Contents

PROGRAMME: MSc Nature Recovery, Restoration and Rewilding

Programme Director: Ian Thornhill

Programme code: 10861

CORE COURSE UNITS			
COURSE CODE	**COURSE TITLE**	**CREDITS**	**NOTES: P = Prerequisite & C = Co- requisite**
PLAN64111	People and Nature	15	
PLAN64121	Planning for Nature Recovery	15	
PLAN64131	Rewilding: Principles and Practice	15	
GEOG64142	Environmental Restoration	15	
PLAN64152	Methods for Ecological Analysis	15	
PLAN64162	Nature Positive Field Tour	15	
PLAN64170	Dissertation	60	
OPTIONAL COURSE UNITS (course unit details given below are subject to change, and are the latest example of the curriculum available on this course of study).			
Choose one semester one course unit from the following list:			
PLAN60771	Planning for Environmental Change	15	
GEOG60941	Environmental Remote Sensing	15	
GEOG70581	Environmental Monitoring and Modelling	15	
EART62051	Human Impacts on the Biosphere	15	
Or a free choice semester one elective on approval by the Programme Director		15	
Choose one semester two course unit from the following list:			
PLAN60442	Concepts in Environmental Law	15	
PLAN60402	Conservation Management Project	15	
GEOG71922	Spatial Ecology – still to be confirmed for 2025-26	15	
MGDI60552	Climate, Environment and Development	15	
SALC60422	Natural Heritage	15	
ECON60782	Economics of Environmental Policy	15	Requires 40 credits of associated UG learning
Or a free choice semester two elective on approval by the Programme Director		15	

Title	People and Nature
Unit code	PLAN64111
Credit rating	15 Credits
Unit Level	FHEQ Level 7
Teaching Period	Semester 1

OVERVIEW

"*We do not inherit the Earth from our ancestors, we borrow it from our grandchildren*." (Native American proverb)

To address the biodiversity crisis we need a paradigm shift in the co-existence of people and nature. The *People and Nature* course unit draws on multi-disciplinary experts to explore some of the contemporary philosophical, ethical, moral and practical debates and dilemmas confronting the imperative for transformative change for nature. Join us, and our external speakers, to embark on an engaging yet challenging journey exploring diverse perspectives on the intricate relationship between humanity and the natural world.

The course content will blend philosophy and ethics with specialisms spanning sociology, economics, politics, natural resource management and ecology. The course unit launches with introductory sessions that provide the theoretical and conceptual context for understanding the nature-people nexus. The remaining sessions then welcome a variety of guest speakers to provide inspirational 'soap-box' lectures that will encourage you to question, challenge and re-evaluate preconceptions about people and nature. Each of the guest lectures will be followed by an interactive workshop, where you will be invited to discuss and debate relevant topics, present and 'perform' (through role-play) diverse perspectives on challenging topics and develop skills in co-production, public participation and persuasive communication. The unit concludes with a session that reviews and reflects across the taught material to develop transdisciplinary perspectives. The *People and Nature* course unit will enable you to challenge conventional wisdom, cultivate critical thinking skills, and to develop nuanced, balanced and inclusive perspectives about our collective responsibility towards nature's restoration and our ethical obligations to future generations.

AIMS

- Convey the complexity of the relationship between humans and non-human nature and the scale of behaviour change required to achieve transformative change that will reverse biodiversity declines
- Encourage students to reflect on their personal environmental values, to identify and establish their role as nature positive facilitators and to foster the ability to communicate these positions to diverse audiences
- Offer students the opportunity to critically engage with diverse interdisciplinary approaches to nature recovery, restoration and rewilding provided by guest speakers working in practice or research
- Immerse students in the diverse range of contemporary debates that surround the nature positive agenda to demonstrate the philosophical, ethical and moral challenges and to expose uncertainties and contestations

LEARNING OUTCOMES

- Summarise, evaluate and defend their own values of, and relationships with nature and reflect on the positive and negative implications of these for addressing the biodiversity crisis
- Recognise, explain and respect diverse worldviews, opinions and values of nature and humanity's role in its restoration and recovery, including where these are in opposition to the student's own opinions
- Develop a transdisciplinary awareness of human-nature relationships that reflect inclusive, multi-cultural perspectives to address environmental and ecological injustices
- Evaluate the complexity of interactions between the priorities of different sectors that impact biodiversity and the philosophical, ethical and moral obligations required to implement transformative change for nature
- Locate, recognise and reference academic and other information sources that reflect diverse worldviews about nature recovery, restoration and rewilding
- Reflect on the process of designing questions and undertaking group-based interviews with an environmental expert
- Demonstrate empathetic communication skills, combining appraisal, responsiveness and respect for other worldviews
- Articulate ideas and opinion effectively to a target audience
- Confidently ascertain and analyse the opinions of other people
- Assimilate, respect and be open-minded to diverse values and worldviews about nature recovery, restoration and rewilding

TEACHING AND LEARNING METHODS

Students will be taught through a face-to-face format, with three hours of lecture-workshop hybrid each week across 11 weeks (some weeks will be one hour lecture, two hours workshop and other weeks will be vice versa). Guest lectures will be scheduled in the usual lecture slot for the course unit, and materials for/from the guest lecture will be uploaded to the VLE in advance of the session. In most instances, lectures will be recorded using the usual University systems, unless a guest speaker specifically requests not to be recorded - if this is the case, students will be notified in advance if possible. Discursive workshops that require student contributions will not be recorded. Students will also be provided with a suite of additional online learning material that can access asynchronously to augment their learning.

ASSESSMENT

Assignment 1 : Digital Media Recording (1000 words or 10 minute recording) 30% weighting

Assignment 2 : Essay (2000 words) 70% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING LIST

Arnds, P., 2020. Rewilding the world in the postcolonial age: On the nexus between cultural production and species politics. *Journal of Postcolonial Writing*, 56(4), pp.568-582.

Dunn-Capper, R., Quintero-Uribe, L.C., Pereira, H.M. and Sandom, C.J., 2023. Diverse approaches to nature recovery are needed to meet the varied needs of people and nature. *Sustainability Science*, pp.1-17.

Elliot, R., 2008. *Faking nature: the ethics of environmental restoration*. Routledge.

Feinberg, M. and Willer, R., 2019. Moral reframing: A technique for effective and persuasive communication across political divides. *Social and Personality Psychology Compass*, 13(12), p.e12501.

Kohler, F., Holland, T.G., Kotiaho, J.S., Desrousseaux, M. and Potts, M.D., 2019. Embracing diverse worldviews to share planet Earth. *Conservation Biology*, 33(5), pp.1014-1022.

Norton, B.G., 1994. *Toward unity among environmentalists*. Oxford University Press.

O'Neill, J., Holland, A. and Light, A., 2008. *Environmental Values*. Routledge.

Pettorelli, N. and Bullock, J.M., 2023. Restore or rewild? Implementing complementary approaches to bend the curve on biodiversity loss. *Ecological Solutions and Evidence*, 4(2), p.e12244.

Vlasceanu, M., Doell, K.C., Bak-Coleman, J.B., Todorova, B., Berkebile-Weinberg, M.M., Grayson, S.J., Patel, Y., Goldwert, D., Pei, Y., Chakroff, A. and Pronizius, E., *et al*. 2024. Addressing climate change with behavioral science: A global intervention tournament in 63 countries. *Science Advances*, 10(6), p.eadj5778.

Ward, K., 2019. For wilderness or wildness? Decolonising rewilding. In: Pettorelli, N., Durant, S.M. and Du Toit, J.T. eds., 2019. *Rewilding*. Cambridge University Press. pp.34-54.

STUDY HOURS

Scheduled Activity Hours	
Lectures	22
Seminars	8

Independent Study	
Private study	120

TEACHING STAFF

Staff Member	**Role**
Anna Gilchrist	Unit coordinator

Title	Planning for Nature Recovery
Unit code	PLAN64121
Credit rating	15 Credits
Unit Level	FHEQ Level 7
Teaching Period	Semester 1

OVERVIEW

It is widely acknowledged that traditional approaches to nature conservation have failed to reverse losses in biodiversity i.e., bend the curve. To reverse declines in biodiversity, a set of approaches to enhancing biodiversity have emerged under the auspices of the nature positive agenda to realise net gains in biodiversity through the decisions society makes. Nature recovery is one such approach aimed at building resilient landscapes through natural restoration and nature-based solutions, often through exploiting land-use policy mechanisms. In the context of the NR3 degree, nature recovery may be considered an over-arching approach that considers environmental restoration and rewilding as alternative or complementary approaches to enhancing biodiversity across landscapes. Indeed,

Central to this course unit is how planning and land-use policy can support nature recovery. While the phrase 'nature recovery' has been adopted into UK policy, the principles here apply internationally. A series of lectures will provide historical context for nature recovery and the nature positive agenda (and thus the MSc more widely) by exploring conventional approaches to nature conservation. There will also be a series of lectures and workshops that establish some of the current parameters within which nature recovery approaches must operate, or that must be amended to realise a nature positive future. This includes introductions to planning systems and examples of associated nature recovery policies, and agri-environmental schemes and farm management. Similarly, nature recovery will also be considered in sectors of industry not typically considered when attempting to recover biodiversity, which includes national and multinational corporations and the extraction industries (e.g., mining, forestry). The role and influence of the general public as critical stakeholders will be explored in each instance.

The different approaches to nature recovery will be explored through a residential field visit, with students exposed to different approaches to nature recovery being implemented across and urban to rural gradient (e.g., urban and non-urban rewilding, biodiversity net-gain, regenerative agriculture). The field visit will be an opportunity to learn and apply basic field skills to assess and map ecological condition of frequently encountered habitats.

