



# GSE 804

## Ecological Processes

S1 Evening 2015

*Dept of Environmental Sciences*

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## General Information

|   |
|---|
| Unit convenor and teaching staff<br>Jessica Boomer<br><a href="mailto:jessica.boomer@mq.edu.au">jessica.boomer@mq.edu.au</a>  |
| Credit points<br>4  |
| Prerequisites<br>GSE803   |
| Corequisites  |
| Co-badged status  |
| Unit description<br>Principles, applications and implications of ecological knowledge are explored in this unit which covers the science of ecology and current concepts about how natural systems are organised. Global and Australian examples are used. The central theme is how processes operating in nature produce patterns in ecosystems, and how these processes both facilitate and constrain the interactions between humankind and the planet. Note: permission to complete the unit without completion of GSE803 as a prerequisite will only be granted if the student has completed a science-based degree. |

## 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:

- Demonstrate a familiarity with ecological principles in presentations and discussions
- Demonstrate a capacity for undertaking independent research into key topics in ecology
- Identify how underlying ecological processes influence appropriate environmental decision-making
- Demonstrate an appreciation of the complexity of natural systems in interpreting ecological patterns and their underlying processes

## Assessment Tasks

| Name                | Weighting | Due      |
|---------------------|-----------|----------|
| <u>Journal Club</u> | 35%       | TBA      |
| <u>Short Paper</u>  | 25%       | 6/4/2015 |
| <u>Major Essay</u>  | 40%       | 7/6/2015 |

### Journal Club

Due: **TBA**

Weighting: **35%**

Ecology relies heavily on getting information out to other interested parties and the public, be this your family and friends, school children, at a conference, to the media, to your industry stakeholder, to your granting body, government ministers and advisors or the general public. Part of this course, therefore, involves a 15-20 minute talk on the contents of your journal club paper to your peers and staff during the evening classes. Assessment is based on your individual presentation and your participation in the class discussions on all journal club presentations.

Your paper presentation can be loaded onto a class computer where you will need to present it. Talks will be timed. The class will be allowed to ask questions and provide feedback. However, the unit convenor and staff (not the class) will decide on the formal marks for each talk. Good presentations will have a comprehensive understanding of the topic and will speak and participate equally during the presentation.

On successful completion you will be able to:

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### Short Paper

Due: **6/4/2015**

Weighting: **25%**

This 2000 word paper will be assessed based on your demonstrated understanding of the problem, your use of available literature, and your written communication skills. You have a choice of two topics for this paper.

## **EITHER**

Conservation biologists generally agree that landscape connectivity enhances population viability and that until fairly recently most species lived in well-connected landscapes. Because human activities such as urbanisation often sever natural connections, habitat corridors have been suggested as a means of retaining some connectivity between pockets of appropriate habitat. Corridors are frequently cited as of value both for reserve design and allocation and in particular in the urban bush context. However, there is a considerable argument as to whether corridors do indeed enhance population viability. Review the evidence for and against corridors and then discuss how you would empirically test this proposition for three endangered species of Australian flora and/or fauna.

## **OR**

Australia has numerous plants and animals which are considered pests. Most of them were introduced after European settlement, either deliberately or by accident, including some brought in to assist with the control of other nuisance species. Choose one plant and one animal pest and discuss the following:

How and why the species were introduced

What factors contributed to their successful establishment

What were the environmental and economic impacts of the introduction

Discuss pros and cons of the methods used to control these species

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- Identify how underlying ecological processes influence appropriate environmental decision-making

- Demonstrate a capacity for undertaking independent research into key topics in ecology

## Major Essay

Due: **7/6/2015**

Weighting: **40%**

Choose an environmental topic from the list below (or suggest a suitable alternative but discuss with the unit convenor before proceeding with it) and write an examination of how the theoretical side of ecology relates to the practice of tackling that problem or issue. Your essay should not exceed 2500 words in length. This will allow you to examine at least one ecological topic in depth. Remember to explicitly link principles to applications. Also, be sure to set out the problem and your approach in the introduction of your essay. Your essay will be assessed based on your demonstrated understanding of the problem or issue, your ability to logically link principles to applications, your use of available literature, and your written communication skills.

