

Careers Service



# Cambridge Biodiversity Internship Scheme

Reports 2017

## Amy Palmer-Newton - IUCN

I spent two months in the summer undertaking a Cambridge biodiversity internship at the Red List unit of the IUCN (international union for the conservation of nature). The Red List is a global database of the extinction risk of species that provides population information and helps to monitor change and guide conservation actions. Their office in Cambridge coordinates this database and works with organisations around the world to update and expand the list.

My first task was to input Red List Index information on amphibians into SIS (which stands for 'Species information service'). The Red List Index is a measure of how the status of a group of species is changing through time. It was a great exercise to start with as it really helped me get to grips with SIS and each species was like a little case study that showed some examples of great conservation work. After this I started to update the coral red list index, which was a more involved process as I was extracting information from the assessments themselves. I was also tasked with updating biogeographic information which really improved my knowledge of global geography!

A really exciting task I was given was to update the assessments for species last assessed in 1998 that are currently listed as 'Least concern/conservation dependent' which is a category no longer used. My long list of species was quite daunting at first but I was given a lot of help to break it down so that I could contact people around the world. I got to talk to a really wide variety of experts in conservation from directors of national parks to university professors. This has really helped to develop my communication and on occasion diplomatic skills, which are vital in conservation. One of the most exciting days in the office was when I got the opportunity to meet Dr Mei Lin Neo, who was visiting from Singapore to discuss reassessing giant clams. These are truly fantastic species but are sadly quite threatened. I helped by talking Dr Neo through aspects of SIS and GIS and it was really inspirational to hear about her experiences.

One of the best things about the internship was really getting to know the people in the office. They made me feel part of the team from the first day and were always ready to help with any questions. My supervisors Caroline and Craig were fantastic, they were so friendly and supportive throughout so I never felt overwhelmed. They also trusted me with

challenging tasks that I could really engage with, as well as giving me the opportunity to learn a lot of new skills such as GIS in ArcGIS. I also got to learn so much not only on how Red List criteria are applied, but also how it is used for conservation around the world.

At the end of the internship I got a very touching goodbye that included cake, a card and even a present (a fantastic book on the Red List!) It has been a truly fulfilling summer as I feel I was able to really make a positive impact by helping to update Indexes and geographic information, as well as getting the chance to publish updated assessments which I hope will help to raise awareness and promote species conservation. This includes 2 freshwater fish endemic to Sri Lanka that are critically endangered.

I already knew that I wanted to work in conservation, but this internship has really showed that this is the right choice for me. I feel proud of what I have been able to achieve and it has given me great experience to show on my CV, new friends and hopefully more opportunities for my future. I greatly encourage anyone who thinks they may want to work in conservation to apply to this internship scheme as you get a chance to make a positive contribution while developing some great skills.

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*“This internship has been fun, educational and surprising. I have gained an insight into the world of conservation.”*

## Bartłomiej Arendarczyk – BirdLife International

Over the summer, I spent 12 weeks as an intern in the science, policy and information (SPI) department of BirdLife International, a global partnership of 120 bird and nature conservation organisations. This internship proved to be a great

investment of my time and has provided me with valuable experience in nature conservation. I am also pleased to have been able to contribute towards important and globally relevant conservation research.

For the first few weeks of my internship, I helped out with various elements of research and data management. This included working with the BirdLife Red List team to conduct threat assessments for sea birds, using online and book-based literature. Although at times frustrating due to a general lack of available information on many species, this task enabled me to make good use of and to develop my research skills. I was also involved with helping to organise some of the data which the Red List team was using to carry out threat assessments.

For the rest and majority of my internship, I was excited to be given tasks involving considerable GIS analysis, of which I had little previous experience and consequently was really keen to develop upon. My first GIS project involved using newly-published datasets consisting of global surface water maps to identify global Key Biodiversity Areas (KBAs) with a significant freshwater component. Despite the challenges of working with very large datasets (hundreds of gigabytes) and having little GIS experience, I was rapidly able to learn the foundations of BirdLife's preferred GIS software, ArcGIS. As part of this project, I also investigated the possibility of quantifying the change in water availability in the range of some bird species which are thought to be currently threatened with water loss due to factors such as river damming and climate change.

These initial tasks provided me with a great introduction to GIS analysis and helped to prepare me for a far more challenging and extensive project. The goal was to produce maps showing the Extent of Suitable Habitat (ESH) for all 11,000 or so bird species and subsequently using those maps to determine which species are biome-restricted. To create the ESH maps I needed to combine species range maps with their habitat and altitudinal preferences. This proved to be rather challenging as the analysis initially would have taken weeks to run and was susceptible to various errors due to the scale of this task. Luckily, I was able to use my previous computer programming experience to reduce the processing time to only a few days and reduce the likelihood of errors using various validation systems. The biome-restriction analysis

was much faster, requiring me to simply intersect the newly-created ESH maps with a biome map and calculate the proportion of each species' range in each biome. Both the ESH maps and the biome-restriction information will play an important part in future decision making and research. I am therefore really happy to have been able to contribute to this research at this early stage.

I am sincerely grateful to BirdLife for this amazing opportunity. Having no previous experience of working in an NGO, I was pleased to find a genuinely friendly atmosphere and to undertake captivating and relevant work. I would particularly like to thank Dr Paul Donald and Dr Ian Burfield for their support as supervisors as well as everyone in the SPI department and beyond for their help and support. I would also like to thank the Cambridge University Careers Service for running the Biodiversity Internship Scheme and the Not-For-Profit Bursary which made this internship possible.

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## **Bryony Yates - Wildlife Trust BCN**

This Summer I spent eight weeks as a voluntary intern with the Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire. This charity manages and looks after 126 nature reserves across the three counties, for the benefit of wildlife and the local community. I was based at their head office in Cambourne with the Monitoring and Research Team.

