Applied Population Dynamics

WILD 5700/7700

Richard Chandler

Central Questions

1. What causes spatial and temporal variation in population size and structure?

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2. How do environmental change and human activities (including management actions) affect populations?

By the end of the semester, you should be able to:

1. Develop a population model that
   - Describes variation in demographic parameters over time
   - Predicts how a population will respond to management/conservation actions

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2. Design a study to collect the data necessary to estimate the demographic parameters of the model

3. Use software (e.g., `PRESENCE`, `DISTANCE`, `MARK`) to estimate parameters from field data

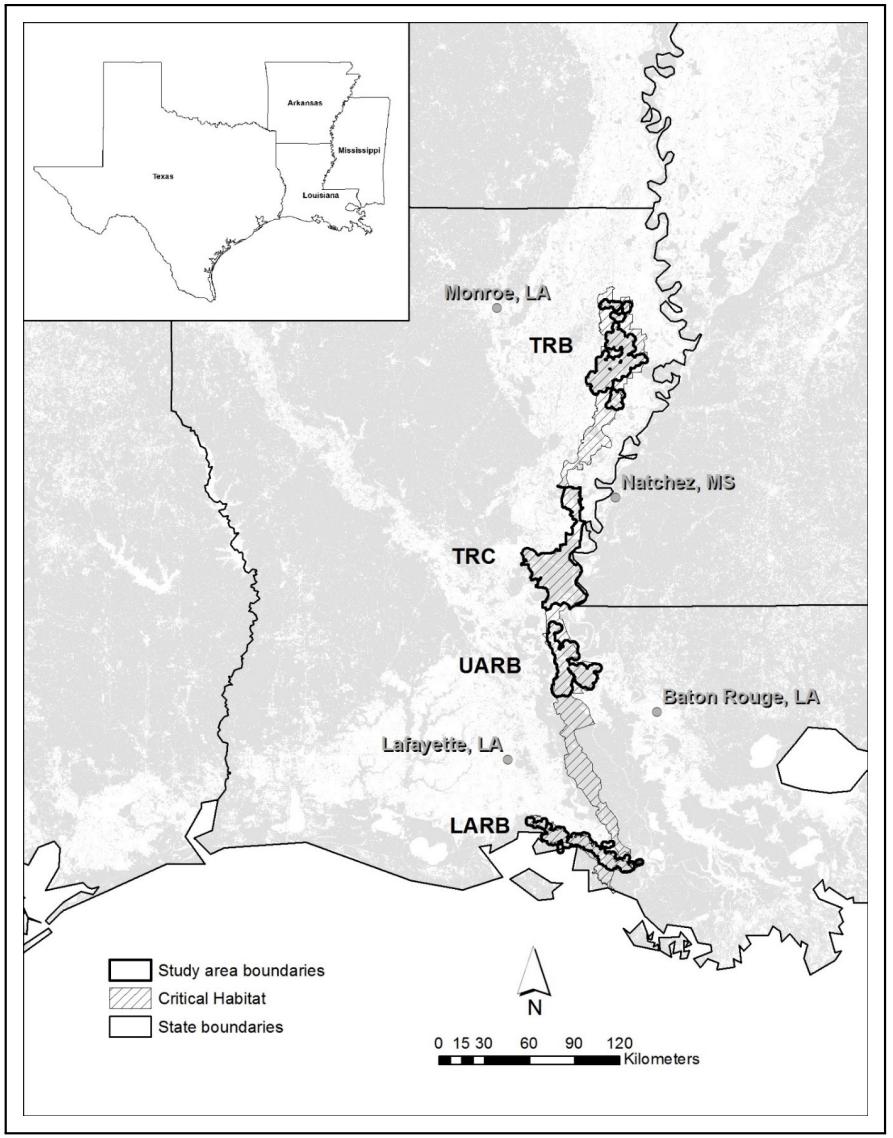
Theory

- Population models

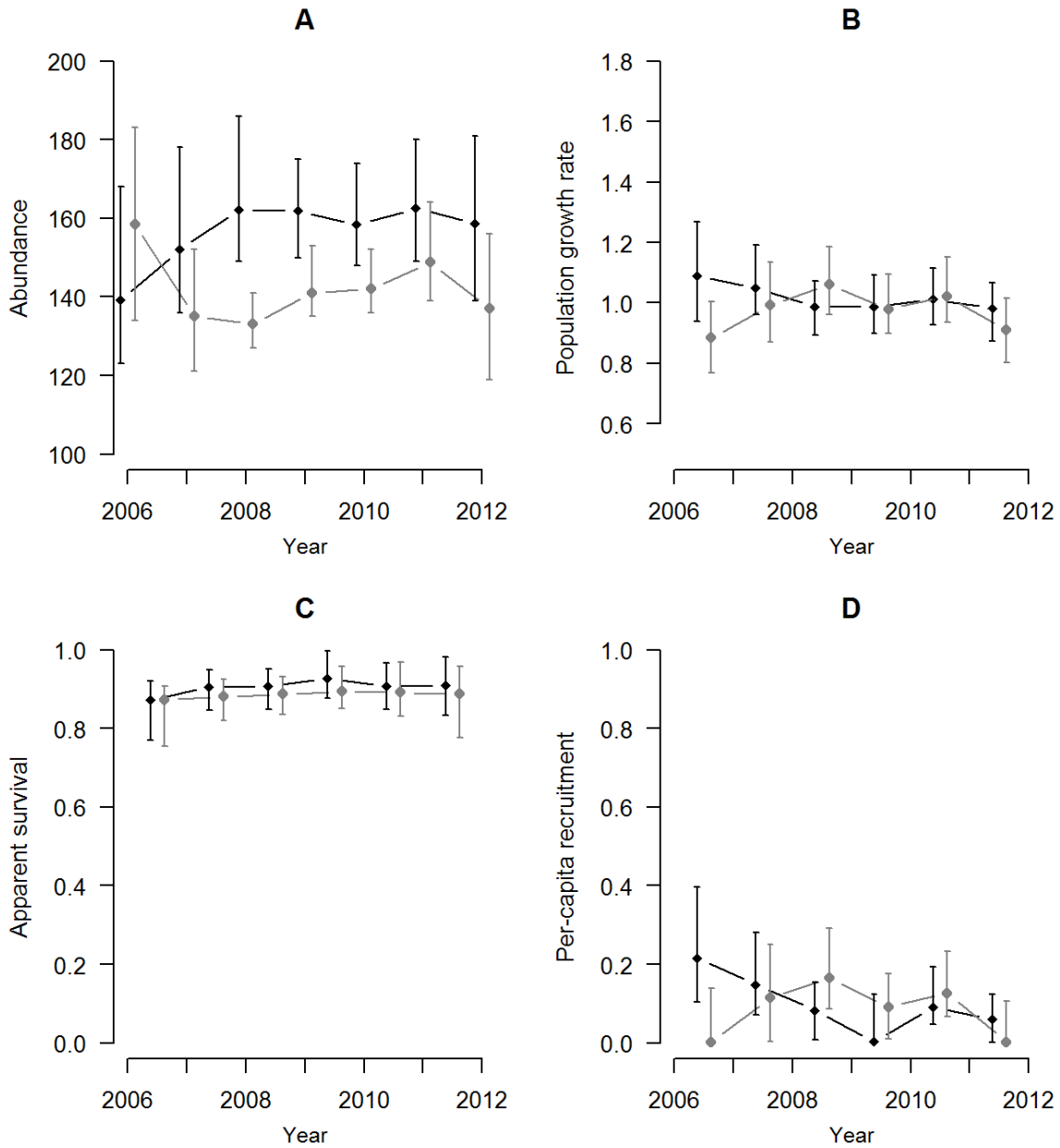
Practice (Application)

