SCHOOL OF GEOGRAPHY AND THE ENVIRONMENT

UNIVERSITY OF OXFORD

MSc BIODIVERSITY, CONSERVATION AND MANAGEMENT

COURSE HANDBOOK 2011/12

Welcome to the School of Geography and the Environment

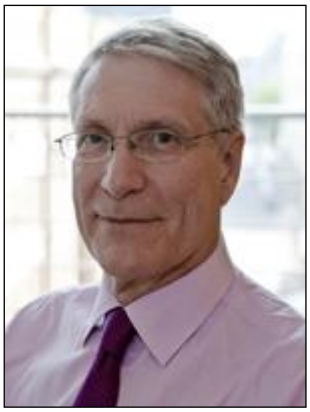
I am extremely pleased to welcome you to the University of Oxford. Oxford is a remarkably diverse and stimulating place, and our postgraduate programmes will be a substantial part of your intellectual and social life over the coming terms. Each and every programme has its essential core features and the chance to reach out and learn about the world in its remarkable diversity. I hope you will take advantage of what we have to offer, and what each College and the wider University has to offer in terms of your broader academic interests.

The School of Geography and the Environment, and its associated research centres in the Oxford University Centre for the Environment, offer a unique blend of teaching and research, providing undergraduates, MSc, MPhil and DPhil students across a range of cognate disciplines the means to engage in the big themes of the 21st century: from climate change to globalization; from the philosophy of nature and society to biodiversity and conservation; and from the frontiers of physical science to the hard realities of public policy and corporate decision-making. Our research expertise and the quality of our research (as recognised in the 2008 national assessment that placed us as the equal top Geography department in the UK), has important implications for our teaching, particularly at postgraduate level. We take pride in the range and scope of our postgraduate programmes, and we are committed to a level of intellectual engagement with the issues that will carry over into your research and subsequent careers. We want to make a difference; we believe that you are an important part of that commitment.

David Thomas
Professor of Geography
Head, School of Geography and the Environment

… and to the International Graduate School

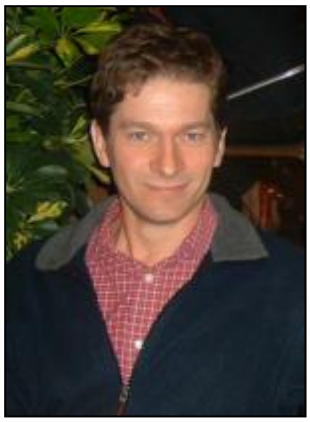
As Director of the International Graduate School, I am delighted to welcome you to Oxford and to the School. One of the most exciting aspects of being a graduate student is the opportunity to meet and get to know students from a remarkable range of backgrounds and disciplines, in the School, in your College and in Oxford more generally.



The challenges ahead of you are exciting and, for many of you, doubtless a little daunting. You should have confidence in your abilities and the experience that you are bringing to your new course. But you should also be ready to tackle new challenges and new ideas. The School is an intellectually demanding but supportive environment in which to study, combining independent and collaborative styles of working and providing a wealth of opportunities to engage in an energetic research culture through seminars, reading groups, field work and other events. I look forward to meeting you.

Gordon Clark
Professor of Human Geography
Director, International Graduate School

… and, finally, to the MSc in Biodiversity, Conservation & Management



Professor Rob Whittaker
Academic Director

Dr Shonil Bhagwat
Course Director

This year's course promises to be an exciting one, with significant developments over the last few years that have strengthened the programme considerably. With biodiversity becoming increasingly aligned with the international development agenda we have expanded our lectures in conservation governance and strengthened our social science research skills training. Furthermore, we are introducing a revised module on Strategic Conservation Planning, which will address complexities of biodiversity conservation on a crowded planet, particularly important to a modern conservationist.

Our programme is justly recognised for the unique nature of its science content. In this respect two modules deserve a special mention: The module in 'Long-Term Ecology and Conservation' covers a subject for which Oxford has a world-class research reputation thanks to the ground-breaking work being done within the Long-Term Ecology Laboratory. Likewise, 'Conservation Biogeography' is an exciting new sub-discipline of conservation in the development of which staff of the School of Geography and the Environment have played a leading role. As usual, we will also be drawing on a wide range of academic and professional expertise within the School of Geography and the Environment, the wider University and many external experts from the University, NGO and Government sectors.

While our focus is biodiversity and conservation, Oxford is a fantastic place for those interested in wider environmental policy and politics. Both inside and outside of the University there is an extraordinary range of events focussed on environmental issues. The University term in Oxford is short and intense so take care to pace yourself and enjoy the course!

Rob Whittaker & Shonil Bhagwat, September 2011

CONTENTS

IMPORTANT NOTE:

The content of this booklet may be subject to change subsequent to its printing, but where change is necessary we will endeavour to keep you informed. Detailed course outlines should in any case be seen as provisional rather than prescriptive in nature. RJW/SB, September 2011

INTRODUCTION

1. Course Introduction

This handbook provides an overview of the MSc in Biodiversity, Conservation and Management (BCM). It sets out the aims of the course, the content of the study programme and the various component parts of the course, including lectures, elective modules, seminars, dissertation, etc. The booklet also contains important information about handing in coursework, guidelines for dissertations, examination regulations, and other relevant aspects of course management. You should read though the handbook carefully and ensure that you understand your obligations throughout the course. We will provide you with more detailed material for particular parts of the course as appropriate during the year. This booklet also serves as a guide to the first year of the two-year MPhil version of the course: those undertaking the MPhil should, however, refer to the additional guidelines provided in the handbook for the *MPhil in Geography and the Environment*.

Most of all we would like to thank you for choosing to come to Oxford to study on this Masters programme. We hope that your year in Oxford will be a formative and memorable time. The 'core' BCM team includes Dr Shonil Bhagwat (Course Director and Senior Research Fellow), Professor Rob Whittaker (Academic Director and Professor of Biogeography), Professor Kathy Willis (Tasso Leventis Chair of Biodiversity and Director of James Martin 21st Century Biodiversity Institute), Dr Paul Jepson (Course Director of MSc Nature, Society and Environmental Policy and Senior Research Fellow in Conservation Practice), Dr Richard Grenyer (University Lecturer in Physical Geography), Professor Yadvinder Malhi (Professor of Ecosystem Ecology), Dr Kate Parr (Trapnell Fellow in African Ecology) and Niamh Tuite (MSc Co-ordinator). We are available to help you to get the most out of the course.

The BCM course is firmly rooted within the Biodiversity Research Group but draws on many aspects of research expertise in the School of Geography and the Environment and the Environmental Change Institute, including research clusters on Climate Systems and Policy, Arid Environmental Systems, Technological Natures and Transformations: Economy, Society and Place.

The course places considerable emphasis on the training and development of transferable professional and research skills in both the natural and social sciences to prepare students for advanced research careers, doctoral research and policy work in government, non-government and business organisations.

1.2. School of Geography and the Environment

The School of Geography and the Environment (SoGE) and its associated research institutes based in Oxford University Centre for the Environment (OUCE) are internationally recognised for their excellence in environmental research and scholarship. The historical origins of OUCE lie in the former School of Geography, the first geography school to be established in the UK, 100

years ago by Halford Mackinder. The School was established through a co-operative effort involving the Royal Geographical Society and Oxford University. From these deep roots the School has grown and prospered. The ethos of the School of Geography and the Environment is to promote research that is bold, innovative and challenging while remaining committed to the highest standards of scholarship.

Today, the School of Geography and the Environment is one of the leading centres of scholarship for environmental and social change. The SoGE is committed to training a new generation of graduate students in the core research fields of the environmental science and human geography and in the new and exciting interdisciplinary research frontiers that exist between and across these disciplines.

The School of Geography and the Environment is home to the internationally recognised Environmental Change Institute (ECI) and other vibrant research centres, such as the Oxford Centre for Tropical Forests (OCTF) and the Oxford Centre for Water Research (OCWR), along with cross-departmental research groups, such as the Climate Systems and Policy, African Environments Programme (AEP) and the Global Environmental Change and Food Systems (GECAFS) international project office. Creative combination of theory and practice provides a relevant and fertile training ground for our postgraduates. Our research programmes span the globe with researchers working in Africa, Asia, the Caribbean, and North America along with a strong record in European studies and, of course, the UK.

The SoGE currently offers two thesis-based higher research degrees (DPhil and MPhil) and four MSc courses. These are:

MSc Biodiversity, Conservation and Management
MSc Environmental Change and Management
MSc Nature, Society and Environmental Policy
MSc Water Science, Policy and Management

We also offer a two-year version of three of these programmes. The MPhil in Geography and the Environment is a two-year course for master's candidates who wish to have a substantial research component to their studies. In the first year, candidates take the coursework associated with the MSc in Water Science, Policy and Management, MSc in Nature, Society and Environmental Policy or Msc in Biodiversity, Conservation and Management and in the second year, students devote most of their time to researching and writing a thesis of 30,000 words.

1.3 Oxford Learning Environment

1.3.1 Learning Approach

During your time at Oxford you will experience a wide range of different formats and styles of teaching from small group discussions to field visits, and from traditional lectures to public talks by some of the world's leading academics. In keeping with Oxford's tradition of academic freedom, the exact nature of the learning experience within any particular tutorial, seminar or lecture is left to the discretion of the lecturer which, we hope, produces a dramatic variety of learning experiences. Yet, the most typical forum for teaching and learning remains the lecture – although there is immense variation in how lectures are delivered and all involve opportunity for discussion.

In the International Graduate School, we place strong emphasis on peer group and individual learning. Your peer group consists of exceptionally talented scholars from around the world, many of whom have practical experience or extensive knowledge of issues and topics that are covered during the MSc course. We strongly recommend that you form strong academic bonds with your peers and we encourage this with small group projects, reading groups and discussions.

There is an obligation on you as an individual to develop your own spheres of interest within the subject area and to work hard at identifying gaps in your knowledge and training. Oxford's exceptional learning facilities provide unrivalled opportunities for individual learning, not to mention the array of international researchers and scholars who present their work at external lectures around the university. We urge you to take full advantage of all of these opportunities in order to get the most out of your time at Oxford.

Staff members are available to advise students on reading, literature, and topics. An Academic Adviser will be allocated to assist students with these matters and your Colleges will provide a personal advisor who can give additional support.

1.3.2 Library and Learning Facilities

The Oxford University library system is extensive, with dozens of individual facilities around the city. A tutorial on using the library facilities will be provided during induction week.

More information may be found at: http://www.ox.ac.uk/research/libraries/

1.3.3 WebLearn

WebLearn is Oxford University's Virtual Learning Environment. BCM has its own space (rooms) where we post general course information along with lecture notes, reading lists and other materials specific to each module, workshop or field trip. There is also a class message board and the WebLearn resource system contains information on all staff and students at Oxford, and their groups, thus allowing you to easily restrict access to certain cohorts.

1.3.4 Oxford University Computing Services

Oxford University Computing Services (http://www.oucs.ox.ac.uk/) offer a wide range of Information Technology support including excellent training courses and a shop selling leading software at educational discount prices.

COURSE INFORMATION

2.1 Aims/Objectives

The conservation and management of biodiversity is one of the most important challenges facing humanity; one that requires the active participation of dedicated professionals who are committed to the interdisciplinary nature of the subject. Our generation has the unenviable task of making hard, possibly irrevocable, decisions on natural resource, allocation and management issues at local, regional and international levels. Our aim is to equip our graduates with all the skills necessary to go out and make a significant contribution to the future of life on our planet. In this context, the aim of the one-year course is to provide a critical and conceptually sophisticated understanding of biodiversity science and the socio-economic, political, cultural and institutional environments within which management and policy decisions are made.

