



S F S THE SCHOOL
FOR FIELD STUDIES

Wildlife & Conservation Biology

SFS 3701

Syllabus for Fall 2022

The School for Field Studies (SFS)
Center for Rainforest Studies (CRS)
Yungaburra, Australia

This syllabus may develop or change over time based on local conditions, learning opportunities, and faculty expertise. Course content may vary from program term to program term.



COURSE CONTENT SUBJECT TO CHANGE

Please note that this is a copy of a recent syllabus. A final syllabus will be provided to students on the first day of academic programming.

SFS programs are different from other travel or study abroad programs. Each iteration of a program is unique and often cannot be implemented exactly as planned for a variety of reasons. There are factors which, although monitored closely, are beyond our control. For example:

- Changes in access to or expiration or change in terms of permits to the highly regulated and sensitive environments in which we work;
- Changes in social/political conditions or tenuous weather situations/natural disasters may require changes to sites or plans, often with little notice;
- Some aspects of programs depend on the current faculty team as well as the goodwill and generosity of individuals, communities, and institutions which lend support.

Please be advised that these or other variables may require changes before or during the program. Part of the SFS experience is adapting to changing conditions and overcoming the obstacles that may present. In other words, the elephants are not always where we want them to be, so be flexible!

Course Overview

This component of the program focuses on identifying threats to wildlife populations, how to obtain data on the impact of these threats on wildlife populations and how to select and apply appropriate conservation methods to mitigate these threats. We will look at these aspects in general and then demonstrate them in case studies of species in the Wet Tropics. To formulate a background understanding of habitats of the Wet Tropic's wildlife, we will explore the origin of the main landscape formations of this part of Australia by looking at geological and biogeographical factors that shaped the landscape and its biota. You will be introduced to Australia's fauna and the unique species that inhabit the diverse habitats of the Wet Tropics. We then will deal with some basic ecological concepts of biodiversity and why so many species can co-exist in one place. This will also involve learning skills to obtain data on various parameters of wildlife populations to assess the impact of habitat loss, fragmentation, introduced species and climate change on them. Field trips and field work in various parts of the Atherton Tablelands will help you in learning these skills.

Using the obtained data on wildlife populations we will explore various conservation techniques in order to mitigate these threats to the flora and fauna of the Wet Tropics, how to identify partners and resources for conservation work, how to triage conservation needs, and how to best advocate conservation. We will consider the role of corridors or landscape linkages, particularly along riparian areas, and ways in which restoration and landscape rehabilitation can overcome negative effects of human driven landscape modification and climate change on these ecosystems. We will consider options on how to efficiently control pest animals and their impacts on native flora and fauna.

The course is a mixture of class lectures, field lectures, field laboratory courses, workshops, field trips, and readings to complement the material presented in the lectures. A major emphasis is on field skills, the collection, management and analyses of data, and skills of writing a scientific paper. A wide range of material will be provided and should be used to study the class topics and to acquire the desired skills. Be aware that all material covered in class, lectures, field lectures, field trips and readings is examinable.

Learning objectives

Following this course, students should have an understanding of:

1. the factors that influenced the origin of the Wet Tropics' landscapes and ecosystems;
2. the ecology of rainforest, freshwater and marine ecosystems of the Wet Tropics
3. the fauna of the Wet Tropics
4. the threats to wildlife populations of various ecosystems in the Wet Tropics;
5. the issues associated with conserving wildlife populations and managing rainforest, freshwater and marine ecosystems in the Wet Tropics

Course parts

The Wildlife and Conservation Biology Course is divided into two parts. In the first part, you will become familiar with the basics of wildlife ecology and wildlife field techniques. The acquired knowledge of this part will help you in the second part to assess the impact of threats to wildlife populations and to identify the most appropriate and effective conservation methods and partners in order to mitigate these threats. The course will also give you an understanding on how to most effectively communicate and advocate conservation needs. Case studies on the conservation of Wet Tropics' wildlife populations will assist you in understanding the principles of effective wildlife conservation.

