

BRETT T. McCLINTOCK

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EDUCATION

Ph.D., Wildlife Biology, May 2008
Department of Fish, Wildlife, and Conservation Biology
Colorado State University, GPA: 4.00/4.00

M.S., Statistics, May 2008
Department of Statistics
Colorado State University, GPA: 4.00/4.00

M.S., Fishery and Wildlife Biology, December 2004
Department of Fishery and Wildlife Biology
Colorado State University, GPA: 3.94/4.00

B.S., Wildlife and Fisheries Science, with Distinction, December 2000
Department of Wildlife and Fisheries Science
Pennsylvania State University – University Park, GPA: 3.65/4.00

RESEARCH AND WORK EXPERIENCE

Doctoral Graduate Research Assistant, January 2005 to May 2008
Colorado State University Department of Fish, Wildlife, and Conservation Biology
Major Advisor: Dr. Gary C. White

As a less invasive and less expensive alternative to traditional mark-recapture methods, my objective is to develop logit- and Poisson-log normal mixed effects models for estimating animal abundance and related parameters in mark-resight studies. The models will be robust to a variety of sampling conditions often problematic in these studies, including sighting heterogeneity, sampling with replacement, unknown numbers of marked individuals, and imperfect marked individual detection. The ability to incorporate covariates in modeling sighting probabilities may also lead to improved precision of estimates. I ultimately intend for the models to combine the favorable qualities of previously available mark-resight and mark-recapture estimators into a generalized framework to estimate demographic parameters for a wide range of species and field conditions. They will initially be applied to black-tailed prairie dogs and burrowing owls on colonies in the Pawnee National Grassland as part of the Colorado State University Plague Project. These models have now been implemented in Program MARK.

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Masters Graduate Research Assistant, August 2006 to May 2008

Colorado State University Department of Statistics

Major Advisor: Dr. Jennifer A. Hoeting

I am developing a mark-resight abundance estimator for when sampling is without replacement and the number of marked individuals is not known. The approach utilizes data augmentation via Bayesian analysis methods and is intended for situations when the distributional assumptions of other mark-resight estimators break down. The model is being applied to mainland New Zealand robin data to ascertain whether or not this methodology may be a reliable alternative for monitoring endangered populations of a closely related species inhabiting the Chatham Islands. The properties of the estimator are also being investigated in simulation experiments.

Masters Graduate Research Assistant, August 2001 to December 2004

Colorado State University Department of Fishery and Wildlife Biology

Major Advisor: Dr. Gary C. White

I designed and implemented a mark-resight field study examining the distribution and abundance of bighorn sheep following a suspected pneumonia epidemic in Rocky Mountain National Park, Colorado. This research is being used by Park Service officials to evaluate the current condition of the herds and develop a long-term monitoring and management program for this fragile species. I also developed and evaluated via simulation a new mark-resight population abundance estimator based on the beta-binomial distribution. The estimator successfully models individual heterogeneity in sighting probabilities and allows data from multiple primary sampling occasions or groups to be combined for improved precision over other available mark-resight estimators.

Data Analyst, January 2004

Northern Spotted Owl Demography Workshop, Corvallis, Oregon

Supervisor: Dr. Robert G. Anthony

I assisted in a meta-analysis of Northern Spotted Owl monitoring data to estimate apparent survival and population growth rates using Program MARK. This work is conducted every five years and plays a substantial role in management actions and regulations regarding this threatened species.

TEACHING EXPERIENCE

UNIVERSITY COURSES:

Interim Instructor, Fall 2005

FW471: Wildlife Data Collection and Analysis, Colorado State University

I presented lecture material, conducted weekly laboratory and recitation sessions, wrote and evaluated exams, and held office hours for undergraduate students. Course material included basic statistical theory, field sampling methods, demographic analysis, and the use of Programs MARK and DISTANCE.

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Teaching Assistant, Spring 2005

FW 471: Wildlife Data Collection and Analysis, Colorado State University

I instructed undergraduate students in weekly laboratory and recitation sessions, wrote and evaluated exam problems, held exam review sessions, lectured in the instructor's absence, and conferred with the instructor on course material and presentation.

Teaching Assistant, Spring 2004

FW 663: Sampling and Analysis of Vertebrate Populations, Colorado State University

I instructed graduate students in weekly laboratory and recitation sessions, wrote and evaluated exam and quiz problems, held exam review sessions, and consulted with instructors on course material and presentation. Course material included statistical theory, vertebrate population sampling, estimation and analysis of demographic parameters, and the use of computer applications including Programs MARK, NOREMARK, and DISTANCE.

WORKSHOPS:

Teaching Assistant, Occupancy Modeling Workshop, Columbus, Ohio, September 2007

Teaching Assistant, Program MARK Workshop, Fort Collins, Colorado, June 2007

Teaching Assistant, Program MARK Workshop, Fort Collins, Colorado, June 2006

Teaching Assistant, Program DISTANCE Workshop, Columbus, Ohio, August 2005

Teaching Assistant, Program MARK Workshop, Fort Collins, Colorado, June 2005

Teaching Assistant, Program MARK Workshop, Columbus, Ohio, August 2004

Teaching Assistant, Program MARK Workshop, Christchurch, New Zealand, December 2003

PUBLICATIONS

REFEREED JOURNAL ARTICLES

McClintock, B. T., G. C. White, and K. P. Burnham. 2006. A robust design mark-resight abundance estimator allowing heterogeneity in resighting probabilities. *Journal of Agricultural, Biological, and Environmental Statistics* 11: 231-248.

McClintock, B. T., and G. C. White. 2007. Bighorn sheep abundance following a suspected pneumonia epidemic in Rocky Mountain National Park. *Journal of Wildlife Management* 71: 183-189.

