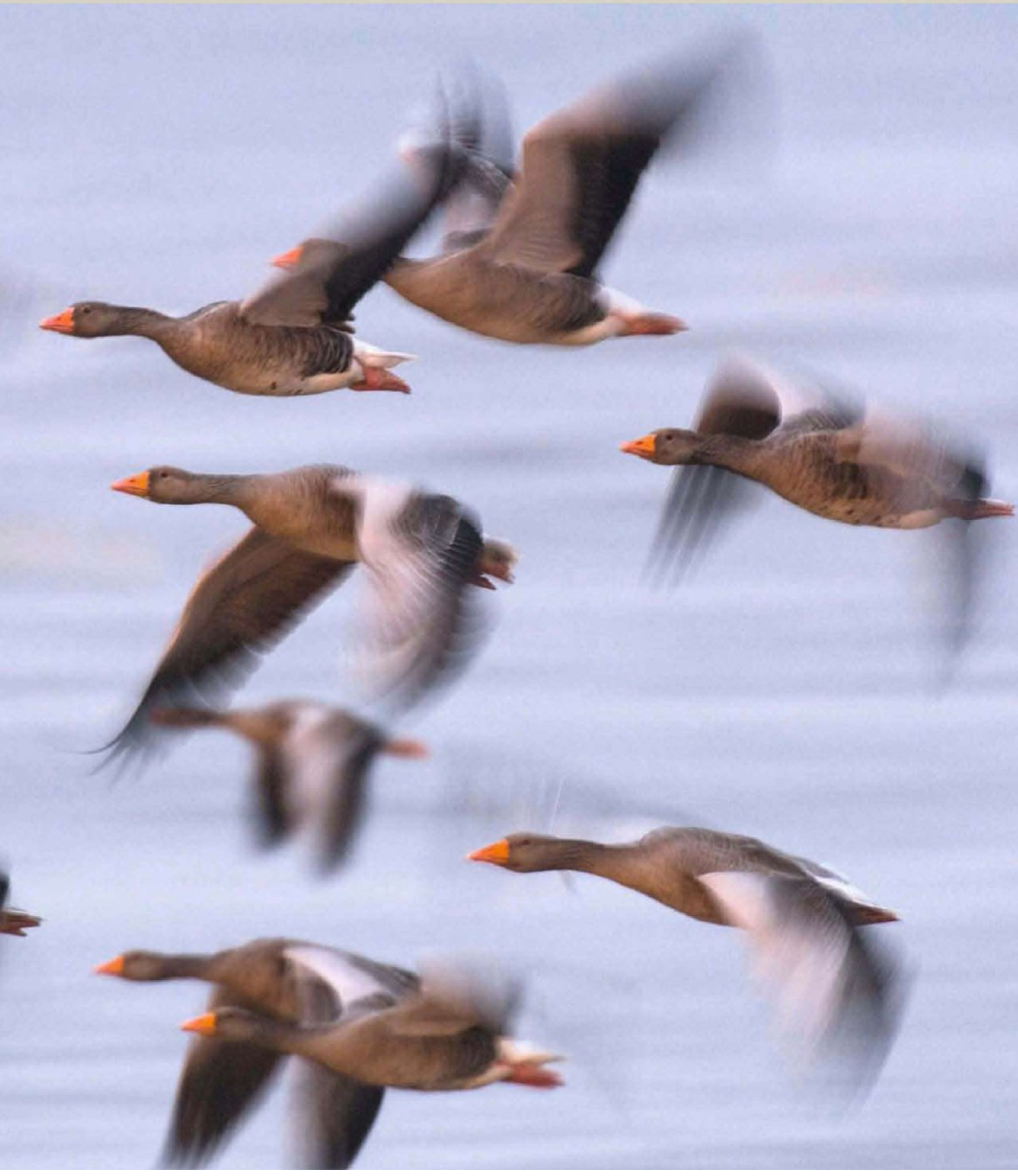

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# HIGHLIGHTS SEPTEMBER

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Gerald D Tang

USA

## Migrating dragons

Cape May in New Jersey is celebrated for its bird migration, but equally impressive is the mass movement of green darner dragonflies. Each September countless thousands of these fast-flying insects pass through, heading south to wintering grounds in Florida and around the Gulf of Mexico. By fixing tiny radio transmitters to the dragonflies, scientists have discovered that they use the same flyways as birds. They follow the coast south, travelling by day and resting in trees overnight; with a good tailwind, some cover 160km a day. Unlike in birds, however, this is not a return migration: the green darners that reach their wintering areas reproduce there and die – it is their offspring that return north in spring to breed.

FIND OUT MORE

www.arkive.org/common-green-darner/anax-junius

Konrad Wothe/Minden/FLPA

MEDITERRANEAN

## Falcon ambush

In September millions of European songbirds surge across the Mediterranean on their migration to Africa. But first they must make it past the waiting Eleonora's falcons. These agile predators nest in sea-cliff colonies on the migrants' flightpath. For much of the year they feed on flying insects but now they switch to a feathered diet, soaring high over the sea and snatching birds that pass below.

To make the most of this seasonal bounty, the falcons breed later than any other European bird. Their eggs, laid in July or August, hatch after 28–30 days, so the baby falcons are in the nest just as the flood of southbound migrants provides a bumper food source. Come October, the raptors head south to their own wintering quarters in Madagascar.

FIND OUT MORE

www.bbc.co.uk/nature/life/Eleonora's_Falcon

AUSTRALIA

## Jungle giants

In the rainforests of Daintree National Park, Queensland, male southern cassowaries are now incubating their partners' eggs. These flightless giants began their courtship season in June, attracting females with booming, low-frequency calls – at 32Hz, the deepest of any bird. After laying between three and eight huge green eggs, the females left their mates to discharge all parental duties, and this month are nowhere to be seen.

Each male tends his nest diligently, turning the eggs and adjusting the leaf litter to keep the clutch at the optimum temperature. Once the eggs hatch, after about 50 days, this formidable father cares for his stripy, yellow-brown brood for nine months or more. The blade-like claws on his inner toes offer a forceful deterrent to any would-be predator – humans included. The juvenile cassowaries will be at least two years old before they finally acquire black adult plumage.

FIND OUT MORE

www.derm.qld.gov.au/wildlife-ecosystems/wildlife/threatened_plants_and_animals/endangered/cassowary

Steffen & Alexandra Sailer/ardea.com

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# WORLDWIDE WONDERS

What's going on in the wild world this month – with MIKE UNWIN

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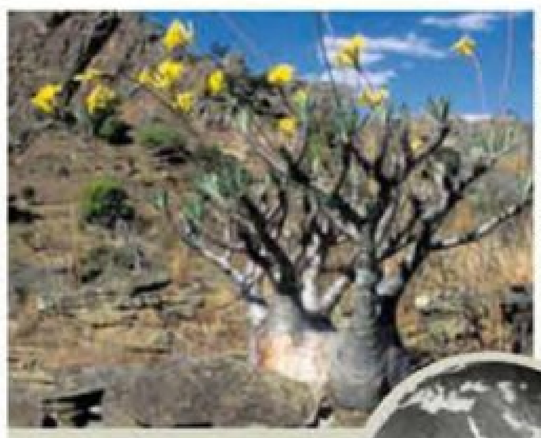
Pete Oxford/naturepl.com

**PERU**

▲ September in Manu National Park is the best time to watch Andean COCKS-OF-THE-ROCK at their courtship arenas. The flame-coloured males of this polygamous species gather in the early morning and late afternoon at traditional sites, or leks, in the cloud forest. They bow, jump, flap and snap their bills in a bid to impress the dowdy brown females.



Jouan & Rius/naturepl.com

**MADAGASCAR**

▲ The odd ELEPHANT'S FOOT PLANT, one of many unusual succulents found on this extraordinary island, bursts into flower this month. Its blooms bring a splash of yellow to the dramatic sandstone canyons of Isalo National Park. The plant looks like a miniature baobab tree due to its bulbous trunk – an adaptation that enables it to store water during droughts.

Richard du Toit/naturepl.com

**SOUTH AFRICA**

▲ The breeding season for SOUTHERN RIGHT WHALES off the Cape coast of South Africa is at its peak. Here, a series of warm, sheltered bays provides the 60-tonne cetaceans with ideal conditions for courting, calving and nursing their newborn young. The whales arrive in June or July from their Antarctic feeding grounds and remain until October or November.

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FloraMags.com

A BRUSH WITH NATURE

# RICHARD MABEY

**After years of debate, we still struggle to make sense of the parallels between human society and wild ecosystems.**

**IT'S HARD TO** imagine how we could even talk without natural metaphors. They are, so to speak, the root and branch of our language. We sing like birds, breed like rabbits and – as a species – generally behave like animals. Which, of course, we are. Natural analogies help to clarify our behaviour, reminding us that we are as inextricably entwined with the biosphere as plankton and parrots.

The trouble starts when these analogies are taken literally. We aren't some kind of bird or rabbit, and to suggest we are demeans both us and them. The distortions become especially pernicious when complex organisations like human societies and wild ecosystems are compared.

June saw the screening of *All Watched Over by Machines of Loving Grace*, a series of films made by Adam Curtis for BBC2. Like all of Curtis' work, they were visually mesmerising and intellectually provocative. His thesis was that, encouraged by the World Wide Web, we increasingly see human society as a self-stabilising system, and so opt out of moral choice and political action. This seems a bizarre framing of the modern world view to me, but, according to Curtis, one of the key ideas behind it is the model of the ecosystem (and perhaps nature itself) as a stable, self-correcting organisation.

The first stirrings of this notion occurred in North America in the mid-19th century, when intellectuals associated with the Transcendentalist movement proposed that there was a semi-mystical order in nature. Then, in the 1920s, the American ecologist Frederic Clements expanded their idea, developing the classic theory of vegetational succession. He saw plant communities as super-organisms that inexorably progress to stable 'climax' forms.

Curtis picked up the story by focusing on the work of British botanist Sir Arthur Tansley, who popularised the term 'ecosystem'. Perhaps more Marxist than mystic, Tansley thought it was primitive 'herd instinct' that drove plant communities towards higher social orders – stable climax forests. His conviction persists among a few conservationists, but, as Curtis brilliantly dramatised, is discredited by most ecologists today. Ecosystems are in fact dynamic entities, constantly rocked by and adapting to stresses such as storms, disease and overgrazing.

Alex Hyde/naturepl.com

**Our much-loved forests march to their own biological tune – using the language of finance to talk about these dynamic and inspiring ecosystems is foolish.**

**"If a forest's social benefits are valued at £1 million and a coal mine's at £10 million, then goodbye forest."**

But ecosystems do try to self-stabilise between catastrophes. They have to, because every component depends on all of the others for food, shelter and oxygen. As the biologist Lynn Margulis suggests, the workings of the biosphere are like the solutions to a myriad constantly shifting simultaneous equations. This might be a more attractive model for human society, if human will didn't disrupt such automatic adaptation.

Shortly after Curtis' series aired, there was a grand exercise in analogy that went in the converse direction. The report of the first UK National Ecosystem Assessment (see News, July 2011) decreed that nature was just a large-scale economic resource for one species – us. In future the infinitely varied transactions of wild beings were to be valued not for what they mean to the organisms themselves – or even for the indefinable and poetic joy they give us – but functionally, in pounds sterling.

By some inscrutable mathematics, the compilers of the report worked out that (taking tourism, health and other 'ecosystem services' into account) the UK's semi-natural habitats will be worth £290 per household. The problem with this kind of dispassionate accounting, as George Monbiot has pointed out, is that it works both ways. If a forest's social benefits are valued at £1 million and a coal mine's at £10 million, then goodbye forest.

It is easy to understand why conservation bodies are supporting the NEA: if you're battling big business, it's smart to talk their language. But ecosystems aren't 'services' for our benefit: they have agendas of their own. Envisioning nature as a commodity could corrupt our whole sense of respect for the natural world.

Human societies are part of Earth's biosphere, yet are not 'natural'. Just as metaphors from brawling, macho stock markets insult the exquisite interactions in a forest, so human affairs are dangerously misunderstood when seen as either imaginary self-regulating systems or mythically chaotic jungles.

BBC TWO Find out more about **All Watched Over by Machines of Loving Grace** at www.bbc.co.uk/programmes/b011lvb9

**RICHARD MABEY** has contributed columns to *BBC Wildlife* since 1984.

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# ESTONIA is a land of great natural beauty

With its Siberian-like forests, Scandinavian peat-bogs, watermeadows full of geese and waders, and a fascinating coastline, together with a low human population, empty roads and excellent infrastructure, Estonia has rapidly become a favourite wildlife destination in Europe.

Estonia is a wonderful place to see wildlife at any time of year with fantastic birdwatching including **Steller's Eiders, Ural Owl, Pygmy Owl, Great Snipe, Nutcracker, Citrine Wagtail, Lesser Spotted Eagle, 8 species of Woodpeckers, sea ducks, Hazel Grouse** and massive numbers of **birds on migration**. **Butterflies, dragonflies** and **flowers** are equally exciting and the country is renowned for its large number of mammals – over 150 **Wolves**, 500-600 **Brown Bears** and almost 20 000 **Beavers** plus **Flying Squirrels** and an incredible 700-800 **Lynx**, one of the strongest populations in Europe!

## Some interesting facts:

> Estonia stretches 350 km from east to west and 240 km from north to south.
> Sea islands form one tenth (10%) and lakes about one twentieth (5%) of Estonia's territory.
> Forests and woodlands cover almost half of the Estonian territory.
> Total area of Estonian fens and bogs is about 140 000 ha.
> An admirable 18% of the country is afforded protection within nature reserves that vary in size from the large national parks to the smaller, locally protected, reserves.
> With an area of 45 000 sq km, Estonia is larger for example than Slovenia, Holland, Denmark or Switzerland.
> Conversely, Estonia's population ranks amongst the smallest in the world: as of January 2011, an estimated 1 340 100 people live in Estonia — a density of only 29,6 people per sq km.

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# PORTFOLIO: MUSHROOM MAGIC

## Edwin Giesbers' sensual photographs of the

**SINCE I WAS** a young boy I've been fascinated by the toadstools and mushrooms that erupt mysteriously in the woods around my hometown of Nijmegen. For centuries the colours, shapes, smells and tastes of fungi have provoked delight and fear in people. In the Middle Ages, the appearance of toadstools was associated with magical or diabolical influences, and they were connected to toads, snakes, dragons, trolls, druids and poisoners.

But for me, they evoke different associations. Though their caps, cones and stems appear throughout the year, in my mind mushrooms and toadstools are inextricably connected with autumn, when they appear in great numbers.

The glistening, golden-brown domes of these mica (or glistening) inkcaps *Coprinellus micaceus*, in a forest on the Warnsborn estate near Arnhem, contrast with a background of bright fallen leaves, embodying the essence of the season. I was grateful to capture this image before an October shower dissolved the caps into an inky mess.

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fungi of his native Netherlands reveal an ankle-high landscape of delicate, multi-hued beauty.

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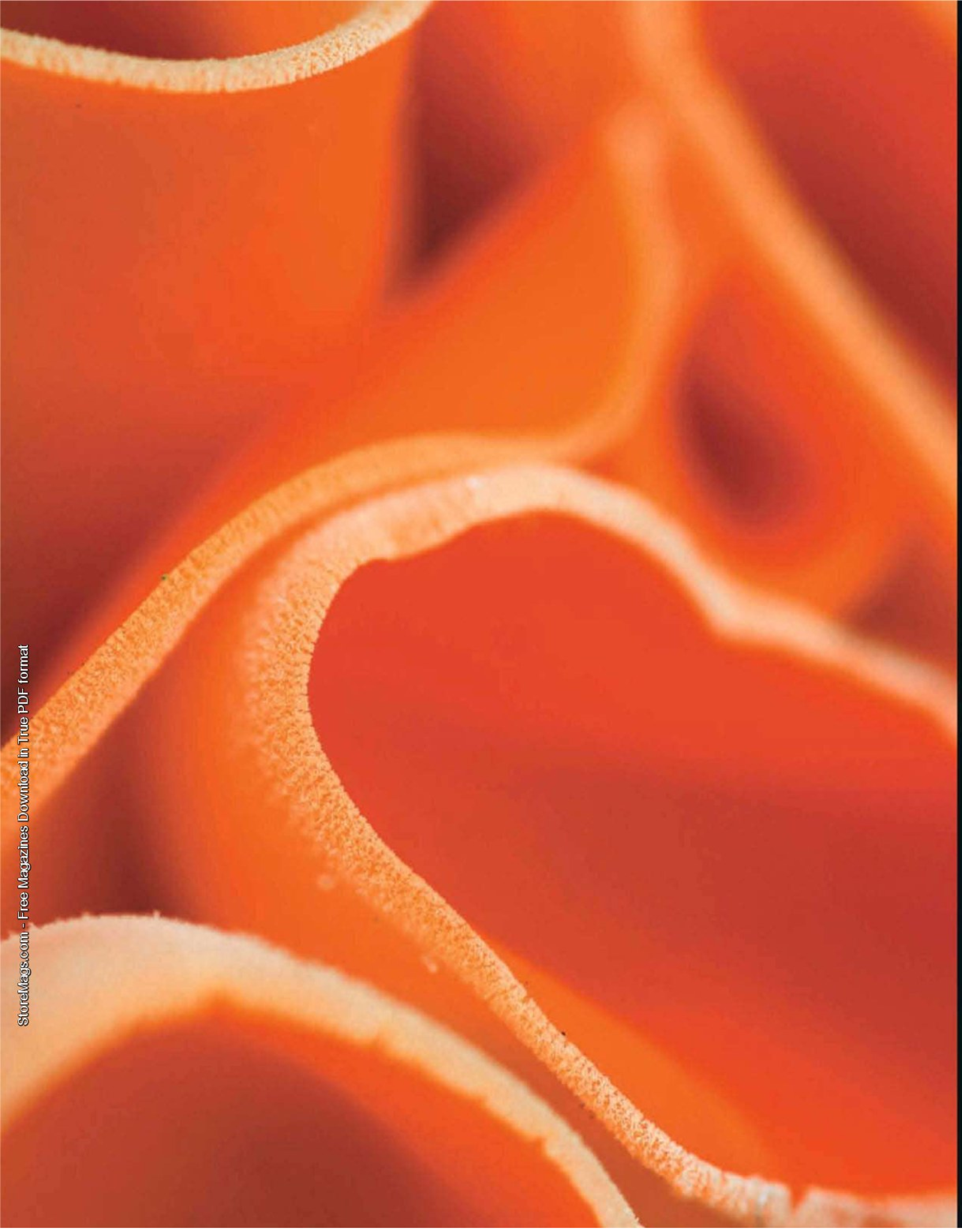

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▲ **THE DELICATE LITTLE** *Omphalina postii* is rarely seen in the Netherlands – and I almost didn't spot these translucent mushrooms, reaching only about 1.5cm tall. I was lying on the mossy ground to photograph another clump of fungi when this tiny trio drew my attention. It was a reminder that beauty can be found in the smallest things, and is all too easy to miss – unless you're willing to take your time, sit on the ground and allow a new world to reveal itself.

◀ **EXPLORING DUNES ON** the island of Vlieland, I was delighted to find a couple of orange peel fungi *Aleuria aurantia* unfurling from the sand. The undulating lines of the cups' upper lips and vivid orange of the inner skin create a wonderfully abstract image. This species is often collected as a garnish and for the extraction of lectin (believed to be useful for the treatment of some cancers), so I don't often have the opportunity to photograph undamaged specimens like this.

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**MY FAVOURITE PLACE** to wander and photograph wildlife is conveniently close to my home: the Hatertse fens, an area of wetland and forest that invites leisurely exploration. I love the mysterious atmosphere created when the trees are draped with fog, but on this day a warm autumn sun sparkled on the waters of the fen. The cold blue background contrasts dramatically with the hot orange of this goblet waxcap *Hygrocybe cantharellus*, a small (4cm high) toadstool that flourishes on rotten logs and other dead plant material. It's a cosmopolitan species growing in locations across the globe, from Australia to North America as well as Europe.

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THE HARE'SFOOT INKCAP *Coprinopsis lagopus* is a curious little mushroom. Its name derives from the appearance of the young fruiting body, which is densely covered in fur and resembles the paw of a white rabbit. Within a few hours of its appearance above ground, the cap spreads and striations appear. Then, equally quickly, the whole deliquesces into a black, inky puddle.

I spotted this pair among the shrubs lining a path in Hatertse fen. Lying prone as I arranged my umbrella to shade the mushrooms and composed my shot, I heard passers-by whispering about the odd man in the bushes – but I didn't care: I'd captured the image I was after.

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▲ **THE CREAMY FINGERS** of the moor coral *Clavaria argillacea* beckon to me from the heaths of Hatertse fen, and I return often to capture this favourite species at successive stages of growth and in different lights. This club fungus is a denizen of heathland, where it's believed to have a symbiotic relationship with heather. Like many other fungal species, it forms mycorrhiza ('roots') that tap into the cells of, or form a sheath around, the roots of true plants. But contrary to the negative image suffered by many fungi in centuries past, this kind of relationship is largely mutually beneficial – the plants often benefit from improved nutritional uptake and resistance to disease and toxicity.

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▲ **THE FLY AGARIC** *Amanita muscaria* is probably the most photographed mushroom – and it's easy to see why: the classic toadstool of children's books, it is so strikingly beautiful, with its white-spotted scarlet cap and fine gills, that taking an ugly image is almost impossible. But I wanted to create an abstract effect, contrasting the strong colour, white dots and vertical lines with a background of soft, brown, dry autumn leaves.

This species is another whose life is intertwined with that of plants, in this case trees including birch and oak. The fungus in effect provides a vastly extended root system for its tree partner, increasing the surface area and, therefore, the water and nutrient uptake for both species.

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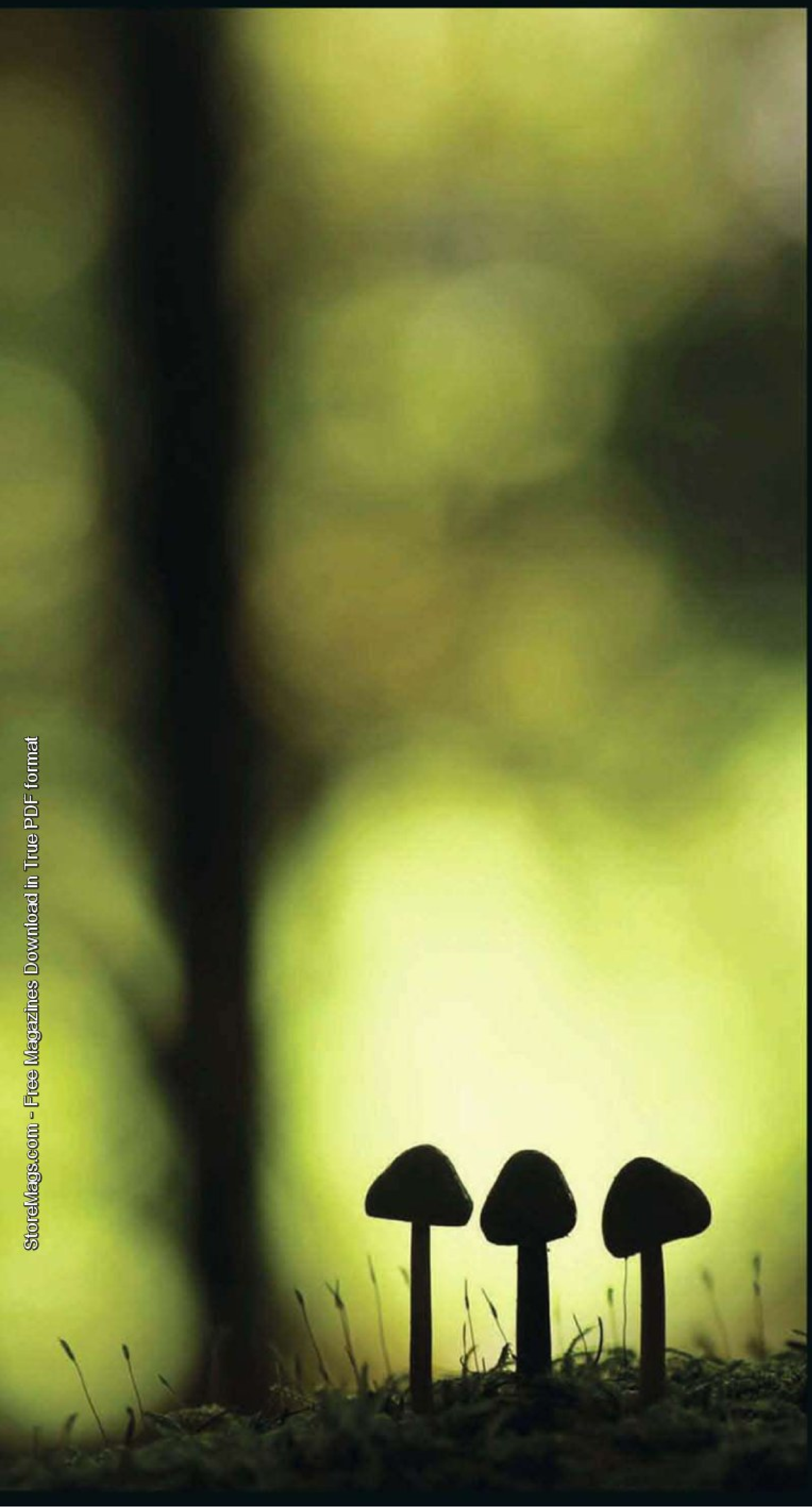
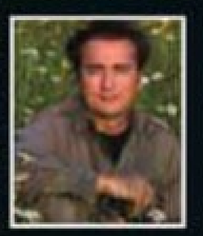


THE FAIRYTALE ATMOSPHERE of this photo was not pure chance – it took me several days of scouring the woods near Nijmegen to find the right setting and the right fungi to realise the image I had in mind.

You might imagine that locating the right mushrooms would be simple enough: there are more than 100 species of bonnets *Mycena* spp. in the Netherlands, and they're extremely common, though distinguishing between them can require a microscope. But tracking down a suitable group proved tricky.

After a long search I happened upon the ideal combination: a dark forest with a sunlit meadow in the background, and clumps of small mushrooms. For me, this simple picture encapsulates the feeling of mystery I enjoy when walking alone among the trees, hunting for toadstools.

## THE PHOTOGRAPHER: EDWIN GIESBERS



Edwin is a professional nature photographer who operates from his home in Nijmegen in the Netherlands, close to the German border. His photography has taken him to wild spots in Borneo, Madagascar and Antarctica, but he still enjoys the challenge of capturing the beauty of his own country in new and interesting ways.

Edwin is a member of the International Environment Photographers Association (IEPA), based in Japan, which focuses attention on global issues through the medium of photography. Because of his love for Borneo and the orangutan, he is proud to be working with Orangutan Outreach Netherlands.

Enjoy more of Edwin's photographs at www.edwingiesbers.com

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## Foreign fleets

**80,000**

The quantity of seafood, in tonnes, that fishing fleets from Europe and Asia are catching off Madagascar each year. It's roughly equal to what local fishermen harvest, and catches are now declining.

National Trust for Scotland

## Wild words

**"I WAS A BIT EMBARRASSED."**

Isle of Arran ranger Corinna Goeckeritz on being unable to identify a bat, discovered by nine-year-old Victoria Mowatt (*left*), that turned out to be a vagrant parti-coloured bat from mainland Europe.

# NEWS OF THE EARTH

Everything you need to know about what's happening to wildlife around the world

# SAVING THE SERENGETI?

**The Tanzanian government has made concessions to conservationists in its plans to build a road across the Serengeti, but it's not certain they will be enough to save the wildebeest migration. Stephen Mills reports.**

Scientists have calculated that a tarmac road through the Serengeti would cut wildebeest numbers from 1.3 million to just 200,000.

David Hosking/FLPA

**JUBILATION AT** news that the Tanzanian government has abandoned plans to build a road across the Serengeti, which would disrupt the greatest mammal migration on Earth, may have been premature, it is slowly emerging.

While some conservation groups expressed cautious optimism at the government announcement in late June, others were more sceptical, saying that the world's media had been fooled.

The assumption that construction has been cancelled is based on a letter written by Ezekiel Maige, Tanzania's new minister for natural resources, to the World Heritage Centre.

"The state party confirms that the proposed road will not dissect the Serengeti National Park and therefore will not affect the migration and conservation values of the property," the letter stated.

### NO HALLELUJAHS

But in two other paragraphs the letter tells a different story, saying that the infrastructure for a direct route from Lake Victoria to the coast, across the northern Serengeti, will be put in place.

The only concessions to conservation are that the stretch of road through the park will be gravel, not tarmac; it will be under the control of the park authorities; and it will be "mainly for tourism and administration".

Serengeti Watch, the group that has spearheaded opposition to the road, immediately issued a statement entitled: "Why We Are Not Celebrating." It said that the only significant change to the government's original plans was that a greater part of the road would be gravel.

But it also fears that the plan is part of a bigger project that will link the flow of resources – including the metallic mineral coltan for mobile phones, other ores and oil from the African interior – with the mining of soda ash in Lake Natron (the world's main breeding ground for lesser flamingos) and the development of a new sea port.

Indeed, the World Bank has already offered to fund a southern route around the Serengeti, so it is possible that Tanzania will end up with two roads: this one, and a minor northern road fulfilling government promises to service disadvantaged communities in the north-east of the park.

*BBC Wildlife* asked Tanzanian ministers to clarify their plans but received no response.

### BACKGROUND

- News of Tanzanian plans to build a road through Serengeti National Park first broke in mid-2010.
- The Tanzanian government's Environmental Impact Statement estimates that 1m vehicles may be using the road each year by 2035.
- Frankfurt Zoological Society has warned that a paved, fenced highway will cut wildebeest numbers from 1.3 million to about 200,000.
- Conservationists accept, however, that Tanzanians living in the north-eastern part of the Serengeti require better transport links to facilitate trade.

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## Humpback in the harbour...

Aberdeen Harbour was the unlikely port of call for a humpback whale in mid-June. Ian Hay, of the East Grampian Coastal Partnership, spotted the whale and said that it appeared to be feeding on small fish.

Brandon Cole/NPL

## For peat's sake.....

**24m**

The number of wheelbarrow-loads of peat that are used by amateur gardeners every year, according to charity Garden Organic. Peat extraction is destroying peatbogs throughout Europe, it says.

# NEWS OF THE EARTH UK & IRELAND

## IN BRIEF

Meul/ARCO/NPL

### LADYBIRD, LADYBIRD

The most common species of ladybird in Britain and Ireland is the **seven-spot ladybird**, with more than 27,000 records over 200 years, according to an atlas put together by scientists from the UK Ladybird Survey. Almost as widespread is the non-native harlequin ladybird, which is having a negative impact on some British species.

David Tipling/NPL

### NIGHTJARS ON THE UP

**Nightjar** numbers in North Yorkshire are growing, Forestry Commission (FC) managers say. A survey underway in Langdale Forest suggests that the FC estate in North Yorkshire is home to 500 pairs – the species was virtually extinct there 40 years ago. Greater areas of felled woodland are providing more nesting sites, experts say.

### GOAT GRAZERS

Six **feral goats** have been released into part of the Avon Gorge in Bristol to encourage the growth of limestone grassland flora such as spiked speedwell. The absence of grazers has resulted in woodland taking over much of the gorge, and it's hoped that the goats will remove scrub and return the land to its former state.

# A nest in the glass

**Sand martins take up residence in a quarry's artificial sandpile, created out of recycled glass.**

A colony of sand martins took up residence in a massive stockpile of recycled glass that had been turned into 'sand' at a quarry in Bedfordshire over the summer.

Made from recycled glass bottles and jars, the 'Envirosand' provides an alternative to conventional building sand and reduces the demand for marine- and land-based sources. It can also reduce the amount of waste going into landfill.

