

Briefly

INTERNATIONAL

The limits of humanity's load

A group of Earth-system and environmental scientists have attempted to define boundaries for the biophysical processes that determine the Earth's capacity for self-regulation. They suggest numerical boundaries, based on existing data, for seven parameters: climate change, ozone depletion, ocean acidification, biodiversity, freshwater use, the global nitrogen and phosphorus cycles, and change in land use, and argue that humanity must stay within all of these boundaries to avoid catastrophic environmental change. For species the boundary set was to cap extinctions at 10 species per million per year (the current extinction rate greatly exceeds this). For anthropogenic climate change and human modification of the nitrogen cycle they suggest we may already have crossed the line, and that for ocean acidification we are rapidly approaching a threshold beyond which there may be abrupt and nonlinear changes. Although the exercise requires many qualifications, it provides a basis for discussion and future refinement.

Source: *Nature* (2009), 461, 472–475, and <http://www.nature.com/news/specials/planetaryboundaries/index.html>

Another benefit of green roofs

Roofs where traditional roofing materials are replaced with plants are known to bring many benefits, including reducing building heating and cooling costs and detaining heavy rainfall. Now a group of researchers have found that green roofs could also have an important role to play in carbon sequestration. The first study into quantifying the carbon storage potential of green roofs examined roofs in Michigan and Maryland planted with *Sedum* spp., plant species commonly used in green roof creation. The researchers found that the green roofs sequestered 375 g C m⁻² in above- and below-ground biomass and substrate organic matter. It is estimated that creating green roofs in an urban area of c. 1 million people would capture > 55,000 t of carbon, equivalent to removing > 10,000 SUVs from the roads every year.

Source: *ScienceDaily* (2009), <http://www.sciencedaily.com/releases/2009/09/090923133000.htm>, and *Environmental Science & Technology* (2009), 43, 7564–7570.

Plant extinction rates in urban areas

Plant extinctions in urban areas are a growing threat to biodiversity. To examine the factors influencing plant extinction rates in

cities an international team compiled plant extinction rate data for 22 cities. Two-thirds of the variation in plant extinction rates was explained by a combination of the city's historical development and the current proportion of native vegetation, with the former explaining the greatest variability. The amount of native vegetation remaining also influenced extinction rates, particularly in cities > 200 years old. The legacies of landscape transformations by agrarian and urban development last for hundreds of years and modern cities potentially carry a large extinction debt. This finding highlights the importance of preserving native vegetation in urban areas and the need for mitigation to minimize potential plant extinctions in the future.

Source: *Ecology Letters* (2009), <http://dx.doi.org/10.1111/j.1461-0248.2009.01372.x>, and *BBC News* (2009), http://news.bbc.co.uk/earth/hi/earth_news/newsid_8295000/8295738.stm

Bushmeat bar-coded

Researchers have added DNA sequences from some of the most commonly traded mammals and reptiles from South America and Africa to the Barcode of Life Data Systems, an open-access database of DNA codes. The researchers sequenced the same 645 base pair region of the COX1 gene from 204 tissue samples from a number of sources including museum specimens and leather items confiscated by the US Fish and Wildlife Service. The species represented by these samples included duikers, red river hogs, monkeys and crocodiles, most of which are embargoed from international trade. The benefit of using DNA information is that these species are often partially prepared before they arrive in urban markets, making identification to species level impossible. The study also revealed new lineages of African crocodiles and high levels of genetic diversity in Peter's duiker.

Source: *ScienceDaily* (2009), <http://www.sciencedaily.com/releases/2009/09/090904165105.htm>, and *Conservation Genetics* (2009), <http://dx.doi.org/10.1007/s10592-009-9967-0>

Experiments prove theory right

For species that are unable to accommodate change or migrate to a more suitable location adaptation has widely been viewed as the only way in which the species can survive in the face of rapid environmental change. Whether such 'evolutionary rescue' will occur depends on a number of factors

including population size and the amount of genetic variation within a population. Researchers have now tested the conditions for evolutionary rescue on yeast populations by exposing hundreds of populations to normally lethal concentrations of salt under varying conditions. The results indicate that rescue can occur, and where it does the population may recover within 25 generations. However, for this to happen the original population needs to be above a certain size to avoid stochastic extinction and to ensure that the population contains resistant individuals.

Source: *Ecology Letters* (2009), 12, 942–948.

Community forests store more carbon

An examination of 80 forest commons in 10 countries across Asia, Africa and Latin America reveals that forests that are managed with greater local autonomy, as well as larger forests, are associated with high carbon storage and livelihood benefits. The authors suggest that in cases where local communities manage forests, they restrict their consumption of forest products, resulting in higher carbon storage. Government-owned forests, on the other hand, were more likely to be over-harvested, and thus store less carbon. These findings are significant for advocates of climate change mitigation strategies such as Reduced Emissions from Deforestation and Forest Degradation, which currently target national governments. The authors suggest that compensating local communities for extracting fewer forest products could provide even more of an incentive to protect forests.

Source: *Journal Watch Online* (2009), <http://journalwatch.conservationmagazine.org/2009/10/11/power-to-the-people/>, and *Proceedings of the National Academy of Sciences of the USA* (2009), <http://dx.doi.org/10.1073/pnas.0905308106>

Agriculture and trees can mix

Researchers from the World Agroforestry Centre have examined the extent of agroforestry across the globe, using a geospatial analysis of remote sensing at 1 km resolution. The term agroforestry refers to a wide range of farming systems, such as silvo-pastoral systems for subsistence livestock, home gardens and diverse sorts of tree crops. If agroforestry is defined as tree cover > 10% on agricultural land, the authors estimate that this system is found on 46% of all agricultural land across the world,

representing >1 billion ha of land and affecting 30% of rural populations. In South-east Asia and Central and South America agroforestry is particularly widespread, covering 80% of these areas. The researchers also found a strong correlation between aridity and tree cover, with more humid areas containing higher levels of tree cover.

Source: *Trees on Farm: Analysis of Global Extent and Geographical Patterns of Agroforestry* (2009), <http://www.worldagroforestry.org/downloads/publications/PDFs/WP16263.PDF>

Feather revelation

For conservationists to implement effective measures for the protection of long-distance oceanic migrants, such as birds, they need to know where these species occur at which points in the year. Researchers use data loggers for this purpose but logistical and financial constraints prevent their use in large-scale, long-term studies. Now researchers have tracked the movements of Cory's shearwaters, a long-distant oceanic migrant, by analysing biogeochemical markers in the birds' feathers. As feathers grow, the elements and their isotopic forms, gleaned from the birds' diets, are incorporated into the feathers' keratin structure. The researchers found that biogeochemical information contained within the feathers was sufficient to assign birds to specific oceanic water masses, and suggest that other tissues such as hair, scales or nails could be used in a similar way for non-avian migrants.