AIMS

- Introduce the benefits and limitations of key conventional approaches to nature conservation and how approaches to nature recovery contrast
- Explore contemporary and emerging developments in planning and land-use policy and legislation that could support nature recovery
- Develop foundational skills in identifying habitats and species
- Develop digital skills to be able to accurately represent field research in a digital form (e.g., Geographical Information Systems)
- Provide context for exploring the opportunities and challenges to implementing alternative approaches to nature positive in different social and environmental contexts
- Identify unique or shared visions to nature recovery across alternative nature-based solutions

LEARNING OUTCOMES

- Contrast conventional approaches to nature conservation with those aligned with nature recovery.
- Identify the key concepts and theories that underpin nature recovery and their translation into practice.
- Describe relevant policy and legislation to nature recovery
- Critically evaluate the opportunities for nature recovery in different social-ecological contexts.
- Describe the role of different stakeholders in achieving nature recovery including the business sector.
- Evaluate some of the ethical, scientific and technological issues related to the implementation of nature recovery.
- Carry out basic ecological surveys to inform a condition assessment of widespread habitat types.
- Use a geographical information system to map habitat boundaries and calculate habitat distribution.
- Take accurate field notes for subsequent desk-based interpretation.
- Empathise with a range of different stakeholder perspectives on nature recovery initiatives.

TEACHING AND LEARNING METHODS

This course unit will utilise the 'flipped classroom' method, introducing core concepts, debates and case studies through a weekly asynchronous content (e.g., recommended reading, videos, blogs) which are complemented with weekly 2-hour lectures and workshops, which will allow students to embed their knowledge and understand complexities. The advantage to flipped-classroom approaches on this module is to allow for flexibility in the independent study – recognising that students will arrive from varied backgrounds. Thus, allowing for more independent, directed study will scaffold students more, or less, familiar with core NR3 topics to top up their understanding in their own space and time, while the face-to-face sessions can offer a more discursive approach and facilitate more peer-to-peer learning. Appropriate approaches to scaffolding student learning may be E-tivities (broadly encompassing the five-stage learning process of 1) Focus; 2) Action; 3) Support; 4) Feedback; 5) Debrief. How asynchronous content is engaged with will be monitored through usage statistics collected by the VLE.

In addition, students will have 6 hours computer suite session where they will utilise ArcGIS Pro. Students will also attend one half day (5 hours) and three full day (8 hours) field visits to learn practical field skills in basic habitat and species identification and mapping, and to explore different nature positive approaches and interact with practitioners responsible for them.

ASSESSMENT

Assignment 1 : Mapping Exercise (Map + 500 words) 50% weighting

Assignment 2 : Essay (1500 words) 50% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Scriven, S.A., Waddell, E.H., Sim, S., King, H., Reynolds, G., Yeong, K.L. and Hill, J.K., 2022. Supporting decision-making by companies in delivering their climate net-zero and nature recovery commitments: Synthesising current information and identifying research priorities in rainforest restoration. Global Ecology and Conservation, 40, p.e02305.

Schéré, Constance M., Cunningham, Charles a., Metcalfe, Chloë Alexia, Griffin, Donal C., Hoppit, George, Turner, Rebecca K., Travers, Thomas, Hill, Jane K. and Sinnadurai, Paul (2022) Protected Areas and Nature Recovery: Achieving the goal to protect 30% of UK land and seas for nature by 2030. Project Report. British Ecological Society.

Elphick, A., Ockendon, N., Aliácar, S., Crowson, M. and Pettorelli, N., 2024. Long-term vegetation trajectories to inform nature recovery strategies: The Greater Côa Valley as a case study. Journal of Environmental Management, 355, p.120413.

Crowther, L.P., Gilroy, J.J., Hawkes, R.W., Peach, W.J., Salliss, D., Webb, J.R. and Dolman, P.M., 2023. Harnessing biodiversity data to inform policy: Rapid regional audits should underpin Local Nature Recovery Strategies. Biological Conservation, 282, p.110004.

Natural England (2024) Policy Paper: The Nature Recovery Network. Available at: https://www.gov.uk/government/publications/nature-recovery-network/nature-recovery-network

Wilkes, M.A., Mungee, M., Naura, M., Bell, V.A. and Brown, L.E., 2024. Predicting nature recovery for river restoration planning and ecological assessment: A case study from England, 1991–2042. River Research and Applications.

Parris, K.M., Amati, M., Bekessy, S.A., Dagenais, D., Fryd, O., Hahs, A.K., Hes, D., Imberger, S.J., Livesley, S.J., Marshall, A.J. and Rhodes, J.R., 2018. The seven lamps of planning for biodiversity in the city. Cities, 83, pp.44-53.

Nilon, C.H., Aronson, M.F., Cilliers, S.S., Dobbs, C., Frazee, L.J., Goddard, M.A., O'Neill, K.M., Roberts, D., Stander, E.K., Werner, P. and Winter, M., 2017. Planning for the future of urban biodiversity: a global review of city-scale initiatives. BioScience, 67(4), pp.332-342.

Hall, T., 2019. Town planning: the basics. Routledge.

Smith, N., Croft, N. and Sheppard, A., 2019. The Short Guide to Town and Country Planning 2e.

Wuepper, D., Wiebecke, I., Meier, L., Vogelsanger, S., Bramato, S., Fürholz, A. and Finger, R., 2024. Agri-environmental policies from 1960 to 2022. Nature Food, pp.1-9.

Leclère, D., Obersteiner, M., Barrett, M., Butchart, S.H., Chaudhary, A., De Palma, A., DeClerck, F.A., Di Marco, M., Doelman, J.C., Dürauer, M. and Freeman, R., 2020. Bending the curve of terrestrial biodiversity needs an integrated strategy. Nature, 585(7826), pp.551-556.

STUDY HOURS

Scheduled Activity Hours	
Lectures	15
Workshops	14
Computer Sessions	6
Field Visits	29

Independent Study	
Private study	86

TEACHING STAFF

Staff Member	**Role**
Ian Thornhill	Unit coordinator

Title	Rewilding: Principles and Practice
Unit code	PLAN64131
Credit rating	15 Credits
Unit Level	FHEQ Level 7
Teaching Period	Semester 1

OVERVIEW

Rewilding is the radical new science aiming to restore natural processes, increase ecological and trophic complexity and establish more resilient ecosystems. Rewilding also holds enormous potential in transforming the relationships that people have with nature. Although it is perhaps the most exciting and innovative solution being proposed to help address the biodiversity crisis, in many situations it remains controversial and contested.

In this course unit, students delve into the interdisciplinary science of rewilding, learning about the ecological principles and practical applications that underpin the restoration of natural processes, alongside recognising the social, cultural, economic and political opportunities and challenges that rewilding poses. The unit begins by exploring the foundational concepts of rewilding, emphasising the restoration of natural processes, the importance of ecological and trophic complexity and core landscape-ecology principles including the importance of scale and connectivity. Commensurate with the ecological focus, students are also immersed in the social dimensions of rewilding, considering the implications of rewilding for culture, heritage, land-based economies, livelihoods, policy and politics. This explores the collaborations and conflicts between stakeholders with diverse perspectives, including local communities, conservation organisations and policymakers.

To gain a comprehensive understanding of the complexities inherent in rewilding principles and practice, this course unit adopts a ‘flipped classroom’ approach, where core knowledge is developed through engaging, asynchronous learning that draws on a wide range of international case-studies. This content is then discussed in weekly interactive workshops designed to enhance skills in critical thinking and embed interdisciplinary and pluralistic perspectives. Additionally, knowledge is also applied through computer sessions and field visits, where students learn core practical skills to implement both the ecological and social requirements of rewilding and reflect on how these play out in real-world situations.

AIMS

- demonstrate the ecological and social imperative for rewilding and embed an interdisciplinary understanding of the key concepts, methods and theories that underpin rewilding's many definitions
- immerse students in the ethical and moral debates surrounding rewilding and establish the importance of embedding people and communities into rewilding principles and practices
- equip students with the ecological and social skills required to effectively implement rewilding
- enable students to effectively communicate the positive and negative impacts of rewilding to a range of different audiences
- support students to assimilate the values and qualities vital to ensuring rewilding success, including empathy, humility, respect and the ability to listen to others.

LEARNING OUTCOMES

- Describe and compare different conceptual and practical interpretations of rewilding and critically analyse their contribution to the nature positive agenda
- Explain and evaluate the influence of key stakeholders, policy and legislation on the practical application of rewilding in different contexts
- Apply systems thinking to justify how rewilding influences broader socio-economic and environmental issues
- Explain, evaluate and defend appropriate rewilding interventions using relevant ecological theories, knowledge of different ecological baselines and awareness of socio-economic and ethical considerations
- Critically analyse the socio-economic implications of rewilding, considering positive and negative perspectives including marginalised voices and indigenous and local communities
- Apply different field and digital techniques to inform recommendations for appropriate rewilding interventions
- Recognise the role of uncertainty and incomplete information when making decisions about rewilding futures
- Clearly communicate complex ideas in written form using visual material and spatial analysis to illustrate information
- Recognise the diverse perspectives on rewilding and communicate thoughts and ideas with an awareness and sensitivity to cultural and ethical challenges
- Integrate ecological and social perspectives on rewilding to develop values that balance the needs of humans and non-humans

LEARNING AND TEACHING METHODS

This course unit will utilise the 'flipped classroom' method, introducing core concepts, debates and case studies through a weekly 'asynchronous lecture' which are complemented with weekly 2 hour workshops, which will allow students to embed their knowledge, understand complexities and appreciate diverse viewpoints. In addition, students will have 6 hours of computer suite sessions where they are provided with an introduction to ArcGIS Pro and ArcGIS Storymaps. Students will also attend two half day (5 hours) and one full day (8 hours) field visit to learn practical field skills in identifying and measuring rewilding interventions in practice and experiencing stakeholder engagement skills.

ASSESSMENT

Assignment 1 : 2 x Post/Blog (Map + 500 words) 30% weighting

Assignment 2 : ArcGIS Storymap (1500 words) 70% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Blythe, C. and Jepson, P. (2020) *Rewilding: The radical new science of ecological recovery* (Vol. 14). Icon Books.

Butler, J.R., Marzano, M., Pettorelli, N., Durant, S.M., du Toit, J.T. and Young, J.C., 2021. Decision-making for rewilding: an adaptive governance framework for social-ecological complexity. *Frontiers in Conservation Science*, 2: 681545.