The M & R team conducts surveys which enable the Trust to monitor wildlife population trends and assess the success of its practical habitat management. This is important for funding applications and reserve management planning. One of my main roles was to organise and help conduct drone surveys. We used the drone to produce detailed maps of the reserves and film video to be used for the Trust's communications work. I had to schedule the surveys, liaise with local airports and operate the mapping software. The drone was flown by Monitoring and Research Manager and licensed drone pilot, Josh Hellon.

Having obtained our maps and footage, I was then tasked with processing it. Before starting, I had very limited experience of GIS software, however, after completing an online course in my first few days, I was able to use QGIS to analyse our aerial maps. A report I produced from my work mapping

scrub cover in Cambourne Nature Reserve was used to develop a Management Plan for that reserve, whilst my maps of water soldier (an invasive plant species) on another reserve, were used by the Trust in a successful funding application. I also carried out work for the Cambridgeshire and Peterborough Environmental Records Centre, digitising orchards from 19<sup>th</sup> century OS maps, for a Heritage Lottery Fund (HLF) project.

I learned to use a number of unfamiliar pieces of software whilst on my internship. As well as QGIS, I learned to use Adobe Premiere Pro, InDesign and Illustrator (again by taking online courses). I used these to produce promotional materials for the Trust. I edited the video footage we shot with the drone to create videos for the Trust's Youtube Channel and produced a poster and official logo for the WILDside Project. This is an HLF funded project to promote biological recording in Northamptonshire. Additional work for Communications included regular updates on Facebook and a blog entry for the website.

Much of my work was carried out away from the office and this consisted of surveys and reserve management. Some surveys were part of ongoing monitoring schemes, such as monthly dormouse box checks to monitor the population in Brampton Wood. Others were for controlled scientific trials: we quantified plant coverage in control and trial plots in Cooper's Hill, where different heathland management strategies are being trialled. Some surveys were timetabled into my internship, whilst others I chose to do as extras in my free time. I was keen to do all the surveys I could! These included dormouse checks on Saturday, inspecting the moth trap at 6:30am and, best of all, evening bat surveys. I am a real bat enthusiast and loved the opportunity to do so much bat monitoring. This mostly consisted of static bat detector surveys, but also included a 5 hour trapping session (finishing after 1am) where I got the rare opportunity to see bats in the hand.

Reserve management activities included pulling up invasive Himalayan Balsam in Bourn Brook, scrub removal using "Tree-Poppers" and path clearance. This work is necessary to maintain and improve the quality of local nature sites for both the wildlife and visitors. The "tree-popping" also contributed to a controlled trial at Fulbourn Fen, which aims to determine the most effective method for removing scrub. Whilst carrying out this work, the staff made

a real effort to educate me about the animal and plant life around us. They taught me how to identify plant species and recognise signs of elusive animals such as water voles and otters. I particularly realised how much I had learned when performing a botanical survey halfway through my placement. Whilst still no expert botanist, I could name a good number of plants, most of which I wouldn't have known four weeks previously.

Carrying out the placement has been very rewarding. It makes me very happy to know that I have made a real contribution to the Trust's important work. I hope to use the skills I have learned to continue volunteering with them in various capacities in the future.

This internship has been fun, educational and surprising. I have gained an insight into the world of conservation and developed many of the skills and knowledge necessary to carry out conservation work. I have also developed numerous transferable skills, which will help me in any career and are already proving useful in my academic and extra-curricular work. Most importantly for me were all the wild encounters: I loved having the opportunity to see and learn about so many fascinating plants and animals, including white-clawed crayfish, kingfishers and bats. I have also developed a new interest in moths!

I want to whole-heartedly thank the staff at the Wildlife Trust BCN for taking me on and being so welcoming and helpful. I especially want to thank Josh Hellon for all the time and effort he put into ensuring I got the most out of my internship. I also want to thank Cambridge Careers Service Not-for-Profit Bursary Scheme and Newnham College for providing me with the funds necessary to take up this placement.

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## **Caroline Johnson - JNCC**

During the 2017 summer break I spent eight weeks with the Joint Nature Conservation Committee (JNCC), primarily based at their Peterborough offices. I was part of the Biodiversity and Ecosystems team, they included me in team meetings, kept me abreast of their own work and answered any questions I had.

The primary aim of the internship was to produce a report on the potential impacts of Brexit on agriculture, with particular consideration of the environmental consequences. Opinions on the potential risks, opportunities and policy suggestions were gathered from a range of organisations, including the various UK Farmer's Unions, NGOs, such as the Green Alliance, RSPB and the National Trust, and the UK government and devolved administrations. The initial step was to search for the relevant material from a wide range of sources to ensure the report would be as representative of the various organisations affected by changes to agriculture. The next step was to assimilate the information and divide the information for each organisation into perceived risks, opportunities and suggested policy suggestions. Following, this was the production of a detailed plan and the writing up of the report.

Throughout all the stages the team was really helpful at providing reassurance and guidance at critical stages of the report production, whilst allowing lots of freedom on the report layout and exact content. Initially the task appeared quite daunting but with the support and guidance I received, I was able to break it down and divide it into manageable tasks to produce a successful report. The report will be used as a reference guide for JNCC and will eventually be published on their website.

The team actively included me in the workings of JNCC, which provided an insight into how the organisation worked and also, provided opportunities to further increase my skill base and experiences. I attended a conference with the team leader, Diana, in London on post-Brexit policy in the UK. It was an interesting experience, that provided the opportunity to listen to the thoughts of panelists experienced in the areas of conservation and agriculture and also the questions offered by the audience which provided an insight into the areas the various organisations present were focused on with respect to Brexit. The experience

also gave me the opportunity to talk to other individuals involved in the environmental sector outside of JNCC, furthering my knowledge about the sector.