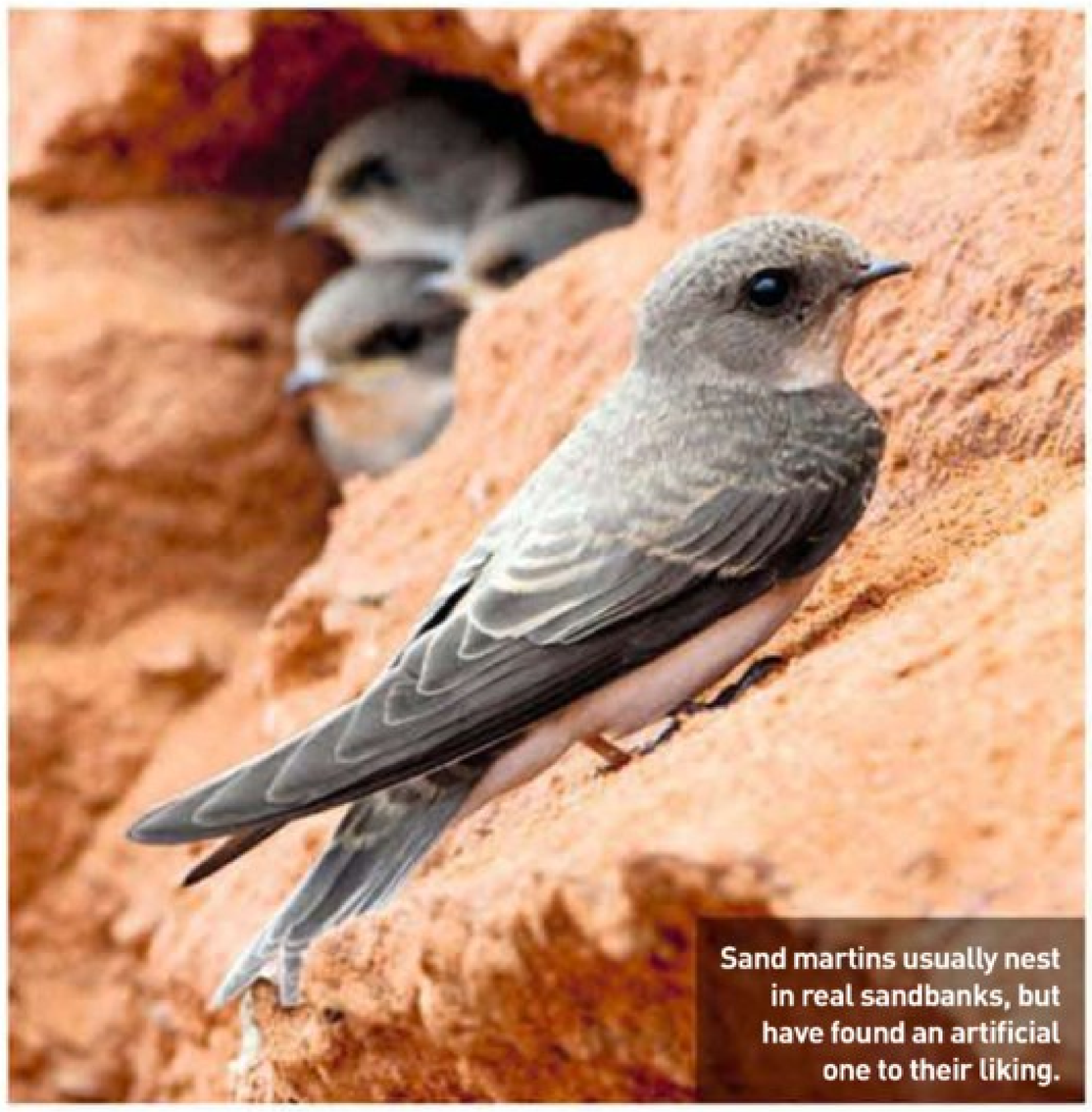
### OUT OF BOUNDS

"Sand martins frequently nest in stockpiles of natural sand, but we've never encountered them in our recycled product before," explained Simon Bryant, the manager of the Lafarge UK quarry at Willington.

"Though Envirosand is soft enough for them to dig in but hard enough to remain stable, we didn't think it would be their cup of tea," he continued. "Nevertheless, about 60 pairs moved in."

All sand-martin nesting sites are protected by law, and the stockpile was out of bounds while the chicks hatched and fledged. As *BBC Wildlife* went to press, the dedicated parents were preparing to start second broods, further suspending any work on the Envirosand stockpiles for another couple of months.

*Tim Deere-Jones*



Sand martins usually nest in real sandbanks, but have found an artificial one to their liking.

David Kjaer/rspb-images.com

## Heathland fire

This female adder stands out against the charred remains of Upton Heath, Dorset, after 50ha of lowland heath were devastated by a wildfire in early June. Wildlife trust volunteers rescued and relocated hundreds of animals, including rare sand lizards and smooth snakes, common lizards, slow-worms, grass snakes and adders. Fires occur each year on Dorset heathland and are often deliberately started when good weather breaks out, which can also coincide with the start of the breeding season. After this year's dry spring, Upton Heath burned viciously, and it could take decades for the habitat to recover fully. *Gavin Parsons*

Gavin Parsons

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## Going grey

London's gardens have lost an estimated 3,000ha of 'green space' in the past decade, according to research carried out on behalf of the London Wildlife Trust and the Greater London Authority. Trends in garden design including the use of decking and paving are blamed for the decrease.

M Hamblin/SpecialistStock

## Eagle economy

**110** The number of full-time jobs generated by white-tailed eagle tourism on Mull in the Inner Hebrides, according to research from agency Progressive Partnership. The eagles bring £5m a year into the economy, up from an estimated £1.4m in 2005.

The UK government plans to cull badgers in bovine tuberculosis hotspots. However, this animal has been trapped for vaccination.

# Badger guru: "Culling is a bad idea"

**The scientist who initiated the culling trial 15 years ago says plans fly in the face of evidence.**

Any strategy for controlling bovine tuberculosis (bTB) that includes badger culling flies in the face of scientific evidence, according to world-renowned zoologist Professor John Krebs, the man who initiated the cull trial that ran between 1998 and 2007.

Now elevated to the House of Lords, Lord Krebs accepts that the bTB issue has proved a thorny one for ministers of all political parties, but insists that they should be guided by the science.

Speaking to *BBC Wildlife* in early July – before environment secretary Caroline Spelman announced plans to allow farmers and landowners to shoot free-ranging badgers in bTB hotspot areas (see box) – Lord Krebs admitted that the fight to control the disease was proving extremely tough. But he said: "I'm unambiguous that culling is a bad idea."

In 1997, a group led by Lord Krebs advised the incoming Labour administration that it should set up the Randomised Badger Culling Trial (RBCT).

The outcome of that trial was that, while culling did reduce bTB among cattle in the cull area, it caused an increase in cases in surrounding habitat. It's believed that culling results in surviving badgers ranging further and taking the infection with them – the so-called perturbation effect.

In 2009, the then-environment secretary Hilary Benn ruled out a cull; at the same time, the Welsh Assembly was working towards a limited one in Pembrokeshire.

But political change in both Whitehall and Cardiff has shifted the debate. Now under Labour control, the Welsh government has put the cull on hold and set up a panel to review the science.

Lord Krebs said that he believes the only viable solution is to "up the stakes on biosecurity", with farmers either getting additional grants for animal-health measures that keep badgers and cattle apart, or being denied compensation where they have not done enough.

"It would be a better bet than starting to kill large numbers of badgers," he said. *Julian Rollins*

Neil Aldridge

### IN FOR THE CULL

- Badger culling will be piloted in two areas to test the "effectiveness and humaneness of shooting". It is likely to begin in 2012.
- Culling licences will be issued by Natural England. Culls will have to be carried out over a minimum of 150km$^2$ and for at least four years.
- Defra says that, if carried out in accordance with criteria identified in the RBCT, culling should reduce TB in cattle by an average of 16 per cent over nine years.

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## Madagascan mammals

**615** The number of new species discovered in Madagascar between 1999 and 2010, according to WWF. There were 41 new mammals found, including Berthe's mouse lemur, the world's smallest known primate.

Harald Schuetz/WWF

## No place like home

Loggerhead turtles living in the north-west Atlantic rarely leave the east coast of the USA, though they travel thousands of kilometres every year. That's the finding of a 10-year study by scientists at Exeter University involving satellite tracking.

# NEWS OF THE EARTH INTERNATIONAL

## MEDIA WATCH

Victor Lyagushkin/Barcroft

### BELUGA WHALES

**What's the story?**
In June, the *Daily Mail* published photographs of a female diver swimming naked with beluga whales in freezing Arctic waters.

**Why is it interesting?**
Amazing as this feat is, the belugas have been trapped and are being tamed for export to dolphinariums around the world.

**Who captured the belugas?**
Utrish Dolphinarium – a Russian company operating in the far north-west of the country.

**How many are caught?**
On average, it's estimated that 22 belugas are taken from the Russian Arctic every year. Only Russia supplies wild belugas to the aquarium industry.

**How are they captured?**
Pods passing close to shore are driven into shallow water and captured using nets. Accidental drowning occasionally occurs.

**Are there belugas in European dolphinariums?**
Yes – two at the Oceanografic marine park in Valencia, Spain. There are 34 dolphinariums in the EU (none in the UK) holding a total of 286 cetaceans.

**What's wrong with this?**
Campaigners say that it is cruel to keep intelligent, social and free-ranging animals such as whales and dolphins in captivity and are lobbying for a ban on the import of any wild cetaceans into the EU. *Gemma Hall*

# Atomic whales

**Japanese whaling programme detects low levels of radioactive caesium in minke whales.**

Scientists in Japan have found traces of radioactive material in two minke whales that were killed off the island of Hokkaidō following the tsunami and subsequent radiation leak from the Fukushima nuclear power plant in March of this year.

Anti-whaling groups said that the discovery threatened the future of coastal whaling in Japan because it might deter people from eating whale meat. The Whale and Dolphin Conservation Society (WDCS) argued that, though the levels detected were low, "the implications for the health of whales, or human consumers, were unclear".

"There are already concerns about levels of contaminants, particularly PCBs and pesticides, in whales and dolphins that are killed in Japanese coastal waters," said WDCS international director of science Mark Simmonds.

Radioactive material from Japan's stricken nuclear power station have been found in coastal minke whales.

### IN THE FOOD CHAIN

Simmonds added that the issue wasn't just about whaling, because many species of fish have been found to contain radiation above recommended safety levels.

"It is going across the whole food chain, but the bioaccumulation of radioactive materials is not something we know a lot about," he said.

However, Professor Atsushi Ishii, a political scientist from Tohoku University in Sendai, Japan, argued that the presence of radioactive material in whale meat would not have any great effect on Japan's whaling programme.

"The Japanese people as a whole eat very little whale meat," he said. "It may have a bit more impact on people living in some coastal areas where eating [it] is a little bit more popular." *James Fair*

Sipa Press/Rex Features

# Cheetahs facing the heat

**Rising temperatures are reducing sperm counts in iconic big cat.**

The ability of the cheetah, the world's fastest land animal, to reproduce is being impaired by climate change, say researchers.

Scientists from the National Museums of Kenya (NMK) and the Kenya Wildlife Service have found that cheetahs' sperm are being permanently damaged by rising temperatures, which are also affecting feeding habits.

"Climate change is contributing to defects in the cheetah sperm," Bernard Risky Agwanda of NMK told *BBC Wildlife*. "Many have low sperm counts and low testosterone. Their sperm count is 10 times lower than that of a domestic cat."

Agwanda added that this problem is compounded by the fact that the cheetahs' preferred prey, Thomson's gazelles, are also declining, partly due to climate conditions. They are switching to species such as zebras that have a poorer protein content, he said. *Charles Njeru*

Females have to bring up cubs, but it is males who may become infertile due to climate change.

Anup Shah/naturepl.com

### BACKGROUND

- There are currently about 1,000 cheetahs in Kenya, according to the Kenya Wildlife Service.
- The biggest issue cheetahs face is habitat degradation. Human-animal conflict is also a major problem.

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## Wild words

Richard Gill/photoshot

**"IT DOESN'T REALISE THAT THE SAND ISN'T GOING TO MELT INSIDE IT."** Museum curator Colin Miskelly on an emperor penguin found thousands of kilometres from its Antarctic home on a beach in New Zealand. The bird will have been eating sand believing it's snow, Miskelly said.

## Final call for curlew

**1987** The year in which the last confirmed sighting of the eskimo curlew was made. The US Fish and Wildlife Service has launched a final review of the species to decide whether it should officially be classified as extinct.

# Brown bears in the ring

**Norway plans to reduce its bear population while EU conservationists say that it should be allowing it to grow.**

Norway is to further cut its population of brown bears, despite a plea from the secretariat of the Bern Convention – the EU treaty that promotes the conservation of wild fauna and flora – to step back from such a drastic policy.

Under provisions approved by all parties in parliament in late June, the number of female bears permitted to breed will be reduced from 15 to 13, while the proportion of males to females will fall to 1.5. A ratio closer to three is regarded as being healthy.

Bears that have not been killed before the hunting season ends on 15 October may be pursued after the start of winter. Since data from northern Sweden shows that 90 per cent of bears are in their dens by early October, conservationists fear they will be dug out during hibernation.

In April, the secretary of the Bern Convention wrote to the Norwegian government requesting it to seek a "more favourable conservation status" for all its threatened carnivores.

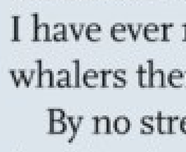
### ON THE EDGE?

The letter pointed out that it was "unsatisfactory" for the brown bear to be endangered "taking into account the vast potential area for this species in Norway."

But the Norwegian government argues that the country is "on the boundary of the Scandinavian brown bear population", so it would be expected to have lower numbers. Indeed, while neighbouring Sweden has more than 3,200 bears, Norway's population will now be limited to some 200. *Stephen Mills*

Norway plans to limit the number of breeding females to 13.

Peter Cairns/naturepl.com



# MARK CARWARDINE WILD THOUGHTS

I had a little contretemps with an American tourist the other day. I was sitting in a café in Reykjavík, Iceland, and he was immediately behind me. Everyone could hear his thunderous voice, boasting about eating whale meat in a nearby restaurant the night before. I couldn't help myself – I spun around and gave him a piece of my mind.

I'd heard his argument many times before: "What harm could it do? I tried it only once." But half a million tourists visit Iceland every year and a shocking number of them try whale meat "only once". It's not much of an exaggeration to say that Iceland's whales are being killed to feed them.

According to surveys carried out by the International Fund for Animal Welfare, only about 5 per cent of Icelanders eat whale meat regularly. The only Icelanders I have ever met who do – in exactly 70 visits – are the whalers themselves.

By no stretch of the imagination is it a traditional local dish. Yet demand has risen alarmingly in recent years, precisely because of my American friend and all the other inconsiderate tourists who are gobbling up no less than 40 per cent of the market.

Mark Carwardine

**Feeling hungry? Well, perhaps you'd better give this restaurant a miss.**

How can people be so naive? And how can they be so utterly, exasperatingly thoughtless? In Reykjavík I've met people who have walked off a whale-watch boat and straight into a restaurant to eat whale meat.

**"In Reykjavík I've met people who have walked off a whale-watch boat and straight into a restaurant to eat whale meat."**

The solution is simple: if you want to try whales, try watching them instead of eating them – whale-watching helps the economy and creates jobs, without causing harm. Then, while you're at it, avoid eating in any of the restaurants that serve whale meat – and encourage everyone else you meet on holiday to do exactly the same.

And, finally, use the same rationale and common sense every time you travel. Don't try shark-fin soup or turtle soup, don't try tiger-bone wine, and don't try anything else that you instinctively know you shouldn't.

Otherwise, I guarantee it will do far worse than leave a bad taste in your mouth.

Mark Carwardine is a zoologist, photographer and TV presenter.

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## Basking embryos

Embryonic Chinese softshell turtles *Pelodiscus sinensis* 'bask' inside their eggs. In tests, embryos always moved to the side of their egg nearest a heat source. So turtle embryos are not inactive, as was thought, but rather seek out optimal habitat – even before they're born.

Bo Zhao

## Not all sweets suffice

Fruit-flies *Drosophila* spp. can detect, assess and – within minutes – learn the nutritional content of a selection of foods. That is, contrary to what was assumed, they don't simply seek out any old sugary snack; they identify the most nutritious to feast on.



# IN BRIEF

### TAKE AND GIVE

Some 'nectar robbing' insects, which chew holes in flowers to steal their nectar, presumably without pollinating them, are not so bad after all. It turns out that in China a bee thief *Bombus richardsi* pollinates 98 per cent of certain flowers. Thus, some plant species benefit from getting broken into – and may even depend on it (Biol. Letters, vol 6, pp785–7).

### SENDING OUT SIGNALS

African snoutfish *Marcusenius altisambesi* spend each day in hiding, staying in contact via electric signals that predators can't detect. But if a male senses a female, he switches to a rhythm she finds attractive – the fish flirt during their daily downtime. This way they can make up for time lost when ducking predators (J. Ethol., vol 29, pp131–42).

### DAMAGED BUT GOOD

A tiger *Panthera tigris* with a broken canine is less fit for the wild, and apt to kill cattle – or so went the myth. But the first data on this issue shows that just 0.06 per cent of such tigers cause conflict. Tigers with damaged teeth had normal life spans and raised many cubs. The work questions the practice of purging 'pest tigers' based on bad teeth (J. Zool., doi:10.1111/j.1469 -7998.2011.00819.x).

Staffan Widstrand/naturepl.com

Coconut meat is a nutritious meal for a rhesus macaque – and the effort expended in opening one can be reduced by utilising gravity (*inset*).

Both images: Jordan Comins & Brian Russ

# The nutcracker's feat

**A monkey on a Caribbean island invents a new foraging technique.**

Of the thousand or so rhesus macaques *Macaca mulatta* on Cayo Santiago Island, Puerto Rico, one stands out from the rest: the single individual that can crack a coconut, according to new research.

His name is Pinocchio (or, more officially, 84 J), a big-nosed, 12-year-old male. Jordan Comins and others from Harvard University recently filmed the monkey in action. They observed that he applies a well-planned, systematic method.

He picks up a ripe coconut that has fallen to the ground and tears off the outer husk with his teeth. Then, using an underhanded toss that starts with two hands and ends with one, he bowls it along the ground towards the same site every time: a cement dock on the coast.

There, he squats over the coconut, grips it with both hands and, lifting it using his arms, back and legs, sends it flying so that it crashes onto the cement or the surrounding rocks. He often pushes off so forcefully with his legs that he hops into the air – clearly, he tries to launch the coconut as high as possible. He repeats this until the coconut cracks, then he digs in.

The fruit of Pinocchio's labour is abundant and highly nutritious. But, curiously, none of the other 130 members of his social unit, many of whom have watched him at work, has ever done it. Hence, it looks like an innovation in its infancy. Further monitoring could help to elucidate why some novel behaviours die with their inventors, while others spread throughout the population and become part of the local culture.

### THAT'S NUTS

- Neither type of toss has previously been witnessed in this species. So Pinocchio's innovation combines at least two novel behaviours.
- This population has been studied since 1938. No monkey has ever cracked coconuts this way before.
- Two other monkeys on this island have had luck opening coconuts. But their method, smashing them against the ground, was much less efficient and the behaviour hasn't been seen in 40 years.
- In 1953, a female macaque in Japan started washing sweet potatoes before eating them. By 1962, almost all monkeys in the population were doing it.
- A macaque in a different region of Japan has recently begun using its own hair as dental floss. Will it catch on?

SOURCE: J. Ethol., vol 29, pp187–89 LINK: www.eol.org/pages/327960

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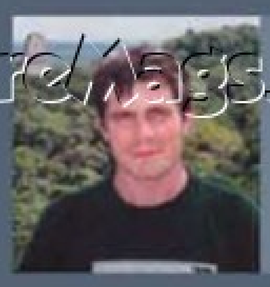

**DAVID BRIAN BUTVILL, ZOOLOGIST**
Our *Discoveries* sleuth David writes about science and nature for magazines, radio and TV. He lives in Costa Rica, where he eagerly assists his marine-biologist wife in the field.

# DISCOVERIES

## Pretty in pink

**How flamingos make themselves up to look more attractive.**

The pink and salmon-coloured pigments of the greater flamingo *Phoenicopterus roseus* derive from its diet of brine shrimp and algae. But there's more to the story: the birds can also physically apply these pigments like make-up, a new study shows.

The feathers of flamingos and other flashy birds get their colour primarily from pigments called carotenoids, which the birds obtain from their diet. The compounds build up in their blood, which nourishes their plumes, so the tints become incorporated directly into the fabric of the feather.

The birds keep their plumage shiny and healthy by spreading oil over their feathers from a so-called preen gland near their tails. It turns out that the oil is more than merely a conditioner.

A team led by Juan Amat, from the Doñana Biological Station in Andalucía, analysed the preen secretions of dozens of flamingos in southern Spain and found that they were packed with carotenoids – the same ones inside flamingo feathers. They also discovered that when the birds applied the oil, their feathers became more colourful – the more they slathered on, the pinker they got.

In other words, the birds also secrete their dietary pigments and apply them directly to the surface of their feathers as dye. It's the first case of a bird producing its own brand of cosmetic.

Like humans, the flamingos seem to use it selectively to make themselves more attractive. The team found that the flamingos applied the secretions 10–15 times more often during the mating season than at any other time of the year – in particular, during ritualised displays in which groups of birds gather together and essentially strut their stuff. This is when the birds choose their mates.

Applying make-up apparently pays off, since the most colourful birds hooked up and began nesting earlier than others. Moreover, early nesters got the best breeding sites. This, in turn, improves the chances of raising healthy offspring – which goes to show that, in flamingos, a little make-up can go a very long way.

SOURCE: Behav. Ecol. Sociobiol., vol 65 pp665–73

**The pink 'make-up' of greater flamingos is applied most often by the birds when showing off to potential mates.**

Eric LeFranc/DSF/Photolibrary.com

### BIRD BLUSHER

- Flamingos know that the brighter a prospective partner, the healthier/more able they probably are – and their chicks will be, too.
- The use of cosmetics might seem like cheating. But carotenoids cannot be synthesised, only consumed, so one's colour ultimately depends on foraging efficiency and broadcasts this information to other birds.
- Applying oil is a luxury rather than a necessity. The less 'fit' an individual is, the more time it must spend on basic survival and the less time there is for primping.
- Feather colour may fade due to wear, sun-induced bleaching, etc, and requires continuous upkeep. In this way, it is like a real-time signal of a flamingo's condition.

## Spider hitcher

**An unusual critter, and its unique behaviour, is captured in amber.**

A thumb-sized chunk of amber from Germany encases a gem of an insect – and captures its strange behaviour, showing that its habits have not changed in ages.

The specimen, identified and described by Michael Ohl from the Museum für Naturkunde in Berlin, is the first fossil of a larval mantid fly, an unusual type of lacewing. It's very well preserved, showcasing exactly what this insect looked like 44 million years ago.

But most remarkable is that it is caught in the act of 'spider boarding' – a behaviour unique to this group, by which a larva leaps onto a female spider and rides piggyback until she begins spinning an egg sac. Then it hops off and sneaks into the sac, using it as shelter for its own development and feeding on the spider's eggs.

The fossil larva is clinging to a female spider with its head wedged between her two body segments, which is how today's species do it. It also has stout, well-developed legs for chasing down and boarding an arachnid, as well as special claws for clinging. These details suggest that this unique 'ride and wait' tactic has changed little, if at all, in tens of millions of years – it's an immensely successful developmental strategy.

SOURCE: Naturwissenschaften, vol 98, pp453–6 LINK: www.eol.org/pages/948

**Hitchhiking has been popular with lacewings for 44 million years.**

Michael Ohl/Museum für Naturkunde

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Steffen & Alexandra Sailer/Ardea

An adult female dingo strolls along a beach on Fraser Island, off the east coast of mainland Australia. Domestic dogs are banned on the island, as its dingo population is said to be one of the purest left on the continent.

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# DEFINING THE DINGO

THE EXPERT

**STEPHEN DUNLEAVY** is a wildlife film-maker. Formerly based at the BBC's Natural History Unit, he now runs Humble Bee Films.

Loved by some and loathed by others, the dingo is the world's most controversial and mysterious dog. **STEPHEN DUNLEAVY** tries to pin down a canine enigma.

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Two dingos co-operate to bring down an eastern grey kangaroo.



Young dingos refine their hunting skills by toying with prey, such as this lace monitor.

Both photos: Jean Paul Ferrero/Ardea

Dingo coats don't just come in sand colour.

Nicholas Birks/Auscape/Ardea

**BRAD IS GESTICULATING** wildly in my direction. It's a hand signal any dog owner would instantly recognise – he's telling me to get down. But I am too slow – by the time I follow his command I've been spotted. A few hundred metres away on the slope below us a tan-coloured dog is standing motionless. It tilts its head back and does something startling – it howls.

Within seconds the valley sides are echoing with the voices of several other dogs. I can't make them out, but they can probably see me exposed up on the ridge.

I am in the southern part of the Blue Mountains National Park, a few hours' drive west of Sydney. My guide is biologist Brad Purcell, who has been studying the dingos of this wild and breathtakingly beautiful area since 2004, and this is my first encounter with an Australian icon. Well, that's what Brad tells me, though I admit my time in the field with him has left me confused as to what exactly is and isn't a dingo.

Unlike other totemic members of the Australian fauna such as kangaroos and koalas, the dingo or 'warrigal' is not a native species. The first dingos are thought to have reached its shores several thousand years ago with Aboriginal people, since when they have become one of the main mammalian predators on the great 'red continent'.

**DID YOU KNOW?**

Opinions vary as to whether dingos played a part in the thylacine's extinction in Australia. One theory is that the latter hunted only small animals, while dingos could tackle more varied prey – so had the edge.

## DOG DAYS

I embarked on my quest to define the dingo with a clear idea of what one ought to look like. It was an image formulated over the years, based on countless TV documentaries, news articles and internet stories. To my mind, the dingo was a medium-sized dog with short, sand-coloured fur, erect ears and smart white paws. But after just a few evenings chatting by a log fire, Brad convinces me to delete that mental snapshot.

As part of his research, Brad is tracking individual dingos using remote camera-traps. He shows me some of his pictures and it's immediately apparent that their coat colour varies a great deal, from light brown to black and – most surprisingly – a piebald form that resembles a Jack Russell terrier. Surely some of these dingos are the result of interbreeding with domestic dogs that have gone feral?

Brad disagrees. "In a country as large as Australia it is simply ridiculous to assume that there is just one type of dingo," he tells me. "When I first began to study dingos my idea of what they should look like was the same as everyone else's, but I now think that's a very narrow view of the species."

Brad adds that he believes 'dingo purists' have created a genetically cleansed image of

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Dingo packs exhibit similar dominance hierarchies to wolves. Here, the top male stands over a kill to warn off subordinates.

this enigmatic species. "The pure dingo idea came from breeding captive animals and selecting traits characterised as authentic. It's a self-fulfilling approach – you decide on what a dingo should look like and any deviation is sidelined as not genuine."

Brad is a brave man: many in the scientific world consider his ideas heresy. After all, a species' identity is encoded in its genes. But Brad thinks it is time to shift the argument away from genetics and to look instead at behaviour. "These dingos are functioning as wild pack animals and the females have just one litter per year – unlike domestic dogs which can have two. We have to start defining dingos by their role in the ecosystem."

This sounds reasonable to an outsider like me, but the dingo polarises opinion. It is perhaps the most controversial canid of all, as becomes apparent when in true Aussie fashion we enjoy a barbie with some park rangers. After a few 'tinnies' one of them reveals that he has shot a "wild dog" on Brad's study site. Brad instantly recognises his description – sadly, it is one he has been tracking.

Top: Gary Steer/Auscape; right: Steven David Miller/Auscape

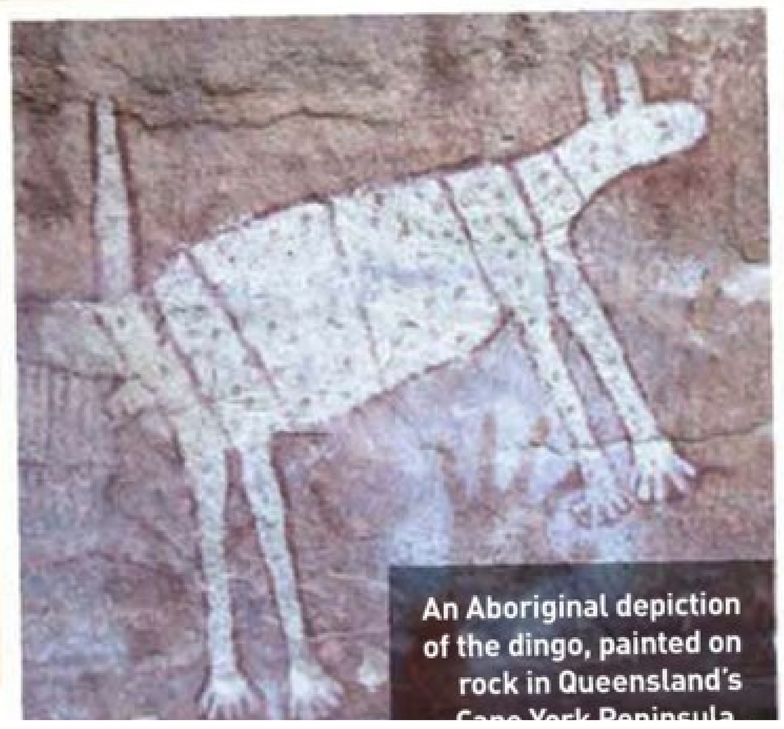
## WHERE DID AUSTRALIA'S DINGOS COME FROM?

### The roots of the continent's 'hungry wolves' are shrouded in mystery.

In 1699, the noted English explorer William Dampier, who made astonishingly detailed records of antipodean wildlife during his voyage around the strange land known then as New Holland, jotted down one of the earliest written references to dingos. His diary entry memorably describes the unfamiliar carnivores as "hungry wolves".

Dingos colonised Australia long before European adventurers arrived. Fossil evidence suggests that they were present 3,500 years ago, though some genetic studies push this date back by another 1,500 years. But the species did not make it to Tasmania, which split from mainland Australia 12,000 years ago, indicating that colonisation could not have occurred before then.

Dingos probably evolved in South-East Asia and were perhaps taken south by nomadic hunters; similar dogs (now extinct in the wild) also reached New Guinea. Whatever their origins, dingos were soon Australia's top land-based predators.



An Aboriginal depiction of the dingo, painted on rock in Queensland's Cape York Peninsula

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Most dingo litters are born during the Australian winter, between June and August. Rock caves and old rabbit warrens are favourite denning sites.

Jean Paul Ferrero/Ardea

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A female with two pups. It is thought that a pack's lower-ranking females may help to rear the young of the dominant pair.

Bartussek/ARCO/naturepl.com

When Brad points this out, the ranger remains unconvinced that the dog he shot was a pure dingo. But gradually, after a good-natured fireside discussion, I sense that Brad has created a sliver of doubt in his mind.

## TAKING A HARD LINE

It may seem a minor academic point, but defining the dingo has serious consequences. How it is perceived is a big issue. Protected within national parks as a native species, the dingo enjoys few safeguards (or none at all) outside them, and in some states is considered a non-native pest to be eradicated at all costs. The approach to dingo conservation and management seems confused at best.

Australians take a hard line when it comes to controlling 'non-natives'. On Brad's study site there are masses of pretty yellow flowers – an introduced plant called St John's wort, originally from Britain. During our visit to the Blue Mountains we watched with amusement as contractors spent days spraying these attractive blooms in a bid to get rid of them.

This national obsession with weed control has implications for the dingo, too. It is in an awkward position – okay, it may not be native, but it nevertheless has become an important part of the landscape. If authorities take a hard-line view on what makes a dingo a dingo, they may consider dogs like those in Brad's packs to be nothing more than pests to be eliminated, just like the St John's wort.

It would be a shame for 'non-conformist' dingos like Brad's to be shot, not least because they are providing valuable insights into the hunting techniques of these canids – insights that, one day, could well prove useful in their management across Australia.

## HUNTING LESSONS

Brad shows me some disturbing images of one of his study packs hunting a kangaroo. The injured marsupial is lying prone, its hamstring tendon severed by the pack's alpha female. Her pups have moved in to finish the job. It's a gruesome sight, but Brad suspects that the adults are training their young.

"It looks as if dingos give small prey such as possums live to their pups to kill," Brad says. "The parents gradually offer them bigger prey such as wombats, so that by the time the offspring are young adults they have picked up all of the hunting skills they need." If

## "A DINGO ATE MY BABY!"

Dingos made global headlines in 1980 when a woman camping near Uluru (Ayers Rock) claimed her baby had been snatched by one. Lindy Chamberlain was found guilty of her daughter's murder, but years later the discovery of baby clothing close to a dingo den led to her release. Attacks by dingos are very rare – though two adult dogs mauled a three-year-old girl on Fraser Island this April – and often involve individuals habituated to humans. Domestic dogs attack many more people than dingos.

The Chamberlains' camping trip at Uluru ended in tragedy.

Newspix/Rex Features

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Adults feed weaned pups for several months. This youngster is begging for a regurgitated meal.

Jean Paul Ferrero/Ardea

Brad is right, then shooting or poisoning the adults could deprive orphaned pups of vital survival skills. And that might encourage them to seek easier meals on farms.

The dingo has long been seen as a threat to livestock. In the 1880s, the Australian government erected the longest fence in the world, stretching 5,400km from Queensland to South Australia. The aim was to keep dingos out of farming areas south of the fence, and it has certainly restricted their movements. Some people believe that 'pure dingos' exist only north of the barrier and that dogs to the south are mainly hybrids.

