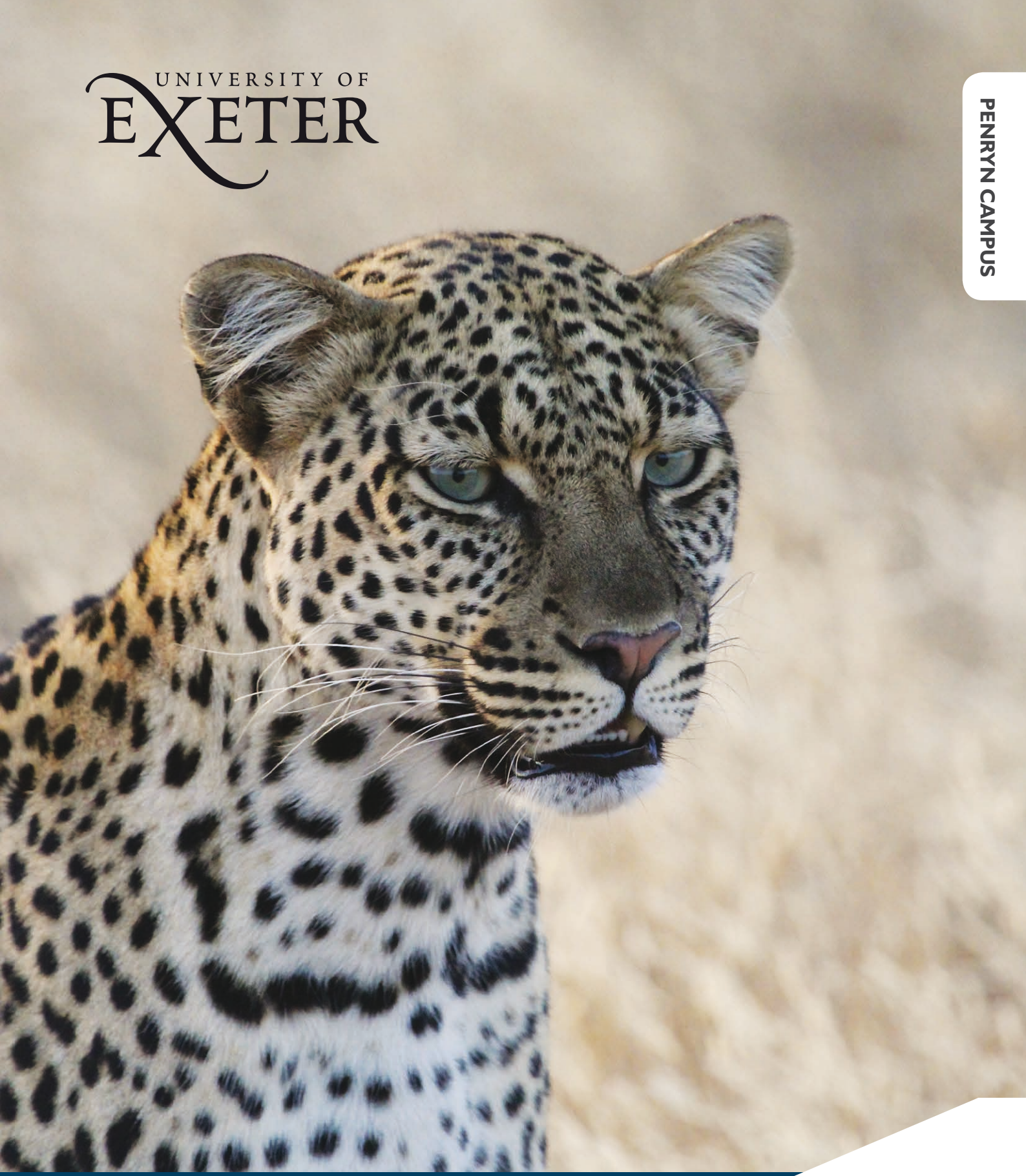
UNIVERSITY OF EXETER

PENRYN CAMPUS



Centre for Ecology and Conservation

Annual Report 2014

Welcome

It has been yet another outstanding year for the Centre for Ecology and Conservation (CEC), with a long list of achievements in research and teaching that highlights what a major powerhouse we have become. Together with our College of Life and Environmental Sciences (CLES) colleagues in Geography and the Environment and Sustainability Institute (ESI), we have now created a formidable research grouping on the Penryn Campus that is becoming nationally and internationally renowned. This is clearly evidenced by the quality of students, staff and visitors we attract – an outstanding feat just 10 years since our inception!

