PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institutions**	Newcastle University
3	**Final Award**	MRes
4	**Programme Title**	Ecology
5	**UCAS/Programme Code**	4871F/P
6	**Programme Accreditation**	N/A
7	**QAA Subject Benchmark(s)**	none
8	**FHEQ Level**	7
9	**Last updated**	May 2024

10. Programme Aims

The overall aim of this programme is to provide graduates in the field of environmental, biodiversity and conservation sciences and related sciences with the skills required for them to follow successful careers in the environmental sector. These skills include advanced conceptual understanding, detailed factual knowledge, specialised technical and research skills, and professional awareness, and they will acquire those through a set of selected modules and implementing a research dissertation project on a topic of their choice over a substantial time period during their studying with us. The programme will provide advanced training in a range of ecology, environmental management and conservation related areas and skills, giving graduates a professionally focussed postgraduate qualification that is directly relevant to a wide range of employment in the ecology and wildlife conservation sectors. Training and case studies include examples from the UK and overseas, so that students will understand the requirements for international sustainable development.

Specifically, the course aims to provide graduates with:

- Advanced knowledge on ecology and conservation science theory, the principles of biodiversity and conservation, environmental impact assessment
- Practical skills in ecological and environmental data collection, data analysis, data handling, statistics, and modelling methodologies with a focus on sustainability
- Field skills in wildlife and environmental monitoring, surveying, and GIS
- Critical thinking to address ecology and conservation problems in both UK and global policy contexts
- Advanced research capabilities and project management experience
- The ability to meet the expectation of the Framework for Higher Education Qualifications as at Level 7.

11. Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills, and other attributes in undertaking research in ecology. Students will gain skills in project management and stakeholder engagement, where applicable by undertaking an advanced research project, supported by an academic supervisor. The programme outcomes have references to the benchmark statements for Biosciences.

Knowledge and Understanding

On completing the programme students should acquire detailed knowledge and thorough understanding of:

A1 the complex interactions between human and natural systems and know how to quantify their relationships.

A2 the mathematics, statistics, and models necessary to analyse and interpret environmental data.

A3 the skills to manage complex data, which depending on the project topic are spatially explicit and can include remote sensing data.
A4 the strengths and weaknesses of qualitative and quantitative ecological data
A5 how to develop a range of context-relevant materials (e.g. assessments, policy briefs, meta-analyses) through which science can be made available to policy officials and decision-makers.
A6 the skills to manage and conduct an independent research project, and knowledge generation through critical evaluation of analytical methods and results.

Teaching and Learning Methods

A1–A5 are achieved by lectures, seminars, case study workshops, computer based and field classes. The teaching strategy for **A1**, **A3** and **A4** includes lectures to set out baseline knowledge, principles and standards, and small group discussions, group exercises and seminars where current knowledge and species or habitat specific case studies are presented and examined from a range of perspectives.

Students will acquire knowledge, particularly for **A3** and **A5,** through teamwork, workshops, case studies, presentations, and independent study and research. Some modules include short problem-solving exercises.

Assessments across the modules are both formative (in workshop immediate feedback) and summative (part of the assessment, e.g. learning and sills outcomes through group-based presentations, writing an individual policy brief document, spatial analysis skills, high quality maps (GIS report) and on understanding of remote sensing data through an essay style questions and answers format (Remote Sensing Report).

A6 will be achieved via an independent research project, led by the student. The thesis format will follow the structure of a peer-reviewed journal publication and is expected to be submitted to a journal following the research. The assessed components of the thesis will hence include conceptual framing of the research, data generation or compilation from existing sources (pending research project) and analyses, and interpretation of findings.

Assessment Strategy

Intended learning outcomes (see **A1** to **A6** above) regarding knowledge and understanding are assessed based on course work involving both written and oral communications at the individual or team level.

This will include a variety of continuous forms of summative and formative assessments including essays, problem-solving exercises, laboratory reports and case studies and provide both formative and summative assessment through relevant examples.

The interactive learning environment will be used for both formative and summative assessments.