- Study design
- Data collection
- Parameter estimation
- Harvest management
- Small population management
- Population viability analysis

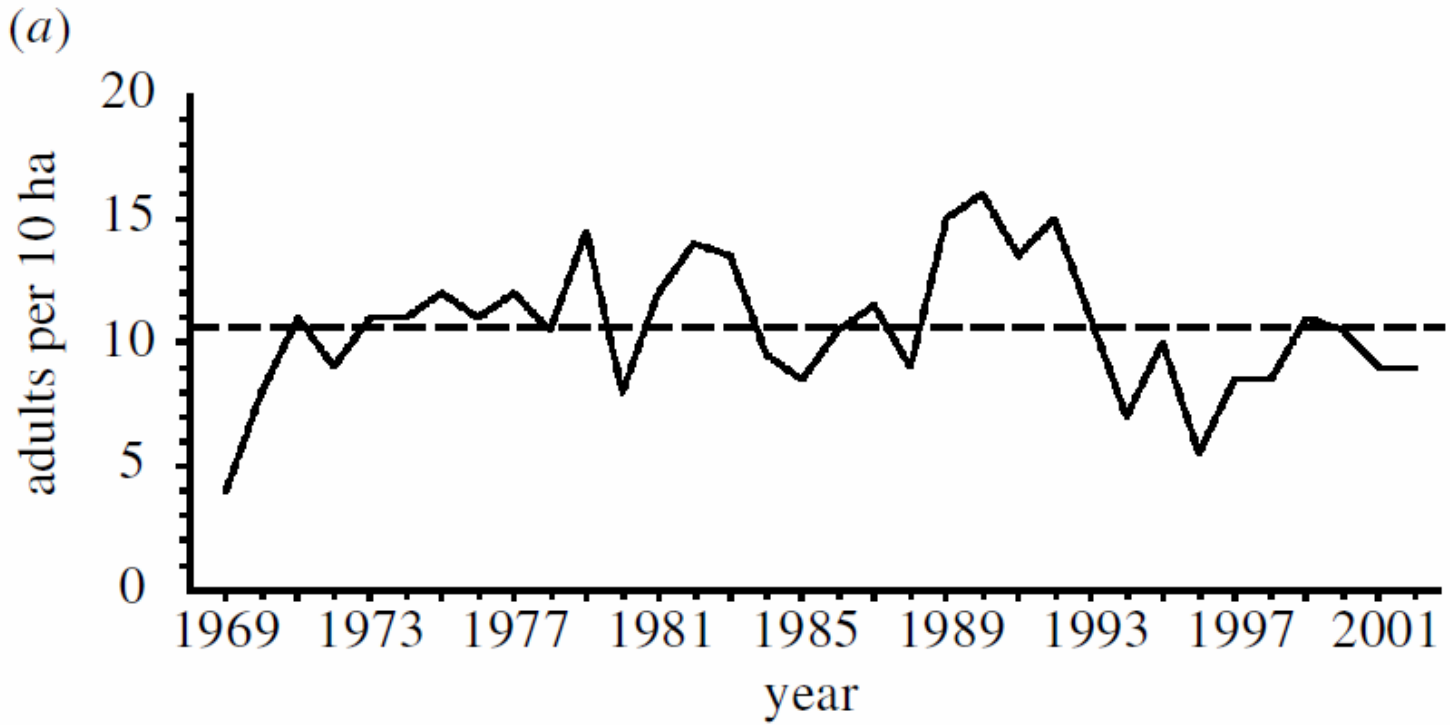
Example I – Louisiana black bear



Estimated demographic parameters

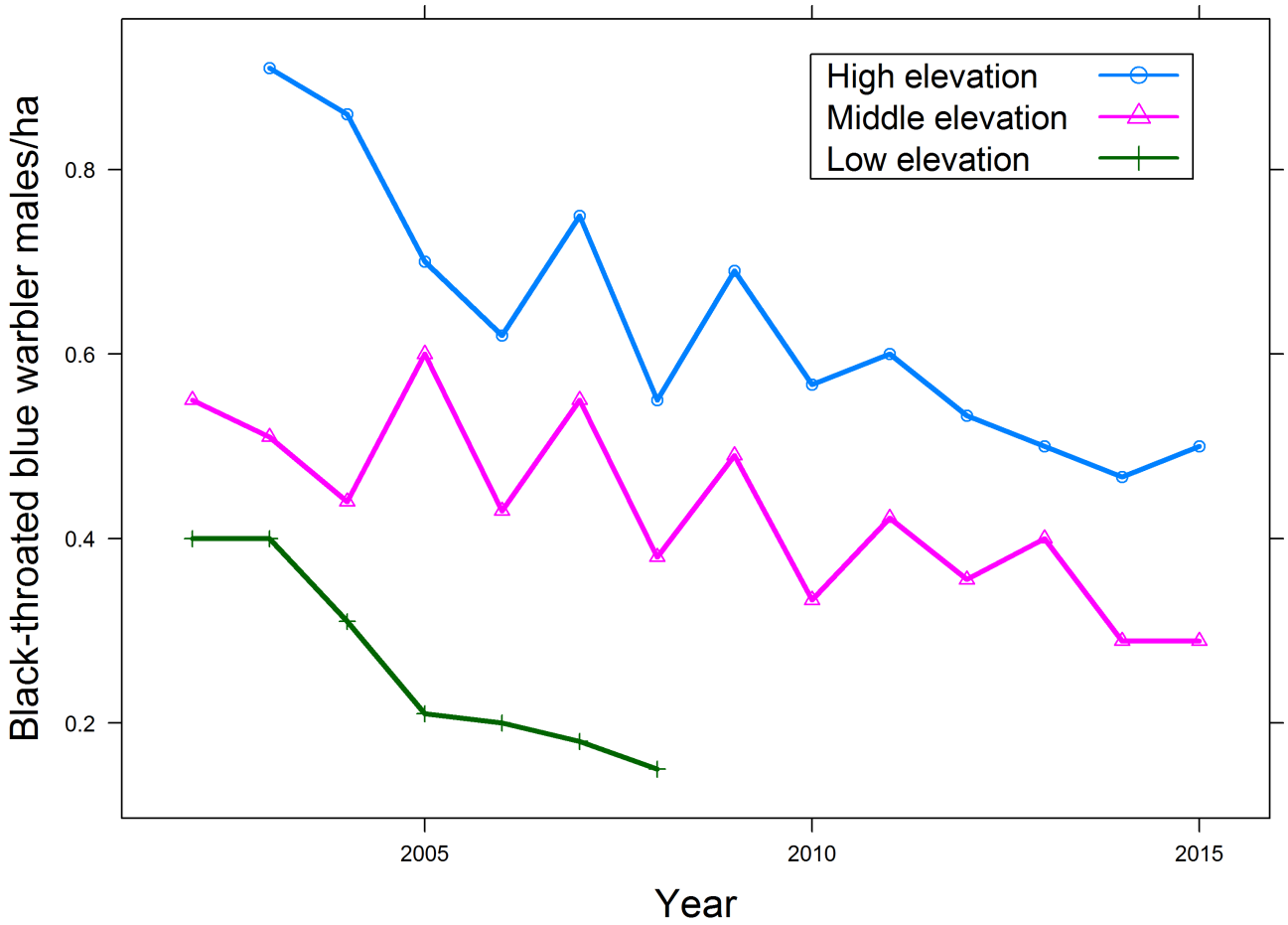


Example II – Black-throated blue warbler



Rodenhouse et al. (2003, Proceedings of the Royle Society)

