E6: Invasive Species – Ecology, Impacts, and Management

Instructor: Ankila Hiremath (hiremath@atree.org)

Credits: 2 credits (32contact hours)

Duration of the course: 6th October to 12th November 2014

Time and Days: 10:00-11:50 AM on Mondays, Wednesdays and Fridays

Office hours: 2-4pm on Wednesdays

Course description:

This course will provide students with an overview of invasive alien plant species, starting with the question of what invasive species are, and why they are of interest. The initial part of the course will focus on the biology and ecology of invasive species and the invasion process – what makes certain species invasive? What makes certain ecosystems more vulnerable to invasion than others? And what impacts do invasive species have at various scales? The later part of the course will focus on various approaches to invasive species management – prevention, monitoring, eradication, control, or utilization. The course will draw upon the recent invasive species literature, with a special focus on the current status of invasive species knowledge and research in India.

Lecture/discussion outline:

The course is structured into 6 modules. Each module will comprise a lecture providing a broad overview of the subject and an in-depth student-led discussion of a recent paper on the topic from the primary literature. We will utilize the weekly tutorial sessions to discuss ideas and progress on projects (e.g., identifying an invasive species issue of interest, and putting together a brief policy-relevant review); we may also use half the tutorial session for a guest lecture on occasion. In addition, there will be a weekend field trip to engage with invasive species management in practice.

	Topic	Readings
Week 1 (6/10)	*Introduction to invasion ecology, the arrival and spread of invasive species*	
M	Lecture: What are invasive species?	Lockwood et al. Chs. 1-3
W	Lecture: Arrival, establishment and spread	Lockwood et al. Chs. 7-8
F	Discussion	
Week 2 (13/10)	*What makes certain species invasive?*	
M	Lecture: Propagule pressure and the evolution of increased competitive ability	Lockwood et al. Ch.4, Ch.11
W	Discussion	
F	Tutorial	
Week 3 (20/10)	*What makes ecosystems invasible?*	
M	Lecture: Diversity, disturbance, and a paradox	Lockwood et al. Chs. 5-6
W	Discussion	

F	HOLIDAY	
Week 4 (27/10)	*Impacts of invasive species*	
M	Lecture: Invasive species impacts from species to ecosystems	Lockwood et al. Chs. 9-10
W	Discussion	
F	Tutorial (or overnight field trip)	
Week 5 (3/11)	*Prevention and prediction*	Lockwood et al. Ch. 12
M	Lecture: Weed risk assessment	
W	Discussion	
F	Tutorial	
Week 6 (10/11)	*Management and restoration*	Lockwood et al. Ch. 13
M	Lecture: Eradication, control, utilization – what is the best strategy?	
W	Discussion and Class wrap-up	

Assessment protocol:

1. Paper discussions
    Discussion note: 10 points
    Leading a paper discussion: 15 points
    Participating in paper discussions: 15 points
2. Project: 35 points
3. Final exam: 25 points

Leading and participating in class discussions:
Each student will be required to lead a paper discussion. (Depending on the number of students in the class, this could be alone, or as part of a 2 or 3 person team.) Discussion leaders will be required to circulate a brief discussion note ahead of class, in which they summarize the take-home message of the assigned paper (in a paragraph or two), and set this in the context of other relevant literature (with a bibliography of 5-6 articles). In class, after introducing the paper they will be responsible for initiating the discussion by raising questions about the paper (its findings, conclusions, methods, assumptions, or any other aspect that they find worth calling attention to).

Discussion participants also need to have read the paper critically. They should come prepared to share their own views on the paper, or with questions that they have about the paper.

Readings:

1. Lockwood JL, MF Hoopes and MP Marchetti. 2013. Invasion Ecology 2nd ed. Blackwell Publishing **(Required)**

2. Elton CS (1958, 2000) The ecology of invasions by animals and plants. University of Chicago Press **(Optional)**

3. Papers for discussion will be made available in a Google drive folder at the start of the semester