

Briefly

INTERNATIONAL

Report highlights role of oceans in carbon storage

On 9 December 2014 IUCN released the report *The Significance and Management of Natural Carbon Stores in the Open Ocean*, which highlights the importance of oceans in carbon storage, and calls for implementation of international policy in recognition of this role. Aquatic organisms act as mobile carbon stores, performing crucial services in carbon sequestration. These organisms include diatoms and krill, which are estimated to facilitate storage of 150 million and 2.8 million tons of carbon per annum, respectively. Climate change may have significant effects on ocean carbon storage; in particular, there are risks of lower oxygen levels as a result of warmer temperatures, and acidification. Ignoring the importance of oceans in carbon sequestration could have serious consequences. However, effective management of oceans for carbon sequestration could yield significant benefits for the environment, biodiversity conservation and food security.

Source: IUCN (2014) www.iucn.org/about/work/programmes/marine/marine_our_work/marine_governance/?18718/Ocean_carbonreport

How do non-echolocating bats navigate?

Researchers investigating the origin of bat echolocation have studied how Old World fruit bats navigate in complete darkness. These bats are non-echolocating, meaning they do not use sonar to sense their environment. The bats were found to use a rudimentary click-based echo system to detect and discriminate objects, with two of the three species studied emitting clicks more frequently in the dark than in the light. The bats emit the clicks using their wings, unlike other bats, which generate pulses using the larynx or the tongue. This rudimentary form of echolocation does not allow the bats to estimate distance accurately as echolocating bats can, and although it enables them to detect large objects they are unable to detect smaller obstacles. The researchers maintain that the fruit bats may be considered behavioural fossils and may be appropriate research subjects to further the knowledge of the evolution of echolocation.

Source: *Current Biology* (2014) [www.cell.com/current-biology/abstract/S0960-9822\(14\)01425-0](http://www.cell.com/current-biology/abstract/S0960-9822(14)01425-0), and *Nature* (2014) dx.doi.org/10.1038/516147d

Ants provide efficient food recycling service...

An understanding of the ecology of urban green spaces could inform urban policy and planning regarding the management of food waste in cities. A study investigated the consumption of littered food waste by arthropods and highlighted the importance and magnitude of this ecological service. Known quantities of food were placed in parks and in green spaces on traffic islands throughout New York City, and arthropods removed up to 59% of the food within a single day. Although arthropod diversity was greater in parks, arthropods in grassy medians removed 2–3 times more food per day. This finding is attributed to the presence of the pavement ant, and to a hotter, drier environment, which may have increased the arthropods' metabolism. It is estimated that arthropods could remove 4–6.5 kg of food waste per year from a single traffic island, which would reduce the availability of food for rats and other vermin.

Source: *Global Change Biology* (2014) dx.doi.org/10.1111/gcb.12791, and *New Scientist* (2014) www.newscientist.com/article/mg22429983.700-armies-of-ants-keep-new-york-squeaky-clean.html#.VLUDtCFBxA

...and giant clams provide multiple benefits to coral reef ecosystems

The 13 species of giant clams of the Indo-Pacific coral reefs, the world's largest molluscs, have significant ecological value in coral reefs, performing multiple functions. A variety of predators and scavengers feed on their tissues, and the zooxanthellae, faeces and gametes they discharge provide food for opportunistic feeders. Their shells serve as nurseries and refuges for young fish, and provide a substrate for colonization by epibionts. The clams help to build the reef structure, increasing its topographic heterogeneity, and act as reservoirs of symbiotic zooxanthellae, which are essential for a healthy reef. Their calcium carbonate shell also provides material that is eventually incorporated into the reef framework. The clams, which are a vital indicator of coral reef health, face significant threats from overfishing, and it is hoped that a greater understanding of their ecological value

will make them a focus for conservation attention.

Source: *Biological Conservation* (2015) dx.doi.org/10.1016/j.biocon.2014.11.004, and *New Scientist* (2014) www.newscientist.com/article/mg22530023.400-multitalented-giant-clams-keep-corals-reefs-healthy.html#.VLVLviFFBxA

Acoustic tags guide grey seal foraging

Marine scientists routinely attach acoustic tags to fish to track populations. Researchers have now discovered that seals can learn to use sounds from these tags to guide them towards prey, thus improving their foraging success while making tagged fish more vulnerable to predation. In an experiment, 10 captive grey seals *Halichoerus grypus* were allowed to explore, individually, 20 foraging boxes in a pool. One box contained a tagged fish, another contained an untagged fish, and the others were empty. The box containing the tagged fish was generally found significantly faster than the control box, and was found increasingly faster during consecutive trials. The results show that seals quickly learnt the relevance of acoustic cues and adapted their foraging strategy accordingly. Such impacts on foraging behaviour could have implications for the entire ecosystem, and should be considered carefully before introducing artificial sound sources.

Source: *Proceedings of the Royal Society B* (2014) dx.doi.org/10.1098/rspb.2014.1595, and *Nature* (2014) dx.doi.org/10.1038/515469e

Global assessment of extinction risk for freshwater crayfish

A global assessment, using the IUCN Categories and Criteria, of the conservation status of the 590 species of freshwater crayfish has revealed that 32% are threatened with extinction, and four species were assessed as Extinct. The main threats to the species vary according to geographical location: in the USA and Mexico the predominant threats are associated with urban development, pollution, damming and water management, whereas Australasian species are at risk from climate change (and related wildfires and droughts), harvesting, agricultural practices and invasive species. Only a small percentage of species occur within protected areas, and their vulnerability is heightened by their small range size; most species are

known from only a single country and some from only a single pond. This highlights the need for more conservation efforts for crayfish, which are important ecosystem engineers in freshwater environments and provide a source of food for humans and other species.

Source: *Philosophical Transactions of the Royal Society B* (2015) [dx.doi.org/10.1098/rstb.2014.0060](https://doi.org/10.1098/rstb.2014.0060), and *ZSL* (2015) www.zsl.org/science/news/critical-crustaceans

Tracking reveals the extraordinary feats of bar-headed geese

Researchers have used global positioning system devices to track the Himalayan migration of bar-headed geese *Anser indicus*. The devices, which also measured acceleration, body temperature and heart rate, were implanted in seven geese captured in central Mongolia. The results indicated that the energy cost of flight increases rapidly with decreasing air density, and thus rather than maintaining high-altitude flight when crossing the Himalayas the birds adopt a roller coaster flight pattern, rising and falling and taking advantage of wind deflected off ridges to provide additional lift. Heart rate was found to increase significantly with altitude, making sustained flight at high altitude energy-intensive. Remarkably, the geese do not soar but flap their wings constantly during flight, and several of the flights recorded lasted up to 17 hours. One goose was recorded at 7,300-m, and the birds have reportedly been seen flying over the peak of Mount Everest.

Source: *Science* (2015) [dx.doi.org/10.1126/science.1258732](https://doi.org/10.1126/science.1258732), and *BBC News* (2015) www.bbc.co.uk/news/science-environment-30799436

Mirror mirror

Monkeys have consistently failed to show signs of mirror self-recognition in previous studies. However, a group of scientists have shown that rhesus macaques *Macaca mulatta* can be trained using visual-somatosensory cues to acquire mirror-induced self-directed behaviours. The monkeys were placed in front of a mirror and a low-powered laser beam was shone on their faces, creating a light spot and causing mild heat irritation. The monkeys were rewarded when they touched the spot on their faces. After 2–5 weeks of training the monkeys had learned to touch an odourless mark or non-irritant light spot applied to their faces, seen in the mirror. Five of seven trained macaques exhibited typical mirror-induced self-directed behaviours, such as touching a mark on the face and then looking at, or smelling, their

fingers, and some used the mirror to explore parts of their bodies that were normally unseen.