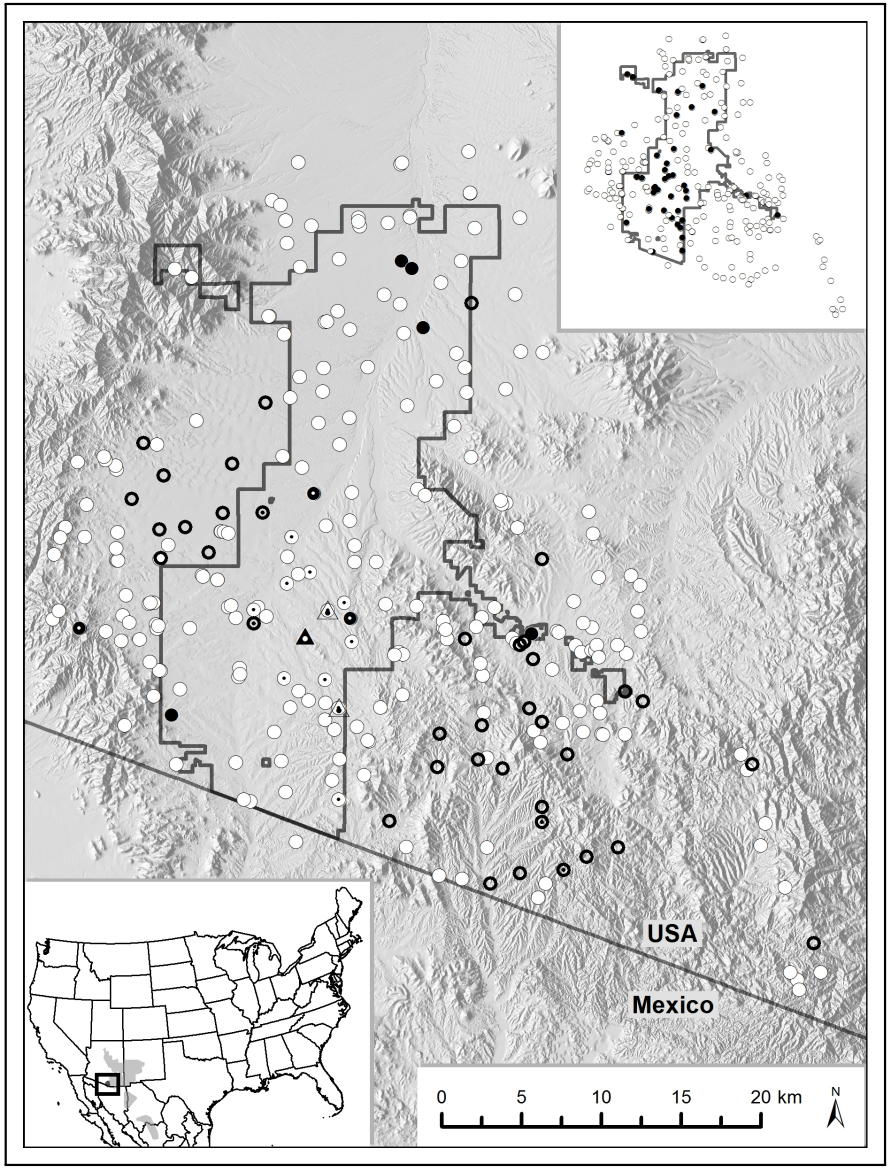
Example II – Black-throated blue warbler



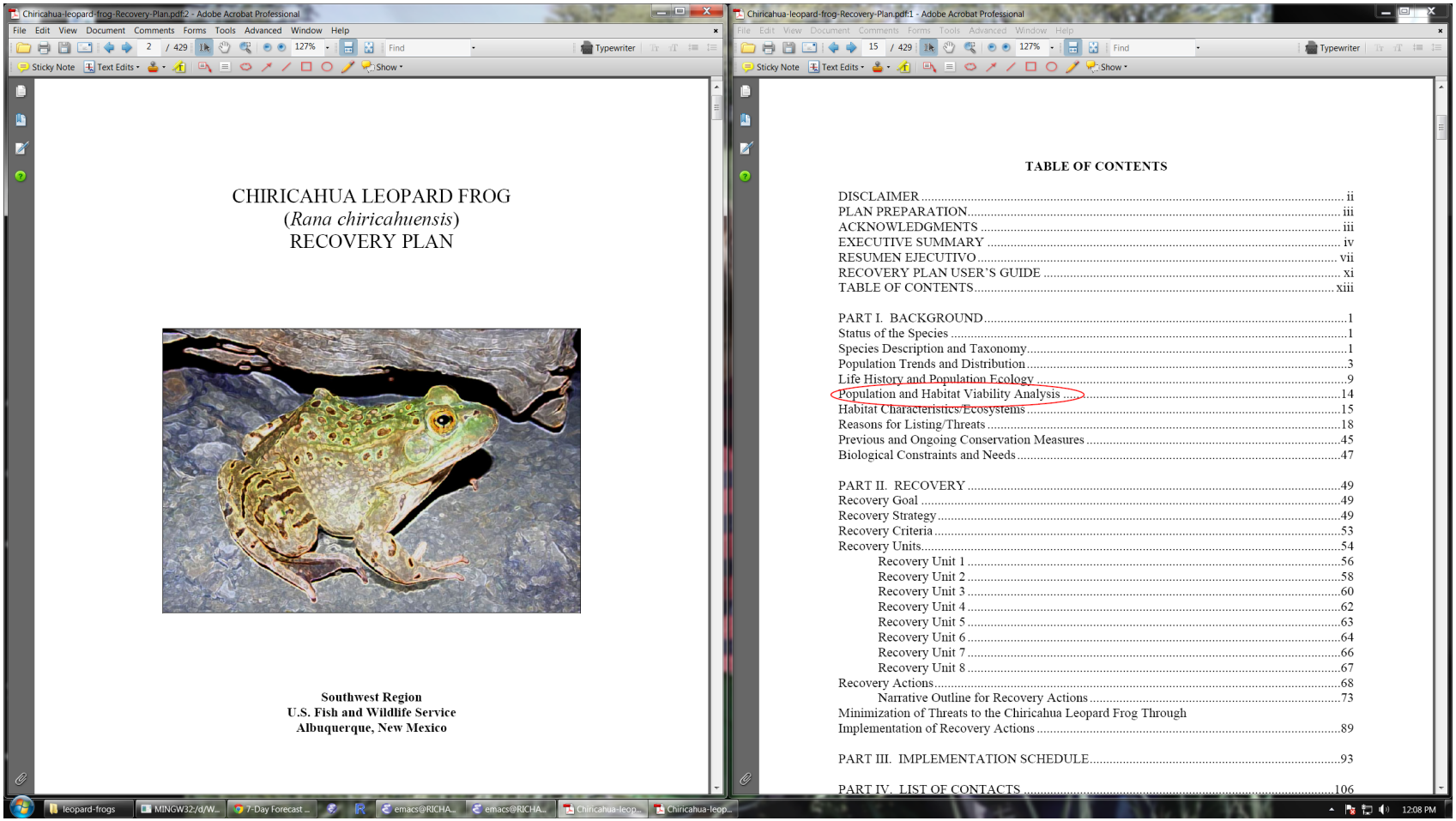
Why are dynamics so different in the southern part of the range?

