WWF
FOR YOUR WORLD

Action

THE MAGAZINE FOR WWF MEMBERS SUMMER 2019

WIN
A COPY OF THE *OUR PLANET* BOOK
See page 30

CLIMATE CRISIS

How you're helping walruses and other Arctic wildlife cope with a rapidly changing world

INFRARED APES

Why we're testing incredible star-spotting technology to help protect orangutans

BE KIND TO BEES

We can't live without bees, so here's how to give them a hand

“WE’RE FACING A MANMADE DISASTER OF GLOBAL SCALE, OUR GREATEST THREAT IN THOUSANDS OF YEARS: CLIMATE CHANGE”

SIR DAVID ATTENBOROUGH, WWF AMBASSADOR

It’s time to get the world talking about the home we all share, before it’s too late. That’s why we partnered with Netflix to create the stunning new series *Our Planet*. Each programme showcases different habitats experiencing change – including the Great Barrier Reef in Australia – and explores what steps we must all take to protect them. Climate change is causing horrific coral bleaching and damaging this vital reef system, the biggest living structure on the planet. It’s a stark reminder that our actions in the next 20 years will determine the future for all life on Earth. Find out more at ourplanet.com

CLIMATE EMERGENCY

Climate change is wreaking havoc on our planet, threatening all life as we know it. If we fail to act on climate change, one in six species faces extinction. Across the globe, we’re uncovering devastating new evidence that wildlife cannot cope with our warming world. Shrinking sea ice is forcing tens of thousands of walruses ashore, with deadly consequences (see page 10). Animals and people are having to adapt or move in order to survive. Rising temperatures are causing insect populations to crash. And precious coral reefs are being destroyed by mass bleaching events.

Thanks to your membership, we’re working hard to protect wildlife, forests and ocean habitats from the worst effects of climate change. It’s possible to prevent the widespread loss of nature and harm to human lives that climate devastation will bring, but we need to act quickly.

We’re calling on the UK government to take urgent action to tackle the crisis and end the UK’s contribution to climate change. Find out more at **wwf.org.uk/actiononclimate**

CONTENTS

MEET THIS ISSUE’S CONTRIBUTORS

TOM ARNBOM is WWF’s senior adviser on the Arctic, based in Stockholm. He first worked in the Arctic 45 years ago, and has seen the impact of climate change first-hand. He says: “It’s not the same Arctic I saw in the 1970s. And what happens in the Arctic doesn’t stay there.”

SERGE WICH is a biologist and professor at Liverpool John Moores University. He’s been working with WWF in Sabah to trial a new method of counting orangutans. He says: “I wasn’t sure infrared would work, but it’s been extremely successful.”

KATE BRADBURY is an award-winning author and journalist, specialising in wildlife gardening. She says: “Our beleaguered bees need our gardens now more than ever. If you create the right habitats, you’ll be surprised at how quickly wildlife turns up.”

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TOGETHER, WE DID IT!

Thanks to your membership, we can help protect wildlife and wild places. Here are some of the great things supporters like you have helped achieve

"IF WE DAMAGE THE NATURAL WORLD, WE DAMAGE OURSELVES. WE HAVE THE POWER AND THE KNOWLEDGE TO LIVE IN HARMONY WITH NATURE"

SIR DAVID ATTENBOROUGH, WWF AMBASSADOR

TOGETHER, WE DID IT!

Timing of the krill fishery activity in the peninsula coincides with the humpback whale foraging season – November to July

DID YOU KNOW?

Humpback whales may consume 1–1.5 tonnes of krill every day during the foraging season

© GETTY

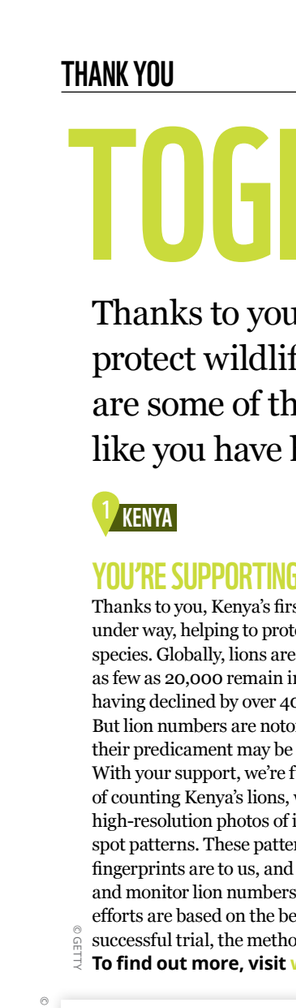
1 KENYA

YOU'RE SUPPORTING A VITAL LION CENSUS

Thanks to you, Kenya's first-ever national lion census is under way, helping to protect one of Africa's most iconic species. Globally, lions are in decline. It's believed that as few as 20,000 remain in the wild, their populations having declined by over 40% in the last three generations. But lion numbers are notoriously difficult to estimate, so their predicament may be even worse than feared.

With your support, we're funding a new, robust method of counting Kenya's lions, which involves taking close-up, high-resolution photos of individual lions and their whisker spot patterns. These patterns are as unique to the lion as our fingerprints are to us, and they'll help us accurately estimate and monitor lion numbers to make sure our conservation efforts are based on the best possible science. Following a successful trial, the method is being rolled out across Kenya.

To find out more, visit wwf.org.uk/lions



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2 BULGARIA

YOU HELPED SAVE AN ANCIENT BALKAN FOREST

Together, we saved Pirin National Park, a World Heritage site, from illegal construction and plans to allow more logging. Bulgaria's flagship park is a beautiful place of limestone mountains, glacial lakes and old-growth pine forests harbouring bears and wolves. Recently, the Bulgarian government proposed a new management plan for the park that would have opened 48% of it up to industrial-scale logging and the construction of new skiing facilities in the Bansko resort. With the help of over 125,000 people from 150 countries – including many WWF members – who signed our global petition, we took the government to court. In a revolutionary ruling, the court overturned the controversial plans, setting an important precedent for nature conservation in Bulgaria.

© GETTY

3 JAVA

YOU HELPED PROVIDE RELIEF IN A CRISIS

With your support, we provided emergency supplies to the victims of the tsunami that hit Java and South Sumatra last year. This tragic event killed over 400 people and made more than 10,000 homeless. Several villages within the areas surrounding Ujung Kulon National Park, where we work, were affected. We helped with search and rescue efforts and set up four relief distribution points to provide blankets, food, water and medical supplies. We also assisted park staff to assess the impact of the tsunami on the 68 Javan rhinos living in the national park, the only place in the world this critically endangered species is found. Fortunately, none were harmed. We're urging the Indonesian government to move forward with plans to establish an additional population of Javan rhinos outside of the park to safeguard these precious survivors.

© GETTY

337

The number of elephants moved off the tracks in Rajaji Tiger Reserve by night patrols since July 2018. On average, about three accidents were averted each week

4 INDIA

YOU HELPED SAVE ELEPHANTS' LIVES

You're supporting our work to protect India's endangered Asian elephants from collisions with trains. The country's expanding rail network is putting pressure on elephant populations already under threat. So we're trialling an early warning system that will detect elephants on tracks in Rajaji Tiger Reserve, Uttarakhand – one of the places where a lot of collisions occur. A network of solar-powered seismic sensors buried beside the tracks will detect the vibrations caused by elephant footsteps, and send an alert so that prompt action can be taken to minimise the number of elephants hit by trains.

© GETTY

5 UGANDA

YOU HELPED PROTECT MOUNTAIN GORILLAS

Thanks to you, we're testing new technology to help protect Uganda's mountain gorillas. We're working through the International Gorilla Conservation Programme (IGCP) and with communities neighbouring Bwindi Impenetrable National Park to help reduce conflict with gorillas and other wildlife. Wild animals can raid crops and endanger local people's livelihoods, and for mountain gorillas it can increase the risk of catching human diseases. So we're working with volunteer community Human and Gorilla (HuGo) conflict resolution groups to pilot a new app that sends real-time incident reports and automates analysis of data. It will provide data that's up to date, to support management decisions and conservation efforts.

© GETTY

6 ANTARCTICA

YOU'RE HELPING PRESERVE HUMPBACK WHALE FEEDING GROUNDS

Thanks to your support, we've been unravelling the mystery of exactly where humpback whales feed on krill. Satellite tracking has identified the western Antarctic peninsula as a feeding hotspot for these gargantuan gastronomers, and highlighted the need for increased protection in the area. Our new report *Whales of the Antarctic Peninsula*, in partnership with the University of California Santa Cruz, reveals that humpbacks rely heavily on the peninsula. "Tracking data from over 60 satellite tags shows that the whales forage, rest and travel between feeding spots here," explains Dr Ari Friedlaender, who led the research. "Feeding without disturbance is critical to store up the energy to sustain them on their long migration to their tropical breeding grounds." Like the humpbacks, the krill fishery follows the seasonal movement of krill close to shore, placing them in direct competition with the whales and increasing the risk of disturbance and ship strikes. We're fighting for a network of marine protected areas to help safeguard these gentle giants.