Source: *PLoS ONE* (2009), 4, e6236, <http://dx.doi.org/10.1371/journal.pone.0006236>

Bird's eye view

Albatrosses fly many hundreds of kilometers across the open ocean to find and feed upon their prey but little is known about how albatrosses locate their prey. The first deployments of a combined animal-borne camera and depth data logger on free-ranging black-browed albatrosses, which breed on Bird Island, South Georgia in the southern Atlantic Ocean, have shown that albatrosses followed a killer whale, possibly to feed on food scraps left by this diving predator. The camera images together with the depth profiles showed that the birds dived only occasionally but that they actively dived when other birds or the killer whale were present. This association with diving predators or other birds may partially explain how albatrosses find their prey more efficiently in the apparently featureless ocean.

Source: *PLoS ONE*, 4, e7322, <http://dx.doi.org/10.1371/journal.pone.0007322>

Time to watch out when relatives go extinct

An analysis of the fossil record of marine bivalves has revealed that extinctions tend to occur in clusters within families, and also between families. In the case of marine bivalves, for example, three families with high extinction rates became extinct by the end of the Cretaceous period. Extinction rates were also influenced by extinctions that had happened previously. The findings of this study are important to those examining the vulnerability of taxa to extinction, as they demonstrate the importance of considering phylogenetic relationships and extinction history.

Source: *Journal Watch Online* (2009), <http://journalwatch.conservationmagazine.org/2009/08/06/a-family-affair/>, and *Science* (2009), 325(5941), 733–737.

Conservation is best

Ecological restoration is widely accepted as a way to reverse damage done to the environment by anthropogenic activities. However, an examination of 89 sites where restoration has taken place found that, although biodiversity improved on average by 44%, levels of biodiversity never returned to their original, pristine state. In addition to biodiversity, the researchers also measured the provision of ecosystem services, finding that restoration of an ecosystem increased its ecosystem services provision by 25%. Of all of the sites investigated in this analysis, which were located on every continent bar Antarctica, tropical terrestrial projects were found to be the most successful but, even so, these results indicate that conservation of pristine sites, rather than restoration of damaged sites, is best for biodiversity and ecosystem services.

Source: *Planet Earth Online* (2009), <http://planetearth.nerc.ac.uk/news/story.aspx?id=488>, and *Science* (2009), 325(5944), 1121–1124.

Aquaculture, the fish saviour?

Aquaculture, the rearing of fish for consumption, is a major consumer of fishmeal, accounting for c. 68% of the world's fishmeal consumption, and also consumes 88% of the world's fish oil. The impact of aquaculture on wild fish stocks is therefore an issue that requires attention. However, researchers examining trends in fishmeal and fish oil use in aquaculture have found that the use of alternative feed-stuffs in the form of plant- and animal-based alternatives, and single-celled organisms, is on the increase. The researchers stress that appropriate economic and regulatory incentives are required to aid the future uptake of alternative feed-stuffs but providing such incentives are in place, aquaculture could have a role to

play in protecting the oceans, rather than depleting them.

Source: *Journal Watch Online* (2009), <http://journalwatch.conservationmagazine.org/2009/09/09/a-fish-eat-fish-world/>, and *Proceedings of the National Academy of Sciences of the USA* (2009), 106, 15103–15110.

Earth's hairline not advancing uniformly

Higher global temperatures are expected to cause treelines to advance beyond their current positions but a new study examining 166 sites where treeline positions have been monitored since 1900 showed that not all treelines are moving to higher latitudes and altitudes. Of the sites examined 52% showed an advance in their treeline, while only 1% were recorded as having receded. The type of treeline was found to influence forward movement, with diffuse treelines more likely to move than other types. Researchers also found that treelines that had experienced conditions of strong winter warming were more likely to have advanced, suggesting that it is the harshness of the winter that controls the advancement of at least some treelines, rather than warmer growing-seasons.

Source: *Journal Watch Online* (2009), <http://journalwatch.conservationmagazine.org/2009/08/13/stop-and-go/>, and *Ecology Letters* (2009), <http://dx.doi.org/10.1111/j.1461-0248.2009.01355.x>

Arctic ice-free by 2030?

Evidence from the Catlin Arctic Survey, which took place between March and May 2009, supports the view that the Arctic could be largely ice-free in the summer by 2030, with much of the melt occurring in the next 10 years. The expedition found that much of the ice they crossed during their 435-km trek was first-year ice, with an average thickness of 1.8 m. The team had been expecting to find more multi-year ice, which is more resilient to melting than first-year ice. In the short-term, an ice-free Arctic will allow increased access to oil and gas reserves, as well as transport across the Arctic Ocean. However, the long-term implications could be hugely damaging, and could include accelerated warming and alterations in the patterns of oceanic and atmospheric currents.

Source: *BBC News* (2009), <http://news.bbc.co.uk/1/hi/sci/tech/8307272.stm>

Amphibian Survival Alliance to the rescue!

A coalition of amphibian experts has been created to tackle two of the major threats

faced by amphibians: the spread of the fatal chytrid fungus and the protection of habitats that harbour endemic amphibians. One in three amphibian species is at risk of extinction, making them one of the most threatened groups of animals in the world. The coalition, the idea of which was mooted at the first Amphibian Mini Summit in August 2009, is made up of specialists working both in the field and in zoos, aquaria and botanical gardens. Efforts to halt the spread of the chytrid fungus are already underway (see also *Oryx*, 43, 527–529), with research taking place into naturally-occurring bacteria that appear to render some amphibians resistant to the fungus.

Source: *IUCN press release* (2009), <http://www.iucn.org/?3811/Deadly-frog-fungus-targeted-by-amphibian-experts>

EUROPE

From Britain to New Zealand and back again

The short-haired bumblebee, declared extinct in the UK in 2000, will soon be buzzing around Britain again, with individuals due to be reintroduced from New Zealand, where they were sent from Britain in 1875 to pollinate red clover. Previous efforts to reintroduce the species have struggled because captive breeding attempts failed and the bees suffered from jet lag following the sudden south-north hemisphere shift. Captive breeding of the species has now succeeded and it is hoped that the first short-haired bumblebee queens will be released in June 2010, having been transported from New Zealand in a refrigerated container to induce hibernation and thus avoid jet lag. This project has a particular urgency because one of the bumblebee's main nectar plants in New Zealand, the introduced viper's bugloss, is about to be targeted by an eradication programme.

Source: *New Scientist* (2009), 203(2725), 16, and *Bumblebee Conservation Trust* (2009), http://www.bumblebeeconservation.org.uk/subt_project.html

An ill wind for vultures

Most studies that examine wind turbines focus on the number of birds killed per turbine per year. Now researchers in Spain have taken a longer-term approach, using data on the number of Egyptian vulture carcasses found with injuries consistent with collisions during 2004–2008 from around 675 wind turbines in southern Spain. These data were added to a computer model constructed around wind turbine distribution

and vulture nesting sites to predict the future for the species in Spain over the next 100 years. The results indicate that if the number of turbines remains at the same number as today, the Endangered Egyptian vulture will go extinct 10 years sooner than would be expected in a scenario without wind farms.