Either way, dingos and 'wild dogs' alike are routinely culled. Is this justified? There's no doubt that dingos do kill livestock, but – like so much about these charismatic carnivores – no one can agree about their impact on farming.

## LOVED AND LOATHED

After a fortnight in the mountains, it has become clear to me that dingos are loved by some and loathed by others. Though Brad hopes that his work will help to create a 'neutral definition' of the species, it will no doubt upset both dingo purists and farmers.

On our last morning, we get up early and drive to a hillside offering a superb panorama. A mob of kangaroos is feeding on a ridge opposite. As the sun peeps above the horizon, we spy two adult dingos and two pups 100m downhill from them, hidden by the swathes of St John's wort.

The dingos split into two groups, which slowly stalk up on either side of the kangaroos – a classic pincer movement. Their targets have no option but to head downhill into a wooded area where the rest of the pack is waiting. But a pup gives the game away and the roos bound away at full speed: being a dingo requires lots of practice.

As we pack up to head for home we suddenly become aware of another dog observing us from further away. Brad tells me that people walking in the Australian bush often get the feeling that a dingo is watching them long before they see it; when they finally spot the dog, it vanishes. That sums up our relationship with the dingo – it's an animal we struggle to pin down.

### DID YOU KNOW?

Observations of captive dingos suggest that, even by the standards of the dog family, they are highly intelligent. One moved a table to climb up and reach a treat. Another pushed its nose through a gap in its cage door to open the latch and walk free.

**BBC WILDLIFE SHOP**

*Dingo* by Brad Purcell (CSIRO Publishing, ISBN 9780643096936, RRP £30.95, reader price £30.95). Buy on p102, quoting code W0911/09.

## BBC Wildlife FACTSHEET

# DINGO

*Canis lupus dingo*

### THE BASICS

- **SHOULDER HEIGHT** 51–65cm; male larger than female.
- **WEIGHT** 13–19kg.
- **APPEARANCE** Medium-sized dog with erect ears and a bushy tail. Coat colour is extremely variable, probably even in pure-bred animals, ranging from the 'classic' pale, sandy variant with white paws to chocolate-brown, black and piebald individuals.
- **DIET** Mainly wallabies, kangaroos, possums and rabbits (proportions vary according to location); also takes birds, lizards and carrion.
- **LIFE-CYCLE** Main mating season is autumn (March–May). Usually only the dominant pair in each pack breeds; in areas with a high dingo population, the subordinate adults may also bear young. A female produces one litter each season, after a gestation of 61–69 days; the typical litter size is 4–6 pups. Weaning occurs at about two months.
- **HABITAT** Extremely adaptable: found in most habitats, from deserts to river basins, forests and mountains.
- **LIFESPAN** Up to 14 years in captivity.
- **STATUS** Common and widespread, but threatened by heavy persecution and by interbreeding with domestic and wild-roaming feral dogs.

### WHERE IN THE WORLD

Illustration by Kenneth Lilly/Dorling Kindersley

Likely distribution of wild dogs, including pure dingos, feral domestic dogs and hybrids. Map combines data from multiple studies, as illustrated in *Dingo* by Brad Purcell (2010).

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# Love wildlife?

## Canon EF 24mm f/1.4L Mk II USM

Canon are well known for creating lenses for use in all environments, the EF 24mm f/1.4 II USM lens extends the range of shooting possibilities for the Canon user even further. Wide angle lenses have always been a popular choice in remote camera traps for capturing the most elusive of creatures. This 24mm is particularly well suited for use in night time situations such as badger and fox camera traps, or mounting near barn owl nests due to the fast f/1.4 aperture which lets in 4 times the amount of light as an f/2.8 lens. This lens is proving very popular with landscape photographers wanting to shoot wide vistas, with a creative shallow depth of field to isolate foreground elements, which isn't possible with most wide angle lenses.

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## Canon EF 100mm f/2.8L Macro IS USM

They say it's the small things in life that you appreciate the most and it's certainly no different when you're trying to capture nature's beauty. The intricate knurling on the bark of a majestic old oak tree, the delicate vulnerability of a rare orchid or the vibrant colours of a Poison Arrow frog can all be captured with the finest detail using Canon's new EF 100mm f/2.8 L IS USM Macro lens. The optical quality is simply unsurpassed, and for the first time Canon have incorporated their Image Stabiliser technology into a macro lens with true 1:1 reproduction ratio.

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The 70-200mm L series lenses have always been favoured by wildlife photographers due to the rugged weather sealed build, fast accurate focusing and typically high L series quality. The latest EF 70-200mm f/2.8 II L IS USM improves on what the previous versions have always offered. The latest generation of Image Stabiliser offers a 4 stop advantage when hand-holding the lens, very useful in the low light of dawn or dusk when animals are often at their most active. This mark II version is the best quality 70-200mm yet, and works superbly well with the latest generation of Canon extenders to offer up to 400mm of magnification.

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ADVERTISEMENT FEATURE

# What a Difference a Lens Makes!

## Find out the best ways to use different Canon EF lenses to improve your nature photography

Words and photos: Peter Travers

Canon

Canon is a world leader in imaging products and solutions for the digital home and office.

Whether you're a relatively new Canon EOS DSLR user or a keen wildlife photography enthusiast, owning a range of different Canon EF L-series lenses is the first step to capturing better images. After all, one of the big benefits of owning a DSLR is that you have the option to switch lenses to suit your subject matter. By changing your lens it opens up a whole new world of photographic possibilities.

There are telephoto zoom lenses for shooting nature subjects that are far away, dedicated macro lenses for photographing smaller creatures in close-up, as well as wide-angle lenses for when you want to shoot the bigger scene to include a sense of scale and your wildlife's surroundings in the frame.

Try out a telephoto zoom lens like the Canon EF 70-200mm f/2.8L IS II USM, an ideal high-quality tool for photographing beautiful birds from a safe distance. There's the Canon EF 100mm f/2.8L Macro IS USM, a brilliant set of optics for getting extreme close-up images of insects, smaller mammals and plant life. Or check out the Canon EF 24mm f/1.4L II USM, a wide-angle prime lens suited for capturing the bigger picture.

L stands for Luxury, so you know you're buying a high quality product, with robust build quality and dust and moisture-resistant seals, reliable optics, fast and accurate autofocusing, and a lens that captures great details and accurate colours.

We reveal how each of these different Canon EF lenses can quickly and easily enhance your wildlife photography...

Picture taken using Canon EOS-1D Mk III + Canon EF 70-200mm f/2.8L IS II USM lens; 1/640 sec at f5.6; ISO200

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# CANON EF 70-200MM F/2.8L IS II USM

Canon EOS-1D Mk III + Canon EF 70-200mm f/2.8L IS II USM lens; 1/640 sec at f5.6; ISO 320

The Canon EF 70-200mm f/2.8L IS II USM telephoto zoom is a very adaptable lens and ideal for any wildlife that isn't too shy – such as squirrels in your local park or inquisitive Robins in your back garden. (Try enticing both with nuts!). The EF 70-200mm f/2.8L IS II USM is also the ideal telephoto zoom lens for photographing the people-friendly puffins on Skomer Island, where a longer telephoto lens would be OTT and impractical.

A fast constant aperture of f/2.8 throughout the zoom range means your exposures will be consistent when you're shooting at 70mm or zoomed in fully to 200mm, making for more consistent results. The wide f/2.8 aperture also makes light work of shooting in poor lighting conditions.

This EF lens proves why it's worth investing in quality kit as it's ultra-fast and silent USM (Ultra Sonic Motor) autofocusing is highly accurate, helping you to capture top shots however fast your wildlife subjects are moving. While built-in IS (Image Stabilization) will help you to capture blur-free photos when shooting handheld, allowing shutter speeds up to four-stops slower than standard.

When using the EF 70-200mm f/2.8L IS II USM lens on the wildlife photography enthusiasts' favourite Canon DSLR, the EOS 7D, the effective focal length (EFL) is increased thanks to the camera's 1.6x crop factor sensor. On an EOS 7D at the 200mm end it equates to an EFL of 320mm.

Use the EF 70-200mm F/2.8L IS II USM with a Canon EF 1.4x or 2x Extender with a EOS 7D and you'll increase the EFL further to 450mm and 640mm respectively! Perfect for filling the frame with wildlife subjects you can't normally get close enough to for a winning shot.

**Picture to the right taken using: Canon EOS-1D Mk III + Canon EF 70-200mm f/2.8L IS II USM lens; 1/1250 sec at f4; ISO 200**

## SHOOTING TIPS FOR BIRD PHOTOS

1. A long focal length lens will mean you can fill the frame with your feathery subjects, which is much more exciting than the results you get using your standard kit lens which end up with birds too small in the frame.

2. Try using a hide to get closer to the birds without scaring them off.

3. Use a wide aperture such as f/2.8 or f/4 to capture a shallow depth of field - this means everything in front of and behind your subjects will be blurred, to help your birds stand out in the frame.

4. Background choice is crucial when it comes to bird and wildlife photos, think about your position and move around so you can shoot with a clean, uncluttered background behind whatever you're shooting.

5. Shoot in High-speed Continuous Drive mode (on the EOS 7D that's 8 frames-per-second) to increase your shooting success rate and really capture the intricacies of birds in flight.

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# CANON EF 100MM F/2.8L MACRO IS USM

Picture taken using Canon EOS-1D Mk III + Canon EF 100mm f/2.8L Macro IS USM lens; 1/800 sec at f6.3 ISO 500

Capturing the world in close-up on camera is a wonderfully enjoyable experience and a reminder that every photography enthusiast should own a macro lens – and there's none better than Canon's EF 100mm f/2.8L Macro IS USM.

This L-series lens will capture life-size images (1:1), combined with its 100mm focal length, it's the perfect lens for taking close-up shots of bugs, butterflies and other insects, without disturbing them. It's also great for getting close-up details of flowers and plant life.

This 'fast' f/2.8 lens is ideal for low light conditions, such as shooting indoors or when photographing bugs hiding in dark woodlands or undergrowth. By using a wide aperture of f/2.8, this lets in more light, resulting in faster shutter speeds – which is the key to capture sharp macro shots when shooting out of hand.

It's packed with advanced features to help you improve your macro photography, such as an Ultra-low Dispersion (UD) lens element to ensure high image quality, and a 3-position distance focusing limiter switch – with limits for close-up subjects, distant subjects and all subjects, you're able to operate with a faster autofocus speed to ensure you don't miss a great shot. The new Hybrid Image Stabilization (IS) provides 2-stops of correction during 1.0x magnification, increasing to 3-stops at 0.5x magnification and 4-stops during normal shooting – which means sharp shots even when working with slow shutter speeds.

All this technology helps you to capture razor-sharp macro images, but you'll have to shoot with the EF 100mm f/2.8L Macro IS USM yourself to truly see how top-notch the images are.

Picture taken using Canon EOS-1D Mk III + Canon EF 100mm f/2.8L Macro IS USM lens; 1/100 sec at f5.6 ISO 1000

## TIPS FOR MACRO PHOTOGRAPHY

1. Use a tripod. Macro lenses capture a very shallow depth of focus so any movement by you will result in the wrong part of your tiny subjects being in focus – such as an insect's wings instead of its head and eyes; the key areas to focus on to draw people into your shots.

2. If you don't have a tripod, increase the ISO on your Canon DSLR to ISO 400, 800 or 1600, to obtain a fast enough shutter (around 1/100 sec or higher when using the EF 100mm f/2.8L Macro IS USM) to override any camera shake and capture pin-sharp macro shots. Or switch on the IS!

3. The further the distance between your subject and its background, the more you can knock it out of focus to really make it standing out from its surrounding for added impact.

4. Rather than shooting wide open at f/2.8, be prepared to shoot using an aperture of f/5.6 or f/8, which on a 100mm macro lens, will still be wide enough to really blur your backdrops behind the bugs, but also narrow enough to ensure the majority of the bug is in focus.

5. You may find it's easier to switch to MF (Manual Focus) on your macro lens for the best results. Use a tripod and LiveView on your Canon camera, and you can zoom in on your LCD to check your focusing is bang on before taking a shot.

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ADVERTISEMENT FEATURE

# CANON EF 24MM F/1.4L II USM

Not all nature photography benefits from zooming in close: some of the world's best wildlife photos are taken on wide-angle lenses as they capture the subject and its surrounding habitat to reveal context. But why chose a fixed focal length (aka prime) lens over a wide-angle zoom? Because prime lenses offer superior optical quality over zoom lenses due to minimised internal moving elements.

The Canon EF 24mm f/1.4L II USM is a wide-angle prime lens of exceptional pedigree. This lens contains aspherical elements to correct spherical aberrations, and Super UD (Ultra-low Dispersion) elements to eliminate secondary chromatic aberrations. The result? Crisp, high-contrast and undistorted image quality across the frame for pro-level results.

A wide angle of view enables you to capture the intimacy as you experience being so close to your wildlife subjects – something you can replicate and communicate to people in your photos taken on this wide-angle EF lens.

Used on full-frame digital cameras (with sensors equivalent to 35mm film, and without any crop factor) such as the Canon EOS 5D Mark II, a 24mm focal length will truly capture a wide-angle view of the wildlife world. While the Canon EF 24mm f/1.4L II USM lens's very fast maximum aperture of f/1.4 makes it a great lens for using in low light when you don't have a tripod handy.

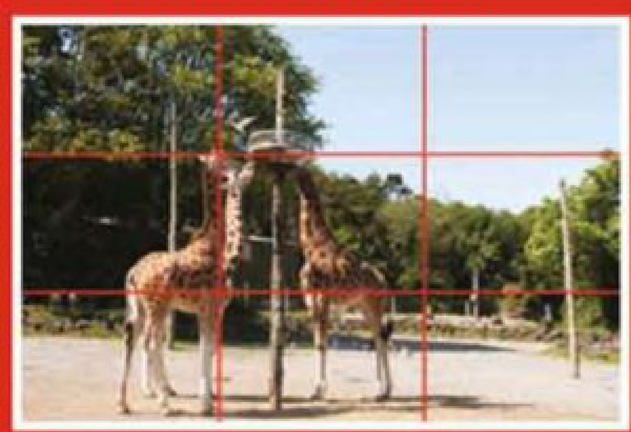
**Picture above taken using Canon EOS-1D Mk III + Canon EF 24mm f/1.4L II USM lens; 1/1600 sec at f5.6; ISO 200**

**Picture to the right taken using Canon EOS-1D Mk III + Canon EF 24mm f/1.4L II USM lens; 1/200 sec at f5.6; ISO 100**

## TIPS FOR WIDE-ANGLE PHOTOGRAPHY

1. Think about your compositions and how elements in shot relate to each other. Give your subjects space to breathe in the frame.

2. Consider applying the Rule Of Thirds; place your subjects at intersections along imaginary lines one-third and two-thirds across your frame for a balanced and more comfortable composition.



3. Get close with a wide-angle lens to capture a distorted, artistic view of your subjects - such as cows' faces or other animals close up.

4. When using wide-angle lenses, even at wide apertures such as f/5.6, they naturally capture more depth of field, which enables you to capture more of your subject and its surroundings in focus, from the foreground to horizon.

**For more details on Canon products and their full range of EF lenses, go to www.canon.co.uk/eflenses, or contact your local Canon dealer.**

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# HOME SWEET HOME

Honeybee society is one of the most complex in the animal kingdom. RICHARD JONES reveals how killer queens rule hives by mind control, and colonies live forever.

THE EXPERT

**RICHARD 'BUGMAN' JONES** is an entomologist and environmental writer, and a contributor to the *Collins Beekeeper's Bible* (2010).

Laurent Geslin

To us, all honeybee workers may look the same but they perform a wide variety of strictly defined roles for the greater good of their colony.

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**CONSIDERING HOW VALUABLE** honeybees are to humanity, how crucial they are to crop pollination and thus to our food security, they are surprisingly nondescript creatures.

Yet it's not the physique of these small brown insects that is amazing, but their complex behaviour. Honeybees are the most highly evolved insects of all – only ants and termites come anywhere close.

But what exactly goes on in the permanent darkness of their hives? How do honeybees create a sophisticated society to rival any in the animal kingdom, with a form of collective consciousness that enables the colony to make group decisions? To understand what makes honeybees tick (or should that be buzz?), we need to travel back in time.

## THE SWEET SPOT

Bees evolved from wasp-like insects 145–100 million years ago, when they switched from hunting invertebrate prey to collecting nectar and pollen. They did, however, retain the nesting instinct of their waspish ancestors.

At first they made their nests inside plant stems or in simple burrows, stocked with food by a lone female who died before her offspring emerged. Many solitary bee species still do this today. But some bees developed a more complex nest, housing perhaps two or three overlapping generations.

Bumblebees represent the next evolutionary stage. Each queen produces several broods of workers, infertile daughters who forage and nest-build for her. A new, sexually active generation of males and queens appears at the year's end, when the colony declines and the old occupants die off.

Honeybees have taken this 'caste' system to its extreme. At the height of summer, a nest may contain 80,000 workers and several hundred males, called drones, all controlled by a dominant, egg-bearing queen. Unlike in bumblebees and wasps, however, the colony does not deteriorate with the onset of winter.

**"The wind flips the drone backwards... he is castrated with an audible snap and an explosive injection of sperm."**

Their secret? Honey. By storing this sweet liquid the bees are able to survive cold, wet periods and droughts, when foraging is impossible. The queen is (by the standards of an adult insect) long-lived: she may rule a colony for four years before a new queen assumes power. This might happen for one of a number of reasons: the old queen may die or grow ill, the colony's population may grow too large or (and we don't know why this happens) the queen may simply depart.

We join the colony's cycle at the moment a virgin queen hatches from her pupa. Within hours, she will seek out other queen pupae in the nest and sting them to death (though on occasion several queens do survive).

Honeybee communal life depends on a queen's ability to determine the sex of each egg as she lays it. To do this, she needs sperm; so, having dispatched her siblings, the victor takes off on a nuptial flight in search of mates.

## BEE COMETS

On sunny afternoons, mature drones leave their colonies to gather in the treetops, leaving pheromone trails to attract just such a visitor. The virgin queen is soon pursued by a comet-shaped cloud of several thousand drones.

A successful drone seizes the queen and inserts his endophallus (an inflatable part of his genitalia) into her sting cavity, then releases his grasp. The rushing wind flips him over backwards and he is castrated with an audible snap and an explosive injection of sperm. The queen mates with nine or ten more drones, storing enough sperm to last her lifetime.

Half an hour later, the queen is back in her birth hive, where she starts to lay eggs in its wax cells. Each egg can be fertilised by sperm – in which case it will become a female bee – or left unfertilised to become a male. Hatching three days later, each developing grub is fed by nurse bees – young workers not yet foraging for sugary nectar and protein-rich pollen.

Illustrations by Chris Shields; dandelion: Leon Baas; drinking: Laurent Geslin

## MEET THE BEE TEAM HONEYBEE CASTES

### QUEEN ♀

SEX Female.
LENGTH 18–19mm.
TIME AS LARVA & PUPA 16 days.
APPEARANCE Abdomen longer and narrower than worker, head slightly smaller; no pollen basket on back legs.
STING Can sting many times.
ROLE Egg producer; lays up to 1,500 eggs each day (perhaps 1 million in her lifetime).
NUMBER IN THE COLONY One, though a colony may have several queen grubs.
LIFESPAN Usually two to four years.

### WORKER ☿

SEX Female, but infertile.
LENGTH 12–15mm.
TIME AS LARVA & PUPA 21 days.
APPEARANCE Abdomen intermediate in width between drone and queen, banded with chestnut, orange or yellow.
STING Able to sting once, then dies.
ROLE Guard, forager, nurse, cleaner; builds the comb and regulates nest temperature.
NUMBER IN THE COLONY Up to 80,000.
LIFESPAN Four to six weeks in summer; up to six months during the winter huddle.

### DRONE ♂

SEX Male.
LENGTH 15–17mm.
TIME AS LARVA & PUPA 24 days.
APPEARANCE Stouter and slightly hairier than female castes; very large eyes meet in centre of the forehead.
STING No (lacks a stinger).
ROLE Mate for queen.
NUMBER IN THE COLONY 100–500.
LIFESPAN A few days or weeks; may be evicted from the hive by workers if food is scarce, leading to death by starvation.

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For the first three or four days the grubs are given a protein-rich secretion from the hypopharyngeal glands in the workers' throats. Formerly called royal jelly – because female grubs fed solely on the secretion develop into queens – entomologists now refer to it as brood food, since all of the larvae receive at least some. Later, grubs not designated as queens are fed honey diluted with water collected from ponds and streams.

After nine days a worker grub is fully fed and its cell is sealed over with wax ready for pupation and metamorphosis into the adult, which finally emerges about seven days later. (Drones and queens take slightly longer to develop; see box, p54.)

## NATURAL ENGINEERS

A newly hatched worker bee's first role is to feed larvae. Within two weeks her brood-food glands are exhausted but wax is now being secreted by special plates on the underside of her abdomen. She scrapes this off with her feet, then lubricates and shapes it with her jaws to build and repair the colony's wax comb.

Throughout this time the worker has been feeding on honey stores in the hive – it takes 1kg of honey to make just 60g of wax. Wax is extremely strong: it can support 40 times its own weight in honey. The hexagonal array of wax cells in the comb, engineered by the bees with great accuracy, is one of the most space-efficient storage systems in nature.

A fully laden worker bee's pollen baskets can carry up to 10mg of pollen – but its hairy body often becomes coated with much more.

Honeybees collect water to help cool their hive by evaporation and to dilute honey for older larvae.

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## VARROA MITES: SCOURGE OF HONEYBEES

**In recent years, honeybee populations have crashed in many parts of the world (though not in Africa or South America). It is thought that the spread of varroa mites is partly to blame, though intensive farming practices are also implicated.**

### WHAT ARE VARROA MITES?

*Varroa jacobsoni* and *V. destructor* are 1.5mm-long parasitic mites that pierce the soft skin between the hard armour plates of pupae and adult bees to suck their haemolymph (blood).

### WHERE DID THEY COME FROM?

Varroa mites evolved on the Oriental honeybee, *Apis cerana*, which can survive infestations. In the 1960s they were accidentally transferred to the western honeybee, *A. mellifera*, in Japan and Russia. It had little or no natural defences against the mites, so they spread rapidly.

### WHAT IMPACT ARE THEY HAVING?

Varroa mites seriously weaken bee hosts, killing many. They also reduce the honey crop and are thought to spread diseases.

### ARE BEEKEEPERS TO BLAME?

Partly. The western honeybee is kept worldwide, well beyond its native range, bringing it into contact with the Oriental species from which it 'caught' the mites. A lack of genetic variation caused by inbreeding has made it more susceptible.

### SO WHAT'S BEING DONE?

Beekeepers monitor varroa mite loads in their hives, applying chemicals to control them. But this is labour-intensive and the mites have already developed immunity to some treatments.

Two honeybee pupae infested with varroa mites.

Pupae: Nigel Cattlin/FLPA; mite: Science Photo Library

Bees buzzing around a hive look chaotic, but the foraging activity is highly regimented – hence the phrase 'to make a beeline'.

Laurent Geslin

The worker next becomes a receptor bee, taking regurgitated nectar from returning foragers and maturing it into honey. She does this by drying the nectar droplet in her jaws, reducing its water content from 60 to 20 per cent – the viscosity that stops honey draining from the vertically aligned honeycombs.

### DANCING IN THE DARK

At about a month old a worker switches to foraging duties, joining a mass of bees dispersing from the hive. This is a co-ordinated harvest, not a random scramble: each such scout will look for new food sources, return to the hive and inform the others precisely where to find them using body language alone.

How? Inside the pitch-black hive, the scout proceeds to dance a figure of eight. The central axis of her dance is an abdomen-shaking waggle, bounded by half-circle turns to left and right. The length of the waggle indicates distance, its intensity is code for food abundance and its direction (relative to the vertical in the hive) signals the flight direction relative to the sun in the sky. This system also works on dull days, since foraging bees can detect the alignment of the sun's light rays even when they are scattered by cloud.

Other workers, using their antennae to feel the scout's dance moves, are duly recruited and fly great distances (up to 14km has been recorded) to fetch the nectar or pollen. They are fastidious foragers, visiting just one species of flower at a time until no food is left. Doing so ensures a uniform food quality, making it easier to process and store.

A worker's many other chores might include hive defence, clearing debris, readying used brood cells for new eggs, feeding the queen, air-conditioning the honeycombs by wing-fanning, fetching water and gathering propolis (sticky plant secretions, such as tree sap, used to seal and repair the nest).

**DID YOU KNOW?**

Some 'heater bees' boost their body temperature as high as 44°C by vibrating their flight muscles rapidly, warming the hive in cold weather.

In summer, a worker will – if she's lucky – live for six weeks. Autumn-reared workers live longer, as foraging activity dies down and the bees cluster at the centre of the nest. Here they remain semi-dormant for several months until spring. Mortality increases in harsh winters, but most of the bees (provided they have fed well and are in good health) usually survive.

### MOUTH-TO-MOUTH MESSAGING

At the heart of everything the hive does is the queen who, as well as laying all of its eggs, generates the chemical signals that control its workings. Queen mandibular pheromone, produced in her mouth, is one of the most important – it keeps the colony 'on message',

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A view inside a hive. Two huge-eyed drones can be seen amid the workers; the grey-pink substance is stored pollen.

ensuring that the workers carry on building, foraging and storing honey. Since workers feed each other – and the queen – mouth-to-mouth, chemical messages pass rapidly through the colony.

If the hive grows too large and crowded (beyond a density of about 2.3 workers per cubic centimetre), the queen's pheromones become too dilute. This subtle chemical change has a dramatic effect on the behaviour of the whole colony – one stimulus for the hive to produce new queens. Workers now start to enlarge some brood cells around the edge of the comb, and to offer only brood food to the grubs inside. The nutritionally enhanced female larvae in these cup-shaped cells are destined to become sexually fertile queens rather than sterile workers.

In this instance, before a queen emerges to mate, the old queen and a large contingent of her workers spontaneously feed up on honey and abandon the nest. Quite why some bees go and others stay behind is not yet known. Those who leave swarm around their leader in a great cloud, finally settling in a seething mass ready to found a new colony.

Scouts are dispatched from the swarm to hunt for a suitable nest site, such as a hollow tree, and so the colony's life-cycle starts over again. In truth, a colony never really dies but merely divides. Individual bees may perish – the colony lives forever.

## CATCHING THE BUZZ: WHAT CAN BEES TELL US?

Beekeeping is part science, part alchemy, and it makes you see the natural world in a new light. It's a bit like looking after 50,000 living barometers. On a sunny morning you'll see a hive of activity by 6am, with a steady stream of workers coming and going. If it's wet, the bees just mooch about inside like sulky teenagers.

Each time you open a hive, you get an insight into the interaction between plants, pollinators and climate over the previous few days. Some beekeepers place their hives on sets of scales: any weight gain represents food brought in by the workers, so the daily changes serve as an index of sunshine, rainfall and nectar. In ideal conditions in midsummer, a British honeybee colony can grow by 4–5kg in one day.

Beekeepers carry out a weekly hive

### NECTAR FLOWS AND GAPS

Budding beekeepers soon become obsessed with 'nectar flow' – the quantity and quality of nectar available in our local area. We begin to distinguish the subtle shades of the seasons as different plants flower. It's also possible to work out what pollen bees are foraging at any given time using colour-coded charts (apple pollen is yellow, bramble grey, for example).

One thing all beekeepers dread is a 'nectar gap' – a dearth of bee food. In the UK there is often one in late May or June, when hives may lose weight as their food stores are depleted. The gap lasts a few weeks, until plants such as white clover and rosebay willowherb bloom and come to the bees' rescue. *Ben Hoare*

**GET INVOLVED**

Find out more about beekeeping at www.bbka.org.uk and www.nationalbeeunit.com

Hive: Andy Luck; beekeeping: Ben Hoare (with thanks to Quantock Beekeepers)

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# THE LIZA

A century ago, whispers reached the West of a real-life dragon prowling the Indonesian island of Komodo. The ancestry and deadly drool of this massive reptile have taxed scientists ever since. **NICK BAKER** investigates.

Photos by **BRIAN W MATTHEWS**

THE EXPERT

Naturalist and TV presenter **NICK BAKER** says that his trip to the 'dragon's den' on Komodo is one of his all-time wildlife highlights.

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# RD KING

A Komodo dragon swaggers across its volcanic island domain, where it has become the top predator. Pigs, deer, buffalo, other dragons and the odd human are all on the menu.

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The dragon has a flexible skull and stretchy throat, enabling it to swallow huge, meaty mouthfuls – grass and all.

Zookeeper: Smithsonian's National Zoo; feeding: Conrad Maufe/naturepl.com

## DISCOVERING THE DRAGON

It was the herpetological event of the 20th century. In 1910, reports that pearl divers had seen huge 'land crocodiles' on Komodo galvanised Lieutenant van Hensbroek of the Dutch colonial administration into acquiring some specimens. Two years later, the director of a small zoological museum in Java published a paper on the skins in an obscure journal, but then the dragons' existence lay forgotten for over a decade.

In 1926, the explorer W Douglas Burden got wind of the discovery. Backed by the American Museum of Natural History, he set off to bag himself a dragon. He returned to New York with 12 skins and a pair of live animals that were housed at the Bronx Zoo (three of his specimens can still be seen in one of the museum's famous dioramas).

The footage shot by Burden's team intrigued film-maker Merian Cooper, who substituted a giant gorilla for a monstrous lizard. And so, in 1933, *King Kong* was born.

Specimens collected on a 1937 East Indies expedition wowed visitors to the National Zoo in Washington.

**AFTER A LONG** journey by boat, your first glimpse of Komodo doesn't disappoint. Through the ocean haze, silhouetted against an equatorial sky, the lines of jagged peaks bring to mind the very teeth of the famous reptile that haunts this volcanic island.

Everything about this remote outpost, from its stark terrain to its furnace-like heat and exotic flora, makes it the kind of place you'd expect to find an extraordinary creature. Komodo resembles a real-life Jurassic Park – a suitably dramatic environment for a dragon to call home.

Just like its mythological namesake, the Komodo dragon has inspired many legends. And, though the western world has known about its existence for almost exactly a century, much of the species' natural history remains shrouded in mystery.

The dragon is found in only a handful of locations – the middle links of a chain of Indonesian islands called the Lesser Sundas. It's the only place on Earth that is ruled by a lizard. But the question is: why here? How is it that a lizard – normally a relatively small, skittish and retiring kind of creature – has managed to seize the top spot and become the apex predator?

### DID YOU KNOW?

In 2006, Flora, a female dragon at Chester Zoo, laid a clutch of viable eggs despite not being kept with a male. It was proof that the dragon is capable of a rare form of asexual reproduction called parthenogenesis, which is known in about 70 vertebrate species.

### ISLAND GIANT

For a long time it was supposed that the Komodo dragon – the world's largest lizard, measuring up to 3m in length and 165kg in weight – was a text-book example of 'island gigantism'.

If an animal becomes isolated from a crowded, species-rich ecosystem, it is freed from the ecological ball and chain – the usual environmental limitations caused by predation or competition for food or habitat that cap its size.

The planet's remote islands are peppered with examples of animals, both living and extinct, that fit this theory: the kakapo, New Caledonian giant day gecko, elephant birds, moas, Flores giant rat and Galápagos giant tortoises, to name but a few.

This is what was assumed to have happened on the Lesser Sunda Islands – little lizards became large lizards. After all, gigantism makes sense on many levels in this case. If you are a big lizard, you're able to make the most of sparse and unpredictable food resources, devouring huge meals when you can and getting by on snacks in times of scarcity.

Moreover, as a cold-blooded reptile your metabolism and overall 'running costs' are low, which in practical terms means that you can go without eating for longer. This would never have been possible for an equivalent-sized mammalian predator on such barren islands.

**"Komodo resembles a real-life Jurassic Park – a suitably dramatic environment for a dragon to call home."**

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A mob of dragons make short work of eviscerating a water buffalo. Each can devour 80 per cent of its own weight at a single sitting.

The ancestors of the Komodo dragon (so the theory went) dispersed across Asia 25–40 million years ago and colonised other land masses. They hopped between various islands as and when the sea level allowed until, about four million years ago, they reached the Lesser Sundas. Here, cut off from the rest of the world, the lizards evolved into giants.

## THE AUSTRALIAN CONNECTION

In 2006, this hypothesis was blown out of the water when fossils of a giant lizard – so similar to today's Komodo dragon as to be indistinguishable – were unearthed in eastern Australia. They are over four million years old.

The creature to which they belonged was evidently not the product of island gigantism. In fact, it came from an era when giant reptiles held their own among Australia's prehistoric fauna, including the ferocious marsupial lion, *Thylacoleo*, which had the strongest bite of any mammal ever to have stalked the Earth. However, somehow this monster succumbed (perhaps to competition from other predators) everywhere except

Mating is a rough affair. The male often lingers for a few days to chase off any rivals tempted to impregnate his female.