### **Suggested topics:**

Effects of a particular type of pollution on natural assemblages.

Conservation biology, especially with regard to the role of interactions between species.

Stock-recruitment relationships and harvesting in fisheries.

Introduction of exotic species across natural barriers of oceans and landmasses.

Habitat fragmentation and landscape ecology.

Ecosystem rehabilitation and reconstruction.

Ecological effects of the release of genetically engineered organisms.

Biological control of pests.

Strategies of biological monitoring.

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## Delivery and Resources

Weekly lectures will be held Thursday 6 - 9 pm in E3B 117

Students will need access to a computer and basic office software (eg. Microsoft Office or OpenOffice) to complete assessment tasks. An Internet browser will also be used to search for background information, for assignments and the weekly discussion group.

There is no set text for this unit. The following lists some useful references.

Attiwill, P. & B. Wilson, *Ecology: an Australian perspective*. Oxford University Press, New York. 648 pp.

Begon, M., J.L. Harper & C.R. Townsend 1996. *Ecology: individuals, populations and communities*. 3rd ed., Blackwell, Oxford. 945 pp.

Begon, M., M. Mortimer & D.J. Thompson. 1996. *Population ecology: a unified study of animals and plants*. 3rd ed., Blackwell, Oxford.

Burgman, M. and Lindenmayer, D. (1998): *Conservation Biology for the Australian Environment*. Surrey Beatty & Sons, Sydney

Ehrlich, P.R. & J. Roughgarden 1987. *The science of ecology*. MacMillan, New York. 710 pp.

Krebs, C.J. 1994. *Ecology: the experimental analysis of distribution and abundance*. 4th ed., Harper, New York. 800 pp.

Magurran, A. E. 2004. *Measuring Biological Diversity*. 1st ed. Blackwell Science, Massachusetts

Townsend, C. R., J. Harper, & M. Begon (2000) *Essentials of Ecology*, 1st ed. Blackwell Science, Massachusetts

Pechenik, J.A. 2009 *A short guide to writing about biology*. Longman: New York. 288p.

## 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)

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.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://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### 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

- Demonstrate a familiarity with ecological principles in presentations and discussions
- Demonstrate a capacity for undertaking independent research into key topics in ecology
- Identify how underlying ecological processes influence appropriate environmental decision-making
- Demonstrate an appreciation of the complexity of natural systems in interpreting ecological patterns and their underlying processes

#### Assessment tasks

- Journal Club
- Short Paper
- Major Essay

### 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

- Demonstrate a familiarity with ecological principles in presentations and discussions
- Demonstrate a capacity for undertaking independent research into key topics in ecology
- Identify how underlying ecological processes influence appropriate environmental decision-making



- Demonstrate an appreciation of the complexity of natural systems in interpreting ecological patterns and their underlying processes

## **Assessment tasks**

- Journal Club
- Short Paper
- Major Essay

## **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**

- Demonstrate a familiarity with ecological principles in presentations and discussions
- Demonstrate a capacity for undertaking independent research into key topics in ecology
- Identify how underlying ecological processes influence appropriate environmental decision-making
- Demonstrate an appreciation of the complexity of natural systems in interpreting ecological patterns and their underlying processes

## **Assessment tasks**

- Journal Club
- Short Paper
- Major Essay

## **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**

- Demonstrate a familiarity with ecological principles in presentations and discussions
- Demonstrate a capacity for undertaking independent research into key topics in ecology

- Identify how underlying ecological processes influence appropriate environmental decision-making

### **Assessment tasks**

- Journal Club
- Short Paper
- Major Essay

## **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**

- Demonstrate a familiarity with ecological principles in presentations and discussions

### **Assessment tasks**

- Journal Club
- Short Paper
- Major Essay

## **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 outcome**

- Demonstrate an appreciation of the complexity of natural systems in interpreting ecological patterns and their underlying processes

### **Assessment tasks**

- Journal Club
- Short Paper
- Major Essay