



# BIOL349

## Biodiversity and Conservation

S2 External 2016

*Dept of Biological Sciences*

### Contents

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<a href="#"><u>General Information</u></a>	2
<a href="#"><u>Learning Outcomes</u></a>	2
<a href="#"><u>Assessment Tasks</u></a>	3
<a href="#"><u>Delivery and Resources</u></a>	6
<a href="#"><u>Unit Schedule</u></a>	7
<a href="#"><u>Learning and Teaching Activities</u></a>	9
<a href="#"><u>Policies and Procedures</u></a>	9
<a href="#"><u>Graduate Capabilities</u></a>	10

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

Nola Hancock

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E8C153

Credit points

3

Prerequisites

BIOL227(P) and BIOL235(P)

Corequisites

BIOL313 or BIOL316 or BIOL318 or BIOL334 or BIOL341 or BIOL347 or BIOL362 or BIOL368 or BIOL369 or BIOL372 or BIOL373

Co-badged status

Unit description

This unit covers the major themes of biodiversity and conservation: patterns of biodiversity, principles of conservation biology, human impacts, and management principles. Topics include global biodiversity, threatening processes, protected area and off-reserve conservation, habitat fragmentation, restoration ecology, climate change impacts, and management. Much of the focus is on Australian examples. Field and laboratory work are an important component of this unit and are conducted in two compulsory on-campus sessions.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

Evaluate the major patterns and services provided by biodiversity globally

Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity

Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques

Understand how to create conservation management plans for practical application, using the principles of conservation biology

Evaluate the efficacy of new conservation management strategies in the professional context.

## Assessment Tasks

Name	Weighting	Due
<u>Oral seminar</u>	10%	27-28 August
<u>Blog</u>	5%	27 August & 6 September
<u>Draft recovery plan</u>	15%	20 September
<u>MQ Ecology Reserve PoM</u>	30%	17 October
<u>Final exam</u>	40%	Exam period

### Oral seminar

Due: **27-28 August**

Weighting: **10%**

You must prepare a 10 minute talk that is a summary and critical appraisal of a journal article chosen from the recent (last 5 years) conservation biology literature. The article you choose should be reporting and interpreting new information, not a review article or opinion piece. Please check your article is suitable with the unit convenor at least one week before the on-campus session. Students will be assessed on the seminar content and presentation quality, and their ability to answer questions. Students will also be assessed on their contribution during question time of the other student talks. A pdf of your powerpoint presentation must be emailed to the unit convenor by 9 am 27 August 2016.

On successful completion you will be able to:

- Evaluate the major patterns and services provided by biodiversity globally
- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Evaluate the efficacy of new conservation management strategies in the professional context.

## Blog

Due: **27 August & 6 September**

Weighting: **5%**

You should prepare a 500 word post about the article you presented for the oral seminar and post it via the iLearn website onto the unit's 'The Conservation piece' blog. Follow the style of websites such as the environmental research briefs of The Conversation (<http://theconversation.edu.au/pages/environment>) (Due **27th August**).

You should look at the other student's posts and comment (intelligently and constructively) on at least 3 on the website (Due **6th September**).

On successful completion you will be able to:

- Evaluate the major patterns and services provided by biodiversity globally
- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Evaluate the efficacy of new conservation management strategies in the professional context.

## Draft recovery plan

Due: **20 September**

Weighting: **15%**

You will write a draft recovery plan for a species of your choice whose life-history and circumstances interest you. You will first select a species that doesn't already have a recovery plan. From the literature you will identify the threats challenging this species' persistence and suggest management strategies necessary to mitigate these threats. Finally, you will suggest performance criteria to measure and evaluate the efficacy of your recommended strategies.

On successful completion you will be able to:

- Evaluate the major patterns and services provided by biodiversity globally
- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Understand how to create conservation management plans for practical application, using the principles of conservation biology
- Evaluate the efficacy of new conservation management strategies in the professional

context.

## MQ Ecology Reserve PoM

Due: **17 October**

Weighting: **30%**

The university is negotiating a Voluntary Conservation Agreement for an area of bushland between Talavera Road and the Lane Cove River. We will assess the area for its biodiversity values, threats including weeds & feral animals, fire management and public access and amenity. All data will be collected, presented and distributed during the second on-campus session (19-21 September). Using these data you will write a Plan of Management for the area. An example PoM will be provided on the iLearn website.