Data courtesy of Dr. RJ Cooper

Example III – Chiricahua Leopard Frog



Recovery Plan



CHIRICAHUA LEOPARD FROG
(*Rana chiricahuensis*)
RECOVERY PLAN

Southwest Region
U.S. Fish and Wildlife Service
Albuquerque, New Mexico

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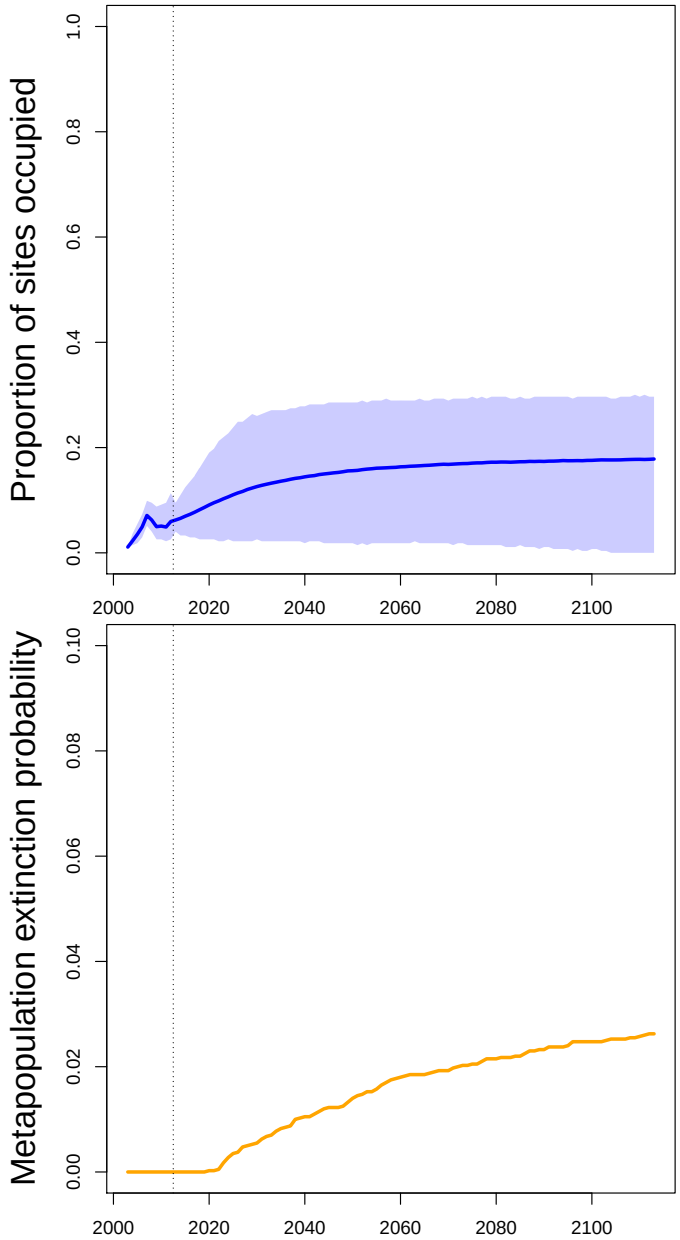
Estimated extinction risk

- We estimated extinction probability to be 2% by 2100



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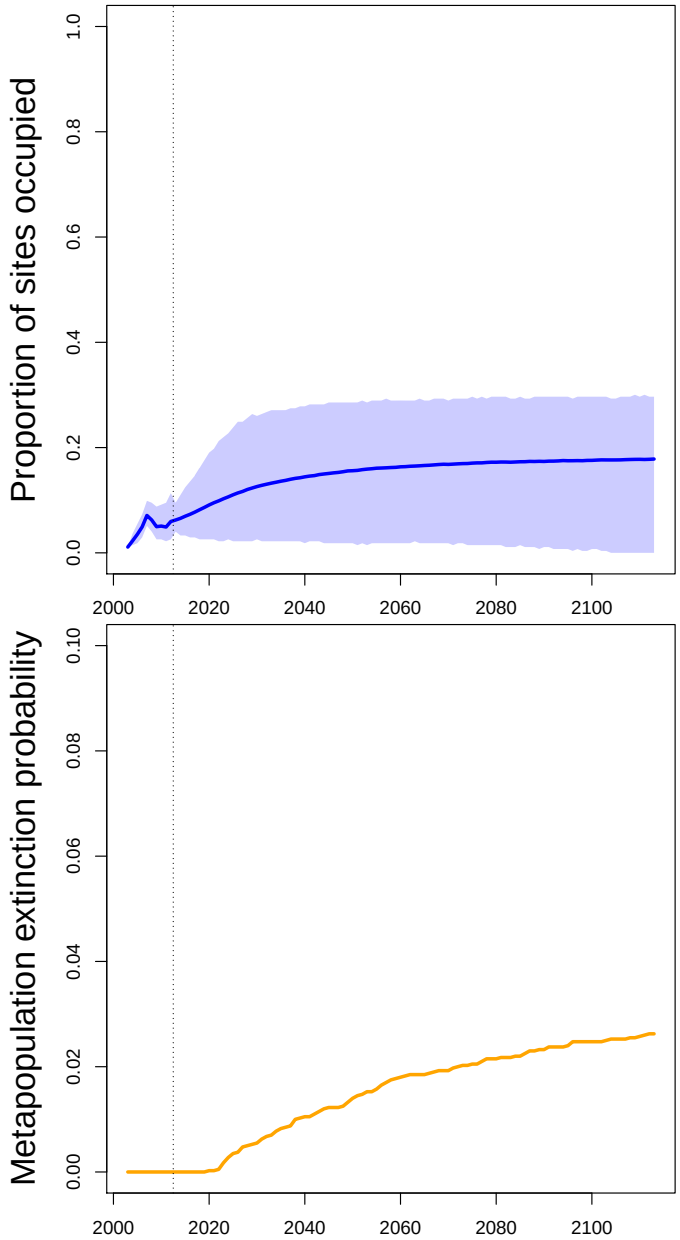

