Workshop de Análise e Manejo de Populações Animais
Chapada dos Guimarães, MT, 29 de Abril – 8 de Maio de 2007

Título Inglês: Parameter Estimation and Decision-Making for Conservation and Management of Animal Populations and Communities

Workshop Outline

Timing
   8 am – 5 pm with a 2-hour lunch break.

Day 1 (April 29)
   Arrival at Cuiabá airport.
   Tansportation to and accomodation in *Chapada dos Guimarães*.

Day 2 (April 30)
   1. Introduction to course (organizers + JDN) (0.75 hr)
      1.1 Overview of population ecology (JDN) (0.25 hr)
      2.0 Overview of models in science/management (JDN) (0.75 hr)
   BREAK
   2. Overview of population models (BKW) (2.0 hr)
      2.1 Discrete time matrix modeling (age/stage)
      2.2 Projection matrix asymptotics (λ, sensitivity, reproductive value, stable stage distribution)
      2.3 Stochasticity (demographic, environmental), PVAs

    2.4 Models for management
LUNCH
    2.5 Population model exercises (JEH-BKW) (.75 hr)
3. Statistical inference (I)
    3.1 Distributions (BKW) (0.5 hr)
BREAK
    3.2 Estimation (BKW) (0.5 hr)
    3.3 Properties (bias, precision, accuracy) (BKW) (0.5 hr)
      Estimation methods
      Confidence intervals
Day 2 Recap (BKW, JDN, JEH) (0.5 hr)

Day 3 (May 1)
    3.4 Hypothesis testing (BKW) (0.5 hr)
    3.5 Model selection, Bayesian updating (JDN) (0.5 hr)
3. Statistical inference Cont. (II)
    3.6 Survey sampling; design features (BKW) (1 hr)
BREAK
4. Abundance estimation (I): observations (JDN) (1.0 hr):
    4.1 Overview
    4.2 Observation based methods
            Marked subpopulation
            Temporal removal modeling
            Sighting probability modeling
            Multiple independent observers
            Multiple dependent observers
    4.3 Multiple observer exercise with DOBSERV (JEH) (0.75 hr)
 LUNCH
    4.4 Observation-based methods: distance sampling
        Introduction to Distance Sampling (BKW) (1 hr)
            Introductory concepts
            Assumptions
            Line transects
            Point transects
        Survey design & field protocol (BKW) (0.5 hr)
            Precision
            Bias
 BREAK
    4.5 DISTANCE 4 Software (JEH) (0.75 hr)
 Day 3 recap (BKW, JDN, JEH) (0.5 hr)

Day 4 (May 2)
    4.5 DISTANCE 4 Software continued (JEH) (0.5 hr)
    4.6 Distance Sampling Analysis (BKW) (1 hr)
            Basic Analysis
            Analysis for clustered populations
            Introducing covariates into the analysis
4. Abundance estimation cont. (II): captures (closed CR models)
    4.7 2-sample model (JDN) (0.50 hr)
BREAK

4.8 2-sample model exercises (MARK) (JEH) (1.0 hr)
4.9 *K*-sample closed models (JDN) (0.75 hr)
LUNCH
   4.10 *K*-sample closed model exercises, CAPTURE, MARK (JEH) (1.25 hr)
4.11 Density estimation with closed CR models (Nichols) (0.5 hr)
          Ad hoc boundary strip approach
          Nested grids
          Gradient designs (e.g., trapping webs)
 BREAK
4.12 Other capture-based methods (JDN; 0.25 hr)
          Removal methods
          Change-in-ratio methods
  5. Vital rate estimation (survival, reproduction, movement)
5.1 Introduction, relevance of detection probability (JDN) (0.25 hr)
  Day 4 recap (BKW, JDN, JEH) (0.5 hr)

Day 5 (May 3)
5.2 All marked animals detected (JDN) (1 hr)
          Binomial survival model
          Nest success
          Radiotelemetry data
5.3 Computer exercises (MARK) (JEH) (1 hr)
BREAK
5.4 Tag recovery models (BKW) (0.75 hr)
5.5 Open single-age population CR models (survival) (BKW) (1 hr)
             Data structure
             Modeling
             Time-specific covariates
             Multiple groups
             Capture history effects
             Individual covariates
LUNCH
  5.6 Program MARK
          PIMs and design matrices (JEH) (0.75 hr)
          Exercises: Single-age models, band recovery models (JEH) (1 hr)
BREAK
5.7 Single-age models (abundance and recruitment) (JDN) (0.5 hr)
          Estimation of abundance
  Day 5 recap (BKW, JDN, JEH) (0.5 hr)

Day 6 (May 4)
  5.7 Single-age models (abundance and recruitment) continued (JDN) (0.5 hr)
          Estimation of 8 and components of 8
5.8 Multiple-age models (JDN) (0.5 hr)
5.9 Multiple-age models exercise (JEH) (0.75 hr)
BREAK
5.10 Multistate models (JDN) (0.75 hr)
5.11 Multistate models; exercises (JEH) (1 hr)
LUNCH
5.12 Pollock's robust design (JDN) (0.75 hr)

5.13 Robust design exercise (JEH) (0.75 hr)
BREAK
  6 Occupancy modeling
    6.1 Single-season, single species occupancy (Nichols) (0.75 hr)
        Data structure and designs
        Modeling
        Abundance estimation
  Day 6 recap(BKW, JDN, JEH) (0.5 hr)

Day 7 (May 5)
    6.2 Computer exercise (PRESENCE) (JEH) (0.75 hr)
    6.3 Multiple-season occupancy dynamics (JDN) (0.75 hr)
        Data structure
        Modeling
BREAK
    6.4 Occupancy multi-season exercises with PRESENCE (JEH) (1hr)
    6.5 Multi-season occupancy modeling example: Amazonian birds (GF) (0.75 hr)
    6.6 GENPRES software for study design (JEH) (0.5 hr)
LUNCH
    6.7 Occupancy; multiple species, states, detection devices (JDN) (0.75 hr)
  7. Species richness and community dynamics
    7.1 Intro to species richness estimation (JDN) (0.75 hr)
BREAK
    7.2 Community dynamics; multiple seasons (JDN) (0.75 hr)
  Day 7 recap(BKW, JDN, JEH) (0.5 hr)

May 8 (May 6)
    7.3 SPECRICH and COMDYN software (JEH) (0.75 hr)
  8. Decision-making and management
    8.1 Decision analysis under uncertainty (BKW) (0.75 hr)
    8.2 Sources of uncertainty (BKW) (0.25 hr)
BREAK
    8.3 Adaptive management (BKW) (1hr)
  Day 8 morning recap (BKW, JDN, JEH) (0.5 hr)
  9. Data-analytic project (participants in groups with own data)
    9.1 Project (participant groups) (0.5 hr)
LUNCH
    9.1 Project (participant groups) (1.25 hr)
BREAK
    9.1 Project (participant groups) (1.5 hr)

Day 9 (May 7)
    9.1 Project; prepare PowerPoint presentations (participant groups) (2 hr)
BREAK
    9.2 Project presentations (participant groups) (1.75 hr)
LUNCH
    9.2 Project presentations (participant groups) (1 hr)
BREAK
  10. Overall Recap (BKW, JDN, JEH) (1.75 hr)

Day 10 (May 8)
  Departure from Cuiabá.

Lecturers:
[James E. Hines](#) (JEH)
[James D. Nichols](#) (JDN)
[Byron Kenneth Williams](#) (BKW)

Guest Lecturer:
[Goncalo Ferraz](#) (GF)