The specific course objectives of the BCM course include:

- To develop the abilities of students to understand conservation theory, participate in research, analyse and communicate effectively and in context and to develop an advanced knowledge of biodiversity, conservation, and management
- To provide an advanced critical understanding of the legislative, statutory policy and political context in which biodiversity operates
- To develop an ability to synthesise and mediate issues relating to biodiversity at local, regional and global scales
- To facilitate a critical appreciation/understanding of the science underpinning biodiversity and its social and ethical roots
- To facilitate the entry-process to those who wish to undertake further advanced study by research at Oxford and beyond

2.2 Core Teaching Staff

This inter-disciplinary course is led by academics in the School of Geography and the Environment, supported by experienced practitioners, all of whom have considerable national and international expertise (Appendix 1).

The core staff teaching on the course includes:

Dr Shonil Bhagwat: Course Director MSc BCM
Professor Rob Whittaker: Professor of Biogeography - Academic Director MSc BCM
Professor Kathy Willis: Director of the Biodiversity Institute of Oxford, James Martin 21st Century School
Dr Paul Jepson: Director of MSc Nature, Society & Environmental Policy
Dr Richard Grenyer: University Lecturer in Physical Geography
Professor Yadvinder Malhi: Professor of Ecosystem Ecology
Dr Kate Parr: Trapnell Fellow in African Ecology

2.3 Course Description

The MSc course comprises:

- Core modules which are assessed by written examination;
- Two elective modules, which are assessed through essays and/or coursework;
- An original and independent research dissertation;
- Training in research methods;
- Workshops, reading groups and additional seminars; and
- Field trips

2.4 Course Structure

The table below outlines the course schedule. Core modules and elective modules are taught in the first two terms leaving the third term for examinations and dissertation preparation.

MSc Biodiversity, Conservation and Management		
1st Term	**2nd Term**	**3rd Term**
Conservation Biogeography	Conservation Beyond Reserves	
Long-term Ecology and Conservation	Strategic Conservation Planning	
Conservation Governance	Contemporary Issues in Biodiversity	
Global change and the terrestrial biosphere (with ECM MSc)*		
Biodiversity Assessment		Examinations
International Environmental Policy & Legal Frameworks (All MScs)	Tenerife Field Trip (1st week of Easter vacation)	Research Dissertation (continues into long vacation)
Research Methods and Skills (All MScs)		
Elective modules, Policy Workshops, Policy Dialogue Seminars (All MScs)		

Only part of this course is in the core for BCM students

2.5 Core Modules

A brief description of each of the modules is given below. Full details on each module, lectures and reading lists can be found in Appendix 2.

Conservation Biogeography

Module Leader: Professor Rob Whittaker

In this module you will develop a critical grasp of the science underpinning biodiversity conservation imperatives on the global stage. In turn, you will examine the state of our knowledge of global biodiversity and biogeography; issues that confound biogeographical analyses at course scales; theoretical frameworks of diversity science; invasive species and biotic homogenization, islands as model systems for the diversity 'crisis' and finally, the basis for predicting losses as a function of habitat loss and fragmentation. Throughout, you will examine key assumptions and uncertainties within the science of biodiversity at a global scale. The module thus sets out to help you develop a secure grasp of the conservation imperative through the application of a critical biogeographical framework.

Long-Term Ecology and Conservation

Module Leader: Professor Kathy Willis

Understanding the structure and diversity of past communities is essential for providing insights into current conservation problems, providing baselines for conservation management and for gaining insights into the response of ecosystems to environmental change. In this module you will be introduced to the concepts and techniques of long-term ecology and their significance for contemporary biodiversity conservation.

Conservation Governance

Module Leader: Dr Paul Jepson

In this module we will adopt a governance perspective to analyse the complex interactions of power, legitimacy and authority that manifest in policy approaches to govern the behaviours of institutions, organisations, individuals in their relations to nature and the environment. We will contrast the traditional state-centric approach to analysing and practising biodiversity conservation with the more expansive governance perspective, with its focus on the role of non-state-actors and voluntary, market-led policy instruments (such as FSC and more recently REDD). We will explore these themes through case studies of plant and bird conservation. Throughout the module we will reflect on the role of conservation NGOs in conservation governance and in particular the agency that NGO-invented measurement and assessment tools play in the creation of the international regimes and institutions that govern the conservation of global biodiversity.

Conservation Beyond Reserves

Module Leader: Dr Shonil Bhagwat

Throughout the 20th Century, conservation has relied on the expansion of the protected area network. However, with the human population expected to reach 10 billion by the middle of this century, conservation will have to operate in an increasingly crowded world. Can we reconcile food production and biodiversity conservation in human-dominated landscapes? Can we maintain biodiversity on land where people live, work and play? This module will compare and contrast land sparing and land sharing as two contrasting approaches to conservation and attempt to find practical solutions for conservation in the 21st Century. The module will also address values underlying conservation in contemporary societies. These include economic values on the one hand (e.g. ecosystem services) and cultural values on the other (e.g. sacred sites). The module will address future challenges for conservation, but will also identify solutions.

Strategic Conservation Planning

Module Leader: Dr Richard Grenyer

This module will provide you with an advanced introduction into spatial and species-based approaches for conservation planning in the terrestrial realm. You will critically examine high profile global biodiversity prioritisation and planning schemes; particularly those promoted by international NGOs. You will also discuss cutting edge approaches to conservation planning that incorporate landscape, social values and climatic frameworks.

Contemporary Issues in Biodiversity

Module Leader: Dr Shonil Bhagwat (and various guest speakers)

This module will be organised as a series of seminars that will examine current issues in biodiversity conservation and management. Although the nature of these seminars changes from year to year, a wide variety of topics are normally on offer: from agriculture to conservation in marine habitats to ecosystem services to cultural-spiritual values. Top conservation scientists and practitioners from around the globe are invited to give seminars as part of this module.

Biodiversity Assessment

Module Leader: Dr Shonil Bhagwat (and various guest speakers)

This module involves a series of field trips that will introduce you to the theory and practice behind collecting biodiversity data. These field trips are spread over two terms and will include visits to locations near Oxford (e.g. Wytham Woods), elsewhere in the United Kingdom (e.g. Dale Fort, Pembrokeshire, Wales) and abroad (e.g. Tenerife). The field trips will be supplemented with theory classes or workshops. The main objective of this module is to equip you with knowledge of biodiversity surveys, even if it is not always possible to practise the hands-on survey skills. We will cover subject areas such as sampling design, ecological field techniques and rapid biodiversity assessment for a variety of taxa.

Global change & the terrestrial biosphere (with Environmental Change and Management MSc)

Module Leader: Professor Yadvinder Malhi and others

NB. This is a core ECM module, which may be audited by BCM students, and from which certain lectures supplement the Biodiversity Assessment course. Further guidance will be given by the course director on which lectures will be of most value in the context of BCM course requirements.

The module will outline and explore the functioning of the terrestrial biosphere, from global to local scales, and explore how contemporary global change is affecting the biosphere and its composition. The approach will to introduce key overarching questions and concepts and then examine how research scientists address these questions through a variety of tools and approaches. An underlying theme is to place contemporary environmental change into the context of changes throughout Earth history.

International Environmental Policy and Legal Frameworks (All MSc courses)

Module Leader: Marta Lang

This module aims to: (1) introduce structures, processes, mechanisms and actors in international environmental frameworks and policy; (2) focus in on four key issue areas: pollutants, ocean depletion, global warming and terrestrial species conservation; (3) encourage critical thinking about underpinning concepts and principles; (4) elicit perspectives on the value and limits of using international rules and policy to solve environmental problems or take reform agendas forward.

Research Methods and Skills (All MSc courses)

Module Leaders: Course Directors

Research Methods and Skills module is offered to all four MSc courses in the School. It runs over two terms and includes basic and advanced research skills that will equip you for your research dissertation and a possible future career as a researcher and academic. The sessions will cover important technical and professional skills and will build into a broad ranging portfolio of the skills needed for dissertation projects.

2.6 Elective Modules

There is a separate Electives Handbook that provides outlines of available elective module options in the School of Geography and the Environment for the forthcoming year. Please note, however, that module details may change at short notice due to changes in staff availability.

Elective Modules offer a small-group, tutorial-style teaching and discussion environment, based on a suite of contemporary research themes that reflect the specific interests of core faculty and visiting research associates. Each student has the opportunity to identify electives of particular interest, though the selection process will be made through committee at the start of term. The teaching aim is to foster discussion and debate between academic staff and students to identify and explore theory, methods and practice in an academic space that encourages a critical dialectic.

Students are also required to submit written essays (of no more than 4,000 words plus 150 word abstract) on two elected courses. These must each be submitted on the first Monday of the following term after which the elective module was taken (i.e. a Michaelmas elective module requires submission on the first Monday of Hilary Term). Two hard copies of each essay must be submitted to the Clerk of the Schools, Examinations Schools, High Street, Oxford OX1 4BG and marked for the attention of the chair of the M.Sc. Examiners (Biodiversity, Conservation and Management). One identical pdf copy is also required to be supplied to Niamh Tuite, MSc Course coordinator by the same deadline: email to msc-coordinator-bcm-nsep@ouce.ac.uk. This must also include the 150-word abstract. Note that you are given a candidate number to use for these purposes and your name should not appear within the submitted essays.

See section 4.2 for details on submission.

2.7 Reading Groups

Each term we may offer reading groups led by doctoral students in the department. Reading groups are linked to core module teaching and offer an opportunity for an in depth exploration of a particular set of literature in a smaller group setting.

2.8 Dissertation

In addition to the core and electives, you are expected to undertake an independent and original research dissertation. The dissertation is an integral and formal part of the course, and completing a good dissertation is essential for further research study in the School of Geography and the Environment leading to the degree M.Phil. or D.Phil.

The dissertation gives you the opportunity to design and execute your own research. The choice of research topic is up to you. However, the topic must fall within the broad scope of the Biodiversity, Conservation & Management course, and normally relates to themes taught within the programme and/or to staff research interests. A supervisor will be appointed to guide you during this work, the bulk of which will be carried out after the examinations are over. The thesis must be submitted on or before the first weekday of September 2012.

It is expected that the best of dissertations will be of publication quality and all should show originality in and/or competent and creative scholarship. Indeed, it is possible to submit the work in the form of a journal paper prepared as if for submission to a journal, together with a review chapter (see below for further details). This should be discussed with your dissertation supervisor beforehand.

All dissertations will be judged on the degree to which they fulfil the criteria of a comprehensive and coherent treatment of a suitable research question in an analytical and critical manner. On successful completion of all of the necessary components of the MSc programme - assessed

essays, examinations, and dissertation - you can be considered for entry into a higher research degree in the School of Geography and the Environment.

Many students will have never completed an extended piece of independent and original research before the course. To assist students develop the skills and techniques necessary to execute a successful research project, a number of inter-connecting modules, training sessions and seminars are provided throughout Michaelmas, Hilary and Trinity Terms. These training modules are compulsory:

- Research Methods and Skills – This module runs for students taking all MSc courses and includes a comprehensive set of skills including GIS, statistics, quantitative and qualitative methods and social surveys techniques. Gaining a firm foundation in these skills is critical both in terms of the process of designing and implementing effective research, and the ability to recognise biased results or unsubstantiated conclusions from poorly conceived or executed research.

- Dissertation Planning – a series of linked and iterative individual and group sessions will guide students through the planning cycle of their dissertation research. Beginning from the Michaelmas Term, students will be given support and direction on appropriate and timely steps in planning a successful research project, including submission of a formal research proposal and making presentation about the proposed research project. In addition, students will be given guidance on the standard and format of written material expected. For some students the standard required may be different from your previous academic experience.

The formal training programme is designed to provide in-depth knowledge over a wide range of topics related to Biodiversity, Conservation and Management, but a fundamental component of the Oxford educational system is students engaging in individual reading and study in order to broaden and deepen their knowledge of their chosen field. Simply, lectures and seminars are indicative of knowledge, not exhaustive, and much of the value of an Oxford University degree lies in student initiative and effort in exploring literature and ideas. Students hoping to excel at Oxford will need to demonstrate significant reading and understanding beyond the taught material. Staff members will be available to advise students on further reading, literature, and suitable topics, but the responsibility ultimately lies with the student to push her/himself to realise their potential.