I was lucky enough to be one of the first faculty appointments when we started with a small group of staff and a dozen students on one degree programme. We now have over 500 undergraduates and 70 taught MSc students across a rich portfolio of degrees and are proud to host 85 research students (PhD and Masters by Research) from across the world. All of these are taught and mentored by 45 Biosciences academics, who unlike many other biology departments in the country, are largely driven by questions about whole animals and plants, their ecology, behaviour, evolution and conservation. This makes for an exciting mix when it is the shared interest of staff and our students. I am particularly proud of the vocational and highly motivated nature of the students we attract. The character of the student body is evidenced by the wide and ever-expanding range of extracurricular societies and activities they coordinate. This makes for an invigorating campus environment for all and contributes greatly to their personal development (see section on Student Societies).

Our research portfolio continues to go from strength to strength, with £3.75 million in new grants in 2014, taking our current grant holdings to over £20 million. Funders included Research Councils (BBSRC, ESRC, NERC), Defra, EU, Marine Conservation Society, Natural England, Leverhulme Trust, the Royal Society, Rufford Foundation, Scottish Natural Heritage, Wildlife Conservation Society and the Wissenschaftskolleg Zu Berlin.

We also continue to publish well, with in excess of 200 papers published in 2014, many in the most prestigious journals (some of which are featured in the Research Highlights and Selected Publications sections later in this report). The ever expanding research base of the Centre has, however, meant that we have outgrown our existing laboratory and office provision. During 2014, the new Science and Engineering Research Support Facility (SERSF) has sprung up beside the main Daphne du Maurier Building. Part funded by the European Regional Development Fund, it will house a large number of CEC staff from spring/summer 2015. We already know, however, that another building will be needed very soon.

Our staff may have given plenary addresses and guest lectures across the world, but we also have a very strong record of local schools liaison (see Science in the Community section). With regard to reaching out to the wider community, our now annual, Science in the Square event during Falmouth Week was again a great success. This year we added further strings to our bow. In the autumn, many members of our collaborating marine organisations were treated to a demonstration dissection of a large bluefin tuna which stranded over the summer. This event was led by **Dr Lucy Hawkes** and **Dr Matthew Witt** and visiting veterinary pathologist, James Barnett. As the year drew to an end, we hosted The Science of Christmas event in the Falmouth Polytechnic in association with Café Scientifique. Over 160 people attended on a cold night; mostly children. They were treated to a series of excellent light-hearted science talks by CEC research students and staff on topics related to Christmas. Every family also received copies of our student-created *Life* magazine and our own **Prof Richard Ffrench-Constant's** children's book, *The Last Butterfly*.

It is clear that we are a very outward looking department, but we have also been very much involved at looking at our own culture and processes as part of our Athena SWAN (AS) agenda to promote gender equality in science. After a successful Bronze award in 2013, we have continued to progress and submitted our Silver application at the end of the year. A great deal of effort was invested by students and staff of all job families and there is now universal awareness of AS. Indeed, many of us are starting to note the positive effects of the process and changes we have introduced.

We are also known as a unit that enjoys life and a place where professional services, academics and students jointly celebrate the successes of our shared endeavours. To commemorate our 10th anniversary, we hosted a symposium with former staff and alumni joining with current staff and students for a mixture of tongue-in-cheek review and hard science. Speakers included some of our first undergraduates, **Dr Tony Bicknell** and **Dr Erika Newton**; our first PhD student, **Dr Matt Witt**; our first postdocs, **Dr Amanda Bretman** and **Dr Tom Price**; **Prof Nina Wedell** (appointed to EMBO in 2014); and three of the former Directors of the Centre, **Profs Matthew Evans**, **Allen Moore** and **Dave Hosken** (below). Closing remarks were from **Anna Leonard**, our first ever member of professional services staff, who has been a keystone to the building of our unit. We were also joined by a significant number of our alumni and it was great to catch up and reminisce on fieldtrips of yesteryear.

In closing, it has been a few short months since I took over from Dave Hosken as Director of the Centre. I inherited a thriving and healthy department and the intervening period has been eventful and positive. I look forward to 2015 being even bigger and better. We have the staff and students to do it!

Professor Brendan Godley
Director, Centre for Ecology and Conservation
Head of Discipline, CLES Penryn Campus.

Research Highlights

Flexible parents

The flexibility of parental behaviours to respond to changes in behaviour of their offspring may actually constrain the ability of parents to adapt to changes in their wider environment. This is the paradoxical conclusion of a review article by **Drs Nick Royle**, **Andrew Russell** and **Alastair Wilson**. Parenting behaviours, such as the provisioning of food by parents to offspring, are highly responsive to changes in environmental factors. These include not only climatic (eg, temperature) and ecological (eg, food availability, predators) factors, but also social factors, in the form of partner and/or offspring behaviour. (Published in *Science*)

Gabon Marine Protected Area

Work undertaken by **Prof Brendan Godley**, **Dr Kristian Metcalfe** and **Dr Matthew Witt** has been instrumental in the announcement by the government of Gabon of its decision to create a new marine protected area network. The network will consist of ten marine parks covering over 46,000 square kilometres covering about 23 per cent of Gabon's territorial waters and EEZ (Exclusive Economic Zone). The announcement was made by His Excellency The President of Gabon Ali Bongo Ondimba in Sydney at the 2014 IUCN World Parks Congress. It will safeguard whales, sea turtles, and other marine species inhabiting the country's coastal and offshore ecosystems.