Source: *Current Biology* (2015) [dx.doi.org/10.1016/j.cub.2014.11.016](https://doi.org/10.1016/j.cub.2014.11.016), and *Nature* (2015) [dx.doi.org/10.1038/nature.2015.16692](https://doi.org/10.1038/nature.2015.16692)

Challenges to sustainable resource use

A study has investigated the peak-rate years for consumption of 27 global renewable and non-renewable resources considered essential for human well-being, such as land, food and energy. A peak-rate year was identified for 21 of the resources, and for 20 resources the peak-rate year occurred during 1960–2010. The hypothesis that peak-rate years are synchronized was tested, and peak consumption of multiple resources, including food and wood, was found to have occurred c. 2006. This synchronicity may be attributed to the fact that multiple resources are used simultaneously to meet a variety of needs, and multiple resources are needed to generate new resources. The possibility of synchronous depletion of multiple resources means that achieving sustainability may be more challenging than previously thought, and indicates a need for simultaneous management of resources, taking into account relationships in resource appropriation.

Source: *Ecology and Society* (2014) [dx.doi.org/10.5751/ES-07039-190450](https://doi.org/10.5751/ES-07039-190450), and *Nature* (2015) [dx.doi.org/10.1038/517246e](https://doi.org/10.1038/517246e)

Biochar put to the test

Biochar is a carbon-rich material that offers potential for improving agricultural yields and controlling pollution, and scientists are investigating various applications of the substance, and particularly how it affects water movement through soil, removes pollutants, alters microbial communities and reduces carbon emissions. Biochar is produced by heating biological material, such as rice and wheat husks and other agricultural waste, in a low-oxygen chamber, and a key concern related to its environmental impact is the choice of feedstock, and whether it can be sourced sustainably for large-scale production. Using wood as a feedstock, for instance, could drive deforestation or negative changes in land-use practices. Biochar can vary significantly, depending on the biomass and conditions used in its production, and although its positive impacts appear to outweigh the negative, some studies found that it decreased crop yields, and one found that it may reduce plants' resilience to attack by insects and pathogens.

Source: *Nature* (2015) [dx.doi.org/10.1038/517258a](https://doi.org/10.1038/517258a)

Global fishing industry predicted to incur economic losses as a result of climate change. . .

A report by the European Climate Foundation, the Sustainable Fisheries Partnership and the University of Cambridge estimates that the fishing industry will suffer losses of tens of billions of dollars within the coming decades as a result of the effects of climate change on the world's oceans, with the greatest losses predicted in East Asia and the Pacific. Global shellfish production is projected to decline during 2020–2060 as a result of ocean acidification, and fishing yields are expected to decrease as a result of ocean warming, most significantly in the tropics and Antarctica, where a 40–60% decrease is predicted. Acidification and rising temperatures are also having a negative impact on coral reefs, half of which are at risk of degradation. In some regions climate change may benefit the aquaculture industry, promoting fish growth, expanding habitats for some species, and increasing fishing yields, but overall the outlook is negative.

Source: *Mongabay.com* (2015) news.mongabay.com/2015/0116-montoro-fishing-industry-loss-cc.html

... as 2014 declared the warmest year on record

U.S. government scientists have published the results of an analysis of global temperature datasets, which show that 2014 was the warmest year on record, with global temperatures 0.68°C higher than the long-term mean calculated using data from 1951–1980. According to the analysis, 14 of the 15 warmest years on record have occurred in the 21st century. Record temperatures were recorded in many places on land, including parts of Europe and Australia, and in parts of every ocean, but other areas, including parts of the USA, were cooler than average. Meanwhile, the World Meteorological Organization has highlighted a number of record-breaking weather events during 2014, including persistent drought in parts of the USA, China and Central and South America, and record levels of rainfall in parts of the Balkans, Turkey, Morocco and Japan. The report supports the growing body of evidence of global warming in response to greenhouse gas emissions.

Source: *NASA Research News* (2015) www.giss.nasa.gov/research/news/20150116/, and *BBC News* (2015) www.bbc.co.uk/news/science-environment-30852588

Agriculture surpasses deforestation in driving climate change

A study has examined greenhouse gas emissions from all anthropogenic sources, under five categories: buildings, energy, industry, transport, and agriculture, forestry and other land uses. The results indicate that emissions from deforestation have decreased by almost 25% since the 1990s, whereas emissions from agriculture have increased by an eighth. Agriculture is now a more significant driver of emissions than deforestation and land-use change, and the increase in emissions from this sector is attributed to increasing consumption of meat and dairy products. There was an almost 70% increase in global meat production during 1990–2012. Meanwhile, the production of milk and eggs increased by 39 and 93%, respectively. On the basis of their results, the study's authors maintain that the investment of resources in mitigating agricultural emissions in the coming years should be on a scale similar to that of investment in REDD+ to mitigate the effects of deforestation during the past decade.

Source: *Global Change Biology* (2015) [dx.doi.org/10.1111/gcb.12865](https://doi.org/10.1111/gcb.12865), and *Mongabay.com* (2015) news.mongabay.com/2015/0118-afolu_emissions.html

Data on movement behaviour can inform connectivity conservation

Connectivity is increasingly of conservation concern. Connectivity assessments, however, rarely incorporate data related to animal movement but tend to be based on expert opinion or on animal presence data. A study conducted by scientists at the University of Florida, Wildlife Trust of India, and Wildlife Conservation Society—India Program has demonstrated how small-scale movement behaviour can be easily incorporated into currently used connectivity models. Focusing on the arboreal (and hence movement-limited) western hoolock gibbon *Hoolock hoolock* population in Garo Hills, India, the research found that ignoring landscape heterogeneity had a significant impact on conservation solutions. Although fragment prioritization based on presence data was largely in concordance with prioritization based on movement data, there were some discrepancies, which increased with landscape heterogeneity. The study informs gibbon conservation in assessing the movement permeability of existing land uses, and emphasizes the need to incorporate animal movement data in connectivity conservation.

Source: *Biological Conservation* (2015) [dx.doi.org/10.1016/j.biocon.2014.11.021](https://doi.org/10.1016/j.biocon.2014.11.021)

EUROPE

Europe's olives threatened by disease

A report by the European Food Safety Authority has warned of the threat of the spread of disease to olive production in the EU. An outbreak of the virulent pathogen *Xylella fastidiosa* was reported in the Puglia region of Italy in 2013, thought to have been introduced via plant material from outside the EU, and biosecurity measures were put in place, prohibiting the transfer of propagation material from susceptible host species in the region. The bacterium, which starves olive trees, can spread rapidly under favourable environmental conditions and has multiple hosts and vectors, including xylem-feeding insects. If the disease spreads to other olive-producing regions it could have a significant impact on crop yields and require the establishment of expensive control measures. The pathogen also represents a threat to other crops in Europe, including citrus, grapevine and stone fruits, and tree and ornamental plant species, including oak, sycamore and oleander.

Source: *EFSA Journal* (2015) [dx.doi.org/10.2903/j.efsa.2015.3989](https://doi.org/10.2903/j.efsa.2015.3989), and *BBC News* (2014) www.bbc.co.uk/news/science-environment-30737754

Blooming start to the new year in Britain and Ireland...