2.9 Research Seminars and Workshops

Oxford offers a truly outstanding opportunity to immerse oneself in public talks from leading global thinkers, activists and politicians on a kaleidoscope of topics and issues. There is always a busy programme of additional seminars and lectures relevant to the course going on in a variety of departments and institutes in Oxford, and BCM students are encouraged to attend those they find interesting providing they don't clash with core BCM classes. A number of regular

seminar series have an environment focus. These include the Linacre Lecture Series and a seminar series convened by the Smith School for Enterprise and the Environment.

2.9.1 Departmental Research Seminars

The School of Geography and the Environment normally runs a weekly departmental seminar series where leading geographers from outside Oxford are invited to share their work.

2.9.2 Policy Dialogue Seminars

This series provides an opportunity to ground theory in practice through in-depth discussions with professionals, occupying different roles in the policy process. In short, the policy dialogue seminars provide an opportunity to gain insights into the real world of policy, the various career routes within it and how policy professionals talk and think about emerging issues.

2.9.3 Policy Workshops

Students may choose to participate in workshops that provide for an in-depth exploration of key issues in environmental policy. Each year we convene a series of policy workshops and an Environmental Innovation Forum. The number of places on workshops is normally restricted to thirty. We can guarantee your participation in at least two workshops. The Innovation Forum is open to all.

A selection of workshops on the following themes is planned for 2011-12:

- Environmental Innovation Forum brings together students with Oxford-based groups working at the cutting-edge of environmental policy and practice.
- Oceans Policy Symposium will profile cutting-edge initiatives to create meaningful governance approaches in the marine environment
- Workshop on Media and the Environment will analyse how science is represented in the media, and interrogate the politics, ethics and impact of media representations of environmental problems.
- Science and Evidence Policy workshop will examine the actors and pathways through which science enters the policy process and how it is mediated along the way.
- Workshop on Participation and Policy Complexity will examine the complex interplay of the different elements that conspire to shape transport policy drawing on Oxford as a case-study.
- Workshop on BioInformatics will examine the creation of EU science-infrastructures intended to strengthen and broaden scientific inputs into policy. A particular focus will be the role of measurement and categorisation 'devices' in the assembly of the interoperable databases that characterise these new science networks.

2.10 Fieldwork

Important Note: You should check if you need a visa to travel to Spain and, if so, ensure you allow plenty of time to obtain one in advance of the Tenerife field course.

Fieldwork is an important element of the programme's teaching philosophy. This year we are planning three compulsory residential field trips and possibly a number of one-day study visits. Field trips for this year include:

- **Induction Field Trip to Swanage, Dorset.** A central purpose of this field course is to get to know each other. You will also be introduced to a range of issues surrounding protected area design and management, as exemplified by several very different types of protected area, and learn about the structure and governance of conservation in the UK.
- **Dale Fort, Pembrokeshire, Wales.** The main purpose of this field trip is to engage with issues concerning marine and coastal environments – their ecology, management, policy and law. Dale Fort is located in the spectacular surroundings of The Pembrokeshire Coast National Park and the Field Studies Centre here is close to the famous bird-islands of Skomer, Skokholm and Grassholm. This field trip is organised prior to the Oceans Policy Symposium in the School and will help students to get grounding in various topics related to the marine and coastal environments.

- **Tenerife, Spain**. This one week compulsory field trip is scheduled to start on the Tuesday of the 9th week of Hilary Term (i.e. immediately after the end of full term). The flight and accommodation costs are covered but not the costs of visas (if required), lunch, or travel to/from the airport in the UK. The trip has the following goals. 1. To gain an understanding of the conservation problems inherent in a highly biodiverse island in which there are strongly competing economic and social drivers. 2. To familiarise participants with the different categories of protected area designation, from rural parks to national parks, visiting different categories of PAs and learning about the history of their designation and some of the current pressures and management interventions. 3. To provide some illustrative practical experience in biodiversity science field and analytical techniques, focusing on rapid biodiversity assessment. 4. To undertake some simple field exercises drawn from the social sciences focusing on environmental interpretation as a management tool, the public interface with protected areas, and (possibly) tourist awareness of environmental issues that affect the Canary Islands. 5. To examine the distinctive ecologies of an extraordinarily wide range of habitats from semi-desert, through cloud forests to high altitude desert, gaining an understanding of the climatic controls on these ecosystems. 6. To gain an appreciation of the differing degrees of endemism of the Tenerife flora, and the more important scenarios of plant and animal evolution for the Canaries.

There may also be other field excursions and educational visits (usually day-trips), which will be arranged on an *ad hoc* basis throughout the course. **Please be aware that there is provisionally a trip to Cambridge arranged for Monday of Week 9 of Michaelmas Term so please avoid booking flights/returning home before then**.

2.11 Induction

All new postgraduates are expected to attend a full-time orientation and induction programme in the week before term commences in Michaelmas Term. The purpose of this orientation is to

provide an opportunity to lay out the structure and expectations of the programme in an informal setting. The first half of the induction programme is led by the Course Director and comprises, among other things, an introduction to the School of Geography and the Environment, its component centres, and its facilities. It also introduces and explains the training and research programme, institutional and organisational procedures, the aims, objectives, structure, outline, and assessment methods of the course, the key expectations and responsibilities of the students. Information about supervision arrangements is provided. In addition, specialist induction to library and database resources, electronic databases and Internet facilities, GIS and mapping, and the use of available equipment and facilities is provided. The second half of the induction is organised by the student's respective Colleges and includes induction and information concerning College facilities and arrangements, College computing and internet access, university affairs, and the like.

2.12 Security and care of personal belongings and data

People outside the School have access to the building. It is important therefore that you are vigilant of your own and others valuables at all times. This applies particularly to laptops, tablets and phones. In an effort to combat crime the University runs registration schemes for bikes and personal possessions and you are encouraged to use these. Please contact your college for details. You are strongly advised to back-up your data, lecture notes and drafts of written work at regular intervals. In addition, we request that you are particularly vigilant of 'tail gating' i.e. people coming in through the security barriers behind you and who lack swipe card access to the Department.

ASSESSMENT REGULATIONS

3.1 Assessment

Regulations for the Degree of Master of Science (MSc) by coursework are set out in the University of Oxford Examination Regulations, known as the Grey Book. The assessment will consist of:

1. three individual examination components with each written component set in a three-hour paper as described in the schedule (40% of total marks);
2. a dissertation on a subject selected in consultation with the Academic Supervisor and/or Course Director (40% of total marks);
3. two assessed essays based on elective modules (20% of total marks).

The marking range for assessed work is:

- 70% and above (Distinction);
- 50-69% (Pass); and,
- Less than 50% (Fail)

NB A detailed marking scheme is included in the Appendices

3.2 Criteria for overall classification.

Based on a weighted average score, candidates will be classified as follows:

- Distinction: a weighted average score of 70% and above with grades of 50% or more for each examination paper and the dissertation.
- Pass: a weighted average score of between 50% and 69% with grades of 50% or more for each examination paper and the dissertation.
- Partial Pass: a weighted average score of between 50% and 69%, with a mark of less than 50% in (a) one or more examination paper(s) and/or (b) the dissertation.
- Fail: a weighted average score of less than 50%.

In exceptional circumstances the examiners may decide to award a classification notwithstanding the conventions.

3.3 Re-assessment

A candidate who has been classified with a Partial Pass or Fail may enter again for each failed component on one, but not more than one, subsequent occasion.

Arrangements for reassessment will be as follows:

- Examination. Candidates may re-sit the failed examination component(s) in the Trinity Term of the following academic year.
- Dissertation. Candidates who fail the dissertation have to resubmit the dissertation by the required date the following academic year.

- Assessed essays. Candidates cannot resubmit a failed essay.
  Candidates under re-assessment have neither the right to attend classes nor to expect further dissertation supervision.

ASSESSMENT COMPONENTS

4.1 Written Examination

Core courses will be examined by means of three three-hour written examinations in the middle of Trinity Term. These examinations are designed to determine the student's critical understanding and knowledge of the range of issues covered, and also provide opportunity for students to display the results of their individual study, and use information gained from field courses and seminar series.

4.2 Elective Modules

Students are also required to submit written essays (of no more than 4,000 words plus 150-word abstract) on two elected courses due on the first Monday of the following term after which the elective module was taken (i.e. a Michaelmas elective module requires submission on the first Monday of Hilary Term). Essays must be submitted to the Clerk of the Schools, Examinations Schools, High Street, Oxford OX1 4BG and marked for the attention of the Chair of Examiners (Biodiversity, Conservation and Management). Note that you are given a candidate number to use for these purposes and your name should not appear within the submitted essays.

The essay topic and scope will be decided in consultation with the elective module leader. Unless otherwise agreed with the module leader, the format for the assessed essays is as follows:
Two hard copies to Examination Schools plus one electronic copy supplied to Niamh Tuite, MSc Course Coordinator, by the same deadline:

Max word count:	4,000
Type:	12 point
Font:	Times New Roman or Arial
Spacing:	1.5 or double

A front page with the title of the essay and title of the elective module. You should not put your name on the submissions but should instead put your candidate number (to be supplied) on the front cover.
Unless you have been instructed otherwise use a references section rather than a bibliography

Printing:	Print on both sides of the paper

4.3 Dissertation

You must submit to the MSc Co-ordinator by the end of the first week in Trinity Term in the year in which you enter the examination, the title and details of your dissertation as set out in the proposal template, together with the name of a person who has agreed to act as your supervisor during preparation of the dissertation.

Bound, typewritten or printed copies of the dissertation must be received, not later than 12 noon on the first weekday in September 2012 by the Clerk of the Schools, Examination Schools, High Street, Oxford OX1 4BG and marked for the attention of the Chair of Examiners (Biodiversity, Conservation and Management).

Copies:	Two hard copies to Examination Schools, plus one pdf electronic copy supplied to Niamh Tuite, MSc Course Coordinator, by the same deadline
Max word count:	15,000 including footnotes and excluding references and appendices.
References:	Unless you have been instructed otherwise use a references section rather than a bibliography
Type:	12 point
Font:	Times New Roman or Arial
Spacing:	1.5 or double
Printing:	Single sided
Front Page:	A front page with the title of the dissertation. You should not put your name or your supervisor's name on the submissions but should instead put your candidate number (to be supplied) on the front cover.
Anonymity:	Do not identify yourselves to the markers within the dissertation: your candidate number and not your name go on the cover.

Plagiarism declaration: Insert one loose completed form not bound with the dissertation.

It is also permissible to write the dissertation in journal paper format prepared as if for submission to a specified international journal. All paper format dissertations should contain two separate sections: a) a 4,000-7,000 literature review on the subject area addressed by the paper, and b) an academic paper in the appropriate format for submission to an international journal, where students should follow the published "Instructions for Authors" for the journal in question and should prepare the paper according to the exact requirements of submission to that journal, including a copy of those instructions bound in as an appendix to the thesis. The total text of the entire thesis (as defined above) should not exceed 15,000 words.

The examiners may retain one copy of the dissertation of each candidate who passes the examination for deposit in an appropriate library. All copies must bear the candidate's examination number but not his/her name.

4.4 Submission Deadlines

The deadlines for handing in assessed course work are as follows:
Elective Module Essays:
Michaelmas Term essay: 1st Monday of Hilary Term by 12 noon
Hilary Term essay: 1st Monday of Trinity Term Monday by 12 noon
Note: There are no elective modules in Trinity Term

Research Dissertation: By 12 noon on first weekday of September 2012

4.4 Plagiarism

Oxford University imposes severe sanctions for cases of plagiarism. In the most extreme case, a student will be judged to have failed the course. These regulations are imposed by the University and if a student is suspected of plagiarism the matter is likely to pass to the Proctors who will rule on the matter independently of the OUCE. We expect students enrolled at Oxford to exhibit the highest standards of academic integrity and not knowingly submit any work or intellectual ideas that have been adapted from or copied from a third-party source without appropriate recognition (see below). In addition, we expect all assessed work you submit to represent new and original writing conducted during your relevant terms in Oxford. It is not acceptable to re-package essays presented for degrees elsewhere (i.e. self-plagiarism). Students found suspected of plagiarism will be referred to the Proctors and if plagiarism is confirmed, the student may be failed.