Carver, S., Convery, I., Hawkins, S., Beyers, R., Eagle, A., Kun, Z., Van Maanen, E., Cao, Y., Fisher, M., Edwards, S.R. and Nelson, C., 2021. Guiding principles for rewilding. *Conservation Biology*, 35(6):1882-1893.

Glentworth, J., Gilchrist, A. and Avery, R. (2024) The place for people in rewilding. *Conservation Biology*. DOI (forthcoming):

Hayward, M.W., Scanlon, R.J., Callen, A., Howell, L.G., Klop-Toker, K.L., Di Blanco, Y., Balkenhol, N., Bugir, C.K., Campbell, L., Caravaggi, A. and Chalmers, A.C. (2019) Reintroducing rewilding to restoration–Rejecting the search for novelty. *Biological Conservation*, 233: 255-259.

Pascual, U., Balvanera, P., Anderson, C.B., Chaplin-Kramer, R., Christie, M., González-Jiménez, D., Martin, A., Raymond, C.M., Termansen, M., Vatn, A. and Athayde, S., 2023. Diverse values of nature for sustainability. *Nature*, 620(7975): 813-823.

Perino, A., Pereira, H.M., Navarro, L.M., Fernández, N., Bullock, J.M., Ceauşu, S., Cortés-Avizanda, A., van Klink, R., Kuemmerle, T., Lomba, A. and Pe'er, G. (2019) Rewilding complex ecosystems. *Science*, 364(6438): p.eaav5570.

Pettorelli, N., Durant, S.M. and Du Toit, J.T. eds. (2019) *Rewilding*. Cambridge University Press.

Ward, K. (2019) For wilderness or wildness? Decolonising rewilding. *Rewilding*, 34-54.

Popular Science Reading:

Macdonald, B., 2019. *Rebirding: Rewilding Britain and its birds*. Pelagic Publishing Ltd.

Monbiot, G., 2014. *Feral: Rewilding the land, the sea, and human life*. University of Chicago Press.

Tree, I., 2018. Wilding: *The return of nature to a British farm*. Pan Macmillan.

STUDY HOURS

Scheduled Activity Hours	
Lectures	22
Workshops	20
Computer Sessions	6
Field Visits	18

Independent Study	
Private study	84

TEACHING STAFF

Staff Member	**Role**
Anna Gilchrist	Unit coordinator

Title	**Environmental Restoration**
Unit code	GEOG64142
Credit rating	15 Credits
Unit Level	FHEQ Level 7
Teaching Period	Semester 2

OVERVIEW

"One of our best tools for confronting urgent global environmental challenges is ecological restoration" (Peter Raven 2013).

Anthropogenic activities have profoundly altered environments and ecosystems at all scales from local to global, and the human aspiration to live sustainably has led to attempts to more effectively manage environments and ecosystems to prevent future degradation. Crucially however, there is now clear recognition that we also require active restoration of damaged environments and ecosystems to provide greater resilience to climate and biodiversity change and associated environmental pressures such as increased flood frequency, water resource availability, food security, etc.

Environmental Restoration can be defined as the process of assisting the recovery of an environment or ecosystem that has been degraded, damaged or destroyed, and as a term is often used interchangeably with Ecological Restoration. Environmental restoration is increasingly recognised as a practical application of our knowledge of earth surface processes and environmental change, for example through advising environmental managers on river restoration or coastal management schemes for flood defence.

This course reviews the principles and concepts of environmental restoration before critically evaluating a range of examples, focusing throughout on the science and monitoring that that underpin and inform restoration practice.

AIMS

- demonstrate the principles and concepts of environmental and ecological restoration and explore a range of examples of environmental restoration in relation to nature recovery.
- equip students with a scientifically grounded understanding of the strategies and techniques used to restore degraded or damaged environments, including the importance of monitoring to produce robust scientific evidence for the impacts of restoration.
- enable students to critically examine the role of restoration for environmental management at a range of scales.
- demonstrate how scientific research on environmental restoration informs policy and practice.
- Immerse students in the key debates and challenges surrounding environmental restoration in relation to varied stakeholder requirements and our changing climate.

LEARNING OUTCOMES

- Describe and compare the principles and concepts of environmental and ecological restoration and recognise the importance of restoration in relation to nature recovery
- Explain the hydrological, geomorphological and ecological processes underpinning the science of environmental restoration.
- Comprehend the wider role of environmental restoration in environmental management.
- Critically evaluate a wide range of practical examples of environmental restoration and understand their value in terms of ecosystem services.
- Identify and critically evaluate strengths and weaknesses of environmental restoration schemes.
- Apply their detailed understanding of the key principles and concepts of environmental and ecological restoration to practice and policy
- Identify and apply the correct monitoring techniques and data analysis methods for a range of restoration scenarios
- Design scientifically robust monitoring regimes.
- Think critically, communicate complex ideas in a written format, and self-direct learning.
- Evaluate scientific evidence and outputs.
- Recognise the diverse perspectives on environmental restoration and critically engage with and contribute to key debates and controversies.

TEACHING AND LEARNING METHODS

The core of the course is delivered through a series of two hour flexible (and largely interactive/sometimes flipped) lecture and one hour support/seminar sessions, but will also include other teaching types specifically: a field class to visit a live environmental restoration project, labs classes, computer practicals.

The sessions will be supported by online material (including VLE), directed reading and practical assignments.

Students are expected to read widely to support these classes, and fully participate in the 'nonstandard' classes including the class debate and field class.

Feedback will be provided in the following ways:

Verbal feedback through interactive Q&A during the lecture classes

Verbal feedback on course unit issues through consultation hours

Verbal formative feedback on a coursework proposal and data analysis task

Detailed written feedback on coursework assignments

ASSESSMENT

Assignment 1 : Coursepaper project (2000 words) 70% weighting

Assignment 2 : Data Analysis Workbook (1000 words) 30% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Specific reading lists with be provided for each lecture, but broad course texts include:

Clewell, A.F. & Aronson, J. (2013) Ecological Restoration: Principles, Values and Structure of an Emerging Profession. Island Press: London, 303pp.

Perry, M.R. & Davy, A.J. (Eds) (2002) Handbook of Ecological Restoration Volume 1: Principles of Restoration. Cambridge University Press: Cambridge, 444pp.

Perry, M.R. & Davy, A.J. (Eds) (2002) Handbook of Ecological Restoration Volume 2: Restoration in Practice. Cambridge University Press: Cambridge, 444pp.

Woodworth, P. (2013) Our Once and Future Planet: Restoring the World in the Climate Change

Century. University of Chicago Press: London, 515pp.

Key journals include:

Ecological Restoration, Journal of Environmental Management, Science of the Total Environment, Landscape Research, Journal of Applied Ecology, Journal of Hydrology, Ecological Engineering, Restoration Ecology.

STUDY HOURS

Scheduled Activity Hours	
Lectures	16
Seminars/Workshops	4
Field Visits	7
Computer Sessions	4

Independent Study	
Private study	115

TEACHING STAFF

Staff Member	**Role**
Emma Shuttleworth	Unit coordinator

Title	Methods for Ecological Analysis
Unit code	PLAN64152
Credit rating	15 Credits
Unit Level	FHEQ Level 7
Teaching Period	Semester 2

OVERVIEW

Evidence comes in many forms, both quantitative e.g., numbers, and qualitative e.g., expert opinion, and all have value provided that they are robustly and objectively collected and analysed. Such evidence is critical to demonstrate the effectiveness or not of interventions, or to inform decision-making and policy development. Consequently, to realise the transformative change needed in conservation, and when implementing interventions that are in themselves contested or in locations where they may be considered controversial, the evidence base must be convincing.

Students on NR3 will have encountered a range of methodological approaches during Semester 1. The present module will begin by reviewing and recapping those previously covered. Thereafter, the course unit will consolidate, and compliment knowledge previously learned to set into context the toolkit of approaches available to data generation in social-ecological studies. Thus, qualitative and quantitative analyses will be introduced and reviewed for their role in evidence generation, with an emphasis on mixed-method approaches.

Students taking the course unit will broadly follow the scientific process: observing and questioning, identifying research areas, generating hypotheses, experimental set ups, data analysis, reporting results. A central theory will be the reduction of uncertainty and thus, the sources of uncertainty in data collection and analysis e.g., reduction of error and redundancy in data collection and handling. Throughout the unit, students will be encouraged to consider their dissertation topics during this process by identifying which methods they may wish to employ / are feasible given the topic of interest.

AIMS

- Introduce students to range of methods to collect quantitative or qualitative data
- Develop students quantitative and qualitative data handling skills for use in ecological and environmental management.
- Increase students confidence in generating, retrieving, manipulating and presenting quantitative and qualitative data.
- Enable students to understand quantitative data to facilitate the implementation of descriptive and inferential statistics.
- Introduce a range of relevant software for quantitative or qualitative data analysis

LEARNING OUTCOMES

- Describe and summarise secondary data using descriptive and basic inferential statistics.
- Demonstrate data literacy including knowledge of data types, distribution, visualisation and manipulation.
- Appraise the suitability of data for different analyses, including interrogating sources, sampling and techniques for manipulation.
- Identify some of the ethical, scientific and technological issues related to the use of quantitative data for environmental management.
- Retrieve and manipulate quantitative data from a variety of secondary data sources.
- Analyse data for use in a range of situations and applications; including screening, cleaning and recognising parametric and non-parametric distributions.
- Select and use appropriate software to perform basic quantitative methods of data analysis to help understand environmental challenges.
- Synthesise and present data in a variety of ways to communicate a specific environmental challenge or solution.

TEACHING AND LEARNING METHODS

The unit will be delivered through a combination of lectures, workshops and computer suite sessions where they will use Excel and be introduced to R Statistics Software and NVivo for quantitative and qualitative data analysis respectively. There will also be a single field practical based within the University campus to demonstrate data collection methods and hypothesis testing (8 hours).