Magle, S. B., B. T. McClintock, D. Tripp, G. C. White, M. F. Antolin, and K. R. Crooks. 2007. Mark-resight methodology for estimating population densities for prairie dogs. *Journal of Wildlife Management* 71: 2067-2073.

McClintock, B. T., G. C. White, K. P. Burnham, and M. A. Pryde. *In press*. A generalized mixed effects model of abundance for mark-resight data when sampling is without replacement. *Environmental and Ecological Statistics*.

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McClintock, B. T., G. C. White, M. F. Antolin, and D. Tripp. *In press*. Estimating abundance using mark-resight when sampling is with replacement or the number of marked individuals is unknown. *Biometrics*.

McClintock, B. T., and G. C. White. *In review*. A less field-intensive robust design for estimating demographic parameters with mark-resight data.

THESES

McClintock, B. T. 2004. The mark-resight method: an application to bighorn sheep in Colorado and a simulation study evaluating estimators. M. S. Thesis, Colorado State University, Fort Collins, USA (<http://holly.colostate.edu/~btm119/thesis.pdf>).

McClintock, B. T. 2008. Bayesian analysis of abundance for binomial sighting data with unknown number of marked individuals. M. S. Thesis, Colorado State University, Fort Collins, USA.

McClintock, B. T. 2008. Generalized mixed effects models for estimating demographic parameters with mark-resight data. Ph. D. Dissertation, Colorado State University, Fort Collins, USA.

TECHNICAL REPORTS

McClintock, B. T., and G. C. White. 2006. Distribution and Abundance of Bighorn Sheep in Rocky Mountain National Park. Final Research Report *for* Rocky Mountain National Park, Estes Park, Colorado, USA.

PRESENTATIONS

McClintock, B. T., G. C. White, and K. P. Burnham. 2007. A generalized mixed effects model of abundance for mark-resight data when sampling is without replacement. EURING Technical Meeting. 14 – 20 January, Dunedin, New Zealand.

McClintock, B. T., G. C. White, and K. P. Burnham. 2006. A generalized mixed effects model of abundance for mark-resight data when sampling is with replacement. The Wildlife Society 13th Annual Conference. 23 – 27 September; Anchorage, Alaska.

McClintock, B. T., and G. C. White. 2005. Distribution and abundance of bighorn sheep following a suspected pneumonia epidemic in Rocky Mountain National Park, Colorado. The Wildlife Society 12th Annual Conference. 25 – 29 September; Madison, Wisconsin.

McClintock, B. T., G. C. White, and K. P. Burnham. 2004. Variation in sighting probabilities and mark-resight closed population abundance estimators: a simulation study and its implications for model selection. The Wildlife Society 11th Annual Conference. 18 – 22 September; Calgary, Alberta, Canada.

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HONORS AND OFFICES

HONORS: 2007-2008 PRIMES/NSF-IGERT Fellowship, \$34,000
2006-2007 PRIMES/NSF-IGERT Fellowship, \$34,000
2005-2006 PRIMES/NSF-IGERT Fellowship, \$20,500
2005-2006 F. Breniman Jr. Memorial Graduate Student Assistance Award, \$1000

REVIEWER: Journal of Wildlife Management; Australian Wildlife Research; Journal of Economic Entomology; Biometrics

MEMBER: The Wildlife Society (1999 –); International Biometric Society (2005 –); American Statistical Association (2007 –)

BOARD: The Wildlife Society Biometrics Working Group (2007 – 2008)

RELEVANT EXPERIENCE

COLORADO STATE UNIVERSITY GRADUATE COURSEWORK:

Bayesian Statistics	Categorical Data Analysis
Computational Statistics	Data Analysis and Regression
Design and Linear Modeling	Design of Fish and Wildlife Studies
Differential Equations	Generalized Linear Models
Mathematical Statistics	Probability Theory
Sampling and Analysis of Vertebrate Populations	Sampling Theory
Stochastic Processes	Wildlife Population Dynamics

SOFTWARE: SAS, R, MAPLE, MARK, WINBUGS, DISTANCE, PRESENCE

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REFERENCES

Dr. Gary C. White, Professor Emeritus
Department of Fish, Wildlife, and Conservation Biology
Colorado State University
Fort Collins, CO 80523-1474 USA
PHONE: (970) 491-6678
E-MAIL: gwhite@warnercnr.colostate.edu
(Ph.D., M.S. Major Advisor, Teaching Supervisor in FW 663, Supervisor in Workshops)

Dr. Paul F. Doherty, Jr., Assistant Professor
Department of Fish, Wildlife, and Conservation Biology
Colorado State University
Fort Collins, CO 80523-1474 USA
PHONE: (970) 491-6597
E-MAIL: doherty@warnercnr.colostate.edu
(M.S. Committee Member, Teaching Supervisor in FW 471, Supervisor in Workshops)

Dr. Jennifer A. Hoeting, Associate Professor
Department of Statistics
Colorado State University
Fort Collins, CO 80523-1877 USA
PHONE: (970) 491-2897
E-MAIL: jah@lamar.colostate.edu
(M.S. Major Advisor, Ph.D. Committee Member)

Dr. Kenneth P. Burnham, Professor
Colorado Cooperative Fish and Wildlife Research Unit
Department of Fish, Wildlife, and Conservation Biology
Colorado State University
Fort Collins, CO 80523-1474 USA
PHONE: (970) 491-5396
E-MAIL: kenb@lamar.colostate.edu
(Ph.D. Committee Member, Teaching Supervisor in FW 663, Supervisor in Workshops)