Managed honeybees linked to new diseases in wild bees

Research carried out by **Prof Juliet Osborne** has found diseases that are common in managed honeybee colonies are now widespread in the UK's wild bumblebees. The study suggests that some diseases are being driven into wild bumblebee populations from managed honeybees. This research provides vital information for beekeepers across the world to ensure honeybee management supports wild bee populations. (Published in *Nature*)

42,000 sea turtles legally harvested each year

A new study has found that 42 countries or territories around the world permit the harvest of marine turtles – and estimates that more than 42,000 turtles are caught each year by these fisheries. The research, carried out by Blue Ventures and the Centre for Ecology and Conservation (**Fran Humber**, **Dr Annette Broderick**), is the first to comprehensively review the number of turtles currently taken within the law and assess how this compares to other global threats to the creatures. (Published in *Diversity and Distributions*)

Love thy neighbour

A theoretical study led by **Dr Florence Débarre** has shed new light on the conditions that lead to the evolution of spite or altruism in structured populations. Understanding the way in which social behaviours such as altruism – when animals benefit others at their own expense – develop, is a long-standing problem that has generated thousands of articles and heated debates. The study presents a comprehensive framework that applies to a large class of population structures and identifies the crucial elements which support the evolution of social behaviour. (Published in *Nature Communications*)

Gannet sat nav reveals impact of fishing vessels

Fishing vessels have a far bigger ecological footprint than previously thought, according to research which tracked the movement and behaviour of seabirds using GPS devices. **Dr Tom Bodey**, **Dr Steve Votier** and **Prof Stuart Bearhop** discovered that northern gannets change their behaviour in response to the presence of large vessels such as trawlers, suggesting each boat can significantly influence the distribution and foraging patterns of these and other marine predators. (Published in *Current Biology*)

Self-deceived individuals deceive others better

Over confident people can fool others into believing they are more talented than they actually are, a study by **Dr Shakti Lamba** has found. These 'self-deceived' individuals could be more likely to get promotions and reach influential positions in banks and other organisations. They are also more likely to overestimate other people's abilities and take greater risks, possibly creating problems for their organisations. The study also found that those who are under confident in their own abilities are viewed as less able by their colleagues. (Published in *Proc Roy Soc B*)

Global warming may increase methane emissions from freshwater ecosystems

The results of a collaborative study, led by **Dr Gabriel Yvon-Durocher** suggest that rising global temperatures will increase the quantity of the key greenhouse gas methane emitted from freshwater ecosystems to the Earth's atmosphere – which could in turn lead to further warming. Data from hundreds of laboratory experiments and field surveys were collated to demonstrate that the speed at which methane fluxes increase with temperature was the same whether single species populations of methanogens, microbial communities or whole ecosystems were analysed. (Published in *Nature*)

Females prefer lovers not fighters

It's official – in the horned beetle world at least – females prefer courtship over competitiveness and it doesn't matter about the size of your mandibles either. An international study including **Prof Dave Hosken**, **Dr Clarissa House** and **Dr MD Sharma** investigated the complicated sexual conflict over mating in the horned flour-beetle. Female mate choice and male-male competition are the typical mechanisms of sexual selection. However, these two mechanisms do not always favour the same males. (Published in *Proc Roy Soc B*)

Scientists find best way to rid a garden of snails

Gardeners wanting to rid their spring flowerbeds of pesky snails can ditch the beer traps and egg shells and instead develop a strong throwing arm. A study involving **Dr David Hodgson** has used statistical models to show that removing snails out of the garden by a distance of over 20 metres or more is just as effective as simply killing them. (Published in *Physica Scripta*)

Climate change not necessarily bad for plants

Research carried out by **Dr Regan Early** found that plants are able to deal with changes in climate much better than previously thought. In fact, the species around them – the insects, fungi and viruses – may play a bigger factor in determining whether they survive. (Published in *Global Ecology and Biogeography*)

CASE STUDY

Camouflage made visible

The research group of **Dr Martin Stevens** studies sensory ecology, particularly bird vision and animal coloration. Their work is world-leading, as is their commitment to sharing their science widely beyond academia. This year Martin appeared on a BBC 2 TV series, Inside Animal Minds, with Chris Packham about bird vision and behaviour, and on BBC1's the One Show about camouflage in rockpool animals. Working with a local company, FoAM Kernow, and the BBSRC, Martin's group has produced citizen science games and videos to showcase their work on camouflage in ground-nesting birds and reveal how scientists study camouflage and predation. Over 40,000 people have now played the games, and one video has been watched by more than half a million people online. The work has been covered widely in the media, from *The Independent* and *Economist* to the *Daily Mail*. As a result of this and other local widening participation activities, Martin has been made a 'Schools Regional Champion' for the SW by the BBSRC, and the games have been included in the BBSRC's Key Stage 4 schools resource pack.

