

THERE ARE
BIRDS
EVERYWHERE

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BRITTA TECKENTRUP





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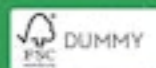
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THERE ARE BIRDS EVERYWHERE



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B P P

THERE ARE BIRDS EVERYWHERE

Birds soar through the skies, chatter in treetops, dabble in duck ponds and dive into the deep blue sea. Songbirds welcome each new day with a chorus of cheeps and tweets, while dancing birds delight us with their dazzling feathers and fine displays. Birds are also some of the world's greatest travellers and have made their homes from the Arctic in the north to the icy Antarctic in the south - and almost everywhere in between.



All birds have wings and feathers, but not all of them can fly. Can you spot four flightless birds from New Zealand?

IT'S A BIRD! (SO WHAT IS THAT?)

There are more than 10,000 species of bird around the world and they all have a beak, two legs, two wings and a feathered body. Mother birds lay eggs with a hard shell to protect the chick that grows inside. After a few weeks, the eggs hatch and the parents feed the chicks until they can take care of themselves.

BONY SKELETONS

Birds are **vertebrates**, which means they have bony skeletons. Their muscles are attached to their bones, which also protects the bird's soft organs such as the heart. The bones in a bird's skeleton are full of tiny holes, which keeps them light and makes it easier to fly.



LUNCHBOX

Some birds have a **crop** (a muscular pouch in their throats), where food is stored before it passes into the stomach. The **gizzard** is part of the stomach and birds that eat hard food often have little stones inside it. These stones help to grind the food into smaller pieces so they are easy to digest.

A bird's bones are supported by **struts**.



Struts are structures that help to strengthen the bone and protect it during take off or landing.

SENSES

Most birds have excellent eyesight and good hearing, but do not have strong senses of smell or taste. Their ears are small holes that are hidden behind their eyes, protected by feathers.



FLEXIBLE FEET

Bird feet are adapted for walking, perching and holding. Each foot has two, three or four toes. Birds have different shaped feet depending on the environment where they live.



Ducks spend much of their time in water and have webbed feet that are perfectly suited for swimming.



Songbirds have three toes facing forwards and one toe facing back. This arrangement works well for perching on branches.



Jacanas are tropical waders. They can walk on floating lily leaves because they have very wide feet that spread their weight.

WHY FLY WHEN IT'S FUN TO RUN?

Before humans brought land mammals, such as cats and dogs, to New Zealand, the birds that lived there had few predators. Over time, some of the birds that could safely live and nest on the ground lost the ability to fly.



The **kakapo** is the world's rarest parrot. It only comes out at night and it uses its stout legs to walk, jog or climb.



Kiwis have soft, fluffy feathers. They sniff out worms using nostrils at the tip of their beak, which is so sensitive it can feel the wriggling of worms under the soil.



Takahēs live in pairs and often stay together for life. If one takahē cannot see its partner, it calls 'cooet' loudly so the birds can quickly find each other.



Weka hens stay close to the burrow where they hide their cup-shaped nest and eggs. Wekas eat almost anything, from seeds and lizards to rotting meat.

BIRDS HAVE BEEN AROUND FOR AGES

Birds have been around for a really long time. Many dinosaurs had colourful feathers and, by around 150 million years ago, some of them had evolved (gradually developed) wings. They used their wings to fly into the trees, possibly to escape from predators or to find food. Over time, these flying dinosaurs evolved to become the first birds.

230 MILLION
YEARS AGO

Eoraptor

The ancestors of flying birds were dinosaurs that lived on land. Known as **theropods**, these creatures were small and speedy hunters that feasted on other reptiles and bugs.



Anchiornis

Although **Anchiornis** had wings, it probably couldn't fly. It used its long feathered limbs to climb trees instead. This bird-like dinosaur was just 35 centimetres long.

Archaeopteryx

Often called the 'first bird', its thought **Archaeopteryx** could fly short distances. It had feathers, a long bony tail, claws on its wings and a beak that was lined with teeth.



Confuciusornis

Confuciusornis had reddish-brown feathers and claws on its wing tips. It spread its wings to glide between trees, but it may have been able to travel further by flapping them.



Hesperornis

Stubby little wings are no use for flying, but they can be used like paddles to swim. **Hesperornis** was a diving bird that, like a modern **penguin**, swam underwater to catch fish.