I was also given the opportunity to take part in a R training day, alongside the other interns and also members of staff. It was a very useful day, initially it re-enforced my previous experience with R. It then went on to show applications of R I had not previously experienced and how R is used in a commercial environment. The course was interactive throughout, enabling the re-enforcement of new skills through integrated activities that will be relevant to my future activity in R.

The internship was a really enjoyable opportunity, that led to an improvement in my ability to review and assimilate information, which will be really useful going into my final year and also, into the future where report writing and literary review will be very important. The internship re-enforced the idea that I would like to continue my studies after next year via masters. I believe regardless of whether I decide to have a career in research or a non-research based job in the conservation sector I feel that a masters will be a really enjoyable experience and also, important for furthering any future career.

I would like to thank the biodiversity and ecosystem team at JNCC, Diana, Matt and Deanna; the staff at the Cambridge Careers service who provided help in the application process and financial support through the not-for-profit bursary and St John's College who provided further financial support, enabling my participation in the internship scheme.

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## **Dominic O'Neill – UNEP-WCMC**

Over the summer I completed a seven week internship at UNEP-WCMC in Cambridge. This was part of the Cambridge Biodiversity Internship Scheme, and was partly funded by the Career Service Bursary. UNEP-WCMC is an agency of United Nations Environment that focusses on collating data and information relating to global biodiversity in order to inform and support decision- and policy-making.

I worked with the brilliant Marine Programme as a Marine Policy Intern. This team focusses on the protection of marine biodiversity and environments,

through consideration in policy and practice. My work consisted of conducting research into strategic areas that the Marine Programme could contribute towards, but are not currently working on. This involved making three concept notes, which were then presented to the Marine Programme. These concept notes were short, non-technical reports aimed at giving a brief overview of each topic, so that any member of the team could quickly get the main facts and potentially produce a new project from these notes.

The three topics that I focussed my concept notes on were Human Health and Biodiversity, Food Security and Nutrition, and Human Migration and Biodiversity. These were all linked to humanitarian and health areas, along with conservation, which was particularly interesting to me as a medic. Making each concept note required a short literature review detailing the main facts and problems associated with each topic. I then narrowed down the topic to a specific area (for example, in the Human Health and Biodiversity note, I focussed on harmful algal blooms as the issue to be tackled).

After this background section, I provided a brief overview of the marine policy landscape relevant to the topic. This included highlighting UN Sustainable Development Goals (SDGs), relevant convention targets (such as the Convention on Biological Diversity – CBD) and EU policy, among other policy areas. This was probably the most challenging part of the internship for me, as I was new to policy. However, with the help of my excellent supervisors, I managed to learn a lot about international marine policy, as well as how to work my way through (often very long!) policy documents.

I then proposed several actions the Marine Programme could take in order to combat the highlighted issue, with reference to the strategic priorities of UNEP-WCMC. This involved me learning about the kind of work UNEP-WCMC conduct and how this sort of work could fit in to addressing the issue. After this section I then looked into potential partners and funding sources that could be used to work on this issue.

My experience at UNEP-WCMC has been really valuable, as I have gained a better idea of what a conservation organisation does, and what it is like to work within one. I have improved my literature review and writing skills, as well as time management in a project-based environment.

Additionally, it has reassured me that I would like to pursue work in the conservation in the future, hopefully alongside a career in medicine (or even combining the two!). I would recommend this to anyone who wants to learn more about the sector, policy or how conservation works in general.

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## **Georgia Stewart – Fauna & Flora**

This summer, from June 26<sup>th</sup> to September 8<sup>th</sup>, I worked at Fauna and Flora International (FFI), an NGO I have idolised since I was young. The opportunity to gain an internship in such a competitive field as conservation, while receiving financial help from the careers department, was brilliant and I am so grateful to have had this experience.

Originally, I set out to find work in an NGO focused on conservation in order to compare the experience to my previous internships in the private sector. At FFI I worked in the Business and Biodiversity unit, which perfectly complimented the work I have previously done in responsible investment firms. The chance to compare the workplaces, the types of people, the work flows and the general feeling of the organisations has been influential in shaping my future career decisions, and for that I am very grateful to the Biodiversity Scheme.

Throughout my time at FFI I feel as though I was handed responsibility and the opportunity to make a tangible impact. I was able to complete a wide variety of tasks, as well as participate in relevant meetings, both internal and with external visitors. Tasks included researching and writing an executive summary of forest governance around the world; researching Islamic finance initiatives as a form of sustainable investment; and researching the hypothetical commercialisation of a sustainable consumption app focused on giving consumers more choice when it comes to grocery shopping. My overarching project, however, was to analyse the results of a Natural Capital Coalition Survey which will form the basis of future editions of the Natural Capital Protocol or a Supplementary Document – a key document in the future of sustainable business and finance. This analysis involved working with Excel and PowerPoint in order to discern what directions businesses, governments and NGO's are moving in in terms of valuing natural capital and to seek out those interested in being involved to a greater degree.

While at the organisation, I also had the opportunity to speak to people from many different departments such as fundraising, administration, communications, finances and project development. Meeting team members from across the organisation gave me an insight into the different types of careers in conservation and enabled me to see where my skills might be best used in a similar organisation in the future. I also had the opportunity to help another team with their on-going work in organising a conference on technology, focusing on how tech might help us reach food sustainability. It was great to be included in this way and to observe the functioning of another team.

All in all, I had a fruitful experience at Fauna and Flora International and hope that after my Masters I might be able to return there one day as an employee. I'm very grateful to the careers department for organising the placement and to the Bursary Scheme for helping me to fund my time this summer.