Assessment

Most of the assessments will be based on individually written or orally presented work. Below is a table of the assessments for this course.

Assessment Item	Value (%)
Fauna quiz	15
Biodiversity assignment - iNat	15
Conservation planning assignment (group assignment)	20
FEX report	20
Final Exam	25
Participation	5
Total	100

Fauna Quiz (15%)

The purpose of this quiz is to develop your skills in identifying birds and mammals of our rainforest by sound and visual cues. As the Atherton Tablelands is home to a diverse fauna the familiarization with the most common species will help to better understand the roles these animals play in the ecosystems of this region. We will conduct bird walks to practice techniques to quickly identify birds by sight and/or sound and you will be trained to recognize mammalian species by their tracks and other signs left behind by them. The quiz will give you some familiarity with the Wet Tropics fauna, most of which will be new to you.

Biodiversity assignment – iNat (15%)

This activity is linked to the iNat assignment given in the Tropical Biome Ecology course, but here we will focus on animal groups. You will be given an assignment to make observations and take pictures of invertebrate and vertebrates and upload your photos and write descriptions of your observations on iNat. This assignment is designed to train your powers of wildlife observation.

FEX Report - Scientific Writing (25%)

During our Field Exercise we will collect data on the colonization of restored rainforest habitat by wildlife populations. We will apply some of the wildlife field techniques with which you became familiar to assess which species are utilizing the restored habitat. You will design data sheets, collect data and develop your own research question. Workshops on scientific writing and statistical data analysis will prepare you to write a mock scientific paper addressing your research question.

Conservation planning assignment (group assignment) (20%)

You will be given a conservation issue/case and have to develop a plan to solve this issue. The plan needs to describe the threat to a wildlife population, and to derive appropriate actions to mitigate the threat. It has to outline potential funding sources and how to gain them. Selected mitigation techniques have to be described.

Final Exam (25%)

During the final exam you will be tested on material presented in lectures, field lectures, and excursions. Answering questions will require critical and analytical thinking across the various teaching units.

Grading Scheme

A	95.00 - 100%	B+	86.00 - 89.99%	C+	76.00 - 79.99%	D	60.00 - 69.99%
A-	90.00 - 94.99%	B	83.00 - 85.99%	C	73.00 - 75.99%	F	0.00 - 59.99%
		B-	80.00 - 82.99%	C-	70.00 - 72.99%		

General reminders

Plagiarism: Using the ideas and material of others without giving due credit, is cheating and will not be tolerated. A grade of zero will be assigned if anyone is caught cheating or aiding another person to cheat either actively or passively (e.g., allowing someone to look at your exam).

Deadlines for written and oral assignments are instated to promote equity among students and to allow faculty ample time to review and return assignments before others are due. As such, deadlines are firm and extensions will only be considered under extenuating circumstances. If you believe that you have been prevented from completing your work on time for reasons beyond your control (e.g. illness), make sure that you discuss this with the relevant faculty member as soon as possible, and certainly before the assignment is due. Late assignments will incur a penalty proportional to the length of time that they are late. This means an assignment that is one day late when students were given two days to work on it will have 50% of total points removed from the grade awarded for that assignment, and an assignment that is 2 hours late when two full days (16 hrs) were allocated to work on it will have 12.5% of total points removed from the grade.

Course components

The column Readings contains suggestions to deepen and expand the knowledge. **Compulsory reading material (indicated below in bold) is provided as Pdf files on the Student Drive.**

L: Lectures, **GL:** Guest Lecture, **FL:** Field Lectures, **FEX:** Field Exercise, **EX:** Exams, **REV:** Review, **WFT:** Wildlife Field Techniques **WS:** Workshop,