Goldfinch

The first songbirds were perching in trees and singing to their mates more than 50 million years ago. They probably ate seeds, like modern **finches**.



Presbyornis

Presbyornis was a long-legged bird and is thought to be a prehistoric relative of water-loving birds such as **geese**, **ducks** and **swans**.



Argentavis

Argentavis was a giant bird with a wingspan of six metres. It was a member of a group of predatory birds called the 'monster birds' and would have dwarfed modern **condors**.



Titanis

Huge 'terror birds', such as **Titanis**, couldn't fly but they could chase their prey, using their long legs to race across the grasslands of North America.

Enormous birds of prey, such as **Teratornis**, were fierce hunters until the last Ice Age 11,700 years ago. As the world cooled down, there was less food to eat and **Teratornis** - along with many other large birds - died out.



Teratornis

TODAY

There are at least 10,350 species of bird alive today and scientists now believe that all of them are closely related to dinosaurs - from the smallest **oriole** to the mighty **golden eagle**.



Golden oriole

WHERE DO BIRDS LIVE?

Birds need a safe home to raise their chicks, in a place where they can find food nearby. They can be found near rivers, coasts, deserts and grasslands, but forests and woodlands are their favourite homes. In fact, there are more types of bird found in forests than any other habitat.

HIDEY-HOLES

Hornbills, macaws and owls make their homes inside natural tree holes, but woodpeckers use their sharp beaks to drill a new hole where they lay their eggs.

BEST FOR NESTS

Tucked away in a leafy tree, a goldfinch nest can be hard to find. That means this little bird's eggs and chicks are more likely to survive.

CAN YOU FIND?

Potoos and frogmouths have such good camouflage they are almost impossible to see when they sit perfectly still on a branch. Can you find one of each?

KITCHEN CUPBOARD

Trees provide plenty of food for birds, from seeds, flowers and fruits to bugs and small reptiles. Butcherbirds and shrikes first kill their prey, then impale them on twigs or thorns while they eat them and return later for the leftovers.

A PLACE TO PERCH

There's a bird's eye view from a treetop. Perched high up, blackbirds can look out for food, danger or a mate.

GLOBAL BIRDS

DESERT BIRDS

Water can be difficult to come across in a desert, but sandgrouse have a clever way to solve this problem. Males sit in waterholes where their feathers soak up water, like a sponge. Then they fly back to the nest and the chicks suck on their feathers when they are thirsty.

MOUNTAIN BIRDS

Enormous condors fly above the Andes mountains. They use their broad wings to glide on warm air currents, which lift them high into the sky. Some condors have wingspans of more than three metres.

GRASSLAND BIRDS

Having long legs and a swift running speed can come in useful in grassland habitats where there are few places to hide and hungry lions prowl. Ostriches are flightless birds, but they can race along the savannah at speeds of 60 kilometres per hour.

GROUND BIRDS

Ground birds often have patterned feathers that help them to hide from potential predators. Female pheasants have dull brown feathers that camouflage them when they nest on the ground. You can easily spot their male partners as they have much more colourful plumage.

WATER BIRDS

Birds from all over the world gather at the Andalusian coast in Spain, where the Atlantic Ocean and Mediterranean Sea meet the land. Alongside rivers and wetlands, birds can find food in the shallow sea waters and rest before continuing their journeys to places where they will nest and lay their eggs.

OCEAN HABITAT

Out at sea, there aren't many places to stop and rest, or to lay eggs. Many seabirds are long-distance travellers that have to fly for hours - or even days - dipping and diving to find food before they reach their coastal homes.

Large flocks of **shearwaters** skim across the surface of the water looking for fish, shellfish or squid.

The **skua** is known as a 'pirate bird' because it attacks other seabirds and steals food from them.

WETLAND HABITAT

Wetlands and rivers are home to many birds, but there's enough food for millions of migrating birds passing through, too. These weary travellers enjoy a well deserved rest before continuing their journeys.

There's a flash of bright yellow as some **golden orioles** fly past. These migrating birds nest in trees that grow alongside rivers and wetlands.

Puffins are called 'parrots of the sea' because they stand upright and have colourful faces. They nest at the coast where they hunt slippery sand eels to feed to their chicks.

CAN YOU FIND?

