



*Newsletter of the Biometrics
Working Group, The Wildlife Society
Edited by Christine Bunck
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Message from the Chair

Terry Shaffer

This is my second run at being your Chair and I have yet to figure out what makes a good “Message from the Chair”; so I think I’ll simply relate the following story about “Age and Experience” meeting “Youth and Vigor.”

Sarge, a longtime friend and hunting buddy 20 years my senior, taught me an important lesson (or at least he tried) when it came to hunting. Sarge and I along with his son Glen and a mutual friend Steve (who was also 20 years more experienced than me) made annual sojourns to the North Dakota badlands during the early archery season to pursue mule deer and pronghorn. I think it was Steve who first coined the nicknames “Age and Experience” (referring to himself and Sarge) and “Youth and Vigor” (referring to Glen and me). It was never clear (to me at least) which of us was “Youth” and which was “Vigor,” but it didn’t matter. The names, you see, were not so much about individuals as about individual hunting styles. Many a cold beer was consumed around a warm campfire as we debated the relative merits of the patient approach of Age and Experience versus the dogged approach of Youth and Vigor. Although the debate was never settled, I think it was obvious to all that both approaches had

something to offer and complemented one another well.

And so it is with the Biometrics Working Group (BWG). Aside from having to write this column, being Chair is actually pretty darn easy with all the hard work falling to Board members who chair the various committees and to you members who, year after year, make BWG one of the most active and successful TWS working groups ever. I am fortunate to be backed by a capable and dedicated cadre of volunteers who comprise this year’s Board. Some have served before while others are charting new territory as first-time Board members. As an organization, BWG thrives on the combination of Age and Experience working hand-in-hand with the fresh ideas and unbridled enthusiasm of Youth and Vigor. This is something we should all be proud of and continue to encourage!

Other than getting through the annual meeting without totally massacring Robert’s Rules, I must confess that I don’t have much of an agenda as your illustrious Chair. I do believe, however, that there are a couple opportunities on which we should move forward. The first, a carry-over from my previous stint as your Chair, has to do with finding ways to get more mileage from the many excellent workshops and symposia that our members deliver. We all recognize the sizeable investment in time that it takes

to prepare for these sorts of events. It seems terribly inefficient to deliver them only once to a relatively small audience, especially when we know that interest often is much greater than we can accommodate in a one-time showing. Some of us are fortunate in that we are able to attend many of the TWS annual conferences and take part in BWG-sponsored events. But there's a large group of us who may not have that opportunity. Finding ways to make BWG-sponsored events more accessible to the larger TWS membership strikes me as an excellent way for us to further our contributions to TWS and increase our impact on wildlife science and management.

We have in the past looked into potential technical solutions to this issue (such as podcasting or webinars) but have yet to take significant steps forward. I have asked Mike Conroy to help me and the rest of the Board figure out how we might move ahead on this need. Some of you undoubtedly have wrestled with this issue before and probably are aware of solutions or have experience that can help us move forward. If so, please share your ideas with Mike or me.

Another potential opportunity (suggested by past-Chair Bill Gould) that we might want to consider is periodically contributing articles to *The Wildlife Professional*. I see this as an opportunity to not only influence how practitioners and researchers use and view quantitative methods, but also a means for achieving additional recognition for BWG. I encourage you to send me ideas and suggestions for contributions to *The Wildlife Professional* and I will work with you and the editors to develop them.

As always, contact me or other Board members with questions or suggestions for keeping the BWG not only wise and experienced but also youthful and vigorous.

Highlights from 2008 Annual Conference

Ryan Nielson, Clint Moore & Steve Sheriff

Workshop - Regression Modeling for Habitat Selection Using GPS Data

Organized by Ryan Nielson, Hall Sawyer & Lyman McDonald.

This BWG-sponsored workshop was held on Saturday, 8 Nov 2008. Over 40 biologists and biometricians from federal and state agencies, universities, and NGOs participated in the workshop. The purpose of the workshop was to improve understanding of modern methods for retrospective modeling of resource/habitat selection by animals when large sets of Global Positioning System (GPS) data are available for multiple tagged animals. The workshop focused primarily on scenarios where detection bias can be ignored (i.e., when GPS fix success approaches 100%), and where missing data in the time series of relocations of radio-tagged animals are negligible. However, methods and results from recently developed techniques that deal with significant detection bias and missing data were also discussed. The full-day workshop was based largely on methods presented in Sawyer et al. (2007; Habitat selection of Rocky Mountain elk in a non-forest environment; *Journal of Wildlife Management* 71:868 – 874). All presentation materials, including R computer programs and datasets can be downloaded from <http://www.west-inc.com/workshops.php>.