Student Societies

EcoSoc

EcoSoc has had another brilliant year! We've been getting involved with groups across Cornwall, from running mammal trapping sessions with Cornwall Mammal Group to surveying wildlife with the Cornwall Wildlife Trust. We've also worked with Swanpool Beach to keep our beautiful coastline clean and the National Trust on conservation projects. Alongside this, we've run many events ourselves. Our bird-watching trips have taken members to see the best avian fauna Cornwall has to offer and our identification sessions have improved our wildlife knowledge. Camera trapping has given us a view into the secret world of the Cornish Woodland and our moth project is continuing to grow. We can't forget Chill Out for Charity, our fundraiser for Cornwall Wildlife Trust and Wild Futures, which raised £500! Nor our biggest event of the year, BioBlitz! This 24-hour survey of campus found hundreds of species and was a great day enjoyed by all!

BeeSoc

BeeSoc is a small society with the aim of promoting a big issue: the importance of our pollinators! In 2013/14 we had the pleasure of hosting talks from our very own Dr Lena Wilfert and Dr Matthias Becher, and Dr Peter Graystock from the University of Sussex, who gave us insight on his research on bumblebees. We were also lucky enough to receive funding for our new hive, which will be located on campus and is well on the way to be completed in 2015. Our local beekeeper Matt, who has strong ties with BeeSoc, held a series of six beekeeping lectures for us so we would be ready to handle honeybees for ourselves, which we are very excited to do! Mathilda Janicot Bale has stayed as BeeSocs President for 2014/15 along with Catherine Mitson as Treasurer and Asiya Aziz as our Vice President.

Expedition Society

The Expedition Society runs trips for every kind of walker from strolls around campus and hikes in more challenging environments, through to multi-day expeditions with a greater focus on navigation and teamwork.

On top of these UK-based recreational trips we also offer members the opportunity to take part in international research-orientated 'FXpeditions' and organise a host of other events including: BBQs, society meals, camping trips, guest speaker talks and skills workshops. This year we've streamlined the 'FXpeditions' process so that now we have two trips returning to previous destinations and six hoping to tread new ground in countries such as Mozambique, Peru and Tanzania.

Back on home turf, we ran another successful trip to the Royal Geographical Society's 'Explore' conference; a weekend expedition on Dartmoor; plus Martin Holland, the FXpeditions founder, came down to Falmouth to give a focused workshop on organising expeditions.

Wildlife Documentary Society

The Wildlife Documentary Society (WildDocSoc) is a student-run society that aims to provide activities and guest speakers that inspire students with a passion for wildlife documentary film. This year we hosted a careers talk by natural history presenter Steve Backshall (an Exeter alumnus), an exclusive premiere viewing of Snow Wolf Family and Me, and a talk by BBC Producer Ted Oakes. We also hold regular wildlife documentary film nights and socials, including our fresher's pub crawl and Christmas Polar ball! Throughout the past year we have improved as a society, providing more opportunities for our members, which has resulted in us earning our Gold society accreditation from the FXU.

BSEC

The Bioscience Student Employability Committee (BSEC) aims to provide insight into the different paths people take to achieve their professional goals and encourage networking opportunities between the University, its students, and relevant local and national organisations. We have booked some very exciting guests for our weekly seminar series including a Senior Conservation Advisor with the WWF, and a member of the Executive Committee of the IUCN/SCC Primate Specialist Group. This year we are also working closely with academic staff, the Career Zone, and our Geography and Renewable Energy counterparts to put together the most comprehensive careers fair yet!

Sarah Newton – fifth from left – with members of the AS working group and ECR students.

Athena SWAN Silver application

Following on from our joint CEC and Geography's Athena SWAN Bronze award, we continued on our journey to achieve gender equality in the department.

In 2014, we appointed an Athena SWAN champion (**Prof Stuart Bearhop**) and 17 female staff and research students completed our first Springboard development programme (which will be repeated in 2015). We kept 100 per cent completion rates for Equality and Diversity training, and created a Twitter account to keep staff and students updated on Athena SWAN-related news and events *@UoECornwall_AS*. Local MP Sarah Newton came to visit our working group to discuss gender and STEMM issues as part of her work as a member of the House of Commons' select committee for Science and Technology. We also produced and displayed 10 posters of women from the department, as part of a role models project (http://lifesciences.exeter.ac.uk/athenaswan/cornwall/science). Finally, we submitted our Silver application in November 2014. It has been a busy year for us!