Intellectual Skills

On completing the programme students should be able to:

B1 synthesise key findings and knowledge from across natural and social sciences, those relating to ecological management and associated policy and regulatory frameworks.
B2 critically evaluate the quality of data and information offered from different sources.
B3 develop logical thinking and a structured approach to problem solving.
B4 plan and conduct applied research projects individually and as a team, and critically evaluate results.
B5 determine the appropriate method for analysis and modelling of data and interpret results.
B6 plan how to make science available to inform policy decisions.
B7 reflect on and evaluate methods of communicating science to policy.

Teaching and Learning Methods

Intellectual skills (**B1-B5**) are developed progressively throughout the programme in modules containing seminars and case studies. Students will be expected to engage with the school's existing seminar series, which will introduce a variety of speakers and topics on ecology and related subjects to them. The degree programme will take advantage of successful engagement of MSc degree programme students: bi-weekly journal club during term time, coffee chats on Friday afternoons.

Throughout the programme, students will develop intellectual skills by participating in group discussions, case studies and science and technology workshops, and working independently, to enhance their **(a)** analytical and interpretative faculties and **(b)** ability to formulate objective and coherent arguments.

Team problem solving exercises are the main method used to enhance intellectual skills related to technology transfer capabilities, and these are implemented in field-based environments, computer-based practicals or workshops (this will depend on the choice of modules). **B6** and **B7** will be developed as students study case studies of science-policy dialogue in case studies, and through in-depth student-led work on assessments and other forms of evidence.

Design, execution, statistical analysis and reporting of the final dissertation project enhance the learning of these skills in a focused manner.

Assessment Strategy

Intellectual skills in **B1, B2** and **B5** will be assessed through individual and group work, including coursework assessments, group presentations and closed-book examinations.

B3 and **B4** will be assessed through coursework, and **B4** through an advanced, substantive research project. All assessments will place an emphasis on understanding, rather than memorising methods. **B6** and **B7** will be assessed during coursework, allowing students substantial opportunity to reflect on formative feedback, including from peers.

Throughout the programme, students will develop intellectual skills by participating in group discussions, case studies and science and technology workshops to enhance their **(a)** analytical and interpretative faculties and **(b)** ability to formulate objective and coherent arguments. This will be facilitated as part of the modules the students selected and/or as part of the student working as part of the supervisor's research group on their chosen research topic.

Practical Skills

On completing the programme students should be able to:

C1 undertake systematic reviews and meta-analyses of the scientific literature, and report findings to a high standard in written English, for both specialist and generalist readers.
C2 design and undertake data collection (ecological surveys and monitoring schemes) or collation (data synthesis, meta-analysis) to collect robust and appropriate data for scientific analysis.
C3 manage, critically analyse and visualise data using statistical and modelling approaches needed to address raised research questions.
C4 prepare and present information, in both written and verbal formats, to stakeholders (e.g. policy makers, advisors and consumers) with contrasting levels of knowledge and understanding.
C5 present independent research output in the form of a scientific research manuscript formatted for publication in a peer reviewed journal in the field of ecology and related subjects.

Teaching and Learning Methods

Most of the skills will be developed throughout the degree programme, primarily through content delivery in form of lectures (supported by online material sourced appropriately), coursework, and workshops (hands on practical and IT classes). Students will further develop skills through either fieldwork or an in-depth modelling project focussing on data processing and analysis within the conceptual framework of a research question.

The student will engage with the supervisor and the wider team of the supervisor's lab or the research group within which the supervisor is located. The research groups meet on a weekly basic providing plenty of opportunities for engagement.

The research project will require students to search the scientific literature and plan data collection or collation (**C1** and **C2**), undertake data analyses (**C3** and **C4**) and, depending on their choice of subject-matter, present results appropriately (**C1**, **C3, C4, C5**). Some individual modules will be particularly focussed on some practical skills (especially **C2**).

Assessment Strategy

Practical skills **(C1-C4)** will be assessed primarily through continuous assessments, both individual and group-based, will be based on **(a)** bibliographies produced as part of essays, seminar presentations and the final project thesis, **(b)** data handling and analyses carried out as part of problem-solving exercises and the project thesis. Assessment will take place frequently during the academic year.