Workshop – The Play's the Thing: An Adaptive Management Re-enactment

Organized by Clint Moore, Mike Conroy & Ken Williams

The second BWG-sponsored workshop was an unconventional one that featured a cast of

managers and research biologists from the Webb Wildlife Management Area in south Florida. These managers and biologists are faced with the very real-life problem of managing a northern bobwhite population under uncertainty. After introductory presentations on the principles of structured decision making and adaptive management, the workshop participants followed a process to identify the decision problem and its structural components. The format of the workshop was back-and-forth discussion among the participants as these components were introduced, but at various points, the workshop audience was invited to ask questions and make comments. At moments it was rough, and even awkward; that is, it proceeded a lot like any real collaborative effort involving strong personalities but took place in compressed time. The participants were engaged, enjoyed the dialog and left with insights and new information. Plans to provide video-recorded proceedings were disrupted by equipment problems in the morning sessions. However, the afternoon sessions were captured, and the organizers are working to release portions of the sessions on a web site. Watch for an announcement on the BWG web site or in this newsletter.

**Symposium – Biometrics in Wildlife:
Looking into the Future**

Organized by Steve Sheriff, Gail Olson & Chris Ribic

This BWG-sponsored symposium was the second in the series on the topic of Biometrics in Wildlife. At the 2007 TWS annual conference in Tucson, Arizona, we covered the history and the future of popular methodologies for analyzing population, survival, and habitat data. This year, we focused on new techniques that are generating much interest in the literature and will impact wildlife management and

science in the future; thus, the title of this year's symposium was "Biometrics in Wildlife: Looking into the Future." Our symposium was held during the first afternoon of the conference unlike last year's symposium, which was held on the last day. Therefore, our audience was fresh and ready to absorb the information that our wonderful slate of speakers provided.

Doug Johnson from USGS started the session with his humorous and informative talk entitled "Confessions of a Wildlife Statistician." As a recent past-chair of BWG and its first elected secretary, Doug reflected on his career as a wildlife statistician to explore where the profession has been and is going. Doug's insights provided much food for thought in how to improve our applications of statistics in wildlife.

Lisette Waits from the University of Idaho followed with a presentation focused on the potential of using non-invasive genetic sampling to monitor populations. One of the important points of Lisette's presentation, entitled "Realizing the Potential of Non-Invasive Genetic Sampling of Wildlife Populations," concerned the examination of field collection methods. Many times the field collection methods will not produce a random sample of individuals from the population, which must be taken into consideration during the analysis of the resulting data. If used with care, genetic sampling can provide insights into the occurrence of rare and elusive species, genetic diversity and gene flow within a population, mating systems, hybridization, and even population size.

In the third presentation, Paul Lukacs from the Colorado Division of Wildlife described the use of genetics in estimating population size. He presented models that he developed for estimating populations using genetic

sampling to identify individuals in a “mark and recapture” study. As explained both in this and the previous presentation, the problem is that genetic sampling can be error prone. Paul’s methods account for simple misidentifications, which can occur during the analysis of genetic materials, and are currently available in Program MARK. Within his presentation, entitled “DNA-Based Capture-Recapture for Wildlife Population Estimation,” he indicated that recent statistical developments will much improve his methods.

In fact, Bill Link from USGS, in a presentation co-authored with Richard Barker of the University of Otago, provided some details for newer methods to estimate population size using genetic sampling. Bill and Richard have developed an approach for handling misidentification in population estimation and their approach will be published in a future issue of Biometrics. Given the co-authors of this presentation, entitled “On the Appeal of Bayesian Inference for Wildlife Data,” the audience was treated to real showcase of the Bayesian methods. These methods are appealing when estimation of a large number of parameters is required. For more information on this topic, Bill and Richard will have a book available on this subject within the next year.