Code	Titles of Lectures /Field Exercises	Time (hrs.)	Type	Readings
Part 1 Basics of wildlife ecology and wildlife field techniques				
	Wildlife and Conservation Biology: Course Overview This lecture introduces to you the course content, course components and resources. You will hear about the assignments. This lecture will get you into the swing of discovering Australia's unique wildlife, the threats to it and attempts to conserve it.	1.0	L	Woinarski et al. (2015; 2016); Reside et al (2017) Fisher et al. (2014) Recommended: Cox (2017); Strahan et al. (2016)
	Geological processes that shaped the landscapes and fauna of the Tablelands and the Great Barrier Reef Let's dive into the past and see how geological events created	1.5	L	Whitehead et al. (2007); Winter (1997); Moritz et al. (2009); Macqueen et al. (2012); The Rise of Australian Marsupials

Code	Titles of Lectures /Field Exercises	Time (hrs.)	Type	Readings
	the various landscape elements we are seeing today along the coast of Far North Queensland, and how they have affected the fauna of this area.			
	Past and current landscapes of the Atherton Tablelands A tour on the Tablelands will show you the main land formations of this area. We will see different soil types and discuss how their distribution has affected the rainforest distribution and land uses.	3.0	FL	Atherton Seven Sisters Stephensons, P.J. (1989): Rocks and Landscapes of the Cairns District.- Qld Dept. of Mines – CRS Library ECO081; Haberle (2005); Haberle et al. (2006)
	Fauna of rainforests and freshwater ecosystems of the Wet Tropics We will talk about the lives of some faunal elements of the rainforest and water streams around you. Keep your eyes open and explore the fauna at all times. Contact your faculty for assistance in identifying your observations	2.0	L	Ramsey, D. (2005): Rainforests of tropical Australia. Ecosystem Manual series; CRS Library TRF072 Wildlife of Tropical North Queensland; Cooktown to Mackay, Queensland Museum 2000 -CRS Library TRF 066 Pearson et al. (2015); Pepper et al. (2018); Pettit et al. (2016) Further articles on student drive, e.g.; Cramb et al. (2009); Heise-Pavlov et al. (2011); Freeman and Freeman (2009); Heise (2017)
	Overview of the diversity and biogeography of Australian tropical marine fauna This lecture will define fish, marine invertebrates, marine mammals, and reptiles (sea turtles and saltwater crocodiles) inhabiting Australia’s tropical coastal and marine environments.	2.0	GL	Ceccarelli et al. (2014); Cheal et al. (2012); Jones et al. (2018); Hof et al. (2017); Emslie et al. (2017); Kingsford et al. (2012); Sobotzick et al. (2017)
	Biodiversity and Life in the Jungle: We will explore the different meanings/types of biodiversity and some ecological terms related to biodiversity. We will analyze the different roles animals play in an	1.5	L	Attiwill, P. and Wilson, B. (2006): Ecology – an Australian Perspective.- pages 550 – 554, CRS Library ECO086 Kitching et al. (2007); Sekercioglu (2006) Perry, D. (1990). Tropical Biology:

Code	Titles of Lectures /Field Exercises	Time (hrs.)	Type	Readings
	ecosystem and mechanisms that ensure that species can all co-exist.			A science in the sidelines – pgs 26 – 29- CRS Library TRF008 Attiwill, P. and Wilson, B. (2006): Ecology – an Australian Perspective.- chapters 18 to 22; CRS Library ECO086 Gordon et al. (2010); Graham et al. (2010); Kiley et al. (2019); Tingley et al. (2014); Zavaleta et al. (2009) Bradford and Westcott (2011); Sax and Gaines (2003); Williams (1997);
	Wildlife Field Techniques Introduction You will be introduced into various methods to collect data on wildlife in the field, and the characteristics of these methods in relation to animal welfare. <i>(in lab demonstration with following PP on invasive and non-invasive methods)</i>	2.0	WFT	Henderson (2003): Practical Methods in Ecology; CRS Library ECO075 (also see ECO064); See also: Fauna Field Guides on Student Drive; Lindenmayer et al. (2001); Fuller et al. (2015); Cilulko et al.(2013)
	Wildlife Field Techniques 1 Species identification in the field and in the lab You will be introduced to species ID methods <i>(birdsongs, tracks, scats, ant ID, dung beetle ID, moths; including early bird walks)</i>	4.0	Siggy David re iNat	
	Wildlife Field Techniques 2 Animal observations You will be given a brief introduction to the study and description of animal behavior – Observation techniques and will practice them in the field while applying the stag watching method <i>(will include drive to forest with Yellow-bellied gliders and observing them appearing from their dens at night)</i>	0.5 hour lecture; Field: 2 hours		