Source: *New Scientist* (2009), 203(2724), 7.

Bison bottleneck brings species to genetic brink

An investigation into the genetic diversity of one of last remaining wild herds of European bison, on the Polish side of the Białowieża forest, has shown that the species has not recovered from the genetic bottleneck that resulted from its reintroduction into the wild in the 1920s. European bison were exterminated from Europe by 1919 but the species was subsequently reintroduced into the wild in the 1920s, with biologists using animals from private and public collections and zoos to create the founding population. Researchers have now analysed the genetic differentiation of 178 individual bison born between 1955 and 2005 and have found that, despite the population in the forest having increased to 800, the effective population size is only 25.

Source: *BBC News* (2009), http://news.bbc.co.uk/earth/hi/earth_news/newsid_8182000/8182104.stm, and *Biological Journal of the Linnean Society* (2009), 97, 801–809.

Salmon scales tell their own tale

Being able to tell the difference between a farmed salmon and a wild salmon is important, both for researchers examining the effects of escaped farmed salmon on wild populations and also to detect mislabelling of salmon. Researchers have now devised a simple way to tell the difference, after examining the scales of wild and domesticated salmon in Scotland. Scales from farmed salmon had higher levels of manganese and lithium, and lower levels of lead and chromium than scales from their wild counterparts. The levels of manganese in farmed fish scales was particularly high, probably because of the manganese supplements fed to farmed fish. This non-invasive technique was found to determine correctly whether a fish was wild or farmed 98% of the time, and it was also able to distinguish between different fish farms 87% of the time.

Source: *Planet Earth Online* (2009), <http://planetearth.nerc.ac.uk/news/story.aspx?id=552>, and *Marine Ecology Progress Series* (2009), 390, 225–235.

Bird-watching by computer

Guillemots on Skomer Island, off the Pembrokeshire coast, are at the forefront of a project to use computers to monitor vulnerable habitats. Computers watching the birds are recording behaviour, such as how long they spend at the breeding colony. Seabirds such as guillemots are an indicator species that can give early warnings of habitat degradation or other environmental problems. A monitoring system is being created that films nesting birds and then analyses images to work out what the birds are doing, how long they are at the colony caring for young and how long they spend foraging. The research project is gathering data about nesting pairs and the time they spend foraging for food or sitting on a nest caring for their young. Monitoring these populations will help monitor the health of the marine environment.

Source: *BBC News* (2009) <http://news.bbc.co.uk/2/hi/technology/8285880.stm>

Seeds of 10% of wild plant species now in storage

The Millennium Seed Bank at Kew Royal Botanic Garden, an insurance strategy against future biodiversity losses, has reached its target of collecting 10% of the world's wild plants (24,200). The Seed Bank is a partnership involving more than 120 organizations in 54 countries. All the seeds are kept both in their country of origin and at Kew, where they are stored in underground vaults at -20°C. The cold, arid conditions keep the seeds in pristine condition for anywhere between a few years to thousands of years, depending on the species. The aim is that each seed stored in the Bank can be grown should the need arise. The project is now aiming to collect and conserve seeds from 25% of all flowering plant species by 2020.

Source: *BBC News* (2009), <http://news.bbc.co.uk/2/hi/science/nature/8305456.stm>

Gardens offer lifeline to wildlife....

Evidence from 61 gardens in Sheffield, UK, collected over a 3-year period, has shown that gardening for wildlife need not be a complicated affair: the key to making a garden attractive to wildlife is to take a laissez-faire attitude, leaving grass to grow tall and allowing deadwood to rot down. Large gardens are not necessarily better than small gardens, and the use of non-native species is also not necessarily detrimental to wildlife. This study found that biodiversity was higher in urban gardens than in the countryside, with intensive farming having had a detrimental effect on rural wildlife. Gardens make up 25% of the urbanized area of Sheffield, comparable to other large cities in

the UK, but the trend towards increasing urbanization means that gardens are generally getting smaller as areas become more densely populated.

Source: *Planet Earth Online* (2009), <http://planetearth.nerc.ac.uk/news/story.aspx?id=527>

...while golf courses found to support wetland wildlife

A comparison between ponds on Swedish golf courses and ponds in protected areas and parklands has shown that there is no significant difference between the number of macroinvertebrate species recorded in golf course ponds compared to the number in off-course ponds, with one species, the large white-faced darter dragonfly, only located in golf-course ponds. A significant difference in occurrence of amphibians was recorded between the two sets of ponds, with great crested newts associated with golf-course ponds and the smooth newt not significantly associated with these ponds. The study's findings suggest that, rather than chemical-intensive areas of low biodiversity, golf courses could contribute to the protection of wetlands and, given that in the case of this study, 26% of permanent freshwater ponds in central greater Stockholm were found to be on golf courses, their contribution could be significant.

Source: *Ecological Applications* (2009), 19, 1481–1491.

NORTH EURASIA

Leopards leap into Caucasus

Two Persian leopards have been transferred from Turkmenistan to Sochi National Park in south-western Russia as part of a programme to create a new nucleus for the Caucasus leopard population. It is estimated that only a few dozen leopards currently exist in the Caucasus, bolstered from time to time by individuals from the population in Iran, which numbers several hundred. The two leopards, both male, will be kept in a specially-created centre in the National Park and will form the basis of a captive-breeding programme, with female leopards due to be introduced once the males have settled in to their surroundings. Should the breeding prove successful, the offspring will be introduced into the wild. Infrastructure development is a serious problem for Persian leopards, often destroying migration routes between isolated populations.

Source: *WWF News* (2009), http://www.panda.org/wwf_news/news/?174841/Flying-Turkmen-leopards-to-bring-species-back-to-Caucasus

NORTH AFRICA AND MIDDLE EAST

Middle Eastern bald ibis population takes a hit

Conservationists trying to protect the last few remaining Critically Endangered northern bald ibis (see *Oryx*, 43, 329–336) have been shocked by the deliberate and illegal shooting of one of these birds in Saudi Arabia. The vast majority of northern bald ibises occur in Morocco but a small population was discovered in Syria in 2002. Radio-tracking enabled researchers to discover that the adult Syrian birds overwinter in the Ethiopian Highlands but where the juvenile Syrian birds migrate to for winter is not known. Researchers had therefore attached satellite tags to two subadult birds, and it was one of these two that was shot, bringing the wild Middle Eastern population down to only four individuals.

Source: *RSPB press release* (2009), <http://www.rspb.org.uk/media/releases/details.asp?id=tcn:9-230591>

SUB-SAHARAN AFRICA

Gorillas take first steps to freedom

Six juvenile western lowland gorillas have been released onto Orique island in the Fernan-Vaz lagoon in Gabon, in what is the first step in a 3-year rehabilitation programme to prepare them for release into the wild. All six gorillas, aged between 2 and 7 years, have been orphaned by the bushmeat trade, and have spent the past 2 years being prepared for life in the wild. The training appears to have paid off as, on their release, the gorillas started to build their own nests in which to sleep in overnight. Western lowland gorillas are categorized as Critically Endangered on the IUCN Red List, with major threats to their survival including habitat loss and poaching.

