BIOL787
Biodiversity Conservation
S1 Day 2016
Dept of Biological Sciences

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General Information

Unit convenor and teaching staff
Unit Convenor
David Nipperess
david.nipperess@mq.edu.au
Contact via david.nipperess@mq.edu.au
E8B105

Credit points
4

Prerequisites
Admission to MRes

Corequisites

Co-badged status
BIOL887

Unit description
This unit deals with the problem of conserving biodiversity as a whole rather than concentrating on individual species or populations. The unit is applied and multidisciplinary, drawing on such areas as ecology, evolutionary biology, biogeography, informatics and statistics. We will explore the concept of biodiversity in both the scientific and legislative arenas. The problem of measuring biodiversity is considered in detail, including the conceptual and practical impediments to measurement. Current and emerging threats to biodiversity are reviewed on a global scale, along with the practical and ethical arguments for conservation. An emphasis is given to analysing and interpreting patterns in biodiversity in space and time as a means of informing conservation decisions. Teaching will be via lectures and tutorials.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

Learning Outcomes

1. Knowledge of conservation biology: demonstrate knowledge of the concepts, principles and methods of conservation biology as practiced at the scale of ecological communities and above, including: a) the processes generating patterns of biodiversity at local to global scales; b) patterns, mechanisms and consequences of biodiversity loss; and c)
procedures and philosophies for valuing biodiversity and prioritising locations for conservation.


3. Conservation monitoring and planning: integrate observed spatial pattern of biodiversity with other sources of spatial information, identify key locations for conservation action and biodiversity monitoring, and makes scientifically sound recommendations justified by the evidence.

4. Scientific literacy and communication: Review, critically evaluate and synthesize diverse scientific literature in the area of conservation biology and communicate an understanding of this in a written form.

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotspot prioritisation report</td>
<td>30%</td>
<td>Week 6</td>
</tr>
<tr>
<td>Online test</td>
<td>30%</td>
<td>Every 2nd week</td>
</tr>
<tr>
<td>Conservation Plan</td>
<td>40%</td>
<td>Week 13</td>
</tr>
</tbody>
</table>

Hotspot prioritisation report

Due: **Week 6**  
Weighting: **30%**

You will be analysing a dataset on biodiversity hotspots identified by Conservation International. You will rank these regions for their importance in terms of their irreplaceability and vulnerability, using data provided, as well as any additional information you can source yourself. The initial analysis for this assignment will be conducted in a tutorial. You will need to fully explain your procedure for determining the relative importance of the regions and justify the choices that you make, including reference to ecological theory and the scientific literature. You can collaborate with others in determining your prioritisation but you must write your assignment yourself. Total length of the assignment should be no more than 1200 words, not including references or tables.

This Assessment Task relates to the following Learning Outcomes:

- Knowledge of conservation biology: demonstrate knowledge of the concepts, principles and methods of conservation biology as practiced at the scale of ecological communities and above, including: a) the processes generating patterns of biodiversity at local to...
global scales; b) patterns, mechanisms and consequences of biodiversity loss; and c) procedures and philosophies for valuing biodiversity and prioritising locations for conservation.

- Analysis and interpretation of biodiversity patterns: acquire, compile and analyse biodiversity data, elucidate patterns, and interpret those patterns in a conservation context.
- Conservation monitoring and planning: integrate observed spatial pattern of biodiversity with other sources of spatial information, identify key locations for conservation action and biodiversity monitoring, and makes scientifically sound recommendations justified by the evidence.
- Scientific literacy and communication: Review, critically evaluate and synthesize diverse scientific literature in the area of conservation biology and communicate an understanding of this in a written form.

**Online test**

Due: **Every 2nd week**

Weighting: **30%**

There will be a total of 5 online tests (worth 6 marks each) to be completed in your own time. Each test will consist of a single short-answer question and will be based on any lecture, tutorial or assigned reading given up to that point. The question will normally involve interpretation of a graph or some data. You will have one week in which to prepare and submit an answer to the question. Marks and feedback will become available after the test has closed.

This Assessment Task relates to the following Learning Outcomes:

- Knowledge of conservation biology: demonstrate knowledge of the concepts, principles and methods of conservation biology as practiced at the scale of ecological communities and above, including: a) the processes generating patterns of biodiversity at local to global scales; b) patterns, mechanisms and consequences of biodiversity loss; and c) procedures and philosophies for valuing biodiversity and prioritising locations for conservation.
- Analysis and interpretation of biodiversity patterns: acquire, compile and analyse biodiversity data, elucidate patterns, and interpret those patterns in a conservation context.