On successful completion you will be able to:

- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Understand how to create conservation management plans for practical application, using the principles of conservation biology
- Evaluate the efficacy of new conservation management strategies in the professional context.

## Final exam

Due: **Exam period**

Weighting: **40%**

The final examination is worth 40% of the unit's assessment. It will be 2 hours plus 10 min reading time. The examination will consist of a mixture of multiple choice, short answer and essay questions: examples will be provided in Lecture 25. There will be an emphasis placed on integration of material from lectures and practicals rather than on rote learning of facts and figures.

On successful completion you will be able to:

- Evaluate the major patterns and services provided by biodiversity globally
- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world

conservation issue, and communicate that understanding using a variety of techniques

- Evaluate the efficacy of new conservation management strategies in the professional context.

## Delivery and Resources

### Unit web page

The unit web page can be accessed via the student portal (log in at <https://ilearn.mq.edu.au/login/MQ/>). There you will find unit information, resource material, links to interesting websites including career information, ECHO (formerly iLectures), announcements, forum and dialogue facilities, as well as links to Turnitin for submitting assessment tasks. You are encouraged to use the discussion & email facilities for communication among staff and students. Please also check the unit webpage regularly for announcements and additional resource material.

### RECOMMENDED TEXTS

There is no single text that covers the whole unit. Several general texts are recommended and are in the library or available free on-line:

Primack RB. 2010. *Essentials of Conservation Biology* 6<sup>th</sup> edition. Sinauer Associates.

Groom MJ, Meffe GK, Carroll CK. 2005. *Principles of Conservation Biology*, 3rd edition, Sinauer Associates.

Sodhi N and Ehrlich PR. (Eds.). 2010. *Conservation Biology for All*. Oxford University Press. (Available online at:<http://www.mongabay.com/conservation-biology-for-all.html>).

Lindenmayer D & Burgman M. 2005. *Practical Conservation Biology*. CSIRO.

Attiwill P. & Wilson B. (2006). *Ecology. An Australian Perspective*. 2<sup>nd</sup> edition, Oxford University Press.

Stow, A, Maclean, N., Holwell, G.I (Eds.). 2015. *Austral Ark : The State of Wildlife in Australia and New Zealand*. Cambridge University Press.

### TECHNOLOGY USED AND REQUIRED

Students are expected to access all unit material through the iLearn unit webpage. Basic multimedia software (eg. Windows Media Player, Quicktime) will be needed to listen to recorded lectures. Students will be required to use internet resources for sourcing information and to use appropriate software, particularly Excel, for data analysis.

## Unit Schedule

### Lecture schedule

Date	L#	Lecture	Lecturer
1/8	1	Introduction	Nola Hancock
4/8	2	Valuing & measuring biodiversity	David Nipperess
8/8	3	Global patterns of biodiversity	Nola Hancock
11/8	4	Loss of biodiversity: extinction	Nola Hancock
15/8	5	Vulnerability to extinction	Michelle Leishman
18/8	6	Biodiversity values of wetlands	Mia Dalby-Ball
22/8	7	Human population and habitat loss	Nola Hancock
25/8	8	Habitat fragmentation	Nola Hancock
29/8	9	Over-exploitation, disease & pollution	Nola Hancock
1/9	10	Climate change	Lesley Hughes
5/9	11	Invasive species	Rachael Gallagher
8/9	12	Introduction to conservation genetics	Adam Stow
12/9	13	Genetic management of small populations	Rachael Dudaniec
15/9	14	Captive breeding & re-introduction	Adam Stow
3/10		Public holiday	
6/10	15	Guest lecturer	TBA
10/10	16	Species-level conservation	Nola Hancock

13/10	17	Protected areas	Nola Hancock
17/10	18	Off-reserve conservation	Nola Hancock
20/10	19	Restoration and rehabilitation	Nola Hancock
24/10	20	Species Distribution Modelling	Linda Beaumont
27/10	21	Assisted colonisation	Nola Hancock
31/10	22	Seed banking	Peter Cuneo
3/11	23	Legislation	Michelle Leishman
7/11	24	Integrating conservation science and policy	James Brazill-Boast
10/11	25	Wrap-up	Nola Hancock