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WWF IN ACTION

How we've been fighting for wildlife and our world

© LAUREN SIMMONDS / WWF-UK

EARTH HOUR SPARKS ACTION TO RESTORE NATURE

Earth Hour 2019 focused the world's attention on the loss of nature – and we couldn't have done it without you

On Saturday 30 March at 8.30pm, individuals, businesses and cities in 188 countries and territories worldwide joined us to speak up for nature and inspire urgent action for the environment. As Earth Hour rolled around the globe, thousands of landmarks switched off their lights in solidarity for our planet.

In London, hundreds of landmarks went dark for the hour, including Carnaby Street, the Shard and Tower Bridge. A thrilling countdown to Earth Hour drew huge crowds at Piccadilly Circus. In Wales, the Head 4 Arts event at Parc Penallta welcomed hundreds of people by filling a field with magical giant animal lanterns. In Scotland, iconic landmarks including Edinburgh Castle, Forth Rail Bridge and the Kelpies joined others in a visual display of their commitment.

It was inspiring to see Earth Hour motivating more people than ever to take personal action to protect the planet. Hashtags including #EarthHour and #Connect2Earth trended in 26 countries. Thousands of individuals pledged their support, challenging world leaders to push the preservation of nature up the global agenda.

Our incredible partners also made this Earth Hour one of the best. London's Carnaby Street redesigned its iconic arch to feature some of our most endangered wildlife as a reminder of why we need to make a change this year. Meanwhile, GoodGym organised around 70 events that gave communities the chance to do their bit for their local environment.

This year, ITV's *Coronation Street* and *Emmerdale* joined the fun, with 'Corrie' tweeting an #EarthHourSelfie, while *Emmerdale* shared a video clip on Twitter.

Together, we demonstrated just how powerful Earth Hour can be. More and more people are calling for institutional change to tackle the climate crisis, and global movements such as Earth Hour provide a clear message to our leaders that people want change to halt the loss of nature – and they want it now. From Germany to Morocco to Indonesia, people spoke up on issues such as sustainable lifestyles, plastic-free oceans, water conservation and deforestation.

Earth Hour's greatest strength is the power of people – and with your support, we can inspire even more people to take action. As young influencer Greta Thunberg tweeted: "Earth Hour is every hour of every day." Find out more at **wwf.org.uk/earthhour**

YOUR PROMISE TO THE PLANET

More than 36,000 people have made pledges to protect the planet

I'LL RESTORE NATURE WHERE I LIVE
Support wildlife in your garden or local community by sowing wildflower patches or providing shelter.

I'LL PLAN A HOLIDAY CLOSER TO HOME
Flying is a significant part of most people's climate change footprint. Could you holiday closer to home, or travel by train?

I'LL CHANGE THE WAY I EAT
Food is a major cause of deforestation and wildlife loss. Try to reduce the amount of meat you eat and avoid food waste.

I'LL REDUCE THE PLASTIC I BUY
Make better choices every day, from using refillable water bottles and coffee cups, to buying loose fruit and veg.

I'LL MAKE MY OWN PLEDGE
Think up a big change you can make to your lifestyle that will have a positive impact on our planet.

There's still time to make your pledge today at **wwf.org.uk/voicefortheplanet**

NEWS IN BRIEF


Krill are tiny, shrimp-like crustaceans

© NATUREPL.COM / INGO ARNDT / WWF

KRILL CONCERN AS ICY WATERS WARM

A new study we supported has found that fewer young krill are surviving to adulthood around Antarctica as ocean temperatures rise. Krill are a critical food source for fish, penguins and whales, and the Scotia Sea in the Southern Ocean is home to the largest concentrations. But over the past 40 years, an increasingly unfavourable climate has led to fewer young replenishing the population, and the krill's distribution is contracting south. In future, the wildlife that depends on krill may face more intense competition with each other – and with krill fisheries – for this vital food source.

NEWS IN NUMBERS

50

From algae to yam bean roots, we're championing 50 foods for healthier people and a healthier planet. Our new report *Future 50 Foods*, in partnership with Knorr, aims to inspire people to adopt a more diverse diet. It identifies ingredients that taste good, are nutritious and are kinder to our planet. Visit **wwf.org.uk/futurefoods**

8

Eight million tonnes of plastic is dumped in our oceans every year. From our local beaches to the remote Arctic, plastic pollution is choking our seas. So far, thousands of amazing supporters around the world have signed our petition calling for urgent action at the UN – including an immediate agreement which will stop the leakage of plastics into the oceans.

NEWS IN BRIEF

© NICK KINDON / WWF-UK

WASTESHARK COMBATS MARINE PLASTIC

As part of our efforts to improve the health of our oceans, WWF and Sky Ocean Rescue have launched the UK's first WasteShark. In March, the autonomous marine robot began roaming Ilfracombe harbour, in north Devon, which is home to a rich variety of wildlife, including grey seals. WasteShark swims around capturing up to 60kg of waste at a time, including plastics and pollutants. The plastic is then recycled. By removing waste as it enters the harbour, WasteShark prevents it from being washed out to sea, where it threatens marine wildlife. Watch the film at **wwf.org.uk/wasteshark**

© WWF-BRAZIL

NEW RESEARCH ON 'JAGUAR ISLAND'

Our camera traps are helping to reveal the secret world of jaguars on mysterious Maraca Island, an uninhabited and largely unexplored tropical island lying 5km off the coast of Brazil. Maraca contains around 60,000 hectares of rainforest and is home to magnificent jaguars. But how they got there is still unclear. To find out more, we placed camera traps around the island. As you can see from the picture above, they're already producing excellent results. Next, we hope to collar individual jaguars in order to track their movements. We'll let you know what we discover.

SCIENTISTS SOUND A CALL FOR NATURE

We're backing an urgent call for global action to halt the decline in nature, as a major new report by international scientists reveals that more than a million species are at risk of extinction

In May, the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) launched a landmark report on the state of nature. The Global Assessment report provides compelling scientific evidence of the role biodiversity and natural assets play in our economies and businesses, and demonstrates the connection between climate change and loss of biodiversity. It aims to make governments fully aware of the risks of nature loss for the future development of societies and economies, and reinforces the urgent need for action to reduce our impact on our planet's survival systems.

The IPBES report comes at a critical time, when the devastating impacts of climate change are pushing the planet to its brink. Last year, our Living Planet Report valued the services nature provides for humanity at around US$125 trillion a year, and revealed that wildlife populations had plummeted globally by 60% since 1970. This catastrophic decline in biodiversity is undermining nature's ability to sustain life as we know it.

"To fulfil our basic needs we rely on a complex web of processes, powered by the millions of plants and animals with which we share our planet. But biodiversity is declining at an unprecedented rate," says Rebecca Shaw, a WWF chief scientist. "We need to inspire the world to act in 2020. Governments, businesses, financial institutions and civil society must commit to halting the loss of nature and set it on the path to recovery. Nature needs to be high up on global policymakers' agendas."

To coincide with the IPBES report, we also initiated the 'Call4Nature', an open letter calling on world leaders to act now to save our planet. Renowned scientists, wildlife experts and public figures came together to sign it, including Dr Jane Goodall, Chris Packham, Julia Bradbury, Hugh Fearnley-Whittingstall and WWF-UK's CEO Tanya Steele.

We also released a Call4Nature photo series featuring some of the world's top wildlife photographers. The images, which illustrate some of nature's biggest challenges, are a powerful reminder of the need to create a New Deal for People and Nature in 2020 – a global action plan to tackle climate change and the loss of nature. See for yourself at **wwf.org.uk/call4naturenow**

© SIMON LORENZ / WWF-HONG KONG

Coastal marine ecosystems show some of the most rapid ongoing declines

The fallen log seen in this image is one traditionally used by poachers to set metal snares to capture snow leopards for their pelts. But this family is safe.

SNOW LEOPARDS RECLAIM THE WILD

A remarkable image caught on a remote camera offers new hope for the future of snow leopards in Russia

The image shows a female snow leopard known to experts as Yunchi, with her two cubs, exploring an area that was once riddled with hundreds of poachers' snares. It was captured on one of our remote cameras in the Argut river valley in Russia's Altai-Sayan ecoregion, a landscape of high mountains that offers a last refuge for this rare feline.

Historically, snow leopards were poached out here. Now, the Argut valley is well protected through patrolling and monitoring activities, allowing this family to roam freely and safely. And, slowly, numbers are rising once more.

In 2013, WWF teams in Russia helped establish Sailugemsky National Park and began supporting anti-poaching patrols throughout the Argut region. They also began outreach and education programmes. In 2014, they invited six ex-poachers to become snow leopard guardians and helped them understand how the cats were worth more alive.

Each reformed poacher now protects his own area where one or two snow leopards roam. They monitor the cats using camera traps. Together, they're helping local people to see snow leopards as a treasure they want to protect.

© WWF-RUSSIA

HUNTING FOR GHOST GEAR

We're helping to retrieve and recycle lethal plastic fishing nets from Greenland's waters, and to set better standards for more sustainable Arctic fisheries

We're supporting a project tackling a deadly threat to marine life in the spectacular World Heritage site of Disko Bay, west Greenland. In the dark depths beneath the bay's imposing icebergs lie an overwhelming number of ghost fishing nets.