During Michaelmas term we will discuss these rules and expectations regarding plagiarism. You will be required to complete the University's on-line course on the topic and sign a 'plagiarism declaration' form which accompanies each piece of submitted assessed work.

4.5 Role of External Examiners, Colleges and Proctors

There are several important actors within the examination process all of whom have distinct roles. Below is a brief guide to these roles:

1. The Exam Board. The University appoints an exam board comprising three or four members of faculty and an external examiner. The current chair of the BCM exam board is Dr Shonil Bhagwat. The exam board is responsible for ensuring that the examinations are conducted fairly and according to University regulations. The board of examiners may be assisted in setting and marking assessed elements of the course by other internal staff members who are termed assessors.

2. The External Examiner. This is a senior academic from a reputable external academic institution whose role is to verify the quality of the examination materials, advise the MSc course team on course content, and sit on the final examination board. It is important to note that a key reason why marks from elective module essays or exams cannot be released during the year is that the external examiner has the right and the duty to modify marks if he sees fit. As such, releasing provisional results early may give a candidate a false guide to their final examination grade. Under the University Examination Regulations candidates are not permitted to communicate with examiners about any aspects of the assessment process after the examinations have begun. Any complaints about assessment procedures should be addressed to the Proctors via the candidate's college.

3. Colleges. If you need to ask for an extension on a piece of coursework or your research dissertation, are ill and cannot attend an examination, or have any other reason for not taking part in the examination process in a typical way you should liaise with the university authorities through your college, not through SoGE. Only your college can organise this in advance of the deadline.

4. The Proctors are responsible for the integrity, quality and effectiveness of the Oxford University examination system. Ultimately, they are responsible for making decisions on extensions, resubmission or any other aspect of examination protocol. Requests to the Proctors can only be made through your College.

APPENDICES

Appendix 1: Core Teaching Staff

Dr Shonil Bhagwat (Course Director) is a Senior Research Fellow at the School of Geography and the Environment. Shonil's research focuses on three areas of investigation, each asking a number of questions: (1) *Conservation beyond protected-area boundaries*: How can we, as humans, continue to share this planet equitably with other species? Can we create and maintain landscapes where species can persist alongside humans? What future strategies can we develop to conserve species in human-dominated landscapes? (2) *Cultural and spiritual values in conservation*: What is the role of traditional practises in main-stream conservation? How much of the earth's surface do sites of cultural and spiritual significance cover and which species and habitats do they protect? How has the landscape in and around these sites changed over time? (3) *Climate change and conservation*: Which ecological traits make species fit for surviving climate change? How will changes in species composition affect vegetation communities? How will local peoples' livelihoods be affected by climate change and what adaptation strategies can these communities develop? Shonil's research applies knowledge of the past to interpret present-day landscapes as well as to develop integrated strategies for conservation of future landscapes.

Professor Robert Whittaker (Academic Director) is a Professor of Biogeography and Fellow of St Edmund Hall, and also currently holds an honorary Chair at the University of Copenhagen. Rob has interests spanning conservation biogeography, spatial scale, and species diversity theory, climatic controls on species richness, macro ecology, and island biogeography. Rob is the Editor-in-chief of *Journal of Biogeography*, and is President of the International Biogeography Society (2009-2010). He is author or co-author of over 100 articles and three books: Whittaker, R.J. & Fernández-Palacios, J.M. (2007) *Island Biogeography: ecology, evolution, and conservation*, Oxford University Press; Lomolino, M.V., Riddle, B.R., Whittaker, R.J. & Brown, J.H. (2010) *Biogeography,* 4th edn. Sinauer, Sunderland, MA; and Ladle, R.J. & Whittaker, R.J. (eds) (2011) *Conservation Biogeography*, Wiley-Blackwell 2011.

Professor Kathy Willis is Tasso Leventis Chair of Biodiversity, Director of the James Martin 21st Century Biodiversity Institute and Professorial Fellow of Merton College. Kathy's research interests include the long-term relationship between vegetation dynamics and environmental change; plant evolution, especially rates and mechanisms of evolution; reconstruction and modeling of past vegetation dynamics in response to changes in climate (water/energy), atmospheric concentrations (CO2), soils, and human impact; the use of long-term records in conservation science, practice and policy. Kathy is the head of the Oxford Long-term Ecology Laboratory, which currently comprises four postdoctoral researchers, ten PhD students and a technician. On-going research projects include studies in South America, Africa (Congo basin, Kruger, West Tsavo), Galapagos, Greece, Hungary, India, Madagascar, Morocco, Mongolia, Romania, Slovenia, and Tenerife.

Professor Yadvinder Malhi is a Professor of Ecosystem Ecology and a Fellow of Oriel College. He also co-ordinates the Oxford Centre for Tropical Forests (OCTF), a network of Oxford University departments and neighbouring NGOs, consultancies and businesses in the Oxford area. The major focus of Yadvinder's work is to understand how pristine tropical ecosystems may be responding to atmospheric change and climate change. The main methodology being used is the collection of data from forest sample plots in a range of environments. The data collected include tree species, tree growth rates and soil and leaf nutrient status. This is being achieved by building an international network of forest plots, RAINFOR, that will have the potential to monitor change in tropical forests for decades to come, and that will bear physical witness to the changing structure and ecology of forests. This work has lead to the creation of an active research group distributed between Oxford, Edinburgh and Leeds.

Dr Paul Jepson is a Senior Research Fellow in Conservation Practice and the Course Director of the MSc in Nature, Society and Environmental Policy. Prior to his appointment in January 2007, he held Senior Research Fellowships with the Environmental Change Institute and the Skoll Centre for Social Entrepreneurship at the Said Business School. Dr Jepson transferred into academia from a successful career in conservation management and policy. He has been a consultant for a wide range of inter-governmental and non-governmental organisations, including the World Bank, Birdlife International, WWF, the Wildlife Trust and Proforest. He was Director of Asia programmes for Fauna & Flora International (2001) and Indonesia Programme Coordinator for BirdLife International (1991-1997). Prior to this he was a local government countryside officer developing new urban conservation initiatives in Manchester and Shrewsbury (UK). In his research and teaching he seeks to integrate insights from theory and practice and from the social and natural sciences.

Dr Richard Grenyer is a University Lecturer in Physical Geography. He is an evolutionary biologist and a conservation scientist. His particular areas of interest are conservation decision-making and the role of spatial processes in the generation and maintenance of biodiversity. Questions of interest include the following. Is there solid theory that describes how lineages of organisms evolve in space and time? Does existing theory predict the spatial pattern of species richness and endemism we see around us? As managers, how much does it matter that biodiversity is made up of species, each the current products of a shared evolutionary process? Do we even need to know the difficult geography of which species is found where? Or can we simply abstract all the biology and ecology of species away into different kinds and different amounts of ecosystem services? And whichever aspects of biodiversity we are interested in, how can we use mathematics and computer science to make smarter, cheaper and more universally acceptable decisions about how to protect it?

Dr Kate Parr is the Trapnell Fellow in African Ecology and a community ecologist with particular interest in biodiversity conservation. Her work focuses on how local animal communities are structured in time and space, and the role that processes such as competition and disturbance

play in shaping assemblages. Much of her research focuses on fire ecology and invertebrate ecology (primarily ants). Currently, she is examining the importance of fire in structuring savannah faunal communities in order to better inform conservation management and assist in the development of effective fire management systems. She is also involved with a global ant database, a collaborative project involving more than 20 researchers, which aims to improve understandings of global patterns of ant diversity.

Marta Lang is an international environmental lawyer, an OUCE Teaching Associate, a Fellow at the Australian National Centre for Ocean Resources, and recently established the consultancy Our Nature. Marta is leading projects on fisheries reliance in poor coastal communities, visiting half a dozen countries in the Pacific Islands and South Asia. She is moderating the Environment and Climate Change assembly at the 2009 Commonwealth People's Forum in Trinidad. From 2002-07 she practised law in New Zealand, as an Assistant Crown Counsel, and the Department of Conservation's marine and international lawyer. She was on government delegations to 3 UN negotiations: the 2006 Working Group on Marine Biodiversity Beyond National Jurisdiction, and the 2005 and 2006 Informal Consultative Process on the Law of the Sea. Marta has a BSc and LLB (Hons) from Victoria University, and an MSc (BCM)from Oxford. Her research interests include fisheries management, marine protected areas, marine predator histories, story in conservation, and solar energy generation in Chile.

Appendix 2: Core Modules

Module Title: CONSERVATION BIOGEOGRAPHY

Michaelmas Term

Module leader: Professor Robert Whittaker
Teaching staff: Professor Robert Whittaker, Dr Kate Parr

Module rationale

To develop a critical grasp of the science underpinning biodiversity conservation imperatives on the global stage through the lens principally of Conservation Biogeography: The application of biogeographical principles, theories, and approaches, to problems concerning the conservation of biodiversity. Within the course we examine key biogeographical approaches to the analysis of biodiversity, and to predictive modelling of species losses consequent upon human action. In addition to this applied content, we take a critical look at biodiversity science, focusing on problems of scale, terminological inexactitude and scientific practice.

Teaching approach

The course is delivered through eight sessions consisting of lectures with class discussion. Key readings for each lecture are circulated in advance of the lecture via Weblearn.

Module outline

The course content falls under the following lecture titles (subject to modification)

- Earth's biodiversity inventory: what do we really know?
- What are the units? A) from Regions to Associations
- What are the units? B) from Genes to Areas of Endemism
- Scale dependency in analysis of diversity
- Natives, exotics and transformers: implications of invasions and biotic homogenization
- Climate change and biodiversity responses: a critical assessment
- Understanding fragility: lessons from islands
- Linking habitat fragmentation and biodiversity loss: do we have a predictive science of extinction?

Introductory readings

The recommended text for this course is:

*Ladle, R.J. & Whittaker, R.J. (eds) (2011) *Conservation Biogeography*, Wiley-Blackwell 2011. This book is available in paperback and hardback. It provides key readings also for the Strategic Conservation Planning module.

See also: Whittaker, R.J., Araújo, M.B., Jepson, P., Ladle, R.J., Watson, J.E.M & Willis, K.J. (2005) Conservation Biogeography: Assessment and Prospect. *Diversity & Distributions* 11, 3-23.

Other papers/books:

Hunter, M.L. & Gibbs, J. (2007). *Fundamentals of Conservation Biology, 3rd edn.* Blackwell, Oxford. [Useful background reading, like several other books with Conservation Biology in the title, this one has only partial overlap with the themes of this course]

Lomolino, M.V., Riddle, B.R., Whittaker, R.J. & Brown, J.H. (2010) *Biogeography, 4th edn.* Sinauer Associates, Sunderland, Massachusetts. [Chapter 4,5,16,17 are particularly relevant]

Primack, R.B. (2002). *Essentials of Conservation Biology.* Sinauer Associates, Sunderland, Massachusetts. [See comments on Hunter and Gibbs]

Shrader-Frechette, K. S. and McCoy, E. D. (1993). *Method in ecology: strategies for conservation*. Cambridge University Press, Cambridge. [See useful and pointed critique of application of island biogeography theory]

Whittaker, R.J. and Fernández-Palacios, J.M. (2007) *Island Biogeography: ecology, evolution, and conservation,* 2nd edn. Oxford University Press, Oxford. [See the three chapters on Conservation, especially chapter 10]

Module Title: LONG-TERM ECOLOGY AND CONSERVATION

Michaelmas Term

Module leader: Prof. Kathy Willis (KJW)
Teaching staff: Prof. Kathy Willis & others

Module rationale

This course will evaluate how long-term records could and should be utilized in conservation policy and practice. Traditionally there has been an extremely limited use of long-term (>50 years) ecological records in biodiversity conservation. There are a number of reasons why such records tend to be discounted including a perception of poor scale of resolution in both time and space, and lack of accessibility of long temporal records to non-specialists. Probably more important, however, is the perception that even if suitable temporal records are available, their role is purely descriptive, simply demonstrating what has occurred before in Earth's history, and are of little use in the actual practice of conservation. We examine the role that temporal records can play in conservation management strategies including determination of biodiversity baselines, managing within a range of natural variability, understanding thresholds, resilience, large infrequent disturbances, and invasives and migration rates. We then examine the use of long-term ecological records in restoration ecology, conservation of cultural landscapes and wilderness conservation. The pivotal issue of the course is not whether long-term records are of interest to conservation biologists, but how they are utilised in the process of conserving

Teaching approach

Most of the course will be delivered in traditional lecture format with opportunity for class discussion and reflection. Each week three papers (case-studies relating to topics covered in the lecture) will be sent out before the lecture and all participants will be expected to read them. There will be group discussion based on these readings in the second part of the lecture.