**Conservation Plan**

Due: **Week 13**

Weighting: **40%**
You will prepare a plan for the conservation and monitoring of biodiversity in the Wet Tropics bioregion of Far North Queensland. We will use existing data on species distributions sourced from the Atlas of Living Australia. From these data, you will interpret biodiversity pattern in order to make decisions about conservation risk and prioritisation, and make recommendations of most needed conservation actions and most important sites for ongoing monitoring. Analyses for this assignment will be conducted during tutorials. Students can collaborate on making a conservation plan but write and submit their assignments individually. The plan is expected to be well illustrated with maps and graphs, have an extensive bibliography, and be no more than 2000 words (not including bibliography).

This Assessment Task relates to the following Learning Outcomes:

- **Knowledge of conservation biology**: demonstrate knowledge of the concepts, principles and methods of conservation biology as practiced at the scale of ecological communities and above, including: a) the processes generating patterns of biodiversity at local to global scales; b) patterns, mechanisms and consequences of biodiversity loss; and c) procedures and philosophies for valuing biodiversity and prioritising locations for conservation.
- **Analysis and interpretation of biodiversity patterns**: acquire, compile and analyse biodiversity data, elucidate patterns, and interpret those patterns in a conservation context.
- **Conservation monitoring and planning**: integrate observed spatial pattern of biodiversity with other sources of spatial information, identify key locations for conservation action and biodiversity monitoring, and makes scientifically sound recommendations justified by the evidence.
- **Scientific literacy and communication**: Review, critically evaluate and synthesize diverse scientific literature in the area of conservation biology and communicate an understanding of this in a written form.

**Delivery and Resources**

**Technology**

This unit requires access to a computer and a reliable internet connection to complete tutorials and assignments. Both weekly tutorials (internal students) and on-campus sessions (external students) will be held in computer labs with the relevant software installed. Students attempting tutorials on their own will need to install particular software packages (details in tutorial notes). Some of these packages are only available for Windows OS.

**Delivery**

Students are expected to attend weekly lectures and tutorials. Times and venues can be found in the university timetable. If unable to make the scheduled times, please discuss options with the convenor.
Unit website

Teaching materials and online communications will be via the unit website (ilearn.mq.edu.au).

Changes since last offering

There have been some significant changes since the last offering (2015) of this unit, particularly with respect to assessments. The hotspot prioritisation report replaces a short essay (and annotated bibliography). The single online test has been broken into bi-weekly tests with no time limit (other than due date).

Unit Schedule

Activities are organised into weekly topics. Please note that the current schedule is provisional and is subject to minor changes.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Lecture</th>
<th>Tutorial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Biodiversity and conservation</td>
<td>Biodiversity and conservation</td>
<td>Documentary <em>(Lord of the Ants)</em></td>
</tr>
<tr>
<td>2</td>
<td>Measuring biodiversity</td>
<td>Measuring biodiversity</td>
<td>What is biodiversity?</td>
</tr>
<tr>
<td>3</td>
<td>Loss of biodiversity</td>
<td>Extinction and threatening processes</td>
<td>Hotspot priority setting</td>
</tr>
<tr>
<td>4</td>
<td>Habitat loss and fragmentation</td>
<td>Habitat loss and fragmentation</td>
<td>Island biogeography</td>
</tr>
<tr>
<td>5</td>
<td>Biodiversity informatics</td>
<td>Biodiversity informatics</td>
<td>No tutorial - public holiday</td>
</tr>
<tr>
<td>6</td>
<td>Biodiversity survey</td>
<td>Inventory and monitoring</td>
<td>Biodiversity data analysis</td>
</tr>
<tr>
<td>7</td>
<td>Valuing biodiversity</td>
<td>Conservation ethics and valuing biodiversity</td>
<td>No tutorial - public holiday</td>
</tr>
<tr>
<td>8</td>
<td>Ecological communities</td>
<td>Communities and meta-communities</td>
<td>Mapping and estimating biodiversity</td>
</tr>
<tr>
<td>9</td>
<td>Global biodiversity patterns</td>
<td>Global biodiversity patterns</td>
<td>Prioritisation for conservation</td>
</tr>
<tr>
<td>10</td>
<td>Conservation biogeography</td>
<td>Conservation biogeography</td>
<td>Gap analysis</td>
</tr>
<tr>
<td>11</td>
<td>Conservation planning</td>
<td>Conservation planning</td>
<td>Conservation planning</td>
</tr>
<tr>
<td>12</td>
<td>Ecological management and restoration</td>
<td>Ecological management and restoration</td>
<td>Drop-in session</td>
</tr>
<tr>
<td>13</td>
<td>No lecture</td>
<td>No tutorial</td>
<td></td>
</tr>
</tbody>
</table>

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:


In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

**Student Code of Conduct**

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student_conduct/](https://students.mq.edu.au/support/student_conduct/)

**Results**

Results shown in iLearn, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit [ask.mq.edu.au](http://ask.mq.edu.au).