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### **Georgina Burrows – UNEP-WCMC**

I spent 10 weeks at UNEP-WCMC in the Protected Areas Programme (PAP). A key focus of PAP is to maintain the World Database on Protected Areas (WDPA), but they have various other related projects. My main task was to investigate the global distribution of Transboundary Protected Areas (TBPAs) — protected areas which adjoin at international boundaries — building on work the team had previously done but did not have funding to pursue further. I first had to come up with a methodology for identifying TPBAs within the WDPA using ArcGIS. I had no previous experience with a Geographic Information System (GIS) so I before I could start on the project I had to get to grips with this, largely independently using available training resources, but with help from my

supervisors or others in the team whenever I needed it. It was extremely useful to have to opportunity to learn this as it is a very valuable skill to have but is not something which I am taught in my Natural Sciences degree. Once I had developed a methodology for identifying TBPAs, I was set the task of analysing their distribution around the world by quantifying the proportion of international borders which are protected on both sides. This required further use of GIS as well as Excel, R and Microsoft Access, the last of which I had never used before so had to learn about, again with support from my supervisors. In addition to the technical side of the task, I had to opportunity to read up about transboundary conservation and learn about the ecological theory behind it, its history and about some well-known examples.

Alongside my main project, I was given a few other short tasks during my internship. One was to search the internet for spatial data of conservation value relating to South Georgia and the South Sandwich Islands for a project the team were working on. Another was to create a case study on the removal of Protected Areas in Uganda for a paper which the team were submitting to the journal Conservation Biology. I enjoyed having a bit of variety in my work and getting an idea for the various projects which the team work on.

In addition to the technical and data management skills I developed from working on my specific project, I learnt much about protected areas in general from listening to discussions between members of the programme and hearing about other projects they are working on. I gained an appreciation of how protected areas are relevant to policy, such as how they contribute to the Aichi biodiversity targets. I also became aware of the work of other programmes within the centre through chatting to other interns and staff. Regular lunch time talks also provided an opportunity to hear from people working in various areas of conservation, and I particularly enjoyed hearing from those practically involved in conservation projects, as this practical implementation can often seem far removed from WCMC's work based on collating and using data gathered by other parties. I found that WCMC was an extremely friendly place to work and got the impression that the majority of people enjoyed their job, but the hours could be quite long, particularly when coming up to a deadline, and the pay not particularly rewarding! I felt very welcomed by everyone there and never

felt looked down on for being an intern. Friday evening pub trips were a nice opportunity to talk to others in the centre, both interns and staff, and the summer BBQ was a fun evening.

I enjoyed my time at WCMC and I'm really grateful to have had the chance to experience office-based conservation work. Hearing about the various routes through which staff ended up working there has given me a better idea of my career options after graduating this year.

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## James Grogan – UNEP-WCMC

In the summer of 2017, I spent nine weeks interning with United Nations Environment World Conservation Monitoring Centre (UNEP-WCMC) in Cambridge.

UNEP-WCMC is a collaboration between UN Environment and the World Conservation Monitoring Centre (a UK charity). The principal aim of UNEP-WCMC is to link science with environmental policy and to prioritise the conservation of biodiversity for public benefit. Their vision is a world where decision makers at all levels and in all sectors recognise the value of conserving biodiversity. To facilitate this, their team of experts (most of whom are educated to Masters or Doctorate level) provide authoritative information about biodiversity and ecosystem services in a way that is useful to policy makers.

My internship was in the Climate Change & Biodiversity Programme. This programme provides decision makers with policy-relevant information, syntheses and analyses on the linkages between climate change and biodiversity. Its core work focuses on the impacts of climate change and climate policy on biodiversity and ecosystem services (ecosystem services are essentially everything that an ecosystem “does” – for example water and carbon cycling, or nutrient storage). It also focuses on the role that biodiversity and ecosystem services can play in helping to mitigate and adapt to climate change.

My main goal was to support the programme's work on ecosystem-based adaptation (EbA). In a nutshell, EbA is the use of biodiversity and ecosystem services to help people adapt to the adverse impacts of climate change. For example, the conservation and/or replanting of mangrove

forests can help reduce coastal flooding and erosion, whilst also providing habitat for other animal and plant species. Or, in an agricultural setting, EbA could constitute the use of flood- and drought-resistant crop varieties which will provide stable yields under variable climate conditions.

My first task was to review national policy documents relating to climate change adaptation. The policy documents that I reviewed are known as Nationally Determined Contributions (NDC) and National Adaptation Plans of Action (NAPA). The countries whose policy I reviewed were mainly developing nations in South- and Southeast-Asia, South- and Central-America, along with many Small Island Developing States in the Pacific and Caribbean. This was a steep learning curve, as I had never worked with national policy before. Even finding the relevant policy documents was sometimes challenging and involved accessing online databases maintained by the UN Framework Convention on Climate Change (UNFCCC), and sometimes databases maintained by national governments.

I then scanned the policies and assessed their EbA content. I maintained an Excel spreadsheet which contained information such as how many times EbA was mentioned, what EbA measures (if any) were planned and what climate change-related hazards were mentioned. My overarching aim was to assess the comprehensiveness of any planned EbA actions and to assess which countries would be suitable clients for an “EbA support package” that UNEP-WCMC wishes to engage on in the future. This was challenging, as national policy often uses highly technical language and can be very variable in its structure.

The last step was to pull together the data that I had collected and summarise it into a report (Fig. 1). This was a good opportunity to practise preparing a professional document and conforming to house style guidelines. This report will be circulated internally within UNEP-WCMC and will help guide the future direction of their ecosystem-based adaptation work.

Alongside my main focus on reviewing policy, I also completed several side tasks. For example, UNEP-WCMC maintains a database of over 200 EbA tools which conservation practitioners can use to find appropriate tools for their conservation projects. I added new tools to the database and formatted existing entries to ensure consistent style. I then



researched similar databases and tool navigators and provided advice on how the EbA tools database could be turned into an interactive tool navigator for conservation practitioners. I also conducted a short review of briefing notes produced by conservation NGOs and reviewed their style and layout. This information will be used to guide the production of future briefing notes produced by UNEP-WCMC.

One of the most exciting parts of my internship was the opportunity to attend conferences. During my time at UNEP-WCMC, I was able to attend two multi-day conferences that were hosted in the David Attenborough Building in Cambridge. The first conference focused on negative emissions technologies and the second focused on guidelines for the effective implementation of EbA and Eco-Disaster Risk Reduction. This was a great opportunity to witness collaboration between conservation organisations from around the world (for example, there were representatives of United Nations Environment, World Wildlife Fund and the International Union for Conservation of Nature to name just a few), and to learn how international decisions are made.

It was a pleasure to meet like-minded individuals during my time at UNEP-WCMC – both staff and other interns – and I have made some great connections that would be highly useful should I work in this field in the future. Aside from the work itself, the social side was also a fundamental part of my experience and I regularly attended the Friday night socials. This was a more relaxed environment in which to get to know other staff and interns, and good fun too.

Overall, my internship at UNEP-WCMC was a fantastic opportunity to experience a conservation NGO from the inside and has been incredibly useful in determining my future career direction. I learned a great deal not only about professional conservation, but also about the wider professional environment and the skills required. I would like to thank Careers Service, the Cambridge Biodiversity Internship Scheme and UNEP-WCMC for facilitating this opportunity. I would like to extend my gratitude to the Not-for-profit bursary scheme and Churchill College for providing funding to support my expenses over the summer – this internship would simply not have been possible without this financial support. Finally, I would encourage any student who is considering a career in biodiversity conservation to apply to the

Cambridge Biodiversity Internship Scheme as an invaluable way to experience working in a conservation NGO and meet people from the sector.

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*“I would definitely recommend the internship to anyone with a passion for the environment and who wishes to pursue a related career path.”*

### **Jenna Hatch – Fauna & Flora International**

During the summer of 2017, I spent six weeks as an intern at Fauna & Flora International (FFI). I was part of the Business and Biodiversity team, which works with businesses to help them to manage their dependencies and mitigate their impacts on biodiversity and ecosystems in the landscapes where they operate. The team’s approach is 1) to help businesses to understand the value of biodiversity and ecosystem services to the success of their business, 2) to provide tools and guidance to businesses that help them to evaluate their biodiversity and ecosystem dependencies and impacts and the resulting risks and opportunities, and 3) to develop a strategy for each business for managing their identified risks and opportunities by applying the mitigation hierarchy. I chose to apply to the FFI Business and Biodiversity team because of their practical, pragmatic and effective approach to conservation.

My first project was to investigate the potential applications of environmental DNA (e-DNA) surveys for biodiversity assessments. E-DNA is DNA which is present in environmental samples - such as water, soil and sediments - and derives from sources such as viruses, microorganisms, decomposed cells and shed or excreted cells from macro-organisms. I reviewed a lot of academic and grey literature and wrote up my findings as a report which was circulated to the wider FFI team. I concluded that e-DNA has the potential to be a useful tool to complement other methods of baseline biodiversity assessments, especially in the

context of biodiversity impact assessments for offshore energy infrastructure.

I completed three further literature reviews during my internship, two of which were also focussed on marine energy operations. The first of the marine energy reviews investigated whether or not research into non-toxic oil dispersants should be a conservation priority. I found that modern dispersants are less damaging to habitats than the dispersed oil itself, so the research priority should therefore be to better inform decisions about when dispersants should and should not be used. The second of these reviews looked at the potential for marine infrastructure to have beneficial impacts on biodiversity, via the artificial reef and fish aggregation effects, and the creation of no fish zones. The conclusion of this review was that it may be possible to achieve net biodiversity benefits if the location and design of each new infrastructure project is considered following the mitigation hierarchy.

My final literature review outlined the social and environmental benefits of improving access to clean, affordable and reliable energy in developing countries. The benefits include releasing women from the task of collecting firewood, creating jobs and opportunities for education and training and reducing the health risks, deforestation and pollution associated with burning firewood and kerosene. I then reviewed government and energy company websites to find out whether or not the transition from fossil fuels to renewables is likely to be fast enough to achieve universal energy access by 2030 whilst reducing greenhouse gas emissions in line with Paris Agreement commitments. The lack of firm commitments to the timescale of the transition on energy company websites suggests that this is unlikely to be achieved. I also carried out shorter tasks to help the team, such as assessing whether the Biodiversity Impact Calculator developed by Natural England could be adapted for use in other countries. Jenna Hatch – Fauna and Flora International

Reading for my projects and attending some of the lectures and seminars that were organised in the David Attenborough Building was really interesting and gave me a much broader insight into the sector and the intersection between academia and applied conservation. My projects have also helped me to develop my critical reading skills and to learn how to select information that has the most practical relevance and present it clearly. The workshops

held by the library were also really useful, for example I learned about online graphics tools at one of the sessions and used them to create some infographics for my e-DNA project.

My internship has been an extremely positive experience, and I would highly recommend the Cambridge Biodiversity Internship Scheme and FFI especially to any students interested in a career in conservation. I would like to thank the FFI Business and Biodiversity team, especially my supervisors Jason Sali and Twyla Holland, for being so supportive and for all the knowledge I have gained, the Careers Service for organising my internship, the Selwyn College Master's Fund for the financial assistance which enabled me to take this brilliant opportunity, and everyone at the David Attenborough Building who has helped me and made me feel welcome.