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The Komodo dragon has the thick-set, low-slung build typical of its family – the monitor lizards.

Female dragons dig pits for their eggs. They guard the nests, but their parental duties end there.

on the archipelago where it now rules the food chain. So the Komodo dragon isn't an isolated island giant, but an ancient relic from a long-lost world.

## TIMELESS TERROR

How does a large lizard from another age survive in modern times? The short answer is: by throwing its weight around. An individual dragon can bring down prey as big as buffalo, of which there are plenty in the Lesser Sundas.

The dragon has what would appear to be the perfect tools for this job: 60 serrated, shark-like teeth. (These are not always easy to see: some experts think that they are covered in a membrane that ruptures during feeding.) Yet its skull and the musculature of its jaws don't seem up to the task. Its bite is just one-sixth as powerful as that of a saltwater crocodile of the same size – nasty, but hardly in the animal kingdom's predatory Premier League.

Scientists used to believe that the dragon made up for this deficiency with a little help

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Baby dragons wisely live in trees for their first year or so, feeding on insects and geckos.

A dragon's most acute sense is smell. It is said to be able to detect death from 10km away.

Illustration: Dorling Kindersley

BBC Wildlife FACTSHEET

# KOMODO DRAGON

*Varanus komodoensis*

## THE BASICS

- LENGTH Up to 3m from head to tip of tail.
- WEIGHT Usually up to 90kg; record is 165kg.
- APPEARANCE A huge, muscular monitor lizard with a massive, rounded snout and powerful claws.
- DIET Takes all kinds of carrion; kills prey up to the size of a water buffalo.
- LIFE CYCLE Sexually mature at about 9–10 years; breeding season is July–September. Female lays up to 30 eggs, which hatch 8 months later. Young are 35–40cm long at hatching.
- HABITAT Forest, scrub, grassland and coasts; scavenges near villages.
- LIFESPAN Up to 50 years in the wild.
- STATUS Vulnerable; total population estimated to be 5,000–8,000. Threats include poaching, habitat degradation and declining prey populations.

## WHERE IN THE WORLD

from (several million) of its friends: bacteria. Unless you're a microbe, a Komodo dragon's mouth is not a pleasant place to be.

Its mighty maw provides ideal conditions for up to 57 varieties of potent bacteria, such as *Staphylococcus* and *Escherichia coli*. Until recently, experts assumed that even a slight nick from those teeth would cause a wound that rapidly went gangrenous. The unfortunate victim might stagger on for several days before succumbing, but this would be no problem for a hungry dragon. Tasting the air with its long, bifurcated tongue, it could pick up the faintest whiff of death and decomposition, easily locating prey that perished long after the first bite.

A brutal sequence of a dragon kill in the epic BBC series *Life* seemed to back up this assumption. But there might be more to the dragon's deadly drool than was thought.

First, in 2009, researchers discovered that the types of bacteria found in the mouths of dragons vary greatly between individuals, so there must be more behind the effects of their bite. Then Dr Bryan Fry, a venom specialist at the University of Melbourne, dissected two dragon heads and was amazed to find a pair of venom glands in their lower jaws.

Each gland contained a poison as potent as that of the deadliest terrestrial snakes. Fry suggested that the dragon is armed with one of the most complex venom-delivery systems of any reptile. Though snakes can strike faster, the dragon distributes its venom by raking its teeth through the flesh of its prey. The poison lowers blood pressure and impairs coagulation, leading to blood loss and shock.

> "The victim is overcome by a slithering mass of brawling reptilian bodies, lubricated by blood, viscera and saliva."

Fry's work enhances the dragon's reputation as the enigmatic embodiment of predatory perfection. He claims that bacteria-laden saliva might kill prey by chance; if so, it is not an adaptation in the strict sense of the word – whereas venom is a naturally selected weapon, honed by evolution.

### BLOOD AND GUTS

A dragon kill is one of the most gut-wrenching natural spectacles I've ever seen. The victim is overcome by a slithering mass of brawling reptilian bodies, lubricated by an appalling mixture of blood, viscera and saliva. It's a scene that sends shivers down your spine. The fact that the aggressors are enormous, cold-blooded reptiles only adds to the feeling that you are witnessing an act from a past chapter of life on Earth, preserved by a quirk of geography.

BBC TWO **KOMODO – SECRETS OF THE DRAGON** is part of this autumn's new *Natural World* season.

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# TASMANIA
## PART six
## WHY SO WILD?

**The wild habitats and isolated ecosystems of the island state offer refuge to a feast of unique mammals and rare birds.**

A 'rogue's gallery' of some of Tasmania's most charismatic species should be enough to convince any sceptic that this island's wildlife is special: the eponymous devil with its squat, muscle-bound body, the eastern quoll with its spotty coat and big bushy tail, and the tiny rufus wallaby or pademelon – all three are today found nowhere else in the world.

All islands tend towards endemism because species evolve in isolation. But the reason that Tasmania hosts these unique creatures is different: all three were once found throughout mainland Australia but died out there due to competition with introduced species.

### GREEN AND WILD LAND

So, today, Tasmania is like a fertile ark, providing a refuge for animals that would otherwise have gone extinct. In addition, the island always contrasted with its big brother: its more southerly latitude has given rise to vast temperate rainforests where some of the oldest trees on the planet grow, while ancient geological forces have created spectacular rock formations, not least the dolerite cliffs, resembling petrified church organs, of the south-east and Cradle Mountain.

**"Tasmania is like a fertile ark, providing a refuge for animals that would otherwise have gone extinct."**

The egg-laying, spine-covered echidna: a mammal, yes, but not quite as we know it.

Right on cue: southern right whales can be seen off Tasmania between June and October.

Wombats on the beach: one of the great pleasures of Tasmania is watching wildlife (here at the Bay of Fires) in remote yet easily accessible locations.

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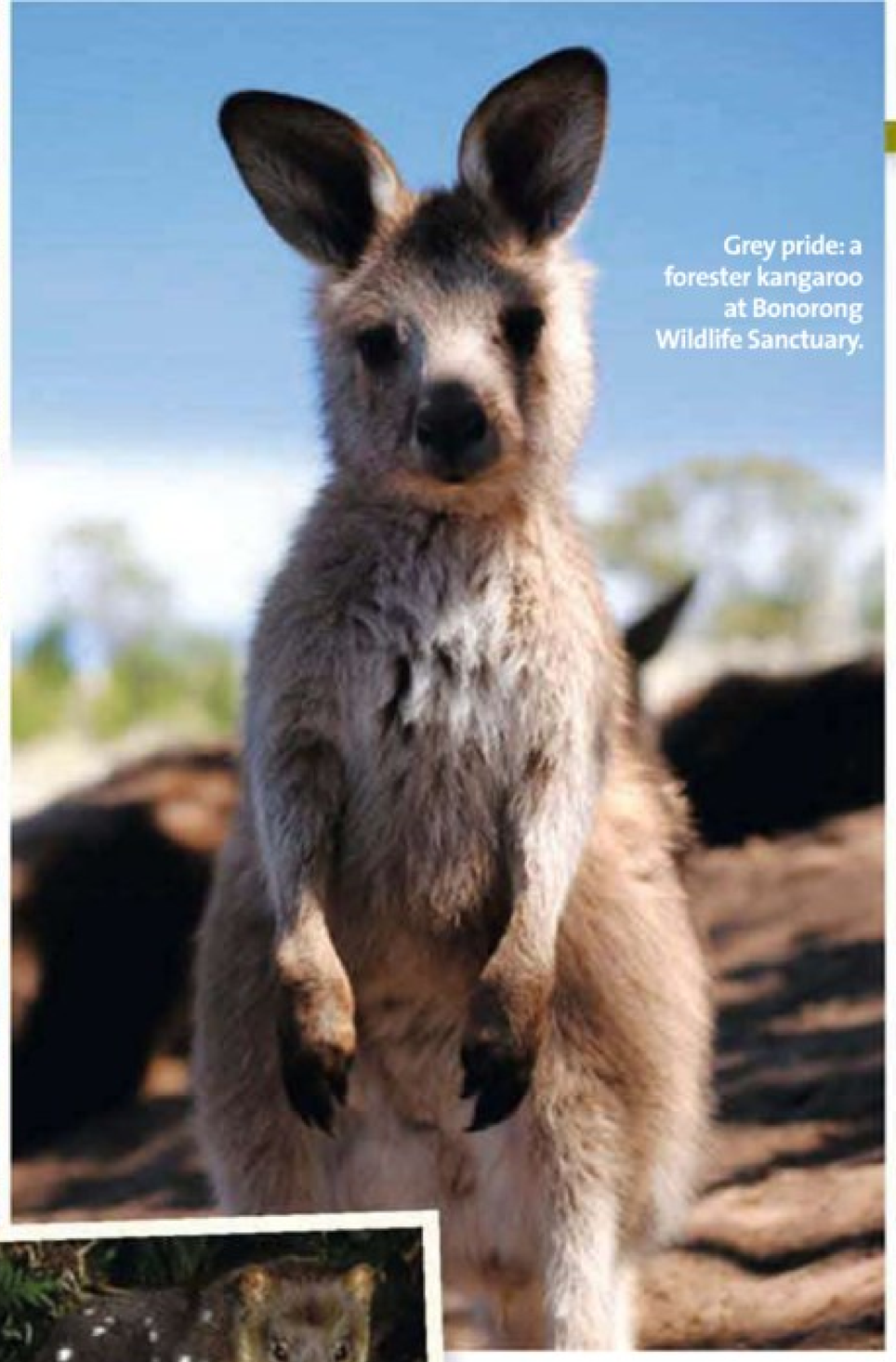


Grey pride: a forester kangaroo at Bonorong Wildlife Sanctuary.

Beauty is the beast: the lovely spotted-tailed quoll.

Indeed, there is an astonishing range of habitats packed into an area the size of Scotland, including magnificent eucalpytus forests, bleak buttongrass moorlands and dry 'sclerophyll' woodlands. You can go from deserted, white sandy beaches on the east coast to the wet, windy and wild west – from one world to another – in less than six hours.

## A WAKING DREAM

Everywhere you go, you'll be amazed by Tasmania's outrageous fecundity, with wombats and wallabies nearly as common in some areas as pigeons in Trafalgar Square. Bird life, too, is a treat, and you may find that the distinctive call of the yellow wattlebird (a large honeyeater and another endemic) comes to haunt your dreams as well as your waking hours.

Out at sea, Tasmania has plenty to offer, including five species of albatross and two of the mightiest leviathans on the planet: humpback and southern right whales. The pristine waters are home to rich and sustainably exploited populations of delicious shellfish and crustaceans such as oysters, abalone and lobsters.

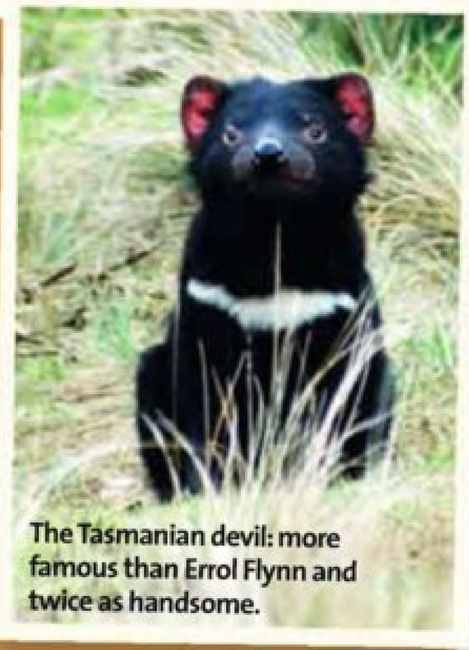
Like most wildlife-rich areas on the planet today, there are huge pressures on Tasmania's natural riches. Great swathes of the state are protected, however, and state scientists have responded to the crisis afflicting the devil – the so-called Devil Facial Tumour Disease – with concerted action that, it's hoped, will save it from going the same way as the Tasmanian tiger or thylacine.

Less than an hour from Melbourne and worth at least two weeks of your time, Tasmania is a prime destination for genuine wildlife lovers. The world's a shrinking oyster: savour it – and them – while you can.

Whale: Gerald Soury/Photolibrary.com; quoll & parrot: Dave Watts/NHPA; kangaroo: Bonorong Wildlife Sanctuary; wombats: Anson Smart/Tourism Australia; echidna: Geoff Murray/Tourism Tasmania; devil: Mark Eveleigh/Tourism Tasmania

## TASMANIA'S KEY SPECIES

# 6 OF THE BEST...



The Tasmanian devil: more famous than Errol Flynn and twice as handsome.

### BEST IN THE BUSH
TASMANIAN DEVIL

If you go to Tasmania and see only one species of wild animal – virtually impossible though that would be – then it has to be the Tassie devil. Arguably better known even than the island's famous son Errol Flynn, this devil may not have the best tunes but it certainly has the most ferocious ones. Reliable sightings at Geoff King's world-famous 'Devil Restaurant' – make your booking now.

### BEST FOR BEAUTY
SPOTTED-TAILED QUOLL

The hardest to see of Tasmania's carnivorous marsupials is also the loveliest, with a splendid spotty coat that extends down the length of a tail measuring 0.4m in a male. Spotted-tailed quolls are usually only spied after dark in areas such as Mt William and Cradle Mountain-Lake St Clair National Parks.

### BEST FOR BIZARRE
ECHIDNA

In a land of strange creatures, top prize goes to the echidna: an egg-laying mammal with a long snout and a 'coat' of spines, it resembles a rockabilly anteater. It's named after a character in Greek mythology who was half-woman, half-snake.

### BEST FOR BIRDERS
ORANGE-BELLIED PARROT

One of Australia's rarest birds, the orange-bellied parrot breeds only in south-west Tasmania, though it migrates to the mainland for the winter. Easy to see at Melaleuca between November and March.

### BEST FOR BOTANISTS
SWAMP GUM

This is one of many common names applied to *Eucalyptus regnans*, the tallest flowering plant in the world. In 2008, staff working for Forestry Tasmania measured at 101m high a gum tree located close to its Tahune AirWalk attraction.

### BEST FOR WHALE-WATCHERS
SOUTHERN RIGHT WHALE

Migrating between Antarctica and southern Australia, southern right whales pass Tasmania between June and September, and again in September and October. Scientists recently found that they use Great Oyster Bay, off the east coast, as a calving ground.

Fewer than 150 orange-bellied parrots live in the wild, and they breed only in Tasmania.

### ★ BOOK YOUR TASMANIAN ADVENTURE

Enjoy a once-in-a-lifetime 16-day 'Best of Tasmania' self-drive adventure, including all the iconic wildlife and wilderness regions, three nights in Hobart, a night at Port Arthur and the four-day Maria Island Walk, from £3,585 per person excluding international flights. For more information and fares to Tasmania, call Tailor Made Travel on 0800 988 5912 or visit www.tailor-made.co.uk/tasmania

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# MISUNDERSTOOD: magpie

The ‘maggot-pie’ has the worst reputation of any British bird. But, says **DEREK NIEMANN**, the case against our piebald corvid is far from black and white.

THE EXPERT

**DEREK NIEMANN** is a country diarist for the *Guardian*. This year he was lucky enough to observe four magpie nests near his home.

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'Hello, Mr Magpie!' This handsome bird is often unfairly blamed for wider changes taking place in the British countryside, but is far from invulnerable itself.

Andrew Parkinson

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We may find egg-stealing hard to forgive, but in most cases it does little or no harm to other species.

Juvenile: Keith Humphrey; stealing egg: Brian Bevan/ardea.com

**IT STANDS ACCUSED** of being a thief, a murderer, a bully bird of the suburbs. But is the magpie really all that it seems? Is there room for a little understanding, tolerance and even sympathy for this most hated of birds?

It's undeniably handsome, and in bright sunlight the magpie is a colourful revelation. Granted, its chest is pure swan-white and its head so dark that a pearly glint is the only sign of its watchful eye. But the glossy wings folded over its back gleam intense indigo – the rarest colour in Britain's natural rainbow.

The bird's royal-blue tail fans out into a graceful curve like the blade of an African spear. The ancestors of this species hopped down from tropical forests in the Far East and it still wears exoticism in its dress.

A stranger stops when he sees my raised binoculars and asks me what I'm watching.

"A magpie," I say.

"Bloody things. I hate them," he volunteers. It's a fairly typical response.

Yet this bird was the darling of the Middle Ages. Affection named it *Margot la pie*, the 'pied Margaret'. Chaucer, a faithful mirror of society's mores, used the phrase "joly as a pye". People caught it and kept it as a pet. But times changed and endearment became enmity. Victorian game-rearing landowners marked it down as a despicable killer. And, in the modern age, many of the same vested interests collared the magpie as one of the principal causes of songbird declines.

The numbers of birds such as bullfinches and yellowhammers were tumbling; magpies were booming. A simple case of cause and effect, they claimed – until, in 2010, the British Trust for Ornithology published the results of research showing that no such link exists.

Juvenile magpies have short, stubby tails. Their lives, too, are often short: the young birds face many dangers.

## A VULNERABLE SIDE

Where game interests are the issue, a dislike of magpies might be understandable, but that doesn't explain their enduring vilification in wider society. After all, nobody keeps pheasants in Tooting Bec nowadays. Perhaps, in our gardens, we are still landowners on a smaller scale, and blackbirds are our pheasants?

The magpie is a hunter without stealth or speed, the burglar who has the effrontery to raid while the family are home, trampling the nest, grabbing the eggs and tearing out the chicks, oblivious to the parents' shrieking protestations. It's just not *nice*.

But this loud, brash species – seemingly the epitome of antisocial behaviour, with its strutting, rollicking gait – is vulnerable, too. The blacker, shorter-tailed youngsters that fledge this autumn are less artful dodgers than their elders. For a few short weeks after leaving the nest, they remain under close parental protection until finally they are driven away to fend for themselves.

Most young magpies won't see next spring. A study of buzzards' breeding success in North Wales by Peter Dare found that where rabbits are scarce, juvenile magpies form the main prey of young buzzards in early autumn. Foxes, crows, stoats, goshawks and tawny owls are among the other predators ready to exploit the juveniles' inexperience and unsteady flight.

Oddly enough, the best survival strategy for a young magpie is to stay close to home. Professor Tim Birkhead supervised a 15-year study of the species in Sheffield. "The distances moved by young magpies were among the lowest recorded for any perching bird," he tells me. "Only 12 per cent of individuals bred more than three territories away from where they were reared. It is not clear why dispersal should be so limited, but our results suggest

**DID YOU KNOW?**

Urban magpies are pooper-scoopers *par excellence*. A study in Sheffield found that up to a sixth of the corvids' food hoards were dog faeces: they can extract nutrients from the ordure.

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Winter gatherings (a 'tidings', 'charm' or – tellingly – 'murder') of magpies should be one of the highlights in any birdwatcher's calendar.

Gathering: Steve Round; artwork: Mary Evans Picture Library/Alamy

that staying near home is a better strategy than moving away." On average, in their first year juveniles venture just 325m from where they hatched. And the less they travel, the better their chances. Local knowledge of where to find food and how to avoid danger seems to be the key.

## LIFE ON THE EDGE

Established pairs of magpies force these footloose, rootless young birds to eke out a precarious living, harried or at best tolerated on the fringes of existing territories. So the great, noisy parties of a dozen or more birds that you see in the bare treetops in late winter and early spring are engendered by weakness, not strength.

Watch one of these so-called 'ceremonial' gatherings and, with luck, you may be treated to a delightfully raucous, follow-my-leader procession as the birds fly from tree to tree along a boundary between two territories. The nearest resident pair will often rise up to meet this challenge, dispersing the intruders.

But if a territorial male or female happens to be old or infirm, its partner may swap it for a younger, sleeker model from the trespassing flock. In some cases, two birds from these gatherings may pair up and squeeze in between two existing territories, effectively acquiring the cabbage patch at the end of the garden.

## THE MAGPIE ON TRIAL GUILTY OR NOT GUILTY?

### GANGLAND BULLY — NOT GUILTY

Do magpies use strength in numbers to bully weaker creatures? During the hour before darkness falls, magpies gather in groups – often of 20 or more. But the purpose is quite innocuous: they are coming to roost. And the small gangs that taunt a cat, fox or stoat are using self-defence, trying to drive a predator away. There have been no known cases of magpies using mob-handed bullying tactics.

### CRIMES AGAINST MUSIC — NOT GUILTY

Angered geese trumpet with higher decibels, but urban magpies have more neighbours to disturb with their rattling fusillades. The best that can be said of their clacking is that it is 'percussive'. But get close enough in spring to see the scarlet tongue lifting in a male's part-opened bill and you might hear it sing a soft lullaby meant for its special other.

### CAUSE OF SONGBIRD DECLINE — NOT GUILTY

British Trust for Ornithology research (2010) combined data from 200 sites in 1967–2000 with information collected by 2,000 volunteers in 1995–2005. It showed that there was no causal link between an increase in magpie numbers and a decline in songbird numbers.

### KILLER OF BABY BIRDS — GUILTY

For eight months of the year the magpie subsists on a largely vegetarian diet. But in the breeding season this alert opportunist has five or six hungry young to feed. It doesn't hesitate to take the eggs and chicks of other birds to sustain its own brood.

### THIEF OF SHINY THINGS — NOT GUILTY

This persistent myth has been perpetuated in the arts, including in Rossini's opera *La Gazza Ladra* (*The Thieving Magpie*). Though captive magpies do learn to pick up the bright trinkets they notice that their owners value, there is no evidence of such behaviour in the wild.

The 'thieving magpie', imagined by a French artist in about 1750.

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Magpies are Europe's oxpeckers, adroitly hitching a lift on sheep and cattle to pick off tasty parasites.

Competition between magpies is fierce enough, but others in the crow family bring yet more trouble. The jackdaw matches its cousin in weight and food requirements, so both birds suffer from each other's presence. A far greater threat, however, comes from the carrion crow: the magpie's bogey bird.

## BOGEY BIRD

If a crow lands in the same tree as a magpie, you will see a bird about the same length as the latter but more than twice its weight. The magpie's 'talkative' tail flicks repeatedly with anxiety, its wings half-raised in a fight-or-flight position. And with good reason: the crow will readily seize the sticks, the eggs and even the young from its nest. It will kill the adults, too. After humans, it is the magpie's biggest killer.

Doesn't the magpie dish out the same treatment to birds smaller than itself? Well, yes, but (like its nemesis) not all of the time. The magpie is nothing if not adaptable. In summer its largely carnivorous diet includes everything from earthworms to frogs – but in autumn reverts to a mainly vegetarian menu of seeds and berries. It caches a surfeit of food from this feast to tide it through leaner months. Surely, in these straightened times, we should admire such natural prudence?

The magpie also scavenges carrion and leftovers – it wastes nothing, another attribute in keeping with the age. One city survey found that nearly half of its diet was bread, takeaways and other human detritus. And yet we revile it, blaming the litter-picker for our own litter.

## TWO FOR JOY?

When the leaves fall this autumn, look again at the huge stick-ball nests lodged high in bare tree forks – they are a symbol of the magpie's more gentle side. Each represents the joint labour of an apparently devoted pair.

**"The magpie's 'talkative' tail flicks repeatedly with anxiety, its wings half-raised in a fight-or-flight position."**

Throughout the incubation period and the raising of the chicks, the adults share feeding duties, and they guard the young together. It's a picture of conjugal bliss – but there is one small hitch. During courtship in spring, the male can be a secretive and active adulterer, the female a passive one. In common with many other birds, the male may not be the father of all the chicks in his nest.

Such contradictory behaviour typifies the magpie in all its complexity. We find it hard to accept its visceral habits. But, for me, this is the most intelligent, easily observable and fascinating of all British birds. Can we find it in our hearts to pity, not pillory, this characterful bird?

**WHAT DO *YOU* THINK?**

Let us know your thoughts about magpies by writing to wildlifeletters@bbcmagazines.com

## LICENSED TO CULL

» When current wildlife laws were enacted in 1981, the magpie was given only minimal protection. With the landowner's permission, anyone can kill a magpie at any time of year, provided they can show it was a last resort to further "the conservation of wild birds".

» Even conservation organisations take out magpies. RSPB species policy officer Jeff Knott says: "In a very small number of cases, such as where the habitat is in poor condition and bird populations are vulnerable, the lethal control of magpies may be needed to protect the last birds in the area. However, this doesn't address the underlying cause of declines, so should be used only rarely."

» Would culling on a greater scale be useful? I don't think so. A widowed magpie has no time to grieve – a new mate may even arrive the same day, since unpaired birds circulate established territories. For culling to work, it would need to be widespread and ongoing.

Larsen traps are a legal

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Trap: William Osborn/naturepl.com; sheep: Chris Robbins/Alamy

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# SWIMMING WITH GIANTS

Ever dreamed of finning beside a whale shark or watching a female humpback nurse her calf? Ten of our top photographers and experts reveal their most incredible underwater encounters – and explain how you can take the plunge and experience them for yourself.

The whale shark, the oceans' biggest fish, is one of the world's great wanderers – each individual may cover many thousands of kilometres in a year.

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**WHERE TO SWIM WITH GIANTS**

1. Whale sharks, Western Australia
2. Hammerhead sharks, Sudan
3. Sealions, Galápagos Islands, Ecuador
4. Orcas, Norway
5. Humpback whales, Tonga
6. Green turtles, Barbados
7. Manta rays, Maldives
8. Basking sharks, UK
9. Stingrays, Cayman Islands
10. Manatees, Florida, USA

# 1 Whale sharks
## Western Australia

Jumping off a boat into crystal-blue oceanic water 50m deep is thrilling enough, but knowing that you're plunging into the path of the world's biggest shark – up to perhaps 15m long – really sends your heart into overdrive.

At least 10,000 tourists do this every year at Ningaloo Reef, Western Australia, which was recently named a World Heritage site. There are more than 20 locations worldwide where you can swim with whale sharks, but Ningaloo is perhaps the best site of all; it's certainly the most famous.

I often relive my first time: as I snorkel languidly at the surface, a creature as big as a bus powers towards me. The shark slides effortlessly past, seemingly unconcerned by my presence. A giant shark, I say to myself, is within 5m of me – and there is no cage between us. Marine encounters truly don't get much better.

*__Brad Norman__ is a marine biologist who has been studying whale sharks at Ningaloo Reef since 1994.*

**NOW YOU DO IT**

» For a list of operators at Ningaloo Reef, visit the Western Australia Tourist Board website: www.westernaustralia.com

» If you go swimming with whale sharks, take a camera and upload your photos to help with research and conservation efforts. Find out how at www.whaleshark.org

**TOP TIP When you enter the water and first see the shark, swim out to the side and stay at least 5m away. Try not to splash.**

Jurgen Freund/naturepl.com

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Gloom with a view: scalloped hammerhead sharks form huge schools – here at Cocos Island off Costa Rica's Pacific coast.

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# 2 Hammerhead sharks
## Red Sea, Sudan

Beyond the reef, out in the current, the hammerheads gather in schools. They are most likely to be seen on an early morning dive, but here, off Sanganeb Atoll in the Sudanese Red Sea, you must wait for them to come to you.

I plunge through the thermocline and down to the colder water that the hammerheads prefer. The current is strong, so I work against it with biting fin strokes while controlling my breathing.

I gaze into the crepuscular emptiness then clang my knife against my air tank a few times. The shimmer of a distant ghost appears through the haze; then several others materialise, followed by many more solidifying forms. A school of scalloped hammerhead sharks populates the liquid half-light, their beautifully ugly, flattened heads jerking from side to side.

In a few thrilling seconds, their primitive curiosity is satisfied – I am inedible – and they turn as one to return to a gloom I cannot enter.

***Jeremy Stafford-Deitsch*** *is a photographer and the author of three books on sharks.*

### NOW YOU DO IT

» Schooling scalloped hammerhead sharks can be encountered on healthy offshore reefs throughout the Indo-Pacific including the Red Sea. Famous locations include Cocos Island, off Costa Rica, and the Galápagos Islands.

» A number of dive operators run trips to see hammerheads, including Diving World (www.diving-world.com) and Undersea Hunter (www.underseahunter.com/uh.htm).

**TOP TIP** **Wherever you go, expert local knowledge is vital, as are good diving skills.**

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# 3 Sealions
## Galápagos Islands, Ecuador

From the moment I hit the water, I know the tables are turned. I thought I was going to be the observer – but I quickly realise that all eyes are on me, and the curious young sealions are eager to engage in rambunctious play.

These underwater aerialists put on quite a show, transforming this undersea realm into a veritable circus. They are full of confidence, reassured by their strength in numbers and bursting with energy, still nourished by their mothers' milk.

The sealions dart, spin, turn, loop and leap, while blowing bubbles and chasing each other in tight circles. They egg each other on – some come closer and closer, heading straight for my mask, then veer away adroitly at the last moment, constantly watching my reactions.

Their greatest joy – and mine – comes when I try to imitate them by turning somersaults of my own. My clumsy antics drive them wild, and they circle me in ever-tighter loops. Their agility makes me feel like a floundering cow, and I nearly drown in my own laughter as I fail miserably to keep up.

*__Tui De Roy__ is a wildlife photographer and author who spent 40 years living in the Galápagos and still returns there frequently.*

### NOW YOU DO IT

» Tui runs workshops with Galapagos Travel: www.galapagostravel.com

» Alternatively, help conservation by joining a trip in support of the Galapagos Conservation Trust: www.savegalapagos.org/galapagos/tour-operators.shtml

**TOP TIP** **Engage the sealions' curiosity by copying their movements or swimming in short bursts then stopping. Trying to get too close will only put them off.**

You need to be young at heart – and have plenty of energy – to play with sealion pups.

Dinner is served – and you're in the middle of the smorgasbord (but not on the menu).

# 4 Orcas
## Norway

Tysfjord is Norway at its deepest, narrowest and moodiest. Winter daylight is in short supply, and the air is very, very cold. We head out to sea in a small boat, and I'm ready for action, dressed in a drysuit, mask and snorkel. I keep an eye out for the familiar dark dorsal fins of the world's apex marine predators – killer whales.

Once we've spotted a pod, we try to get ahead of it and then jump into the water so that the animals swim right past us. There's no guarantee that it will work, but I plunge into the frigid fjord anyway and wait.

Staring into its cold, dark depths, I am suddenly engulfed by a huge school of herring. A moment later, I feel a swishing movement and turn to see an adult female orca disappearing into the murk in hot pursuit. For the brief moment she's in my field of view, the killer whale appears much bigger than she did from the sanctuary of the boat.

Moments later the entire pod surrounds me, stunning fish with slaps of their powerful tails before picking off their prey, one by one. I am floating right in the middle of their meal.

*Zoologist __Mark Carwardine__ is never happier than when swimming with a top marine predator.*

### NOW YOU DO IT

» The number of local orcas has decreased in recent years because the herring have thinned out. Orca Tysfjord runs trips to swim with them between mid-October and January: http://tysfjord-turistsenter.no/safari/english/

**TOP TIP** **Don't try to chase after the orcas – just lie still on the surface and watch.**

2. Alexander Safonov; 3. Tui De Roy/rovingtortoise.co.nz; 4. Amos Nachoum/Corbis

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Green turtles in the Caribbean get up close and personal with Charlie's camera.

# 5 Humpback whales
## Tonga

In the crystal-clear waters of the South Pacific, off the coast of the Vava'u Archipelago in the Kingdom of Tonga, we watch a female humpback apparently dozing near the surface. Her young calf, just a few weeks old, is nearby, and the mother lazily opens one eye to take a better look at us.

Satisfied that we pose no threat to her or her precious offspring, she drifts back to sleep, allowing us so close that we can see the wrinkled skin around their eyes and even the tiny whale lice clustered in folds in their bodies.

At this point my husband, wildlife cameraman Doug Allan, and I have been filming the humpbacks for nearly 10 weeks for the BBC series *Planet Earth*. We have been swimming with this pair many times; perhaps that's why mum is so relaxed in our presence. Then again, every year hundreds of people swim with the whales here, so they probably know by now that they have nothing to fear.

I've been fortunate enough to have enjoyed some amazing encounters with marine mammals in my 25-year career, but nothing beats this. At one point, mum swims close and looks me in the eye – a heart-stopping moment that will stay with me forever.

***Sue Flood*** *is a wildlife photographer and film-maker who specialises in polar and marine environments and species.*

### NOW YOU DO IT

» Sue worked with Whale Watch Vava'u, Tonga's longest-established whale-watch operator: www.whalewatchvavau.com

» Other operators include WhaleSwim Adventures (www.whaleswim.com), Whaledive.net and Swimming With Gentle Giants (www.swimmingwithgentlegiants.com).