The in-person sessions will mostly contain workshops (10 hours) using a flipped classroom styled approach whereby students will be encouraged to participate in asynchronous 'lecture-based' pre-workshop activities (approx. 1 – 2 hours each), that will then be discussed and problem-solved in further detail during the timetabled session. This will encourage students to apply asynchronous learnings to new content during the workshops, which is particularly important where they have different levels of initial understanding. These workshops will mostly take place using computer suites. Lecture content (i.e., asynchronous, 10 hours) will cover essential guidance that provides context for empirical data analyses such as risk assessments (health and safety, ethics), and how to handle data sensitively, as well as conceptual content regarding sources of error and misinformation. Although these sessions will be asynchronous, students will nevertheless be expected to take part in interactive exercises within the sessions, with content to be reviewed pre- and post- session.

ASSESSMENT

Assignment 1 : Open workbook – data exploration (1000 words) 40% weighting

Assignment 2 : Professional Report (2000 words) 60% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Baca, M. ed., 2016. Introduction to metadata. Getty Publications.

Davis, A.J. and Kay, S., 2023. Writing statistical methods for ecologists. Ecosphere, 14(5), p.e4539.

Dormann, C., 2020. Environmental Data Analysis: An Introduction with Examples in R. Springer Nature.

Drinkwater, E., Robinson, E.J. and Hart, A.G., 2019. Keeping invertebrate research ethical in a landscape of shifting public opinion. Methods in Ecology and Evolution, 10(8), pp.1265-1273.

Emetere, M.E., 2022. Numerical Methods in Environmental Data Analysis. Elsevier.

Fox, G.A., Negrete-Yankelevich, S. and Sosa, V.J. eds., 2015. Ecological statistics: contemporary theory and application. Oxford University Press.

Gardener, M., 2017. Statistics for ecologists using R and Excel: data collection, exploration, analysis and presentation. Pelagic Publishing Ltd.

Shukla, S., George, J.P., Tiwari, K. and Kureethara, J.V., 2022. Data Ethics and Challenges. Springer Singapore Pte. Limited.

Steel, E.A., Kennedy, M.C., Cunningham, P.G. and Stanovick, J.S., 2013. Applied statistics in ecology: common pitfalls and simple solutions. Ecosphere, 4(9), pp.1-13.

Van Belle, G., 2011. Statistical rules of thumb. John Wiley & Sons.

Zuur, A.F., Ieno, E.N. and Meesters, E.H., 2009. A Beginner's Guide to R (p. 150). New York: Springer.

STUDY HOURS

Scheduled Activity Hours	
Lectures	10
Workshops	10
Computer Sessions	12
Field Visits	8

Independent Study	
Private study	110

TEACHING STAFF

Staff Member	**Role**
Ian Thornhill	Unit coordinator

Title	**Nature Positive Field Tour**
Unit code	PLAN64162
Credit rating	15 Credits
Unit Level	FHEQ Level 7
Teaching Period	Semester 2

OVERVIEW

A key barrier to the restoration of wild nature is the inability to imagine it; Shifting Baseline Syndrome means that humans all too readily accept an impoverished state of nature from previous generations because we cannot see what existed before our lifetimes. One of the most important tools in the armoury of transformative conservation is therefore exposing students to the inspiration and awe that wild nature and functioning ecosystems can engender, and to demonstrate the positive trajectory of ecosystems where practical projects are delivering nature recovery, restoration and rewilding. In addition to inspiration, exposing students to projects that are delivering these nature positive solutions, also provides the opportunity for developing critical knowledge and skills in research and monitoring. As transformative conservation methods become more mainstream, there is going to be an increasing demand for measuring their 'success', in ecological terms, but also calculating the socio-economic and wider environmental benefits.

The purpose of the *Nature Positive Field Tour* is therefore two-fold: 1) to expose students to inspirational examples of transformative conservation in action and to demonstrate the awe that wilder ecosystems can instil, and 2) to provide students with the knowledge and practical skills in research and monitoring of nature positive solutions that span the natural and social sciences. Pre-field tour sessions expose students to the breadth of techniques available for undertaking research on transformative conservation, enabling them to design and implement independent research in the field, while embedding an understanding of ethics into their research practices. The field tour itself, then allows students to consolidate their learning on a variety of research methods and explore opportunities for monitoring the impacts or trajectory of nature positive interventions. Finally, students will also have the opportunity to reflect on the challenges and opportunities of undertaking research in the field.

AIMS

- Expose students to inspirational examples of nature recovery, restoration and rewilding in different contexts, and develop an appreciation of the ecological and social importance of functioning ecosystems
- Provide opportunities for students to hear from practitioners implementing transformative conservation, and critically evaluate the barriers and opportunities for delivery.
- Explore opportunities for practically measuring progress and/or success in future-oriented nature recovery, restoration and rewilding.
- Develop knowledge of a range of research skills needed to design, collect, analyse, present and interpret empirical quantitative and qualitative data relevant to the programme.
- Apply knowledge of and critically reflect on research design and implementation processes through the development and execution of independent research in the field.

LEARNING OUTCOMES

- Plan mini-independent research projects that include designing, implementing and evaluating research methodologies.
- Measure, summarise and analyse the impacts of nature positive interventions in one or more ways (ecologically, environmentally, socially or economically)
- Describe, compare and contrast the differences between degraded and restoring ecosystems
- Evaluate the rigour, reproducibility and replicability of data collection methods in the field
- Critically analyse and evaluate the barriers and opportunities to implementing transformative conservation in practice
- Appraise and interpret the influence of exposure to nature positive interventions on their personal perspectives and development
- Select, describe, implement and evaluate different practical methods for measuring the success of nature recovery, restoration or rewilding whilst recognising the challenge of uncertainty and incomplete data
- Reflect on the influence of exposure to transformative conservation on their own, personal understanding and development
- Communicate effectively in both verbal and written form.
- Evaluate the ethical implications of different research methods.
- Reflect on the benefits provided by team and partnership working

TEACHING AND LEARNING

This course unit will include three x 2 hour in-class sessions before the field tour, which will be accompanied by four asynchronous group tasks (taking approximately one hour each). The field course itself will be between 5-7 days (depending on the availability of flights, accommodation, etc.). Following the return from the field tour their will be a de-briefing session and drop-in support for Assignment 2.

ASSESSMENT

Assignment 1 : Group Presentation (10 minutes) 25% weighting

Assignment 2 : Field Tour Journal (2000 words) 75% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Cottrell, S., 2019. *The study skills handbook*. Bloomsbury Publishing.

Langhammer, P.F., Bull, J.W., Bicknell, J.E., Oakley, J.L., Brown, M.H., Bruford, M.W., Butchart, S.H., Carr, J.A., Church, D., Cooney, R. and Cutajar, S., 2024. The positive impact of conservation action. *Science*, 384(6694): 453-458.

Montello, D. and Sutton, P., 2012. *An introduction to scientific research methods in geography and environmental studies* (Vol. 1). Sage, London.

Vero, S.E., 2021. *Fieldwork Ready: An Introductory Guide to Field Research for Agriculture, Environment, and Soil Scientists* (Vol. 188). John Wiley & Sons.

Walliman, N (2006) *Social Research Methods*. Sage, London (available online to read/download via University Library)

Wheater, C.P., Bell, J.R. and Cook, P.A., 2020. *Practical Field Ecology: A project guide*. John Wiley & Sons.

STUDY HOURS

Scheduled Activity Hours	
Lectures	8
Seminars	tbc
Field Visits	48

Independent Study	
Private study	94

TEACHING STAFF

Staff Member	**Role**
Anna Gilchrist	Unit coordinator

Title	Dissertation
Unit code	PLAN 64170
Credit rating	60
Unit Level	FHEQ Level 7
Teaching Period	Full Year (mainly Semester 2)

OVERVIEW

Students on Postgraduate Masters degree programmes within the Department of Planning, Property and Environmental Management are required to prepare a dissertation of 12,000 words on an agreed topic. This unit provides students with an opportunity to both synthesise existing scholarly work and conduct their own research, thereby contributing novel insights to the field of nature recovery, restoration or rewilding. Students are free to consider a wide range of relevant topics, subject to approval on the basis of advisory expertise from staff in the Department of Planning, Property and Environmental Management and the feasibility of undertaking the topic within the timescale of the programme. The process of conducting an independent research project and writing a dissertation involves identifying a research problem, proposing a research aim and objectives/questions, reviewing existing literature, selecting appropriate methodologies, collecting and analysing data, presenting findings in a coherent manner and discussing the implications of the findings in the context of existing literature. Throughout this unit, students will get the opportunity to develop advanced research capabilities, enhance their critical thinking, and improve their writing, communication and presentation skills, all of which are essential for both academic and professional success. Upon completion of their dissertation, students will have not only produced a substantial piece of academic work but also developed a deep understanding of their chosen topic. This enhances their expertise in their field and prepares them for future academic pursuits or professional careers.

AIMS

- Provide students with an opportunity to plan, manage and conduct an in-depth, advanced enquiry on a topic of interest related to nature recovery, restoration and/or rewilding;
- Develop students' skills in conducting a review of existing literature and selecting an appropriate research methodology and methods to add to that body of knowledge;
- Provide students with an opportunity to apply data collection and analytics skills, developed in other course units, in a research context;
- Facilitate students to explore and contribute to knowledge about a current issue that has direct topicality related to nature recovery, restoration and/or rewilding
- Enhance students' writing, presentation and bibliographic skills

LEARNING OUTCOMES

- Identify, synthesise and communicate the research problem relating to the chosen topic of enquiry and its relevance to nature recovery, restoration and rewilding
- Comprehend and outline the different stages of the research process from planning, approval to dissemination.
- Identify the importance of conducting ethically sound research in nature recovery, restoration and rewilding
- Critically assess the complexities of the research process, including the analysis of different literature/documents, the analysis and interpretation of data.
- Apply relevant theoretical concepts in devising, applying and critiquing the chosen methodology, methods, and data analysis.
- Synthesise and conceptualise research data into relatable findings and recommendations.
- Identify and apply a range of advanced research skills, which may include: ecological surveys, other field surveys, questionnaire design, interviews, observation; and the recording, analysis and interpretation of qualitative and/or quantitative data.
- Articulate the research process and research findings in an agreed format and appropriate written style using terminology and academic language.
- Employ diverse software, digital tools and analytical techniques that are required and valued in professional practice

TEACHING AND LEARNING METHODS

Lecture-based sessions: 2 x 2 hour sessions (4 hours)
Core content on dissertation and research ethics is taught in lecture-based sessions in Semester 2. E-learning content is provided via the VLE including interactive material using a range of multimedia sources.