Marsh harriers nest on the ground, hidden by the tall reeds that grow in wetlands. They hunt mice, rats and voles as well as other birds. Can you find a harrier in its nest?

COASTAL HABITAT

Coastal birds gather on Andalusia's high cliffs, where they are safe from predators. They hunt fish in the sea, or pick up worms and shellfish that they find in the soft mud when the tide goes out.

Tough shellfish are too hard for most birds to eat, but the **oystercatcher** has a strong, blunt beak that can easily crack open hard shells.

Air sacs beneath a **gannet's** chest feathers work like cushions to soften the blow as it hits the water. Gannets can plunge more than 15 metres into the salty water to catch fish.

As it wades through water, the **egret's** feet disturb little fish, frogs or bugs, which the bird snaps up with its long beak.

The **black-winged stilt** has longer legs for its size than any other bird. Long legs are useful when wading through shallow water looking for tiny insects to eat.

THE POWER TO FLY

Flying is a very useful skill for birds. Imagine flying high in the sky, enjoying a bird's eye view of the world below – you can travel quickly, find food or spot new places to call home. Being able to soar up into the sky is also a great way to escape from dangerous predators on the ground.

BIRDS OF A FEATHER

Feathers grow from a bird's skin, just like hair grows from ours. Birds need feathers to fly, but they have other uses too – they can keep a bird warm and dry, help to camouflage it with its surroundings and attract a mate with their vibrant colours.



THERE ARE THREE MAIN TYPES OF FEATHER:

Down feathers are soft and fluffy for warmth.

Flight feathers grow on a bird's wings and tail. They help to lift the bird's body up into the air.

Contour feathers are stiff and cover the bird's body, giving it a smooth shape so it glides easily through the air as it flies. This is called **streamlining**.

WONDERFUL WINGS

Wings are essential for flight and their shape and size give scientists clues as to the way a bird flies and its speed.



Wandering albatrosses are not the fastest fliers, but they can stay at sea for years at a time. They have the largest wingspan of any bird – up to a colossal three metres. Their huge wings allow them to soar on the wind, barely needing to flap.



Birds with pointed wings that curve backwards are usually fast fliers. **Swifts** are aerial acrobats that quickly change direction as they dart, dip and dive to catch flying insects.



Short rounded wings help small birds, such as **sparrows**, to flit easily between trees and shrubs, and lift off at speed if a quick escape is needed.

FLOCK TOGETHER!

There's safety in numbers, so birds often live or travel in groups called **flocks**. It's harder for a predator to attack a large group than it is to attack a single bird.

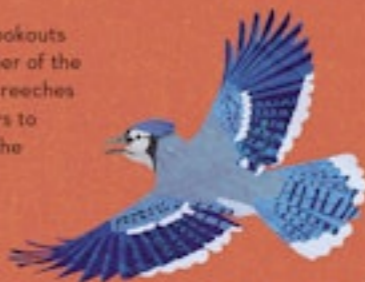
Starlings gather in large flocks called **murmurations**. As the flock flies, the birds swoop, dive and change direction together, creating a beautiful bird dance in the sky. Starlings often perform their flock-dances in the evening, just before they settle down to sleep for the night.

When one bird starts to change direction, the birds nearest to it follow suit. In a blink of an eye, the message to move spreads across the whole flock and the group changes shape and flies away in a different direction.

CAN YOU FIND?

Flocks of starlings twist and swirl to confuse predators, so they can't pick out one starling from the group. Can you find a puzzled falcon?

Blue jays make good lookouts in groups. If one member of the flock spies danger it screeches loudly, telling the others to either escape or mob the potential attacker.



In Africa, **red-billed queleas** gather in flocks of more than one million birds. The largest flocks often form just after the rainy season begins, when there is plenty of food to eat.



FEEDING

Modern birds don't have teeth, but that hasn't stopped them from being able to eat almost every type of food on the planet, from crunchy nuts to wriggly worms.

VEGGIE-BIRDERS

Nuts, seeds and fruits are perfect snacks for birds as well as people. They are packed with energy for a busy lifestyle.

Any predator that tries to eat a **hooded pitohui** gets a toxic shock! Poisons stored in the bird's skin and feathers come from their diet of poisonous beetles.

BUG-EATERS

Birds need good eyesight and quick reactions to snap up insects, spiders and other fast-moving bugs. Having a thin, dagger-like beak also help with the tricky task of picking up tiny creatures.