Assessments implemented as part of chosen modules will be the same for MSc and MRes cohorts. Modules are taught as blocks and as such both student cohorts will be treated the same. Formative feedback (assessment) as part of the in-depth research project will be implemented within the research lab of the project supervisor and or the wider research group, in which the supervisor is located.

All the practical skills will be assessed to some extent via the research project **(C5)**.

Transferable/Key Skills

On completing the programme students should be able to:

D1 communicate and present research clearly to both specialists and non-specialists both in writing and orally.
D2 project management skills, including writing proposals, planning of projects and implementation.

D3 use effective time and resource management practices
D4 work effectively as a member of teams both subject specific and multidisciplinary.
D5 produce effective written communications and presentations using standard software packages.

Teaching and Learning Methods

Transferable/Key skills **D1-D5** will be developed throughout the academic year, as students engage with both individual and group-based lectures, seminars, and practicals.

Assessment Strategy

There will be no explicit assessment solely based on student abilities in the transferable/key skills, but **D1** to **D5** will all be subject to both formative and summative assessment running as part of the rest of the curriculum.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The programme will run for 12-months from late September, across 3 Semesters. It will comprise 180 credits, 60 credits taught (Semesters 1 and 2) 120 credits allocated to the research project (primarily running in Semester 2 and 3). All taught modules will be optional, with taught modules either 10- or 20-credit valency. Full time is recommended to align with block teaching requirements. Part time is possible and will be accommodated.

The programme will be run as part of MSc programmes within the School of Natural and Environmental Sciences. The range of optional taught modules ensure that students will have a solid foundation in both the quantitative and qualitative skills that are essential in modern ecological science. x4 out of the 7 modules will be taught in Semester 1, so that students benefit from peer-support, and all reach a high technical standard before starting their individual Research Project. Taught modules are also shared by one or more-degree programmes, increasing collegiality amongst students, whilst also improving teaching efficiency through larger class sizes.

Key features of the programme (including what makes the programme distinctive)

This is a one year full-time modular programme and consists of 2 parts: *a taught component* which runs from late September until June xx, and *an independent project*, for which a research report is submitted in August.

The taught component of the course consists of 60 credits of modules that students can select. These are dedicated towards advancing knowledge in statistical and technical skills, and specific relevant ecological issues although there is some crossover, revision, and application of skills in the different modules. Overall, the course is designed to accommodate students wanting to gain advanced research experience, supported by modules chosen to improve their research project output (including overseas students) and the nature of modules reflects this.

Unique features of the MRes degree programme

Students will have the opportunity to develop practical skills in environmental monitoring techniques, surveillance, and handling if they want to. Alternatively, they can choose to select a purely theoretic topic for their dissertation, which allows them to focus skills development on data science/data handling and systematic evidence synthesis. This will be informed by detailed discussions between the student and the DPD, taking into account the previous educational journey of the student, practical experiences and future career plans.

Highly quantitative teaching to develop numeric ability and understanding. This will be achieved through familiarisation with techniques and software available for data collection and /or collation, surveillance, analyses, modeling, and interpretation of results for policy and research projects.

Students will be required to conduct an advanced independent research project on environmental problems, which can be purely ecological or socio-ecological, or related to chemistry (e.g. water pollution) and agriculture or policy. The students will be supported by integration within an active research group with national and international research experience.

Programme regulations (link to on-line version)

4871F/P: https://teaching.ncl.ac.uk/docs/regsdocs2024/documents/-R4871FP.pdf

13 Support for Student Learning

Generic information regarding University provision is available at the following link.
Generic Information

14 Methods for evaluating and improving the quality and standards of teaching and learning

Generic information regarding University provision is available at the following link.
Generic Information

Accreditation reports

Additional mechanisms
An industry advisory panel has been established to advise the course management team on industry needs regarding the knowledge and skills transferred on the MSc programme.

15 Regulation of assessment

Generic information regarding University provision is available at the following link.

Generic Information

In addition, information relating to the programme is provided in:

The University Prospectus: Find a Degree | Postgraduate | Newcastle University (ncl.ac.uk)

The University Regulations: University Regulations | University Regulations | Newcastle University (ncl.ac.uk)

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided.