VII Bird Banding and Molt Analysis Course

Observatório de Aves da Mantiqueira, Brazil
Universidade Federal do Rio Grande do Sul, Brazil

March 17-23, 2024

Location: Instituto Alto Montana, Itamonte, MG, Brazil ◆ **Instructors:** Luiza Figueira, Holly Garrod, Pedro Martins, Márcio Repenning, Jared Wolfe, Gonçalo Ferraz ◆ **Assistant instructors:** André Ayres, Victor Gonzalez, Otávio Rocha, Danielle Santos, Affonso Souza ◆ **Sponsors:** OAMa, UFRGS, FURG, Michigan Tech, BirdsCaribbean

SYLLABUS

Day 1, Sunday, March 17

14:00   Meeting at Resende bus station and boarding microbus to *Instituto Alto Montana*.

15:00   Arrival at the course location

16:00   ***Introduction*** to course, site, and participants [Gonçalo, 30 min]

16:45   ***Lecture 1***: Use, ethics, and basic principles of bird banding (1, 2, 3). First contact with equipment, routine procedures, and data organization. [Luiza, 1 h]

18:00   ***Lecture 2***: Introduction to morphological traits that are indicative of age and sex: skull ossification, brood patch, cloacal protuberance, bill gape, eye color, and juvenile plumage. Brief introduction to molt analysis. [Pedro, 1 h]

19:00   Dinner and work group formation.

Day 2, Monday, March 18

5:30   Demonstrative banding session: bird holding grips (extraction, bander, photographer's grip plus hand change); observation of brood patches, cloacas, fat, body molt, flight feather molt, wing wear, and wing cord. Band application. Data entry at camp after the session.

11:30   Lunch

14:30   In-camp net opening and storage practice. [45 min]

15:15   ***Lecture 3***: Band application and removal. Expedient recording of data. Banding station management: rain protocol, overload protocol, minimum data, predators, and visitors. (4, 5). [Márcio, 30 min]

15:45   Birds of Serra da Mantiqueira and the *Instituto Alto Montana* [Danielle, 30 min]

16:30 *Lecture 4*: Bird life cycle and plumage molt cycle. Tropical bird molt strategies in the context of the four molt strategies in the augmented H-P system. (6, 7, 8). [Jared, 1 h]

17:30 *Lecture 5*: Feathers and molt limits. Growth and structure of bird feathers. Differences between juvenile and post-juvenile feathers. (9, 11). [Pedro, 1 h]

19:00 Dinner.

Day 3, Tuesday, March 19

5:30 Demonstrative and hands-on banding session. Revision of techniques for holding and extracting birds, morphological measures, molt terminology recap for each captured bird. Data entry at camp after the banding session.

11:30 Lunch

14:00 *Lecture 6*: Bird life cycle review and detailed presentation of the Wolfe-Ryder-Pyle system (WRP; 6, 7, 8, 9). [Jared, 1 h]

15:15 *Lecture 7*: Age determination from photographs of many species, using the WRP system with detailed discussion of photos. Molt in woodpeckers and raptors. [Luiza, with participation of all instructors, 2 h 45 min]

19:00 Dinner

Day 4, Wednesday, March 20

5:30 Hands-on banding session. Bird extraction and morphological measurements by students with instructor supervision and review. Identification of molt cycles, stage within cycle, and WRP code by students for each captured bird. Data entry at camp after the banding session.

11:30 Lunch

14:30 Camp practice of bird first aid and band removal (with toothpicks). [1 h]

15:30 *Lecture 8*: Bird first aid (dehydration, heat, cold, leg and wing fractures, leg and wing joint dislocation, amputation, euthanasia, sick birds, and dead birds.) [Márcio, 1 h]

16:45 *Lecture 9*: Population studies of neotropical birds with banding and molt data (10, 11). [Jared and Gonçalo, 1 h]

19:00 Dinner

Day 5, Thursday, March 21

5:30 Hands-on banding session. Bird extraction, fast and careful processing (by this time students should have memorized the sequence of measurements to take).

Identification of molt cycles, stage within cycle, and WRP code by students for each captured bird. Demonstrative collection of blood and cloacal contents.

11:30 Lunch

14:30 *Lecture 10*: Estimation of bird population parameters from banding data. Overview of sampling design and analytical options. (12). [Gonçalo, 1 h]

15:45 *Lecture 10*: General review. [Jared, Márcio, Pedro, Luiza 2.5 h]

19:00 Dinner

Day 6, Wednesday, March 22

5:30 Banding session with evaluation of bird extraction and all banding-table techniques practiced in the previous days. Instructors will rotate through banding groups to check on, evaluate and comment on student progress and station order.