Bee-eaters snatch honeybees and other flying insects out of the air. They remove dangerous bee stings by rubbing the insects against a twig and swallow their prey whole.

UNUSUAL DIETS

Lots of birds eat seeds and fish, but others survive on stranger diets – including meals of blood or rotting meat!

The **Eastern spinebill** uses its tongue, which has a brush-like tip, to lap up nectar from flowers.

Parrots have very flexible four-toed feet. This **galah's** toes work like fingers to grip fruit and lift it to the bird's short, curved beak.

SEAFOOD DIETS

Oceans and rivers are home to tasty bird food such as soft-bodied fish, squid and worms, as well as crunchier shellfish and crabs.

Finches often have short, strong beaks for cracking open nuts and seeds. **Gouldian finches** peck at grass seeds that fall on the ground.

Pied avocets are waders that swish their long, curved beaks from side to side in the water, scooping up worms, shellfish and insects.

The rough pads on an **osprey's** feet are perfect for gripping slippery fish, which it snatches out of the water. Ospreys carry their food back to their nests or a perch nearby to eat.

Long-legged **secretary birds** have clever ways to kill venomous snakes without getting bitten themselves. They either stamp on them first, or carry the snake up into the sky and let go, before swooping back down again to gobble them up.

The **redshank** is named after its bright red legs. Its long beak is perfect for digging worms and shellfish out of soft mud and sand.

BARN OWLS

On a dark summer's night, the eerie screech of a barn owl can be heard across fields and around farm buildings. Unlike many owls, which hoot, these pale hunters scream as they fly, which is why they are sometimes known as 'ghost owls'.

Most birds have eyes on either side of their head, which is useful for seeing all around, but an owl's eyes face forwards. This arrangement means owls can spot small animals at night and work out exactly how far away their prey is.

A barn owl's face is creamy-white and the feathers around it are shaped like a heart. Scientists think this shape helps direct sound towards the owl's ears.

Owls use their hand-like talons to grab their prey. They usually return to a perch to eat, swallowing small animals in one gulp.

A barn owl can pinpoint where any sound is coming from because its ears are set at different levels on each side of its head. These night-time hunters have such good hearing they can find small animals in total darkness.

When the barn owl spots its prey, it hangs silently in the air above it before plunging down. It spreads out its wings and fans its tail feathers to hover in the air.

Like many other hunting birds, barn owls attack in silence and take their prey by surprise. Their feathers have soft edges to muffle the sound of their wings flapping.

After a meal, owls vomit up pellets made of all the body parts they can't digest, such as feathers, bones and fur.

CAN YOU FIND?

Barn owls mostly hunt small animals such as mice, shrews and voles. There are five mice hiding in this scene. Can you find them all?

MEAT-EATERS

Birds that hunt other animals are called **birds of prey**, or **raptors**. Most of these meat-eaters are equipped with sharp eyesight, strong talons and a hooked beak.

MONKEY-HUNTERS

Deep in the Amazon jungle, monkeys keep an eye out for **harpy eagles**. These raptors are huge creatures, with powerful legs and talons that can snatch large creatures like monkeys and sloths straight out of a tree.

BUSY BUILDERS

Birds of prey often build large, messy nests and some species return to the same nest year after year, adding more sticks to create enormous piles. The nest of a **bald eagle** can weigh as much as a small elephant! These large birds carry prey back to their huge nests to feed their young.

SCAVENGERS

Vultures feed on the bodies of dead animals that they find. Many of these scavengers have a bald head and neck so they can tuck in to a meal without getting their feathers in a mess.

LOVE BIRDS

Male birds are some of the most brilliant and beautiful show-offs in the animal kingdom. They flash their colourful feathers, sing songs and do dazzling dances to impress females. This behaviour is called **courtship**.

When a male **frigate bird** wants to catch a female's eye, he puffs up his red throat. It fills with air and swells like a big red balloon.

Blue is the favourite colour of **satin bowerbirds**. Males make a **bower** (an elaborate structure) from sticks and decorate it with any blue objects they find to impress their mate. These items include feathers, paper, beads and blue plastic toys.

Male **blue-footed booby** birds wave their bright blue feet, bob their heads and even present females with a gift of food. If the females like what they see, they join in with the toe-tapping dance.