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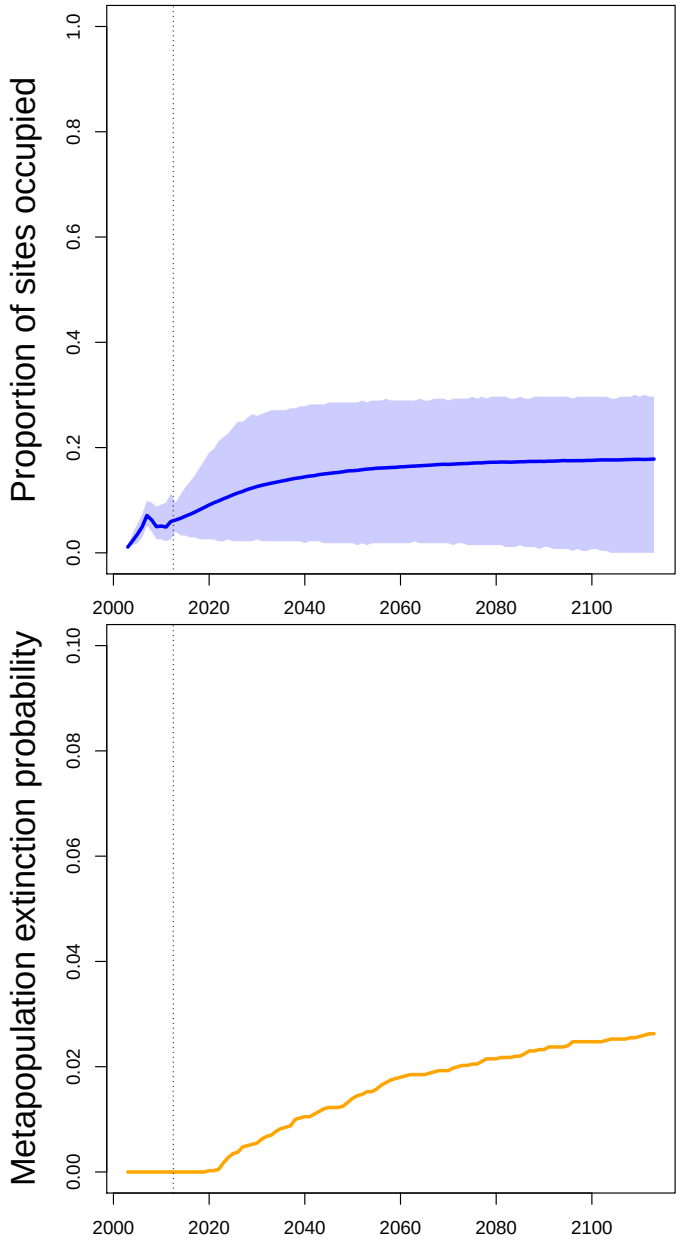

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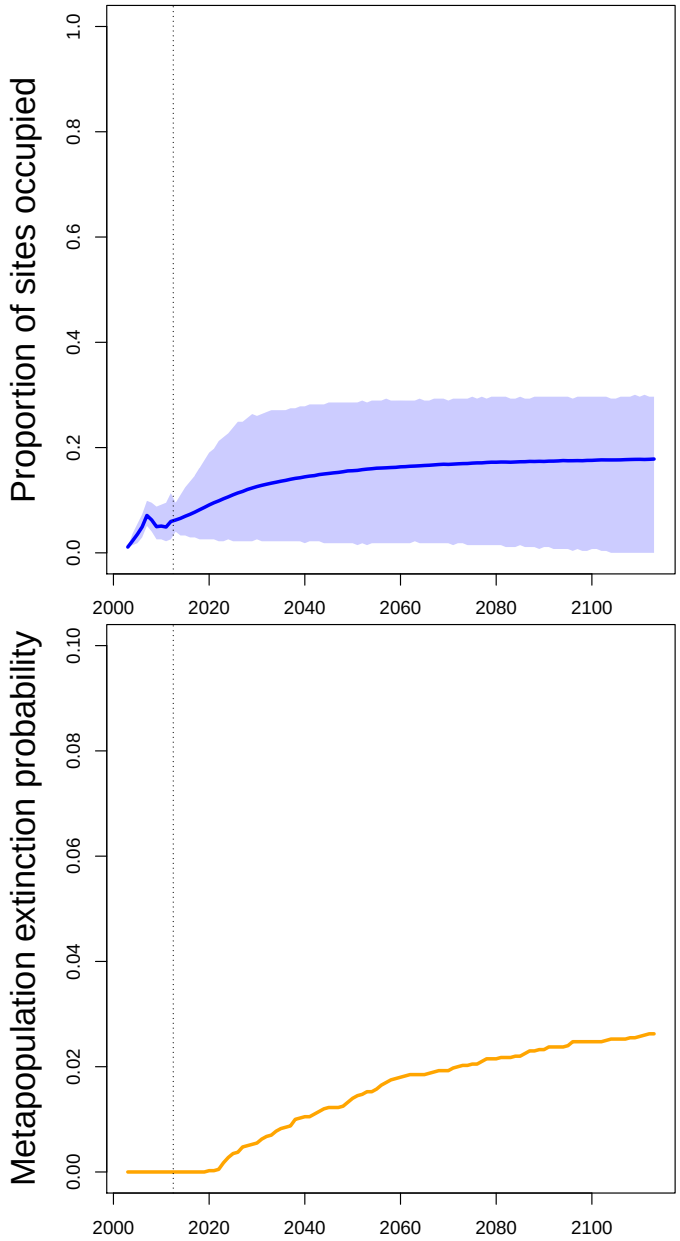
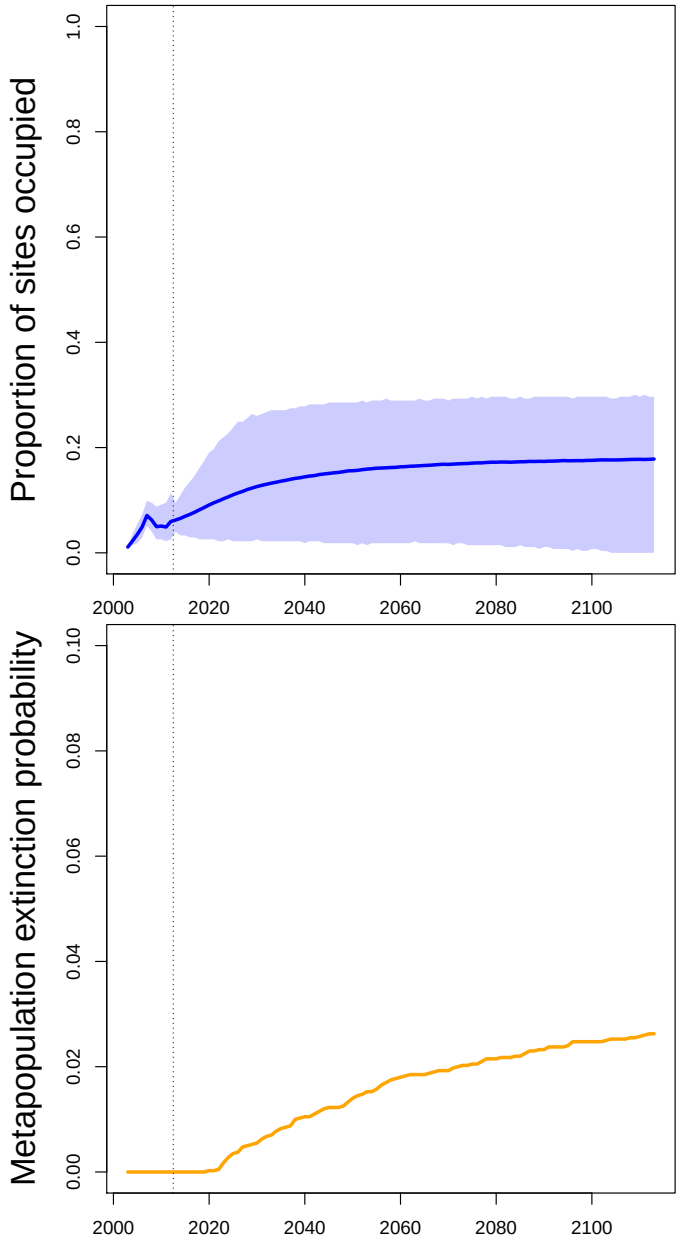
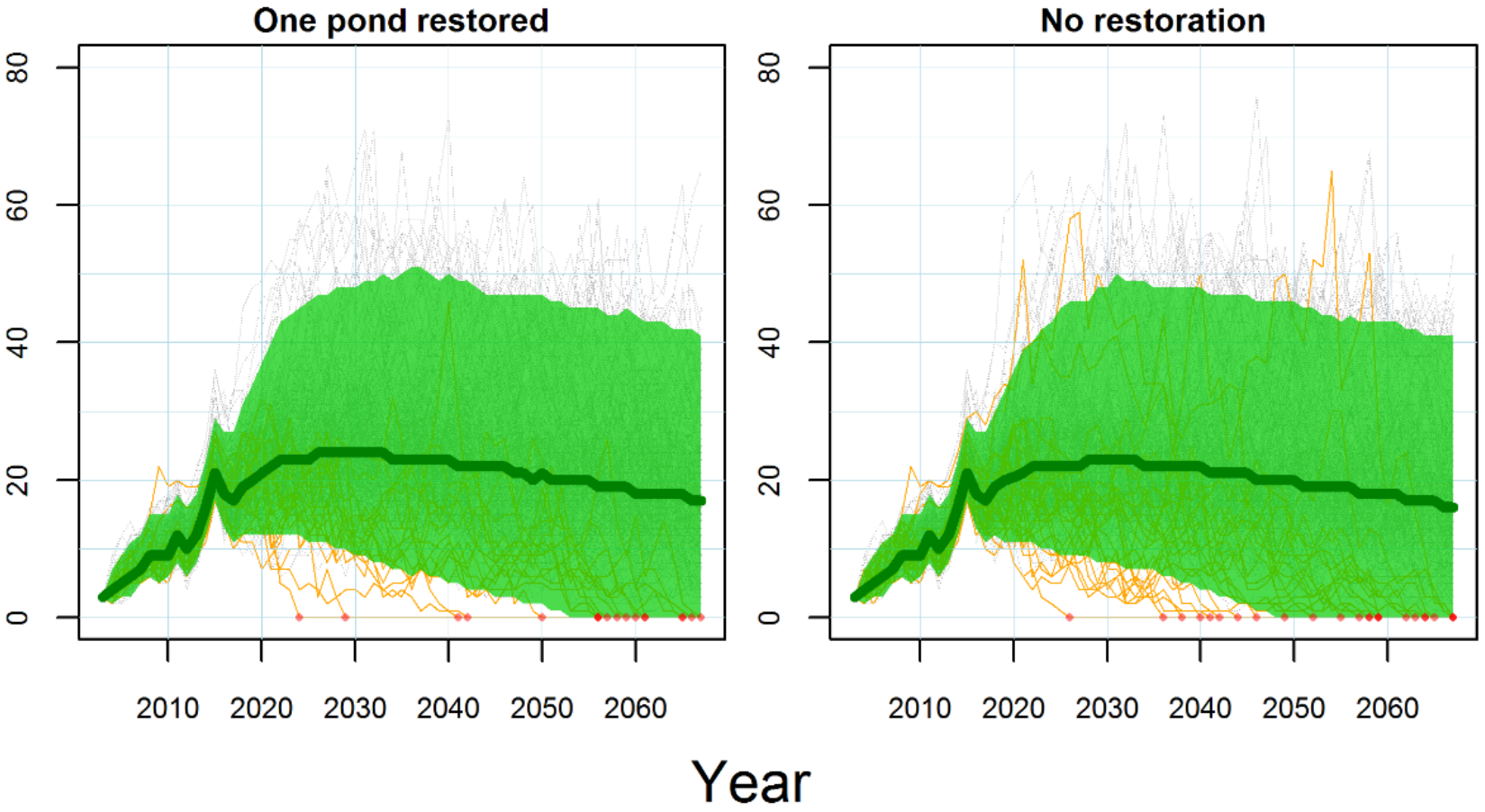