Source: *FVGP Gorilla News* (2009), <http://gorillasgabon.scd-conservation.com/fvgp-news>

Invertebrates crawl, scurry and slither to the attention of biologists

An 8-day systematic survey of Mkhambathi Nature Reserve in South Africa has resulted in the discovery of 18 new species of invertebrates, including snails, spiders, centipedes and worms, and another 18 currently under examination are also thought to be new finds. These findings are valuable because they illustrate the paucity of knowledge about South Africa's biodiversity, despite its being a relatively well-studied

country. Furthermore, the Reserve is threatened by the nearby construction of a motorway, and by mining activities taking place in dunes in the adjacent area. In addition, there is pressure to develop tourism infrastructure inside the Mkhambathi Nature Reserve. The collection of data from the area is therefore timely, and will help to guide future conservation planning and management activities.

Source: *Earthwatch Newsroom* (2009), <http://www.earthwatch.org/europe/newsroom/science/news-3-invertebrate.html>

Lemurs targeted as bushmeat in Madagascar

A break-down in law and order resulting from Madagascar's coup at the beginning of 2009 has had a serious impact on the country's biodiversity. Reports of illegal logging and export of hardwoods have been followed by evidence of lemurs being killed and sold as bushmeat at the behest of restaurant owners. The involvement of the restaurateurs indicates that the lemurs are not being killed for subsistence but rather to be sold as luxury items in urban Malagasy restaurants. The protection of Madagascar's forests and species is vital for many reasons, not least the fact that the island's 20 million inhabitants rely hugely on ecotourism to generate income. Conservationists have urged the international donor community, many of whom switched to providing 'life-saving' aid only following the coup, to resume their support for conservation and development work in Madagascar.

Source: *Conservation International press release* (2009), <http://www.conservation.org/newsroom/pressreleases/Pages/Poaching-Lemurs-Madagascar-International-Community-Must-Actnow.aspx>

Gorilla poaching rife in the Republic of Congo

Up to two western lowland gorillas are being killed per week in Kouilou, a region of the Republic of Congo. Undercover interviews at markets in Pointe Noire revealed that gorillas are killed in the forests of Kouilou and then shipped down the Kouilou River where they are received by traders who transport them to urban centres. Gorilla meat costs c. USD 6 per hand-sized piece, and it appears that the meat is eaten in the cities rather than being exported. An estimated 300 gorillas are sold to markets annually throughout the Republic of Congo, according to the organization that carried out the study, Endangered Species International. Between 100,000 and 125,000 Critically Endangered western lowland gorillas are thought to remain in the wild but their dense forest habitat makes it

hard for a reliable population estimate to be obtained.

Source: *BBC News* (2009), http://news.bbc.co.uk/earth/hi/earth_news/newsid_8256000/8256464.stm

Kenya parches in worst drought for 25 years

Wildlife and people are suffering in northern Kenya as the country is enveloped in the worst drought for 25 years. Community conservancies in the north of Kenya have suffered high drought-related mortalities of buffalo and young elephant, although in some areas, such as the Ol Pejeta Conservancy, wildlife is being sustained by the provision of supplementary food by rangers. In addition to increasing mortality, the drought is causing wildlife to come into increased contact with people. In Ol Pejeta, for example, elephants are travelling to farms to forage for food, with the result that rangers are required to patrol throughout the night to protect local communities. Furthermore, the few water sources that remain are relied on by people, their livestock and wild animals, leading to heightened human-wildlife conflict.

Source: *FFI press release* (2009), http://www.fauna-flora.org/news_kenya_drought.php

Soda ash plant rears its head again

Conservationists in Tanzania are alarmed by signs that the government is pressing ahead with its plans to create a soda ash mine at Lake Natron, the breeding site for three quarters of the world's lesser flamingo population. A government agency recently placed an advertisement for mining equipment, and there have been announcements that the infrastructure around the port of Tanga will be expanded for the transport of soda ash. Previous plans to mine soda ash at the lake were vehemently opposed at local, national and international levels, and the government withdrew their initial Environmental and Social Impact Assessment, which was deemed inadequate and inappropriate, in 2008.

Source: *BirdLife International News* (2009), http://www.birdlife.org/news/news/2009/08/think_pink.html

SOUTH AND SOUTH-EAST ASIA

Bearded vultures seen in Himachal Pradesh

There is increasing concern for the declining populations of vultures in India, which have been badly affected by the use of the painkiller diclofenac in cattle. Vultures feeding on the cattle suffer kidney

failure. However, in a piece of good news, about 200 bearded vultures, or lammergeiers, were seen in late September in Lahaul-Spiti, a remote part of the state of Himachal Pradesh. Lammergeiers have previously been seen on India's border with China but not in such a large group or at so high an altitude. Lammergeiers are long-winged vultures known for their habit of dropping bones on to rocks to smash them open and get at the marrow. Their world population is estimated to be 2,000–10,000. Although lammergeiers have not been so badly affected by diclofenac, their numbers have nevertheless dwindled significantly in India.

Source: *BBC News* (2009), http://news.bbc.co.uk/2/hi/south_asia/8280607.stm

Holding on by a slender bill

The Critically Endangered slender-billed vulture has successfully bred in captivity for the first time, prompting tentative hopes that this species may be saved from extinction. Along with two other members of the *Gyps* genus, slender-billed vulture populations in South Asia have crashed dramatically in recent years as a result of the widespread use of the veterinary drug diclofenac (see also previous item). The Indian population of the Oriental white-backed vulture, one of the other affected species, is declining by > 40% every year, one of the fastest recorded rates of decline in any species. The Oriental white-backed vulture bred in captivity for the first time in 2008 and there are hopes that the third affected species, the long-billed vulture, will breed successfully in captivity in 2010.

Source: *ZSL News* (2009), <http://www.zsl.org/conservation/news/new-nestlings-bring-hope-for-threatened-asian-vultures,619,NS.html>

Cheetahs to return to India?