The next two presentations continued the Bayesian theme and provided two interesting applications of Bayesian methods. The first presentation, entitled “Bayesian Analyses Enhance the Use of Breeding Bird Survey Data for Managers and Scientists,” by John Sauer from USGS concerned the analysis of Breeding Bird Survey (BBS) data. John and co-author Bill Link showed how log-linear hierarchical models using Bayesian inference could be used to examine population changes along

BBS routes. The next presentation by Robin Russell, currently with Montana Fish, Wildlife, and Parks, showed how a large number of bird species monitored in areas of prescribed burns could be simultaneously analyzed using Bayesian methods. Her co-authors included Andy Royle from USGS, Victoria Saab from the US Forest Service, John Lehmkuhl from the US Forest Service, and John Sauer. Their presentation was entitled, “Modeling Changes in Wildlife Communities in Response to Management Activities: an Example with Avian Community Data and Prescribed Fire Treatments.”

Chris Wikle from the University of Missouri introduced the audience to the world of spatial-temporal statistical modeling in his presentation entitled, “Hierarchical Spatial and Spatiotemporal Statistical Modeling.” Because the world of wildlife is spatially oriented and is not static, the methods that Chris described will further our understanding of the highly dynamic systems that wildlife occupies. He showed how we can reduce our uncertainties in the observational process, the spatiotemporal processes acting on these ecological systems, and associated parameters through the use of hierarchical models. One of his examples illustrated spatiotemporal processes at work for an invasive species.

Mike Samuel from USGS at the University of Wisconsin in Madison closed the symposium with a presentation entitled “Spatial Analysis and Disease Ecology.” He described how wildlife disease mechanisms can be studied using spatiotemporal statistical modeling and related the challenges of collecting information useful in this process.

Abstracts for these presentations are available through The Wildlife Society’s

web site at <http://www.wildlife.org> under Past Conferences. Unfortunately, the abstracts for the first symposium in Tucson are not available on the web. Only the presentation titles are available on the BWG web site at: <http://joomla.wildlife.org/biometrics/>.

We would like to thank all the speakers from both years for this outstanding series of symposia. The presentations were well done and very informative. The audiences were large, attentive, and pleased with the materials presented. Hopefully, we will see many changes in how biometrics is used in the wildlife profession as a result of these symposia.

Workshop planned for the 2009 TWS Annual Conference

The BWG is sponsoring a short course, “Wildlife Applications of Bayesian Survival Analysis Using WinBUGS” at the 2009 TWS annual conference in Monterey, CA. It is scheduled for a full day on Thursday, 24 Sep, the final day of the conference. Dennis Heisey is the primary instructor for the course. The target audience is quantitative researchers and biometricians involved in analyzing survival and other event-process rate data in wildlife ecology. The instructors will assume that participants have a background in probability theory and some familiarity with the WinBUGS editor. Participants should bring a laptop and are encouraged to download WinBUGS before the start of the workshop. If names of participants are provided to the instructors in early Sep, instructions on how to download WinBUGS and use the editor will be sent ahead of time.

The objective of the workshop is to demonstrate the implementation of Bayesian

analyses in WinBUGS for modeling and estimating survival and other event-process rates such as infection and parasitism. The Bayesian approach has important advantages over classical methods such as the Kaplan-Meier estimator and the Cox partial likelihood approach. These advantages include stable hazard estimates and simultaneous examination of multiple time scales (e.g., age and calendar time). The approach easily handles left-truncated and interval-censored data that arise, for example, in avian nesting success studies and wildlife disease prevalence studies. The approach is especially well suited for data that have a spatial component; such models are often referred to as spatial frailty models. Examples will illustrate survival estimation for common study designs, analysis of multiple time scales (age and time), covariate analysis, cause-specific mortality, spatial models, and interval-censored data, as time permits.

Student Travel Grants for the 2009 TWS Annual Conference

Chad Bishop

The BWG is offering student travel grants of up to \$2,500 for TWS student members presenting papers or posters at the 2009 TWS annual conference in Monterey, CA. The purpose of the grants is to promote student interest in biometrics. Applicants must be both students and TWS members. Preference will be given to applicants who demonstrate strong statistical or mathematical skills. To be considered, submit: (1) a request for award (a maximum of 1 page) that explains your interest in applying quantitative methods to wildlife/ecological research; (2) a letter of support from a mentor or supervisor or advisor; and (3) an abstract of the paper or poster being presented at the meeting

(formatted according to the meeting guidelines). Refer to the “Student Travel Grants” link on the BWG web site (<http://joomla.wildlife.org/biometrics/>) for additional details.