Estimated extinction risk

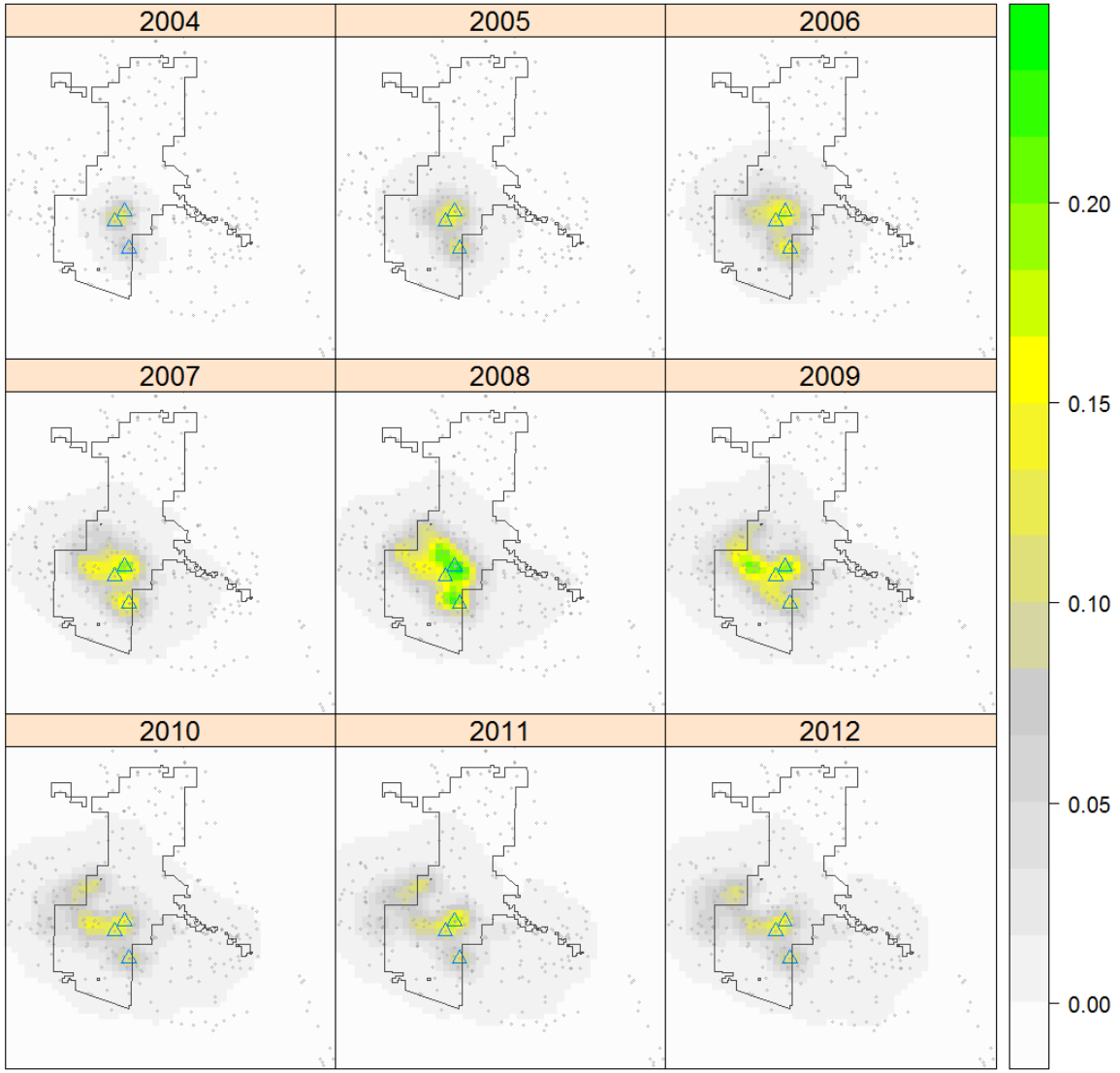
- We estimated extinction probability to be 2% by 2100
- What can be done about it?
  - Control predators
  - Increase hydroperiod in existing wetlands
  - Create new wetlands...