Unpackage Me: A Life Free from Plastics

During October 2014, **Dr Jennifer Sanderson** and **Lindsay Walker**, two early-career researchers, chose to live a life free from plastic to help raise awareness of the problems associated with plastic packaging. Members of the public were invited to join 'Unpackage Me' and pledge not to purchase any products that contain or use plastic for a day or more during October. Unpackage Me gained an international audience with their daily blog www.unpackageme.co.uk, Facebook, and Twitter pages (@UnpackageMe), and was featured both in local newspapers and on BBC Cornwall Radio spreading awareness to the local community. The month-long challenge ended with a special seminar on the Penryn Campus with guest speaker PhD student **Stephanie Wright** who spoke about her research investigating the damaging effects of marine microplastics.

Funding Awards 2014

CEC again obtained significant funding in 2014 totalling £3.75 million. As in previous years, this came from a range of sources including: the Biotechnology and Biological Sciences Research Council (BBSRC); Economic and Social Research Council (ESRC); the Leverhulme Trust; Marine Conservation Society; Natural England; Natural Environment Research Council (NERC); and the Royal Society.

In total there were 46 awards, and here are just a few highlights to give you a flavour of the breadth of funding sources and happy recipients. Substantial **BBRSC** grants went to Juliet Osborne (*Understanding the impacts of sublethal doses of neonicotinoids on bumblebees and honeybees*); Martin Stevens (*Predator learning of camouflage types*); Alastair Wilson and Andy Young (*Chronic stress response in vertebrates: the genetics of constraint and conflict*); Shakti Lamba received **ESRC** funding (*The effects of demography and migration on cooperation and competition: a large-scale field study*); The **Leverhulme** Trust funded Sasha Dall (*A Darwinian framework for phenotypically integrating genetic and epigenetic cues*); and Gabriel Yvon-Durocher and Angus Buckling (*The molecular mechanisms of thermal acclimation and adaptation in marine algae*).

CEC received extensive funding from diverse calls at **NERC** with awards to: Camille Bonneaud and Alistair Wilson (*Evolution of phenotypic plasticity in an emerging pathogen*); Mike Boots (*Modelling optimal control strategies for Grey Squirrels*); Annette Broderick, Alastair Wilson and Robbie McDonald (NERC CASE awards); Mike Cant (with Darren Croft, Streatham, *The evolution of prolonged post-reproductive lifespan in a non-human mammal*); David Hodgson (*Are structured life histories really buffered against environmental change?*); David Hosken (with Fiona Matthews, Streatham, *Improving the ecological sustainability of wind energy*); Robbie McDonald, David Hodgson and Mike Boots (*Infection in dynamic social networks of a wild mammal*); Tom Tregenza (*Life history and ageing in the wild*).

The **Royal Society** funded several projects including Lucy Hawkes (*Are there limits to vertebrate muscle performance?*); Matt Witt received funding from the **Marine Conservation Society** (*Tracking of Basking Sharks*).

Natural England funded Ilya Maclean; Annette Broderick and Brendan Godley received Darwin funding from **DEFRA** (*Linking marine biodiversity and fisher prosperity*). Finally, Steve Votier was funded by **Moray Offshore Renewables Ltd** (*Seabird tracking*).

Science in the Community

Schools Outreach

This year we have continued to run our popular science workshops, reaching over 2,000 students from 26 schools and colleges across Cornwall.

We have put a strong emphasis on taking current research into the classroom, with Masters and PhD students, as well as academic staff, giving interactive talks. At one school in particular, we have run a weekly Ecosoc thanks to an RCUK grant. As the result of this association, Dr Alex Thornton and Dr Guill McIvor received a Royal Society Schools Partnership grant at the end of the year to set up a scientific project in which the students will develop and test cognitive tasks for wild corvids. We have also had a presence at large events, including The Skills Show Experience attended by over 3,000 students considering their future, the Tremough Community Games and Children's University Graduation ceremonies.

Science in the Square

In August, Science in the Square was back for a third year running with this year's theme being 'Nature is Nuts!'

This hugely popular and completely free event was held as part of Falmouth Week. Some 2,000 visitors packed into the Events Square marquee to hear all about Crazy Climate, Strange Sounds, Nutty Navigators, and the planet's Oddest Olympians. Families were able to handle all sorts of living creatures, from cockroaches and giant stick insects, to snakes. Our variety of interactive zones allowed budding scientists to conduct their own experiments, examine specimens, and even dissect owl pellets. We are indebted once again to all the staff and students that make this event happen. It was great to see so many people sharing their passion for science.

Science of Christmas

In December, the University welcomed the holiday season with 'The Science of Christmas', a free family-friendly lecture held at the Royal Cornwall Polytechnic Society in Falmouth.

CEC staff and students presented light-hearted science talks to answer festive questions such as 'How does Santa find you?' and 'Do other animals dress up for special occasions?' The event was enjoyed by all ages, with a turnout of 160 people, and we hope that it will become an annual feature in the CEC's calendar.

Tuna Dissection

This year we carried out a post-mortem of a 2.4m long, 140kg Bluefin tuna that washed up unexpectedly on Cornwall's Kingsand Beach in July.