**Student Support**

Macquarie University provides a range of support services for students. For details, visit [http://students.mq.edu.au/support/](http://students.mq.edu.au/support/)

**Learning Skills**

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- **Workshops**
- **StudyWise**
- **Academic Integrity Module for Students**
- **Ask a Learning Adviser**

**Student Enquiry Service**

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

**Equity Support**

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.
IT Help
For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

PG - Critical, Analytical and Integrative Thinking
Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Knowledge of conservation biology: demonstrate knowledge of the concepts, principles and methods of conservation biology as practiced at the scale of ecological communities and above, including: a) the processes generating patterns of biodiversity at local to global scales; b) patterns, mechanisms and consequences of biodiversity loss; and c) procedures and philosophies for valuing biodiversity and prioritising locations for conservation.
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Assessment tasks

- Hotspot prioritisation report
- Online test
- Conservation Plan

PG - Effective Communication
Our postgraduates will be able to communicate effectively and convey their views to different
social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

**Learning outcome**

- Scientific literacy and communication: Review, critically evaluate and synthesize diverse scientific literature in the area of conservation biology and communicate an understanding of this in a written form.

**Assessment tasks**

- Hotspot prioritisation report
- Conservation Plan

**PG - Discipline Knowledge and Skills**

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

**Learning outcomes**

- Knowledge of conservation biology: demonstrate knowledge of the concepts, principles and methods of conservation biology as practiced at the scale of ecological communities and above, including: a) the processes generating patterns of biodiversity at local to global scales; b) patterns, mechanisms and consequences of biodiversity loss; and c) procedures and philosophies for valuing biodiversity and prioritising locations for conservation.
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**Assessment tasks**

- Hotspot prioritisation report
- Online test
- Conservation Plan
PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

**Learning outcomes**

- Analysis and interpretation of biodiversity patterns: acquire, compile and analyse biodiversity data, elucidate patterns, and interpret those patterns in a conservation context.
- Conservation monitoring and planning: integrate observed spatial pattern of biodiversity with other sources of spatial information, identify key locations for conservation action and biodiversity monitoring, and makes scientifically sound recommendations justified by the evidence.
- Scientific literacy and communication: Review, critically evaluate and synthesize diverse scientific literature in the area of conservation biology and communicate an understanding of this in a written form.

**Assessment tasks**

- Hotspot prioritisation report
- Online test
- Conservation Plan

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

**Learning outcomes**

- Knowledge of conservation biology: demonstrate knowledge of the concepts, principles and methods of conservation biology as practiced at the scale of ecological communities and above, including: a) the processes generating patterns of biodiversity at local to global scales; b) patterns, mechanisms and consequences of biodiversity loss; and c) procedures and philosophies for valuing biodiversity and prioritising locations for
conservation.

• Analysis and interpretation of biodiversity patterns: acquire, compile and analyse biodiversity data, elucidate patterns, and interpret those patterns in a conservation context.

• Conservation monitoring and planning: integrate observed spatial pattern of biodiversity with other sources of spatial information, identify key locations for conservation action and biodiversity monitoring, and makes scientifically sound recommendations justified by the evidence.

Assessment tasks

• Hotspot prioritisation report
• Online test
• Conservation Plan

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

• Knowledge of conservation biology: demonstrate knowledge of the concepts, principles and methods of conservation biology as practiced at the scale of ecological communities and above, including: a) the processes generating patterns of biodiversity at local to global scales; b) patterns, mechanisms and consequences of biodiversity loss; and c) procedures and philosophies for valuing biodiversity and prioritising locations for conservation.

• Scientific literacy and communication: Review, critically evaluate and synthesize diverse scientific literature in the area of conservation biology and communicate an understanding of this in a written form.

Assessment tasks

• Hotspot prioritisation report
• Online test
• Conservation Plan

https://unitguides.mq.edu.au/unit_offerings/55713/unit_guide/print