These lost and discarded plastic nets and long lines continue to be a lethal trap to birds, fish and marine mammals, such as seals, even after they've been discarded. Indeed, a new study has shown that a year after a gill net is lost it can still catch nearly a fifth as many fish as an actively managed net. That's bad news for fish populations, and the wildlife and people that depend on them.

The abandoned polymer ropes and fishing gear also add a significant amount of plastic pollution to the ocean. They leach microplastic fibres into the water, and these enter the food chain when they're ingested by organisms such as fish. A recent study found that microplastics are now found everywhere in Arctic waters, and seabirds are suffering. In several Arctic areas, over 70% of northern fulmars were found to have plastic in their stomachs.

© WWF-DENMARK

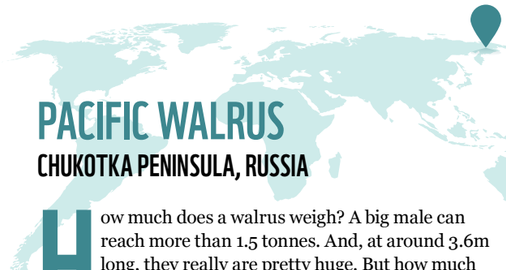
So in October, we began cleaning up Greenland's fishing grounds. We collected and sustainably disposed of ghost fishing nets, helping to save the lives of countless animals. But we're not stopping there. Our goal is to stop fishing gear from being lost or tossed in the first place. So we're fighting to make sure that all gear can be traced back to its owner, that refundable deposits on fishing gear encourage its return, and that insurance incentives encourage safe gear disposal. We're also helping to develop tools, such as sonar reflectors, that will make lost gear easier to find.

Find out more **wwf.org.uk/ghostnets**

CLIMATE CHANGE SURVIVORS

The Arctic is warming rapidly. But thanks to you, we're working to tackle the climate crisis and protect the region's iconic wildlife

In the Arctic, the minimum level of sea ice is declining by around 13% each decade. When the sea ice recedes over the deep ocean basin, walruses must either continue to 'haul out' on the sea ice with little access to food, or abandon the ice and move to coastal areas where they can rest on land. Haul-outs containing thousands of walruses have become increasingly common during low ice years



PACIFIC WALRUS

CHUKOTKA PENINSULA, RUSSIA

How much does a walrus weigh? A big male can reach more than 1.5 tonnes. And, at around 3.6m long, they really are pretty huge. But how much does a walrus smell? That's a more important point than you might imagine – particularly if you live in a village where 40,000 of them have hauled themselves out of the sea and into the schoolyard. The answer is, perhaps unsurprisingly, not good. "They smell like hell," smiles Tom Arnbom, WWF's senior adviser for the Arctic.

It's not a hypothetical question for the residents of Vankarem and Ryrkaypiy, small settlements on the Chukotka Peninsula in far-eastern Arctic Russia. And it became a problem in summer 2007, when the sea ice edge lay a record distance (around 1,200km) away from the Chukotka coast. Indeed, the extent of sea ice across the Arctic that year was the lowest on record: in September 2007 it dropped to 4.13 million sq km – 38% below the 1979-2000 average.

Pacific walruses like to rest on floating sea ice, diving down to eat mussels and clams on the seabed. But if ice is sparse they rest on land, congregating in huge haul-outs often numbering tens of thousands, as it was in Chukotka in 2007. An estimated 20,000–30,000 walruses hauled out near Vankarem (which, according to some, means 'tusk people', referring to the indigenous population's reliance on walrus hunting). Meanwhile, 200km to the north-west, an intimidating 40,000–50,000 individuals congregated in the schoolyard at Ryrkaypiy, a settlement of around 1,000 people. Suddenly, around 70,000 walruses were thronging in places that had never experienced such huge haul-outs in living memory.

A CRUSH OF WALRUSES

"That caused problems, especially in Ryrkaypiy," recalls Tom. "There was a lot of noise, there was a bad smell and when people started taking pictures it caused stampedes." When startled, walruses dash for the ocean – and young calves are easily crushed by huge, panicking males. "More than 650 individuals died in the schoolyards," says Tom, "and there were more deaths near Vankarem. Overall, probably more than 2,000 individuals died, mainly young ones."

The smell of dead walrus wasn't just a superficial sensory problem for these communities. "The people realised that polar bears would arrive in winter and be attracted to the walrus carcasses in the settlements," explains Tom. "So to keep both the people and the ▶

During low sea ice years, remaining on the floes means Pacific walruses have further to swim back to shallower waters to find food, since the sea bed is too deep for them to reach. As a result, females are in poorer condition. Calves are also more likely to become separated from their mothers in the deep water

THE AVERAGE TEMPERATURE OF THE ARCTIC HAS INCREASED BY MORE THAN 2.3°C SINCE THE 1970S, AND CONTINUES TO INCREASE BY 0.6°C PER DECADE

polar bears safe, we gave funds to local communities to cover the fuel and labour required to drag the walrus carcasses away and stack them up to keep bears away from villages. The smell was incredible!"

The problem with shrinking sea ice isn't going away – and neither are the walruses, which have kept returning to the Chukotka coast. "Polar bears have learned this," reports Tom, "and they've started visiting areas in summer that they used to only migrate through in winter, to feed on the walruses. The bears may not even have to hunt – they can just eat the carcasses of walruses killed in stampedes."

Across the Chukchi Sea to the east, too, summer colonies of more than 10,000 walruses now gather at Point Lay in Alaska almost every year. Here, people are kept away from the haul-outs to prevent dangerous stampedes.

Climate change is disproportionately affecting the Arctic and its inhabitants – walruses, humans and other species. The average temperature of the Arctic has increased by more than 2.3°C since the 1970s, and continues to increase by 0.6°C per decade. The retreating sea ice is just one result. Changing conditions are affecting animal migrations, vegetation ranges, even the fat content of marine prey species – and these effects are not the same everywhere.

For example, the impact on the Atlantic walruses, mostly around Greenland and eastern Arctic Canada, has been minimal compared with their Pacific cousins. Atlantic walruses tend to hang out on islands and coastlines because their shallow feeding grounds are closer to the shore, so they aren't reliant on sea ice. Indeed, the population on Svalbard – a Norwegian archipelago in the Arctic Ocean – seems to be growing, in part because of hunting restrictions but possibly also because less sea ice means easier access to their feeding areas around islands.

So it's not just one story for all species across the Arctic, but a mixture. Melanie Lancaster, WWF's Arctic species specialist, explains: "There's a lot of uncertainty for scientists and conservationists in this area, so it's important we continue with monitoring and research, as well as moving quickly on policy."

With your help we're supporting and undertaking a range of work on walruses across the Arctic. In Russia, we've helped fund a report gathering data from different sources on the status of walruses across the Arctic region, and supported DNA studies to determine whether Atlantic and Pacific populations are mingling in the Laptev Sea. We've also been supporting research into behaviour and numbers at haul-outs in western and eastern Russia, looking at how walruses are affected by shipping. Maritime traffic throughout the region is growing as channels become increasingly free from ice, and we want to determine the minimum distance shipping lanes need to be from haul-outs to avoid causing stress to the walruses.

WORKING FOR WALRUSES

Climate change remains by far the greatest threat to walruses. Find out more about how you're helping to protect these Arctic giants at **wwf.org.uk/walrus**

POLAR BEAR

SVALBARD, ARCTIC NORWAY

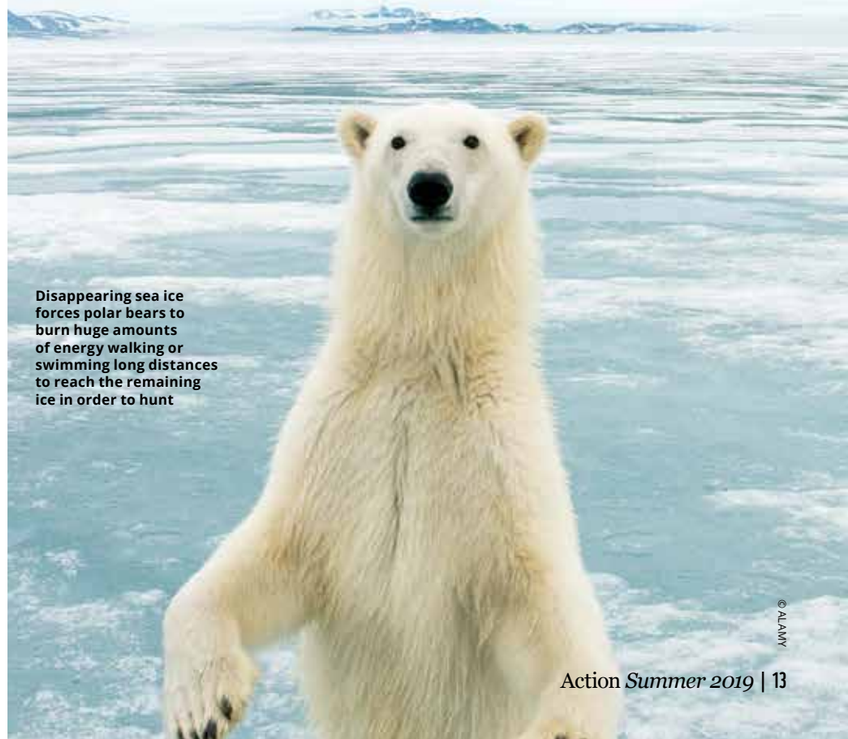
In the future, some polar bears may continue to take advantage of retreating sea ice where walrus haul-outs offer easy pickings. Tom has seen places where there's no sea ice near the coast during summer. "Every walrus haul-out has a polar bear nearby. One pup per month is enough food for a bear – pups are fat! As sea ice shrinks, some polar bear populations will lose access to one food source – seals – but gain another because of the changes in walrus behaviour."