The dissection was held in the Environment and Sustainability Institute and proved to be an impressive spectacle for our audience of local marine stakeholders. Samples were collected by the autopsy team which were then used to investigate the tuna's geographic origins and estimate the tuna's age.

Billy the Banded Mongoose

In the summer of 2014, Dr Jennifer Sanderson led a *Billy the Banded Mongoose* book tour around primary schools both in Uganda and the UK filled with fascinating facts from the Banded Mongoose Research Project.

The Billy outreach project was funded by a small NERC resource development grant and includes a self-published storybook and associated learning materials that are available freely online at: www.billythebandedmongoose.co.uk

More information about our outreach activities can be found on our web pages: http://lifesciences.exeter.ac.uk/outreach/cornwall

Awards and Prizes

Prize Winners

Dr Florence Debarre was awarded the prize for Best Talk at the European Conference of Mathematical and Theoretical Biology conference in Sweden.

Dr Iain Stott was elected as early career representative member to the British Ecological Society Council.

See also Selected Highlights for accolades to **Kristy Flowers**, **Prof Dave Hosken**, **Dr Tom Stringell** and **Prof Nina Wedell**.

FXU Awards

Our students (and staff) were very successful at the 2014 Falmouth Exeter Student Union awards as follows:

Innovative Society Project of the Year – *Life magazine*
Most Original Fundraising Idea – *Monkey Week*
Significant Contribution to Fundraising – *Roger Auster*
Sports Person of the Year (Male) – *Andy Jones*
Sports Person of the Year (Female) – *Frances Bensley*
Innovative Teaching Award – *Professor Robbie McDonald*

Congratulations to the following CEC students who were awarded PhDs in 2014:

Dominic Cram – Causes and consequences of oxidative stress in a cooperatively breeding bird.

Rafael Matias – Limiting factors in colonial seabirds with emphasis on predation, disease, parasites and diet, and implications for monitoring studies.

Caroline Moussy – Spatial ecology of the serotine bat *(Eptesicus serotinus)*.

Matthew Perkins – Quantifying the effects of biodiversity on food web structure. A stable isotope approach.

Alan Rees – Ecology of marine turtles across the Eastern Mediterranean and the Middle East.

Thomas Stringell – Population dynamics of marine turtles under harvest.

Wendi Wolfram – Scent marking: investigating chemosensory signals in wolf urine.

Graduation Awards

Many congratulations to the following students who were awarded prizes at our Graduation ceremony in July:

Undergraduate

Dean's Commendations**: Georgina Chandler, Rosalind Evans, Benjamin Newport, Rhiannon Smith, Hannah Walker**

Centre for Ecology and Conservation Commendations: **Bethany Roberts, Miranda Walters, Jasmin Ashworth, Feargus Cooney, Katherine Koster-Shadbolt, Hannah Fitzjohn, Anna John, Riona Bray**

Oxford University Press**: Georgina Chandler**

ZSL Charles Darwin Award: **Bethany Roberts**

Postgraduate

Dean's Commendations for exceptional performance – 70% + Distinction in all MSc modules:

MSc Evolutionary and Behavioural Ecology 2013/14:
Susanna (Maddy) Vierbuchan

MSc Conservation and Biodiversity 2013/14:
Kelly Atkins, Catherine McNicol, Sarah Nelms, Michael Roast

Centre for Ecology and Conservation Commendations:

MSc Applied Ecology 2013/14:
Claire Buchan – Best Overall Mark (MSc) and Best Research Project

MSc Conservation and Biodiversity 2013/14:
Sarah Nelms – Best Overall Mark (MSc)
Marie Fan – Best Research Project

MSc Evolutionary and Behavioural Ecology 2013/14:
Andrew Szopa Comley – Best Overall Mark (MSc)
Niki Hubbard – Best Research Project

Selected Highlights

Kristy Flowers

Shortlisted for Heroine of the Year

Kristy was nominated for the David Allen Hero/Heroine of the Year Award for her actions on the Borneo field course, when she went above and beyond the call of duty to help a student. The award is part of the University's Professional Services Recognition Awards initiative.

Tom Stringell

P1 Marine Foundation National Student Awards

Tom Stringell, who recently completed his PhD at the Centre for Ecology and Conservation, came runner up in the prestigious P1 Marine Foundation National Student Awards 2013 for his work on sea turtles in the Turks and Caicos Islands (TCI), a UK Overseas Territory in the Caribbean. This unique research will lead to a Caribbean government changing its conservation policy.

David Hosken

ZSL award

Professor David Hosken has been awarded a prestigious prize, the ZSL Scientific Medal, from the Zoological Society of London (ZSL) in recognition of outstanding scientific merit. The award was presented by Professor Sir Patrick Bateson, ZSL President.