Tutorials: 6 hours
Students will use supervision meetings to engage with their advisors to further develop their research plans based on the research proposals they submitted in year 2 and gain further advice on the dissertation including ethics, data collection, analysis, and presentation of findings.

Drop-in sessions will be available during the summer vacation period for students to ask general and technical questions.

Assessment and independent learning: 590 hours
Students will conduct independent learning and research, which includes searching for and reading literature, formulating research questions and objectives, designing methodology, collecting and analysing data, and writing and presenting the findings. In this process, students will be assisted with formative feedback from the teaching team via drop-in sessions and from their supervisors.

ASSESSMENT

Dissertation (12,000 words) 100% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Adams, John., Khan, H.T.A. and Raeside, Robert. (2014). *Research Methods for Business and Social Science Students*. 2nd ed. New Delhi: SAGE Publications.

Berry, R. (2004) *The Research Project: how to write it*, Fifth Edition, Routledge, London.

Cottrell, S., 2019. *The Study Skills Handbook*. Bloomsbury Publishing.

Creswell, J. (2003) *Research Design: Quantitative, Qualitative and Mixed Method Approaches*, second edition, Sage, London.

Frankfort-Nachmias, C. and Nachmias, D. (2007) *Research Methods in the Social Sciences*, Arnold, London.

Karban, R., Huntzinger, M. and Pearse, I.S., 2023. *How to do Ecology: A concise handbook*. Princeton University Press.

Kitchin, R. and Tate, N. (2013). *Conducting research in human geography theory, methodology and practice*. Abingdon, Oxford, England: Taylor and Francis.

Montello, D. and Sutton, P. (2012) *An introduction to scientific research methods in geography and environmental studies (Vol. 1)*. Sage, London.

Parsons, T. and Knight, P.G. (2015). *How to Do Your Dissertation in Geography and Related Disciplines*. Third edition. London: Taylor & Francis Group.

Robson, C. (2011) *Real World Research*, third edition, John Wiley, London.

Vero, S.E., 2021. *Fieldwork Ready: An Introductory Guide to Field Research for Agriculture, Environment, and Soil Scientists* (Vol. 188). John Wiley & Sons.

Wheater, C.P., Bell, J.R. and Cook, P.A., 2020. *Practical Field Ecology*: A project guide. John Wiley & Sons.

Wiersma, Y.F., 2022. Experimental Landscape Ecology. Springer International Publishing.

Yin, R. (2013) *Case Study Research: Design and Methods*, fifth edition, Sage, London.

STUDY HOURS

Scheduled Activity Hours	
Lectures	2 (Semester 1)
Tutorials	6

Independent Study	
Private study	590

TEACHING STAFF

Staff Member	**Role**
TBC	Unit coordinator

Title	**Planning for Environmental Change**
Unit code	PLAN60771
Credit rating	15
Unit Level	FHEQ Level 7
Teaching Period	Semester 1

OVERVIEW

Within the last two centuries, industrial society has generated unprecedented rates of environmental change. A firm commitment to economic optimisation, coupled with a faith in science and technology as a force of modernisation, has pushed environmental systems up to and beyond sustainable limits. Responding to the challenge of environmental change therefore requires a renewed understanding of the relationship between the economy, society and the environment and the development of more appropriate forms of intervention.

AIMS

- Explore the linkages between environmental change, environmental justice and sustainable development
- Understand the complexities associated with planning for phenomena that are dynamic and often poorly understood, and gain skills in navigating these complexities
- Explore the synergies and conflicts between the theories and practices aimed at responding to environmental change
- Develop an awareness of the strengths and weaknesses of environmental planning practices, and push the frontiers of what that practice could be.

LEARNING OUTCOMES

- At the end of this course unit, students should be able to:
- Illustrate linkages between environmental change, environmental justice and sustainable development when exploring future options
- Identify the complexities and uncertainties that affect strategic decision-making in the context of environmental planning
- Critically appraise different environmental planning responses
- Situate different environmental planning responses within the broader context of sustainable development
- Be able to evaluate the possible environmental change dimensions of actions and projects
- Be better prepared to plan responses to environmental change in a variety of contexts
- Demonstrate professional communication skills
- Demonstrate a reflective attitude towards professional practice in environmental planning

TEACHING AND LEARNING METHODS

A high degree of critical analysis will be encouraged, building on both the theory and practice of planning for environmental change. Lectures will introduce a range of perspectives, creating a theoretical basis for critical thought and application of the ideas developed in the course to different areas of practice. A high degree of student engagement with the learning process will be encouraged through interactive workshops, particularly linked to the module assignments, and discussion during the lectures.

ASSESSMENT

Assignment 1 : Essay (2500 words) 90% weighting

Assignment 2 : Reflective Learning Journal (500 words) 10% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Agyeman, J Schlosberg D, Craven L and Matthews C (2016) 'Trends and Directions in Environmental Justice: From Inequity to Everyday Life, Community, and Just Sustainabilities Annual Review of Environment and Resources Vol. 41: 321-340

Benson, J and Roe, M. (2000) *Landscape Sustainability*, Spon, London.

Birkeland, Janis. 2008. Positive development: from vicious circles to virtuous cycles through built environment design. London: EARTHSCAN.

Davoudi, S., Crawford, J., and Mehmood, A. (eds). 2009. Planning for Climate Change: Strategies for Mitigation and Adaptation for Spatial Planners. Earthscan, London.

Haughton, G. (2010) *The New Spatial Planning: Territorial Management with Soft Spaces and Fuzzy Boundaries*, Routledge, London.

Hickey, S. and Mohan, G. (2004) Participation: from tyranny to transformation? Exploring new approaches to participation in development London, Zed Books.

Hough, M. (2006) Cities & Natural Process, Routledge, London. World Commission on Environment and Development (1987) *Our Common Future,* Oxford University Press, Oxford.

McDonough, William, Michael Braungart, Paul T. Anastas, and Julie B. Zimmerman. 2003. Peer Reviewed: Applying the Principles of Green Engineering to Cradle-to-Cradle Design. Environmental Science & Technology 37, no. 23 (December 1): 434A-441A

Morris, Stuart Alastair & Tippett, Joanne (2023) "Perceptions and practice in Natural Flood Management: unpacking differences in community and practitioner perspectives", Journal of Environmental Planning and Management, DOI: 10.1080/09640568.2023.2192861
Pelling M. 2010. Adaptation to Climate Change: From Resilience to Transformation. Taylor and Francis, Hoboken. Available on line through library.

Robèrt, Karl-Henrik. 2000. 'Tools and Concepts for Sustainable Development, How Do They Relate to a General Framework for Sustainable Development, and to Each Other?' Journal of Cleaner Production 8 (3): 243–54.

Selman, P. (2006) *Planning at the Landscape Scale*, Routledge, London.

Tippett, J. and How, F. 2020. 'Where to lean the ladder of participation: a normative heuristic for effective coproduction processes', Town Planning Review, 91, (2), 109–132. https://doi.org/10.3828/tpr.2020.7

Wheeler, S. M. and Beatley, T. (Editors) (2014) Sustainable Urban Development Reader (Routledge Urban Reader Series)

White, I. (2010) *Water and the City: risk, resilience and planning for a sustainable future*, Routledge: London.

Wondolleck, J. M..,Yaffee, S. L..2000. Making Collaboration Work - Lessons from Innovation in Natural Resource Management.Washington D.C. Island Press

STUDY HOURS

Scheduled Activity Hours	
Lectures	20
Workshops	8
Field Trip	6

Independent Study	
Private study	54
Assignment	62

TEACHING STAFF

Staff Member	**Role**
Joanne Tippett	Unit coordinator

Title	Environmental Remote Sensing
Unit code	GEOG60941
Credit rating	15
Unit Level	FHEQ Level 7
Teaching Period	Semester 1

OVERVIEW

Remote sensing provides a unique means of capturing vast quantities of spatially referenced data with complete coverage, synoptically and at a range of spatial and temporal scales. Thus, remote sensing is a fundamental tool for use in environmental modelling and in decision-support for environmental management.

The aim of this unit is to provide students with the knowledge and skills to enable them to use digital data for reliable thematic and quantitative information extraction. The unit places emphasis on the use of some of the more advanced computer-based techniques used for information extraction from remotely sensed data to support environmental applications. Specifically, we will be using the relatively new online Google Earth Engine Code Editor platform to code remote sensing processing operations in JavaScript

AIMS

To provide an understanding of the different ways in which remote sensing data can be used to monitor the Earth's surface. The unit provides a firm foundation in the principles and practice of remote sensing across a range of scales and perspectives

LEARNING OUTCOMES

- Understand of key principles in Earth observation (EO), including: spectral signatures, vegetation indices; image classification; image spatial, temporal, spectral and radiometric resolution
- Develop an awareness of the wide range of remote sensing systems and understand how and why they suit different environmental applications.
- Handle and apply technical concepts in EO and critically evaluate the results
- Critically assess and evaluate the suitability of EO satellite derived products for particular applications
- Develop research skills including reading, critically judging and evaluating scientific
- Handle remote sensing data from a range of systems using computers and appropriate software
- Apply key algorithms to interpret remotely sensed imagery

- Manage raster data and other spatial data files
- Source appropriate EO images from online image archives
- Communicate and express geospatial ideas and results in written, oral and visual form (e.g. images and graphs)
- Develop skills of time management and bibliographic research

TEACHING AND LEARNING METHODS

In person:

- Lectures - Highlighting key points of required knowledge and explaining key concepts and theories (8 hours)
- Tutorial/Discussion sessions - Checking required understanding of the main concepts (3 hours)
- Computer workshops are used for students to gain hands-on experience and learning (6 hours)
- Assessment workshops – Answering questions related to the assessment (6 hours)
- Guided independent study (127 hours) – Additional reading, research and preparation for unit assessments.