Overall, though, climate change is a disaster for polar bears. In western Svalbard, coastal ice has retreated dramatically, which impacts both humans and bears. "Just 25 years ago, you could travel by skidoo along the coast to reach settlements in a few hours," explains Tom. "Now it takes several days to cover the same distance, because there's no ice."

This affects Svalbard's polar bears too, Melanie explains. "There's data covering multiple generations of bears that can pinpoint where one female now has to swim in an area where her grandmother was able to walk over the ice. In just two generations, it has completely changed and, though polar bears are great swimmers, it has a huge impact on their energy requirements. In some areas of the Arctic, the body condition of the bears is poorer, they produce fewer cubs, and juvenile survival rates have fallen.

"The impact of climate change on the Arctic is complex and varies from place to place," she adds. "The same species living in different regions will respond differently to these effects. The lives of polar bears, bowheads, narwhals and other Arctic species are so intimately tied to the sea ice that if their home continues to change at this rate, they won't be able to adapt quickly enough to survive."

It's vital we monitor the big picture to ensure the ecosystem and all the species within it are protected. As well as research and conservation advocacy, we're working to reduce conflict between people and polar bears, a problem that's increasing as bears are forced to spend more time on land searching for food. With your support, we're working across Alaska, Canada, Greenland and Russia, supporting patrols and other strategies to keep humans and polar bears safe.



Disappearing sea ice forces polar bears to burn huge amounts of energy walking or swimming long distances to reach the remaining ice in order to hunt

Snow cover was good during the 2018–19 winter, and biologists counted 109 birthing females

SAIMAA RINGED SEAL
FINLAND

"One aspect of climate change that's not talked about so much is snow," remarks Tom. "Snow cover is decreasing more rapidly than sea ice in some areas, and that's a ticking time bomb – we don't know exactly what it's going to mean. Snow is not one thing, it's hundreds of things. Its loss creates challenges for many different plant, insect and mammal species."

One animal affected by an absence of snow is the Saimaa ringed seal, an endangered pinniped found only in the Saimaa lake system in south-east Finland. Numbers declined as a result of hunting, falling from perhaps 1,000 at the start of the 20th century to fewer than 120 in the 1980s. After we established a seal conservation programme in 1979, the population began to recover. But then it hit another stumbling block: snow – or, rather, a lack of it.

Female Saimaa ringed seals give birth and nurse their pups in dens in snowbanks, which provide protection. Warmer winters result in poor snow conditions, and if there's insufficient snow to make dens, the pups are exposed to predators and disturbance by humans. It may also increase mortality risk and hamper growth.

To compensate, in recent winters, WWF volunteers have scraped snow and ice from the surface of the frozen lake to make artificial snowbanks in which the seals can den. The results have been encouraging. In 2017, the volunteers built 286 snow dens, and 74 pups were born. Indeed, between 2014 and 2017, they've constructed nearly 800 artificial snow banks, where 190 pups have been born. Over that period, half of all Saimaa ringed seal pups were born safe inside human-made dens.

Thanks to these efforts, and work to reduce fishing bycatch, seal numbers have risen to an estimated 392. But what will happen if the lake fails to freeze, or there's no snow for volunteers to make dens? With your help, we're supporting the University of Eastern Finland's research into seal conservation and monitoring, and how dens can be created in years with no snow or ice.

"TODAY, ALMOST ALL OF THE REINDEER POPULATIONS IN THE CANADIAN ARCTIC ARE IN DECLINE, AND SOME ARE IN FREEFALL, DECLINING BY AS MUCH AS 95%"

Climate change threatens the nomadic culture and well-being of reindeer-herding communities in Arctic Russia and Scandinavia

Climate change is affecting weather patterns and vegetation in the Arctic, causing the population of wild caribou to decline by nearly 50% in the last two decades

© GETTY | © JUHA TASKINEN / WWF-FINLAND

CARIBOU/REINDEER
SWEDEN AND CANADA

If too little ice is a problem in the Arctic Ocean, on land there's another headache: too much ice. Or, more accurately, ice in the wrong place – and it's having a huge impact on reindeer. "Local herders say that climate change is affecting their herds," explains Tom. "There's more winter rain, which penetrates the snow and forms a sheet of ice covering the lichen that are the reindeer's main winter food. They can't even smell the lichen, let alone reach it to eat it, so they simply don't know where to go to find food."

In Sweden, the livelihoods and cultural traditions of Sámi people are inextricably linked to the reindeer. They've migrated with the herds for centuries. Now, though, lakes and rivers don't always freeze in autumn, so the Sámi must move through forests, which takes longer. And in hot summers, as last year, the reindeer migrate higher into the mountains to find snowfields where they can evade biting insects. Females have longer treks down to valleys to feed at night, when insects are less active; as a result, some of their calves may weigh less.

These are problems the Sámi have never faced before. They're very concerned. Tom explains: "They say, 'We need to find a new way of reindeer herding, because if it dies, our culture will die – and it will never come back.'"

The reindeer's North American cousins, the barren-ground caribou of Arctic Canada, are also suffering as ice masks the lichen. This is just one of many issues affecting the subspecies, which has experienced calamitous population declines. It's also been hit by changes in the composition of vegetation on feeding grounds caused by a warming climate. Some herds, which once numbered in the hundreds of thousands, have declined by over 95%.

Barren-ground caribou are also sensitive to industrial development – mining and its associated infrastructure – on their migration routes and calving grounds. This is increasing as marine transportation becomes more feasible due to longer open water periods in the Arctic caused by climate change.

"The eastern Canadian Arctic is where most caribou give birth," says Melanie. "All of the females in a herd give birth at virtually the same time. So it's vital they get to their calving grounds at the right time, and that they're not disturbed there, or it'll have a huge impact on the herd. A lot of our work at WWF focuses on protecting the caribou's calving grounds and migration routes from being affected by roads, industry, noise and other threats. By doing this, we're giving the species the best chance of coping with rapid climate change."

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BOWHEAD WHALE

ARCTIC OCEAN

The bowhead whale is the jazz crooner of the cetacean world. "Bowheads have complex songs that change all the time, which they use to find mates," says Melanie. This analogy reveals a big problem facing this huge denizen of the Arctic Ocean, whose vocalisations are increasingly drowned out by a different kind of underwater orchestra – propeller sounds from increased shipping, seismic booms from more oil and gas exploration, and the clash of construction as new infrastructure is built.

"This soundscape is unique," explains Melanie. "Noise travels at a shallower depth in the cold Arctic water, and ice blankets the ocean from wave and wind action for much of the year. So it's a much quieter place than most of the world's oceans. We think the marine wildlife of the Arctic is less accustomed to noise than in other regions, and cetaceans are particularly sensitive." Some bowheads, which can live for up 200 years, were born in an era before motorised vessels.

Today, the Arctic Ocean is noisier than ever as retreating ice unlocks previously inaccessible shipping lanes, reducing some journey times by an estimated 40% compared with routes via the Suez or Panama Canal. As a result, shipping traffic is expected to quadruple here by 2025!

Ship noise and bowhead calls are both low frequency, so the potential disruption to whale communication is worrying. Industrial noise can also cause hearing loss, inflict physiological stress, make it difficult for mothers to find their young, and even scare off their fish prey. Over 70,000 supporters signed our campaign pushing for effective regulation of underwater noise in Arctic waters and to create sound sanctuaries to safeguard marine mammals.

The bowhead's distinctive appearance hints at another growing problem. "Like narwhals and belugas, the bowhead has a small dorsal ridge instead of a big fin. This enables it to swim under ice floes where it skims food from shallow water," explains Melanie. "Orcas have tall dorsal fins, so they aren't suited to hunting amid the floes. But as the sea ice retreats, the killer whales are able to move further north, hunting narwhal and bowhead whales."

We're supporting research on bowhead migration routes and numbers, particularly around eastern Canada and western Greenland, and in the critically endangered population between east Greenland and Svalbard. And we're working on minimising the impact of industry and shipping on these huge, charismatic creatures. "We're advocating for a more precautionary principle to be applied to the Arctic," asserts Melanie. "It's particularly important for long-lived, slow-reproducing species such as the bowhead. It can take, not years, but centuries for a population to recover."