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### **Liam Cawthorne – UNEP-WCMC**

This summer I spent 10 weeks interning at the United Nations Environment Programme- World Conservation Monitoring Centre (UNEP-WCMC). This was organized through the Cambridge Biodiversity Internship Scheme and funded partly through the Careers Service Bursary and partly through the Victoria-Brahm Schild accommodation grant.

UNEP-WCMC is a partner organisation and global leader in biodiversity conservation, combining a team over 100 international staff members, each very diverse in terms of background and expertise, but united in the goal of safeguarding our planet. I spent my time here as an intern in the Conventions and Policy Support Programme (CPS), supervised by Jerry Harrison and Daniela Guaras. This small but influential programme works at the interface of science and policy-making to develop, facilitate and support the Centre's engagement with intergovernmental processes and their implementation at all levels. Due to the rapid expansion and contributions of UNEP-WCMC, it has been hard to keep track and monitor the Centre's progress. Hence, my role as intern involved attaining a greater understanding of the organisation's growing impact.

I started doing this by identifying all the major work done by WCMC in support of the Convention on Biological Diversity (CBD). I then moved on to

review the decisions taken by the governance bodies of the CBD in order to identify references to UNEP-WCMC's work. This allowed me to engage and research major projects managed and overseen by WCMC, such as the World Database on Protected Areas (WDPA) or Biodiversity Indicators Partnership (BIP). Working through this efficiently I then moved on to CITES, another major convention on illegal wildlife trade, and finally to CMS, the convention on migratory species. Identifying contributions by WCMC, was done both quantitatively through sheer number of documentation produced, but also qualitatively by looking at inclusion in decisions and implementation processes. My contribution as an intern was finalised in the format of reports, graphs and statistics in order to present, and make use of the information I had gathered more effectively.

Through my time spent here, I feel I have grasped a greater understanding of how global environmental governance works and learnt a great deal about the involvement of different stakeholders such as NGOs, private and public sector organisation. More importantly, it also gave me insights into what a career in conservation might look like. Lunchtime talks, speaking to other members of staff were good ways of getting to know what's out there in terms of opportunities to work in conservation.

Overall, would definitely recommend the internship to anyone with a passion for the environment and who wishes to pursue a related career path. During my time here, as well as learning and improving my skills, I greatly enjoyed 7-a-side Football matches, Friday night Pub socials, and chatting to the other interns during lunch breaks. I am therefore, very grateful to have had this opportunity and extremely thankful for the financial support I have received.

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## **Lizzie Pearmain - BirdLife International**

In the summer of 2017 I undertook an 11-week internship at BirdLife International, working with the Marine group within the Science team. As a recent graduate without a job lined up, I found it an enjoyable transition into the "real world", and I was able to pick up new skills which have been very useful in my search for employment.

I started off my work at BirdLife conducting literature searches to find new population data for

seabirds in the Indian Ocean, in order to update the core databases. The integrity of these databases is crucial to the science- and evidence-based conservation that Birdlife does, but unfortunately database maintenance is time-consuming work that often gets overlooked. As a result, the most recent population estimates for some species and sites was as much as 30 years out of date. Although this work was sometimes repetitive, it gave me a good feel for the Indian Ocean area that I would be working on all summer, and since I was able to find more recent population estimates for most breeding colonies I knew I was contributing to making BirdLife's research more accurate.

One of the skills I wanted to learn during the internship was GIS. My supervisor took this into account when planning the work I was given, so my next task involved making maps and performing spatial analysis in ArcGIS. I was dealing with Ecologically or Biologically Significant Marine Areas (EBSAs), identified by the Convention on Biological Diversity (CBD), looking specifically at their relationship with seabirds. I used both ArcMap and R to do the GIS analysis, and my findings on the coverage of threatened seabird species' ranges by both IBAs and EBSAs will be used in workshops discussing new IBAs, to help focus on areas and species that currently lack coverage.

The flexibility of my work at BirdLife allowed me to develop my own coding interests, outside of the work I was given. One of the marine team's jobs is receiving seabird tracking data donated to us by researchers (from attaching GPS tags to birds, for example), and uploading it to the large Seabird Tracking Database. However, the data must be in the correct format before they can be uploaded, and some researchers do not read the instructions properly, resulting in long back-and-forth email chains to sort out the formatting. Having experienced this once, I decided to write an R script to automatically format a researcher's spreadsheet and point out any missing data. This script evolved into an interactive app which could be hosted on the website, which researchers would use to format the data themselves without having to talk to staff. I learned how to use a new R package that I'd been meaning to try out for some time, as well as some HTML and general web development principles. My supervisors were very supportive, and the staff who run the Seabird Tracking Database will now be using my app to format researchers' data quickly and easily.

As well as working in the office in Cambridge, another intern and I went to the BirdFair in August to help out on BirdLife's stall there. The BirdFair is a huge festival-type event for birdwatchers and nature lovers held every year in Rutland Water Nature Reserve. The entry fees raise money for BirdLife's projects, but since we were staff we got in free! We helped out at the stall for half the day (in free BirdLife t-shirts), handing out magazines and talking to attendees, and spent the afternoon wandering around the fair, going to talks, and looking out for celebrities. It was a fun day, and it was great to get a free pass to the BirdFair which I had heard about before but never been to.

Overall, I really enjoyed my internship at BirdLife. I have learned new skills and developed old ones, and I feel a lot more qualified and ready for life after university. I am hugely grateful to Ian, Maria and Tammy at BirdLife for organising the internship and supervising me, as well as the University of Cambridge Careers Service Not For Profit bursary, without which I wouldn't have been able to stay in Cambridge for the summer.

