

# Applied Population Dynamics

WILD 5700/7700

January 7, 2019



- (1) What causes spatial and temporal variation in population size and structure?
- (2) How do environmental change and human activities (including management actions) affect population dynamics?

INTRODUCTION

EXAMPLES

SYLLABUS

ASSIGNMENT

2 / 17

## LEARNING OBJECTIVES

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 the population will respond to management/conservation actions
- (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

## THEMES

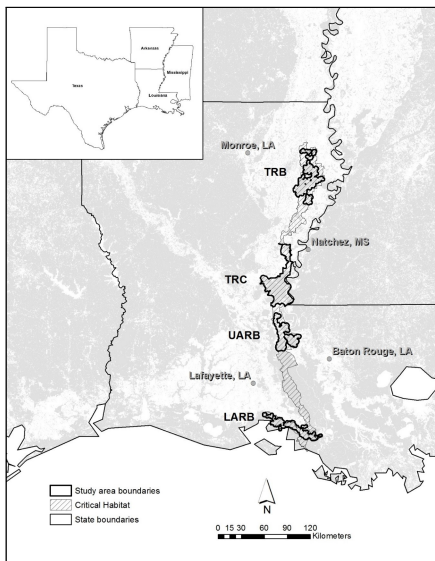
### Theory

- Population models

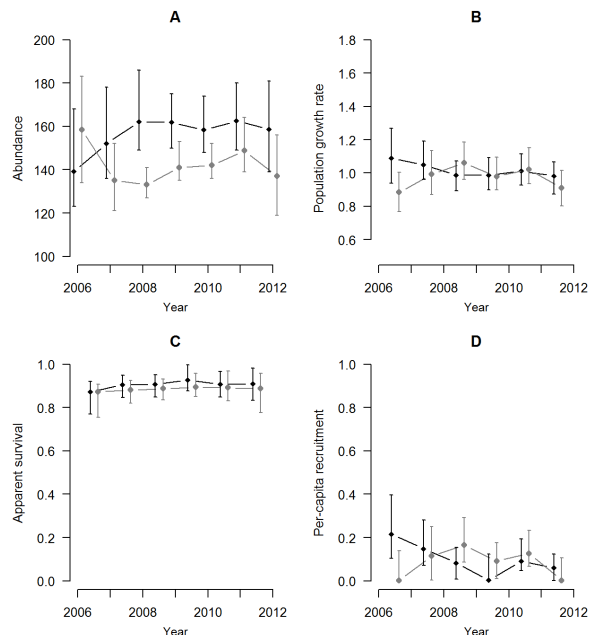
### Practice (Application)