**TOP TIP** **When swimming with humpback whales, move very slowly and gently, and let them come to you.**

5. Sue Flood/naturepl.com; 6. Charlie Hamilton James; 7. Reinhard Dirscherl/ocean-photo.com

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## 6 Green turtles
### Barbados

Tumbling over the side of the boat into the warm waters of the Caribbean, I look around. Immediately some dark shapes below start moving my way. As they get closer, they resolve into a group of green turtles.

They come right up to inspect me, and I fall in love with them on the spot. They're so graceful in the water, a complete contrast to their lumbering movements on land. Local operators have been feeding them strips of fish for years, and the turtles no doubt think I've got my own secret stash. I spend half an hour in the water with them, during which I'm even graced with the company of a couple of hawksbills as well. I return here almost daily for three weeks.

Research by the Barbados Sea Turtle Project (BSTP) suggests that the turtles are passing through these waters and suffer no ill effects from human contact. So you can enjoy a magical encounter with a clear conscience.

***Charlie Hamilton James*** *is a wildlife photographer, cameraman and TV presenter.*

**NOW YOU DO IT**

» Find a list of operators at www.barbados.org/species/turtles-romance.htm
» Learn more about turtle conservation on the BSTP's site: www.barbadosseaturtles.org
**TOP TIP** Never attempt to chase, grab or feed the turtles – they are easily stressed.

It may have the nickname 'devilfish', but the manta ray is no danger to humans.

Lights, camera, action: Sue photographs her husband Doug filming a humpback with her calf.

## 7 Manta rays
### Maldives

As the cry of "Manta! Manta!" rings out over the vermilion blue waves of South Ari Atoll, I prepare to dive. Just 15m below the surface hundreds of cleaner wrasse surround a small coral block. Three manta rays soon join them at their cleaning station. They circle around, each time approaching within a few metres of me.

It's unnerving to see these massive creatures, their mouths wide open as they feed on the plankton-rich waters, coming towards you at speed. But I know that I have nothing to fear: they are truly gentle giants.

***Reinhard Dirscherl*** *is an experienced diver and specialises in marine and travel photography.*

**NOW YOU DO IT**

» To swim with manta rays in the Maldives, contact Sub Aqua: www.sub-aqua.de
» Mirihi Island Resort is located on South Ari Atoll: www.mirihi.com/welcome.html
**TOP TIP** Manta rays congregate at cleaning stations – so wait at one, too.

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Despite basking sharks' size – they can exceed 8m in length – they are sensitive and easily disturbed.

## 8 Basking sharks
UK

It's strange meeting a basking shark. Even though I know that its immense bulk is fuelled entirely by tiny crustaceans, I'm still nervously chewing the little rubber blocks off my snorkel.

But it's hard to stay cool as a vast, pale maw the size of an inglenook fireplace comes hurtling towards you, gills billowing like satin sheets in the wind, seemingly engulfing the entire ocean as it moves. This is my first encounter with this mighty fish and what makes it so much sweeter is that I'm bobbing around in the water off the Lizard Peninsula in Cornwall. It's amazing what you can find off our coasts.

*TV presenter **Nick Baker** loves swimming with sharks, from great whites to dogfish.*

### NOW YOU DO IT

» Manx Basking Shark Watch provides information about boat trips on its site: www.manxbaskingsharkwatch.com

**TOP TIP** **If you want to get close to basking sharks, position yourself ahead of them and hang in the water like a jellyfish.**

## 9 Stingrays
Cayman Islands

With a chunk of squid grasped in my right fist, I dive beneath the surface of North Sound and offer it to the creature on the sandbar at my feet. The stingray locates the prize and then there's a strange rasping sensation as it hoovers up the treat. I look around: stingrays with 1m wingspans litter the seafloor, moving towards me like a group of alien life forms from *Doctor Who*. I'm going to need a lot more squid.

BBC Wildlife *environment editor **James Fair** visited the Cayman Islands in 2006.*

### NOW YOU DO IT

» For information about operators, visit the website of the Cayman Islands Department of Tourism: www.caymanislands.co.uk

**TOP TIP** **Whenever you feed a stingray, make sure you keep your thumb tucked in to avoid it being sucked into the fish's mouth.**

Southern stingrays swim with a snorkeller at the Sandbar, Grand Cayman, known as a species hotspot.

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Go on – do a manatee a favour and scratch that itch.

8. Alex Mustard/naturepl.com;
9. Stephen Frink/Getty; 10. Alex Mustard/naturepl.com

# 10 Manatees
## Florida, USA

Mist hangs over the dark waters and I am pleased to see the first rays of sunlight stretching across Three Sisters Spring. It's dawn, and I'm right on time. In Florida, the early snorkeller catches the manatee.

During winter, these animals seek out the warm waters here to keep them toasty while they sleep. On particularly cold nights, the springs fill up like dormitories and if you arrive early you can expect quite a reception. There is no need to keep your distance – the manatees actively seek you out. Life for them is an itchy business, and there is nothing they like more than a good ol' scratch. And they know just where to get one.

A manatee will swim right up to you, turn on its side or back and rub its flippers on its belly, leaving little doubt as to what it wants you to do. And if you perform a satisfactory service, one individual may bond with you all morning, returning to you again and again.

***Alexander Mustard*** *is a marine biologist who has worked as a professional underwater photographer since 2004.*

### NOW YOU DO IT

- Go with a professional operator and be sure to heed all of their instructions so that you don't stress the manatees.
- Alex travelled with Bird's Underwater: www.birdsunderwater.com
- Other operators include Save the Manatee Club (www.savethemanatee.org), Swim with the Manatees (www.swimwithmanatees.com) and River Ventures (www.riverventures.com).

**TOP TIP** **The less you move in the water, the more manatees will be attracted to you.**

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## HOW WE PICKED THE WINNER

*BBC Wildlife*'s fourth annual nature-writing competition attracted 140 entries and choosing a winner wasn't easy. The judges spent hours discussing the shortlist, which (much to our delight) featured a wide variety of subjects and styles. In the end, the judges had to resort to a form of the Alternative Vote system to separate the final four entries. Chris Dunn's piece about an adopted turkey vulture won because it's an extraordinary story simply and elegantly told, with a great sense of place.

## CHRIS DUNN

Chris spent three years in the Falklands Islands as a 'schoolie' – a travelling teacher. His round included wildlife hotspots such as West Point and Carcass Island. A keen wildlife artist, he currently teaches art and design at a secondary school in Kent.

# THE LIFE OF EGG

A turkey vulture as a pet? Chris Dunn recounts the amazing story of Egg, who stole the hearts – and tea-break cakes – of even the sternest islanders in the Falklands.

**CUTTING PEAT IS** hard work, but it grows on you. It involves standing in an undrained ditch, carving neat, spade-sized clumps from one of the channel's walls, and placing each sod in a stack behind you. You get paid by the cubic yard.

Peat covers much of the Falkland Islands, and is still used as a fuel on some farms. Another thing that hasn't changed much over the years is the shepherds' dislike of turkey vultures. And they have good cause. A sheep lies down to rest or ruminate, but if it stays down for too long it can't get up – and that is good news for vultures. A flock of these birds can reduce it to a pile of bones and rags of fleece in just a few days.

One day while out walking I came across a looted vulture nest. The egg thief (I know not what) had left one egg behind. I put it in my pocket, under my warm jumper, and ambled off. I made my sweaty way up the mountain and down into the ravine where some rare trees grew (trees are an exotic sight on this wind-blasted island).

Back at the settlement, I emptied my pockets and, as I lifted the egg, I felt it move. I put it in one of my slippers in the plate warmer of the Rayburn and, by the time my supper was ready, I could hear the only survivor of the turkey vulture's brood cheeping. But saving it – hatching it even – was only the start of the problem.

Who would want to bring up arguably the ugliest bird in these islands, and certainly the one with the worst press? In fact, it turned out to be easier than I expected: one of the children I taught took it home.

I don't think she told her parents that it was a turkey vulture, judging by the reception I received when I visited her a few weeks later.

> **"Egg never showed any interest in escaping. He was, in his own imprinted mind, a very small, unusually shaped child."**

It had fledged by then and there was no doubt as to what it was. But who would take away a child's much-loved pet?

Later that year, I returned to the island to teach and 'Egg', as he had become known, came to school, too. He was quite big by then and sat at the back, preening or sleeping. At break time he went outside, following the children by skipping from fence post to fence post. He never showed any interest in escaping. He was, in his own imprinted mind, a very small, unusually shaped child.

Once a week, when a sheep was killed, Egg became a vulture again and fence-hopped his way to the butchery. Other scavengers waited on the ridge of the roof, but Egg would amble in through the open door and wait for the shepherds to throw him pieces of offal. He would catch the meat in mid-air then wander off and dismember it with his viciously hooked beak.

At the end of the day Egg travelled home on a shepherd's shoulder, or – if that was denied him – he would hitch a lift on the tractor. The end to a perfect day was to sleep, head under wing, in the rafters of the peat shed. Egg had it made.

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Illustration by Tim Marrs

Peat-cutting season was his favourite time of year. He would come out to the peat bogs, walking, fluttering, flapping and fence-hopping to keep up. During our 'smoko', or tea break, he would visit each digger in turn in the hope of a share of the snacks.

But one thing that Egg never learned to do was fly. He had no motivation. All of the creatures in his world moved at his speed – either that or they carried him (which was even better). To have wings that could soar for miles on a thermal or climb till the farm was a speck far below was of no use to him at all. And that resulted in his demise.

One day as we all trudged from the house to the bog a wind blew up. At first, Egg just hunkered down and let it blow over him. But the wind steadily grew in strength until it was a full gale.

We never knew that he was in trouble until we spotted him tumbling down the hill. Over and over, an inflated bin-liner of a bird, until a gust took him out over the headland. The children ran to rescue him, but by the time they reached the beach there was no sign.

Later that day I picked up a turkey vulture feather. I have no idea if it was Egg's; probably not. But from that day on, he was always remembered fondly when we cut peat, much to the bemusement of strangers.

## ROLL OF HONOUR

WINNER

*The Life of Egg*, Chris Dunn, Kent

Suzi Eszterhas/naturepl.com

Chris wins a place on an Earthwatch conservation expedition. He will take part in one of three exciting adventures: South Africa's Scavenger Species (black-backed jackal, *above*); Amazon Riverboat Exploration; or Mammals of Nova Scotia.

» Earthwatch is a charity supporting scientific research and conservation around the world. Find out more at www.earthwatch.org/europe

RUNNERS-UP

*Afterlife*, Philip Blandford, Dorset
*Kingston Plantation*, Jennifer Hunt, Dorset
*Ashes*, Paul McGranaghan, County Tyrone

Our three runners-up each win three books published by Collins: *The Peregrine* by JA Baker; *Birds Britannia* by Stephen Moss; and a *New Naturalist* paperback of their choice.

THE JUDGES

*Tim Dee*, author and BBC radio producer
*Paul Evans*, nature writer and broadcaster
*Ben Hoare*, features editor, *BBC Wildlife*
*Kate Humble*, BBC television presenter
*Jane Nijssen*, press officer, Earthwatch

**ON OUR WEBSITE**

The winner and all three runners-up are available to read online. Which of them is *your* favourite? You can find the four stories at www.discoverwildlife.com/competitions

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# See Everything Through a Mega Zoom

**The new Tamron 18-270mm f3.5-6.3 Di II VC PZD is a do-it-all mega zoom lens ready to shoot subjects and scenes both big and distant**

Words and photos: Peter Travers

With the new versatile Tamron 18-270mm f3.5-6.3 Di II VC PZD mega zoom lens you can capture the whole wild world: from big wide-angle scenes to zooming in with the telephoto end to fill the frame with your faraway nature subjects. It's the ideal travel companion to take when you want to be able to shoot everything with just one lens.

Shot using Canon EOS 60D + Tamron 18-270mm f3.5-6.3 Di II VC PZD; 1/640 sec at f6.3; ISO200

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RSPB Birdfair

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With its 18-270mm focal length range from wide-angle to super telephoto, the Tamron 18-270mm f3.5-6.3 Di II VC PZD is the world's most compact zoom lens with an impressive zoom ratio of 15X – that's equivalent to an effective focal length range of 28-430mm on a crop-factor sensor D-SLR. At the 18mm wide-angle end of the lens you'll be able to capture big photos to show your wildlife subjects in the context of its surroundings. The mid-range 35-70mm covers day-to-day general photography and compositions, then the 70-270mm telephoto end zooms you in close to wary wildlife to show off your nature subjects in glorious fine detail.

## HI-TECH HELP

The Tamron 18-270mm f3.5-6.3 Di II VC PZD houses lots of clever technology, all designed to make your life easier and your wildlife photography better. This Di II lens is specifically designed for enthusiast-level D-SLRs with crop-factor sensors like the Canon EOS 60D or Nikon D5100. The new Piezo Drive (PZD) uses ultrasonic motors for faster, more precise and quieter autofocus, helping you to get that elusive wildlife shot without your zoom lens being too slow to focus or whirring noisily and scaring off your subjects.

A common problem photographers encounter when using telephoto zoom lenses is blurred results due to camera-shake issues when shooting handheld at the long end of lenses.

Thanks to Tamron's Vibration Compensation (VC) technology, the Tamron 18-270mm f3.5-6.3 Di II VC PZD enables you to shoot using shutter speeds slower than normal and still end up with pin-sharp results.

If's the perfect tool for those who don't want to carry a bagful of lenses or come up short with your restrictive kit zoom lens. With the Tamron 18-270mm f3.5-6.3 Di II VC PZD lens you have a do-it-all lens in a compact, lightweight and affordable package. It measures just 74.4 x 88mm in diameter and length when zoomed in, weighs just 450 grams, and retails for under £500.

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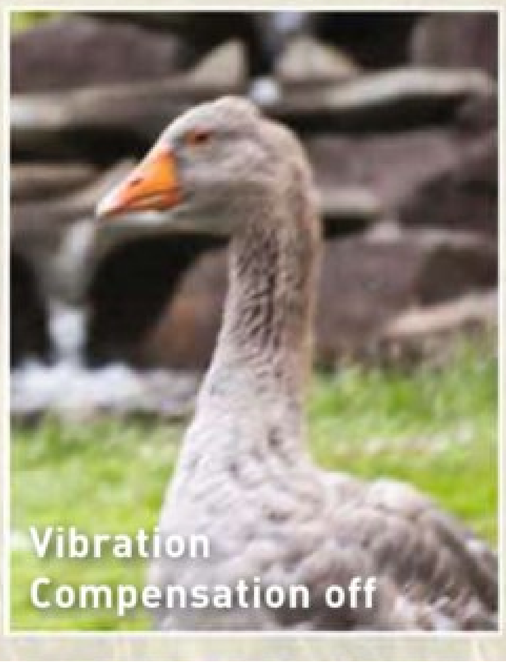
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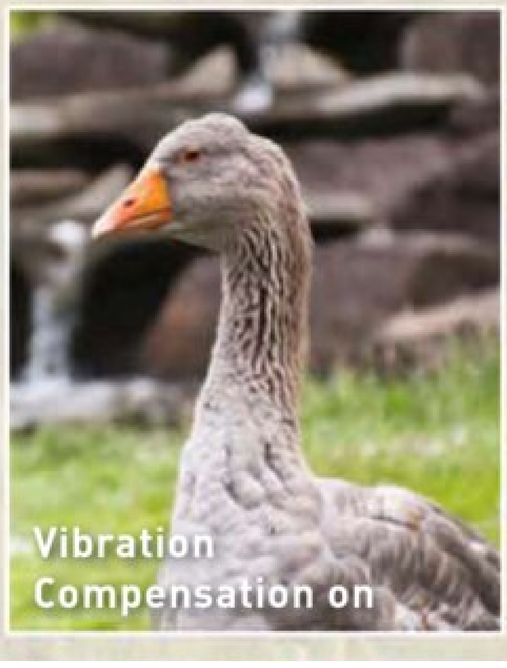
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1 All entries must be made by the closing date of 15th September 2011.
2 The winner must be able to meet basic health and fitness requirements and Chameleon Worldwide reserves the right to refuse to allow the winner to participate in the trip if these requirements are not met.
3 The competition is open to all people aged 18 and over, other than employees of the BBC Worldwide Group, Origin Publishing, Chameleon Worldwide, Air Namibia or Namibian Tourist Board.
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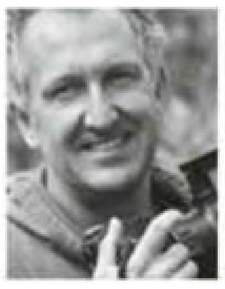
# Photo Masterclass



**Hitting the shutter at the right instant can turn a good wildlife image into a great one. Being able to identify and capture unique moments – whether mid-scratch, mid-sneeze, mid-leap or mid-landing – will take your photography to the next level.**

With wildlife photographer **MARK CARWARDINE**

Mark Carwardine

▲ **KEEP IT CLEAN** The decisive moment may be quite subtle. In this photograph of sandhill cranes, taken in New Mexico, it was the point at which there was no overlap between any of the birds, creating a clean composition.

PART SIX

## Wait for the moment

**IMAGINE TWO PHOTOGRAPHERS** standing side by side, their cameras pointing at an African elephant (or a grey squirrel, for that matter). They're using identical equipment, their settings are the same and they release their shutters almost simultaneously. But the results are dramatically different. Why? Because only one of them captured the 'decisive moment'.

The decisive moment is that split-second when something is amplified or encapsulated in a single image. It conveys a feeling or captures climactic behaviour. The concept applies to all genres of photography – during the recent royal wedding, for instance, it was the balcony kiss.

Henri Cartier-Bresson, renowned French photographer and father of modern photojournalism, was a big fan of 'the moment', as he called it. He believed that everything has one, and that it's fundamental to great picture-taking. "Photography is not like painting," he said. "There is a creative fraction of a second when you are taking a picture."

So this month we'll be making the most of the photographer's ability to freeze time. And we'll be mindful of Cartier-Bresson's warning: if you miss the moment, "it is gone forever".

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# 1 ANTICIPATE THE ACTION

**JASPER DOEST** ARCTIC FOX CUB LEAPING

**Jasper specialises in wildlife and conservation photography and lives in the Netherlands.**

www.jasperdoest.com

You usually know when you have caught the decisive moment, as Jasper did when he took this fabulous picture of Arctic foxes in Svalbard. Not only is the cub in mid-air, but its paw has just hit its mother's face. If Jasper had released the shutter a split-second earlier – or later – he would have missed it.

"Sometimes you have to read subtle signals," says Jasper, "such as a slight change in expression, a tightening of muscles or a sense of alertness, to get an inkling that action might be imminent. But often it's more a matter of getting to know your subjects by spending time with them. You can never really predict a great wildlife moment, but understanding your species intimately increases your chances."

Anticipating an animal's next move is just a part – albeit a crucial one – of great picture-taking. As Jasper demonstrates, the trick is to do it with terrific composition and wonderful light. A lot of things have to fall into place.

**TECHNICAL SPECS**

Nikon D3 + Nikkor AF-S 500mm f4 lens; 1/1000 sec at f8; ISO 1250

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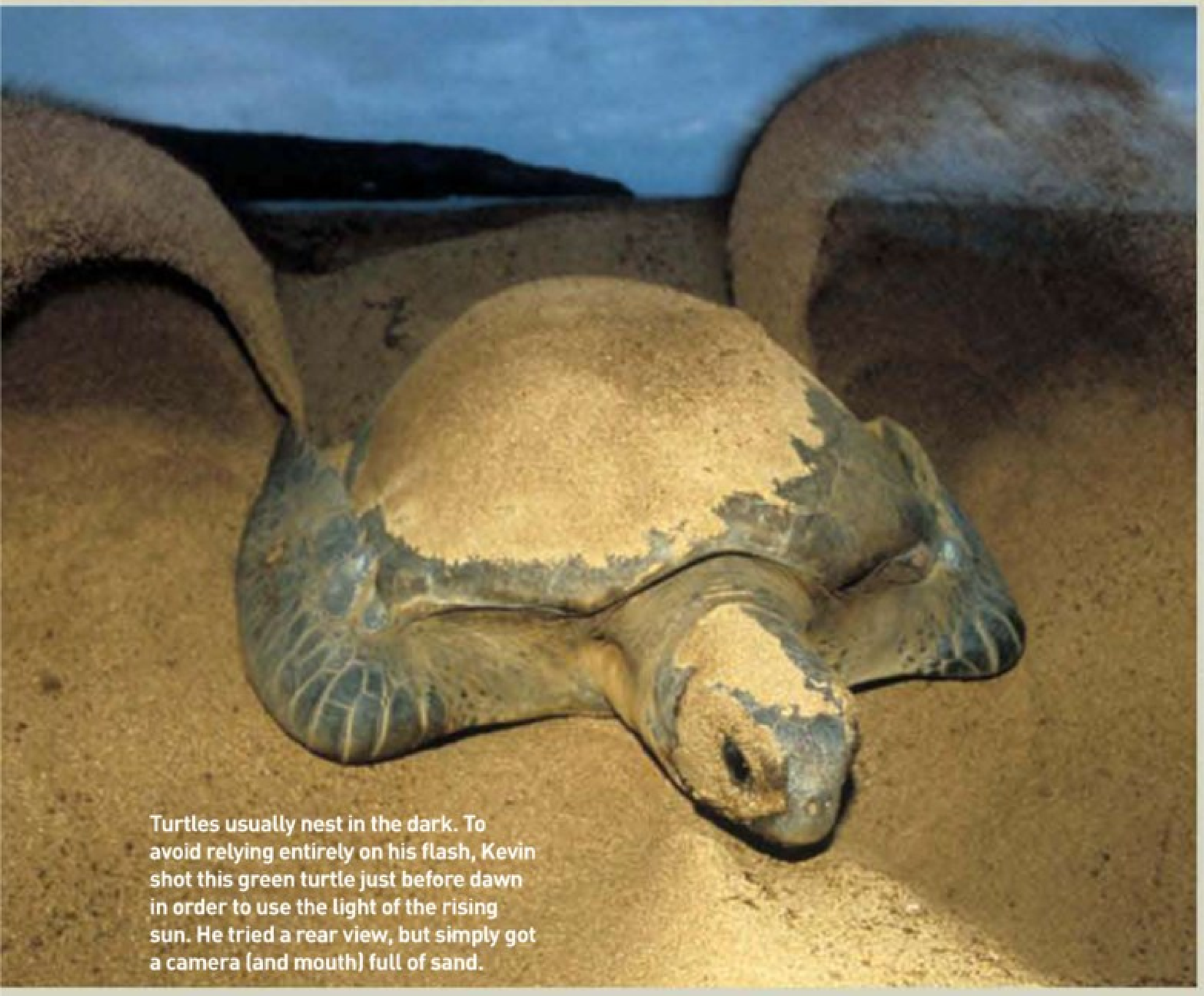

Turtles usually nest in the dark. To avoid relying entirely on his flash, Kevin shot this green turtle just before dawn in order to use the light of the rising sun. He tried a rear view, but simply got a camera (and mouth) full of sand.

# 2 BE A PHOTO 'GUNSLINGER'

**KEVIN SCHAFER** GREEN TURTLE DIGGING

**Kevin is an American photographer who specialises in taking images of endangered wildlife.**

www.kevinschafer.com

It is no accident that great photographers take a lot of images. They develop swift reactions and a kind of intuition that soon becomes almost subconscious. If they were gunslingers, then they would be among the quickest on the draw.

You can teach yourself to be a photographic gunslinger. The trick is to see the moment approaching, by careful observation, then try to predict exactly when to trip the shutter.

This is what Kevin did on Ascension Island in the South Atlantic. "I was watching this green turtle excavating a nest on its breeding beach, and I noticed the wonderful shapes formed by the displaced sand," he says. "It was just a matter of timing and taking lots of pictures to capture two parallel arcs."

It's a perfect decisive moment: a split-second in a sequence of events that sums it all up.

**TECHNICAL SPECS**

Nikon F100 + 17–35mm lens; Fuji Velvia film; flash

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An Arctic fox cub jumps up and pats its mother's nose. The female barely has time to blink, her unmoving pose perfectly complementing the sprightly youngster.

## 3 BE DECISIVE

**BEN HALL** LONG-TAILED TIT LANDING

**Ben's photography focuses almost exclusively on the wildlife and landscapes of the British Isles.**

www.benhallphotography.com

Everything is just right – you've found a suitable spot, your subjects are nearby, the light is gorgeous and you're in position, waiting patiently. Only one thing can ruin your pictures now – indecisiveness.

"You may have to sit in a hide for hours or even days waiting for the perfect moment," says Ben, who took this delightful image of long-tailed tits. "There aren't many perfect moments, so you can't afford to miss them. You have to be ready to start shooting as quickly as possible, and there is no time to hesitate or the opportunity will have gone."

This is one of the great advantages of digital photography – you can take the risk and start firing. If it wasn't the decisive moment after all, there's nothing lost; if it was, you've captured it for all to see.

**TECHNICAL SPECS**

Canon EOS-1D Mark II + 100–400mm lens; 1/320 sec at f5.6; ISO 100

Never waver if conditions are right – don't fall prey to indecision.

Defining moments can be found even while shooting commonly photographed wildlife. Spend enough time watching and you will see artistry in the ordinary.

## 4 PERFECT YOUR TIMING

**MALCOLM SCHUYL** MUTE SWANS COURTING

**Malcolm is based in Oxfordshire but photographs wildlife both above and below the water all over the world.**

www.wildvisions.co.uk

Capturing the decisive moment makes viewers want to linger and take a closer look. It lifts your images to another level. But it's easier said than done – especially with subjects that have been widely covered.

Malcolm has been photographing mute swans for a new book. "The birds are so accessible that it's not hard to get decent shots," he says. "The challenge is to take something exceptional, and that is often down to timing."

Watching this pair's courtship dance, Malcolm realised that there was a brief moment when their heads came together in a heart shape. "That was the split-second I wanted," he says. "The trick was to shoot first and ask questions later. As soon as the display moved towards the 'heart', I started firing. This was the only image in the sequence that captured exactly what I had in my mind's eye."

**TECHNICAL SPECS**

Nikon D2X + 200–400mm VR lens; 1/1250 sec at f8; ISO 200

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# BREAKING THE RULES

**Once you know the rules, bending them can result in an even better picture.**

If the action is not forthcoming, look for other ways to create a unique image. Unexpected weather conditions, for instance, can portray a species in a completely new way.

## 5 IF THE MOMENT NEVER COMES

**ANDY ROUSE** RED SQUIRREL IN SLEET

**Andy is an award-winning writer, wildlife photographer and presenter who lives in Cardiff.**

www.andyrouse.co.uk

The concept of the decisive moment is absolutely sound. Waiting for your subject to do something – cock its head, scratch, stretch, call, jump – often makes for a more dynamic image.

But that's not always the case, as Andy's evocative picture of a red squirrel beautifully demonstrates. This is a classic example of bad weather making good photography. Andy has transformed a simple portrait of a squirrel in hard sleet into an absolute corker, even without an archetypal decisive moment.

No matter how long you hang around, some animals seem intent on doing absolutely nothing. "The temptation may be to try and coax an animal into doing something, such as flushing a bird to make it fly," says Andy. "But this is a bad idea for several reasons. First, you don't always need a perfect moment to get a great shot; second, you might miss other interesting behaviour (such as preening or yawning) before the bird takes flight of its own accord; and thirdly – and most importantly – it's unfair to disturb it at all."

**TECHNICAL SPECS**

Canon EOS-1Ds Mark II + 300mm lens + 1.4x teleconverter; 1/50 sec at f2.8; ISO 250

## TRICKS OF THE TRADE

**Our pro photographers share their top tips to help you ensure that your compositions shine.**

▶ **REMEMBER TO RELEASE** Don't just hold the shutter button down and hope for the best – if you fill the camera's internal memory buffer it will lock at the crucial moment. It's usually better to shoot in short bursts.

▶ **NO PRODDING** Never prompt an animal to perform for you. Be patient and wait for the moment to occur naturally.

Mark Carwardine

**Firing as soon as this baby ring-tailed lemur started to yawn captured this decisive moment.**

▶ **BE VIGILANT** The best shots often present themselves when you least expect it. Make sure that your camera is switched on all the time and that you are ready to swing into action as soon as an opportunity presents itself.

▶ **CHECK YOUR SETTINGS** Keep your camera on a high shutter speed (say, 1/1000 second) to freeze the moment when it does eventually happen.

## TECH ZONE SWITCH TO MANUAL: READ, LEARN, PRACTISE

A well-heeled friend recently commented: "My decisive moment was shelling out £5,000 on a new camera." That's great – but only if he learns how it works. It's all very well having a blisteringly fast autofocus system, for example, but it's as good as useless if you don't understand how it operates or the best way to use it. You can't afford to waste time fumbling with mysterious camera settings at the crucial moment. Read the instructions at home, not in the field, and practise until your camera feels like a natural extension of your hands.

Don't waste decisive moments figuring out how to work your camera.

Mark Carwardine

## NOW YOU DO IT

Craig Jones

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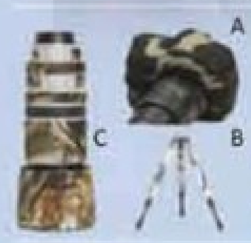

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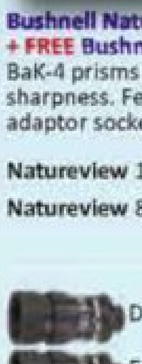

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# Your Q&A...

**Send us your wildlife questions – our experts have all the answers.**

## OUR EXPERTS

**STEVE HARRIS**
Professor of biological sciences at Bristol University, Steve is one of the UK's leading mammal experts.

**RICHARD GIBSON**
Richard is Chester Zoo's curator of lower vertebrates and invertebrates. He has 20 years' experience in zoos and field conservation.

**JAMES GIBBONS**
James is an ecology lecturer at Bangor University. He is also an expert on climate change and forest biodiversity.

**MIKE TOMS**
Mike is head of garden ecology at the BTO and has written and co-written several books, including *BTO Garden Birds and Wildlife*.

**STUART BLACKMAN**
Stuart started out as a zoologist, with a PhD in evolutionary biology. He is now a science writer and editor.

**RICHARD JONES**
Richard is a former president of the British Entomological Society and now works as a surveyor and writer.

## WE'D LOVE TO HEAR FROM YOU

**SEND YOUR QUESTIONS TO**
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**OR EMAIL**
wildquestions
@bbcmagazines.com

We are very sorry, but due to the high volume of questions we receive, we are not able to acknowledge or answer any personally.

## Green sheen

**Why don't grassland or forest-dwelling mammals have green skin or fur for camouflage?**
**Wendy Baxter** Via email

While there is no truly green mammal, some primates, such as the olive colobus, have a greenish tinge, and three-toed sloths have green algae in their fur.

Most terrestrial vertebrates can only produce two pigments – black and yellow-red. Virtually all of the greens in birds are generated by microscopic ridges on their feathers that refract light, and the occasional greens and blues in mammals (such as the human iris) are also produced by refraction.

Many amphibians and reptiles use refracted greens for their camouflage. However, these species tend to be immobile, waiting for prey to come to them. Since most mammals are very active, green camouflage may be of little benefit. Besides, most of their predators are other mammals that do not see colour.

Birds *do* see colour. However, raptors mainly hunt small mammals that live in the base of dense vegetation, which is mostly brown, and owls hunt in dim light, using their hearing. Birds with green colours tend to use speed and manoeuvrability to escape predators, and ground-nesting birds are chiefly brown, like mammals. Perhaps there has been no selection pressure for mammals to evolve refractive structures to produce green tints.

**Steve Harris** Mammalogist

Sloth: Norbert Wu/Minden/FLPA; mouse: Makoto Iwafuji/Eurelios/Science Photo Library

The three-toed sloth is slow-moving, so must rely on green camouflage to evade predators in its forest canopy habitat.

### DID YOU KNOW?

Somewhat bizarrely, scientists have created green mice by inserting a fluorescent jellyfish protein into the mouse genome. The animals shine bright green under blue light (*above*).

## Queuing up

**Last year I saw a grass snake lying motionless beside a mating pair. What was it doing?**
**Mick Tyler** Via email

Grass snakes *Natrix natrix* mate in spring, after emerging from hibernation. Since they often hibernate communally, they regularly find themselves lacking privacy. Indeed, an adult female, fresh from her winter retreat and resplendent in a shiny new skin, is likely to be pursued by a dozen or more potential suitors. The slender males tangle themselves around the much larger female in a 'mating ball'. They neither bite nor scuffle, but engage in a more subtle form of combat that is known as tail-wrestling.

What you witnessed was probably a toned-down version of this. A lone male lucky enough to encounter an unattended and receptive female wasted no time in courting and then mating with her. The second male arrived too late for any tail-wrestling, but may have hung around in case the female became ready to mate again. Many snake species mate more than once, and the sperm compete to fertilise the eggs on reaching the reproductive tract.