Extinction risk

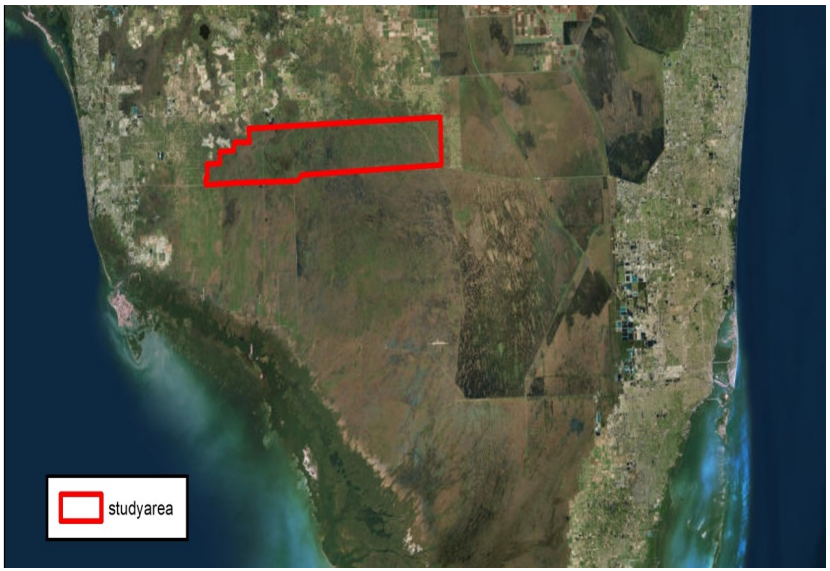


Colonization Probability Maps

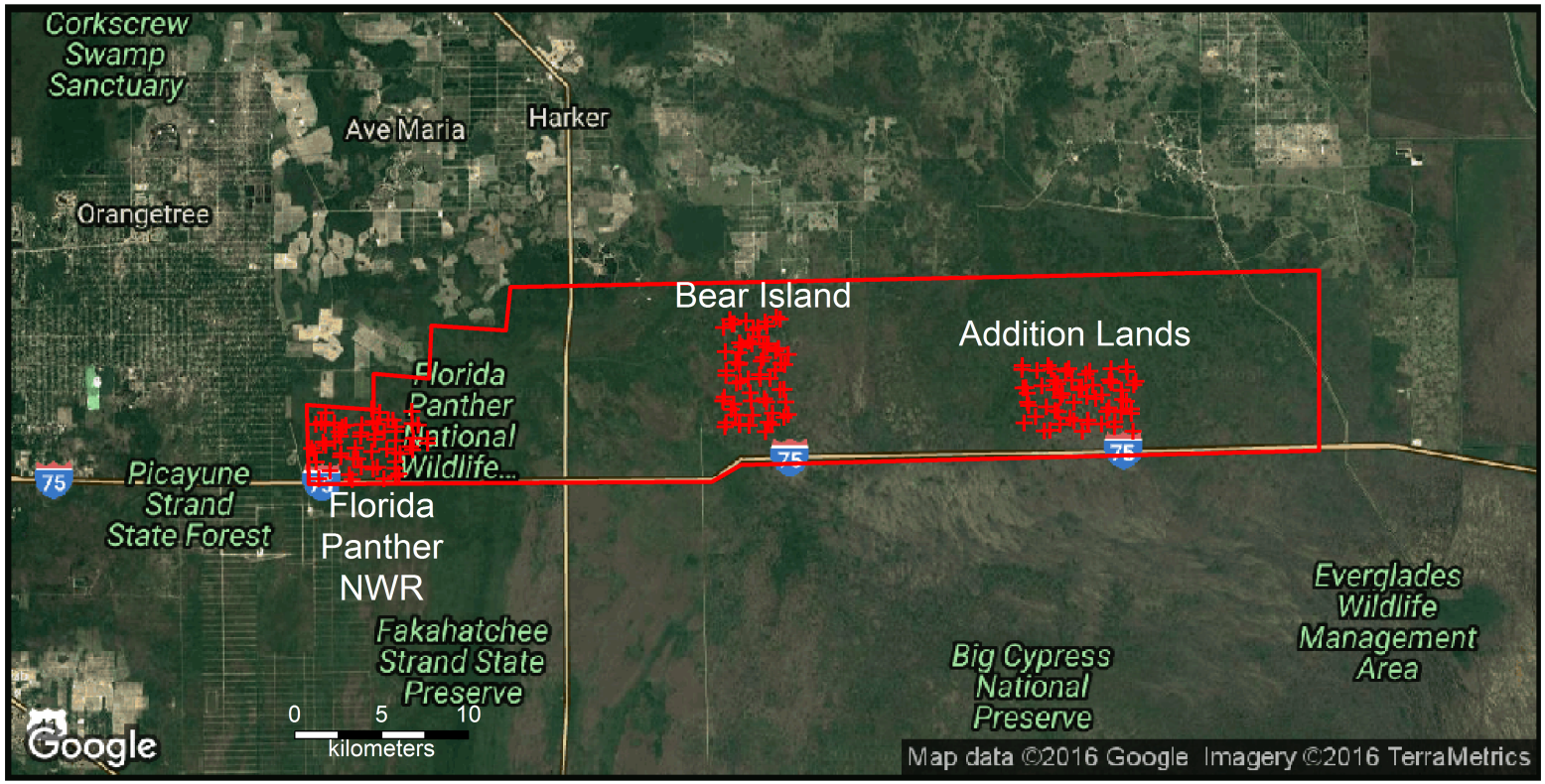


Objectives

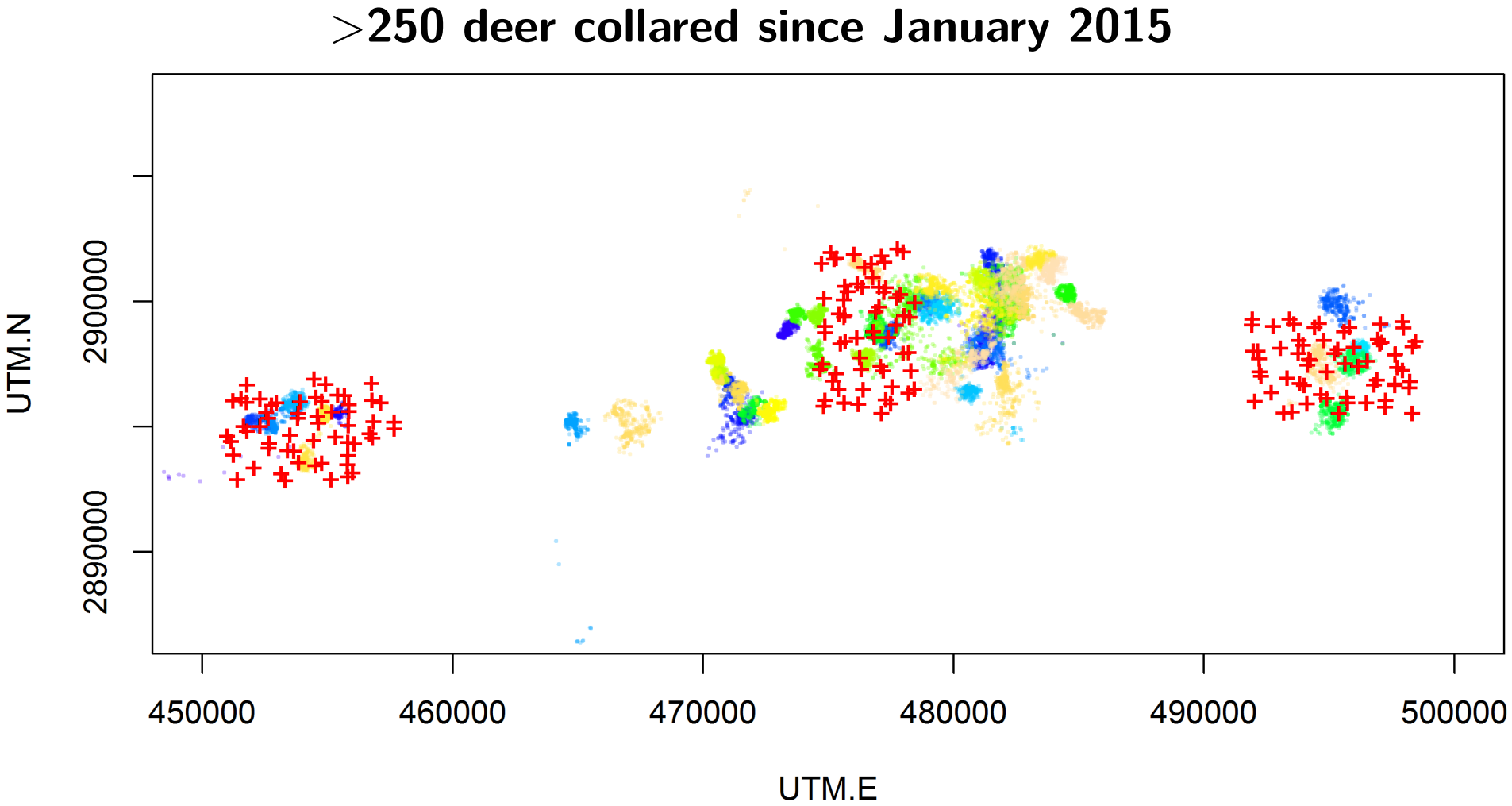
1. Understand effects of hydrology, hunting, and predation on deer population dynamics
2. Develop a camera trapping study for large-scale investigation and monitoring of deer populations



Camera study



- 180 cameras
- Operated Jan 2015 – Jan 2018
- Spanning hunting and hydrology gradients


>250 deer collared since January 2015
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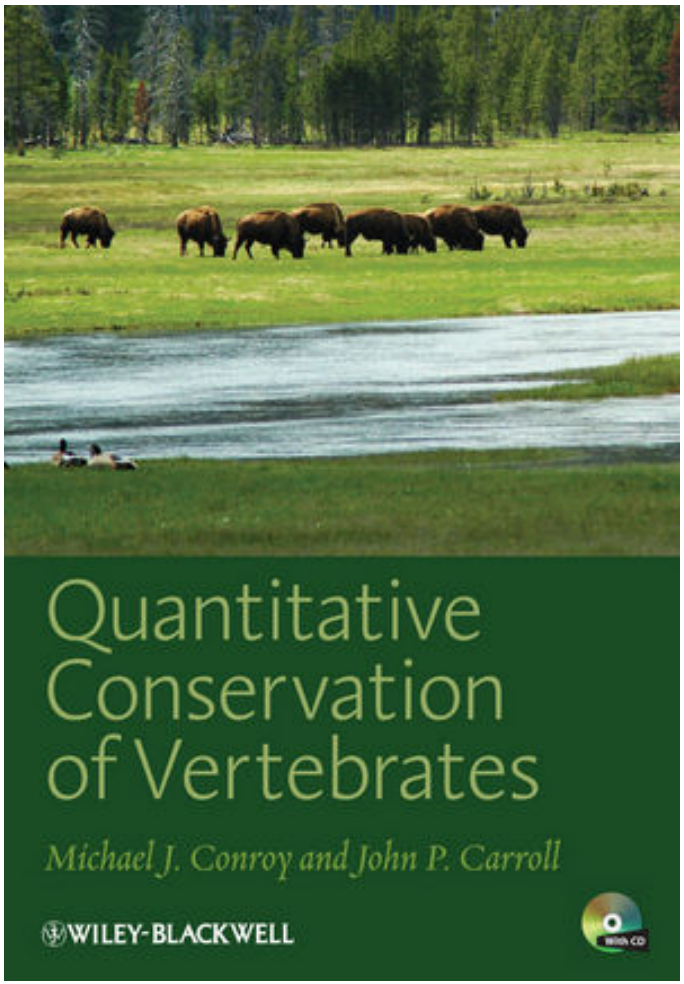
Assignment

1. Read Chapters 1 and 2 of Conroy and Carroll

2. Complete the introductory "quiz" found here:

   `https://goo.gl/forms/OpmugP5lmMrrXTIY2`



Applied Population Dynamics

WILD 5700/5700L, 7700/7700L
Lecture: Mon, Wed 9:10–10:00 AM; Room 1-304
Lab: Wed 1:50–4:50; Room 1-304

Instructor	**Teaching Assistants**	
Dr. Richard Chandler	Danielle Bradke	Lydia Stiffler
Phone: 706-542-5818	—	—
email: rchandler@warnell.uga.edu	danielle.bradke25@uga.edu	llstiffler@uga.edu
Virtual office hours: Mon 10:00-11:00 & Thurs 2:00–3:00	Tues 2:30-3:30	Wed 10:00-11:00

Course Description
This course will present the theory necessary for understanding wildlife population dynamics, and it will explain how to use theory and data to inform management and conservation efforts.