- Estimation
- Harvest management
- Small population management

# EXAMPLE I – LOUISIANA BLACK BEAR

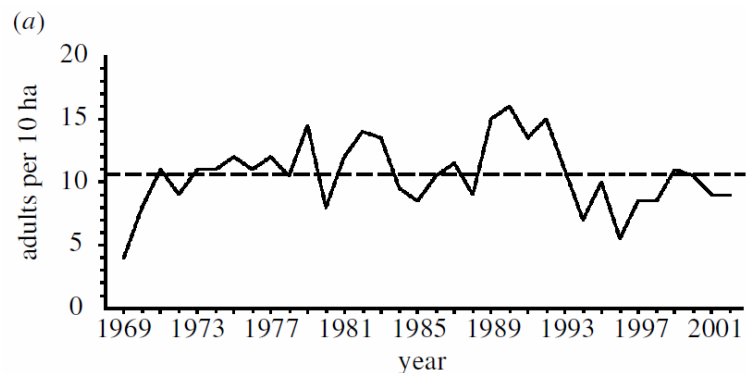


# ESTIMATED DEMOGRAPHIC PARAMETERS



# EXAMPLE II – BLACK-THROATED BLUE WARBLER

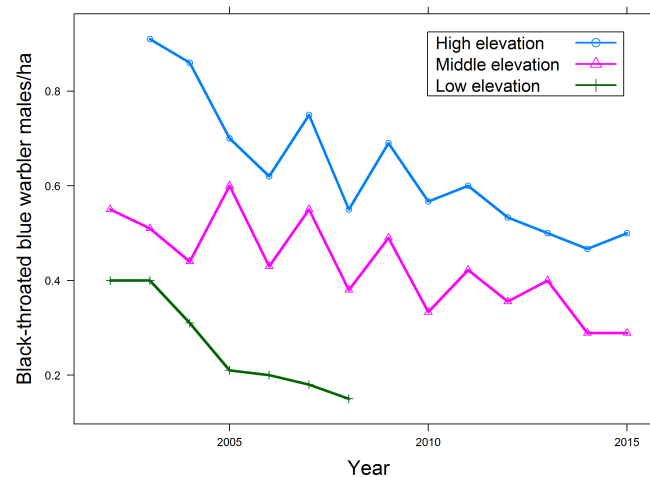
What do these data tell us? What don't these data tell us?



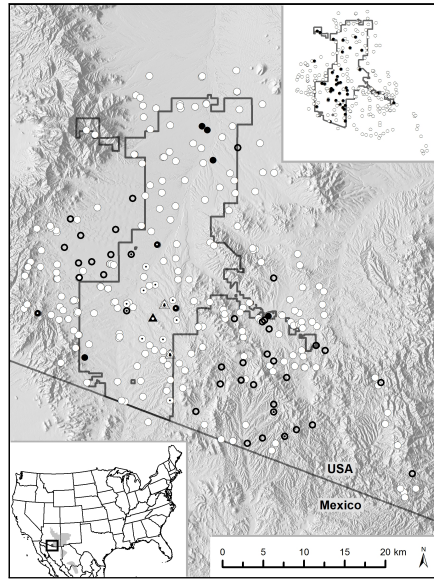
Rodenhouse et al. (2003, Proceedings of the Royle Society)

# EXAMPLE II – BLACK-THROATED BLUE WARBLER

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



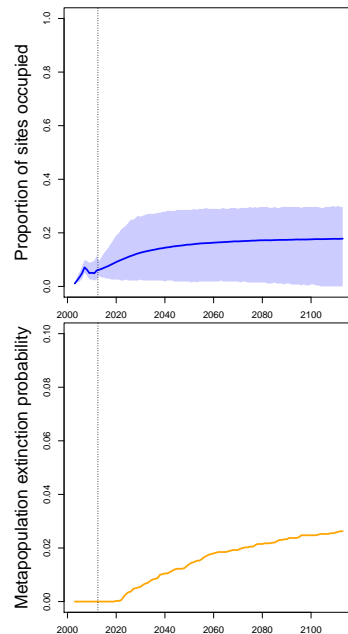
Data courtesy of Dr. RJ Cooper



ESTIMATED EXTINCTION RISK

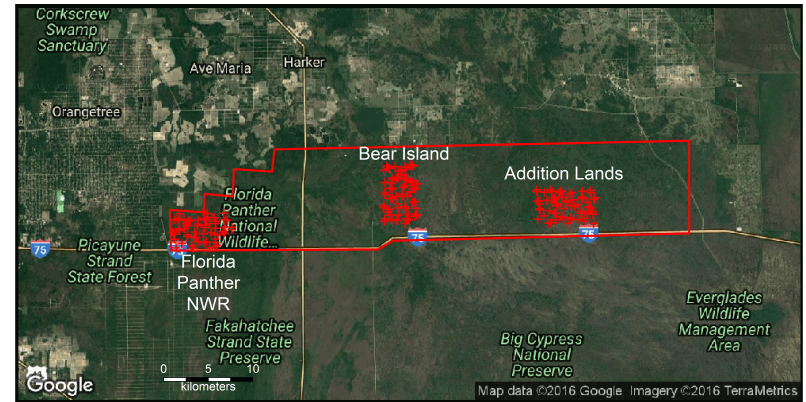
COLONIZATION PROBABILITY MAPS

- 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...
  - ▶ ...but where?