Module outline

Week 1: Drivers of change in ecosystem conditions and services (KJW)
Week 2: Determination of baselines and natural ecosystem variability (KJW)
Week 3: Ecosystem thresholds, resilience and large infrequent disturbances (KJW)
Week 4: Migrations, invasions, extinctions (KJW)
Week 5: Conservation of cultural landscapes (KJW)
Week 6: Case study – NW European heathland conservation (KJW/PEK)
Week 7: Grazing ecology and wilderness conservation (KJW)
Week 8: Case study – re-wilding Oostvaardersplassen (KJW/FV)

Introductory readings

Ladle, R.J. & Whittaker, R.J. (eds) (2011) *Conservation Biogeography*, Wiley-Blackwell; see Chapter 3 on Baselines.

Willis, K.J., Bailey, R., Bhagwat, S.A. and Birks, H.J.B. 2010. Biodiversity baselines, thresholds and resilience: testing predictions and assumptions using palaeoecological data, *Trends in Ecology and Evolution,* **25,** 583-591.

Willis, K.J. and Bhagwat, S.A. 2010. Questions of importance to the conservation of global biological diversity: answers from the past, *Climates of the Past*, 6, 1139–1162

Willis, K.J., Bennett, K.D., Bhagwat, S.A. and Birks, H.J.B. 2010. 4°C and beyond: what did this mean for biodiversity in the past? *Systematics and Biodiversity*, 8, 3-11.

Van Leeuwen, J., Froyd, C.A.; Van der Knapp, P., Coffey, E., Tye, A.,Willis, K.J. 2008. Fossil pollen guides conservation in the Galapagos. *Science,* 322, 1206.

Willis, K.J., Gillson L. and Knapp S. (2007) Biodiversity hotspots through time: using the past to manage the future. *Philosophical Transactions of the Royal Society, Series B*. 362, 169-174

Willis, K.J. and Birks, H.J. B. (2006) What is Natural? The need for a long-term perspective in biodiversity conservation. *Science,* 314, 1261-1265.

Willis, K.J., Gillson, L., Brncic, T. and Figueroa-Rangel, B. (2005) Providing baselines for biodiversity measurement. *Trends in Ecology and Evolution*, 20, 107-108.

Willis, K.J., Gillson, L. and Brncic, T.M. (2004) How 'Virgin' is Virgin Rainforest? *Science*, 304, 402-403.

Gillson, L. and Willis, K. J. (2004) 'As Earth's testimonies tell': wilderness conservation in a changing world *Ecology Letters* 7: 990–998.

Module Title: CONSERVATION GOVERNANCE

Michaelmas Term

Module leaders: Dr Paul Jepson
Teaching staff: Dr Paul Jepson (PJ), Dr Noel McGough (NM, Kew/CITES), Dr Susanne Schmitt (SS, WWF-UK), Dr Tom Thornton

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Module rationale

Biodiversity conservation involves different actors mobilising policy approaches to modify the behaviours of institutions, organisations, and individuals in their relations to nature and the environment. To this end, conservation bodies have traditionally pursed regulatory (command and control) approaches, but in recent years non-state market-led approaches (such as FSC and more recently REDD) have come to the fore. In addition, voluntary, self-governance approaches are now being developed to deal with more specific and/or localised issues. Parallel and linked to these developments have been initiatives to enrol communities and local forms on knowledge in the co-production of approaches to conservation management.

These developments amount to a complex and dynamic conservation governance landscape that invites conservationists to select governance approaches that best suit a particular issue, culture or locality and/or that blend elements of different approaches to develop more effective conservation instruments. We will develop a critical and grounded understanding of these three general categories of governance approach drawing on case-study examples from cutting-edge projects.

Teaching approach

The module will be taught through a series of lectures and workshop based sessions. It will include a group exercise involving the creation of an advocacy video and a day study tour to Cambridge to visit organisations involved in the invention and production of conservation measurement devices. The module will be supported by DPhil-led reading groups on frame analytics, governmentality, and certification. The module will be supported by four DPhil-led reading groups on frame analytics, Actor-network theory, governmentality, and certification.

Introductory readings

Key readings and relevant journals for the module:

Lemos, A.C and A. (2006) Environmental Governance. Rev. Environ. Resources 2006. 31:3.1-3.29

Patterson, M (2003) Conceptualising Global Environmental Governance: From Interstate regimes to counter hegemonic struggles. Global Environmental Politics 3 (2): 1-8

Jordan, R., Wurzel, R.K.W and Zito, A (2006) The Rise of 'New' Policy Instruments in Comparative Perspective: Has Governance Eclipsed Government? Political Studies 53, 477-496

Module outline

Week 1: Dr Paul Jepson

Introducing conservation governance

This session will contrast the term governance with government and outline the scope of governance as a way of analysing and doing conservation. The second part of the session will introduce the class exercise and assessment which will involve creating YouTube conservation advocacy videos and the concept of frames which will provide the academic framework for the exercise (see exercise brief for details and readings).

Week 2: Dr Paul Jepson & Dr Noel McGough

Regulatory approaches: CITES as a case study

Many conservation policy instruments were developed during the 1970s when the state was the main actor steering societal behaviours. Consequently, the 'command & control' approach as embodied in CITES and characterised by state regulation of society-nature interactions was perceived as both legitimate and effective. It has become the normative approach advocated by many wildlife conservation organisations. This session will examine the role of a Scientific Authority within the CITES system and critically examine the pros and cons of each.

Week 3: Dr Paul Jepson

NGO governance, accountability and legitimacy

NGOs are central to the development and delivery of conservation governance. But how is it that they have assumed this position and will it last? We will draw on concepts of legitimacy within organisational theory to examine the basis by which other actors accord legitimacy and ask whether ENGOs should be more accountable and if so how and to whom.

Week 4: Dr Paul Jepson & Dr Susanne Schmitt

Market-based approaches: the application of FSC and other standards in conservation

In 1980s conservation groups sought to harness the power of markets and consumer choice to enhance the sustainability of supply chains in natural products. In this session we will examine the certification and 'eco-label' tool that have become synonymous with new, market-based conservation policy instruments. We will examine the governance system of the FSC mark which constitutes the 'gold standard' and assess the feasibility of extending these strategies to more localised trade-related issues drawing on case studies of WWF projects targeting wood-carving in Kenya and the medicinal plant *Arnica montana* in Romania

Week 5: Dr Paul Jepson

Transforming governmentalities of species conservation: a case study of the Bali Starling

The utility of the distinction between state and non state actors and mechanism is being called into question. Foucault's governmentality approach draws attention to the assemblages of knowledge, techniques and practices through which power to govern is created and enacted. This session will discussion the key concepts of governmentality and deploy the case of the Bali Starling to explore the value of this analytic for understanding conservation governance.

Week 6: Dr Paul Jepson and Giulia Wegner

Economic discourse and new logics of conservation.

Economic logics increasingly shape, inform and legitimate decisions relation to the conservation and utilisation of biodiversity. In this session we will compare the fields of environmental, resources and ecological economics and examine the influence of each of these three discourses in conservation policy. We will take as a case study the reports of the important and influential TEEB (The Economics of Ecosystems and Biodiversity) project.

Week 7: Dr Tom Thornton

The political ecology of resource conservation: embracing local and indigenous perspectives and practices in landscapes and seascapes

It is increasingly recognised that for policy to be effective it needs to incorporate the particularities of national and cultural context in its formulation. What's being conserved and for whom? This are critical questions that cut to the heart of whose knowledges and practices matter in conservation policy& to what extent is cultural diversity necessary to conserve biodiversity.

Week 8: Dr Paul Jepson & Class

Conservation issues framing and constituency building

In this session will view and discuss the advocacy videos produced by the class. As well as generating deeper insights into the role of frame alignment process in policy advocacy this session will discuss the role of the new media in framing attributes of nature as governable entities or domains. Full details of this exercise will be contained in an exercise brief.

Week 8 (Friday) Dr Paul Jepson

Study day to BirdLife International and WCMC Cambridge

The purpose of the study day is to gain a sense of the role of different conservation NGOs in constructing and supporting institutions of international conservation. More specifically the day will offer an opportunity to: think about how biodiversity assessment and categorisation devices are developed and gain legitimacy, and how they influence the networks and practices of international conservation; to deepen understandings of how international NGOs view and interact with people (local communities, private sector, academia, governments etc.) and how people and organizations operate within particular institutional contexts.

Module Title: GLOBAL CHANGE AND THE TERRESTRIAL BIOSPHERE

Michaelmas Term

Module leaders: Professor Yadvinder Malhi
Teaching staff: Professor Yadvinder Malhi and others

NB This is an additional module, core to the ECM course, and which BCM students may audit this year. Further guidance will be given on which elements are examinable for BCM by the course director.

Module rationale

This module will outline and explore the functioning of the terrestrial biosphere, from global to local scales, and explore how contemporary global change is affecting the biosphere and its composition. The approach will to introduce key overarching questions and concepts, and then examine how research scientists address these questions through a variety of tools and approaches. An underlying theme is to place contemporary environmental change into the context of changes throughout Earth history.

Teaching approach

The module will be taught through a series of lectures and introduction to some field-based methods.

Introductory readings

Key readings and relevant literature for the module:

Bonan GB (2008) Forests and climate change: forcings, feedbacks, and the climate benefits of forests, Science, 320, 1444-1449

Bowman et al (2009) Fire in the earth system Science, 324, 581-884

Butt, N, et al. (2009) Initial Results from Establishment of a Long-term Broadleaf Monitoring Plot at Wytham Woods, Oxford, UK. University of Oxford Report. http://www.eci.ox.ac.uk/publications/downloads/butt09-wythamwoods.pdf

Chen et al. 2009. Elevation increases in moth assemblages over 42 years on a tropical mountain. PNAS 106: 1479-1483.

Cochrane MA (2009) Tropical fire ecology. Springer-Verlag, 682 pp

Cockell C. (ed) (2008) An Introduction to the Earth-Life System, Cambridge University Press.

Colwell et al. 2008, Global warming, elevational range shifts and lowland biotic attrition in the wet tropics. Science 322: 258-261.

Galbraith, D., Levy, P., Sitch, S., Huntingford, C., Cox, P., Williams, M. and Meir P. (2010) Multiple mechanisms of Amazonian forest biomass losses in three dynamic global vegetation models under climate change. New Phytologist, 187: 647-665.

Girardin, C.A.J.et al 2010 Net primary productivity allocation and cycling of carbon along a tropical forest elevational transect in the Peruvian Andes, Global Change Biology, 16, 12, 3176-3192

Malhi, Y. et al. (2009) Exploring the likelihood and mechanism of a climate-induced dieback of the Amazon rainforest. Proceedings of the National Academy of Sciences of the United States of America, 106: 20610-20615.