At a recent meeting Indian wildlife officials, cheetah experts and conservationists discussed the possibility of reintroducing the cheetah to India, nearly 50 years after it became extinct in the country. Seven sites in the Indian states of Rajasthan, Madhya Pradesh, Gujarat and Chhattisgarh have been shortlisted as potential reintroduction sites for the species, and will now be surveyed to assess the suitability of their habitat, the number of prey they contain and whether human-cheetah conflict would be a problem. Should these sites be deemed suitable, cheetahs would most likely be imported from Africa, as the Asiatic cheetah that previously occurred in India now numbers < 100. Some concerns have been voiced about the proposal; some conservationists fear that India's apparent haste to

reintroduce the species could result in cheetahs being housed in semi-captive conditions, and others have made reference to India's chequered history of reintroducing animals. Source: *BBC News* (2009), http://news.bbc.co.uk/1/hi/world/south_asia/8262862.stm

Neutrino lab hits elephant-sized snag

Plans to build an underground laboratory for the detection of neutrinos is courting controversy because the site chosen for its construction lies within the Nilgiri Biosphere Reserve. This Reserve includes > 5,500 km² of forest cover and is prime habitat for elephants and tigers. The proposed site lies within 7 km of the boundary of one of the six protected areas in the Reserve, and the main concerns of those opposed to the construction focus on the ecosystem impacts of the tunnelling required for the lab's construction and the increased human population. One estimate puts the number of truck trips required to move the construction debris at 156,000, all of which will pass through forest and two tiger reserves. Supporters of the project urge the government to proceed with the plan, as it will enhance India's position in the world of scientific research.

Source: *Nature* (2009), 461(7263), 459.

Poachers kill captive tiger

The threats faced by tigers have been starkly underlined by the killing of a Critically Endangered Sumatran tiger in Taman Rimba Zoo, on the Indonesian island of Sumatra. Poachers broke into the zoo to kill the female tiger and subsequently removed her body, leaving only the intestines behind. Conservationists believe that the poachers intend to sell the tiger's skin and bones, despite laws prohibiting the sale of tiger parts. A study by TRAFFIC in 2008 found tiger bones, claws, skins and whiskers being sold openly in eight Sumatran cities. Estimates put the number of Sumatran tigers remaining in the wild at < 400 individuals, with deforestation, conflict with humans and poaching hastening this species' demise.

Source: *BBC News* (2009), <http://news.bbc.co.uk/1/hi/8217408.stm>

Underwater Cabinet

On 17 October the government of the Maldives held a cabinet meeting underwater to highlight the threat of global warming. President Mohamed Nasheed and his cabinet signed a document during the dive, calling for global cuts in carbon emissions. The aim was to highlight the risks of rising

carbon in the atmosphere and encourage world leaders to commit to reducing carbon dioxide levels in the atmosphere to 350 parts per million—the amount believed to be the safe upper limit to avoid irreparable damage to the environment. Some 80% of the Maldives archipelago is < 1 m above sea level and is therefore extremely vulnerable to any rise in sea levels as a result of global warming.

Source: *BBC News* (2009), http://news.bbc.co.uk/2/hi/south_asia/8291487.stm

Being eaten to extinction

An increase in demand for wild animal meat in Vietnam is threatening to push a number of species into extinction. Demand for bushmeat in the country has spread from mountain communities to rich urban areas, with an estimated 3,400 t of wild meat consumed annually, some of it in Vietnam's restaurants. About 200 species are traded in Vietnam, including rhinoceros, white-handed gibbon, tapirs, civets, pangolins, turtles and elephants. Eighteen percent of the one million individual animals consumed each year in Vietnam are thought to be eaten illegally. This insight into the trade in wildlife in Vietnam came to light at a conference in which discussion focused on how to protect the country's wildlife and natural resources, and marked the first time that an advising body to the ruling communist party has been involved in awareness-raising efforts for the illegal wildlife trade.

Source: *BBC News* (2009), <http://news.bbc.co.uk/1/hi/world/asia-pacific/8199997.stm>

Himalayan treasure-trove

A newly-published report details the myriad species found in the Eastern Himalayan region by researchers from a number of organizations over the past 10 years. The new finds include 242 species of plants, 16 reptiles, 16 amphibians, 14 fish, two birds, two mammals and at least 61 new species of invertebrates. Among the new species are a blind snake, one of the world's smallest deer, the first scorpion recorded in Nepal and a bright green frog with red webbed feet. Conservationists are urging action to protect the Eastern Himalayas region, which covers Bhutan, the Indian states of Arunachal Pradesh, Assam, North Bengal and Sikkim, the far north of Myanmar, Nepal and Tibet, because the area and its species face a wide array of growing pressures, including forest destruction, overgrazing, mining and poaching, as well as being vulnerable to global climate change.

Source: *The Eastern Himalayas: Where Worlds Collide* (2009), <http://www.worldwildlife.org/what/wherewework/easternhimalayas/WWFBinaryitem13235.pdf>

Fruit bats' future not so fruity

The impact and sustainability of hunting practices on the Malayan flying fox in Peninsular Malaysia has been examined in a new study, and it makes for gloomy reading: one model calculated that the current hunting rate could cause the population to become locally extinct within 6–81 years. Hunting activity has more than doubled since 1996, and an examination of licence sales to bat hunters indicates that the minimum legal harvest between 2002 and 2005 was 87,000 bats. This figure is likely to be lower than the actual total, as it does not include illegal hunting or the killing of bats as agricultural pests. Flying foxes travel extensively between roost sites throughout the year, often crossing the Malayan border with Indonesia and Thailand, and thus unsustainable hunting in Malaysia threatens the regional population of this species.

Source: *Journal Watch Online* (2009), <http://journalwatch.conservationmagazine.org/2009/08/26/under-the-gun/>, and *Journal of Applied Ecology* (2009), 46, 991–1002.

Deforestation moves across the borders

The increase in forest cover in Vietnam since 1992 has been heralded as a success for conservation but new evidence has now come to light indicating that deforestation has merely been exported to Vietnam's neighbours such as Cambodia, Laos and Indonesia. Vietnam's afforestation is attributed to the introduction of restricted logging policies but over the time period studied, 1987–2006, demand for wood increased as Vietnam's exportation of processed wood products grew. As a result, timber was imported from Vietnam's neighbours, more than half of it illegally. Researchers estimate that c. 39% of the regrowth of Vietnam's forests between 1987 and 2006 is, in essence, negated by the same volume of timber having been extracted from forests in other countries. This makes it hard to know where to attribute deforestation: Vietnam, its neighbours or the final consumers.

Source: *Journal Watch Online* (2009), <http://journalwatch.conservationmagazine.org/2009/08/31/not-in-my-forest/>, and *Proceedings of the National Academy of Sciences of the USA* (2009), 106, 16139–16144.

Saola suffers

The elusive saola, which occurs in the Annamite Mountains along the border of Lao PDR and Vietnam, is on the brink of extinction, a fact that has prompted an

emergency meeting of conservationists. The Critically Endangered saola looks like an antelope but is more closely related to wild cattle, and was only discovered in 1992. Rarely seen, saola are not kept in any zoos, meaning there is no experience of the conditions required to keep this species in captivity. Should the species become extinct, therefore, it would not be possible to instigate a recovery programme using captive individuals. The main threats to the saola are snaring and hunting with dogs, and the conservationists identified the removal of snares and a reduction in hunting with dogs as imperative for the species' survival.