E-learning approaches:

- A virtual learning environment - Delivery of all materials related to the unit.
- Discussion boards (knowledge-based and technical) - To address student questions and to generate a FAQs resource for all.
- Interactive asynchronous pre-session learning materials delivered via a web interface - Provide the background knowledge required for each lecture. Materials include links to online quizzes where students can check their knowledge, selected web sites providing additional information and videos to further aid understanding of key concepts.

ASSESSMENT

Assignment 1 : Poster (500 words) 20% weighting

Assignment 2 : Research Paper (2500 words) 80% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Basic reading

- Campbell, J.B. (2007), Introduction to Remote Sensing.
- Lillesand, T., Kieffer, R.W., and Chipman, J. (2008) Remote Sensing and Image Interpretation

STUDY HOURS

Scheduled Activity Hours	
Lectures	8
Tutorials	3
Workshops	12

Independent Study	
Private study	127

TEACHING STAFF

Staff Member	**Role**
Angela Harris	Unit coordinator

Title	Environmental Monitoring and Modelling Concepts
Unit code	GEOG70581
Credit rating	15
Unit Level	FHEQ Level 7
Teaching Period	Semester 1

OVERVIEW

The unit introduces students to a range of techniques for monitoring and modelling the environment, with case studies from hydrology and geomorphology. Topics include environmental monitoring approaches and techniques, types of environmental model, and model calibration and evaluation. Students will gain understanding of these key concepts, as well as a range of practical skills and expertise.

AIMS

- Introduce students to the key approaches to measuring and monitoring environmental systems
- Teach students how to display, describe and analyse numerical environmental data
- Introduce students to the key concepts associated with environmental modelling, including model types, model structure, model calibration and model evaluation
- Develop students' practical data analysis and modelling skills

LEARNING OUTCOMES

- Display an awareness of the approaches to measuring and monitoring environmental phenomena through space and time
- Select appropriate methods for displaying, describing and analysing data
- Describe the key characteristics of environmental models, including model classification and the identification of model components
- Evaluate model performance, including quantifying error, and identifying and explaining possible sources of error
- Interpret and analyse numerical data
- Integrate and synthesise evidence and information.
- Apply critical thinking and problem solving skills to practical and written work
- Effectively display, interrogate and analyse numerical data
- Apply statistical techniques to environmental problems
- Calibrate and validate environmental models
- Use a range of software for environmental data analysis and modelling

- Use IT to an advanced level
- Communicate written ideas and information clearly and concisely

TEACHING AND LEARNING METHODS

The unit is delivered via a mix of lectures, computer practicals, and in-class discussions (33 hours). Course materials are hosted on Blackboard. Coursework is submitted and marked through turning. All sessions are synchronous although there is some asynchronous materials the students are expected to view outside of the classes. Students are expected to spend 117 hours on private study and directed reading.

ASSESSMENT

Practical 1 (1,500 words) 50% weighting

Practical 2 (1,500 words) 50% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Artiola, J. F., Brusseau, M. L., & Pepper, I. L. (2004). *Environmental monitoring and characterization*. Academic Press.

Gray, W. G., & Gray, G. A. (2017). *Introduction to environmental modelling*. Cambridge University Press.

Smith, J. U., & Smith, P. (2007). *Introduction to environmental modelling*. Oxford University Press.

Wainwright, J. & Mulligan, M. (2013). *Environmental Modelling*, John Wiley & Sons, Ltd, Chichester, UK.

STUDY HOURS

Scheduled Activity Hours	
Lectures	13
Computer Practical Class	20

Independent Study	
Private study	117

TEACHING STAFF

Staff Member	**Role**
Claire Goulsbra	Unit coordinator

EART62051

Title	Concepts in Environmental Law
Unit code	PLAN60442
Credit rating	15 credits
Unit Level	FHEQ Level 6
Teaching Period	Semester 2

OVERVIEW

In this course, we will examine how law and policy can be used to further environmental protection objectives. We begin with an Introduction to Environmental Law. In this first session, you will be introduced to some of the key sources of environmental law including legislation and case-law, and some important principles of environmental law. We will also track the historic development of environmental law. In the second session, and by way of a case-study, we'll explore the international and national law relating to a particular environmental challenge, namely climate change. This has been very much in the news recently with COP27 (Conference of the Parties) held in Egypt late last year. Session three will outline the key policy framework within which environmental law has evolved, namely sustainable development. We will be contrasting this with an alternative approach called ecological modernisation. In session four, we will look at the role of the common law – judge made rules that have been developed over time and potentially have a place in the environmental law landscape. In sessions five to ten, we will be exploring different ways in which we can use law and regulation to tackle environmental challenges. Our starting point, is to introduce you to the concept of regulation – what is it and why do we need it? We then turn to different instruments of regulation – command and control, economic instruments, self-regulation and information and disclosure mechanisms. What are these approaches? What are their strengths and weaknesses? We end, in session 11, by evaluating the role of public participation in planning law. Public participation is a core principle of sustainable development and depends, to a great extent, on the availability of information. Whilst participation in planning is important, it is difficult to achieve.

AIMS

- Provide an overview of the legal, institutional and policy frameworks which structure and regulate decision-making concerning the environment
- Investigate the role of law and regulation in securing environmental aims and evaluate the strengths and weaknesses of different regulatory mechanisms used in environmental law
- Develop an understanding of environmental law and its impact through the use of examples

INTENDED LEARNING OUTCOMES

- Explain the different sources of environmental law, using climate change as a case-study
- Critically evaluate the importance of sustainable development as an environmental policy goal
- Evaluate the nature of regulatory change, using ecological modernisation as a theoretical framework
- Critically evaluate the range of legal and regulatory mechanisms that can be used to secure environmental protection aims, drawing upon examples to illustrate
- Analyse the principle of public participation in planning law
- Assemble relevant information and subject it to critical legal analysis
- Engage in and cultivate reasoned legal and policy arguments
- Develop research skills in a legal context
- Develop written reasoned arguments

TEACHING AND LEARNING METHODS

Lectures (22 hours):
Each element of the course unit will be covered through interactive lectures with opportunities for small-group working and interaction in almost all lecture sessions, supported by asynchronous lectures and materials. Core themes are discussed in these sessions to allow discussion and application of knowledge and skills in small groups followed by plenary discussion.

Workshops (4 hours):
Specific support for the assignment is provided through workshop activities, where students are provided with advice on all aspects of assessment.

Surgeries (4 hours):
Students can request additional one-on-one support to assist with the assessment.

ASSESSMENT

Essay (3,000 words) 100% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

E. Fisher, B. Lange and E. Scotford, *Environmental Law: Text, Cases and Materials* (OUP, 2nd ed, 2019)

J. Holder and M. Lee, Environmental Protection, Law and Policy: Text and Materials (CUP, 2nd ed, 2007)

R. Macrory, *Regulation, Enforcement and Governance in Environmental Law* (Hart Publishing, 2nd ed. 2014)

N. Gunningham, R. Kagan and D. Thornton, *Shades of Green* (Stanford, California: Stanford University Press, 2003).

A. Mol, Sonnenfeld, D. And Spaargaren, G. *The Ecological Modernisation Reader* (Routledge, 2009).

M. Hajer *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process* (Clarendon Press, 1997).

N. Carter, *The Politics of the Environment* (Cambridge University Press, 2007)

STUDY HOURS

Notional hours of Learning***	200 hours

Scheduled Activity Hours	
Lectures	
Workshops	
Field Trip	

Independent Study	
Private study	

TEACHING STAFF

Staff Member	**Role**
Carolyn Abbott	Unit coordinator
Gary Lynch-Wood	Unit coordinator

Title	**Conservation Management Project**
Unit code	PLAN60402
Credit rating	15
Unit Level	FHEQ Level 6
Teaching Period	Semester 2

OVERVIEW

This course unit will provide you with experience of undertaking a practical project for a 'real-world' client, Manchester City Council (MCC). Your focus will be on developing a conservation management plan, as part of a team of students, for an urban biodiversity site (which may include a Site of Biological Importance (SBI), former SBI or candidate SBI). The course unit runs throughout the second semester and provides you with the opportunity to coordinate, design and implement your own project, supported by meetings, workshops and presentations with the course unit convenor and external contributors. This course unit develops practical knowledge and skills in relation to group working, project design and planning, with a particular focus on undertaking work related to the management of sites for biodiversity conservation whilst maximising other ecosystem services.

AIMS

- To provide students with practical experience of issues related to the assessment and management of an urban biodiversity site.
- To introduce students to the roles of the range of various practitioners and stakeholders involved in managing urban biodiversity sites.
- To develop students understanding of the conservation management planning process and how to produce a viable conservation management plan.
- To enable students to demonstrate the range of their knowledge on environmental issues within a practical project.
- To enable students to utilise the self-learning capabilities learnt during their programme and to demonstrate them in a student-led group project.

LEARNING OUTCOMES

- Identify the steps that form the conservation management planning process
- Recognise key issues related to the management of urban biodiversity sites
- Evaluate multiple sources of information to make decisions linked to the management of urban biodiversity sites for conservation
- Design and implement the required stages of developing a conservation management plan
- Design and implement a methodology for data collection, analysis and synthesis to support the development of a conservation management plan
- To deliver professional standard reports
- Deliver professional standard presentations

TEACHING AND LEARNING METHODS

Lecture-based sessions: Twelve lecture-based sessions (two hour duration) are timetabled for this unit. These take various formats including presentation of topics and processes linked to conservation management planning, invited practitioner presentations, workshop exercises, formative presentations from student groups and assessed presentations from student groups.

Workshops: A particular focus for the workshops that take place outside of the lecture-based sessions is on spatial data gathering, analysis and presentation. Two workshops (2 hours duration) are focused on this topic, with additional opportunities for one-to-one meetings with the teaching assistant on this unit who specialises on the spatial data element of the unit.

Site visit: A site visit takes place during week 3, with students introduced to the sites that form the focus of their conservation management plan. Site visits are supported by external stakeholders who have knowledge and experience of the sites.