The deadline to submit applications for student travel grants is 1 Jul 2009. Please share this announcement with eligible students. For more information or to submit an application, contact Chad Bishop at chad.bishop@state.co.us. Following submission, you should receive an email confirming receipt of your application.

Treasurer’s Report

Bridgette Flanders-Wanner

The balance as of 15 Feb 2009 reflects memberships paid through Oct 2008. The balance also reflects the expenditure of \$2,000 for two student travel grants to attend the TWS annual conference in Miami, FL.

Balance as of 19 Aug 2008	\$14,531.06
<i>Income</i>	
Dues (2008 memberships)	\$20.00
Interest	2.70
Total Income	\$22.70
<i>Expenses</i>	
Student travel support (2008)	\$2,000.00
Total Expenses	\$2,000.00
Balance as of 15 Feb 2009	\$12,553.76

Early Notice – Nominations for 2009 Elections

Lianne Ball

Consider nominating yourself or a colleague for a position as a board member or officer of the BWG. In addition to providing service to the wildlife community, it’s a great way to get to meet members of the BWG members and contribute to TWS. The list of candidates and their biographical sketches will be included in the July/August newsletter. The election will follow thereafter. Results are announced during the BWG meeting at the 2009 TWS annual conference. This year we will be developing a slate of candidates for the following:

Chair-Elect: 3-year term, first year as Chair-Elect but then as Chair and Past Chair in subsequent years

Treasurer: 2-year term

Board Members: Four positions, each with 1-year term

Upcoming Workshops, Meetings, Conferences and Short Courses

The Status and Trends Program in USGS is offering short courses designed to explain quantitative methods and techniques to resource managers. These short courses are free and open to all who are interested. They are offered through a Webinar format and are presented via conference call or voice over IP (VoIP) format with live web demonstrations. The presentations for each of the short courses are recorded for later viewing by those who may be unable to participate in the initial broadcasts.

For additional details on this series of short courses, contact Paul Geissler at via email at Paul_Geissler@usgs.gov. To view past broadcasts or to register for upcoming short

courses go to:

<http://www.fort.usgs.gov/brdscience/courseRegister.aspx>

Two upcoming short courses are described here.

Natural Resource Monitoring Survey Design on 20-23 Apr 2009

Presenters include Drs. Steve Garman, Paul Geissler, Kurt Jenkins, John Sauer, Dave Smith, and Andrea Woodward

Course abstract. Effective stewardship of natural resources requires monitoring to assess the condition of the resources and to detect threats in time to take effective action. We will give examples where monitoring provided critical information for resource managers, examples of statistical blunders as a consequence of poor survey design, and experiences and case studies of sampling vegetation and birds. There will be a basic introduction to sampling, using online exercises. We will describe situations where it is advantageous to use different sampling techniques including: stratification (dividing the population into relatively homogenous areas), cluster sampling (measuring several subplots or using transects), double sampling (using an inexpensive preliminary sample to stratify the sample), and adaptive sampling (taking more samples near where a rare species is found). Procedures for projecting the necessary sample size and optimal allocation of samples to strata and clusters will be discussed. A simulation program will allow participants to model their area, and to try and compare alternative sampling designs. Random, systematic, grid and GRTS sampling will be compared. Changes in the detectability of individuals may be interpreted as population changes. We will present methods of estimating and adjusting for differences in detectability to avoid biases and indefensible estimates, and

discuss the sampling of bird populations considering detectability.

For more details on this short course, see: <http://www.fort.usgs.gov/brdscience/SamplingCourse.htm>.

Adaptive Management of Natural Resources on 4-7 May 2009

Presenters include Drs. Jim Nichols, Mike Runge and Julien Martin

Course abstract. This short course is designed to expose scientists and managers to the basic components and process of adaptive management. This approach is relevant to any sort of management decision that is repeated over time and may be useful in some cases with spatially replicated, one-time decisions. We begin with a discussion of structured decision making, an umbrella process of which adaptive management is a special case. We then focus on the key elements of structured decision making and adaptive management: objectives, potential management actions, models of system behavior, optimization methods, and monitoring programs. We discuss approaches for selecting appropriate objectives and show how general objectives can be formalized into explicit objective functions. We discuss management actions for different classes of problems. We describe the development of models designed to project the consequences of the potential management actions on system behavior. We will briefly discuss optimization methods to identify decisions that are optimal with respect to the management objectives. Because estimates of system state are typically needed for informed management, we provide a general approach to developing a monitoring program, as well as discuss the specific roles of resulting data in the decision process. Finally, we show how these components

combine in the adaptive management process. We argue that this process is ideal for management in the face of uncertainty and provides a natural mechanism for the conduct of science useful to management. Throughout the course, we will illustrate general approaches and concepts with a specific application involving possible management of disturbance of nesting golden eagles in Denali National Park.