**Richard Gibson** Herpetologist

Grass snake mating – a

Richard Gibson (captive)

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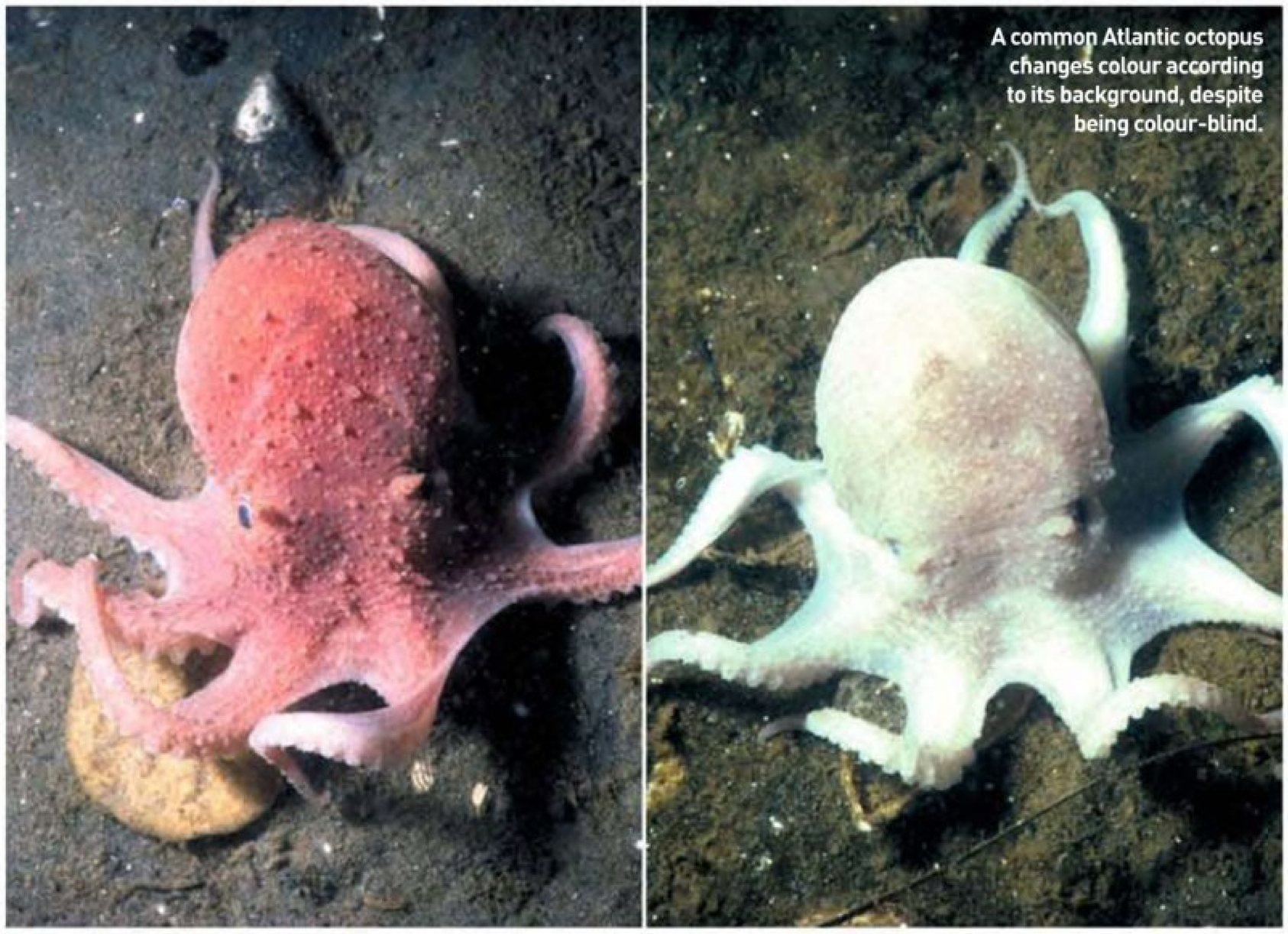
# Octopus optics



A common Atlantic octopus changes colour according to its background, despite being colour-blind.

Both photos: Jeff Rotman/naturepl.com

**If octopuses do not have colour vision (Your Q&A, February), how and why do they change colour for camouflage and to express their mood?**
**Laine Eastabrook** Cornwall

You're not the only person confused by this – it's got a few scientists baffled, too. Of all the cephalopods (octopus, squid, cuttlefish and nautilus) studied so far, just one – a squid – has colour vision, and it can distinguish only blue light.

Part of the answer is that an animal doesn't need to be able to see the colours it produces if its display is aimed at other species – predators or prey – that aren't colour-blind. A colour-blind person still blushes red with embarrassment, after all.

Displays intended for their own species are trickier to explain, though associated changes in intensity, contrast and pattern might be more important than the specific colours involved, just as a colour-blind person knows when someone is blushing.

But the ability of a colour-blind animal to match its colour to its surroundings – and there is good evidence that some species can – is truly baffling. Last year, scientists at Woods Hole Marine Biological Laboratory in Massachusetts reported that they'd found a light-sensitive pigment in the skin of a cuttlefish, raising the tantalising possibility that background colours are detected by something other than the eyes. Until they know more, all we can do is enjoy the spectacle.

**Stuart Blackman** Science writer

**DID YOU KNOW?**
The almost instantaneous colour changes seen in cephalopods are controlled by the electrical circuitry of the nervous system. In contrast, a chameleon's colour is regulated by hormones, which take effect more slowly.

Making the most of its intimidating wingspan, a crow wastes no time in seeing off a fox.

Laurent Geslin

# An attack from the air

**I recently saw a crow diving on a fox. The bird attacked several times. What was going on?**
**Ali Roberts** Via email

Most birds will respond to the presence of a potential predator. Initially, the reaction might just be an alarm call, which both alerts others to the threat and lets the hunter know that it has been spotted.

Depending upon the species involved and the level of perceived risk, a bird may then mob the predator, diving at it and perhaps striking out with its feet or beak in an attempt to drive it away.

Many members of the crow family are well known for mobbing large predators, both avian (including buzzards and owls) and mammalian. Though crows are territorial during the breeding season and defend their patches against neighbouring pairs, they will still work together to see off very dangerous hunters. These group efforts are particularly effective.

You might wonder why a bird such as a crow, which can fly and nests well above the ground, would be bothered by a fox. Well, crows spend a fair bit of time feeding on the ground, and as such are at constant risk of a surprise attack. Newly fledged crows are especially vulnerable, since they are rather poor fliers and often end up grounded. There's no point in taking risks – it's better to drive away any predators. Besides, mobbing rarely escalates into full-blown combat.

**Mike Toms** BTO

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# STRANGE BUT TRUE...

## Flying squid

**IS IT A BIRD?** Is it a plane? No, it's a squid. That's right, a squid. A host of squid species regularly take to the air. And, though only a dozen or so studies have documented the invertebrates in action, they appear to share the same basic technique.

When underwater, a squid mostly uses a form of jet propulsion to get around, sucking water into its body and forcing it out of an organ called a siphon, which can be rotated to change the direction of travel. The method packs surprising power – some species can cruise at more than 40kph.

This speed is what enables the animals to get airborne. If an individual swimming near the surface is spooked by a predator (or a boat), it assumes a torpedo shape and launches itself out of the water. At the same time, it splays its eight tentacles into a flat, fan-like pattern in front of its face and may exude mucus to fill in the spaces, resulting in a unified, kite-like surface. It also flares a pair of fins near its rear end and – *voilà* – the squid is a living, breathing jet. Literally.

The airborne cephalopod blasts water out of its siphon when it feels the need for speed. One individual was captured on film accelerating from 6.5 to 26kph in this way. Biologists have concluded that if the animal had angled its siphon or 'wings' the right way, it would have climbed higher, achieving powered flight. However, until this potential is proved, suffice it to say that the squid is the only creature that may be capable of jet-propelled flight.

David Butvill

A squid uses its water-blasting system to launch itself into the air.

Anthony Pierce/Alamy

### AIRBOATS

- Squid are the fastest-moving ocean invertebrates, thanks to their ability to produce strong water jets.
- Some species also use the skill to shoot water at predators or prey.
- Squid have been observed flying at up to 36kph, 6m above the water, over a distance of 55m.
- Many flying squid rapidly undulate their fins when airborne – perhaps the squid equivalent of flapping.
- Flying squid (and fish) frequently end up on boat decks.
- Neon flying squid *Ommastrephes bartrami* often travel in schools and fly in flocks of up to 100 individuals.

## QUICKFIRE

**I saw swallows and martins flying east along the Dorset cliffs. Were they looking for the shortest Channel crossing?**
Angela James, Bristol

Many migratory birds will choose the shortest sea crossing. While you might expect aerial-feeding species such as those you saw to be less constrained by distance, they, too, seem to prefer such routes. Swallows leaving Britain and Ireland initially take a south to south-easterly heading, only switching to south-westerly when they reach France. This then takes them through western France and eastern Spain, to cross the Mediterranean at its western end. Long sea crossings can be perilous – birds caught in a storm cannot land to sit it out.
Mike Toms BTO

Two close for comfort: an intriguing 'Siamese apple'.

Adrian Smith

**What caused these two apples to originate from one stalk, then split into two to produce this odd 'Siamese apple'?**
Adrian Smith, Pinner

Your photograph is a fine example of the rare 'double apple', where two apples share the same stem. The phenomenon arises at the flowering stage, when two blooms that share the same stalk are both pollinated, and both set fruit. The receptacle at the base of an apple blossom is the part that later develops into the fruit. The extent of fusion varies – the greater the amount the receptacles are combined, the greater the degree of fusion.
James Gibbons Ecologist

## Hitch a lift

**I photographed this harvester ant in France carrying another on a seed. What was going on?**
**Anna Nielsson** Via email

Harvester ants specialise in collecting plant seeds for food, rather than seeking arthropod prey or honeydew (aphid excrement). They store them in underground granaries to prepare for hard times.

The southern European species *Messor barbarus* and *M. structor* impressed the ancient Greeks and Romans with their diligence, giving rise to tales such as Aesop's fable of *The Ant and the Grasshopper* (retold by Pixar in *A Bug's Life*).

The ants bite off the radical (root embryo) to prevent the seeds from germinating, and any that manage to sprout are cleared out, which aids seed dispersal in many arid-zone plants.

Harvester ants have powerful jaws and can carry seeds much larger than themselves. Sometimes, foraging columns clear heavy seedfalls from individual plants, with two or more ants working together. It's possible that your photograph has captured an assistant that has inadvertently become a hitchhiker.

An interesting parallel exists among neotropical leafcutter ants. Here, small ants 'ride shotgun' on the cut leaf fragments. They do this to fend off parasitic flies that try to fly down and lay eggs in the muscle-packed heads of the large, leaf-carrying ants.

Richard Jones Entomologist

A harvester ant lets his partner do the heavy lifting.

Anna Nielsson

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This female humpback whale and her calf were photographed off the Hawaiian Islands. A stream of bubbles shows where she slapped her pectoral fin on the surface.

Flip Nicklin

## ON NATURE: UNEXPECTED RAMBLINGS ON THE BRITISH COUNTRYSIDE

**Edited by Jeff Barrett, Robin Turner and Andrew Walsh**

Collins, 320pp, £19.99

ISBN 9780007424986 (hb)

**An entertaining and diverse collection of rural musings from 26 authors.**



This unusual anthology does exactly what it says on the tin. Only a couple of the writers, such as *BBC Wildlife* contributor Paul Evans and angling writer Charles Rangeley-Wilson, might be considered 'expected'; the rest are decidedly unexpected, from radio presenter Stuart Maconie's unmasking as a Wainwright walking guides evangelist to Everything But The Girl's Tracey Thorn's witty tales of allotments and divas (of the cucumber variety).

There are also diverting rambles. Bill Drummond of The KLF, famed for pop-art stunts, reveals his damson obsession, while novelist Dexter Petley writes with real fire about rural secondary schools teaching nature and nurture to their written-off pupils, of which he was one.

The editors admit that their intention to produce a 'how to' guide to the British Isles was subverted by their eccentric contributors. As a result, the book has two distinct personalities. Some authors stick to the brief and write informative chapters on how to watch wildlife or enjoy seasonal beers, while others produce whimsical and striking pieces of writing. Only one or two manage both.

The collection aims to offer 'jumping-in' points for urban naturalists. The instruction may be a little basic, but if you struggle to tell a swallow from a swift then there is plenty of diversion in this varied and surprising book.

Verdict ★★★☆☆

**Patrick Barkham** Naturalist and writer

**BBC WILDLIFE SHOP**

**Reader price £15.99. Subscriber price £14.99.** Code W0911/02

## THE OCEAN AT HOME

**By Bernd Brunner**

Reaktion Books, 160pp, £17.95

ISBN 9781861898166 (pb)

**A captivating history of the aquarium in a revised and updated second edition.**

Flotillas of pulsating jellyfish, bizarre nautiluses, mudskippers on 'mangroves'... our public aquaria offer windows onto an eye-popping array of underwater life. The management of these attractions is undergoing a sea change: not long ago, they still consisted of depressingly predictable rows of tanks housing unsustainably sourced reef fish.

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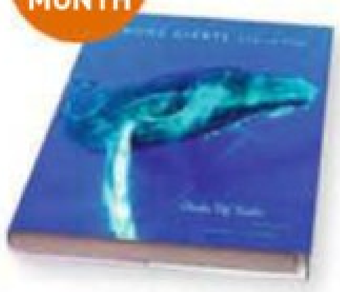
**STAR RATINGS**

★★★★★ Excellent – a classic
★★★★ Very good – outstanding in places
★★★ Good – definitely worth a look
★★ Fair – may be of interest
★ Poor – not worth the time

BOOK OF THE MONTH



## AMONG GIANTS

**By Charles 'Flip' Nicklin and KM Kostyal**

**In the early 1960s, Nicklin's diver father was photographed freeing a Bryde's whale from an anchor line. The picture became a sensation, and inspired young Flip to film the adventures of the whale researchers alongside whom he grew up. Now one of the world's leading cetacean photographers, he has produced a captivating book documenting over 30 years of marine escapades.**

**BBC WILDLIFE SHOP**

**RRP £25.99. Reader price £22.99. Subscriber price £21.99.** Code W0911/01

Brunner traces our fascination with domesticating the deep, from the goldfish barrels of ancient China to today's giant oceanaria owned by multinationals. During the 1850s, 'aquatic vivaria' became a craze, and this well-illustrated book is full of wonderful engravings of ingenious Victorian tanks.

The text (translated from German) is often clunky, and its survey of the ecological impact of sourcing aquatic life from the wild is inadequate. Nevertheless, it is still an absorbing read.

Verdict ★★★☆☆

**Ben Hoare** Features editor

**BBC WILDLIFE SHOP**

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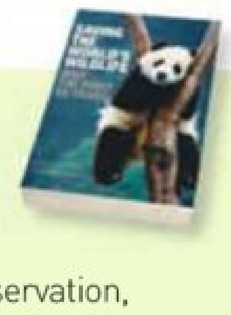
# Happy 50th, WWF



## SAVING THE WORLD'S WILDLIFE

**By Alexis Schwarzenbach**

Profile Books, 350pp, £24.99

ISBN 9781846685309 (pb)

The remarkable story of the first 50 years of WWF.

During the decade following its launch in 1961, the World Wildlife Fund (or WWF, as it is now known) raised more than $5.6 million and supported 356 conservation projects. Just two decades later, it was protecting 1 per cent of the planet.

Celebrating WWF's golden anniversary, *Saving the World's Wildlife* charts the rise of one of the planet's most influential environmental organisations. What is striking is that, despite all of the fundraising and the huge increase in public awareness of conservation, many issues remain the same. One of WWF's key campaigns was Project Tiger, a global bid to save the species, but there are now fewer tigers in the wild than in captivity. Meanwhile, African megafauna is still in peril and intensive agriculture continues to threaten many ecosystems.

This is a beautifully illustrated and meticulously researched account. But, perhaps because the author is a historian not a conservationist, WWF's projects, such as conserving the Amazon and the Save the Whales campaign, are barely covered.

Verdict ★★★☆☆

**Sanjida O'Connell** Writer and broadcaster

**BBC WILDLIFE SHOP**

**Reader price £22.99. Subscriber price £20.99.** Code W0911/04

**WWF doesn't just work to conserve pandas and tigers – this Victoria crowned pigeon is one of many rare species it has helped to protect.**

Brent Stirton/Getty Images/WWF

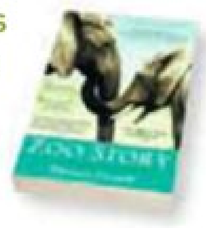
## ZOO STORY: LIFE IN THE GARDEN OF CAPTIVES

**By Thomas French**

Hyperion, 304pp, £9.99

ISBN 9781401310530 (pb)

A behind-the-scenes look at a scandal-hit Florida zoo proves less *Animal Magic* and more *Dallas*.



*Zoo Story* begins with 11 wild elephants on a jumbo jet. Their million-dollar flight from Swaziland to two zoos thousands of kilometres away in the USA is Thomas French's introduction to a topsy-turvy world where money is spent like water on grandiose schemes of dubious value, and conservation is a brand name not a serious practice.

TV shows have often revealed the secret lives of zoos. This book focuses on Lowry Park Zoo in Tampa, Florida, the destination for some of the elephants. It, too, has a cast of charismatic animals and besotted keepers, not to mention crises, conflicts and death-bed scenes with furry sweethearts.

French animates these stories as a Pulitzer Prize-winner should, but what kept him stalking the zoo for four years was its one-time chief executive. A cross between Tarzan and JR Ewing, Lex Salisbury also owned a nearby safari park. The flow of animals and funds between the institutions was not audited, and dividing lines became increasingly blurred.

As long as spectacular fundraising and rapid expansion made the zoo glow, Tampa's authorities turned a blind eye. But when debacles culminated in its star tigress heading for the exit, Lex was thrown to the lions.

This is less 'zoo story' than minor Greek tragedy. But it's a fun read, and you won't believe what happened to the elephants...

Verdict ★★★☆☆

**Stephen Mills** Naturalist

**BBC WILDLIFE SHOP**

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# W2 BOOKS

# WILDLIFE SHOP

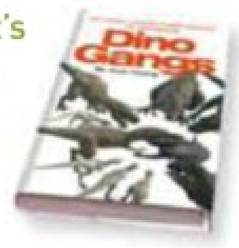
## DINO GANGS

**By Josh Young**

Collins, 320pp, £19.99

ISBN 9780007413393 (hb)

**A palaeontologist's quest to uncover the truth about tyrannosaur behaviour.**



Despite its title, *Dino Gangs* is intended for adults. The book outlines renowned 'dinosaur hunter' Dr Phil Currie's theory that tyrannosaurs were not lumbering lone predators or scavengers, but hunted in co-ordinated packs or 'gangs'. Since behaviour is notoriously hard to determine from fossils, the evidence has to be very convincing.

Young starts with a brief biography of Currie and outlines the context of his work, including accounts of expeditions to Canada and the Gobi Desert. He then moves on to the multidisciplinary research applied to the numerous tyrannosaur remains collected. This includes comparisons with modern animals to clarify the physical capabilities of the adults and juveniles, and computer tomography of a skull to identify whether the dinosaurs had the cognitive ability to behave as an effective pack.

It's interesting material, but the discussion is not always balanced – other viewpoints are only briefly covered, if not ignored. In addition, perhaps because the author is not Currie himself, the book's argument is weakly structured and relies too heavily on quotes. The text feels too much like an adaptation of the script for the accompanying TV documentary, which was aired on the Discovery Channel in June.

This is a shame. Such a complex theory would greatly benefit from a well-thought-out discussion. Instead, this glossy but superficial summary leaves me intrigued but unconvinced that tyrannosaurs hunted in packs.

Verdict ★★★☆☆

**Timothy Ewin** Palaeontologist, Natural History Museum, London

**BBC WILDLIFE SHOP**

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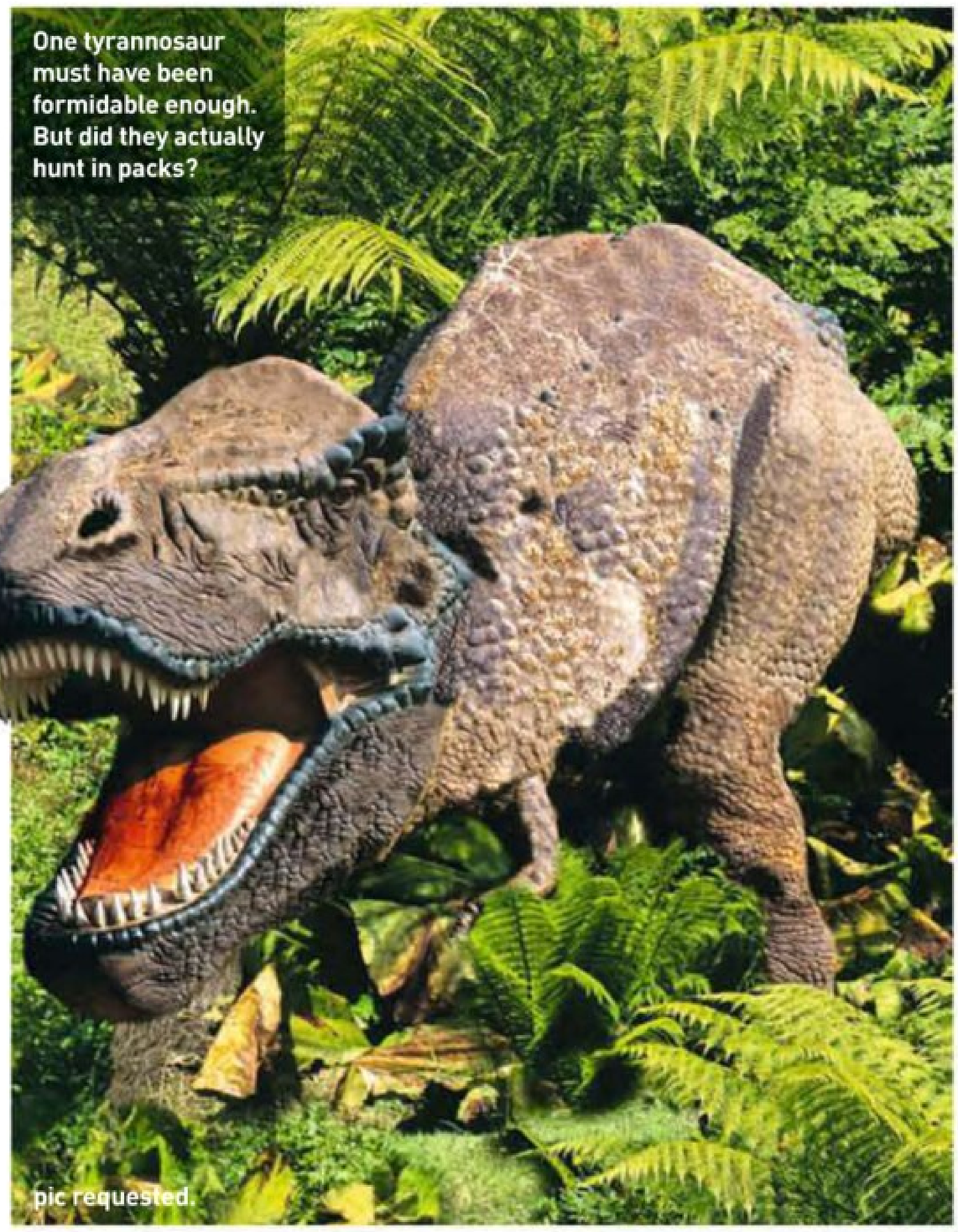

**One tyrannosaur must have been formidable enough. But did they actually hunt in packs?**

pic requested.

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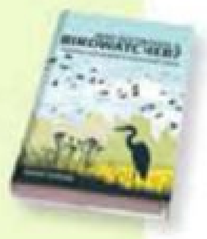

**Was Beethoven a Birdwatcher?**

From the skylark to the 'bonxie', journalist and birder David Turner examines our often complicated relationships with 60 species of birds in this offbeat miscellany. His lively and readable text ranges as widely as the globetrotting house sparrow, covering poetry, art, classical music, war, religion and much more. The book's title alludes to Beethoven's second symphony, the opening notes of which are said to be inspired by the staccato call of the Cetti's warbler.

**RRP £12.99. Reader price £12.99.** Code W0911/07


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Visitors to Heligan share its beautiful gardens with a host of wildlife, such as this common toad.

PICK OF THE MONTH

# A horticultural wildlife haven

**NATURAL WORLD: HELIGAN – SECRETS OF THE LOST GARDENS**

BBC2 (CHECK RT FOR DETAILS)

**The BBC's fabulous** *Natural World* series returns to our screens this month with the heartwarming story of the Lost Gardens of Heligan. Founded in the 1200s, this 200-acre estate in St Austell, Cornwall, fell into disrepair when most of its workers left during World War I and was only rediscovered, restored and opened to the public in the 1990s.

This documentary reveals a wild side to Heligan that its visitors don't always see, as award-winning film-maker Charlie Hamilton James and his wife Philippa Forrester (both regular contributors to *BBC Wildlife*) go behind the scenes to discover the rich variety of wildlife that calls these gardens home.

The film sweeps us up and over the garden wall and into the daily lives of badgers, foxes, barn owls, woodpeckers, kingfishers, toads and even a green heron that has set up home in the ponds after being blown off-course from Central America. "It's no wonder that wildlife thrives here, because *people* thrive here," says Sir Tim Smit, finder and founder of the renovated gardens (and the Eden Project). And, as the seasons turn, we see how Heligan's gardeners work in harmony with nature, adopting traditional techniques inherited from when this Georgian estate was in its heyday.

The film is gently paced, evocative and lyrical, allowing you to appreciate every beautifully filmed moment. A shot of a gardener tenderly plucking ripe peaches was so utterly delicious I almost dashed out to buy some for myself. But it also highlights how far removed we have become from nature to the point at which we are no longer producers, merely consumers.

In the past, Heligan prided itself on being a perfect example of self-sufficient living, its fecund gardens providing everything the family – and its workers – needed. The same model is followed today. A 'waste not, want not' philosophy filters through every aspect of the gardens' daily routine. It is an inspiring showcase of the life we could all live if only we made a little more effort with our own green spaces.

This is a feel-good film – even grey squirrels get a good press – and when, finally, we are lifted back over the wall, a warm, comfortable feeling lingers.

**Rachel Ashton** Wildlife writer and editor

Richard Stafford

## WILDLIFE HIGHLIGHTS: 4 AUGUST – 31 AUGUST

**A GUIDE TO BRITISH FARMLAND BIRDS**

BBC RADIO 4, MONDAY 15 – FRIDAY 19 AUGUST, 3.45PM

These five episodes complement four previous Radio 4 series covering garden, woodland, coastal and water birds. Presented by *BBC Wildlife* regular Brett Westwood, each programme focuses on a different farmland habitat and the avian species that make it their home, respectively arable fields, winter pastures, hedgerows, copses and farmyards. Not to be missed.

**MONKEY LIFE**

ANIMAL PLANET, MONDAYS FROM 29 AUGUST, 6PM & 6.30PM

Film-makers just love following conservation groups as they go about their daily business. *Monkey Life*, the programme about Monkey World in Dorset, returns to our screens with a fifth series of 20 episodes. Expect heartwarming drama as the centre's dedicated staff rescue and rehabilitate abused and neglected captive primates.

**THE JOUBERTS: LIVING WITH BIG CATS & BIG CAT ODYSSEY**

NAT GEO, DVD, £14.99 EACH

This summer sees the release of a pair of DVDs, both of which feature two documentaries made in Botswana by Dereck and Beverly Joubert. *Living with Big Cats* explores the relationship between a female leopard named Legadema and the film-makers, who followed her during the first three years of her life for *Eye of the Leopard* (included). On the second DVD, *Big Cat Odyssey* features highlights from the pair's 30 years spent filming in the country, while the bonus film *Lions of Darkness* meets a pride under pressure from a trio of interlopers.

The star of *Living with Big Cats* gets to grips with fame.

Wild Films Botswana/Beverly Joubert

Due to last-minute schedule changes, *BBC Wildlife* regrets that we cannot guarantee the accuracy of transmission information. Please check *Radio Times* magazine or www.radiotimes.com for channel listings.

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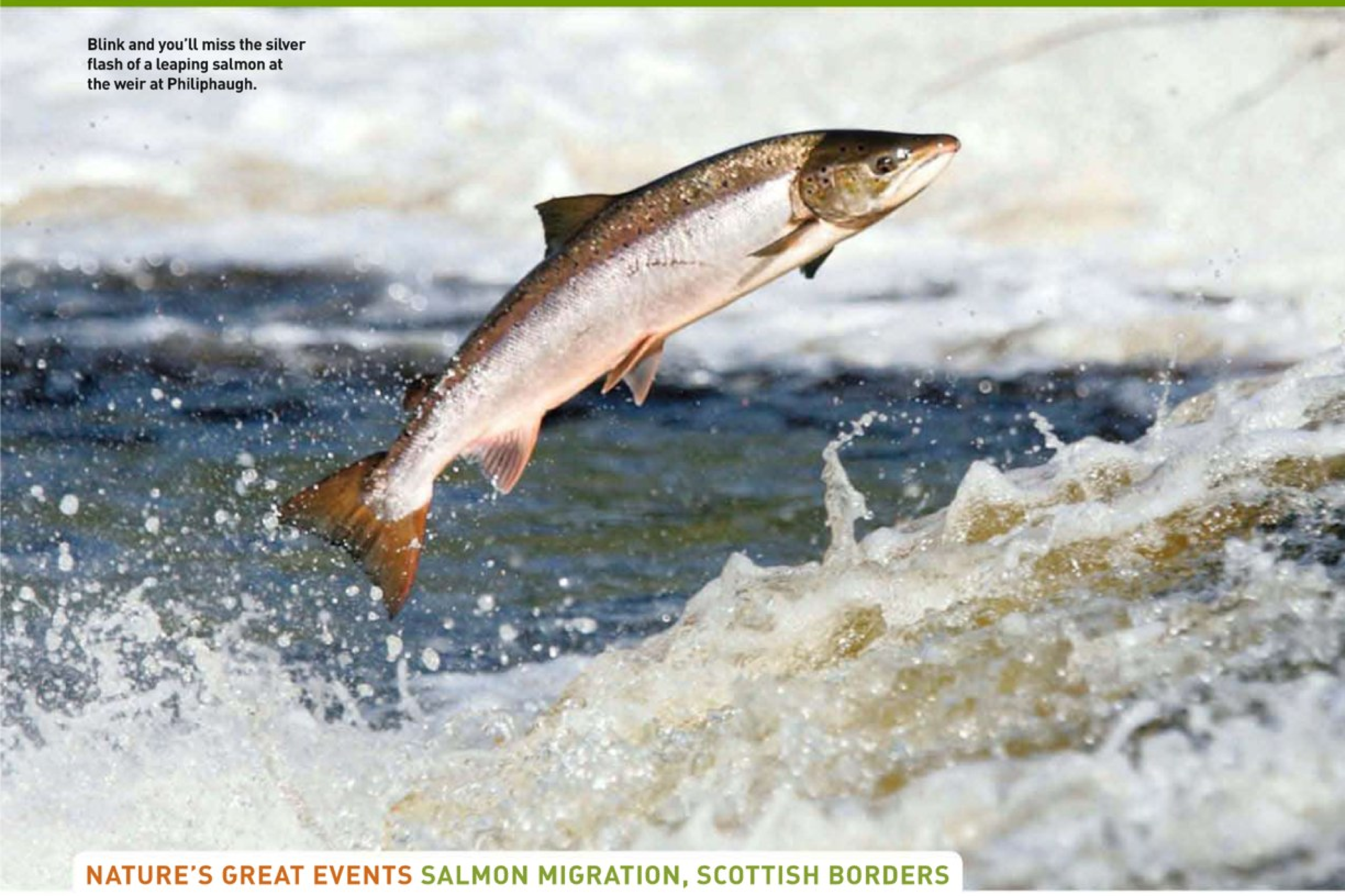

Blink and you'll miss the silver flash of a leaping salmon at the weir at Philiphaugh.

Dipper: Tom Marshall/RSPB Images; salmon: Epicscotland/Alamy



# A leap into the light

Carvings on millennia-old stones bear witness to our ancestors' fascination with the miracle of salmon fighting their way upstream to spawn. **Kenny Taylor** finds the spectacle no less captivating today.