Prentice IC, et al 2007 Dynamic global vegetation modelling: quantifying terrestrial ecosystem responses to large-scale environmental change. In: Canadell JP, Pataki D & Pitelka LF (eds.) Terrestrial Ecosystems in a Changing World. Springer, Berlin, Heidelberg, New York, Pp. 175-192

Savill P et al. (2010) Wytham Woods: Oxford's Ecological Laboratory, Oxford University Press, pp. 288.

Steffen, W., et al. (2011) The Anthropocene: conceptual and historical perspectives. Philosophical Transactions of the Royal Society a-Mathematical Physical and Engineering Sciences, 369, 842-867.

Module outline

Week 2: The functioning of the biosphere in the Earth system (Prof Yadvinder Malhi)

History of key concepts in biosphere science. The main regions of the biosphere and their key properties and differences. The cycles of energy, water, carbon, nitrogen and phosphorus in the terrestrial biosphere. The ecology of ecosystems. Ecosystem services at global, regional and local scales.

Week 3: Modelling the biosphere-atmosphere system (Dr David Galbraith)

Why do we need models? Brief history of climate and biosphere modelling. Overview of key concepts in biosphere-atmosphere modelling. Modelling ecosystem processes. Modelling species distributions and extinction risk. Key questions and uncertainties. Case study: trying to understand the risk of Amazon forest dieback under climate change.

Week 3 (Friday): Wytham Woods lecture and field trip (Dr Nathalie Butt, Dr Mike Morecroft, Prof Yadvinder Malhi)

Key questions in forest ecology in the context of global change. Methods to assess plant species composition, diversity and carbon stocks. The history and ecology Wytham Woods. Ecosystems research at Wytham Woods.

Week 4: The deep history and 21st Century prospects of the terrestrial biosphere (Prof Yadvinder Malhi)

Introduction to timescales. Development of key components of the biosphere over Earth history, from evolution of photosynthesis to present. Snowball Earth and Hothouse Earth. Mass extinctions. Period of rapid climate change - the Palaeocene-Eocene thermal maximum and glaciations. Contemporary global change in the context of Earth history. The concept of the Anthropocene.

Week 5: Tropical forests and global change (Prof Yadvinder Malhi) The history, evolution and ecology of tropical forests. The biogeography and biodiversity of tropical forests. Attributes of tropical forests in Earth system functioning. Patterns of deforestation and climate consequences of deforestation. Understanding and monitoring intact forests. The impacts of climate change on tropical forests. Feedbacks between tropical forests and the atmosphere. Managing tropical forest regions in the context of global change.

Week 6:. Using tropical elevation gradients to understand global change (Prof Yadvinder Malhi and Dr Kate Parr)

Why tropical elevation gradients are powerful tools. Introduction to the Andean transect study. Description of methods in tree, bird and insect diversity. Methods in plant and soil sciences. Insights in ecosystem science and response of carbon cycle to global change. Insights into response of species to global change.

Week 7: Case studies of global change research (Dr Chris Doughty and Dr Imma Oliveras)

7a. Pleistocene megafaunal extinctions and their impact on the biosphere

Global ecology in the early Pleistocene- what has been lost? The Pleistocene megafaunal extinctions. Causes of the extinctions: humans or climate? Impacts of the extinctions on high latitude ecology. Impacts on low-latitude ecology. Possible implications of contemporary megafaunal decline.

7b Fire in the earth system (Dr Imma Oliveras).

Global patterns of fire. A history of fire in the earth system. Fire as a natural and anthropogenic component of the earth system. The ecology and impacts of fire in tropical savannahs and high elevation grasslands. Interactions between drought and fire.

Week 8: Synthesis: managing the terrestrial biosphere in the Anthropocene (Prof Yadvinder Malhi)

Presentations of posters on key questions for the terrestrial biosphere under contemporary environmental change. How do we expect the biosphere to change in the 21st century? How do we manage such change? What role does conservation and preservation have in a rapidly changing biosphere? How vulnerable or resilient is the biosphere?

Module Title: CONSERVATION BEYOND RESERVES

Hilary Term

Module leaders: Dr Shonil Bhagwat
Teaching staff: Dr Shonil Bhagwat and others

Module rationale

Throughout the 20th Century, conservation has relied on the expansion of protected area network. However, with human population expected to reach 10 billion by the middle of this century, conservation will have to operate in an increasingly crowded world. Can we reconcile food production and biodiversity conservation in human-dominated landscapes? Can we maintain biodiversity on land where people live, work and play? This module will compare and contrast land sparing and land sharing as two contrasting approaches to conservation and attempt to find practical solutions for conservation in the 21st Century. The module will also address values underlying conservation in contemporary societies. These include economic values on the one hand (e.g. ecosystem services) and cultural values on the other (e.g. sacred sites). The module will address future challenges for conservation but will also identify solutions.

Teaching approach

Most of the module will be delivered in traditional lecture format with opportunity for class participation and reflection. Students will be expected to have read appropriate key readings or sections of key reading prior to the lectures in addition to any readings indicated during one of the previous classes. Students should also come prepared to actively engage in class discussions and will be expected to have worked through their personal position on the key issues covered in each lecture.

Module outline

Week 1: Land-sparing vs. land-sharing debate
Two contrasting ways have been proposed for conservation of biological diversity: a. intensifying agriculture in certain areas and sparing land for conservation in others; b. practicing wildlife-friendly agriculture. The lecture will examine pros and cons of both.

Week 2: Maintaining biodiversity on agricultural land: challenges and opportunities
The lecture will take an overview of challenges and opportunities for maintaining biodiversity on agricultural land; and balancing food production with conservation of biological diversity.

Week 3: Agroforestry systems and matrix management in the tropics
The lecture will focus on biodiversity conservation and management in tropical landscapes and discuss a number of case studies of tropical agroforestry systems.

Week 4: Conservation in semi-urban and urban landscapes
Conservation has to operate successfully on an increasingly crowded planet. This means peoples' livelihoods and conservation often come into conflict. Can we find win-win solutions? This lecture will explore opportunities for finding such solutions.

Week 5: Business and biodiversity
In recent years, market-based mechanisms for conservation have grown in popularity and are often relied on in global conservation-development planning. What are the strengths of market-based mechanisms and what are the pitfalls? This lecture will address some of the key issues surrounding market-based conservation.

Week 6: Culture and conservation
Cultural and spiritual values of indigenous societies are known to have contributed to conservation for generations together. What role can these traditions play in modern-day conservation? This lecture will take an overview of the role of culture in conservation and assess it with a number of case studies.

Week 7: Cultural heritage and conservation: Speaker and content TBC

Week 8: Human-wildlife conflict and conservation: Speaker and content TBC

Introductory readings

Badgley, C. et al. (2007) Organic agriculture and the global food supply *Renewable Agriculture and Food Systems* 22(2); 86–108.

Bhagwat, S.A. and C. Rutte (2006) Sacred groves: potential for biodiversity management. *Frontiers in Ecology and the Environment*, 4(10): 519-524.

Bhagwat, S.A. et al. (2008) Agroforestry: A refuge for tropical biodiversity? *Trends in Ecology & Evolution*, 23(5): 261-267.

Daily Gretchen C *et al.* (2009) Ecosystem services in decision making: time to deliver *Frontiers in Ecology and the Environment* 7(1): 21–28.

Ewers, R. M. et al. (2009) Do increases in agricultural yield spare land for nature? *Global Change Biology* (2009), doi: 10.1111/j.1365-2486.2009.01849.x

Fischer, Joern et al. (2008) Should agricultural policies encourage land sparing or wildlife-friendly farming? *Frontiers in Ecology and the Environment* 6(7): 380–385.

Gabriel, D. et al. (2009) The spatial aggregation of organic farming in England and its underlying environmental correlates *Journal of Applied Ecology*, 46, 323–333.

Inskip, C. & Zimmerman, A. (2009) Human-felid conflict: a review of patterns and priorities worldwide. *Oryx*, 43, 1, 18-34.

Mauro, F. and Hardison, P. D. (2000) Traditional knowledge of indigenous and local communities: international debate and policy initiatives. *Ecological Applications* 10(5): 1263-1269.

McCauley, D. J. 2006. Selling out on nature. *Nature* 443: 27-28.

Norris, K. (2008) Agriculture and biodiversity conservation: opportunity knocks *Conservation Letters* 1: 2–11.

Pyle, R. M. 2003. Nature matrix: reconnecting people and nature. *Oryx* 37: 206-214.

Sagoff, M. 2008. On the economic value of ecosystem services. *Environmental Values* 17:239-257.

Spash C. L. 2008. How much is that ecosystem in the window? The one with the biodiverse trail. *Environmental Values* 17: 259-284.

Turner, R. K., and G. C. Daily. 2008. The ecosystem services framework and natural capital conservation. *Environmental & Resource Economics* 39: 25-35.

West, P., J. Igoe, and D. Brockington. 2006. Parks and peoples: The social impact of protected areas. *Annual Review of Anthropology* 35: 251-277.

Module Title: STRATEGIC CONSERVATION PLANNING

Hilary Term

Module leader: Dr Richard Grenyer

Teaching staff: Dr Richard Grenyer, Dr Paul Jepson, Prof Robert Whittaker, Dr Bob Smith, Dr Mark Mulligan, Ms Erin Parham.

Module rationale

This module will explore strategy in the spatial planning of reserve networks. The aim is to equip participants with a critical understanding of protected area planning in the terrestrial realm. The 1990s was characterised by a suite of planning and prioritisation frameworks that sought to conserve global biodiversity in an efficient and effective manner, and legitimise the flow of international conservation funding. But without answering the question "exactly what is it we are trying to achieve?" how can we define efficiency and effectiveness? Within conservation, strategic conservation planning is a major success story. This is because reserves and reserve networks designed 100 years ago by early conservationists still exist and indeed are frequently taken for granted. At that time conservationists had to plan for massive social and economic change, whereas today planners need to look ahead to impacts of climatic, land use and other environmental change. In meeting the challenges of conservation planning in the 21st century, we have the benefits of hindsight, sophisticated and powerful technology and international communications. This module is designed to equip participants with a holistic understanding of protected area planning and management. The various sessions apply the scientific frames introduced in conservation biogeography and explore how these intertwine with policy and politics.

Introductory readings

Core text:

Moilanen *et* al (2010; "Spatial Conservation Prioritization — Quantitative Methods and Computational Tools", OUP, 328pp.

See also Ladle, R.J. & Whittaker, R.J. (eds) (2011) *Conservation Biogeography,* Wiley-Blackwell. See chapters 5,6, 7.

You are also advised to visit the key NGO 'resource' web-sites and review the various reports and guidelines relevant to this module and your interests. These include:

BirdLife International Data Zone http://www.birdlife.org/datazone/index.html

Centre for Applied Conservation Biology http://science.conservation.org/portal/server.pt

World Conservation Monitoring Centre http://www.unep-wcmc.org/

World Commission on Protected Areas
http://www.iucn.org/about/union/commissions/wcpa/index.cfm

Module outline

Week 1: Dr Paul Jepson

Values and protected areas

This session will review and contrast the different conceptions of value, specifically social values and resources values that legitimated the reservation of land in protected areas. We will examine a suite of social values that emerged as a consequence of nature-related knowledge-practices in Western Europe and East Coast America during the 19th century and that give rise to a foundational set of reserve types. These values will be contrasted with the 'valuation' conception that dominates current PA discourse and so the question posed is: "fundamentally what is the purpose of protected areas?"

Week 2: Dr Rich Grenyer

Global Protected Area Planning and Prioritization Frameworks: an overview

This and the week four session will compare and contrast the suite of planning and prioritization frameworks that guide spatial conservation actions and investments internationally. Specifically we will discuss group presentations of the 1972 IUCN biogeographic province framework, WWF's Global 200 Ecoregions, CI's Biodiversity Hotspots and BirdLife's Important Bird Area approaches. A new typology of reserve planning schemes will be introduced and the underlying science and methodological approaches of the various schemes will be examined.