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	Wildlife Field Techniques 3 Nocturnal fauna methods We will go out to explore the nocturnal fauna of a rainforest habitat. You will become familiar with the technique of spotlighting and white-sheet moth trapping method	2.5		
	Wildlife Field Techniques 4 Crane Count participation You will participate in the local crane count and see how a strong volunteer conservation movement collects data on crane populations	2.0		
	Excursion to Fitzroy Island Learn about efforts to rehabilitate and raise turtles and also coral restoration work. Snorkel on a continental island to discover more of the marine diversity in the Great Barrier Reef	10	EXC	
	Fauna quiz Contact your faculty for assistance.	1.0	EX	Utilize your knowledge acquired during the bird walk and the provided resources on the student drive to prepare yourself for the fauna quiz. Various Field Guides to the Birds of the Wet Tropics and material on the students' drive
	Introduction to spatial tools in wildlife conservation (GPS/Topographic maps/GIS): This workshop consists of three parts: Part A: In this part we will learn how to extract spatial information from topographic maps and how to collect spatial data in the field Part B: In this part we will practice how to manage spatial data that we collected in the field and we will familiarize ourselves with the various parts of ARC-GIS software.	5.5	WS	Kozak et al. (2008) O'Kane et al. (2014) Heise-Pavlov and Gillanders (2016)

Code	Titles of Lectures /Field Exercises	Time (hrs.)	Type	Readings
	Part C: a practical application for each group (<i>give them some data and they should extract some information...</i>)			
	The outback of Australia In this component you will get a taste of the Australian outback with its typical landscapes and vegetation.	3.5	FL	Some interesting articles are provided on the student drive (including articles about termites, how animals can survive fires etc.)
Part 2 Threats to wildlife populations and how to mitigate them				
	Assessment of wildlife populations For a realistic assessment of the impact of threats to wildlife populations we need an understanding of population parameters such as birth rates, fecundity, growth rates, reproductive parameters, mortality rates and how they interact (<i>also consider to present population viability analysis/assessments</i>) – <i>will be linked to introduced wildlife field methods by asking students which methods they would use to get data for these parameters</i>)	3.0	L	Articles are provided on the student drive
	Basics of wildlife conservation Given the usual shortage of resources for Wildlife conservation, triaging conservation work is essential. We will look at ways to triage conservation needs, attract funding and the role of different players of conservation work. (<i>intro to conservation rating at different levels [IUCN, Fed and State laws]; Recovery Plans; Threatened Species Strategies; grants and philanthropic sources; governments and grass root activities, communication methods – explained in general</i>)	2.0	L	Articles are provided on the student drive