These problems are only getting worse. Scientists estimate that summer sea ice could be virtually gone by the 2030s. "If we protect an area of old-growth forest from destruction, species such as orangutans will benefit," says Melanie. "But in the Arctic, it's different. We can protect an area – but if climate change continues unchecked and sea ice vanishes, it's no good. Sea ice is as fundamental to a bowhead as trees are to an orangutan – and it will disappear unless we take action to mitigate climate change impacts today."

Listen to a bowhead's song and find out how the underwater soundscape of the Arctic Ocean is changing at wwf.org.uk/arcticnoise

The Arctic fox faces many threats from climate change. Its sea ice and tundra habitat is shrinking, its lemming prey is less abundant, and competition with red foxes is increasing

ARCTIC FOX

SCANDINAVIA AND FINLAND

An Arctic fox in winter is a heart-warming sight – if you can locate one! Its gorgeous thick fur turns white in autumn, providing excellent camouflage against the snow. But there's another reason why spotting one is a rare treat in Scandinavia and Finland: there are very few left.

Intensive hunting in the 19th century decimated these populations. Locally extinct in Finland by the early 1980s, the Arctic fox was saved from a similar fate in Sweden by a hunting ban in 1928. Even so, by 1980 just 30 Arctic foxes survived here.

Temperatures in the Arctic fox's tundra habitat have risen by 1°C in the past century. As a result, the treeline is advancing north and the tundra is receding. This has opened the door to red foxes, which are twice the size of their cousins and which kill or chase away Arctic foxes from their dens.

Whereas Arctic foxes near the coast have access to fairly consistent food sources such as seabirds, those on the tundra are largely reliant on lemmings and voles, populations of which boom and plummet in regular cycles. Climate change seems to be affecting these rodent cycles, reducing prey availability for Arctic foxes, which won't breed when rodent numbers are low.

We're taking action in Scandinavia to help Arctic fox numbers recover, providing dog pellets at dens year round – not enough to make them breed, but sufficient to increase survival rates in winter so that when a lemming or vole surge happens, they can take advantage. We're also putting out trails of food between core areas to encourage them to spread to new locations. And we're protecting Arctic fox dens to ensure they have safe places to raise their cubs.

Thanks in part to this work, Arctic fox numbers have increased in Sweden and Norway to about 300, some of which are spilling over into Finland. "We're hoping for a lemming peak in Scandinavia this summer," says Tom, "so Arctic fox numbers should rise by 50 to 100. When we reach about 2,000 Arctic foxes, the population will be able to take the bumps and our work here will be done. Sadly, there's not much we can do about the retreating tundra – except keep working to combat climate change."

CLIMATE CHANGE VERSUS THE ARCTIC

Shrinking sea ice is not the only sign of climate change in the Arctic. Other far-reaching – and surprising – threats affect landscapes, animals and people

ARCTIC LAKES ARE DISAPPEARING

Since 1970, more than 400 tundra ponds have vanished in Greenland due to advancing plant cover, thawing permafrost and evaporation.

DISEASES SPREAD

Arctic warming allows diseases to spread. The muskox lungworm is rapidly expanding its range north and east, probably due to warmer conditions.

NATIVE PLANTS ARE LOST

If snow cover only lasts for shorter periods and summers become longer, plants from the south can gain a foothold and outcompete native Arctic-adapted plants.

HUMAN COMMUNITIES AT RISK

As sea ice that protected coasts from storm surges vanishes, land is lost to the waves, while thawing permafrost causes damage to buildings and roads.

HELP US PROTECT THE ARCTIC TODAY

The Arctic region is facing a climate emergency. Through our Arctic programme, we're working to combat the urgent threat of climate change, save wildlife and support communities. Your membership works in many ways, from supporting patrols to monitor polar bears and walruses, to providing essential kit for field teams. You're also enabling us to discover more about species that depend on sea ice, and helping to persuade governments to tackle the underlying causes driving climate change.

£10 could help pay for a blood sample from a polar bear to assess its health

£70 could help pay for a polar bear patroller for a day, to keep people and bears safe

£100 could support our advocacy with governments and decision makers to push for action to tackle climate change

£200 could help pay for tags to monitor marine mammals, such as bowhead whales and walruses

If you'd like to do even more, you can donate today at wwf.org.uk/arcticaction

MAKING NEW FRIENDS

From deserts to the frozen Arctic wilderness, the production team behind Netflix series *Our Planet* travelled the globe to capture its most compelling conservation stories. But it wasn't always as glamorous as it sounds...

"For the Frozen Worlds episode, I was working in Russia with a WWF scientist, Anatoly Kochnev, and an all-male crew. So it wasn't ideal to discover that our accommodation was essentially a large garden shed," chuckles Sophie Lanfear, producer-director for Silverback Films, who made the spellbinding series.

"There were seven of us sleeping in one room," she explains. "We each had our own shelf, with four on each wall, and we had to get into bed in a certain order. Fortunately, it only became a problem if you needed to pee in the middle of the night!"

The hut was surrounded by thousands of Pacific walruses, day and night. "It was sad," sighs Sophie. "We wanted the Frozen Worlds episode to highlight the importance of sea ice for the animals that depend on it – and for the planet. In Russia, the sea ice has retreated so far north that this beach is the only place close to their feeding grounds that the walruses can rest. So now they all haul out at this one location and that's dangerous for the calves, which can get crushed if the herd panics."

Every now and then, the walruses would become curious about their new neighbours and stick their heads through the hut's open door. "I kept very still so as not to startle this individual. It was a beautiful, intimate and slightly melancholy moment to share with an animal that's struggling to survive in a changing Arctic."

Find out more and explore at **ourplanet.com**

ORANGUTANS AND ASTROPHYSICS

Borneo's orangutans are facing a crisis. Poaching and destruction of the rainforest has driven them to the edge of extinction. But by embracing innovative approaches to monitoring wildlife, we can help protect them for generations to come

Orangutans face a precarious future. So with your help, we supported a groundbreaking survey – using drones and special star-spotting thermal technology – that will help us protect these precious apes

The work of primatologists and astrophysicists rarely overlaps. But when Serge Wich, from Liverpool John Moores University (LJMU), got talking to his neighbour and colleague Steve Longmore, they discovered that studying apes and analysing stars have more in common than you might think.

"A couple of years ago, I started using infrared cameras to monitor wildlife," explains Serge. "I quickly accumulated hours and hours of video data, but I just don't have the time to go through it all. One day I was moaning about this on the train, when Steve offered to help." Serge thought his friend was volunteering his time to review the footage – but Steve had something else in mind. Finding orangutans in the rainforest, it turns out, isn't so different from detecting the light from far-flung galaxies in the vastness of space. And Steve and his colleagues at the Astrophysics Research Institute at LJMU had been doing that for years.

WHY DATA MATTERS

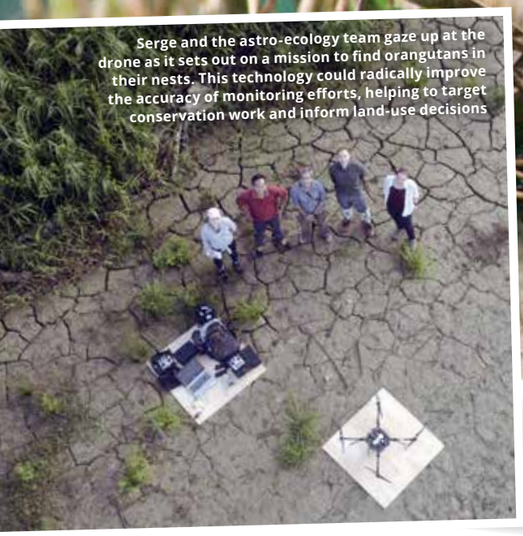
Here at WWF, we know that successful conservation depends on having good data. We need to monitor critically endangered orangutan populations to see if our conservation efforts are working.

Serge agrees: "Does protecting an area as a national park have an impact? Can well-managed logging concessions help maintain a stable orangutan population? How effective is our work to educate and reduce hunting? We can only answer those questions if we know the areas the orangutans are using, and how many of them there are left."

The most common way to monitor orangutan populations is by counting their nests. "Like all great apes, orangutans make nests out of branches, high in the treetops, every night and sometimes during the day. Here, they can sleep, comfortable and protected from predators. From those nests, we can estimate the number of orangutans," says Serge. Usually finding nests involves walking in straight lines through the forest looking out for nests in the canopy – a long and laborious process. Thanks to your support, we've been able to carry out helicopter surveys, which allow us to cover larger areas in a shorter time. But this is expensive, and flying low over the forest canopy can be risky.

To make matters more complicated, counting nests – which may not necessarily be in use – provides only an imprecise estimate of orangutan numbers, with room for error. "When the numbers are not exact, it can be difficult to determine whether a population is growing, stable or declining," says Serge. "And, of course, that's exactly what ▶

“ORANGUTANS ARE MUCH EASIER TO SPOT BEFORE THE SUN RISES”



Serge and the astro-ecology team gaze up at the drone as it sets out on a mission to find orangutans in their nests. This technology could radically improve the accuracy of monitoring efforts, helping to target conservation work and inform land-use decisions

At the end of a long day foraging, orangutans build a safe and comfortable nest in the forest canopy to sleep in. This is the best time to try to count them to inform our conservation efforts

we need to know. So we have to find a way to minimise the amount of error in order to identify population trends accurately.”