Nina Wedell

European Molecular Biology Organisation

Professor Nina Wedell has been elected to the membership of the European Molecular Biology Organisation (EMBO), which supports talented researchers, stimulates scientific exchanges and advances policies for a world class European research environment. Election to life-long membership of EMBO is a mark of recognition of research excellence and the outstanding achievements made by a life scientist.

Congratulations!

This past year saw a number of key promotions: Dr Gabriel Yvon-Durocher and Dr Andy McGowan to Senior Lecturer. Drs Annette Broderick, Andy Russell and Martin Stevens to Associate Professor. Dr John Hunt to Professor. We also saw the welcome return of Dr Sarah Hodge (0.6 time) from maternity leave.

Selected CEC Publications from 2014

Allen WL, **Stevens M**, Higham JP (2014) Character displacement of Cercopithecini primate visual signals. ***Nature Comms*** doi:10.1038/ncomms5266

Aplin L, Farine D, Morand-Ferron J, Cockburn A, **Thornton JA**, Sheldon B (2014) Experimentally induced innovations lead to persistent culture via conformity in wild birds. ***Nature*** doi:10.1038/nature13998

Bell MB, **Cant MA**, Borgeaud C, Thavarajah N, Samson J, Clutton-Brock TH (2014) Suppressing subordinate reproduction provides benefits to dominants in cooperative societies of meerkats. ***Nature Comms*** doi:10.1038/ncomms5499

Bodey T, **Cleasby I**, **Votier SC**, **Bearhop S** (2014) Seabird movement reveals the ecological footprint of fishing vessels. ***Current Biology*** doi:10.1016/j.cub.2014.04.041

Cant MA, Nichols HJ, Johnstone RA, **Hodge SJ** (2014) Policing of reproduction by hidden threats in a cooperative mammal. ***Proc National Academy Sciences*** doi:10.1073/pnas.1312626111

Capodeanu-Nägler A, **Rapkin J**, Sakaluk SK, **Hunt J**, Steiger S. Self-recognition in crickets via online processing. ***Current Biology*** doi:10.1016/j.cub.2014.10.050

Careau V, Biro PA, **Bonneaud C**, Fokam EB, Herrel A (2014) Individual variation in thermal performance curves: swimming burst speed and jumping endurance in wild-caught tropical clawed frogs. ***Oecologia*** doi:10.1007/s00442-014-2925-7

Currie TE, Mace R (2014) Evolution of cultural traits occurs at similar relative rates in different world regions. ***Proc Royal Society B*** doi:10.1098/rspb.2014.1622

Dall SRX, Griffith SC (2014) An empiricist guide to animal personality variation in ecology and evolution. ***Frontiers in Ecology and Evolution*** doi:10.3389/fevo.2014.00003

Débarre F, Hauert C, Doebeli M (2014) Social evolution in structured populations. ***Nature Comms*** doi:10.1038/ncomms4409

Early R, Sax DF (2014) Climatic niche shifts between species' native and naturalised ranges raise concern for ecological forecasts during invasions and climate change. ***Global Ecology and Biogeography*** doi:10.1111/geb.12208

Fossette S, **Witt MJ**, Miller P, Nalovic MA, Albareda D, Almeida AP, **Broderick AC**, Chacón-Chaverri D, **Coyne MS**, Domingo A, **Godley BJ** (2014) Pan-atlantic analysis of the overlap of a highly migratory species, the leatherback turtle, with pelagic longline fisheries. ***Proc Royal Society B*** doi:10.1098/rspb.2013.3065

Fürst MA, McMahon DP, **Osborne JL**, Paxton RJ, Brown MJF (2014) Disease associations between honeybees and bumblebees as a threat to wild pollinators. ***Nature*** doi:10.1038/nature12977

Harrison XA, **York JE**, **Young AJ** (2014) Population genetic structure and direct observations reveal sex-reversed patterns of dispersal in a cooperative bird. ***Molecular Ecology*** doi:10.1111/mec.12978

Hayward AD, Nussey DH, **Wilson AJ**, Berenos C, Pilkington JG, Watt KA, Pemberton JM, Graham AL (2014) Natural selection on individual variation in tolerance of gastrointestinal nematode infection. ***PLOS Biology*** doi:10.1371/journal.pbio.1001917

Head M, Hinde C, **Moore A**, **Royle N** (2014) Correlated evolution in parental care in females but not males in response to selection on paternity assurance behaviour. ***Ecology Letters*** doi:10.1111/ele.12284

House CM, **Roth C**, **Hunt J**, **Kover PX** (2014) Paternal effects in Arabidopsis indicate that offspring can influence their own size. ***Proc Royal Society B*** doi:10.1098/rspb.2010.0572

Humber F, **Godley BJ**, **Broderick AC** (2014) So excellent a fishe: a global overview of legal marine turtle fisheries. ***Diversity and Distributions*** doi:10.1111/ddi.12183

Hunt J and **Hosken DJ** (Eds) (2014) Genotype by environment interactions and sexual selection. ***Oxford University Press***