Following the fourth consecutive mild winter, and the UK's warmest year on record, botanists recorded an unprecedented 368 plant species in flower on New Year's Day, during the New Year's plant hunt organized by the Botanical Society of Britain and Ireland. This represents 15% of the flowering plants of Britain and Ireland. Fifty years ago only 20 species in flower were found at the start of the year, and although the number of volunteers has increased, the high count is primarily attributed to climate change. The highest numbers of species in flower were recorded in the mild south and west of Britain, with 71 species in flower recorded in Cardiff and 70 in Cornwall. Thirty-nine species flowering were recorded in Edinburgh. Daisy and dandelion were the most commonly recorded, each appearing on 75% of lists. In Ireland 40 species in flower were recorded on Bull Island, in Dublin Bay.

Source: *BBC News* (2015) www.bbc.co.uk/news/science-environment-30754443

...and changes in butterfly phenology blamed on climate change

The wall brown butterfly *Lasiommata megera* has disappeared from much of central and southern England, with a population decline of 86% since 1976. A study by Belgian scientists has found that climate change may be affecting the phenology of the species, with warmer weather causing butterflies to hatch in September or October rather than emerging the following spring. These butterflies that emerge in autumn are a lost generation because there is not sufficient food for their caterpillars at this time of year, and thus no caterpillars survive to become butterflies in spring. Other butterfly species that traditionally emerge in spring or summer have also been found to produce doomed generations in autumn, including the white admiral *Limenitis camilla*, the Duke of Burgundy *Hamearis lucina*, and the orange tip *Anthocharis cardamines*. Some butterfly species have adapted remarkably quickly to changing climate, however, including the brown argus *Aricia agestis* in the UK.

Source: *The Guardian* (2014) www.theguardian.com/environment/2014/dec/24/wall-brown-butterfly-may-be-a-victim-of-climate-change

Loft insulation a factor in sparrow decline

A report by the British Trust for Ornithology suggests that house sparrows have declined by 70% in the UK since the 1960s, with the greatest declines recorded in urban and suburban areas. Numbers of starlings and house martins have also dropped by c. 50% during the past 4 decades. Loft insulation has been cited as a contributing factor in the decline of these bird species. People have become more aware of energy efficiency in their homes, with many insulating their lofts and filling in potential nesting spaces. Although loss of suitable nesting sites may have affected sparrow numbers in some areas, the birds have also disappeared from areas where there appear to be plenty of suitable nesting sites available, which indicates there are probably other factors involved in the decline. In contrast, 18 generalist species, including the buzzard, magpie and jackdaw, have doubled in population size over 31–45 years.

Source: *BBC News* (2015) www.bbc.co.uk/news/uk-30794552

Forensic breakthrough in the fight against wildlife crime

Scientists from the University of Abertay, in Dundee, have been able to recover

fingerprints from the feathers of birds of prey, using red and green magnetic fluorescent powders. They also recovered fingerprints from eggs, using black magnetic powder. They successfully recovered prints from kestrels, sparrow hawks, buzzards, red kites, golden eagles and white-tailed eagles, and found that the flight feathers were most suitable for analysis. Birds of prey in the UK and elsewhere are threatened by illegal poisoning, shooting and trapping, with more than 120 confirmed incidents in the UK in 2013 according to the Royal Society for the Protection of Birds. This forensic breakthrough could help police to identify the perpetrators of such crimes if the birds have been handled.

Source: *Science & Justice* (2015) [dx.doi.org/10.1016/j.scijus.2014.12.004](https://doi.org/10.1016/j.scijus.2014.12.004), and *BBC News* (2015) www.bbc.co.uk/news/science-environment-30802401

Badger culling not the most effective measure against bovine TB

The UK has seen a rise in bovine TB in recent decades, and the controversial practice of badger culling has been sanctioned as a measure to control the disease. However, large-scale computer modelling of TB in cattle and badgers indicates that more frequent testing of cattle is more effective than badger culling for controlling the spread of the disease. The study found that whether or not cattle were housed in winter had a significant effect on the number of cattle infected, potentially doubling the number of infected animals by creating favourable conditions for the spread of the disease, although this has been refuted by the National Farmers' Union. According to the modelling, in an area containing c. 1.5 million cows, of which 3,000–15,000 might be infected, badger culling would reduce the number of infected cattle by 12, whereas more frequent testing could reduce this number by 193.

Source: *Stochastic Environmental Research and Risk Assessment* (2015) [dx.doi.org/10.1007/s00477-014-1016-y](https://doi.org/10.1007/s00477-014-1016-y), and *BBC News* (2015) www.bbc.co.uk/news/science-environment-30820579

Disease threat to wild bees from commercial counterparts...

Species of bees traded commercially for crop pollination or honey production can represent a significant threat to wild pollinators, including bumble bees, wasps, ants and hoverflies. A study has found that commercial pollinators can carry diseases that could threaten native species, and they are known to suffer from parasites and viruses, including the varroa mite and a virus that

causes wing deformities. A sample of commercial bumble bee hives imported to the UK last year was tested, and 77% were found to host up to five parasites. Three other parasites were found in the pollen accompanying the hives. These findings highlight the importance of preventing the release of contaminated pollinators into the wild, and the need to monitor the health of both wild and commercial species. Wild honey bees are no longer found in England and Wales, and they are thought to have been extirpated as a result of disease.

Source: *Journal of Applied Ecology* (2015) [dx.doi.org/10.1111/1365-2664.12385](https://doi.org/10.1111/1365-2664.12385), and *BBC News* (2015) www.bbc.co.uk/news/science-environment-30831257

...but good housekeeping reduces risk

By adopting good standards of hygiene, honeybees can protect their hives against the harmful effects of the varroa mite. The mite sucks the blood from the pupae of worker bees, compromising their immunity to disease and transmitting viruses, which can have catastrophic consequences for the hive. Worker bees find infected pupae and remove them from the hive. In a study of this behaviour, honeycomb containing dead pupae was placed inside 42 honeybee colonies. In most colonies c. 50% of the dead pupae had been removed within 1 day, but in some colonies more than 95% had been removed. These super-hygienic colonies were found to be much healthier, with less than half of the varroa mite levels of the less hygienic colonies and less evidence of viral infection. The findings offer hope of reducing the effects of varroa naturally by breeding colonies that exhibit super-hygienic behaviour.

Source: *Journal of Apicultural Research* (2014) [dx.doi.org/10.3896/IBRA.1.53.5.10](https://doi.org/10.3896/IBRA.1.53.5.10), and *New Scientist* (2015) www.newscientist.com/article/dn26774-ubertidy-bees-defend-their-hives-from-disease.html#.VLo_qSFFBhE

Rhodope Mountains chosen for rewilding

The Rhodope Mountains have been chosen as the seventh rewilding area under the Rewilding Europe project, which aims to establish 10 such areas across Europe by 2022. The mountains are located south-east of Bulgaria's capital, Sofia, and are ecologically connected to extensive areas of wilderness in Greece, and to other mountain ranges in Bulgaria, making them a natural hotspot. The project aims to restore > 100,000 ha in the eastern part of the Rhodope Mountains over 10 years, restoring wildlife species such as fallow and red deer, horses, wolves,

brown bears, the European ground squirrel, a large number of raptor species, and black, Egyptian and griffon vultures. It will build on conservation work carried out in the Eastern Rhodopes during 2009–2014, which promoted wilderness and biodiversity preservation, organic farming practices, and sustainable tourism. Rewilding will commence in the four key priority areas of Chernoochene, Madzharovo, Studen Kladenets and Byala Reka.