Code	Titles of Lectures /Field Exercises	Time (hrs.)	Type	Readings
	<i>and then a case study of an endangered animal in the Wet Tropics)</i>			
	<p>Consequences of habitat loss and fragmentation for wildlife populations</p> <p>Habitat fragmentation has profound impacts on terrestrial and freshwater ecological communities – we will consider some theoretical aspects of these impacts and consider some examples from our rainforest fauna. <i>(also add here loss of riparian vegetation and impact on water quality – water quality degradation means loss of habitat to freshwater fauna)</i></p>	2.0	L	<p>Latch, P. (2008): Recovery Plan for Mabi Forest- Mabi Forest Recovery Team, Queensland Government, EPA- Pdf file Laurance (2008b);</p> <p>Couvet (2002); Harding and Gomez (2006); Pettit et al. (2016); Goosem and Turton (2000)</p>
	<p>Restoring habitat</p> <p>In a video and some field lectures you will be introduced to various ways to restore lost habitat and hear about connectivity projects driven by governmental and non-governmental entities in the Wet Tropics</p> <p><i>(Brief intro into defragmentation theory; TREAT video, visit of restoration sites; during FL talk about how to get restoration started – practically and financially – carbon credits, volunteer agreements- NRs etc; wildlife colonization of restored habitat – passive, active, relocation etc)</i></p>	6.0	FL Simon: riparian area; Lemurod Leap NR at McKelly Road (SET) – wildlife crossing rope bridge)	<p>Soule, M.E. et al. (2004): The role of connectivity in Australian conservation.- <i>Pacific Conservation Biology</i> 10: 266-279. CRS Library JPCB104</p> <p>Jones et al. (2011); Goosem et al. (2005); Pascual-Hortal and Saura (2006); Villard-Metzger (2014); Cattarino et al. (2016); Zeller et al. (2012); Wintle et al. (2018); Lindenmayer et al. (2019)</p>
	<p>Introduced species</p> <p>We learn about the impact of non-native plant and animal species on the Australian ecosystems and the tropical rainforests and freshwater ecosystems of the Atherton Tablelands in particular.</p>	1.0	L	<p>Harrison, D.A. and Congdon, B.C. (2002): Wet Tropics Vertebrate Pest Risk Assessment Scheme.- CRC, Cairns, chapters 1.2.1; 2.1 and 2.2</p> <p>Attiwill, P. and Wilson, B. (2006): Ecology – an Australian Perspective.- Chapter 26; CRS Library ECO086</p> <p>Pest Animals WHA (docx file); Brown and Sax (2004); Petersen et. al (2006);</p>

Code	Titles of Lectures /Field Exercises	Time (hrs.)	Type	Readings
				Clavero (2014); Shea and Chesson (2002), Heise-Pavlov and Longway (2011)
	<p>Mitigating impact of introduced species to native wildlife populations There are numerous conventional methods to control introduced species and reduce their impact on native Australian wildlife populations, but you will also hear about some modern techniques that genetics and animal behaviour research are now providing to wildlife ecologists (<i>trapping, poisoning, fencing, diseases; pheromones, genetic engineering; sniffer dogs; guardian dogs etc</i>)</p>	1.5	L	<p>Heyword and Norbury (1999); Cooke (2012); Nelson et al. (2011); Caro and Sherman (2013); Dexter et al. (2013); Fisher and Blomberg (2012); Van Bommel and Johnson (2016; 2017); Extra folder “Dingo” provides material on the Dingo debate: Please check a few of the articles provided there</p>
	<p>Impact of Climate change on Australian wildlife populations You will hear some of the predictions for changing climatic conditions in Australia and how these changes will affect our wildlife populations, particularly in the Wet Tropics.</p>	1.5	Guest lecture	
	<p>Mitigating the effects of climate change on wildlife populations Apart from reducing our green house gas emissions to prevent further global warming, there are a number of measures we can implement to reduce the impact of global warming on wildlife populations, particularly in the high elevated areas of the Atherton Tablelands which contain many endemic species that depend on cooler climates (<i>identification, protection and connection of climate refugia</i>)</p>	1	L	
	<p>Assessing effects of conservation actions How can we assess whether our conservation work was successful? Shortage of resources for conservation demands effective methods that</p>	1.5		

<i>Code</i>	<i>Titles of Lectures /Field Exercises</i>	<i>Time (hrs.)</i>	<i>Type</i>	<i>Readings</i>
	work, but how to assess their outcomes? <i>(requirement of monitoring and appropriate data collection in relation to the goal of intervention)</i>			
	Field Exercise: You will develop, prepare, implement and report on a small research project. You will be introduced to rules of scientific writing and methods for statistical data analysis (these are parts of the DR syllabus) during the FEX. You will develop your own specific research question and write a mock scientific paper to address your question. Contact your faculties for assistance in selecting your research question, and with questions about scientific writing and statistical data analysis. <i>(topic to be developed)</i>	10.0	FEX	Various articles are provided in the FEX folder on the student drive. However, you are required to search for further articles in relation to your research question. See also FEX rubric on the Student Drive
	Exam Review Consult your faculty during exam preparation.	2.0	REV	
	Final Exam	1.0	EX	
	TOTAL	60		