Meetings with the module convenor: Meetings between the module convenor and each group of students take place at various points to provide an opportunity for formative feedback and to address specific issues related to the production of the conservation management plans. These meetings last 30-45 minutes and take place on four occasions over the courses of the unit.

ASSESSMENT

Assignment 1 : Group presentation stage 1 (20 minutes) 25% weighting

Assignment 2 : Group presentation final plan (20 minutes) 25% weighting

Assignment 3 : Group Report (6,500 words) 50% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Alexander, M. (2020). *A Guide to Management Planning*. Wildlife Trust of South and West Wales, Bridgend, Wales.

Ausden, M. (2007). *Habitat Management for Conservation: A Handbook of Techniques*. OUP Oxford.

CABE Space and Mayor of London. (2009). *Open Space Strategies: best practice guidance*. CABE, London

Institute of Environmental Assessment. (1995). *Guidelines for baseline ecological assessment.* Institute of Environmental Assessment. E & F Spon, an Imprint of Chapman & Hall, London

Tait, J., Lane, A. and Carr, S. (1988). *Practical Conservation: Site Assessment and Management Planning*. Hodder and Stoughton, London.

STUDY HOURS

Scheduled Activity Hours	
Lectures	24
Workshops	16
Field Visit	8

Independent Study	
Private study	72

TEACHING STAFF

Staff Member	**Role**
Jeremy Carter	Unit coordinator

Title	**Spatial Ecology**
Unit code	GEOG71922
Credit rating	15
Unit Level	FHEQ Level 7
Teaching Period	Semester 2

OVERVIEW

This module will explore the theory and principles of landscape ecology and the spatial techniques available to test, demonstrate and put into practice these principles.
Students will explore ecological data (habitat, species and topographic) across a range of spatial contexts and explore the effect of landscape configuration, land-use and land-cover combinations, on biogeographical patterns, ecological functions and species distribution.
This will be done through the application of spatial techniques such as density functions, point pattern analysis and graph theory, as well as through computational landscape ecology metrics and analyses.

AIMS

Equip students with knowledge on the theory of spatial ecology, primarily focused on landscape-ecological methods and principles.

LEARNING OUTCOMES

- Key concepts in spatial ecology, knowledge of landscape ecological processes and reflecting on their importance across a range of contexts.
- Use of spatial, ecological and geo-statistical techniques such as networks, density functions, species distribution models, buffers and landscape ecology metrics.
- Accessing, interpreting and analysing large spatial datasets such as multi-band imagery, land-use datasets and species record data.
- Identifying key spatial components of ecological systems
- The ability to critically evaluate the opportunities and limitations of applying spatial data and techniques to the analysis of complex systems.
- Employ critical analytical factors such as scale and spatial context.
- Model ecological processes
- Use of R as a GIS
- Statistical analysis
- Programmatic geo-computation skills
- Ability to express complex ideas related to spatial ecological
- Experience of project design and report-writing
- Ability to communicate knowledge and reasoned arguments on complex topics and debates
- The ability to source, manage and operationalize spatial data and techniques to explore real-world problems

TEACHING AND LEARNING METHODS

The module will be delivered through nine one-hour lecture sessions and 11 two-hour practical classes.

All materials will be delivered synchronously but with the addition of asynchronous access and materials. For example, practical classes are made available through web pages and examples are facilitated trough interactive apps developed by the convenor and made available to students.

Links to all resources are made available through the course Blackboard page.

ASSESSMENT

Assessment 1 : Practical Workbook (1000 words) 40% weighting

Assessment 2 : Individual Student Project (2000) 60% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Fletcher, R. and Fortin, M., 2018. *Spatial ecology and conservation modelling* (p. 523). Cham: Springer International Publishing.

Miguet, P., Jackson, H.B., Jackson, N.D., Martin, A.E. and Fahrig, L., 2016. What determines the spatial extent of landscape effects on species?. *Landscape ecology*, *31*, pp.1177-1194.

Guisan, A. and Zimmermann, N.E., 2000. Predictive habitat distribution models in ecology. *Ecological modelling*, *135*(2-3), pp.147-186.

Renner, I.W., Elith, J., Baddeley, A., Fithian, W., Hastie, T., Phillips, S.J., Popovic, G. and Warton, D.I., 2015. Point process models for presence-only analysis. *Methods in Ecology and Evolution*, *6*(4), pp.366-379.

Dennis M, Huck J, Holt C, McHenry E. 2024. A mechanistic approach to weighting edge-effects in landscape connectivity assessments. *Landsc Ecol* **39**, 68.

STUDY HOURS

Scheduled Activity Hours	
Lectures	9
Computer Practical Work	22

Independent Study	
Private study	119

TEACHING STAFF

Staff Member	**Role**
Matt Dennis	Unit coordinator
Gary Lynch-Wood	Unit coordinator

Title	**Climate Environment and Development**
Unit code	MGDI60552
Credit rating	15
Unit Level	FHEQ Level 6
Teaching Period	Semester 2

OVERVIEW

Climate change represents one of the most serious challenges currently facing urban poverty reduction. Despite uncertainties within the field of climate science, there is a broad consensus that human-induced carbon emissions are already causing climate change. At a global level, the poor are most likely to experience its effects; in particular, the urban poor majority in cities of the global South are among the most vulnerable to climate-related disasters and changing patterns of severe weather.

Over the past two decades alone, disasters have claimed more than two million lives, with 98 per cent of casualties occurring in developing countries, and climate-related disasters accounting for two-thirds of the total. As well as one-off events, urban residents' homes

and livelihoods are also threatened by slow, insidious, weather-related changes brought about by climate change. In urban areas where institutional responses are limited by resources or capacity, households, small businesses and communities are leading adaptation efforts at the local level.

This course will explore how best to strengthen the resilience of these communities to climate change and climate-related disasters, in support of sustainable urban poverty reduction.

AIMS

- An understanding of the complex relationship between climate change, disasters and poverty.
- An understanding of the impacts of climate change, in particular its implications for vulnerable groups within society
- An understanding of the implications of differences in perception of climate risk for enhancing resilience understanding of the relationship between vulnerability, resilience and adaptation to climate change.
- A comprehensive understanding of adaptation responses for enhancing resilience to climate change
- An understanding of the limits and opportunities of climate change adaptation
- An opportunity for students to develop their range of competencies in transferable areas, including research, analysis, team-work and both written and verbal forms of communication

LEARNING OUTCOMES

- Show knowledge of frameworks and operational tools for integrating climate change adaptation and risk reduction into urban development planning, disaster response and recovery, thus building related governance capacities
- Demonstrate a critical understanding of climate change and disasters, as well as of related theories and concepts on adaptation and disaster risk management for sustainable urban poverty reduction.
- Demonstrate the need to adopt a holistic approach to adaptation and disaster risk management

TEACHING AND LEARNING METHODS

Learning will be through six lectures (six two-hour lectures), three two-hour tutorials, one 6-hour thematic session for student presentations and one one-hour guidance session for assessments). Students will be asked to prepare presentations throughout the course. Students are encouraged to develop their own theoretical understanding through guided individual reading and private study as well as through group tutorial interactions.

ASSESSMENT

Assignment 1 : Written Assignment (inc essay) (2000 words) 75% weighting

Assignment 2 : Recorded presentation 25% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Bicknell, J., Dodman, D. and Satterthwaite, D. (eds) (2009) Adapting Cities to Climate Change, London: Earthscan

DFID (2005) Disaster risk reduction: a development concern, [URL document], 2010-01-19, Available online: http://www.dfid.gov.uk/Documents/publications/disaster-risk-reduction.pdf

Few, R., Osbahr, H. et al. (2006) Linking Climate Change Adaptation and Disaster Risk Management for Sustainable Poverty Reduction, Synthesis Report. Vulnerability and Adaptation Resource Group (VARG), European Commission. Available online: http://www.preventionweb.net/files/570_10367.pdf

Moser, C., A. Norton, Stein, A., Georgieva, S., 2010. Pro-Poor Adaptation to Climate Change in Urban Centers Report No. 54947-GLB, Washington D.C., World Bank.

Pelling, M. (2011) 'The adaptation age'. In: Pelling, M. Adaptation to climate change : from resilience to transformation. London : Routledge. 3-19.

Cynthia Rosenzweig et al eds (2011) Climate Change & Cities Cambridge: CUP.

Satterthwaite, D.; Huq, S.; Pelling, M.; Reid, H. and Romero Lankao, P. (2009) 'Adapting to Climate Change in Urban Areas: The possibilities and constraints in low- and middle income nations', in Bicknell, J., Dodman, D. and Satterthwaite, D. (eds) (2009) Adapting Cities to Climate Change, Earthscan: London.

Tanner, T. and Allouche, J. (2011) 'Towards a New Political Economy of Climate Change and Development', IDS Bulletin 42(3), 1-14. Available online: http://onlinelibrary.wiley.com/doi/10.1111/idsb.2011.42.issue-3/issuetoc

UNHabitat (2011) Global Report on Human Settlements 2011 Cities & Climate Change London: Earthscan.

STUDY HOURS

Scheduled Activity Hours	
Lectures	12
Seminars	6
Tutorials	6

Independent Study	
Private study	126

TEACHING STAFF

Staff Member	**Role**
Rose Pritchard	Unit coordinator

Title	**Natural Heritage**
Unit code	SALC60422
Credit rating	15
Unit Level	FHEQ Level 7
Teaching Period	Semester 2

OVERVIEW

This optional course provides students with both theoretical and professional knowledge and understanding of the concept and practice of natural heritage. The course provides a historical and contemporary analysis of the concept of natural heritage and its manifestations and applications in diverse cultural and geographical contexts. In particular, the course explores the interrelation between making, using, representing and managing different sites and environments of natural heritage. This includes an analysis of political, governmental, social and financial factors in defining and valuing natural heritage. The course considers different sites of natural heritage, including water-based sites, parks, forests, gardens etc. Similarly, it examines issues of authenticity, conservation, sustainable development, tourism and considers the impact of resources, skills and funding on natural heritage management and use. The understanding of natural heritage is deliberately broad, in order to identify commonalities and specificities across a breadth of disciplinary, organizational and professional models.