Source: *BirdLife News* (2015) www.birdlife.org/europe-and-central-asia/news/birdlife-bulgaria-supports-rewilding-rhodope-mountains

Restoration of Berlengas archipelago

A project has been launched to restore the ecosystem of the Berlengas archipelago off the coast of Portugal, which is included in UNESCO's World Network of Biosphere Reserves. The *Life + Berlenga* project aims to restore the natural resources of the fragile ecosystem, which have deteriorated as a result of overexploitation in response to economic conditions in the region. Although there are only 30 inhabitants in the archipelago, the islands receive > 200,000 visitors annually, attracted by the rich biodiversity, including several iconic species of marine birds. The project will aim to control non-native mammalian species and invasive plants, which threaten birds such as the common guillemot *Uria aalge*. It also includes plans for sustainable use of resources, and a campaign to promote sustainable tourism in the archipelago, which will benefit the livelihoods of local communities. Half of the initial funding for the project was provided by the European Commission.

Source: *BirdLife News* (2015) www.birdlife.org/europe-and-central-asia/news/new-project-repair-and-protect-berlengas-archipelago%E2%80%99s-rich-ecosystem

Malta approves referendum on spring bird hunt

Despite objections from Malta's powerful hunting lobby, the country's Constitutional Court has approved a referendum on the abolition of spring hunting. A coalition of 11 conservation groups presented a petition signed by 40,000 Maltese voters, and according to opinion polls the majority of Maltese voters oppose the spring hunt. Many migratory bird species use Malta as a stopover during their migration from Africa to Europe, and a decline in migrating birds has been recorded in many European countries. Over 10,000 turtle doves and 5,000 quail may be killed during the controversial hunt, and illegal hunting is also a

problem in Malta, with hunters targeting threatened species. Meanwhile the hunting lobby is blaming pesticide use and habitat loss for the decline. The referendum will be held sometime between April and July, and more than 50% of the electorate must participate to make it valid.

Source: *Mongabay.com* (2015) news.mongabay.com/2015/0112-hance-malta-bird-referendum.html

NORTH EURASIA

Little auks adapting to Arctic warming

Researchers studying the feeding habits of little auks *Alle alle* in Franz-Josef Land, off the northern coast of Russia, discovered they are adapting to environmental change by feeding on zooplankton that are stunned by cold water from melting glaciers. Auks typically fed on zooplankton congregated around sea ice but since 2005 there has been virtually no sea ice in their environment during summer. Although the growth rate of chicks is the same as it was before 2005, there has been a mean decrease of 4% in adult body mass since the early 1990s. The future of the species remains uncertain, as all continental glaciers are predicted to disappear from Franz-Josef Land within c. 180 years, which could result in insufficient food resources for the birds. Little auks play an important role in the Arctic ecosystem, and therefore any impacts on the species could have a knock-on effect on other species.

Source: *Global Change Biology* (2015) dx.doi.org/10.1111/gcb.12811, and *National Geographic* (2015) news.nationalgeographic.com/news/2015/01/150112-little-auks-global-warming-climate-change-environment/

Wildlife decline linked to political instability in Russia

A study has investigated population trends recorded for eight large mammal species in Russia during 1981–2010. The species included in the study were roe and red deer, reindeer, moose, wild boar, brown bear, lynx and grey wolf. With the exception of wolves, all of the species experienced a decline in population growth rate immediately after the collapse of the Soviet Union, in 1991, and for wild boar, moose and brown bear the decline continued throughout the following decade. In contrast, wolf populations increased significantly after 1991. Similar fluctuations were not observed in politically stable regions of North America and Europe during the same 30-year period. It is likely that hunting and poaching

increased in Russia following the political upheaval and economic collapse. The increase in the number of wolves, possibly as a result of a lapse in government control measures, would also have been a contributing factor in wildlife declines.

Source: *Conservation Biology* (2015) dx.doi.org/10.1111/cobi.12450, and *Science* (2015) dx.doi.org/10.1126/science.aaa6362

SUB-SAHARAN AFRICA

A palm oil hypothesis for the Ebola outbreak

Researchers have hypothesized that the Ebola outbreak in West Africa may have been the result of complex economic and agricultural policies in the region, and particularly an increase in the cultivation of oil palm *Elaeis guineensis*. Agriculture in Guinea, the source of the outbreak, was traditionally characterized by coffee, cocoa and kola nut cultivation, and slash-and-burn farming. In 2007, however, the government began exporting palm oil, and with developments in palm oil production came changes in agroforestry practices. The town where the first victim of the disease was reported is surrounded by a mosaic of villages and dense vegetation interspersed with oil-palm plantations. The plantations offer desirable habitat for frugivorous bats, which are considered the most likely source of the Ebola outbreak. They offer food, shelter, and ease of movement between roosting and foraging sites via plantation trails, but they also bring the bats into closer contact with people.

Source: *Environment and Planning A* (2014) dx.doi.org/10.1068/a4712com, and *Mongabay.com* (2015) news.mongabay.com/2015/0114-urey-ebola-palm-oil.html

Relics of extinct species found in Madagascan cave

Divers have discovered the skeletal remains of extinct lemurs and other animals in an underwater cave in Tsimanampesotse National Park, in Madagascar. The bones of dozens of giant lemurs *Pachylemur insignis* and the 30-cm-long skull of a koala lemur *Megaladapis* sp. have been recovered, and there are thought to be thousands more bones remaining on the cave floor. These include the remains of other extinct species, including elephant birds *Mullerornis* spp., giant fossa *Cryptoprocta spelea*, dwarf hippopotamus *Hippopotamus lemerlei* and horned crocodile *Voay robustus*. It is estimated that two-thirds of lemur species, which are unique to Madagascar, have

gone extinct within the past 1,000 years. The cave where the bones were found is accessible only to specialist divers, and further diving expeditions are planned for this summer to retrieve more specimens.

Source: *Nature* (2015) dx.doi.org/10.1038/517248a

South Africa rhino poaching record set in 2014

A record 1,215 rhinos were poached in South Africa in 2014, a 21% increase on the previous year. More than two-thirds were killed in Kruger National Park. The last few years have all seen new records set, with poaching fuelled by demand for rhino horn in China and Vietnam. The lucrative market has attracted criminal gangs. More than 100 rhinos had been moved to more secure locations, including neighbouring countries, to protect the animals. Conservationists are facing an ever greater challenge to protect animals against poachers who are equipped with sophisticated tools such as night-vision goggles and long-range rifles.

Source: *BBC News* (2015) www.bbc.co.uk/news/science-environment-30934383

SOUTH AND SOUTH-EAST ASIA

India reports 30% increase in tiger population

India's Environment Minister, Prakash Javadekar, has presented the findings of the country's latest tiger census, which indicate that the tiger population increased by 30%, from 1,706 in 2011 to 2,226 in 2014. Following the census, unique photographic records now exist for 80% of India's tigers. The Minister attributed the positive results to a number of government initiatives to streamline tiger conservation, and suggested that conservation practices that had proved successful in India could also be applied elsewhere. It is estimated that 70% of the world's tigers are found in India, and thus the country could play a key role in global tiger conservation. India is reportedly willing to donate tiger cubs to other countries for conservation purposes. The Wildlife Conservation Society–India has cautioned, however, that although Project Tiger has arrested the species' extinction, it has not been able to substantially increase tiger numbers since the Project was launched in 1973.

Source: *BBC News* (2015) www.bbc.co.uk/news/world-asia-30896028, and *Wildlife*

Conservation Society–India Press Release, 21 January 2015.

Myanmar to China: growth in illegal trade in tigers and other wild cats. . .