11:30 Lunch

14:30 Written test consisting mostly of bird descriptions with multiple choices of WRP code. Course evaluation questionnaire. Individual student meetings with the group of instructors to talk about progress during the course.

17:00 Final meeting.

19:00 Dinner and refreshments.

Day 7, Saturday, March 23

5:30 Free time for bird watching.

8:00 Breakfast, packing, and departure to Resende.

LITERATURE CITED IN SYLLABUS

1. NABC (2001) *The North American Banders' Study Guide* (NABC Publications Committee, Point Reyes Station).

2. NABC (2003) Guía de Estudio del Anillador de Norteamérica (Comité de Publicaciones, Point Reyes Station)

3. CEMAVE (1994) *Manual de anilhamento de aves silvestres* (IBAMA, Brasilia). 2nd Ed.

4. NABC (2001) *The North American banders' manual for banding passerines and near passerines* (NABC Publications Committee, Point Reyes Station).

5. Ralph CJ, Geupel GR, Pyle P, Martin TE (1999) *Handbook of Field Methods for Monitoring Landbirds* (USDA Forest Service - Pacific Southwest Research Station, Albany, California).

6. Wolfe JD, Ryder TB, Pyle P (2010) Using molt cycles to categorize the age of tropical birds: an integrative new system. *Journal of Field Ornithology* 8:186–194.

7. Howell SNG, Corben C, Pyle P, Rogers DI (2003) The first basic problem: a review of molt and plumage homologies. *Condor* 105:635–653.

8. Wolfe JD, Ryder TB, Pyle P, Johnson EI (2012) Using molt and plumage cycles to age tropical birds: updates and recent advances. *Ornitologia Neotropical* 23:153-158.

9. Pyle P, Gahbauer M, Johnson EI, Ryder TB, Wolfe JD (2021) Application of a global age-coding system ("WRP"), based on molts and plumages, for use in demographic and other studies of birds. 139: 1-12.

10. Wolfe JD, Ralph CJ, Elizondo P (2015) Changes in the apparent survival of a tropical bird in response to the El Niño Southern Oscillation in mature and young forest in Costa Rica. *Oecologia* 178: 715-721.

11. Muñoz AP, Kéry M, Martins PV, Ferraz G (2018) Age effects of survival of Amazon forest birds and the latitudinal gradient in bird survival. *The Auk* 135: 299-313.

12. Yoccoz NG, Nichols JD, Boulinier T (2001) Monitoring of biological diversity in space and time. *Trends in Ecology & Evolution* 16: 446-453.

OTHER RECOMMENDED READING

On birds from the Mantiqueira region

Santos, KK (2015) *Aves da RPPN Alto-Montana: Serra da Mantiqueira, Itamonte – MG*. Instituto Alto-Montana da Serra Fina. Itamonte, MG.

On banding

Spotswood EN, Roesch Goodman KR, Carlisle JC, Cormier RL, Humple DL, Rosseau J, Guers SL, Barton GG (2012) How safe is mist netting? Evaluating the risk of injury

and mortality to birds. *Methods in Ecology and Evolution* 3: 29-38.

On molt

Johnson EI, Wolfe JD (2014) Thamonophilidae (antbird) molt strategies in a central Amazonian rainforest. *The Wilson Journal of Ornithology* 126: 451-462.

Johnson EI, Wolfe JD, Ryder TB, Pyle P. (2011) Modifications to a molt-based ageing system proposed by Wolfe et al. (2010). *Journal of Field Ornithology* 82: 422-424.

Johnson EI, Wolfe JD (2021) *Molt in Neotropical Birds: Life History and Aging Criteria*. CRC Press. Boca Raton, FL.

Ryder TB, Wolfe JD (2009) The current state of knowledge on molt and plumage sequences in selected Neotropical bird families: a review. *Ornitologia Neotropical* 20: 1-18.

On parameter estimation

Kéry M, Schaub M (2012) Bayesian Population Analysis Using WinBUGS: A Hierarchical Perspective. Academic Press, San Diego CA.

MacKenzie DI, Nichols JD, Royle JA, Pollock KH, Bailey LL, Hines JE (2006) Occupancy Estimation and Modeling – Inferring Patterns and Dynamics of Species Occurrence. Academic Press, San Diego CA.

Platt JR (1964) Strong inference: certain systematic methods of scientific thinking may produce much more rapid progress than others. *Science* 146: 347-353.

Royle JA, Kéry M, Guélat J (2011) Spatial capture-recapture models for search-encounter data. *Methods in Ecology and Evolution* 2: 602-611.

Williams BK, Nichols JD, Conroy MJ (2002) Analysis and Management of Animal Populations. Academic Press, San Diego CA.