Recently, technological innovations have begun opening up ways to improve precision and reduce the workload and expense involved in wildlife monitoring. Unmanned aerial vehicles (UAVs) – better known as drones – equipped with digital cameras offer an efficient way to cover large areas, and are less expensive and more environmentally friendly than using helicopters and conducting ground surveys. Conservationists are also increasingly using infrared thermal imaging cameras, which capture information invisible to the naked eye. And this is where the astrophysicists come in.

“Like all mammals, orangutans produce heat to maintain their body temperature. By using infrared cameras, we can detect that heat,” explains Serge. “In recent years, infrared cameras have become increasingly popular as a way to monitor wildlife. But astrophysicists have been using them to detect the infrared signals from stars and galaxies for much longer. What we’re doing is applying the techniques they’ve developed over many decades to identify orangutans.”

With the right hardware and software, it’s possible to identify the unique thermal profile or ‘heat signature’ of different species, and to teach computers to recognise them. In theory, we should be able to fly a UAV equipped with a thermal imaging camera over the forest, then run the footage through a program that will automatically detect orangutans and other species it recognises. This works for galaxies billions of light years away, at any rate.

THE APPLIANCE OF SCIENCE

Having developed the method in zoos, Serge, Steve and the LJMU astro-ecology team were keen to try it out in the field. And because we’re always on the lookout for innovative ways to protect endangered animals, such as orangutans, a partnership was formed.

Last year, we worked with LJMU and Hutan Kinabatangan Orangutan Conservation Programme to test the technology in the Malaysian state of Sabah on the island of Borneo. Thanks to your support, and in particular to our amazing orangutan adopters, we were able to see whether UAVs with thermal cameras really could be an effective way to monitor orangutans and other threatened animals. We also used the opportunity to refine the system to allow for the effects of weather, humidity and other environmental factors.

We chose two sites for the trials. The first, Sepilok, is a rehabilitation area where orangutans are habituated to the presence of humans, meaning they’re relatively easy to find and follow. The second site, alongside the Kinabatangan river, is globally renowned for its orangutans, but the population has fallen dramatically – from more than 4,000 in the 1960s to only around 800 today. As in other parts of Borneo and Sumatra, deforestation – particularly conversion to oil palm plantations – is the main cause of their decline.

As evening approached, our teams on the ground would head out into the forest and follow individual orangutans. Once the orangutans had made a comfy nest out of branches and bedded down for the night, the team would note down the nest’s GPS coordinates. Then we’d fly the drone over that location – as the sun set that night, and again the next day around sunrise – to see if it could successfully detect the sleepy apes.

“During the day, the temperature of a hot and humid forest is similar to the body temperature of wild animals. So you can’t detect them that well,” explains Serge. “During the evening, the forest cools down, and the heat difference becomes greater, so it gets easier to detect warm-bodied wildlife.

“The morning is the best time to look for orangutans, because the forest has cooled down a lot over night, and the animals’ heat causes them to glow brightly on the infrared images. They’re much easier to spot before the sun rises and begins to warm up the forest again. As a result, we’re all early risers now!”

Another strategy was to fly the UAV over a large area in a grid pattern, then try to locate and identify animals in the footage using the astrophysicists’ algorithms. The specially developed software accounts for vegetation blocking body heat, so animals can still be detected even when they’re partly concealed by trees or leaves. When an orangutan was detected, the ground team would be despatched to the location to check for the individual or a recently vacated fresh nest.

EXCEEDING EXPECTATIONS

In both cases, the system proved extremely effective. “When we started this trial, I wasn’t sure how well it would work,” admits Serge. “The tropics are hot and humid, so we weren’t positive the heat signal of an orangutan in a nest would be visible on the drone images. Fortunately, it is. The results were even better than I expected.”

There’s still work to be done to refine the system and reduce the costs, but this new technology has the potential to radically improve the accuracy and efficiency of monitoring orangutan populations.

“We hope you’re as excited as we are,” says WWF’s Asia regional manager Nicola Loweth. “This could make a big difference to this precious ape’s future prospects, enabling us to help conserve and connect their most important habitats.”

And what works for orangutans can work for other threatened species too. Looking towards the furthest reaches of the universe may just have given us a new way of seeing life here on Earth.

HOW YOU CAN HELP

In the last 20 years, forest destruction and hunting have halved orangutan numbers. You’re already helping to fund our pioneering use of new technology to monitor these incredible animals. Watch the footage from our infrared cameras at **wwf.org.uk/infrared**

But if you’d like to do more to help protect Asia’s only great apes – before it’s too late – adopting an orangutan can help preserve the rainforest and promote sustainable palm oil. Adopt today at **wwf.org.uk/orangutan**

SPOT THE HEAT SIGNATURE

It’s not just orangutans that show up on infrared images.

Borneo is home to incredible wildlife. Along with orangutans, the Kinabatangan test site is home to at least 10 other primates, as well as the island’s unique pygmy elephants.

“For this trial, we focused on the orangutans,” says Serge. “But while we were flying the drones around, we realised that we could also pick up the thermal signature of other animals – proboscis monkeys, macaques, elephants.

“It’s our hope that we can develop this technique to help protect other threatened mammals in Sabah and other places around the world in the future.”

An orangutan in its nest

Pygmy elephants

Macaques

On New Britain Island in Papua New Guinea, where the *Our Planet* team filmed, virgin rainforest had been recently cleared and the land prepared to plant a monoculture of palm oil trees

Time to save our JUNGLES

Huw Cordey is the producer of the Jungles episode of *Our Planet*. We asked him about filming challenges, conservation and choices...

How is* Our Planet *different?
We wanted to create a series that would reach a massive global audience and not just celebrate the natural world, but show in depth the challenges it's facing today. We're approaching a tipping point when those changes are going to affect us all – our food supply, our air, our quality of life. We need to change our view of nature, from a 'luxury' to a necessity for life to continue as we know it. The future of our planet is in our hands. We must all start thinking hard about how our choices affect nature. The next 20 years will be critical. We have the power to save our world, but we must act now.

What's special about the Jungles episode?
It explores the greatest and most important rainforests in the world and introduces their unique cast of characters. Jungles are by far the most diverse habitat on the planet. They represent only about 7% of the world's land area, yet they are home to almost 50% of its species. They are also crucial to all life on Earth because they drive the water cycle and remove carbon from the atmosphere. In this episode, we wanted to convey their huge importance and need for protection.

How did you choose what to film?
The great thing about jungles is that we still don't know that much about them, so there are always new species and stories to share. Years ago, I captured the first-ever footage of a displaying male western parotia – a bird of paradise – for *Planet Earth*. Technology has advanced a lot in the past 15 years, so I wanted to film the parotia's dance again, using new, smaller remote cameras. Located high above the action, they enabled us to show a fresh perspective on the male's performance – the female's point of view – which gives much more insight.

What filming challenges did you face?
When you're making a programme about jungles, almost every shoot is challenging. They're difficult places to film in, because the wildlife is hard to spot – you hear everything, but see nothing. The greatest challenge on this shoot was filming orangutans in a swamp in Suaq Belimbing, Sumatra. The water was up to our shins or even our knees for 12 hours a day. We were carrying really expensive camera equipment, but we couldn't see the hazards waiting to trip us up beneath the surface. There was also a plant called 'ringus' whose fallen fruits turned the water toxic, creating a nasty skin infection a bit like a poison ivy. Our poor cameraman's legs were red raw for days!

Were there any film-making firsts?
Our aim was to show the orangutans using tools – a behaviour never documented for TV before. This population is the only one in the world that uses tools, which they fashion out of bits of stick and use to winkle out insects and beetle grubs from the tree bark. We knew it would be hard to film this behaviour, because the orangutans live in the tree tops, blocked from view by dense foliage. We were thrilled when we succeeded.

How were drones used in the filming?
Our Planet is the first big, blue-chip natural history series that has used drones for filming. In the past, we would've had to use a helicopter, but drones can fly much lower and give a more intimate aerial view. For example, we deployed drones to show the impact oil palm is having on the orangutan's home. We found a place where virgin rainforest was butted right up against an oil palm plantation. The footage reveals the stark contrast between the incredibly diverse and pristine rainforest, and the relatively lifeless oil palm monoculture. It's a poignant moment in the film, and one of my favourite drone shots in the whole episode.