A study based on 2 decades of survey data has revealed an increase in the trade in tiger and other wild cat parts from Myanmar into China, with the border town of Mong La serving as a gateway for the illegal trade. There is little or no enforcement in the town, and the number of shops selling wild cat parts, including claws, skulls, teeth and skins, increased from six to 21 during 2006–2014. In contrast, data from the town of Tachilek on the Myanmar–Thailand border showed a decrease in the wild cat trade during 1991–2013, possibly as a result of greater enforcement in Thailand. Surveys revealed the clouded leopard *Neofelis nebulosa* was the most commonly traded species in both towns; leopard cat *Prionailurus bengalensis*, leopard *Panthera pardus*, tiger *Panthera tigris* and Asiatic golden cat *Catopuma temminckii* were also commonly traded. All wild cat species are designated protected species under CITES.

Source: TRAFFIC (2014) www.traffic.org/home/2014/12/22/myanmar-a-gateway-for-illegal-trade-in-tigers-and-other-wild.html, and *Biological Conservation* (2015) [dx.doi.org/10.1016/j.biocon.2014.10.031](https://doi.org/10.1016/j.biocon.2014.10.031)

. . . and demand for slow lorises creates extinction risk

Slow lorises are traded as exotic pets in Asia but there is also a high demand for body parts for use in traditional medicine. Although they are protected under CITES, illegal trade in slow lorises is rife in markets close to international borders where enforcement of regulations is weak. Based on surveys carried out in recent years it is estimated that at least 1,000 Bengal slow lorises *Nycticebus bengalensis* are traded annually in the town of Mong La in Myanmar, close to the border with China, and the real number is likely to be significantly higher. The animals are killed, dried and sold as individual body parts, including arms, legs, skins and skeletons. The Bengal slow loris is the largest of the slow lorises, a group of eight species of venomous primates native to South and South-east Asia. These species are threatened primarily by habitat loss and over-exploitation.

Source: TRAFFIC (2015) www.traffic.org/home/2015/1/8/brisk-trade-threatens-slow-lorises.html, and *Primate Conservation* (2014) www.primatesg.org/storage/pdf/

PC28_Nijman_et_al_Mong_La_Bengal_slow_lorises.pdf

Lao PDR implicated in wildlife trafficking

In 2014 Lao PDR was implicated as the source, transit or destination country in a number of high-value seizures of illegally traded wildlife. One of these involved the discovery of 170 juvenile radiated tortoises en route from Madagascar to Lao PDR, which were intercepted by customs officers in Paris's Charles de Gaulle airport. The country is vulnerable to exploitation by organized crime networks, given its lack of law-enforcement capacity and its strategic location, sharing land borders with Cambodia, China, Myanmar, Thailand and Vietnam. TRAFFIC has identified Lao PDR as a major source of wildlife products, such as bear bile, to supply the illegal international trade, and CITES has identified the country as one of three Parties of 'importance to watch' in the global ivory trade. The country reported no major seizures of wildlife in 2014, and has never reported an ivory seizure to the Elephant Trade Information System database.

Source: TRAFFIC (2015) www.traffic.org/home/2015/1/6/wildlife-seizures-in-2014-highlight-lao-pdrs-role-in-traffic.html

Discovery of new legless amphibian species in Cambodia

A new caecilian species has been discovered in the Cardamom Mountains of Cambodia. Caecilians are an order of limbless amphibians that are often mistaken for snakes, and the new discovery, *Ichthyophis cardamomensis*, is one of three species of the genus *Ichthyophis* discovered recently in Indochina, the other two being in Vietnam. These are among the most poorly known amphibian taxa in South-east Asia, and the similarity between various species makes them difficult to distinguish. Thus morphological and DNA analysis is required to recognize a new species. The forested Cardamom Mountains were not accessible to researchers prior to the 1990s, being in a region that was formerly held by the Khmer Rouge, and much remains to be learned about the biodiversity of the region, which contains some of the largest remaining areas of habitat for more than 80 threatened species, and is home to a diverse range of reptiles and amphibians.

Source: FFI (2015) www.fauna-flora.org/news/new-legless-amphibian-discovered-in-cambodia/

New species of frog exhibits unique reproductive mode

A new species of fanged frog from Sulawesi has been observed giving birth to tadpoles. This is the first time this phenomenon has been observed in frogs, most species of which use external fertilization of eggs. Only c. 12 species of frogs are known to have evolved internal fertilization and of these the new species, *Limnonectes larvaepartus*, is the only one observed giving birth to tadpoles rather than laying fertilized eggs or giving birth to froglets. It is not yet known how fertilization of eggs inside the female occurs, as frogs do not have typical sexual organs. The frog has been known to scientists in Indonesia since the 1990s but was only recently confirmed as a distinct species. The island is thought to be home to up to 25 species of *Limnonectes* frogs but to date only four species have been described, and there is little knowledge of their biology.

Source: PLoS ONE (2014) [dx.doi.org/10.1371/journal.pone.0115884](https://doi.org/10.1371/journal.pone.0115884), and BBC News (2014) www.bbc.co.uk/news/science-environment-30643756

Rare cat photographed with cub in Sumatra

An Asiatic golden cat *Catopuma temminckii* carrying a cub in her mouth has been photographed by researchers in Kerinci Seblat National Park. The Asiatic golden cat, categorized as Near Threatened on the IUCN Red List, ranges across South-east Asia and is threatened by habitat loss, prey decline, snaring and the illegal wildlife trade. Being a generalist species, however, it is better able than more specialized species to adapt to changes in its environment. In addition to the Asiatic golden cat, Kerinci Seblat National Park is home to four other wild cat species: the Critically Endangered Sumatran tiger *Panthera tigris sumatrae*, the Vulnerable Sunda clouded leopard *Neofelis diardi* and marbled cat *Pardofelis marmorata*, and the leopard cat *Prionailurus bengalensis*. Although research has shown that Asiatic golden cats and Sunda clouded leopards generally avoid each other, they have been found to co-exist in areas with large prey densities.

Source: Mongabay.com (2015) news.mongabay.com/2015/0113-hance-asian-golden-cat.html

Guns kill trees too

New research has shown that hunting birds and mammals will drastically raise the risk of extinction for tropical trees. Researchers tested the impact of dispersal loss on population viability of a tropical tree species,

Milvusa horsfieldii, currently dispersed by an intact community of large mammals in a Thai forest. They evaluated the effect of spatial aggregation for all tree life stages, from seeds to adult trees, and constructed simulation models to compare population viability with and without animal-mediated seed dispersal. In simulated populations, disperser loss increased spatial aggregation fourfold, leading to increased negative density dependence across the life cycle and a 10-fold increase in the probability of extinction. Given that the majority of tree species in tropical forests are animal-dispersed, overhunting will potentially result in forests that are fundamentally different from those existing now.

Source: *Proceedings of the Royal Society B* (2014) [dx.doi.org/10.1098/rspb.2014.2095](https://doi.org/10.1098/rspb.2014.2095), and *Mongabay.com* (2014) news.mongabay.com/2014/1112-hance-hunting-seeddispersal.html

EAST ASIA

Wildlife detector dogs prove successful in Asia

The inaugural World Customs Organization seminar took place in China in December 2014 as part of international efforts to increase the number of wildlife detector dogs deployed in Asia, and to expand the range of products they are trained to detect. Customs officials discussed the successes and challenges encountered in training detector dogs, which are already used by a number of countries to combat wildlife crime. In 2014 a single dog in China detected 16 cases of wildlife smuggling, involving ivory, pangolin scales and rhinoceros horns. Four dogs are being trained for operations in Xinjiang province, where they will be used to detect wildlife products such as saiga horns and tiger and leopard parts, and there are also plans to deploy a team of detector dogs at China's fourth-largest airport, in Chengdu.