Koskella B (2014) Bacteria-phage interactions across time and space: merging local adaptation and time-shift experiments to understand phage evolution. ***American Naturalist*** doi:10.1086/676888

Lamba S (2014) Social learning in cooperative dilemmas. ***Proc Royal Society B*** doi:10.1098/rspb.2014.0417

Lopez Pascua L, **Hall AR**, **Best A**, **Morgan AD**, **Boots M**, **Buckling A** (2014) Higher resources decrease fluctuating selection during host-parasite coevolution. ***Ecology Letters*** doi:10.1111/ele.12337

McDonald JL, Smith GC, **McDonald RA**, Delahay RJ, **Hodgson D** (2014) Mortality trajectory analysis reveals the drivers of sex-specific epidemiology in natural wildlife-disease interactions. ***Proc Royal Society B*** doi:10.1098/rspb.2014.0526

Minter EJ, **Lowe CD**, Brockhurst MA, Watts PC (2014) A rapid and cost-effective quantitative microsatellite genotyping protocol to estimate intraspecific competition in protist microcosm experiments. ***Methods in Ecology and Evolution*** doi:10.1111/2041-210X.12321

O'Brien S, **Hodgson DJ**, **Buckling A** (2014) Social evolution of toxic metal bioremediation in Pseudomonas aeruginosa. ***Proc Royal Society B*** doi:10.1098/rspb.2014.0858

Okada K, **Katsuki M**, **Sharma MD**, **House CM**, **Hosken DJ** (2014) Sexual conflict over mating in Gnatocerus cornutus? Females prefer lovers not fighters. ***Proc Royal Society B*** doi:10.1098/rspb.2014.0281

Pikesley SK, **Broderick AC**, Cejudo D, **Coyne MS**, Godfrey MH, **Godley BJ**, Lopez P, López-Jurado LP, Merino SE, Varo-Cruz N, **Witt MJ**, **Hawkes LA** (2014) Modelling the niche for a marine vertebrate: a case study incorporating behavioural plasticity, proximate threats and climate change. ***Ecography*** doi:10.1111/ecog.01245

Price TAR, Bretman A, Gradilla AC, Reger J, Taylor ML, Giraldo P, Campbell A, Hurst GDD, **Wedell N** (2014) Polyandry controls population sex ratio across the USA via regulation of a selfish gene. ***Proc Royal Society B*** doi:10.1098/rspb.2013.3259

Royle NJ, **Russell AF**, **Wilson AJ** (2014) The evolution of flexible parenting. ***Science*** doi:10.1126/science.1253294

Timmermans MJTN, Martijn JTN, Baxter SW, Simon W, Clark R, Heckel DG, Vogel H, Collins S, Papanicolaou A, Fukova I, Joron M, Thompson MJ, Jiggins CD, **Ffrench-Constant RH**, Vogler AP (2014) Comparative genomics of the mimicry switch in Papilio dardanus. ***Proc Royal Society B*** doi:10.1098/rspb.2014.0465

Turchin P, **Currie T**, Turner EAL, Gavrilets S (2014) Reply to Thomas: diffusion of military technologies is a plausible explanation for the evolution of social complexity, 1500 BCE–AD 1500. ***Proc National Academy Sciences*** doi:10.1073/pnas.1322988111

Wilfert L, Jiggins FM (2014) Flies on the move: an inherited virus mirrors Drosophila melanogaster's elusive ecology and demography. ***Molecular Ecology*** doi:10.1111/mec.12709

Winters AE, **Stevens M**, **Mitchell C**, Blomberg SP, **Blount JD** (2014) Maternal effects and warning signal honesty in eggs and offspring of an aposematic ladybird beetle. ***Functional Ecology*** doi:10.1111/1365-2435.12266

Yvon-Durocher G, Allen AP, Bastviken D, Conrad R, Gudasz C, St-Pierre A, Thanh-Duc N, del Giorgio PA (2014) Methane fluxes show consistent temperature dependence across microbial to ecosystem scales. ***Nature*** doi:10.1038/nature13164

UNIVERSITY OF EXETER

Centre for Ecology and Conservation
Daphne du Maurier building
Penryn Campus
Penryn, Cornwall TR10 9FE

Telephone +44 (0)1326 255822
Email g.reeves@exeter.ac.uk

www.exeter.ac.uk/biosciences/cec

Photography by: Stuart Bearhop (cover), Thomas Bodey, Peadar Brehony/WCS, Matthias Fürst, Cristian Gudasz, Steven Haywood, Lindsay Leyden, Robbie McDonald, Hannah Pollock, Peter Richardson, Catherine Sheppard, Martin Stevens, Jan Stipala, Alexander J Turner, Frank van Veen, Andrew Young.

Find us on Facebook and Twitter:
www.facebook.com/exeteruni
www.twitter.com/UoExeterCEC

Information is correct at time of going to print.

2015CLES004