Source: *IUCN press release* (2009), <http://www.iucn.org/?3851/Last-chance-to-save-Saola-from-extinction-IUCN>

India holds the key for tigers

A genetic study of tigers in 28 reserves in India has revealed that the country's tigers retain more than half the extant genetic diversity of the species. Furthermore, researchers were able to examine the past demography of the species, using DNA data to estimate that c. 58,200 tigers used to roam through peninsular India south of the Ganges plains but that, c. 200 years ago, this population underwent a huge decline. India is thought to harbour c. 60% of the global tiger population of 3,000–3,500, even though the country only contains an estimated 8–25% of remaining global habitat. The findings of this study serve to underline the critical importance of the Indian tiger populations, and the authors see the preservation of the tigers' genetic diversity in the face of myriad pressures as a cause for hope.

Source: *PLoS Genetics* (2009), 5, e1000585, <http://dx.doi.org/10.1371/journal.pgen.1000585>

EAST ASIA

Up the Yangtze without a paddle(fish)

A 3-year search to find the Critically Endangered giant Chinese paddlefish, which can grow up to 7 m long and is endemic to the Yangtze river system in China, has failed to see a single individual. The last confirmed sighting was on 24 January 2003. The survey covered 488.5 km of the upper Yangtze between Xinshi, Sichuan Province, and Chongqing, mostly within the Upper Yangtze National Nature Reserve. It is possible, however, that some paddlefish, especially younger, smaller individuals, may have eluded the team. Individuals born in the late 1980s and early 1990s may survive in the wild (the species has an estimated life span of 30–40 years)

as the Yangtze river system is large and has complicated habitats where paddlefish could hide. The survey team believe the upper Yangtze is probably one of the last places that the fish may survive and now propose to focus their efforts there.

Source: *Journal of Applied Ichthyology* (2009), 25, 95–99, and *BBC News* (2009), http://news.bbc.co.uk/earth/hi/earth_news/newsid_8269000/8269414.stm

New protected areas designated for Critically Endangered primates

Two new protected areas, one in northern Vietnam and the other in China, have been designated to protect the only known population of the cao vit gibbon, and the most viable population of the Tonkin snub-nosed monkey, both of which are among the 25 most threatened primates in the world. The new Vietnamese reserve is in Khu Ca forest, Ha Giang Province, and contains 90 Tonkin snub-nosed monkeys, almost half the world population. The 6,530 ha Bangliang Nature Reserve, in China's Guangxi Province, is adjacent to Vietnam's Cao Vit Gibbon Conservation Area, established in 2007, and these two areas now contain the global population of cao vit gibbons, c. 100 individuals. The main threat faced by both species is habitat loss as a result of human activities, and FFI is working with local communities to reduce the pressures on the primates' fragile habitats.

Source: *FFI press release* (2009), http://www.fauna-flora.org/docs/MEDIA_RELEASE-New_safe_havens_created_in_China_and_Vietnam_for_two_of_worlds_most_endangered_primates.pdf

NORTH AMERICA

Bats hom[e]ing in on the highway

The expanding human population increasingly encroaches on natural landscapes and wildlife habitats, and species able to acclimatize to human-altered environments should have a selective advantage over those unable to do so. In the past 2 decades bats have increasingly begun to roost and raise offspring beneath concrete bridges. A comparison of birth size and postnatal growth of Brazilian free-tailed bat pups born at natural and human-made roosts (concrete bridges over busy roads) has shown that pups born at bridges were on average larger at birth and grew faster than those born at a cave site. Thus, some bridge roosts are suitable, and in some cases may provide better conditions, for raising young bat pups than cave roosts. Such man-made structures could provide corridors for these

bats to expand their range if, as predicted, the changing climate moves US agriculture northwards. These bats rely heavily on agricultural pests for food.

Source: *Journal of Zoology* (2009), <http://dx.doi.org/10.1111/j.1469-7998.2009.00636.x>, and *BBC News* (2009), <http://news.bbc.co.uk/2/hi/science/nature/8291195.stm>

Text a beaver

An installation in two of New York's rivers allows Americans to keep tabs on their aquatic neighbours. A series of buoys equipped with sensors, which monitor some of the river's attributes such as water quality as well using sonar to detect and identify moving animals underwater, have been deployed in the Bronx and East rivers. The buoys are equipped with LEDs above water, which respond to the information being received by the sensors. In addition, the installation also allows people to text the rivers' inhabitants, including José, the first beaver to live in New York city for 200 years. Anyone with a US mobile phone can take part, by texting EastRiver or BronxRiver to 41411.

Source: *New Scientist* (2009), 203(2727), 6, and *Amphibious Architecture* (2009), <http://www.amphibiousarchitecture.net/>

Shrinking sea ice results in increasing numbers of problem polar bears

Changes in the Hudson Bay ecosystem brought about by climate change appear to be influencing human–polar bear interactions. Researchers have found that between 1970 and 2005 the number of bears reported as attacking people, buildings and/or hunting camps around the town of Churchill rose from 20 to 90 per year. In this study variation in the occurrence of problem bears was best predicted by the date on which the sea ice freezes up, with shorter sea ice seasons leading to greater numbers of problem bears. Hudson Bay's sea ice now melts 3 weeks earlier than it did in the 1970s, meaning that the bears have less time to catch seals and build up the fat reserves they need to survive the ice-free summer months.

Source: *New Scientist* (2009), 203(2756), 6, and *Polar Biology* (2009), <http://dx.doi.org/10.1007/s00300-009-0653-y>

Reefs work a treat for oysters

A field experiment in which native oyster reefs were constructed in nine protected sanctuaries in the Great Wicomico River in Virginia has been heralded a success. Surveys of the reefs in 2007 and 2009 revealed a population of 185 million oysters of varying age classes. The reefs, originally constructed in 2004, were of three types,

high-relief, low-relief and unrestored, with high-relief reefs proving most popular with the bivalves: oyster density was fourfold greater on high-relief reefs compared to low-relief reefs. In addition, oyster density was correlated with juvenile recruitment and reef accretion, which bodes well for the continued persistence of this population as well as for reef development. Native oysters play an important role in ecosystem engineering but overfishing and habitat destruction have decimated populations worldwide.

Source: *Science* (2009), 325(5944), 1124–1128.

Fishes full of mercury

An investigation by the US Geological Survey has found that fish at more than two-thirds of sampled sites contained levels of mercury that are of concern for fish-eating mammals, and concentrations exceeded the levels deemed safe for human consumption at 27% of sites. Most studies of mercury concentration focus on lakes, reservoirs and wetlands but in this study researchers examined mercury levels in top-predator fish living in 291 streams and rivers across the USA. Fish from streams that drain gold and mercury-mined basins contained the highest levels of mercury, as did fish living in the blackwater coastal-plain streams that drain forests or wetlands in the eastern and southeastern USA. Mercury concentrations in largemouth bass from unmined basins showed a positive correlation with the percentages of evergreen forest and woody wetland in the basins, emphasizing the sensitivity of these land-cover types to mercury bioaccumulation.