**Lecture topics and presenters may change due to the availability of lecturers. Any changes to the schedule will be advertised on learn.**

**Field trip sessions (includes on-campus pracs and field trips):**

**Session 1: 27-28 August**

Day 1 AM	Seminars
Day 1 PM	Assessment of threat status
Day 2 AM	Seminars
Day 2 PM	Ecological restoration in practice - Lane Cove National Park site visit

**Session 2: 19-21 September**

Day 1 AM	Overview of MQ Ecology Reserve with Lane Cove National Park staff
Day 1 PM	Organise into groups, collate resources, field work
Day 2	Group field work
Day 3 AM	Group field work, prepare data for presentation



Day 2 PM

Data presentation

## Learning and Teaching Activities

### Lectures

Lectures on theory and principles of conservation biology

### Practicals

Practicals include exercises in assessment of threat of extinction, population viability analysis, collecting data for conservation planning and management.

## 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:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

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/>

### 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 Services and 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.

## Student Enquiries

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

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](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

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcomes

- Understand how to create conservation management plans for practical application, using the principles of conservation biology
- Evaluate the efficacy of new conservation management strategies in the professional context.

## Assessment tasks

- Oral seminar
- Blog

## Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

### Learning outcomes

- Understand how to create conservation management plans for practical application, using the principles of conservation biology
- Evaluate the efficacy of new conservation management strategies in the professional context.

## Assessment tasks

- Oral seminar
- Draft recovery plan
- MQ Ecology Reserve PoM

## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

### Learning outcomes

- Understand how to create conservation management plans for practical application, using the principles of conservation biology
- Evaluate the efficacy of new conservation management strategies in the professional context.

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge,

scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

## **Learning outcomes**

- Evaluate the major patterns and services provided by biodiversity globally
- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Understand how to create conservation management plans for practical application, using the principles of conservation biology
- Evaluate the efficacy of new conservation management strategies in the professional context.

## **Assessment tasks**

- Oral seminar
- Blog
- Draft recovery plan
- MQ Ecology Reserve PoM
- Final exam

## **Critical, Analytical and Integrative Thinking**

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## **Learning outcomes**

- Evaluate the major patterns and services provided by biodiversity globally
- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world

conservation issue, and communicate that understanding using a variety of techniques

- Understand how to create conservation management plans for practical application, using the principles of conservation biology
- Evaluate the efficacy of new conservation management strategies in the professional context.

## **Assessment tasks**

- Oral seminar
- Blog
- Draft recovery plan
- MQ Ecology Reserve PoM
- Final exam

## **Problem Solving and Research Capability**

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## **Learning outcomes**

- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Understand how to create conservation management plans for practical application, using the principles of conservation biology
- Evaluate the efficacy of new conservation management strategies in the professional context.

## **Assessment tasks**

- Draft recovery plan
- MQ Ecology Reserve PoM

## **Effective Communication**

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess,

write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

### **Learning outcomes**

- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Understand how to create conservation management plans for practical application, using the principles of conservation biology

### **Assessment tasks**

- Oral seminar
- Blog

## **Engaged and Ethical Local and Global citizens**

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

### **Learning outcomes**

- Evaluate the major patterns and services provided by biodiversity globally
- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Evaluate the efficacy of new conservation management strategies in the professional context.

### **Assessment tasks**

- Draft recovery plan
- MQ Ecology Reserve PoM

## **Socially and Environmentally Active and Responsible**

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active

participants in moving society towards sustainability.

This graduate capability is supported by:

### **Learning outcomes**

- Evaluate the major patterns and services provided by biodiversity globally
- Identify key threatening processes that lead to the loss of biodiversity, including those experienced through the PACE activity
- Critically evaluate and synthesise diverse information sources on a current, real-world conservation issue, and communicate that understanding using a variety of techniques
- Evaluate the efficacy of new conservation management strategies in the professional context.

### **Assessment tasks**

- Draft recovery plan
- MQ Ecology Reserve PoM