PROTECTING TROPICAL FORESTS

Safeguarding forests and their magnificent wildlife has been at the heart of our work for half a century. With your support, and through our collaboration on *Our Planet*, we're also helping to highlight the urgent need to stabilise our climate. Find out how to save our jungles at **wwf.org.uk/savejungles** and discover more at **ourplanet.com**

GIVING BEES A LIFELINE

Pollinators such as bees are in decline and struggling because of habitat loss. This is due to increased urbanisation and industry, agricultural intensification, heavy use of pesticides and herbicides, and the loss of wildflower meadows

THE SHOCKING TRUTH

90%

Almost **90%** of the world's wild plants depend on pollinators, along with **75%** of leading global crops

1 IN 3

One in three mouthfuls of food we eat only exists because of pollinators. Bees pollinate crops from tomatoes to strawberries

40-70%

Experts predict **40-70%** of pollinators could go extinct if action is not taken to enable them to move through the landscape

24%

According to the IUCN Red List, as many as **24%** of Europe's bumblebee species are threatened

17

A new report by WWF and BugLife found that **17 species** of bees have been lost from the east of England **wwf.org.uk/bees**

We cannot live without bees, but in the UK they're being pushed to the brink. So this summer let's make every garden an oasis for pollinators, says wildlife gardener **Kate Bradbury**

Imagine living in a desert with barely any food, water or shelter. That's what much of the British countryside is like for wild pollinators today. Our bees, butterflies, moths, hoverflies, wasps and pollinating beetles are in trouble. Over the past 50 years, they've experienced staggering declines. About 23 species have become extinct since 1850, and the ranges of many other species have shrunk until they are surviving only in small isolated patches of suitable habitat.

The threats our pollinators face are many and varied. Habitat loss, fragmentation and degradation are key factors driving bee declines. A staggering 97% of all flower-rich grasslands in England – an area the size of Wales – has been lost since the 1930s. Modern farming practices, including the use of pesticides and grubbing out hedgerows, environmental pollution, climate change, non-native invasive species, diseases and pests have also had an impact.

As well as being widely loved, bees play a vital role as pollinators. In addition to wildflowers and trees, bees and other insects help to pollinate our food crops. It's estimated these pollination services are worth £600 million to the UK's crops every year – and, of course, they do this free of charge. A third of the food we eat relies on bees for pollination and they are essential for our survival. We all need bees – and they need our help.

PUTTING NATURE FIRST

Thanks to you, we're shining a light on the plight of these precious pollinators and highlighting the loss of wildlife across the UK. It's a sad fact that we live in one of the most nature-depleted countries in the world. But right now we have a real opportunity to change this, so we're fighting for better protection for UK species. "The government is currently making big decisions about how it will manage nature in England," explains WWF's science adviser Lucy Young. "As new environmental policies are being negotiated, we're pushing for legally-binding targets to restore habitats for bees and other wildlife and a strong watchdog to hold governments to account."

We're also supporting BugLife to call for the creation of 'B-Lines' through the new Environment Bill being introduced to Parliament. These are a series of flower-rich 'insect pathways' running through our countryside and towns that will link together the best of our existing wildlife areas to benefit pollinators and people. By creating and restoring at least 150,000 hectares of flower-rich habitat across the UK, we hope to provide a long-term solution to help our bees recover.

You can restore nature on your own patch, whether you have a large garden or a windowbox, and do your bit to give struggling species such as bees a huge helping hand. Turn over for our top tips to get started...

▶

WORDS BY KATE BRADBURY; IMAGE © GETTY

SEVEN WAYS YOU CAN HELP POLLINATORS

1 Grow flowers from March to November, longer if possible (especially if you live in the south). Start the year with bulbs such as crocuses, snowdrops and aconites, and end it with winter-flowering clematis and honeysuckle.

2 Grow a wide range of plants with different-shaped flowers. Grow daisy-like blooms such as marguerite and chamomile, tubular flowers such as honeysuckle and foxglove, bowl-shaped blooms such as cranesbill and poppies, and flat, plate-like fennel and *Verbena bonariensis*.

3 Select single bloom over double-bloom flowers. Some varieties of dahlias and roses, for example, have extra petals. But they're like a closed shop for pollinators, which can't reach their pollen and nectar.

4 Avoid using pesticides. The use of neonicotinoids has been partially banned, but these chemicals are still used in horticulture, including bug sprays. Some plants purchased from garden centres contain neonicotinoids, so choose carefully where you buy plants. You can also make your own natural spray out of neem oil, which contains 50 insecticides.

5 Buy organic food, which is grown without synthetic fertilisers and pesticides, so pollinators can feed without being exposed to harmful chemicals. What's more, organic farms tend to be more nature friendly, so you're not only supporting bees but whole ecosystems.

6 Make bees and other beneficial minibeasts more welcome in your garden by providing an insect hotel. Include lengths of bamboo, twigs and stems, grass seed heads, pine cones, leaves and lichen and remember to clean it out every year in winter.

7 If your garden is buzzing with bees and other insects, why not share your photos and top tips for creating a wildlife-friendly patch with us? Simply share on Instagram or Twitter with the hashtag **#GrowForYourWorld** and tag **@wwf_uk** We can't wait to be inspired!

Kate is passionate about wildlife-friendly gardening. She says: "Even the tiniest urban space can be rewilded and transformed into a haven for our most important insects"

SIX GARDENER'S FRIENDS TO SPOT

BUFF-TAILED BUMBLEBEE
Bombus terrestris

A common bumblebee, with a dark-yellow band on the thorax and abdomen. The large queen has a distinctive buff tail. Nests in colonies of up to 300 in old mouse holes and beneath sheds. Flies February to August.

ELEPHANT HAWKMOTH
Deilephila elpenor

Nocturnal, this large pink and brown moth feeds on honeysuckle and other tubular flowers. It is attracted to light. The caterpillar has distinctive markings resembling an elephant.

RED MASON BEE
Osmia bicornis

A solitary bee covered in dense, gingery hair. Females often nest in bee hotels, laying eggs singly in 'cells' of mud, which they stock with pollen. In autumn, the larvae pupate in the nest until the following spring. Flies March to June.

SMALL TORTOISESHELL BUTTERFLY
Aglais urticae

A beautiful, common but declining butterfly with orange, yellow, blue and black markings. Adults feed on a range of nectar-rich flowers, and their caterpillars feed on nettles. Flies March to October.

MINT MOTH
Pyrausta aurata

A tiny, purple-brown moth with yellow markings. Breeds on mints, such as lavender, mint and catmint. Adults rest on the foodplants during the day, and flutter if you disturb them. Flies April to September.

MARMALADE HOVERFLY
Episyrphus balteatus

A common hoverfly with an orange body and black, 'moustache'-like bars. It feeds on a variety of flowers but favours umbellifers such as fennel, and daisy-type blooms. Its larvae eat aphids. Flies March to November.

PLANTING FOR POLLINATORS

The creation of a network of flower-rich habitats across the UK is vital for pollinators and our own future food security. Together, our gardens take up more space than all of the UK's nature reserves put together. So by growing a mix of flowering plants, we can all help our pollinators find enough food.

Pollinators need a range of different flowers to feed from. While most common species of bee are generalist feeders, meaning they're not fussy about the blooms they visit, others have more specific requirements. The bilberry bumblebee, for example, feeds almost exclusively on the flowers of its namesake plant. Other bees are closely associated with dandelions, white deadnettle and red clover – plants generally regarded as weeds. All we have to do to help is to resist the urge to pull up these unloved flowers and allow them a little space in our gardens to bloom. Wildflowers such as scabious, knapweed, bird's foot trefoil and ox-eye daisy support a range of pollinators, but garden cultivars can be just as valuable.

Another thing the wildlife-friendly gardener should consider is the shape of a pollinator's mouthparts, as this determines the type of flowers it can visit. Bees, butterflies and moths suck nectar through a straw-like proboscis. The length of this tube varies with each species – that of the honeybee is quite short, while in some bumblebees, moths and butterflies it can be impressively long.

Species with elongated tongues will visit blooms with deep flower tubes, such as honeysuckle, foxglove and red clover. Those with a shorter proboscis are restricted to bowl-shaped flowers such as cranesbill, and flat, daisy-type blooms, such as ox-eye daisy, fennel and white clover, which allow them to access the nectar easily. Hoverflies have a sponge-like proboscis they use to dab flowers to absorb the nectar and pollen. They also require flat blooms, which enable them to rest on the flower while feeding. Planting a wide variety of flowers that will bloom for as long as possible is key to supporting the greatest number of pollinators on your patch.

It's also important to cater for the complete life cycle of different pollinators. While adults consume pollen and nectar, their larvae may have different needs. The caterpillars of butterflies and moths eat leaves, while the larvae of most hoverflies munch on aphids. Herbaceous plants such as nettles, bird's foot trefoil, cuckoo flower and honesty feed the caterpillars of many common butterflies, while shrubs and trees such as hawthorn, buckthorn, silver birch and oak can support the life cycles of huge numbers of moths. By growing just one or two additional caterpillar foodplants in your garden, you can make a huge difference to pollinators.

DIVINE JEWELLERY

We're giving two lucky winners their choice of three fabulous animal-inspired pieces of jewellery by Tatty Devine

Born in 1999 in the heart of east London, today Tatty Devine's original, handmade jewellery has a cult following. So we're delighted they're collaborating with us on 15 covetable pieces of statement jewellery that capture the spirit of some of the world's most iconic wildlife. Prowling leopards, swinging orangutans and striding elephants are all lovingly brought to life in Tatty Devine's fun and distinctive style – in brooches and necklaces.

This exclusive collection is created from infinitely recyclable acrylic and designed to last a lifetime, with repairs to well-loved pieces provided by a team of 18 ladies in Tatty Devine's Kent studio. So not only do they look good, they also do good.