Source: *TRAFFIC* (2015) www.traffic.org/home/2015/1/7/meeting-to-expand-the-role-of-wildlife-detector-dogs-in-asia.html

Pandas face habitat loss as a result of climate change

Researchers have assessed the conservation effectiveness of reserves for the giant panda *Ailuropoda melanoleuca*, considering food availability and climate and geographical variables. Wild populations have been reduced to a very limited gene pool and face increasing pressure from infrastructural development projects in China. The results of

the study indicate that warming by even 1°C globally by 2100, which is among the most conservative climate change scenarios, could result in a loss of > 50% of suitable habitat for pandas by 2070. Habitats are also predicted to become more fragmented and isolated, and c. 20% of reserves could lose all suitable habitat this century. Translocation of pandas from the south-west to the north-west of their current range may be necessary to ensure their viability, and planting bamboo in northern areas of the panda's homeland now could prepare these areas as they become more suitable for pandas in the future.

Source: *Biological Conservation* (2015) [dx.doi.org/10.1016/j.biocon.2014.11.037](https://doi.org/10.1016/j.biocon.2014.11.037), and *New Scientist* (2015) www.newscientist.com/article/mg22530031.700-climate-change-may-halve-giant-pandas-habitat-by-2070.html#.VLU4DyFFBxA

State-owned Chinese company adopts zero tolerance towards illegal wildlife trade

New Era Health Group has added a clause to its Code of Conduct for employees, prohibiting the consumption and gifting of illegal wildlife products. The move follows a series of environmental training lectures held at the company's headquarters, in Beijing, during which wildlife trade specialists from TRAFFIC and WWF spoke with senior company representatives about various environmental issues, including wildlife conservation and forest preservation. The company has committed to strict enforcement of the policy, and it is hoped their actions will help to change the attitudes and behaviours of other businesses, and encourage other State-owned companies to follow suit. New Era is the first State-owned company to make a formal commitment on corporate gifting and personal consumption of illegal wildlife products, and it has also expressed a broader commitment to responsible environmental protection policies.

Source: *TRAFFIC* (2015) www.traffic.org/home/2015/1/13/new-era-health-group-makes-formal-commitment-not-to-tolerate.html

NORTH AMERICA

Prairie butterflies protected under Endangered Species Act...

Two species of prairie butterflies have been listed under the Endangered Species Act by the U.S. Fish and Wildlife Service, following significant declines in recent decades. The Poweshiek skipperling *Oarisma poweshiek* and the Dakota skipperling *Hesperia*

dacotae reside in the North American tall-grass prairie, most of which has been converted to agriculture over the centuries. The prairie is one of the world's most threatened ecosystems, with < 1% remaining. Inclusion of the butterfly species on the endangered species list should help to preserve their remaining habitat, which also hosts many other threatened species of prairie butterflies, which play an important ecological role as pollinators. It is estimated there may be only a few hundred Poweshiek skipperlings remaining, and attempts are underway to breed both Poweshiek and Dakota skipperlings in captivity as part of Minnesota Zoo's Prairie Butterfly Conservation Program.

Source: *Mongabay.com* (2015) news.mongabay.com/2015/0105-hance-poweshiek-dakota-esa.html

... and monarch butterfly assessed for inclusion on endangered species list...

The U.S. Fish and Wildlife Service will assess the monarch butterfly *Danaus plexippus* for inclusion on its endangered species list, following significant declines in the species in recent years. The iconic orange-and-black butterflies are known for their mass migrations between Mexico, USA and Canada, and were estimated to number only 35 million by last winter, representing a 90% decrease in the population in 20 years. The main threats to the species are climate change and loss of breeding and winter habitats. The herbicide Roundup has been implicated in the decline, as it kills milkweed, which is the sole food source of monarch caterpillars. Severe weather events and illegal deforestation in the species' overwintering grounds in Mexico have also been cited as contributing factors. The review of the petition to include the monarch butterfly on the endangered species list will take a year, beginning with a 60-day information gathering process.

Source: *New Scientist* (2015) www.newscientist.com/article/mg22530033.500-save-the-monarch-butterfly-from-extinction.html#.VLALUyFFBhE, and *The Washington Post* (2014) www.washingtonpost.com/news/speaking-of-science/wp/2014/12/31/the-monarch-butterfly-might-end-up-on-the-endangered-species-list-this-year/

... as good intentions to save the species have unintended consequences

Across the USA people responded to the plight of the monarch butterfly by planting milkweed in their gardens. Many gardeners, however, planted the species *Asclepias*

curassavica, which is most widely available. This species is native to the tropics and, unlike native milkweed, does not die back in winter when planted in warm environments such as that of southern Texas and the Gulf Coast. This could threaten the monarch's iconic migration to Mexico by offering them winter breeding sites in the USA. Tropical milkweed also represents a direct threat to the species because it hosts the parasite *Ophryocystis elektroscirrha*, which is debilitating to the butterflies when they ingest it as caterpillars. A study has found that monarchs that remained in the USA during winter were five to nine times more likely to be infected with the parasite than those that migrated, and at some breeding sites all monarchs tested were infected.

Source: *Proceedings of the Royal Society B* (2015) [dx.doi.org/10.1098/rspb.2014.1734](https://doi.org/10.1098/rspb.2014.1734), and *Science* (2015) [dx.doi.org/10.1126/science.aaa6337](https://doi.org/10.1126/science.aaa6337)

Federal judge rules in favour of wolves in the Midwest

Almost 3 years after the grey wolf *Canis lupus* was removed from the endangered species list, a federal judge has ruled that hunting of the species is in violation of the Endangered Species Act, and hunting and trapping of wolves have been put on hold in Minnesota, Wisconsin and Michigan. The judge criticized the absence of limits on wolf hunting and culling in some places, and the federal government's decision to delist the species despite its lack of recovery across much of the suitable habitat in its historical range. Since wolves in the Great Lakes region were delisted in 2012, 1,599 wolves have been killed by hunters and trappers in Minnesota, Wisconsin and Michigan, most of them under 2 years old. Wolves play an important ecological role by controlling populations of prey species, and they have been shown to have an impact on forest regeneration, stream health and biodiversity.

Source: *Mongabay.com* (2015) news.mongabay.com/2015/0106-hance-wolves-esa.html

California introduces bill to close loophole on ivory trade

Although the sale of ivory has been banned in California for almost 40 years, the law allows ivory from elephants killed before 1977 to be sold as an antique. Traders exploit this loophole in the law to sell illegal ivory, and it is estimated that up to 80 and 90% of the ivory sold in San Francisco and Los Angeles, respectively, and half the ivory sold throughout the state of California is

illegal. A bill has been introduced to close the loophole and, if passed, it will strengthen enforcement, prohibiting the sale, purchase or import of ivory and rhinoceros horn, with offenders facing a charge of misdemeanour and a fine of up to USD 10,000. It is estimated that c. 20% of Africa's elephants were lost to poaching in just 3 years, and it is thought the USA is the second largest market for ivory, after China. Source: *Mongabay.com* (2015) news.mongabay.com/2015/0108-hance-ivory-ca.html

Critical Arctic habitat designated for seals

The U.S. National Oceanic and Atmospheric Administration (NOAA) Fisheries has proposed the designation of more than 906,000 km² of the Bering, Chukchi and Beaufort Seas as critical habitat for the Arctic ringed seal *Phoca hispida hispida*, which is one of four subspecies of ringed seals considered threatened or endangered under the Endangered Species Act. The seals raise their pups in snow caves and use ice platforms for extended periods during moulting, breeding, whelping and nursing, and thus their survival is threatened by the loss of sea ice, late ice formation and earlier break-up of ice in the spring, and declining snowfall. Under the proposed designation, federal agencies would be prohibited from funding or authorizing activities, such as drilling for oil, in the habitat without prior consultation with NOAA Fisheries. Subsistence harvesting of the seals by Alaska Natives, however, would not be affected by designation of critical habitat.