Source: *Mercury in Fish, Bed Sediment, and Water from Streams Across the United States, 1998–2005* (2009), <http://pubs.usgs.gov/sir/2009/5109/pdf/sir20095109.pdf>

What a tangled web we weave...

The order in which invasive species are removed from an area can be integral to the success of an eradication programme, according to research from the USA's Santa Cruz Island. On this island golden eagles were preying the Critically Endangered island fox but feral pigs had acted as an eagle food source that had caused the eagles' colonization of the island in the first place. Both pigs and eagles needed to be removed, therefore, and the findings of a model of the three species' interactions suggested removing the eagles first to avoid increased predation of the foxes in the absence of pigs. Evidence from one remaining pair of eagles found that, following the removal of the pigs, the eagles did prey more on the foxes, vindicating the decision by the conservationists, and underlining

the importance of research prior to an eradication programme.

Source: *PLoS ONE* (2009), 4, e7005, <http://dx.doi.org/10.1371/journal.pone.0007005>

Salmon numbers affect killer whale populations

As an apex predator the top-down effects of killer whale predation on food webs has been well-studied. Less well-known are the effects of fluctuations in the killer whales' prey on killer whale populations. Now research that used 25 years' worth of demographic data from two populations of fish-eating killer whales in the north-eastern Pacific Ocean has revealed that fluctuations in killer whale populations are closely linked to the availability of these whales' favourite prey item, the Chinook salmon. The researchers suggest that, although killer whales feed on many different fish species, these populations in the north-eastern Pacific have specialized to feed on Chinook salmon, and that other killer whale populations may have developed similar specializations elsewhere.

Source: *Biology Letters* (2009), <http://dx.doi.org/10.1098/rsbl.2009.0468>

Type of nature experience influences willingness to support conservation

Researchers in the US have examined datasets of people's nature-based activities and contributions to conservation NGOs to explore the hypothesis that people's willingness to support conservation is dependent on their type of interaction with nature. The results indicate that hiking or backpacking is correlated with increased conservation donations 11–12 years later but that other activities such as fishing, viewed as less elite activities, are negatively correlated with conservation contributions. The researchers estimate that each hiker/backpacker equates to c. USD 200–300 annually in future contributions to NGOs. With these results in mind the researchers express their concern at the decline in popularity of hiking/backpacking since 1998–2000, predicting that these declines will start to affect NGO revenues in c. 2010–2011, and continue until 2018 at the earliest.

Source: *PLoS ONE* (2009), 4, e7367, <http://dx.doi.org/10.1371/journal.pone.0007367>

CENTRAL AMERICA AND CARIBBEAN

Stressed corals succumb to heat

Coral bleaching is one of the most serious threats to coral reefs but it is not entirely clear how local stressors interact with conditions

that cause bleaching, namely high water temperatures and solar irradiance. Evidence suggests, however, that bleaching events, during which symbiotic dinoflagellates are lost from corals, are happening more frequently and over a wider area. Now researchers have used tree-ring methods to examine growth rates of the reef-building coral *Montastraea faveolata* in waters around Belize and Honduras over the past 75–150 years. These records indicated that the bleaching event in 1998 was unprecedented in the 20th century, despite not coinciding with times of highest water temperatures or solar irradiation. The researchers found that local stressors, represented in this study by the human population, appeared to reduce the thermal tolerance of coral reefs, leaving them more vulnerable to bleaching events.

Source: *Global Change Biology* (2009), <http://dx.doi.org/10.1111/j.1365-2486.2009.02043.x>

SOUTH AMERICA

Mozzies threaten Darwin's finches

The finches made famous by Darwin are among the species threatened by the establishment of the mosquito *Culex quinquefasciatus* on the Galapagos Islands. *C. quinquefasciatus* is a vector for diseases such as West Nile fever and avian malaria, although these diseases have not yet been detected in mosquitoes on the Galapagos. Monitoring of aeroplanes indicates that *C. quinquefasciatus* is regularly introduced to the archipelago by aircraft, and genetic analysis revealed that mosquitoes introduced by this method are able to integrate into already-established populations of the species. Furthermore, the insects subsequently spread between islands, probably via tourist boats or inter-island boat services. Should West Nile fever become established on the islands it could potentially affect mammals and reptiles as well as the archipelago's avifauna.

Source: *New Scientist* (2009), 203(2721), 9, and *Proceedings of the Royal Society B* (2009), 276, 3769–3775.

Amazon Fund provides hope for rainforest

A major international initiative, the Amazon Fund, is considering its first project, amid hopes that it will provide a blueprint for how tropical forest conservation could be included in a future global warming treaty. The Amazon Fund was created by Brazil to allow the country to use direct international aid to reduce deforestation, as opposed to European and American companies offsetting their emissions by paying

for tropical forest conservation. Norway was the first country to pledge money to the Fund, committing up to USD 1 billion until 2015, although this total is dependent on Brazil's emission rates continuing to decline. The first project being considered for funding is in Pará state, where landowners will be paid monthly to preserve their forests, and further investment will focus on modernizing agriculture to increase income from land that has already been cleared.

Source: *Nature* (2009), 460(7258), 936.

Jaguars in the Pantanal

The Pantanal of Brazil is an important area for the jaguar but, as the size of traditional large ranches decreases, human access to jaguar habitat increases, resulting in human-altered landscapes that may influence patterns of space use by jaguars. In a study using global positioning system radiocollars on six male and four female jaguars, home ranges during the dry season were found to be generally larger than during the wet season. Locations of females suggested a pattern of avoidance among females during the wet season. Home-range overlap among males was extensive in both wet and dry seasons. Overlap between the sexes occurred both in the wet and dry seasons, and jaguars were located < 200 m apart more often than expected, suggesting some degree of sociality. The reproductive profiles of females suggested either a low conception rate, a low survival rate of young, or that jaguars may be more social than previously thought. Source: *Journal of Mammalogy* (2009), 90, 935–945.

Freshwater dolphins killed by fishermen

Fishermen in the Amazon basin have been killing two endemic freshwater cetaceans that occur in the basin, the tucuxi and the boto. Out of 18 dolphin carcasses examined by researchers, three appear to have been attacked and killed intentionally, with the injuries that caused their death consistent with the use of harpoons and machetes. In all three cases the dolphins' bodies were not removed from the water, indicating their deaths were not linked to meat consumption, commerce of organs or the use of dolphin meat as fishing bait. Interviews with local people suggest that in two cases the animals were seen swimming near fishing nets and were therefore killed to avoid them feeding on catches or damaging the gear. The authors speculate that these deaths may be linked to dolphins being perceived as competitors for fish, and to myths and cultural taboos associated with these species.

Source: *Biodiversity and Conservation* (2009), <http://dx.doi.org/10.1007/s10531-009-9693-4>

David Attenborough lends his name to new tree

A new tree species currently only known from one reserve in Ecuador has been named after Sir David Attenborough. *Blakea attenboroughii* was discovered in 2007 in Cerro Candelaria reserve in Ecuador, and is a distinctive species, with blue flowers that include lavender- to blue-coloured anthers. The reserve where the new tree was identified was bought by local Ecuadorian conservation organizations, with funding from the World Land Trust, and had proved itself to be a particularly biodiverse area of rainforest, with many new species of orchid having been discovered there, as well as a new species of frog.