Course Objectives and Learning Outcomes
By the end of the course, students should know how to develop models to forecast the impacts of environmental change and management actions on wildlife populations. Students will learn how to design wildlife studies, collect data, and estimate parameters such as abundance, survival, and recruitment.

Textbook
Conroy, M.J. and J.P. Carroll. 2009. Quantitative Conservation of Vertebrates. Wiley-Blackwell. Digital copies are available for free through the UGA library: `http://preproxy.galib.uga.edu/login?url=http://onlinelibrary.wiley.com/book/10.1002/9781444303155`

Grading

	Quantity	Grade percentage
Quizzes	10	10%
Lab assignments*	13	35%
Final paper**	1	20%
Exams	3	30%
Class participation		5%

*Late assignments will be penalized 3 points/day

**Graduate students will analyze a real dataset and summarize the results in their final paper.

The plus/minus grading system will be used, according to UGA policy, and assigned following this plus/minus grading scale: A = 93-100, A- = 90-92.9, B+ = 87-89.9, B = 83-86.9, B- = 80-82.9, C+ = 77-79.9, C = 73-76.9, C-= 70-72.9, D = 60-69.9, F = <60.

Attendance
Attendance is optional, but it will be impossible to succeed in the class if you don't participate in either in-person or online lectures. Quizzes will be taken during lectures.