Each week focuses on a key concept and includes also student-led activities, fieldwork and professional presentations. The idea is to stimulate critical reflection, as well as enable students to acquire nuanced and contextualized knowledge and understanding of some of the key intellectual, ethical, professional and political questions posed by, and of, natural heritage.

AIMS

- Equip students with thorough knowledge and understanding of the social, ethical, political and financial and historical contexts of natural heritage
- Investigate the interrelations between making, using and managing natural heritage
- Map the development of the concept and practice of natural heritage internationally
- Introduce and apply key concepts in heritage theory to the critical analysis of natural heritage.
- Prepare students for work-based practice through the interaction with heritage professionals and the opportunity to debate critical issues in policy and practice.
- Develop students' skills in preparing and chairing meetings, conducting debate and facilitating discussion.
- Develop students' research and written communication skills and styles.

LEARNING OUTCOMES

- Demonstrate knowledge and understanding of the field of natural heritage and its social, ethical, political and financial contexts
- Appreciate the impact of cultural, geographical and other contexts on valuing and safeguarding natural heritage
- Understand the role of local, national and international policies and organisations in managing natural heritage
- Analyse the historical and contemporary development of natural heritage and its relation to cultural heritage
- Identify and evaluate diverse approaches to the theoretical and critical analysis of natural heritage
- Understand the interrelations between managing, using and communicating natural heritage
- Lead and participate in informed debate about key issues affecting natural heritage policy and practice today.
- Demonstrate a capacity to apply theoretical and critical concepts to the understanding and analysis of natural heritage
- -Apply disciplinary knowledge and understanding to an analysis of institutional policies/practices.
- Conduct independent research in order to produce a sustained, analytical enquiry into an aspect of natural heritage.
- Design, research and present empirical research, determining and implementing a reflexive and appropriate methodology
- Apply skills and ideas learned in one institutional context to another, while remaining aware of the complexity of the issues
- Apply research methods to understand the making, using and valuing of natural heritage
- Collaborate effectively with fellow students.
- Prepare and deliver a short oral presentation, and respond to questions and discussions.
- Conduct effective fieldwork as part of an institutional analysis.
- Plan and deliver presentations, chair discussions, provide feedback.
- Communicate information and ideas effectively in a professional, as well as an academic, environment.
- Retrieve, select and critically evaluate information from a variety of sources, including museums, archives, libraries and the Web.
- Work effectively within a team
- Communicate the value and applicability of critical heritage thinking into organisational practice
- Articulate clearly key challenges related to natural heritage
- Manage time efficiently
- Generate ideas and think laterally
- Map career directions and trajectories

TEACHING AND LEARNING METHODS

The course will be delivered through a combination of:
- University-based lectures and seminars
- Individual fieldwork
- Group site visits
- Student presentations

ASSESSMENT

Essay (4,000 words) 100% weighting

FEEDBACK METHODS

Feedback given as per Faculty's timeframe

RECOMMENDED READING

Alberti, S.J.M.M. 2012. Nature and Culture. Objects, disciplines and the Manchester Museum. Manchester: Manchester University Press.
Bandarin, F. and R. van Oers (eds). 2014. Reconnecting the City: The Historic Urban Landscape Approach and the Future of Urban Heritage. Wiley-Blackwell

Barthel-Bouchier, D. 2013. *Cultural Heritage and the Challenge of Sustainability.* Walnut Creek, CA: Left Coast Press

Cameron, C. and Rossler, M. 2013. Many Voices, One Vision: The Early Years of the World Heritage Convention. Aldershot, UK: Ashgate

Cassar, M. 2005. *Climate Change and the Historic Environment*. London: Centre for Sustainable Heritage

Colette, A. 2009. *Case Studies on Climate Change and World Heritage*. Paris: Unesco World Heritage Centre

CBD. 2012. Resourcing the Aichi Biodiversity Targets: A First Assessment of the Resources Required for Implementing the Strategic Plan for Biodiversity 2011-2020. UNEP/CBC/COP

Descola, P. 2013. Beyond Nature and Culture. Chicago: University of Chicago Press.

Dicks, B. 2000. *Heritage, Place and Community*. Cardiff: University of Wales Press

Evelpidou, N. T. de Figueiredo, F. Mauro, V. Tecim and A. Vassilopoulos (eds). 2010. *Natural Heritage from East to West: Case studies from 6 EU countries*. Berlin: Springer

Grober, U. 2012. *Sustainability. A Cultural History*. Totnes: Green Books

Harvey, D.C. and J. Perry (eds). 2015. The Future of Heritage as Climates Change. Loss, Adaptation and Creativity. London and New York: Routledge

Harrison, R. 2015. 'Beyond “Natural” and “Cultural” Heritage: Toward an Ontological Politics of Heritage in the Age of Anthropocene'. *Heritage & Society*, Vol. 8, No. 1. May, 24-42

Harrison, R. 2012. *Heritage: Critical Approaches*. Routledge

Harrison, R. 2008. *Understanding the Politics of Heritage*. Manchester: Manchester University Press

Latour, B. 2004. Politics of Nature: How to Bring the Sciences into Democracy. Cambridge, Massachusetts: Harvard University Press

Moss, B. 2012. *Liberation Ecology: The Reconciliation of Natural and Human Cultures.* Excellence in Ecology. Oldendorf/Luhe: International Ecology Institute

Onciul, B. M.L. Stefano and S. Hawke (eds.), 2017. *Engaging Heritage, Engaging Communities*, Martlesham

Pelling, M. 2011. Adaptation to Climate Change: From Resilience to Transformation. Abingdon, UK: Routledge

Perry, J. and C. Falzon. 2014. *Climate Change Adaptation for Natural World Heritage sites: A practical guide*. World Heritgae Papers series 37. Paris: Unesco

Roe, D., J. Elliott, C. Sandbrook, and M. Walpole (eds). 2013. *Biodeversity Conservation and Poverty Alleviation. Exploring the Evidence for a Link.* Chichester: Wiley-Blackwell

Scheffer, M. 2009. *Critical Transitions in Nature and Society*. Princeton: Princeton University Press

Smith, C., Smith, G. S., Messenger, P. and Soderland, H. (eds.) 2009. *Heritage Values in Contemporary Society*, Left Coast Press Inc

Smith, L. 2006. *Uses of Heritage*. London: Routledge

Sørensen Marie Louise Stig. 2009. *Heritage Studies. Methods and Approaches*, Routledge
TEEB. 2011. *The Economics of Ecosystems and Biodiversity for National and International Policy Makers.* UNEP/TEEB

Taylor, K. and J. L. Lennon (eds). 2012. *Managing Cultural Landscapes*. London and New York: Routledge

Turgeon, L, (ed) *Spirit of Place: Between Tangible and Intangible Heritage.* Quebec: Les Presses L'Universite Laval

Unesco. 2001. Convention on the Protection of the Underwater Cultural Heritage. Paris: Unesco

Unesco. 1972. Convention Concerning the Protection of the World Cultural and Natural Heritage. Paris: Unesco

United Nations. 2014. Prototype Global Sustainable Development Report. New York: United Nations

Wang, Y. 1990. *Gardens and Chinese Culture.* Chinese. Shanghai: Shanghai People's Press

Waterton, E. 2010. *Politics, Policy and the Discourse of Heritage in Britain*. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan

West, S. 2010. *Understanding Heritage in Practice*. Manchester: Manchester University Press

Willems, W.J.H and H.P.P. van Schaik. 2015. *Water & Heritage. Material, conceptual and spiritual connnections*. Leiden: Sidestone Press

Word Commission on Water. 2000. *A Water Secure Future: Vision for Water, Life and the Environment.* Marseille: World Water Council

STUDY HOURS

Scheduled Activity Hours	
Lectures	18

Independent Study	
Private study	132

TEACHING STAFF

Staff Member	**Role**
tbc	Unit coordinator

Title	**Economics of Environmental Policy**
Unit code	ECON60782
Credit rating	15
Unit Level	FHEQ Level 6
Teaching Period	Semester 2

OVERVIEW

To develop students' intellectual understanding of the economics of public policy issues regarding the protection of the environment. Students will investigate both conceptual and methodological topics in environmental economics and consider recent applications in numerous case studies.

AIMS

To develop students' intellectual understanding of the economics of public policy issues regarding the protection of the environment. Students will investigate both conceptual and methodological topics in environmental economics and consider recent applications in numerous case studies.

LEARNING OUTCOMES

On successful completion of this course, students should be able to understand and discuss: theory on the economic significance and causes of environmental degradation, including the consideration of market failure, regulatory failure and organisational failures; alternative approaches to pollution management, including first-best and second-best solutions and the selection of policy instruments; complications for the selection of environmental policy instruments including: dynamic analysis; imperfect information (uncertainty and non-point sources of pollution); sub-optimal firm behaviour; and non-uniformity of pollutants; analytical methods (including cost-benefit and cost-effectiveness analysis) to assess the efficiency and effectiveness of alternative environmental policy approaches both ex ante and ex post. international environmental issues: transboundary pollution, pollution havens, trade and the environment, environmental Kuznets curve.

TEACHING AND LEARNING METHODS

Lectures

ASSESSMENT

Assignment 1 : Written exam 70% weighting

Assignment 2 : Written assignment (inc essay) 30% weighting

RECOMMENDED READING

Callan, Scott J. and Janet M. Thomas (2013) Environmental Economics and Management: Theory, Policy, and Applications (6th Edition), South-Western, International Edition.Keohane,

Nathaniel O. and Sheila M. Olmsted (2016) Markets and the Environment, Washington etc.: Island PressSome chapters from: Perman, Ma, Common

Maddison and McGilvray. Natural Resource and Environmental Economics, Fourth Edition. Addison Wesley

STUDY HOURS

Scheduled Activity Hours	
Lectures	18

Independent Study	
Private study	132

TEACHING STAFF

Staff Member	**Role**
Grada Wossink	Unit coordinator