Source: *World Land Trust press release* (2009), <http://www.worldlandtrust.org/news/press-releases.htm>, and *Proceedings of the California Academy of Sciences* (2009), 60, 69–72.

Potential toothache for sugar cane producers

New legislation by the Brazilian government could protect the country's environmentally sensitive areas by banning the creation of sugar cane plantations in these places. The government's plan, which has yet to be passed by Congress, would mean that sugar cane plantations could only be created on 7.5%, or 64 million ha, of Brazilian territory, and would ban the building of ethanol distillation plants in food-growing areas and in the Pantanal. This decision follows concerns that the biofuels industry, heralded as an environmentally friendly source of energy, is contributing to deforestation in the Amazon. This new legislation appears to be part of the 'greening' of the Brazilian government's agenda in the run-up to presidential elections in 2010, at which it is thought that the former environment minister Marina Silva may stand as the Green Party candidate.

Source: *BBC News* (2009), <http://news.bbc.co.uk/1/hi/world/americas/8262381.stm>

PACIFIC

Lost and found: the Fiji petrel

One of the world's rarest and most elusive birds, the Critically Endangered Fiji petrel, has finally been seen flying in its natural habitat. The species was formerly known from only a single, immature specimen collected in 1855 on Gau Island, Fiji. Then, in 1984, on Gau, a single adult was caught, photographed and released. A sea expedition to find the species in May baited the sea

surface 25 nautical miles south of Gau with a specially made food made from finely cut fish offal mixed with very dense fish oil. Frozen 10 kg blocks cast into the sea create a pungent oil slick that attracts petrels. In all the expedition team believe they saw eight individual Fiji petrels in 11 days of observations. More surveys are now planned for 2010, to locate the breeding area of the Fiji petrel.

Source: *Bulletin of the British Ornithologists' Club* (2009), 129, 129–148, and *BBC News* (2009), http://news.bbc.co.uk/earth/hi/earth_news/newsid_8250000/8250215.stm

Jungle yields giant rat

A team of researchers in Papua New Guinea's Southern Highlands have discovered a new species of rat, thought to be one of the world's largest, in the Mount Bosavi crater. Having captured video footage of the rat, the researchers had to trap a live specimen to determine whether it was a new species. The individual they succeeded in trapping measured 82 cm from nose to tail, and weighed c. 1.5 kg. It also had a thick coat of fur, thought to be an adaptation to the cold and wet conditions in which it lives, on the slopes of the volcanic crater at an elevation of > 1,000 m. The rat is only one of a number of new species discovered during the expedition to the remote jungles of the Southern Highlands, many of which are thought to be restricted to the Mount Bosavi crater.

Source: *BBC News* (2009), http://news.bbc.co.uk/earth/hi/earth_news/newsid_8210000/8210394.stm

Sharks fin(d) sanctuary in Palau's waters

The President of Palau has declared its entire Exclusive Economic Zone a shark sanctuary by banning all commercial shark fishing in the area. Although the human population of Palau is only 20,000, the number of islands in its territory numbers 200, meaning that the new sanctuary will cover an area of c. 600,000 km² and protect c. 130 threatened species of shark that frequent Palau's waters. Most of Palau's income derives from tourism, and with sharks being a major attraction for scuba divers, the decision should benefit the Palau economy too. Almost half of all oceanic sharks are at risk of extinction, with shark-finning a particularly serious threat, and it is estimated that as many as 100 million sharks are killed worldwide every year.

Source: *BBC News* (2009), <http://news.bbc.co.uk/1/hi/sci/tech/8272508.stm>

AUSTRALIA/ANTARCTICA/ NEW ZEALAND

Booby bounces back to life

The Tasman booby *Sula dactylatra tasmani*, first described in 1988 from fossils found on Australia's Lord Howe and Norfolk Islands, was thought to have gone extinct in the late 18th century. However, a comparison between DNA fragments from six fossil Tasman boobies and DNA obtained from a living bird, *Sula dactylatra fullagari*, in the North Tasman Sea has revealed that the Tasman booby is alive and well. The booby now reverts to its first recorded name, *S. d. tasmani*. Researchers are unsure of how this situation arose, suggesting that it may be to do with the fact that female Tasman boobies are larger than the males. This is believed to be the first time that an 'extinct' avian taxon has been brought back to life.

Source: *New Scientist* (2009), 203(2721), 4, and *Biology Letters* (2009), <http://dx.doi.org/10.1098/rsbl.2009.0478>

Sometime too hot the eye of heaven shines (for birds too)

Australian researchers looking at changes in body size of eight passerine bird species from south-eastern Australia over the last 100 years have found evidence that the birds' body size is shrinking. Four species showed significant decreases in body size (1.8–3.6% of wing length), a trend that was confirmed across all species. The researchers in this study were able to rule out the possibility that these changes had occurred in response to changes in nutrition, leading to the conclusion that global warming is probably the cause of these morphological changes.

Source: *New Scientist* (2009), 203(2721), 13, and *Proceedings of the Royal Society B* (2009), 276, 3845–3852.

Unexpected benefit from Antarctic melting?

For the most part, the effects of melting ice in the Antarctic are thought to precipitate further warming through positive feedback loops, for example by exposing darker soil that reflects less light from the earth's surface. However, researchers looking at the loss of ice shelves and the retreat of coastal glaciers around the Antarctic peninsula have found that at least 2.4 10⁴ km² of new open water have been exposed as a result of these processes over the last 50 years. The colonization of these areas of open water by phytoplankton, zooplankton and seabed communities has resulted in increased carbon storage by these organisms; researchers

estimate that the combined carbon storage by these organisms could amount to 910,000 t. Source: *Journal Watch Online* (2009), <http://journalwatch.conservationmagazine.org/2009/09/29/southern-exposure/>, and *Global Change Biology* (2009), <http://dx.doi.org/10.1111/j.1365-2486.2009.02071.x>

Origin of invasive rats identified by genetic techniques

Following the eradication of an invasive species from an area, the reinvasion of the species indicates that either the eradication has not been successful, or that the species has travelled to the area from elsewhere. If the first of these scenarios

proves to be the case, this may require the eradication technique to be altered. Conservationists in New Zealand have used genetic assignment techniques to identify the origins of rats found on Pearl Island 9 months after an eradication procedure that aimed to rid the island of three invasive rat species. The genetic analysis revealed that the re-invading rats were most likely to have come from the adjacent Stewart Island. Although this finding indicates that the rats are swimming to Pearl Island at a greater rate than anticipated, it also indicates that the original eradication programme on Pearl Island was successful.

Source: *Biological Invasions* (2009), <http://dx.doi.org/10.1007/s10530-009-9586-1>

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