Source: *Nature* (11 December 2014), and NOAA Fisheries (2014) www.alaskafisheries.noaa.gov/newsreleases/2014/arcticringedseal120214.htm

Woodrats prefer spiny cacti

Cacti rely on their spines as a defence against being eaten by herbivores. However, research has shown that the white-throated woodrat *Neotoma albigula*, found in the deserts of the south-western USA and in central Mexico, prefers spiny cacti over those without spines. When offered a selection of cacti, with and without spines, all woodrats in the study by researchers at the University of Utah in Salt Lake City showed a preference for spiny plants. The spines offer the woodrats a visual indication of the nutritional value of a cactus, with spiny plants generally having a higher protein content and less fibre than those without spines. Not only do spiny cacti provide a valuable food source for the rats, the animals also use the spines

for their own defences, lining the entrances and runways of their nests to defend them against attack by snakes and other predators.

Source: *Oikos* (2014) [dx.doi.org/10.1111/oik.02004](https://doi.org/10.1111/oik.02004), and *New Scientist* (2014) www.newscientist.com/article/mg22429983.800-the-rodent-with-a-taste-for-spines.html#.VLUKaSFFBxA

SOUTH AMERICA

Global demand for gold linked with deforestation of tropical forests...

A regional assessment of deforestation for gold mining in the tropical moist forest biome of South America, covering Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, Ecuador, Peru and Bolivia, has revealed that c. 1,680 km² of forest was lost at gold mining sites during 2001–2013. Satellite images show deforestation increased significantly after the global financial crisis in 2007, when global demand for gold soared, and represents a significant threat to some of South America's most remote and pristine tropical forest. Although deforestation for gold mining is less extensive than for other land uses, much of the deforestation recorded occurred within or close to protected areas, in regions of high biodiversity. Gold mining can have long-term environmental and social impacts, through deforestation and road-building, and the pollution of rivers with mercury, and these impacts can extend well beyond the mining sites.

Source: *Environmental Research Letters* (2015) [dx.doi.org/10.1088/1748-9326/10/1/014006](https://doi.org/10.1088/1748-9326/10/1/014006), and *BBC News* (2015) www.bbc.co.uk/news/science-environment-30804820

...and deforestation in the Brazilian Amazon is on the rise

Satellite data indicate that 1,373 km² of the Brazilian Amazon was deforested during August–December 2014, which is an increase of 224% relative to the corresponding period in the preceding year. Meanwhile, forest degradation, which usually precedes clearing, has increased by 66.4%. These figures raise concern that a reversal of the progress in reducing deforestation in Brazil over the past decade may now be imminent. Data from Global Forest Watch indicate there is also a rising trend in deforestation in the Guianas, Peru and Ecuador. There are also concerns in Brazil about the appointment to key ministerial

positions of two politicians who have been criticized by environmentalists. The Minister of Agriculture has lobbied on behalf of agribusiness for a loosening of environmental laws, and the Minister of Science, Technology and Innovation has denied the existence of evidence for anthropogenic climate change. Both have considerable influence on land-use policy in Brazil.

Source: *Mongabay.com* (2015) [news.mongabay.com/2015/0113-imazon-amazon-deforestation-2014.html](http://mongabay.com/2015/0113-imazon-amazon-deforestation-2014.html)

New Brazilian Red List of Threatened Species

After 4 years of workshops, the Instituto Chico Mendes Brasileiro de Conservação da Biodiversidade of the Brazilian Ministry of the Environment released the Official National Lists of Flora and Fauna Threatened with Extinction on 17 December 2014. The lists were published as edicts (*portarias*) on 18 December: Edict No. 443 listed the plants (2,113 taxa), Edict No. 444 listed the mammals (110 taxa), birds (234 taxa), reptiles (80 taxa), amphibians (41 taxa) and terrestrial invertebrates (233 taxa), and Edict No. 445 listed the fishes (408 taxa) and aquatic invertebrates (67 taxa). The assessments were carried out following the IUCN Red List criteria and categories.

Source: *Diário Oficial da União—Seção 1* (245), 110–130, 18 December (2014)

Two new magnolia species discovered in Río Zuñac Reserve

A botanical survey has resulted in the discovery of two new species of magnolia in a small area of Ecuador's Río Zuñac Reserve, which is home to at least 20 endemic plant species. The trees, among the biggest in the forest, were identifiable as magnolias but were unknown to local people, who had no name for them. Without finding flowers it was impossible to be certain the species were new to science, but subsequent expeditions revealed flowers of both species. The magnolia lineage can be traced back 100 million years, and the South American lineage of the genus diverged from other magnolias c. 40 million years ago. These are not the first new species to be discovered in the Río Zuñac Reserve: a new species of frog, *Pristimantis ardayae*, was discovered there in 2013, and three species of *Lepanthes* orchids have been found there in recent years.

Source: *World Land Trust* (2015) www.worldlandtrust.org/news/2015/01/botanists-find-new-species-magnolia-rio-zunac-reserve

Recovery of giant tortoises in the Galapagos

The population of Pinzón giant tortoises *Chelonoidis ephippium* appears to have stabilized on Pinzón Island, in the Galapagos, for the first time in 150 years, having been almost wiped out in the past by rats, whalers and pirates. By the 1960s only c. 100 of the tortoises remained, and the Galapagos National Park and partners established a conservation programme to save the species, collecting eggs and raising hatchlings in captivity for 4–5 years until they became large enough to avoid predation by rats. Rat eradication measures were also introduced on the island. Ten newly hatched tortoises were found on Pinzón in December 2014 and there may be many others: the hatchlings are difficult to observe because of their tiny size and the camouflage of their shells. This discovery indicates that the giant tortoise can reproduce naturally in the wild once again.

Source: *Nature* (2015) dx.doi.org/10.1038/517271a

Tropical bird fools predators by mimicry

The cinereous mourner *Laniocera hypopyrra* is a tropical lowland bird that inhabits an area of the Peruvian Amazon where losses to nest predation can be as high as 80%. During a long-term study of avian ecology, researchers discovered the second nest described for the species, and set up cameras to study its nesting behaviour. Parents are often absent from the nest, foraging, but the chicks exhibit a remarkable adaptation to deter predators. In contrast to the drab grey colour of adults of the species, chicks have bright orange feathers with a white tip, giving them the appearance of a poisonous caterpillar found in the same area. When a chick senses a potential predator nearby it moves its head slowly from side to side in a way that is typical of many hairy caterpillars. The researchers believe this may be an example of Batesian mimicry, which is rare in vertebrate species.

Source: *The American Naturalist* (2015) www.jstor.org/stable/10.1086/679106, and *New Scientist* (2014) www.newscientist.com/article/mg22430001.800-the-bird-that-mimics-a-toxic-caterpillar.html#VLUUnUCFFBxX

PACIFIC

Pacific salmon adapt to moderate warming

Researchers in Canada have investigated the response of Pacific chinook salmon

Oncorhynchus tshawytscha to an increase in temperature, to predict how the species may adapt to climate change. They exposed the offspring of wild-caught salmon to an environment at current temperatures, and to temperatures several degrees higher. They measured the fishes' maximum heart rate and found that in temperatures 2° warmer the animals were able to adapt their cardiac capacity to attain maximum heart rate. However, the salmon began to show signs of heart failure under conditions 4.4° warmer than at present. The researchers concluded that if warming reaches the maximum projected by 2100 the salmon populations face a 98% chance of being wiped out; however, under moderate warming the salmon may be able to adapt, with only a 17% chance of catastrophic loss by 2100.