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### **Rebecca Richmond-Smith - UNEP-WCMC**

During my internship with the United Nations Environment Program – World Conservation Monitoring Centre (UNEP-WCMC) I was a member of the Science Program. I worked with Dr Michael Harfoot (Mike) on the Madingley Model, a general ecosystem model that aims to predict fundamental patterns in biodiversity on a global scale from simple environmental parameters. Specifically, after discussion with Mike, I compared the outputs of the model with empirical data to assess how effective the model is. The results of my work will hopefully be able to aid development of the Madingley Model in the future, and potentially lead to a publication. At the end of my internship I produced a draft paper for Mike, which helped improve my scientific writing.

I have taken away highly valuable skills from this internship. I developed my research skills, becoming more efficient at finding information, analysing and referencing it. I have also improved my R coding skills. As some of my work was largely independent, it enabled me to get the experience of what further study would be like, where I would input on decisions and directions of research.

All these skills are highly valuable to me as I progress into my final year, as they build upon skills in previous years as well as allowing me to develop new skills. Looking further forward, the experience has been fantastic at enthusing me into further study, as well as giving me some skills and knowledge required to progress my career. It was great to experience a place like UNEP-WCMC with such a great sense of motivation whilst there being a friendly atmosphere. I have thoroughly enjoyed getting to know the people at UNEP-WCMC and the routes they have taken into conservation.

Whilst learning about UNEP-WCMC and how it operates, I also developed connections with the centre, within the science team where I was based, as well as other teams. These connections were aided by attending lunchtime talks, occasional social dinners, Wednesday tea and Friday pub meets. My interaction was further extended to other conservation organisations as I worked one day a week at the David Attenborough Building (DAB), where the Cambridge Conservation Initiative (CCI) is located. The CCI houses many leading internationally-focused biodiversity conservation organisations in the DAB, enabling me to further learn about these organisations.

I was also able to travel to London with Mike to meet Professor Brian McGill, to discuss our work on the Madingley Model. Following that, I presented my work at the Friends of Madingley Symposium at the David Attenborough Building, where I presented on 'Comparing Madingley Model Against Macroecological Patterns'. This was a great experience for presenting, getting feedback on my work and also building connections with other scientists working on the Madingley Model. Overall this placement has been a fantastic experience for me.

This placement has taught me a lot about working in conservation as well as inspiring me to further pursue my career. I hope my work has contributed towards the greater efforts of UNEP-WCMC, and I thoroughly recommend this internship to anyone interested in biodiversity, conservation or ecological modelling.

Many thanks to UNEP-WCMC for hosting me this summer, Mike for his mentoring, the Cambridge Biodiversity Scheme for providing the opportunity for this placement, as well as the Cambridge University Careers Service Not-for-profit Bursary

Scheme and St John's College, Cambridge for providing financial assistance.

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### **Richard Hibble – Birdlife International**

Between the 3<sup>rd</sup> of July and 12<sup>th</sup> of August 2017, I was lucky enough to be an intern for BirdLife International, a conservation NGO based at the David Attenborough Building in central Cambridge. It was a very enjoyable six weeks for me, as I got to grips with the day-to-day workings of a large conservation NGO.

BirdLife were incredibly welcoming, allowing me to experience the inner workings of the organisation, attending meetings not just for the science team, within which I was based, but for the wider organisation. With staff involved via video from diverse locations such as Quito, this gave me a taste of the wide-ranging activities of BirdLife, and also some of the challenges to its operation.

Working within the Science team, my role was described as helping 'to improve the integrity of key data sets, conduct analyses, contribute to reports and perform various other tasks to support BirdLife's conservation goals'. With over 11,000 bird species, at a time of rapid global change, there was never a shortage of work.

My first major task was producing habitat and threat information for a variety of birds whose ranges overlap with the area covered by the East Atlantic Flyway Initiative. With millions of migratory birds travelling from as far as the high arctic to the southern coasts of Africa, EAFI is focussed on ensuring the protection of key sites along this flyway through western Europe and Africa. Understanding the types of habitats these birds use, and the type and scale of threats they face is essential to guiding conservation actions. A key challenge was taking fairly nebulous threats, and conversely very localised threats, and attempting to establish an arbitrary assessment of that threat for the whole species, which could be coded into an excel workbook. Trying to establish if the use of Little Swifts in traditional Nigeria medicine threatened the wider population became the order of the day. Having developed my threat coding skills, I switched my focus to seabirds. As you work, you pick up on fascinating information, such as how could two scientists quantify the passage of 10.56 million crested auklets in 4 hours, and the

possible purpose for the tangerine-like smell associated with their colonies.

These tasks were interspersed with others, such as an urgent need to provide information to assist in the cleaning of oiled White Storks in Armenia by volunteers, or a couple of days working on a document to aid the Philippine government in submitting a resolution on protecting intertidal habitats at an upcoming intergovernmental policy meeting. These tasks make the work one is doing feel more concrete, and connected action on the ground. To round out the variety of birds I'd been researching, I shifted to working on raptors. This encompassed numerous tasks, from ensuring that datasets contained the correct nomenclature in the wake of recent taxonomic changes, to researching the literature for the migratory and congregatory behaviour of less well studied species, such as the Omani Owl.

Outside of work, the internship allowed me to meet and talk to a wide variety of people, not just within BirdLife, but across the DAB. Events such as weekly cake and tea, and 7-a-side added to the fun. Overall, working for BirdLife was a fantastic experience. My supervisors ensured I had a variety of tasks to keep me engaged, and I felt that the work I was doing was useful, an essential motivator to get me to work in the mornings.

Through offering a range of different organisations within the biodiversity internship scheme, the careers service helped me find the ideal summer internship with BirdLife, picking up new skills, while doing something worthwhile. It was a fantastic opportunity which I would strongly encourage others to seize.

