

## **AWARDS, HONORS AND SPECIAL ACTIVITIES**

State of Oregon partial tuition scholarship at Portland State University from September 1962 to June 1966.

Undergraduate Award, The Portland State College Club of the Society of the Sigma XI in recognition of outstanding scholarship and exceptional promise in science, June, 1966.

Department of Health, Education and Welfare NDEA Title IV Fellowship for graduate studies at Oregon State University, September 1966 through August 1969.

Department of Health, Education and Welfare, National Institutes of Health, Public Health Service Research Predoctoral Fellowship, for graduate studies at Oregon State University, September 1969 through August, 1971.

Received an award for excellence for a paper presented at the 50th Annual meeting of the Pacific Division, American Association for the Advancement of Science (meetings in Pullman, Washington, August 18-23, 1969). Paper title: "Robust estimation of population size from live trapping data."

The Li award, October 1970. Dr. Jerome C. R. Li was the first chairman of the Department of Statistics at Oregon State University. This award is given annually to the outstanding student in the Statistics Department; the recipient is determined by a vote of the department faculty.

Short course (non-credit): Ecological Simulation and System Analysis, by Dr. Bernie Patten, April 20-30, 1971 (approximately 80 hrs. of work). This course presented some formal aspects of system theory relevant to ecological modeling and a lot of lab work mostly on an analog computer developing small scale models.

Adjunct Faculty Appointment, as Assistant Professor of Statistics, University of Alaska, 1972-1973, Academic year.

Successfully completed the special Federal training course, "The Supervisor's Job, Part 1," December 16-20, 1974.

National safety council defensive driving course, October 9, 1979.

Approximately 65 hours special training in Federal Government contract procurement procedures and in duties and limitations of a contract Project Officer. Contract management for non-procurement personnel, December 15-17, 1975; Contract management (emphasizing writing the statement of work and subsequent duties of the Project Officer), February 28 through March 2, 1977; and Project Officer's Course in Contracting, July 27-28, 1981.

Participated in a series of workshops of the National Marine Fisheries Service (at the Southwest Fisheries Center, La Jolla, CA) to plan, and then analyze data from, aerial line transect surveys of porpoise populations in the Eastern Tropical Pacific. These workshops provided major input into this aspect of the NMFS porpoise Stock Assessment Program which is concerned with the impact of the tuna fishery on porpoise. Workshop dates were August 30-September 1, 1977, December 8-9, 1977, October 5-6, 1978, and June 25-26, 1979. See the NMFS report NOAA-TM-NMFS-SWFS-23 (Holt and Powers 1982), "Abundance Estimation of Dolphin Stocks in the Eastern Tropical Pacific Yellowfin Tuna Fishery Determined from Aerial and Ship Surveys to 1979."

Affiliate Faculty Appointment, to the Department of Fisheries and Wildlife, Colorado State University, Academic years 1978 through 1981.

Co-instructor of a short course entitled "Inference procedures from capture studies to estimate population size in closed animal populations and other population estimation techniques." Presented February 27 through March 2, 1979, to the Denver Wildlife Research Center.

Quality Performance Award, U. S. Fish and Wildlife Service, December 4, 1979 for sustaining quality of on-the-job performance and productivity.

Invited participant in the International Whaling Commission sponsored "Workshop on Design of Sightings Surveys" (for whales). Held in Seattle, Washington, September 11-16, 1980. This was a workshop of about 30 people (mostly IWC Scientific Committee members and National Marine Fisheries personnel); objectives were to explore use of line transect sampling (both aerial and shipboard) for estimating whale abundance.

Active participant in a one-week aerial line transect study of the humpback whale population on the Silver bank (just north of the Dominican Republic), Feb. 1981. This activity provided me with valuable field experience in line transects and made a contribution to knowledge of the status of the Western Atlantic humpback whale population.

The Wildlife Society's 1981 Wildlife Publication Award for a monograph was awarded to me, David R. Anderson, and Jeffrey L. Laake for Wildlife Monograph No. 72, "Estimation of Density from Line Transect Sampling of Biological Populations."

Invited participant in an Electrical Power Research Institute (EPRI) review of the EPRI-funded project "Sampling Design for Aquatic Ecological Monitoring" (contractor: Dept. of Civil Engineering, University of Washington), June 13-15, 1983; Seattle, Washington.

Appointment as Associate Professor (USDA), Department of Statistics, North Carolina State University, and associate membership in the Graduate Faculty, NCSU, Fall 1983.

Special Achievement Award received November 1983, from the U. S. Fish and Wildlife Service, for efforts during January to June, 1983 on my contributions to the product entitled "Field Methods and Statistical Analysis for Monitoring Small Salmonid Streams."

Invited participant in the Southwest Fisheries Center (SWFC, National Marine Fisheries Service) 1983-1984 pre-SOPS Panel C meetings (in San Diego, CA, December 5-9, 1983 and March 1-2, 1984). The panel provided expert review of SWFC research programs as part of the SWFC's preparation for the Status of Stocks (SOPS) analysis in 1984, which itself is to be the basis for a "Draft Environmental Impact Statement for the tuna-porpoise fishery of 1986 and beyond."