## AT A GLANCE

**WHAT?** Atlantic salmon leaping high out of the water (the UK record is 3.7m) as they swim upstream to spawn.

**WHERE?** Waterfalls or weirs on clean, fast-flowing rivers; Ettrick Water in the Scottish Borders is a hotspot.

**WHEN?** September to November, with October the peak month. Also April and May.

**ALSO LOOK FOR** Dippers (*left*), goosanders and grey herons, and for signs of otters.

**Perching dippers bob up and down on the rocks of Ettrick Water.**

**I HEAR** the river long before I see it. Over the rustle of leaves, the creaking of branches and the soft crunch of my heavy boots on the gravel rises the sound of water rushing over stones.

The constant '*sh-sh-sh*' manages to be both soothing and exciting. It instantly creates the impression of power and movement, a sense of wildness just beyond my vision, audible and insistent.

I reach an opening in the bankside trees and see Ettrick Water unscreened for the first time. The river stretches 20–30m across to a fringe of broadleaved woodland along the opposite bank. Upstream is a large pool, the surface of which is barely rippled.

The pool ends abruptly in front of me, where a *cauld* – a kind of weir – spans the channel. The water is high today and running smoothly over the concrete that lies beneath the surface. It tumbles in a crashing cascade, powering over the lip and plunging to raise a constant froth of white water downstream. Swirls, bubbles and spray add to the effect as the stream is transformed from near-silence to white noise.

The spectacle is exhilarating, but it's not what I've come to see. Spatters of rain land on my coat, so I shelter in a small hut by the bank from where I have a clear view of the pool, cauld and foaming water.

### MOVING ON UP

I don't quite believe it when the first salmon leaps. It's a movement at the corner of my eye that is only half-registered, then gone. I keep staring at the water.

Minutes pass. Then a dark shape, unmistakably a fish over 30cm long, hurls itself upwards.

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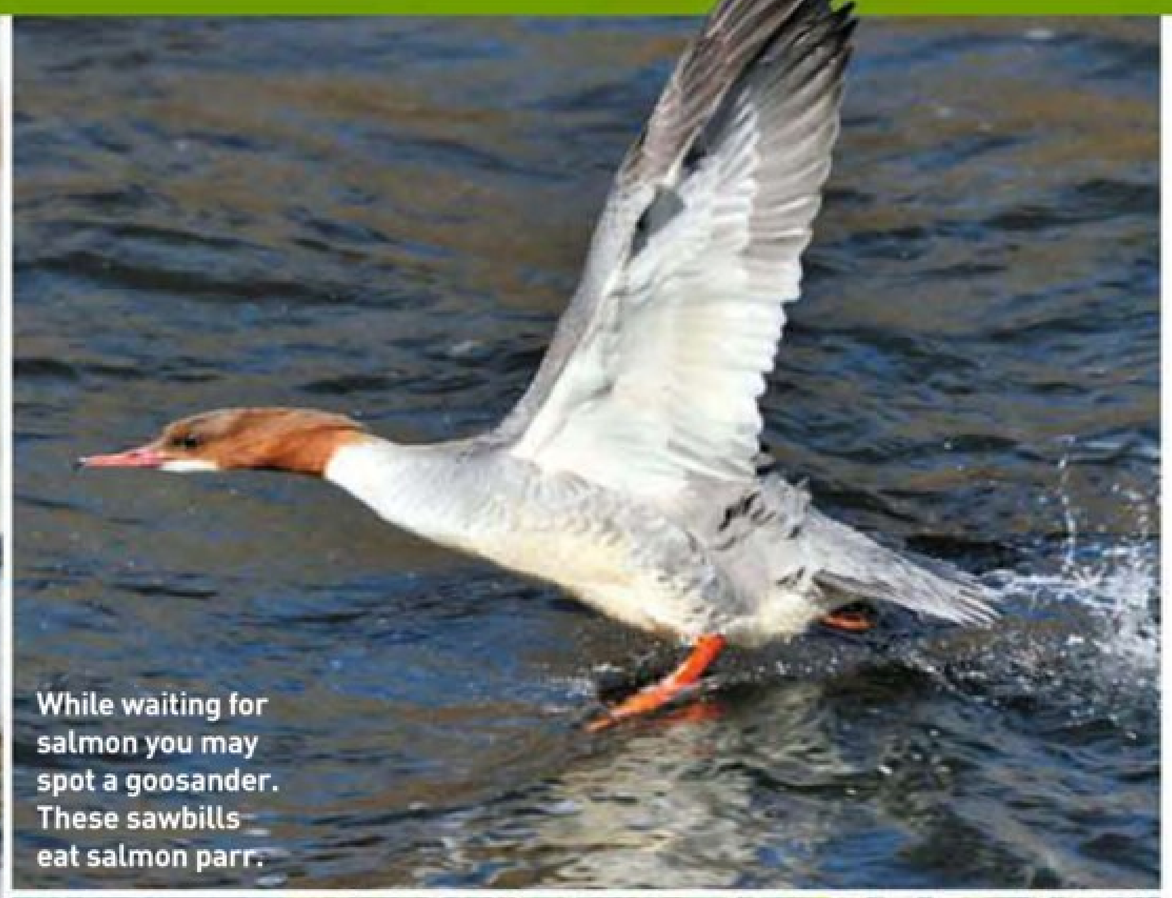
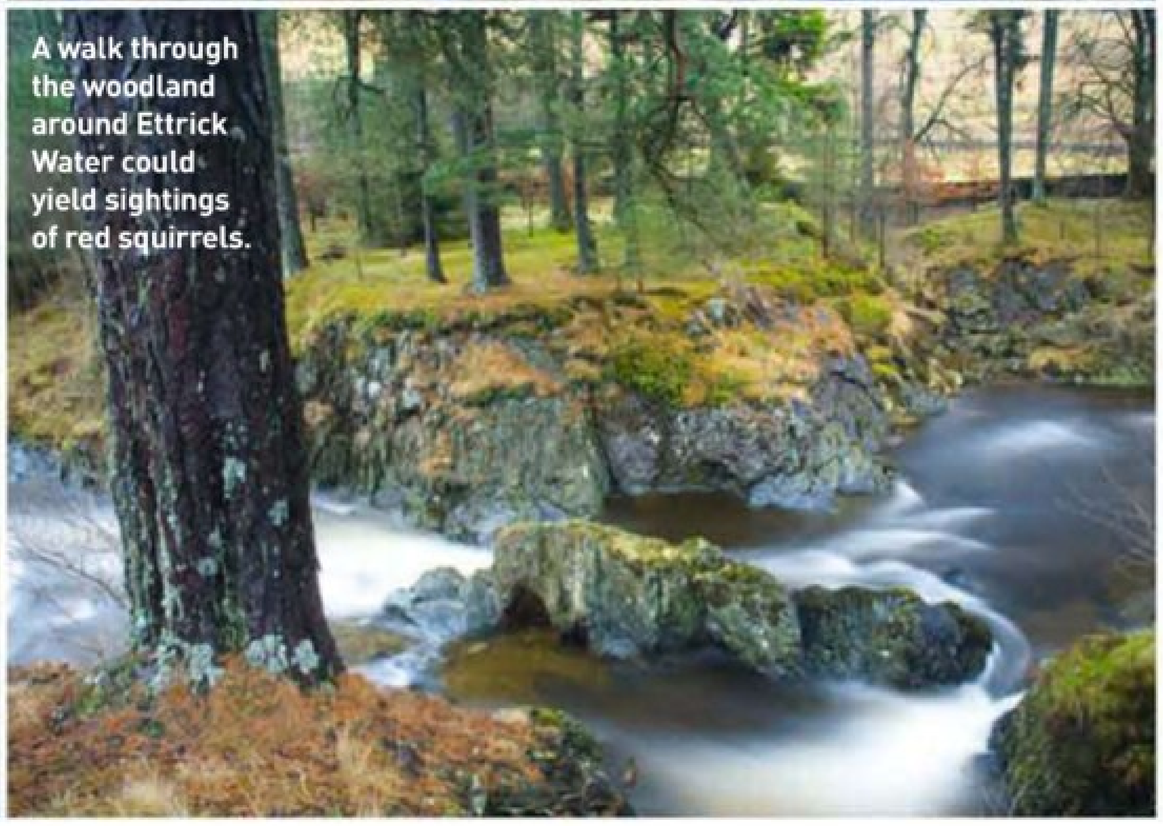


While waiting for salmon you may spot a goosander. These sawbills eat salmon parr.



A walk through the woodland around Ettrick Water could yield sightings of red squirrels.

I see its tail flick in the air before it crashes against the cauld edge and vanishes, presumably hurled back into the cauldron from which it had emerged a second or two earlier.

This is compulsive viewing – I daren't look away in case I miss the action. It's not long before another one leaps and plummets; this time I can see the glisten of water on its skin and truly appreciate the power of its jump.

'Burst speed' is what some biologists call the sudden acceleration that propels the salmon skywards. Its muscular body provides the initial thrust, then its tail helps to keep the fish aloft, twisting and flapping in the brief moments that it is airborne.

But even when you know the science behind it, the salmon's transition from water to air and back again, in amazing leaps often many times greater than the swimmer's length, still seems miraculous. It's no wonder that we have marvelled at these creatures through the ages.

Ancient Pictish stones in Scotland are carved with images of leaping salmon, and tales composed in the Bronze Age tell of their magic. People still journey, at this season of changing light, to catch the flash of bright scales against sparkling waterfalls and marvel at the life force of this fish. Mesmerised, I, too, succumb and am reeled in by the salmon.

Living beside the River Spey precipitated **Kenny Taylor's** love of swimming near waterfalls and his admiration for salmon.

## NOW YOU DO IT

### GETTING THERE

- Park beside the Waterwheel Restaurant on the Philiphaugh Estate, 1.6km from Selkirk in the Scottish Borders. ☎ 01750 722258
- The cauld on Ettrick Water is beside one of several trails within the Philiphaugh Estate and a short walk from the Salmon Viewing Centre. ☎ 01750 21766; www.salmonviewingcentre.com
- The centre has displays about Atlantic salmon and video links to Ettrick Water. It's open year round from 9am to 5pm; entry is free.
- To explore the river and its fringes above and below the cauld, use the waymarked 5km-long Salmon Leap Walk.

### PLACES TO STAY

- The Glen Hotel in Selkirk is on Ettrick Water. ☎ 01750 20259; www.glenhotel.co.uk

## SPOTS TO SEE SALMON

### 1 FALLS OF SHIN

The falls are about an hour's drive north of Inverness and close to a visitor centre with a new exhibit on Atlantic salmon. A short, sharp descent runs to viewing areas overlooking the water. ☎ 01549 402231; *www.fallsofshin.co.uk/fallsofshin.php*

### 2 FALLS OF BRAAN

Just west of Dunkeld, the River Braan plummets past some of the tallest trees in Britain. Ossian's Hall, a spectacular 18th-century folly, overlooks the falls. You may see red squirrels here, too. ☎ 0844 493 2192; *www.nts.org.uk/Property/57*

### 3 BUCHANTY SPOUT

A dramatic pothole where the River Almond squeezes through rock clefts several kilometres north-east of Crieff in Perthshire. A track leads from a carpark to the river; watch your step on the curving, wet rocks near the water. *www.perthshire.co.uk/index.asp?pg=362*

Get close to leaping salmon at Buchanty Spout.

### 4 STAINFORTH FORCE

Beside the village of Stainforth in the Yorkshire Dales, the River Ribble descends a series of cascades, easily seen from the riverbanks. *www.stainforth.info*

Goosander: Laurie Campbell; Ettrick Water: Jason Friend/Photolibrary.com

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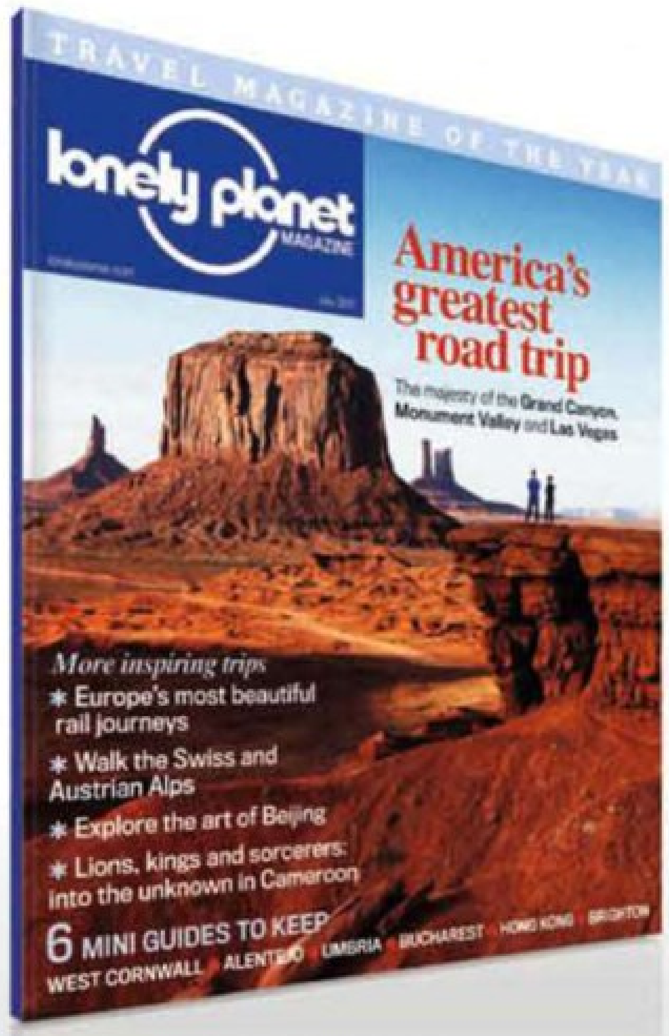


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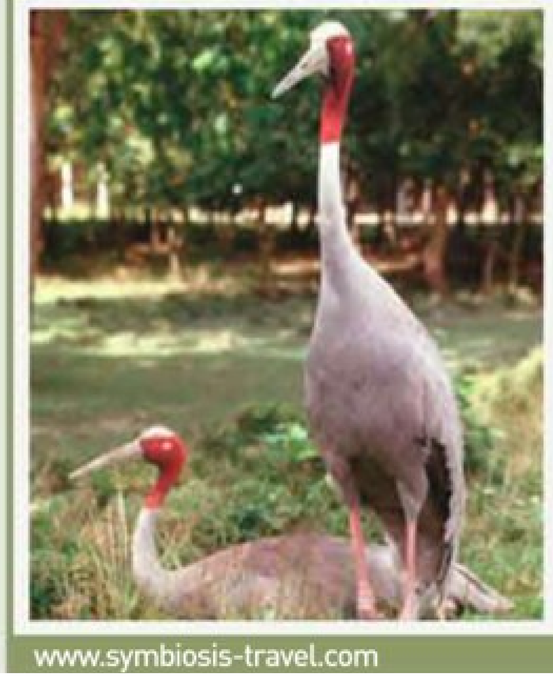

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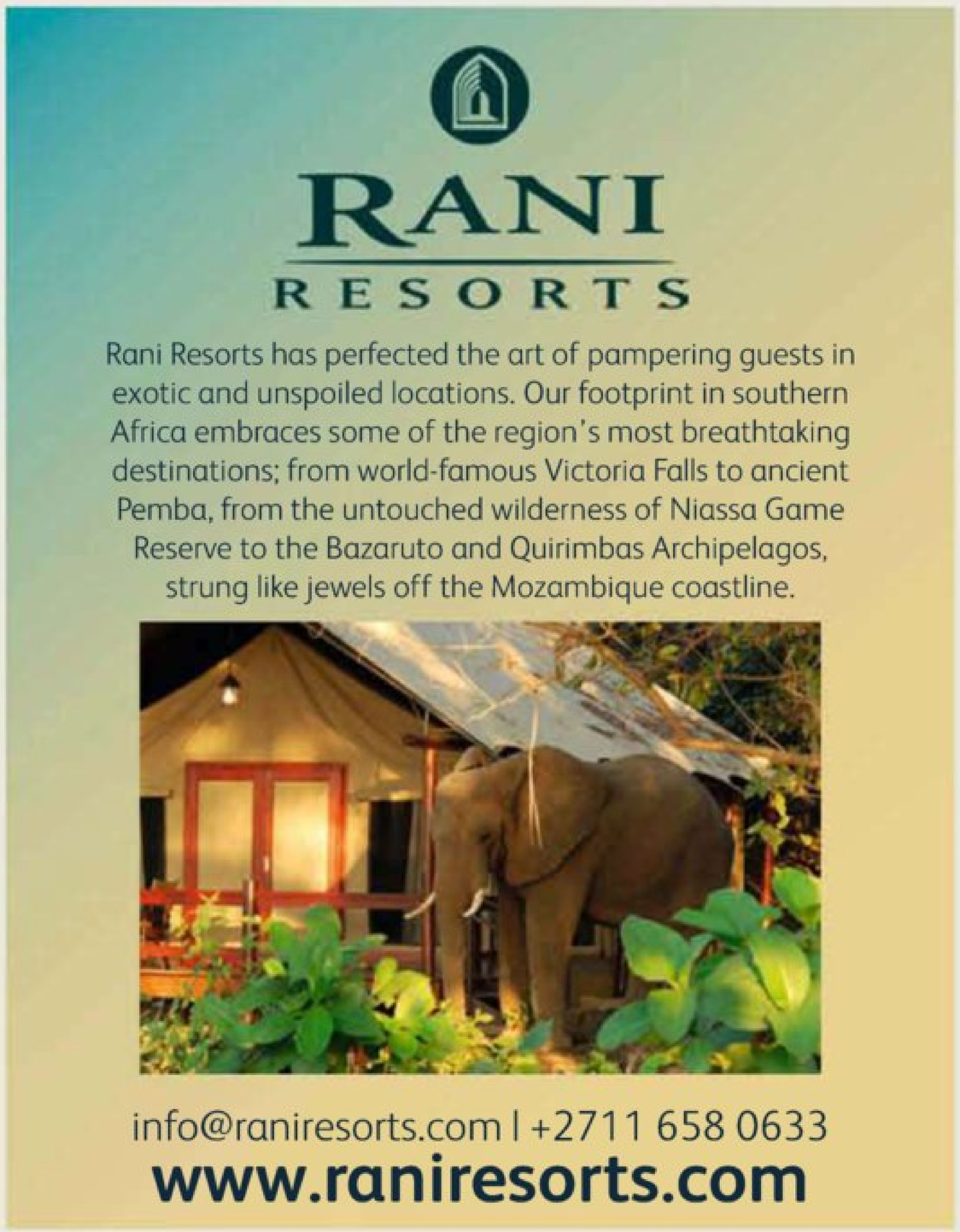


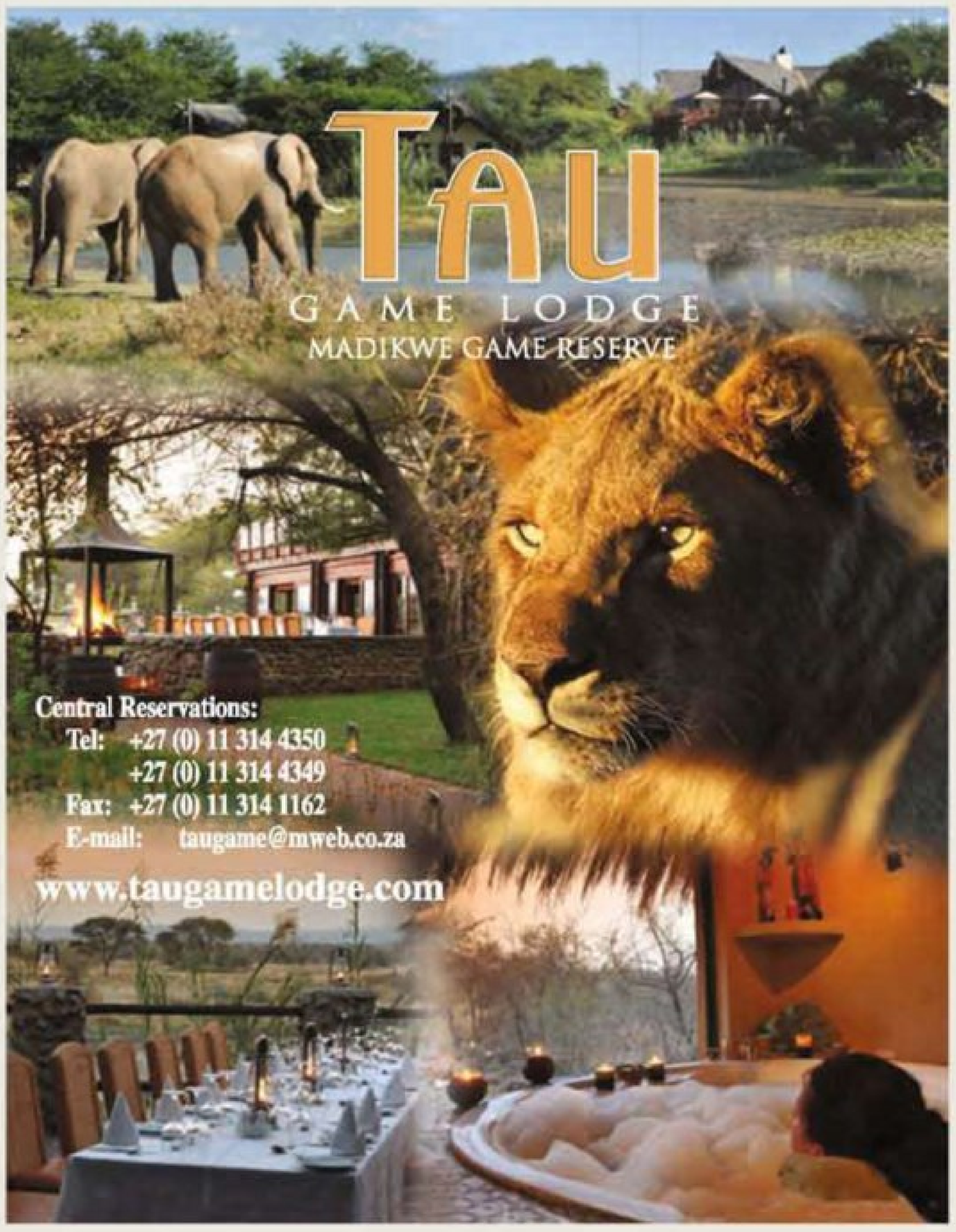




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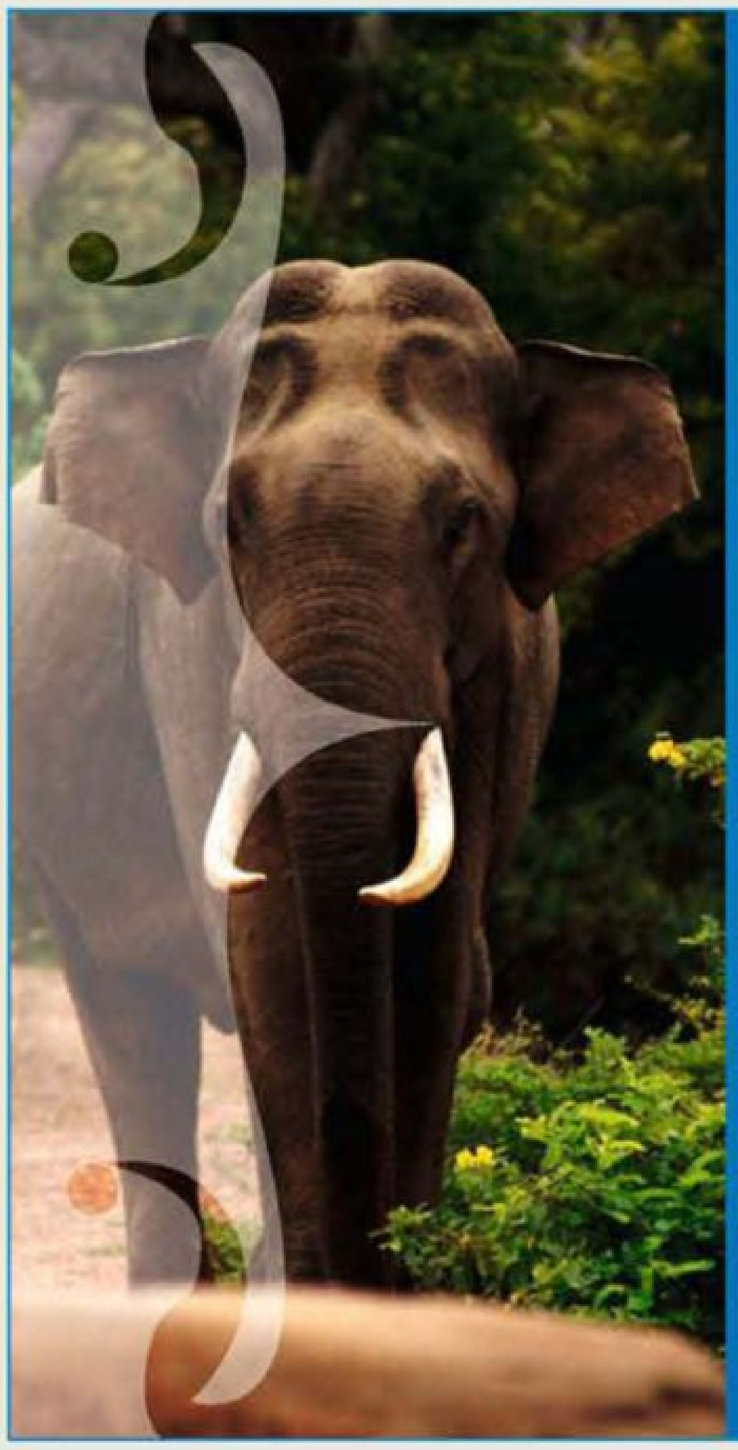

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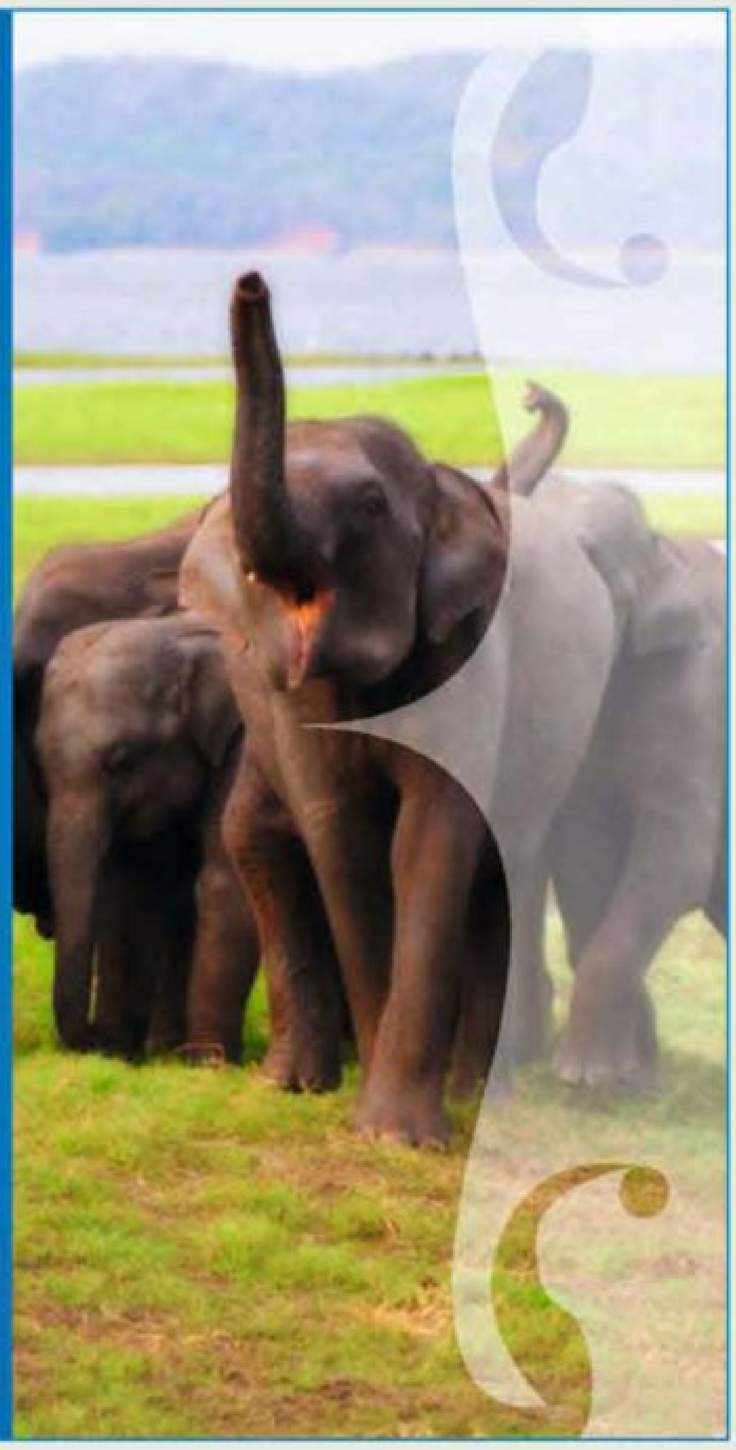



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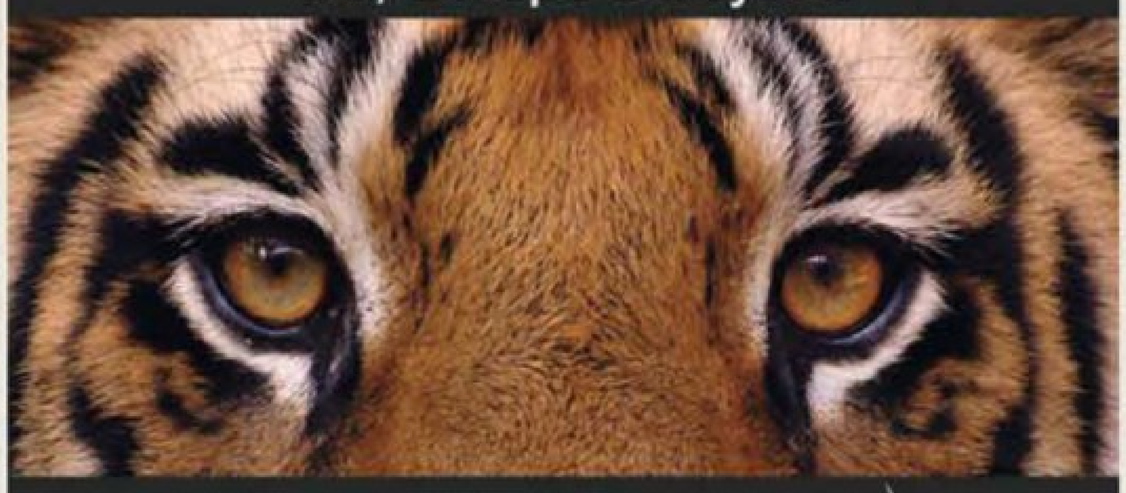

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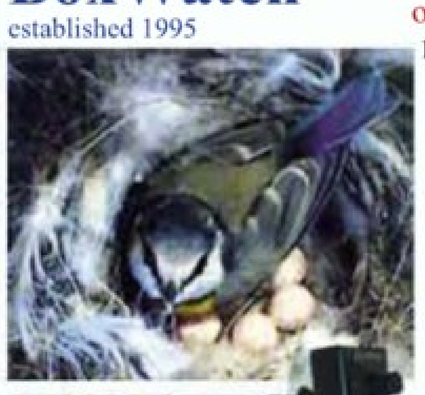

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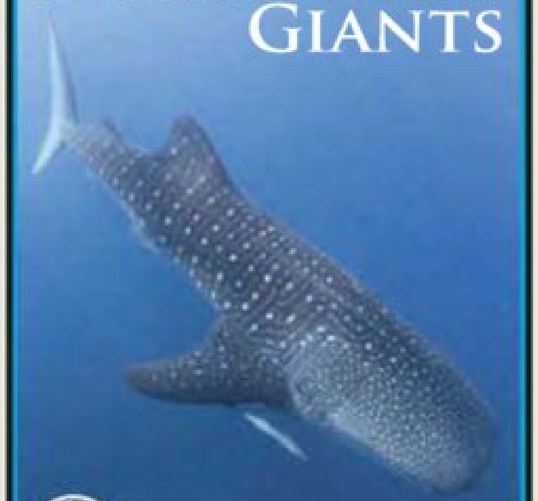

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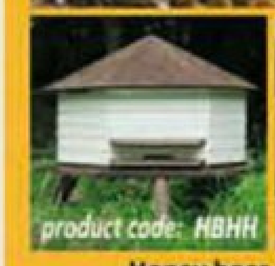


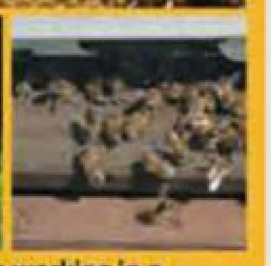

Honey bees working in a 'Homebee Honeyhive'

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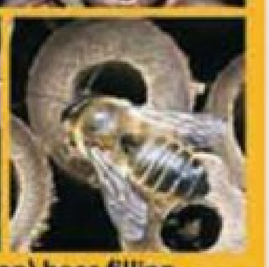

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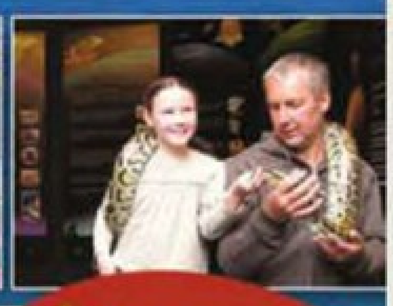

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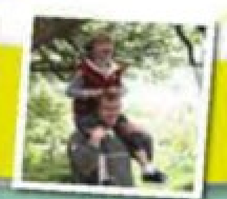

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## IT'S NOT WHAT YOU EAT...