For more details on this short course, see: <http://www.fort.usgs.gov/brdscience/AdaptiveManagementCourse.htm>

Biometrics Forum

Gary White is evaluating options for starting up a Biometrics Forum that is hosted by TWS. When it is fully operational, Gary and Terry Shaffer will be sending out an announcement with additional details. We would like to thank Gary for his help with getting the forum started and for re-vamping the BWG web site. To visit the BWG web site, go to <http://joomla.wildlife.org/biometrics/>

Member News

Ken Burnham, Bob Anthony, David Anderson, Gary White, Eric Forsman, and Joe Lint received the “2009 Northern Spotted Owl Conservation Award” on 15 Jan 2009 in Corvallis, OR. This award was given by their peers in recognition of their exceptional leadership and intellectual contribution to the long-term conservation of the Northern Spotted Owl.

Duane Diefenbach was selected as a TWS fellow in recognition of his exceptional service to the wildlife profession. His

selection was announced at the 2008 TWS annual conference

Ken Burnham retired from Federal service on 2 Jan 2009 after 36.5 years as a federal employee with over 20 of those years spent at the Colorado Cooperative Fish and Wildlife Research Unit at Colorado State University (CSU). For now, Ken is planning to continue to work on selected projects of interest from his office at CSU.

Lyman McDonald spent part of Feb 2009 visiting the Mibirikani Group Ranch in Kenya, enjoying great vistas of Mt. Kilimanjaro, and tracking lions with Maasai Lion Guardians. One of his photos from his trip closes this issue of the BWG Newsletter.

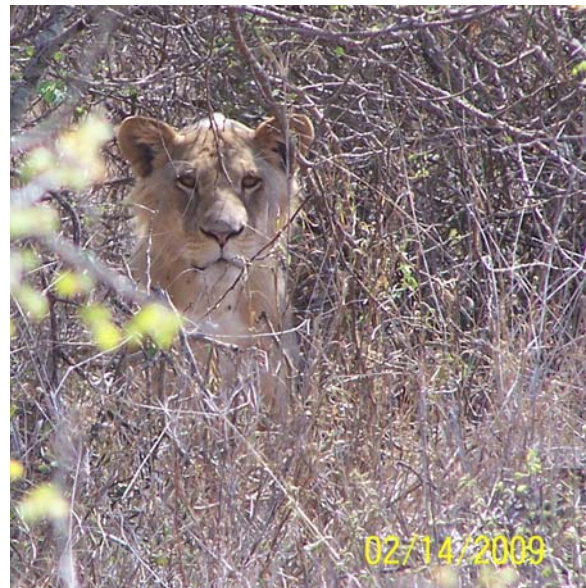


Photo by L. McDonald

**Biometrics Working Group
Contact Information for Current
Officers and Board Members**

Chair	Terry Shaffer, USGS Northern Prairie Wildlife Research Center, tshaffer@usgs.gov
Chair-elect	Chris Bunck, USGS National Wildlife Health Center, cbunck@usgs.gov
Secretary	Gail Olson, Washington Department of Fish and Wildlife, gail.olson@dfw.wa.gov
Treasurer	Bridgette Flanders-Wanner, US Fish and Wildlife Service, Huron Wetland Management District, bridgette_flanders@hotmail.com
Past-Chair	Bill Gould, New Mexico State University, wgould@nmsu.edu
Board member – Nominating& Elections	Lianne Ball, USGS Biology Science Office, lball@usgs.gov
Board member – Membership & Student Travel Grants	Chad Bishop, Colorado Division of Wildlife, chad.bishop@state.co.us
Board member – Technical Sessions	Khristi Wilkins, US Fish and Wildlife Service, khristi_wilkins@fws.gov
Board member – Advisory & Audit	Mike Conroy, USGS Georgia Cooperative Fish and Wildlife Research Unit, mconroy@ugs.edu