Week 3: Prof Rich Grenyer

Systematic Conservation Planning – the theory

This session will introduce the sub-discipline of systematic conservation planning. Key concept such as complementarity and irreplaceability will be discussed in the context of complex decision problems, where species persistence is sought at minimum cost. In the session, we will examine the distinction between systematic and strategic; the benefits of the systems approach; how well such schemes build on pre-existing reserve networks and how well they address varied conservation values/objectives.

Week 4: Dr Richard Grenyer and Erin Parham (Flora & Fauna International)

Strategic conservation planning – the practice

In this session we will explore how the process of strategic conservation planning translates into real-world management decisions. SCP is sometimes criticised as inflexible, remote, complicated or too abstract for practitioners. After a lecture on the problems and process of acceptance, Erin Parham, whose job it is at FFI to bridge this gap between theory and practice, will hold an informal discussion and reflection session.

Week 5: Dr Richard Grenyer

Implications of evolution and phylogeny for protected area planning

This session will introduce the results of new spatial techniques that bridge different taxonomic levels and compare maps of phylogenetic richness and endemism with the species-level mapping that has largely guided protected area planning since the 1980s.

Week 6: Dr Bob Smith (DICE) and Dr Paul Jepson

The High Conservation Value Approach: a case study application in Madagascar

This criteria-based scheme for identifying important forest areas is gaining traction in the commercial centre, particularly among plantation companies involved in the production of palm oil and soy. It represents an important intersection between established reserve planning frameworks and the market-based certification instruments discussed in the conservation governance module. This session will examine the commercial drivers of the HCV approach along with its conceptual and methodological under-pinning. Drawing on a case a case study from Cabo Delgado Province in Mozambique we will examine the potential to combine the HCV approach with principles from systematic conservation planning.

Week 7: Dr Mark Mulligan (King's College London)

Mapping Ecosystem Services: mapping and quantifying the water and carbon services provided by the world's protected areas.

International conservation policy is embarking on a major reorientation away from biodiversity towards the maintenance of ecosystem service as the overarching policy goal. In response new global maps of water and carbon resources are being combined with maps on protected lands. This session will introduce and explore these new developments.

Week 8: Prof Robert Whittaker

Implementation of Protected area planning: a case study from the Canaries

This session will draw together some of the themes covered in the module through a protected area planning case study. The session will trace the development of a protected area network from initiation in 1954, with the first reserves designated in 1974, to the present state whereby approximately 40% of the Canarian archipelago's land surface area (and also a part of the seascape) is covered by some sort of protected area designation. We will explore how this happened and evaluate the network's present and future prospects. We focus particularly on the island of Tenerife, which has an indigenous protected area network based on the IUCN PA categories, supplemented by other networks and planning frameworks, such as NATURA, RAMSAR, and World Heritage Sites.

Module Title: CONTEMPORARY ISSUES in BIODIVERSITY

Hilary Term

Module leaders: Dr Shonil Bhagwat (and various guest speakers)
Guest speakers: To be confirmed

Module rationale

This module will be organised as a series of seminars that will examine current issues in biodiversity conservation and management. Although the nature of these seminars changes from year to year, a wide variety of topics are normally on offer: from agriculture to conservation in marine habitats to ecosystem services to cultural-spiritual values. Top conservation scientists and practitioners from around the globe are invited to give seminars as part of this module. The speakers normally talk for 60 minutes followed by up to an hour of questions and discussions. This module is designed to illustrate the wide range of opinions and values held by international conservationists.

Teaching approach

Most of the module will be delivered in traditional lecture format with opportunity for class discussion and reflection.

Students will be expected to have read appropriate key readings or sections of key reading prior to the lectures (TBA) in addition to any readings indicated during one of the previous classes. Students should also come prepared to actively engage in class discussions. Students will be given training in writing executive summaries and will be expected to write-up four of the seminars.

Module Title: BIODIVERSITY ASSESSMENT

Michaelmas and Hilary Terms

Module leader: Dr Shonil Bhagwat
Teaching staff: Professor Yadvinder Malhi, Professor Rob Whittaker, Dr Richard Grenyer, Dr Kate Parr (and various guest speakers)

Module rationale

This module involves some field trips that will introduce you to the theory and practice behind collecting biodiversity data. These field trips are spread over two terms and will include visits to locations near Oxford (e.g. Wytham Woods), elsewhere in the United Kingdom (e.g. Dale Fort, Pembrokeshire, Wales) and abroad (e.g. Tenerife). The field trips will be supplemented with theory classes and/or workshops. The main objective of this module is to equip you with knowledge of biodiversity surveys, even if it is not always possible to practise the hands-on survey skills. We will cover subject areas such as sampling designs, ecological field techniques and rapid biodiversity assessment for a variety of taxa.

Teaching approach

This course will be spread over two terms. The students will be expected to cover key readings, to collect and to work up data (individually or in small groups after fieldwork). The range of topics covered varies from year to year, but will normally include how to undertake biodiversity assessments in a variety of contrasting taxa and environments.

Further details are unavailable at time of going to press and will follow

Introductory readings

Gaston KJ (2000) Biodiversity: Higher-taxon richness. Progress in Physical Geography 24(1):117–127.

JNCC (2009) Joint Nature Conservation Committee Surveillance and monitoring http://www.jncc.gov.uk

Kent, M. & Coker, P. (1994) Vegetation description and analysis: a practical approach. John Wiley, Chichester.

Newton, A. C. (2007) Forest Ecology and Conservation, A Handbook of Techniques. OUP, Oxford.

Phillip, M. S. (1994) Measuring trees and forests. CAB International, Wallingford.

Sutherland, W. J. (2006) Ecological Census Techniques: A handbook, Cambridge, Cambridge University Press

Module Title: INTERNATIONAL ENVIRONMENTAL FRAMEWORKS & POLICY

Michaelmas Term

Module leader: Marta Lang
Integrated Module: All MSc Courses

Module rationale

The IEF module aims to:

(1) introduce structures, processes, mechanisms and actors in international environmental frameworks;
(2) canvas key international environmental law frameworks, how obligations are differentiated, and mechanisms to support compliance;
(3) focus on important obligations in four issue areas: terrestrial species conservation, ocean depletion, pollutants, and global warming;
(4) encourage critical thinking about underpinning concepts and principles;
(5) use case studies to bring issues alive;
(6) elicit perspectives on the value and limits of using international agreements as a tool to move environmental agendas forward.

Teaching approach

These classes will be taught in the lecture theatre. You are expected to complete 2-3 hours of readings prior to each lecture. Reading list and chapter extracts for lectures will be posted two weeks ahead of the class. Questions from the module will appear in compulsory examinations.

Introductory readings

Brand, U. and Gorg, C. (2003) The state and the regulation of biodiversity: International biopolitics and the case of Mexico. Geoforum 34: 221–233.

Chukwuka, E. (2007) The Bamako Convention on the Ban on the Import into Africa and the Control of the Transboundary Movement and Management of Hazardous Wastes Within Africa: a milestone in environmental protection? African Journal of International and Comparative Law 15(2): 208–229.

Cullet, P. (2003) Differential Treatment in International Environmental Law. London: Ashgate. Chapter 1: International Environmental Law, Sustainable Development and Differential Treatment: An Introduction, pp1–20. RSL, L2: K 3585 CUL or law library: Internat 610 C967a.

Oberthür, S and Lefeber, R. (2010) Holding countries to account: The Kyoto Protocol's compliance system revisited after four years of experience. Climate Law. 1(1): 133–158.
Scovazzi, T. (2004) Marine Protected Areas on the High Seas: Some Legal and Policy Considerations. International Journal of Marine and Coastal Law 19: 1–17.

Module outline

Week 3: Treaty making

The state, the commons and international multilateral treaty frameworks. How international law is made: national positioning, actors, state consent, and the function of the conference of the parties (COP). Case study on the Convention on Biological Diversity Nagoya COP outcomes.

Week 4: Terrestrial species loss

Approaches applied to stem species loss, and regulate the appropriation of biodiversity. The biodiversity, migratory species and trade in endangered species conventions. Case studies on access and benefit sharing in Mexico and South Asia.

Week 5: Marine depletion

Treaties governing fisheries management and marine conservation, with a focus on exclusive economic zones and the high seas. The implementing agreement for straddling and highly migratory fish stocks. Case studies on Australian fisheries legislation, bottom trawling, and Bluefin tuna.

Week 6: Pollution

The toxic waste, persistent organic pollutants, marine dumping and ship pollution conventions. How international obligations can be brought to bear in domestic court cases. Case study on toxic waste dumping in Africa.

Week 7: Global warming

How the climate change regime has evolved. Common but differentiated responsibility. The Kyoto Protocol, Clean Development Mechanism and recent developments. The place of science, experts and ad hoc working groups.

Week 8: Compliance, concepts and challenges

Mechanisms that encourage national implementation and a case study on the Kyoto Protocol compliance regime. Drawing together overarching concepts across issue areas. Key challenges in the use of international agreements as a tool to move environmental agendas forward.

Module Title: RESEARCH METHODS AND SKILLS

Michaelmas/Hilary Term/Trinity Term

Module leaders: Shonil Bhagwat

Teaching staff: Dr Rob Hope, Dr Paul Jepson, Dr Derek McCormack, Dr Craig Jeffrey and others.

Integrated Module: All MScs

Module rationale

This module will focus on a suite of common research practices and methods in the social sciences and policy studies. Subject to timetable constraints students may also attend other methods classes on offer in the IGS such as GIS. Students who have not already had training in basic statistical methods will be expected to attend the relevant course in Trinity Term.

Teaching approach

Several of the sessions will be delivered in larger classes involving students from the other MSc. courses. The timing of several classes is designed to support the research dissertation processes. The full list of classes is outline below and those that are required for BCM are indicated.

Michaelmas Term

Week 0: Introduction to the University library and e-resources

Sue Bird

This lecture will introduce you to libraries and e-resources at Oxford:
(1) Borrowing & photocopying / scanning in libraries;
(2) Training courses available SOLO, OLIS & OXLIP (e-journals & e-books); Web of Science, Scopus, & Google Scholar

Week 0: Introduction to research in the School of Geography

Prof David Thomas

In this lecture, the Head of the School of Geography and the Environment will provide an overview of geographical research at the school itself.

Week 2: Bibliographic skills

Sue Bird

This session will cover (1) Plagiarism v. Referencing; (2) Organizing your research and managing your database of references; (3) using Refworks or EndNote (3) Reference works (4) Brief introduction to Databases covering various databases & platforms & saying why Google is no use at this level of research.

Weeks 3-4: Statistics (Basic)

Dr Richard Bailey

The first lecture will provide an introduction to data collection, data reduction, and statistical confidence /uncertainty. The second lecture on statistics is an introduction to hypothesis testing methods, with time set aside for general Q&A.

Week 3: Introduction to qualitative techniques 1: Research Design and Interviews

Dr Craig Jeffrey

The session will begin with a brief introduction to qualitative research design and the role and importance of interviews for geographical research. In particular we will address questions of Why? Who? What? and How? with respect to interviews. The session will also include discussion in smaller groups.

Week 4: Introduction to qualitative techniques II: ethnography and participant observation

Dr Richard Powell

This session will introducing ethnography and participant observation within the context of other qualitative techniques. The session will involve the interpretation and analysis of some observational field notes and will consider the relative merits of qualitative methods.

Weeks 6-7: Policy Analysis

Prof Diana Liverman

The first session will discuss methods and frameworks for analyzing environmental policies using techniques that include critical analysis of the media, texts, web pages, government reports and statistics and that do not necessarily involve fieldwork.

The second session will discuss methods of understanding how to evaluate the success and failures of environmental policy at the local level including approaches to research design, case studies, fieldwork and combining natural and social science analysis using examples from projects on climate and development

Weeks 5-8: Bibliographic skills

Sue Bird

ECM (week 5); WSPM (week 6); BCM (week 7); NSEP (week 8)

This session will cover advanced bibliographic skills with examples relevant to each MSc and include (1) Searching techniques: wild cards, truncation, Boolean operators, exact phrases, synonyms, etc.; (2)Saving & rerunning searches to keep up to date.