Chris Packham (Interview, June) described himself as a 'veggie', but later said that if there were a magic button that exterminated grey squirrels in the UK to help our native reds, he would be first in line to push it. In my opinion, these are not the words of a true 'veggie': it's not just what you do or don't eat that makes you a vegetarian, it's how much you care about animals as a whole.

**Danny Gunner (aged 13)**
Liverpool

## SAY NO TO TREES

The publicity given to trees and their ability to capture carbon emissions has led to the view that they are suited to any habitat – including, sadly, brownfield sites (Letters, May and July). But, as your correspondents point out, many brownfield sites already have a rich diversity of wildlife, with features such as scrub cover, nectar and larval foodplants, varied heights of grasses and areas of bare soil.

Two nationally endangered butterfly species, the grizzled and dingy skipper, use brownfield sites, and afforestation would wipe them out, along with many other species that don't live in woodlands.

**Richard Stewart**
Former Suffolk butterfly recorder

## STARLING HUNTERS

Past correspondence in *BBC Wildlife* has highlighted the way the flocking behaviour of starlings minimises predation, and I was reminded of it earlier this summer when my attention was caught by a flock of gulls circling around the treetops.

Some of the gulls flew into the trees as if they were trying to catch something. When several small fireworks were fired into the trees, the gulls dispersed and several hundred starlings scattered in all directions. I think the gulls were trying to catch roosting starlings – but is that possible?

**Chris J Turner**
Via email

Alan Mould/www.clikpic.com/amould

## READER LETTER OF THE MONTH

### Make the most of our natural world

I turned 60 this year and sympathise with Sophie Prater's frustration at being unable to enjoy nature as earlier generations could (Letters, August). Many species I saw when I was 15 are no longer abundant, though some, such as lichens, are more numerous.

Then again, in the past few months, I have been on a bat walk, listened to the dawn chorus, seen swifts mating above a carpark and watched a grass snake cross the path in front of me – and all in London, too.

Sophie should join a wildlife society, because she is needed and would learn so much. The beauty of the natural world is that it is accessible however old you are.

Oh, and I still collect feathers, but do not eat blackberries – not due to pesticides, but because the woodmice may need them more.

**Wendy Knight** Via email

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## PLASTIC FANTASTIC

It was a shame that Richard Mabey (June) failed to mention that there is, and has been for many years, a solution to plastic waste. Oxo-biodegradable plastics were developed in the early 1970s by my research group at Aston University, and many peer-reviewed papers have since confirmed that they are totally biodegradable (the speed of which can be controlled by the manufacturer to fit the lifetime of the product), recyclable, safe for packaging food and do not produce methane in landfill.

Had oxo-biodegradable plastics been taken up by the industry 20 years ago, there would be no 'plastic soup' in the Pacific and no build-up of plastic detritus throughout our landscape.

At that time, there was no incentive for the polymer industry to use this technology. Now the political climate has changed, and there is a will to find a solution to this problem.

**Gerald Scott**
Professor emeritus, Aston University

Richard Mabey refers to residues in unleaded petrol affecting the scent of flowers, making it difficult for bees to find nectar and leading to their starvation. He cites research from the University of Virginia, but is this the reason for bee colonies collapsing?

And, given the damage plastic does in our environment, why does the UK not introduce a tax on plastic bags as other countries have done?

**Alexandra Murrell**
Via email

*BBC Wildlife* invertebrate expert **RICHARD JONES** responds:
There are many reasons why bees – like many groups of insects – are struggling, and they include the loss of wildflowers, the intensification

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of agriculture, a lack of genetic variation due to the industrialisation of beekeeping and the use of pesticides. Neonicotinoids are the latest group of chemicals to be viewed with suspicion.

## HUNTING THE TASSIE TIGER

Remote cameras *have* been used to search for thylacines (Letters, April). Dr Bob Brown, now a senator and leader of the Australian Green Party, used them in his hunt for the Tasmanian tiger in the early 1970s, though the technology was unsophisticated by current standards.

My wife and I spent our honeymoon on Tasmania's remote west coast in late 1970 in the hope of seeing a thylacine – some fishermen had allegedly caught one for use as crayfish bait a few years earlier. But, like Bob, we were unsuccessful in our quest.

**Bob Holderness-Roddam**
Austins Ferry, Tasmania

## HANDS OFF MY GREEN SPACES!

Full marks to Buglife for its 'Get Britain Buzzing' campaign (News, July). There is no doubt that we need a nationwide campaign to educate those responsible for verges, roundabouts, undeveloped plots and other informal open spaces about the biodiversity they could protect and encourage without it costing them a penny.

I work in an office block in Cardiff Bay. Until a couple of years ago, the area next door was rich with wild plants, which in turn attracted crickets, moths, bees and other invertebrates, as well as rabbits and the occasional fox. Then the space was tarmacked to provide an occasional carpark for events and film crews.

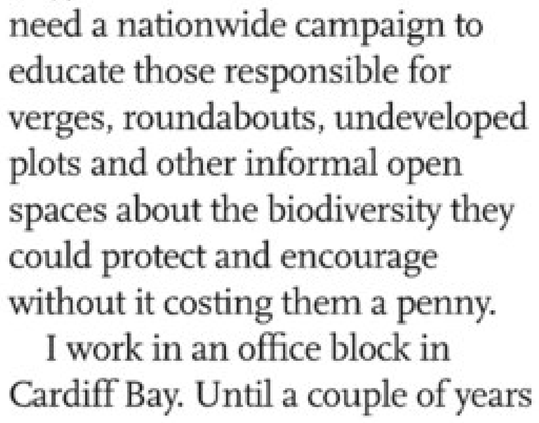
That was a commercial decision, but the continual strimming of the ox-eye daisies, wild carrots and other wildflowers fringing the site is simply unnecessary.

I've tried contacting the people carrying out this 'maintenance', but have either received denials of responsibility or no reply at all.

**Paul Seligman**
Cardiff

## WHO NAMED THE ORCA?

**In July, we asked you to suggest a name for a young female orca known only as W10 – and we've been inundated with brilliant responses. The judges, chaired by researcher Dr Andy Foote, liked 'Iona' (by Kim Rowswell), but chose 'Occasus', meaning 'sunset' and 'west' in Latin. Well done to Abi Gazzard for her suggestion.**



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## BACK-GARDEN BANDIT OF THE HOME COUNTIES

**Racoons don't just love Canada's urban jungle ('Back yard bandits', July) – they're here in Hampshire, too! Tony Large** Eastleigh

## I'M A BELIEVER, TOO

Richard Mabey (July) describes how Norwich Cathedral is the heart of the city "even for non-believers", clearly referring to those who have no religious faith. In fact, such people usually have very strong beliefs, they just believe in quite different things.

**Ted Black**
Glasgow

## DON'T SAVE THE WHALES

I was disappointed with Kenny Taylor's article on the pilot whales that swam into Loch Carnan (News, June). I live in South Uist and saw both the pod that visited the loch in May and the previous one that turned up last October.

I watched both groups closely and, in my view, it was wrong to assume that something needed to be done. The pod of 100 (not 60) whales had come for a reason and the over-zealous desire to 'rescue' them by driving the group out to sea clearly distressed them. One of the whales was found dead after this and, while I don't think that the two events are related, it certainly didn't help.

A similar situation nearly arose last October when 40 (not 30) pilot whales also came into the loch. That time, would-be rescuers wanted to form a line of boats to push the pod into deeper waters; fortunately this was stopped before it got out of control.

This pod was assumed to have been the same one that later came ashore in Donegal, but this was never confirmed from photos of their dorsal fins.

**Steve Duffield**
www.western-isles-wildlife.com

We asked the article's writer, **KENNY TAYLOR**, to respond:

My story made no judgment on efforts to drive the whales out of Loch Carnan, though clearly this is an interesting debate as it may not always be the best thing to do. What do other readers think?

The numbers I reported came from eyewitnesses I spoke to and reputable media reports, but it is notoriously hard to count large groups of cetaceans. Finally, the Whale and Dolphin Conservation Society confirmed that some of the Donegal pilot whales had been positively identified from dorsal fin photos as being in Loch Carnan a few days before they stranded.


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Alfie and Hattie, two Dartmoor hill pony foals born this year and are now safe and well at Honeysuckle Farm. Their mothers Alice and Helga, were in foal when they were rescued at the annual pont sales where the dealers and meat men bid for them.

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Andy Hay/RSPB

## WILDLIFE-FRIENDLY FARMERS

**The four finalists in the RSPB's Nature of Farming Award have been announced. They now go to a public vote which runs until the end of August. They are:**

- **Robert Law, Herts Arable farm with lapwings and skylarks.**
- **Robert Kynaston, Shrops Mixed farm with grey partridges.**
- **David White, Wilts Chalk downland farm with turtle doves and yellow wagtails.**
- **Somerset and Carolyne Charrington, Mull Upland farm with corncrakes and otters.**

**FIND OUT MORE**

**You can cast your vote at www.rspb.org.uk/farmvote**

## AVOIDING PALM OIL

It was interesting to read Ian Redmond's timely feature on orangutans ('Hope for the red ape?', August). Though palm oil does indeed permeate so many products, you can avoid it in soap by buying yours from the Orangutan Foundation.

You can also buy palm oil-free toothpaste, chocolate and bread, which makes me wonder why it is needed so much. Even the Co-op's own-brand powdered milk, dried fruit and breads have it – why?

**Alan Drever**
Isle of Skye

Following your excellent feature on orangutans and the threats facing their habitat, I thought your readers would like to know the outcome of the 'Clear Labels, Not Forests' campaign, which called for the mandatory labelling of palm oil on food packaging.

Thanks to thousands of supporters across Europe, the European Parliament has now passed a regulation that means palm oil will no longer be a hidden ingredient. Soon we will be able to choose products that contain certified sustainable palm oil over those that contain standard palm oil, and in so doing encourage retailers and manufacturers to clean up their supply chains.

This is fantastic news for forests, biodiversity and local communities – not to mention a great example of consumer power in action.

**Helen Buckland**
Sumatran Orangutan Society

## CORRECTIONS

- Sincere apologies to artist Kim Maher for getting her name wrong in our Wildlife Artist of the Year results (August). Kim was commended for her painting of black-tailed godwits.
- Apologies also to Isabella Fay whose painting 'Fish' was commended in the International Artists category.
- Both artworks – and all of the other winners – can be seen on our website: www.discoverwildlife.com


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- Submission of your photos to Your Photos constitutes a grant to *BBC Wildlife* to publish them at any time in any media with attribution.

PHOTO OF THE MONTH

1

**1 SUMMER LOVING**
On a recent trip to the Hebrides, I visited the Treshnish Isles for my first-ever view of a puffin. The place was teeming with these endearing seabirds. I lay in the grass and tried to capture the affection they show each other.
**Lesley Wright**
Nottingham

**2 DAISY CRANE**
Walking through a buttercup patch in my garden, I was amazed to see how many crane flies were around. But no matter how much I tried, I couldn't get the shot I wanted. Eventually, I found this individual on a lone daisy. I crouched down just in time to take my photo before it moved on.
**Alexander John**
France

2

**WIN, WIN, WIN**

The photo of the month wins a 12 megapixel LTL Acorn Scouting Wildlife Camera, worth £199.95, courtesy of CJ Wildlife. The camera is compact, waterproof and, thanks to its infrared sensor and temperature trigger, enables you to record wildlife in action day and night – even when you're not there. To find out more, visit www.birdfood.co.uk/acorn or call 0800 731 2820 quoting C2033.

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# Your photos

3

4

5

**3 EARLY ELEPHANTS**
We had spent three enjoyable days in Kenya's Amboseli National Park, though persistent cloud hid the famous snows of Kilimanjaro. But on the morning we were due to leave, the skies cleared, the sun came out and, as if on cue, a herd of elephants completed a magical moment.
**Danielle Mussman**
Kentucky, USA

**4 LET'S BE FRIENDS**
Unfortunately the spiny-tailed lizard is almost extinct in Saudi Arabia where they are hunted for food, profit and even just for fun. These amazing animals need help. I intend to buy some and release them back into the wild.
**Wessam Atif**
Riyadh, Saudi Arabia

**5 SUDDEN LANDING**
On a birding trip to Queensland last July, my wife and I visited the Centenary Lakes in Cairns. While I was trying (unsuccessfully) to photograph another individual, this yellow-bellied sunbird landed on a flower next to me. It stayed long enough for me to take this picture.
**Tony Hovell**
Via email

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**6** CAUGHT IN THE ACT

When my currants started disappearing as soon as they were ripe, I wondered who the culprit was. Then, having just picked some myself, I snapped the guilty blackbird red-handed.

**Jonathan Bye**
Via email

**7** RARE BEAUTY

My family and I were visiting Ipsilou Monastery on the Greek Island of Lesbos in late May when my son saw this stunning ladybird spider on a wall. This arachnid is very rare in Britain, only found in Dorset. It was the first time we have seen the species.

**Keith and Adam Scovell** Merseyside

**8** TUNNEL VISION

My housemate and I saw a pair of great tits visiting an old drainpipe on the side of our house. Wondering what was inside, we taped a camera to a pole, set the timer and after a few misses got this shot. Curiosity satisfied, we left the nest alone.

**Tom Barton and Sam Grundy**
Birmingham

**9** VOLE'S VOYAGE

On a scorching day beside the River Dun in Lockerley, Hampshire, I was lucky enough to spot this water vole swimming towards me. With its reedy hide-outs and big muddy banks, the Dun is perfect for these animals.

**Oliver Atkinson**
Via email

## PHOTO CONTEST The editor's pick from July's 'In praise of plants' competition

COQUELICOT By Christian Gillardin

HIMNARIKI By Thom Jones

MANY-ZONED POLYPORE By Shaun Parrin

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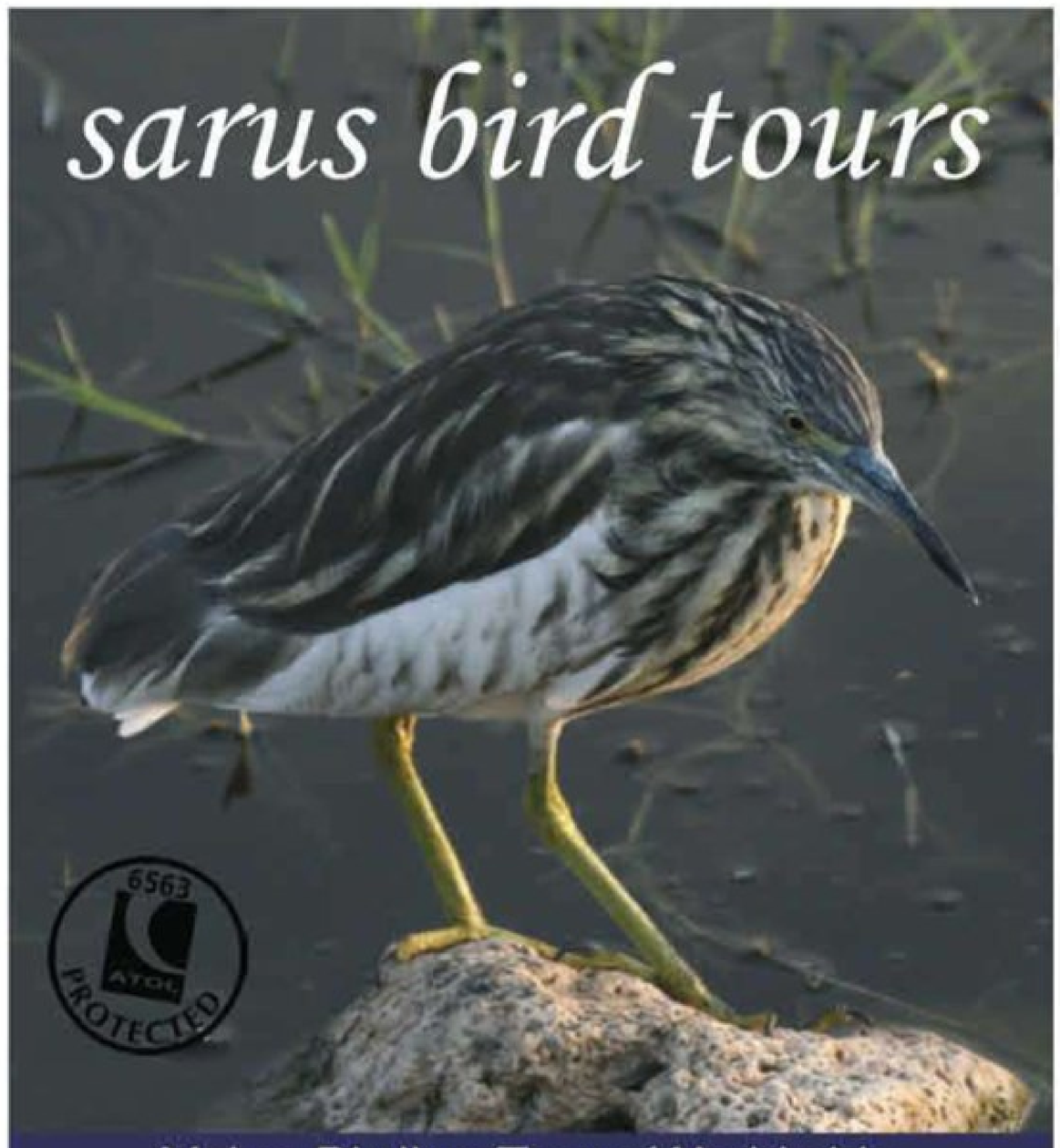


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# Next month

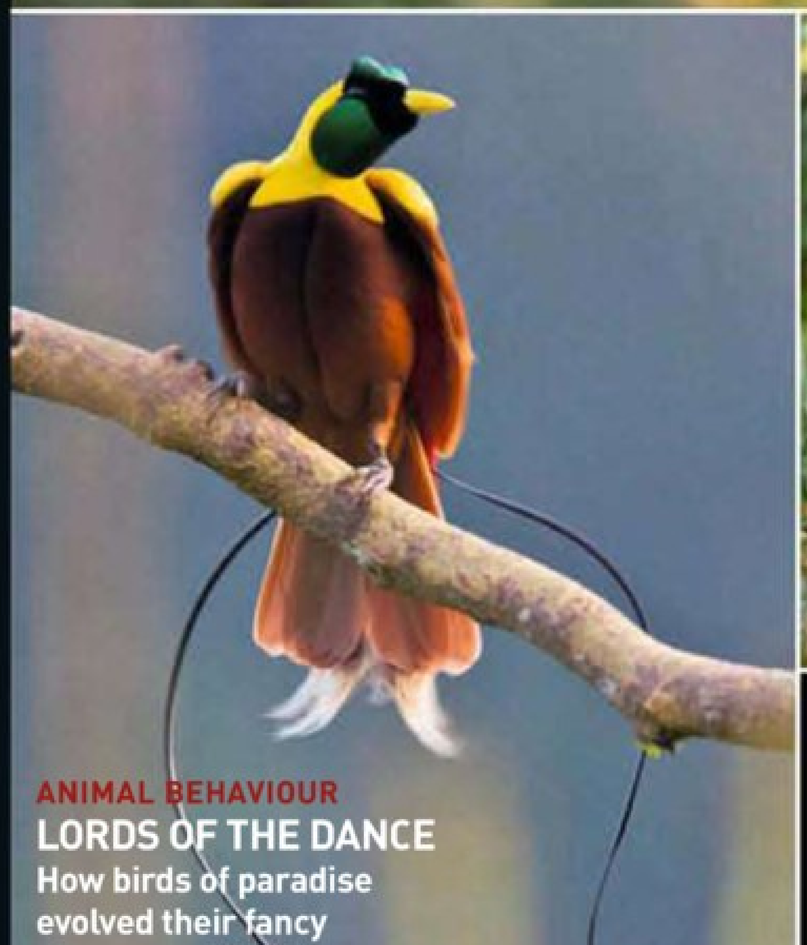
BBC Wildlife

Clockwise from top left: Andrew Parkinson/naturepl.com; James Gifford; BBC; Alex Badyaev; Tim Laman/naturepl.com; Elliott Neep/FLPA

SPECIAL INVESTIGATION

## KILL OR CURE?

**Can vaccinating badgers solve the problem of bovine tuberculosis? We join the frontline of the battle to save Brock from a cull.**



ANIMAL BEHAVIOUR

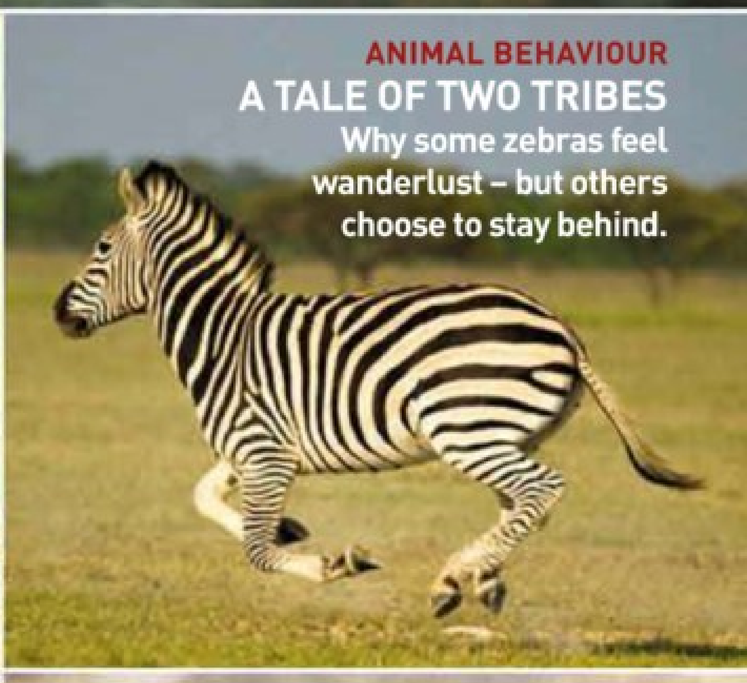
### LORDS OF THE DANCE

How birds of paradise evolved their fancy plumes and 'look at me' dance moves.

BRITISH WILDLIFE

### FALLOW DEER RUT

Watch rival stags battle it out in Dorset's woods.



ANIMAL BEHAVIOUR

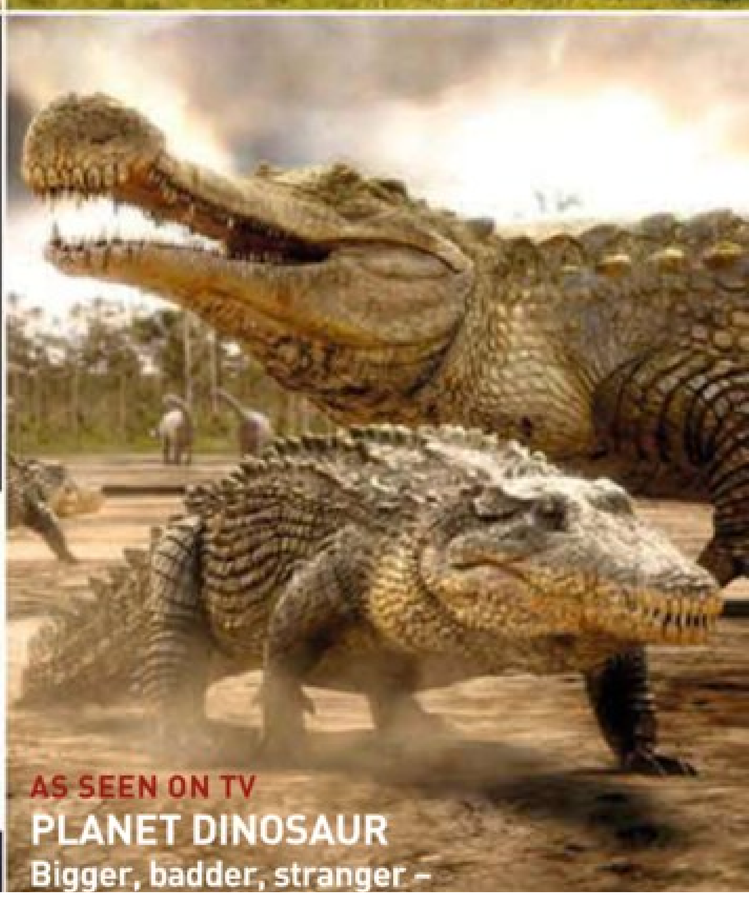
### A TALE OF TWO TRIBES

Why some zebras feel wanderlust – but others choose to stay behind.

PORTFOLIO

### UNSEEN AMERICA

Unique images of flying squirrels, beavers and ferocious shrews.



AS SEEN ON TV

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# The call of nature

The best toilets are out in the bush – though you run the risk of sharing your most private moment with an audience...

Martin Briggs

If you know of a better place in the world to obey the call of nature, we'd love to see it.

MARTIN BRIGGS
Veterinarian
South Africa

**ON THE FARM** where I grew up, in Eastern Cape province, South Africa, we didn't go in for mod cons. Our toilet was a 'long drop': a hole dug deep into the ground, topped by a shack of galvanised iron, far from the house. A wooden floor (that creaked and sagged alarmingly) and a timber platform with a circle sawn out of it completed our outhouse. The hole was big enough for an adult to fall through, let alone a small child. But that wasn't the main reason why a simple visit to the loo could prove to be something of an adventure.

The long drop was located at the distant end of a path that led into thick bush; as you'd expect, its isolation made it a favourite haunt of all manner of wildlife. We often shared the shack with spiders, bees, scorpions, fieldmice – even snakes.

Wendy Dennis/FLPA

**Eight legs good: baboon spiders keep undesirable insects under control.**

I can't remember if our loo had a door. If it did, we never had to shut it – nobody else lived for miles around. This made visiting our *picannin khaya* ('small house' in Xhosa) doubly rewarding, as we could pass the time watching wildlife coming and going in the bush.

I do recall that the seat had a rectangular cover, presumably to reduce the influx of swarms of flies into the shack. One of my most vivid childhood memories involves manoeuvring this block of wood off the hole and coming face-to-face with a very large, very hairy spider. We called this familiar species 'tarantula', though our eight-legged giants were actually the baboon spiders common all over South Africa – not that this made them any less intimidating.

**"Our loo was a favourite haunt of all manner of wildlife: we often shared the shack with spiders, scorpions, mice – even snakes."**

I had grown accustomed to them from an early age, because they were frequent visitors to the playroom where my sister taught her dolls. Though these critters were quite lethargic, I was summoned to rescue my sibling whenever they paid her a visit.

I soon learned not to squash them – if I did, they splattered with an unpleasant 'pop'. Instead, I herded each one onto a sheet of paper before carrying it into the bush to release it.

Spiders, my father told us, keep undesirable insects under control. It was enough to convince barefoot children: we had often been afflicted by bee stings which made our soles swell up painfully. The arachnids hunted any bees unfortunate enough to settle on the floor, reducing our chances of being stung, so we tried not to harm the spiders when we found them at the long drop or inside the house.

Indeed, we were so relaxed in the presence of our eight-legged guests that we were astonished when a neighbour announced that the widow spider he'd spotted at our long drop had a bite that could kill a small child. So my father forbade us to visit the loo for a while, though he never changed his view that spiders, as a whole, are our friends.

**EVENTUALLY, MY MOTHER** decided that she'd had enough of long drops, and an indoor toilet was duly installed. What a horrible metal contraption it was! You cranked a lever to produce a noisy and ineffective flush, and I hated it, preferring to take my chances in an outside loo where one's doings disappeared into the dark caverns of the earth, never to be seen again.

Luckily, I was still able to enjoy the long-drop experience courtesy of my friend Charlie, whose family toilet was a far grander affair: the wooden platform had four holes of different sizes, so you could pick one that suited you, eliminating the danger of falling into that bottomless pit.

Charlie's long drop was also notable for the comic books stacked on both sides. I could sit there for hours, happily lost in the misfortunes of Dagwood or Richie Rich.

And that's exactly what I was doing when I had my most dangerous wildlife encounter. On that day, a slender reptilian head poked inquisitively out of the hole furthest away from where I was sitting and fixed its piercing eyes on me.

I sat there mesmerised, even after I recognised the serpent as a Cape cobra. It was only when its forked tongue flicked out suggestively that the adrenalin kicked in.

I will always be grateful that there was nobody around to see a small boy practically fall out of the shack, then stumble and hop along as quickly as he could with his trousers around his ankles.

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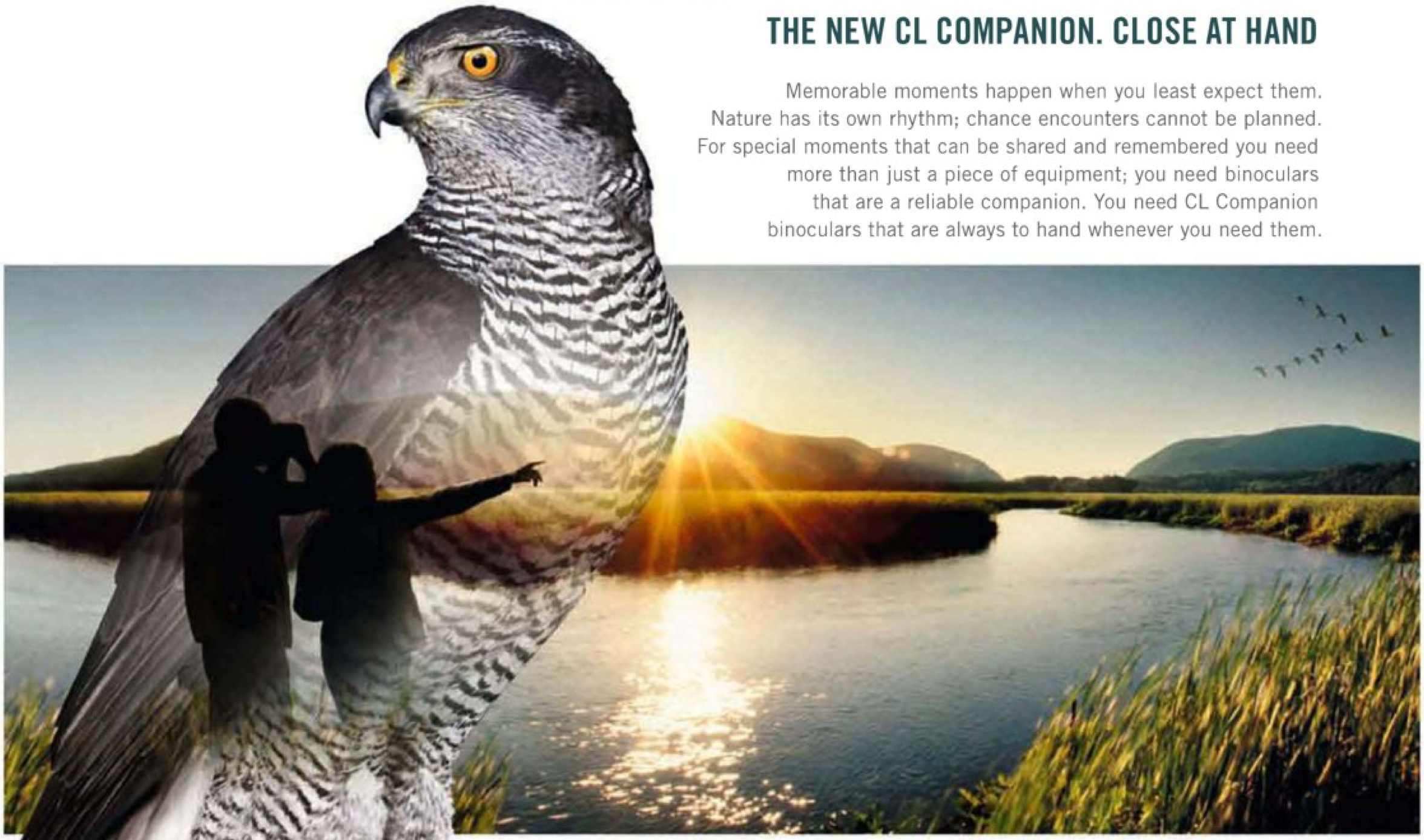

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