Source: *Nature* (2015) dx.doi.org/10.1038/517124a, and *Nature Climate Change* (2014) dx.doi.org/10.1038/nclimate2473

Deepest fish discovered in the Mariana Trench

A 30-day international expedition to conduct the most comprehensive survey yet of the Mariana Trench, the world's deepest undersea canyon, has discovered several new species of fish, including one at 8,145 m, which breaks the record for the deepest known fish and is close to the depth-limit at which biologists believe fish can survive. Previously the deepest fish, a shoal of snailfish *Pseudoliparis amblystomopsis*, was recorded at a depth of 7,700 m in the Japan Trench, also in the Pacific Ocean. The newly discovered fish is so strange looking that scientists do not yet know what type of fish it is, although they believe it is an undescribed species and may be another species of snailfish. The fish was recorded during dives by unmanned vehicles, which also recorded a species of giant amphipod measuring up to 30 cm in length, compared to the 2–3 cm length of a typical amphipod.

Source: *BBC News* (2014) www.bbc.co.uk/news/science-environment-30541065

Moorea ecosystem provides basis for virtual ecology laboratory

An international team of scientists is developing a digital model of the Pacific island of Moorea, in French Polynesia. Although models have been used to study specific species or relationships between aspects of the environment, the Moorea IDEA (Island Digital Ecosystem Avatars) project is the first attempt to replicate an entire ecosystem, from the genetics of its flora and fauna to its geographical features, integrating societal data with physical and

biological components. In an era of environmental change, such a holistic model will facilitate investigation of the impacts of human activity, including activities such as creating protected areas or reducing fossil fuel consumption, on entire ecosystems. Moorea is a suitable candidate for the digital project because, in addition to its small size and population (16 km wide and 17,000 people, respectively), a considerable ecological dataset already exists for the island, where research has been taking place since the 1970s.

Source: *Nature* (2015) [dx.doi.org/10.1038/517255a](https://doi.org/10.1038/517255a)

AUSTRALIA/ANTARCTICA/ NEW ZEALAND

Loss of Antarctic ice accelerates...

Some of the fastest-melting glaciers in Antarctica are those flowing into the Amundsen Sea, and the rate of ice loss from these glaciers has accelerated in recent years. Various remote-sensing techniques have been used to study the glaciers, and researchers from the University of California, Irvine, compared and reconciled four such methods in a 21-year analysis of the region, finding remarkable agreement between the techniques. All four techniques measured the mass balance of glaciers, or how much ice they accumulate and lose over time, from melting or accumulating snow, iceberg formation, and other causes. Their findings indicated that the loss of ice in the Amundsen Sea during 2003–2009 accelerated at a rate almost three times faster than during the entire study period of 1992–2013. According to the researchers the behaviour of glaciers and ice sheets is the greatest uncertainty in predicting future sea level, and the changes must be monitored closely.

Source: *Geophysical Research Letters* (2014) [dx.doi.org/10.1002/2014GL061940](https://doi.org/10.1002/2014GL061940), and *Nature* (2014) [dx.doi.org/10.1038/516146d](https://doi.org/10.1038/516146d)

...and may be irreversible

Researchers at the UK Met Office's Hadley Centre have used a global climate model to investigate how polar sea ice responds to climate change. In the Arctic, sea ice was found to melt and reform in response to changing temperatures when carbon dioxide concentrations in the models were increased and then decreased gradually to pre-industrial levels. In contrast, the

model showed that sea ice in Antarctica formed initially but by the end of the simulation it had not recovered, even after modelling a further 150 years at the lowest levels of carbon dioxide. The lack of ice recovery in Antarctica is attributed to heat uptake by the Southern Ocean and increased heat transport to the Weddell Sea. The Southern Ocean, which dominates ocean heat uptake globally in climate models, would continue to warm the seas around Antarctica for a long time even if global warming were reversed.

Source: *Geophysical Research Letters* (2014) [dx.doi.org/10.1002/2014GL062167](https://doi.org/10.1002/2014GL062167), and *Nature* (2014) [dx.doi.org/10.1038/516146e](https://doi.org/10.1038/516146e)

Penguins face disease threat from tourists

Until c. 200 years ago the Antarctic was virtually untouched by human influence. It is believed that because of this long isolation Antarctic species have weak immunity to pathogens that are common in other parts of the world, and thus the increasing number of tourists and researchers visiting the region may be putting penguins and other wildlife at risk of disease. There were more than 37,000 visitors to Antarctica during the 2013–2014 tourist season, and 4,400 researchers may also be accommodated there simultaneously. A survey of disease in Antarctic penguins has shown them to be susceptible to infectious diseases, with evidence of salmonella, *E. coli*, West Nile virus, and avian pox virus in captive individuals. A number of mass mortality events among Antarctic penguins have been recorded since 1969, including the loss of 400 wild gentoo penguins to avian pox in 2006.

Source: *Polar Biology* (2014) [dx.doi.org/10.1007/s00300-014-1632-5](https://doi.org/10.1007/s00300-014-1632-5), and *New Scientist* (2015) www.newscientist.com/article/mg22530022.100-antarctic-tourism-may-pose-disease-threat-to-penguins.html#.VLU_7iFFBxA

Tasmania's wilderness world heritage area under threat

The state government of Tasmania has drafted a plan to remove the word 'wilderness' from the state's wilderness world heritage area, claiming that it is offensive to Aboriginal people because it implies the landscape is devoid of human culture. The wilderness world heritage area covers c. 20% of the state's land area and is recognized internationally for its environmental

and cultural value, containing tracts of virtually untouched forests, lakes and mountains. The plan seeks to undermine the protection afforded to the area and open up the ecosystem to logging and commercial tourism development, with a proposal for aircraft landing strips and cruise ship berths. The plan will be submitted to the federal environment minister for consideration, and will be strongly opposed by conservation groups. Last year a United Nations committee rejected a proposal by the federal government to remove 74,000 ha of forest from Tasmania's world heritage area.

Source: *The Guardian* (2015) www.theguardian.com/australia-news/2015/jan/15/tasmania-plans-to-open-wilderness-world-heritage-area-to-logging-and-tourism

Volunteers crowd-sourced to survey black cockatoos

BirdLife has received funding from the Western Australian government to conduct population surveys of the forest red-tailed cockatoo *Calyptorhynchus banksii* and the Endangered Baudin's cockatoo *Calyptorhynchus baudinii*. Both species are endemic to the forests of south-western Australia, and an accurate population count is difficult because of their extensive range. Numbers are currently estimated at c. 15,000 for each species. Up to 1,000 volunteers will be recruited to survey the black cockatoos in their local area, and volunteers will also support a netting trial to mitigate conflict between fruit farmers and the Baudin's cockatoo, which feeds on fruit. It is hoped that by involving local communities in surveying they will become committed to the species' survival.

Source: *The Guardian* (2015) www.theguardian.com/environment/2015/jan/20/birdwatchers-crowdsourced-to-help-save-endangered-black-cockatoos-in-wa

All internet addresses were up to date at time of writing. Note that in the online version of this document (at journals.cambridge.org/orx) all links are live and can thus be used to navigate directly to the cited sources. The Briefly section in this issue was written and compiled by Cella Carr and Martin Fisher, with additional contributions from Eleanor Drinkwater, Anthony Rylands and Divya Vasudev. Contributions from authoritative published sources (including web sites) are always welcome. Please send contributions by e-mail to oryx@fauna-flora.org