Week 8: Science writing

Prof Rob Whittaker

Preparing papers for submission to scientific journals & insights into the peer review process

Hilary Term (Schedule tbc)

Week 1: Making presentations
Prof David Thomas
In this lecture, the Head of School will provide advice on communicating your research to an audience

Week 1: Writing Research Proposals
Dr Paul Jepson and Dr Derek McCormack
Writing skills for developing funding and grant applications

Weeks 2-4: Geographic Information Systems and Remote Sensing (Basic)
Dr Richard Grenyer and Mike Athanson
(1) What is a GIS? What isn't a GIS? Representing the real world via a computer. Georeferencing. Working with map projections. Outputs: map-making, map-using.
(2) Finding, importing, georeferencing and working with imagery data - aerial photographs, remote sensing data and topography. DEMs and TINs. Raster calculus.
(3) Finding, importing, georeferencing and working with vector data - vector organisation and theory. Topological and georelational vector data. Geomanipulation and buffering.

Weeks 5-7: Geographic Information Systems and Remote Sensing (Advanced)
Dr Richard Grenyer and Mike Athanson
(1) How to do line-of-sight, watersheds and overlay analyses.
(2) Getting started with transport and hydrographic networks in GIS. Linking in external models.
(3) Geostatistical output. Geolocation studies. Decision support.

Week 3: Questionnaire design
Dr Paul Jepson
This session will aim to build proficiency in designing and conducting robust questionnaire-based surveys. We will cover the use and agency of questionnaire-based research in environmental policy, the principles of question design and sampling frames and the practicalities of survey administration.

Week 4: Questionnaire Analysis
Dr Rob Hope
This session will cover how to analyse survey data in SPSS. Data cleaning and transformation, exploratory data analysis and some statistical methods will be introduced.

Week 5-6: Statistical Software for Social Scientists, SPSS Course
OUCS (Oxford University Computing Services)

This session will provide a supervised practical session for using SPSS statistical package for those who have not used it previously. This session will introduce students to creating SPSS data sets, transforming data in SPSS, producing simple statistical and graphical analyses and annotating data so that results are immediately usable.

Week 7: Risk Assessment and Fieldwork Safety
Area Safety Officer

This lecture will be presented by the Area Safety Officer and will introduce all students to the University of Oxford's protocol for risk assessment before you begin fieldwork for your dissertation projects.

Week 8: Social Science Writing
Prof Gordon Clark

This is will give guidance for social science-oriented research and development of writing skills.

Trinity Term (Schedule TBC)

Week 1: Key Informant Interviews Surgery
Dr Paul Jepson

Key informant interviews are the most popular method chosen for dissertation research. This workshop-style session will complement the session in Hilary Term and extend the discussion to consider the practicalities of securing and conducting interviews. It also deals with the transcription and analysis of interview data.

Week 2: Focus Groups Surgery
Dr Rob Hope

This session will introduce the rationale, design and practice of Focus Group Discussions. Sampling, participation and analysis issues will be discussed. Merits and constraints of FGDs as a research tool will also be explored.

Week 3: Ethnography Surgery
Dr Tom Thornton

This session introduces basic ethnographic methods, such as participant observation, used to investigate and analyse socio-cultural aspects of environmental issues. The session further examines the utility of an anthropological stance in interpreting data, even when conventional ethnographic methods are not employed.

MSc MARKING GUIDELINES

NB These guidelines are as used in assessments in the 2010/2011 academic year. They may be subject to change, but if so you will be informed of any changes that are made.

CLASS OR GRADE	MARK RANGE %	DESCRIPTIVE EQUIVALENT FOR EXAMS	DESCRIPTIVE EQUIVALENT FOR PROJECTS/ESSAY	DESCRIPTIVE EQUIVALENT FOR DISSERTATIONS
DISTINCTION	81+	A comprehensive and complete answer that clearly demonstrates a deep understanding of the subject, high intellectual quality and comprehensive knowledge of the facts. As good as could have been expected under examination conditions.	Worthy of retaining for future reference and application to teaching or research. Outstanding work based on a critical appraisal of a good volume of material that makes an original contribution to the subject.	Outstanding independent research of a standard equivalent to work published in leading academic journals in the field.
	80 70	Goes beyond simply answering the question. Perceptive focused use of a good depth of material. Original ideas or structure of argument and critical evaluation of the literature.	Wide breadth and intensity of accessed data or literature plus critical contribution or original finding relevant to the topic.	Identification with professional research approach. Full completion of task, achievement of stated objectives and good philosophical review of shortcomings. Clear critical appreciation of subject, study methods and findings.
MSc PASS	69 63	Perceptive analytical and critical understanding of the issues plus a coherent, well read and good presentation. MUST show evidence of wide background reading around the subject and a deep approach to study that goes beyond reproducing material given in lectures and seminars.	Thorough, clear treatment showing an understanding of arguments, contribution and context. Efficient use of literature. No serious flaws or misconceptions. Engages with the major issues and comes to sound and coherently argued conclusion.	Clear programme of study and worthwhile objectives. Well-conceived and executed. A highly satisfactory piece of work but with some unfulfilled potential.
MSc PASS	62 58 55 50	A "correct" answer based largely on lecture material. Little detail or originality but presented in an adequate framework. Lacks evidence of significant outside reading and, while sound, does not penetrate the subject sufficiently, nor display much critical evaluation.	Adequate treatment of literature or data but with little spark or critical insight. Efficiently reproduces material covered in lectures/seminars but adds only a little that comes from the student's own course of personal research and investigation.	Good effort and sound outcome but pedestrian or lacking in imagination and critical insight. Failure to achieve objectives fully. Programme of work not particularly ambitious or innovative. Satisfactory, but not stylish or perceptive.
FAIL	49 45 40	Engages with question but is a poorly structured answer based entirely on lecture material and containing several important errors of concept and/or fact. Overall, concepts are disordered or flawed, factual material is poorly presented and there is only shallow consideration of issues.	Basic approach to a narrow or misguided selection of material. Lacking in background or flawed in arguments. Lines of thought are not sustained and conclusions and not supported by the text/project analysis.	Deficient in effort or arguments/discussions poorly resourced. Uncritical use of literature. Little sign of analytical techniques or depth. No clear programme of work and insufficiently clear objectives.

FAIL	39 30	Attempts to engage with the question but with significant errors of content and scope, or poor in knowledge, structure and expression. No evidence of relevant outside reading.	Work is shallow and poorly presented. Lacking in sustained lines of thought or reasoning. No conclusions or conclusions incorrect. No evidence or relevant outside reading.	Low input of effort and superficial write-up conveying little of the context or value of the research. Barely adequate effort given the dissertation's importance.
FAIL	29-	Significant inability to engage with the question. Either, an answer to an imaginary question, or mostly irrelevant material to the question posed.	Inadequate and without any serious scholarly content.	Insufficient effort to complete a reasonable piece of work. An inadequate thesis.
	0	Copied or plagiarised answer with no intellectual input from the student resulting in immediate academic failure from the module, OR work penalised for late submission submitted without the granting of a specific dated extension by the lecturer of the appropriate module.		

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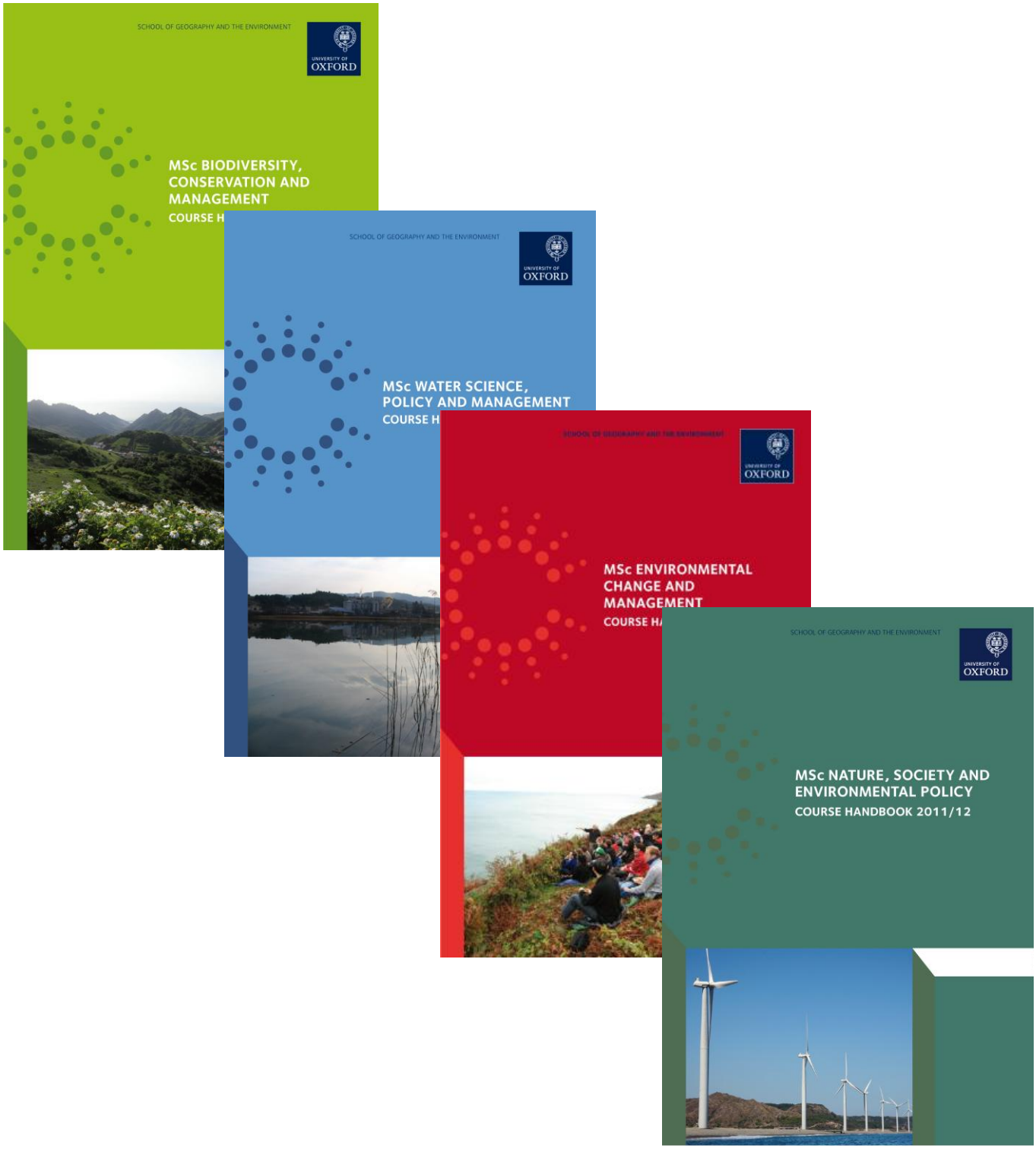
SCHOOL OF GEOGRAPHY AND THE ENVIRONMENT
UNIVERSITY OF OXFORD
MSc BIODIVERSITY, CONSERVATION AND MANAGEMENT
COURSE H
SCHOOL OF GEOGRAPHY AND THE ENVIRONMENT
UNIVERSITY OF OXFORD
MSc WATER SCIENCE, POLICY AND MANAGEMENT
COURSE H
UNIVERSITY OF OXFORD
MSc ENVIRONMENTAL CHANGE AND MANAGEMENT
COURSE HA
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UNIVERSITY OF OXFORD
MSc NATURE, SOCIETY AND ENVIRONMENTAL POLICY
COURSE HANDBOOK 2011/12

MSc BIODIVERSITY, CONSERVATION AND MANAGEMENT

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Course Director: Dr Shonil Bhagwat

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