Two lucky winners will have their choice of jewellery from a leopard brooch, a panda necklace or an elephant necklace, worth £35-£45 each. To be in with a chance of winning, simply follow the instructions below and mark your entry '**Tatty Devine Competition**'.

STUNNING PHOTO PRINT

We're giving away a gorgeous photographic canvas print of your choice, courtesy of Nature Picture Library

Are you passionate about penguins, devoted to dolphins or in love with lions? Now is your chance to grace your home with a stunning photographic canvas print of your favourite species. In this exclusive competition for WWF members, one lucky winner can take their pick from thousands of beautiful professional wildlife photos at natureplprints.com. You'll receive an impressive 90 x 60cm canvas, worth £160. To enter, follow the instructions on the right and mark your entry '**NPL Photo Competition**'. Please include the Media ID number of your chosen image – it can be found below the picture at **natureplprints.com**.

OUR PLANET BOOK

We're giving away three copies of *Our Planet*, the must-have photo book that accompanies the Netflix series

With a foreword by WWF ambassador Sir David Attenborough, this is the stunning photographic companion to *Our Planet*, the groundbreaking Netflix series. Every page takes you on a spectacular journey around the globe's richest ecosystems, with stunning visuals of nature's most intriguing animals in action and environmental change on a scale that must be seen to be believed. Revealing the most amazing sights on Earth in unprecedented ways, this book is at the forefront of a global movement to work together to protect our world. To enter, follow the instructions below and mark your entry '***Our Planet* Competition**'.

HOW TO ENTER ACTION GIVEAWAYS

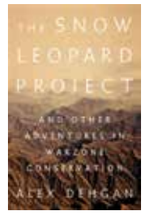
Send an email with your name, address and phone number, along with Tatty Devine Competition, NPL Photo Competition or *Our Planet* Competition in the subject line, to **competition@wwf.org.uk**

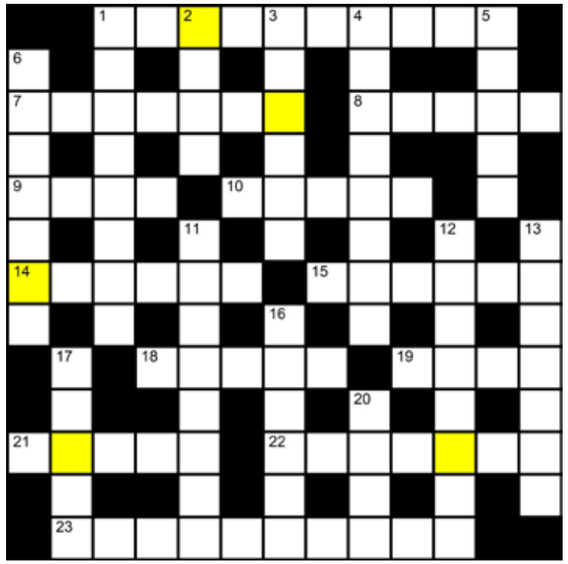
Alternatively, post your entry to **Action Mag, WWF-UK, Living Planet Centre, Rufford House, Brewery Road, Woking, Surrey GU21 4LL**. Only one competition per entry please.

Closing date: Friday 19 July. For terms and conditions, visit wwf.org.uk/compterms

CROSSWORD

Solve our crossword and you could win a copy of *The Snow Leopard Project*, published by PublicAffairs, worth £20.99





WWF Action summer 2019 crossword complied by Aleric Linden

After solving the crossword, take each letter from the shaded squares (going from left to right and top to bottom) to spell out the prize word. To be in with a chance to win, just send a postcard with the prize word to the address on page 30, or email it to **competition@wwf.org.uk.** *The closing date is Friday 19 July.*

Clues Across

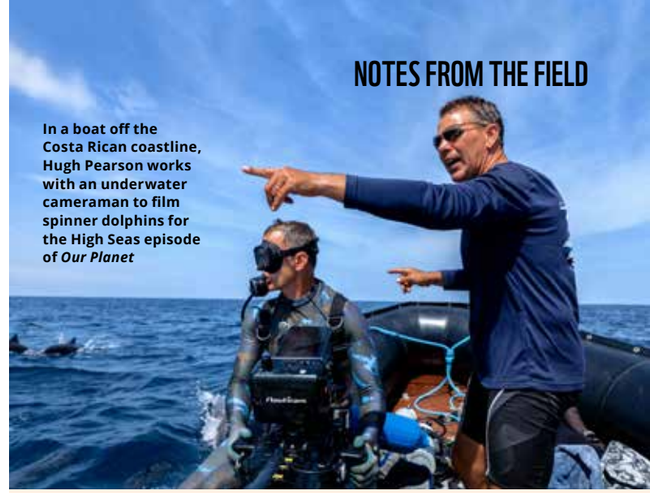
1 Natural gas or coal, eg a big contributor to global warming when burned (6,4)
7 The accidental escape of oil and water etc from pipelines (7)
8 _ Pole, point located in the middle of the Arctic Ocean (5)
9 The young of bears or tigers (4)
10 Walking routes, nature trails etc (5)
14 The polar bear's home – most northern region of the Earth (6)
15 How corals turn white because of warmer seas (6)
18 Dark sticky substance obtained from tar distillation (5)
19 This furry Arctic creature is one of the Arctic wolf's main prey (4)
21 Plant life (5)
22 A notably salty lake – lowest point on the Earth's surface (4,3)
23 The frozen continent (10)

Clues Down

1 Australian sea turtle (8)
2 Robert, well-known polar and Antarctic explorer (4)
3 A large frozen mass, often polar (3,3)
4 Ocean creature – second-largest living mammal on the planet (3,5)
5 A metric measure of water (5)
6 A lake that was once frozen (7)
11 Huge lake on the border of Peru and Bolivia high up in the Andes (8)
12 Rainforest-rich Asian country, part of which is on the island of Borneo (8)
13 The world's fastest land mammal (7)
16 Because of CO_2 emissions, our naturally alkaline oceans are becoming increasingly what? (6)
17 Great Russian river – Europe's longest (5)
20 A north African or Arabian river bed, usually dry (4)

Spring 2019 answers

Prize Word: TIDAL
Across 1. Big-leaf 6. Melt 8. Shelf ice 10. Leak 11. Wildlife 13. Eiders 14. Desert 17. Bushmeat 19. Burn 21. Polluted 22. Kelp 23. Craters
Down 2. Iceland 3. Lift 4. Arctic 5. Tepui 7. Threatened 8. Silverback 9. Adder 12. Crime 15. Equator 16. Vapour 18. Seals 20. Flat



In a boat off the Costa Rican coastline, Hugh Pearson works with an underwater cameraman to film spinner dolphins for the High Seas episode of *Our Planet*

BEHIND THE SCENES ON OUR PLANET

The Coastal Seas episode of *Our Planet* explores the super-abundance of life in the waters around our coasts. Coastal seas make up only 10% of the surface of the ocean, but support 90% of all marine life. The aim of this episode was to explore why oceans are important, why we need them and how we can protect them.

One of my favourite shoots was the sea otters in Monterey Bay, California. Sea otters are arguably the cutest animals in the ocean, but they're also vitally important. They're the guardians of their kelp forest home, because they help to keep numbers of kelp-munching sea urchins in check. If allowed to increase, urchins would literally eat the whole kelp forest.

Sea otters are easy to film above water, and we were able to get nice shots of them rolling up in the kelp to sleep and eating sea urchins using their bellies as tables. But filming them beneath the surface is difficult because they don't like people being in the water with them. Fortunately, cameraman Doug Anderson was able to establish a respectful relationship with a dog otter. Doug began snorkelling with him, getting closer and closer until he was allowed to dive with him. Then we got amazing shots of the otter swimming sinuously through the kelp, hunting sea urchins.

IN THE NIGHT OCEAN

One of the key sequences we wanted to film for Coastal Seas was a shark feeding-frenzy at night. We travelled to a small island in French Polynesia, which is one of the few places where shark populations are still abundant, thanks to legal protection. The crew got amazing footage of hundreds of grey reef sharks and whitetip sharks hunting at night. We wanted to highlight how important sharks are to the marine environment. They help keep the whole system in balance. But humans have ruthlessly exploited them. More than 100 million sharks are killed every year, mostly for their fins. As a result, most shark populations have declined by 90%. By taking out so many sharks, we're causing real damage to the ocean.

Our coastal seas have been pushed to the brink of collapse. A third of fish populations are in decline. But it's not too late – we can restore them to full health. To protect them, we need to establish marine protected areas, where commercial fishing is not allowed. Fish spawn here and overspill to populate the surrounding area, where fisherfolk see their harvests increase. If given a chance, our oceans can recover their true glory amazingly quickly.

Hugh

Hugh Pearson Silverback Films producer & director *Our Planet*

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THEIR FUTURE OUR PLANET YOUR LEGACY

Our planet is extraordinary and we're fighting to keep it that way. To find out how a gift in your will can leave a lasting legacy, please email our legacy supporter manager Maria Dyson: maria@wwf.org.uk

IN YOUR NEXT ISSUE

PROTECTING KENYA'S LIONS + IN SEARCH OF JAGUARS