Objectives

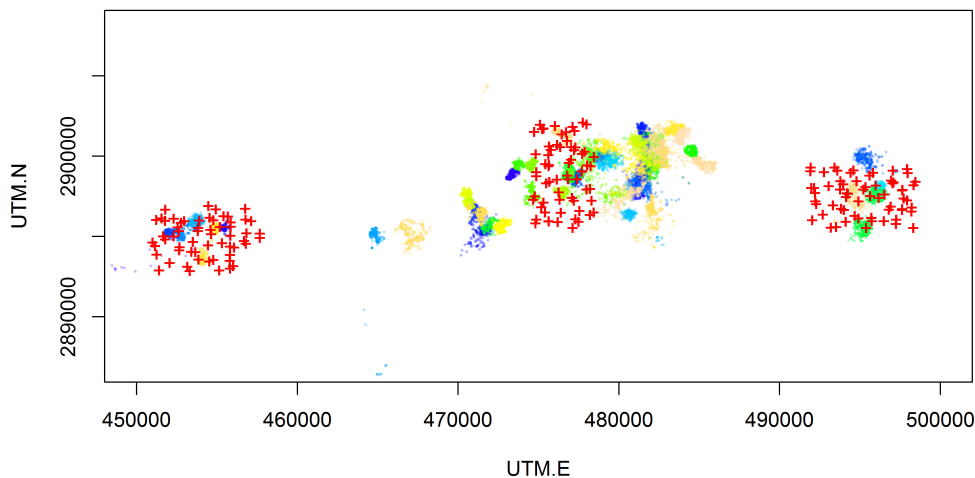
- (1) Understand effects of hydrology, hunting, and predation on deer population dynamics
- (2) Develop a camera trapping study for large-scale investigation and monitoring of deer populations



- 180 cameras
- Operated since January 2015
- Spanning hunting and hydrology gradients

TELEMETRY DATA

>250 deer collared since January 2015



SYLLABUS

**APPLIED POPULATION DYNAMICS**  
WILD 5780/5786L, 7700/7704L  
 Lecturer: Mon, Wed 9:05-9:55 AM; Room 4-517  
 Lab A: Mon 1:25-4:25; Room 1-201 Lab B: Fri 9:05-12:05; Room 1-201

**Instructor**  
 Dr. Richard Chandler  
 Office: 3-409B  
 Phone: 706-542-5818  
 email: rchandler@usg.edu  
 Office hours: Thurs (Fri 2:00-3:00)

**Teaching Assistant**  
 Brianna Williams  
 Office: Wildlife Health building, room 112A  
 email: williams.brianna.m@gmail.com  
 Office hours: Wed 2:00-3:00

**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 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. You do not need to buy a hard copy. Digital copies are available for free through the UGA library: [http://pepweb.galtz.usg.edu/galtzwebpage/online-library-stay-one.html?01\\_1027070146420108](http://pepweb.galtz.usg.edu/galtzwebpage/online-library-stay-one.html?01_1027070146420108)

**Grading**

	Quantity	Grade percentage
Quizzes	10	15%
Lab assignments*	13	20%
Written assignment**	1	20%
Exams	3	20%
Class participation		5%

\*Late assignments will be penalized 10%  
 \*\*Graduate students will analyze a real dataset and summarize the results in their final paper.

**Academic Honesty**  
 As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty," and the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty" found at: <http://honesty.usg.edu/academic-honesty-policy/>. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

**Cell Phones and Laptops**  
 Cell phones are not allowed during class unless explicit permission is granted. Laptop computers should be brought to class for quizzes and exercises.

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(1) Read Chapters 1 and 2 of Conroy and Carroll

(2) Complete the introductory “quiz” found here:

<https://goo.gl/forms/0pmugP51mMrrXTIY2>