SHOW-OFFS

Birds of paradise are experts at the art of courtship displays. There are around 40 species in total and most of them live on the tropical island of New Guinea.

The long, glossy, elegant feathers of a male **ribbon-tailed astrapia** show a female that he is healthy and fit. Females prefer to mate with healthy males, as their chicks are more likely to survive.

When a **raggiana bird-of-paradise** puts on his courtship display he dips his head down and spreads out his wings like a colourful fan, and shakes his long, fluffy tail feathers.

The slender tail feathers on this **king bird-of-paradise** are called **wires** and they normally hang downwards. However, during courtship, the male wobbles from side to side on his blue feet and flips the wires up so they wave around behind his head.

It's not just how you dance, it's *where* you dance that matters. The **Wilson's bird-of-paradise** clears the forest floor of any fallen leaves to create a smooth stage where he can perform elaborate dance routines for his mate.

The male **greater bird-of-paradise** sings to help females find him. His strange songs include calls of 'caw-caw-caw', 'wick-wick', 'koo-koo' or 'waak' but some even miaow like a cat!

This female **superb bird-of-paradise** looks very different to her mate, who turns his feathers into a shiny black cape with a startling blue bib! As he dances, he trots from side to side to keep her attention.

PENGUIN PARADE

Antarctica is the coldest place on Earth. It is covered with a thick blanket of ice and snow that stretches out into the Southern Ocean, where it is so cold that even the seawater freezes. Despite the howling winds and blizzards, hardy **emperor penguins** complete a long and dangerous journey each year in order to raise their families.



The long Antarctic winter - which lasts from **March to October** - is just beginning and thousands of emperor penguins gather together in a huge group, called a **colony**. The male penguins find their partners and mate. Each female lays a single egg.



Plants can't grow in this icy wilderness, so the penguins don't make nests. Instead, females keep their eggs warm and safe by resting them on their partner's feet.

Together, the families begin to make their way to the sea. They will spend the rest of the summer there, eating and fattening up so they are ready to survive the next winter.



By **December**, the chicks have grown almost as tall as their parents. Their fluffy grey plumage is gradually being replaced by glossy black and white feathers.



It's **September** and summer is finally on its way. The chicks are growing bigger and their parents take turns trekking back to the sea to fetch more food.



Some of the eggs have already begun to hatch. The females feed the chicks with fish that they regurgitate from their stomachs. Their partners can now begin the long journey back to the sea to eat for the first time in months.



In **July**, the females begin to return to the colony with stomachs full of fish. The males and females call out to each other until each bird finds its mate.



Males must survive for months on end without food while the females are gone. Cold and hungry, they huddle together for warmth and protection as the worst of the winter's weather hits the colony.



In the middle of winter, a night can last for 24 hours in Antarctica. There is no food in this frozen land, so the females must make the long journey to the sea to go fishing. Depending on the location of the colony, this can be a gruelling 80 kilometre journey.

NESTS

Emperor penguins don't build nests, but most birds do. Nests come in many shapes and sizes, but a cup shape is the most common. They are usually made from plant material and they protect eggs from predators.



Swiftlets make tiny nests from dried spit and attach them to cave walls. In some parts of the world, the nests are collected and turned into soup.



Ovenbird parents work together to build a big nest from mud. The mother sits on her eggs for 14 days to keep them warm, a process called **incubation**.

This male **weaver bird** uses grass to weave nests. He hangs upside-down beneath a nest and flaps his wings to tempt a female to come and lay her eggs inside.



LONG DISTANCE TRAVELLERS

When the weather turns bad or there's no food to be found, it's time to make a move. Many birds go on long journeys to find warmer or more protected places to raise their chicks. **Arctic terns** are the world's champion migrators, travelling an astonishing 2.4 million kilometres in one lifetime. That's like flying to the Moon and back three times!

This epic journey takes an Arctic tern through a year of endless summers, from the Arctic region at the top of the world, to the Antarctic at the bottom. The birds can fly further than 50,000 kilometres in just one year, making this the longest migration of the animal kingdom.

It's the end of summer in Greenland, near the North Pole, and it's time for the Arctic terns to fly south. If they don't leave before winter, they will starve or freeze to death.

After flying about 6,000 kilometres, the birds enjoy a month-long summer holiday on islands in the North Atlantic Ocean.