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### **Rory Barber – JNCC**

During the summer of 2017, I completed an 8 week internship (3<sup>rd</sup> July – 25<sup>th</sup> August) with the Joint Nature Conservation Committee (JNCC) in Peterborough, as part of the Cambridge Biodiversity Internship Scheme. JNCC is a public body that advises the UK government on both national and international conservation issues and acts as a forum for bringing together the four national country conservations bodies, such as Scottish Natural Heritage and Natural England. A key focus of the organisation's work is the UK's

marine environment and this was the area in which my internship was undertaken.

During my internship, I worked closely with my line manager on an on-going project concerned with modelling marine ecosystem services across the UK. JNCC is attempting to model both the current and potential delivery of a number of different ecosystem services in the marine environment in order to improve our understanding of these ecosystems and better value the services they provide. Having conducted some background reading on the project, I was asked to choose an ecosystem service that was of interest to me and which would form the basis of my internship. I chose my service, the provisioning service provided by different kelp species, both because of its ecological importance in the UK's marine environment and because I was keen to develop a variety of valuable skills during my internship ranging from conducting a systematic literature review to spatial modelling using GIS and R.

Working in an office environment was a new experience for me and I feel particularly lucky to have had that first experience at JNCC, where I was warmly welcomed and made to feel part of the team from Day 1. For example, I was surprised to learn on my first day that I was to have an hour-long meeting with the CEO the following day in order to introduce me to the organisation and explain some of their main activities. This was a valuable opportunity to learn more about the workings of the organisation and their role both within UK conservation and the government. Furthermore, the flexitime system in place at the office allowed those with lengthy commutes like myself to have greater control over the hours they were in the office, contributing to the friendly and welcoming atmosphere.

As previously mentioned, one of the most exciting opportunities of my internship was the ability to practically apply and, more significantly, develop some of the GIS skills I had learnt previously during my geography undergraduate degree. My initial work was focused on performing a systematic literature review by creating a search strategy to be used on a variety of academic journal databases and subsequently downloading and testing articles for relevance with the project. Data were then extracted from these articles to build a database on the growth rates of kelp in the UK, for later use in the modelling stages of the project. Despite focusing on the literature review during the initial

stages, I was given training by JNCC and access to a wealth of online resources in order to introduce me to and develop my proficiency with R and QGIS, two important modelling and GIS software packages. The first few weeks were therefore both interesting and challenging. Significantly, when using these programmes later in my internship I felt well supported by my patient colleagues. My line manager in particular was friendly, patient and always willing to help whenever I had any problems with the programmes and for that I am grateful.

I am very grateful to all those at JNCC who welcomed me into the organisation, and the Cambridge Not-for-Profit Bursary Scheme whose funding enabled me to undertake this internship. I'm delighted to say that as a result of this internship I was offered a short-term job contract continuing the Kelp modelling project I was previously working on at JNCC. This is a valuable and exciting first step towards what I hope will be a successful career in the environmental and conservation sectors.

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## **Stephen Parkinson- Fauna & Flora International**

During the summer of 2017, I was lucky to be able to spend 10 weeks as an intern with Fauna & Flora International (FFI). My main work was part of a project on business vulnerability to pollinator decline. This placement was organised through the Cambridge Biodiversity Internship Scheme. I therefore owe the University's Careers Service an enormous amount of gratitude as they helped me find a placement, helped me to fund the experience through the Not-For-Profit Bursary, and have been tremendously supportive throughout the process. I also owe my college, Gonville and Caius, thanks for their Internship grant. Most importantly, I am immensely indebted to FFI for the experience they have given me this summer. The organisation had a very supportive work environment, and everyone I met there was very friendly.

Before the internship, I had a relatively limited knowledge of pollination. There was therefore a steep learning curve as I familiarised myself with the specifics of plant reproduction and the status of pollinators and crops around the world. This internship opened my eyes to how quickly this understanding can be picked up and, within a few weeks, I felt confident with the topic and its

associated terminology. I also carried out some work for the communications team, choosing photos for the new website from a database. FFI also put on some seminars, specifically for their interns. These gave us a much deeper insight into the different departments within the organisation and the work that each staff member carried out.

I spent the next three weeks as part of a team, carrying out a literature review of pollination scientific papers. This helped me to become increasingly comfortable with the complexities of pollination science. It also allowed me to develop several skills which I had started to acquire as part of my undergraduate degree. These included collating large quantities of information, sourcing literature from online databases and libraries, and inputting this data into databases. I was also able to develop new skills, such as bug testing a new online database.

After a week's holiday, I spent a further four weeks starting to analyse the data that had been collected in the literature review. In this time, I was introduced to the mathematical field of meta-analysis. This was another example of a steep learning curve as I had very little experience of these methods prior to the internship. I was also given the opportunity to sit in on several project meetings. This was personally satisfying as it helped me understand how my work would contribute to the rest of the project. It was also interesting to learn about the work being carried out by the rest of the team. Most excitingly, I got a sense of how the project would continue into the future and the potential conservation outcomes of this.

My working week at FFI was flexible and I was able to work from home when I needed. This was especially important as I was carrying out dissertation research at the same time as the internship. FFI was extremely supportive of this work and I was allowed to organise my working week so that it suited my schedule and personal working preferences. FFI was also very flexible for holiday dates meaning I was able to take two weeks holiday during the internship. While I worked hard throughout my internship and thoroughly enjoyed the work, this flexible approach meant that my summer holiday could still be just that - a holiday.

I could not have asked for a better internship. Throughout my time with FFI, I was supported and

encouraged. It was a fantastic environment for me to explore my own strengths and weaknesses. This knowledge about myself will be invaluable in future jobs. I came to the internship with an interest in conservation and I am now confident that I would thoroughly enjoy working in this area in the future.

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