By **May and June** most of the terns have reached Greenland. It's summer again, and with warm weather and plenty of food in the sea, it's a perfect time to lay eggs and care for their chicks.

When their well-earned rest is over, in **September** the Arctic terns head south again. Some birds fly along the coast of Africa while others cross the ocean and fly along South America's coastline.

It's a mystery how migrating birds know how to follow the same route each year. They may recognise places like mountains and coasts, but scientists think they also use the Earth's **magnetic field** as a compass.

For the next five months the birds focus on eating, growing and putting on weight as they prepare for the long return journey. The Antarctic winter is fast approaching and soon it will be time to head north. With strong winds behind them, they can often fly more than 500 kilometres a day.

By **November**, the birds have reached the Weddell Sea and take another break – this time perching on giant icebergs. It's summer in Antarctica and they feast on **krill**, the tiny pink shrimp-like animals that thrive in these waters.

BIRDS AND PEOPLE

Birds have been part of culture, mythology and history for thousands of years, but they also enrich our daily lives with their songs and fascinating behaviour. As we become more aware of the importance of the natural world, we are learning to treasure our feathered friends and take better care of their habitats.



THAT'S EGGSTRA-ORDINARY!

An **ostrich** egg is about 15 centimetres long and it can be turned into a giant omelette! **Chickens** and **ostriches** that live on farms lay eggs that are **unfertilised**. This means the eggs won't grow into chicks and can be used as a good source of protein in our diets.



BIRD GODS

The **phoenix** is a mythical bird that the ancient Greeks believed could live for hundreds of years before dying in a blaze of flames and being reborn from the ashes. The ancient Egyptians revered the **hawk** god, Horus, who they believed protected their **pharaohs** (rulers) from evil.



HERO BIRD

A **pigeon** called GI Joe saved the lives of 100 soldiers in the Second World War. He carried a message to American soldiers that warned them not to bomb a town where the British soldiers had just arrived. GI Joe was awarded a medal for his bravery.

BIRDWATCHING

Birdwatching is one of the world's most popular hobbies. It's fascinating learning how to recognise the birds that live around us in gardens and parks, and visiting wild places to spot new species.

Binoculars, a camera, a notebook and a pen are useful tools for a birdwatcher.



You can watch from a safe distance, but you should never disturb a bird's nest or touch its eggs and chicks. This is to avoid hurting the animals and spreading diseases between people and birds.

If you see a bird with a metal ring on one leg, it might be part of a scientific study on migration. Scientists track these birds to discover how well they are coping with climate change, the loss of their habitats and other threats.

Make a note of the bird's size and how it behaves, looking carefully at its colours and listening to its song. Use this information to identify the bird and find out more about how it lives.



BIRDS IN SCIENCE

People have always wondered what it would be like to fly like a bird. In the fifteenth century, Italian artist and inventor Leonardo da Vinci designed a flying machine called the **Ornithopter**. It wasn't until 1903 that the first successful aeroplane was invented by Wilbur and Orville Wright.



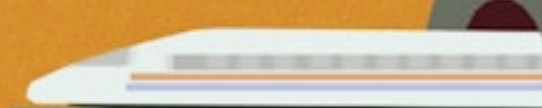
Some drones are designed to look like **herring gulls**. They fly smoothly because they mimic the way real gulls fly, twisting and flapping their wings to gain height, move forwards and change direction.



In 1976, a scientist called Irene Pepperberg bought Alex, an **African grey parrot**, from a pet shop. She taught him to say at least 150 words, which he used to 'talk' with Dr Pepperberg. Alex helped scientists discover more about how birds learn new skills and communicate.



When bullet trains speed out of tunnels at 300 kilometres per hour, they create an unpleasant booming noise. Engineers copied the long beak of a **kingfisher** - a bird that dives into water - to improve the trains' shape. The new design cured the noise problem and cut the trains' energy use.





CAN YOU FIND?

This little gecko is critically endangered, which means it is at very serious risk of dying out forever in the near future. It's called *Phelsuma antanasy* and it lives in forests on the island of Madagascar. In recent years, large areas of forest have been cut down for farming and today there are fewer than 10,000 of these geckos left alive. But there is one *Phelsuma antanasy* hiding somewhere in this book!

Can you find it?