The Wildlife Society's 1984 Wildlife Publication Award for a monograph was awarded to Drs. Gary C. White, David R. Anderson, David L. Otis and me, for the publication "Capture-recapture and Removal Methods of Sampling Closed Populations."

Appointment to the NCSU Ecology Advisory Committee (1984-1988).

Member of the Scientific Review Panel (also called the Study Design Group) on Monitoring Dolphin Populations in the Eastern Tropical Pacific (ETP). This is a committee of in and out-of-house experts established to provide advice to the SWFC (NMFS) about a long-term dolphin monitoring program (which had just been mandated by Congress in the reauthorization of the Marine Mammal Protection Act). First met Nov. 1-2, 1984 in La Jolla, CA.

Member of the panel reviewing the final products from the EPRI project "Sampling Design for Aquatic Ecological Monitoring;" met Nov. 27-28, 1984, in Seattle, Washington.

Appointment at NCSU, as Statistics Department representative to the university Ecology Executive Committee, August 1986, for a three-year term.

Consultant to the National Marine Mammal Laboratory, Seattle, WA, Sept. 29-30, 1986, regarding line transect sampling of Dall's porpoise in the Northern Pacific. Also presented a seminar on population estimation.

Appointment to the Regional Advisory Board of the Eastern North American Region (ENAR) of the Biometric Society, Jan. 1987, for a three-year term.

Cooperator on an NSF travel grant under the NSF International Cooperative Research Program. Awarded Jan. 1, 1988 to run 2.5 years. David Anderson and me are cooperating with Drs. Jean Clobert (Paris), and Jean-Dominique Lebreton (Montpellier, France) to write a monograph on case-studies in state-of-the art release-recapture data analysis. To this end, all 4 of us were in Montpellier, France the week of May 1 to 6, 1988, working on the project.

Co-instructor (with Drs. David R. Anderson and Gary C. White) of the "Workshop on design and analysis methods for fish survival experiments based on release-recapture," July 6-8, 1988, in Fort Collins, CO, attended by 23 participants, most of them doing work on fisheries issues on the Columbia River system. The textbook for this workshop was Burnham, Anderson, White, Brownie and Pollock (1987).

Affiliate faculty appointment as Associate Professor, Department of Statistics, North Carolina State University, 1988-1989.

Affiliate faculty appointment at Colorado State University in both the Departments of Fisheries and Wildlife Science, and Statistics, since Sept. 1988.

Invited participant the Smolt Survival Workshop held February 1-3, 1989, at the U. of Washington's Friday Harbor Lab, San Juan Island, WA and sponsored by Bonneville Power Administration. The workshop was held to "evaluate measures of juvenile salmon and steelhead survival and to recommend approaches for future studies in the Columbia River."

Took the short course "Practical Biological Modeling" given on March 19, 1989 (at the Spring ENAR meetings in Lexington, KY) presented by Drs. David Allen (U. of KY) and James Matis (Texas A & M); it dealt with the statistical fitting of data to kinetic models (compartment) in biology.

Member of the Quality Review Board on the Minerals Management Service contract (to EnviroSphere Company) "Oregon and Washington Marine Mammal and Seabird Surveys." Participated in first Board meeting in Bellvue, WA, April 20-21, 1989 (there are 5 scientists on this QRB) to review EnviroSphere's detailed study design and field plan.

On the Editorial Board of Ecology, Oct. 1, 1989 for a 3 year term; responsible for handling manuscripts dealing with new or innovative statistical methods in ecology, or manuscripts otherwise "heavy" on statistics.

On the 1990 WNAR Nominating Committee which is responsible for the names put on the 1990 ballot to elect the WNAR President-elect, Secretary-Treasurer, Program Coordinator (for the annual WNAR Spring meeting), and at least 4 nominees for 2 positions on RECOM (the Regional Committee of WNAR, which is something like a board of trustees).

On the BLM (Boise office for studies in the Snake River Birds of Prey Area) Study Design Team, 1991-1994, for Studies 5 (survey of active burrow density in the SRBOPA) & 6 (jackrabbit density estimation); the Contract with BLM (Dr. Bea van Horne, CSU) is their study 4. Studies 1,2 and 3 directly concern the Raptors in the SRBOPA.

Invited visit to the Institute of Statistics, National Tsing Hua University, Hsinchu, Taiwan, June 4-6, 1990. Presented one seminar: A unified theory for release-resampling studies of animal populations.

Participated in a 2 day meeting of the Study Design Group on monitoring dolphin populations in the Eastern Tropical Pacific (ETP), held at SWFC (NMFS) July 10-11, 1990 in La Jolla, CA. The objective of this meeting was to recommend the future course of action (in 1992 and beyond) for ship-board line transect surveys of dolphin in the ETP to meet the needs for management data on these species as regards regulating the purse seine tuna fisheries. The 6-survey MOPS study has done 4 surveys (1986,87,88,89) and will finish its 1990 and 91 surveys. There is a 2 year lead time to reserve research vessel time in NMFS, hence we had to make our 1992 recommendations now.

Honored by being selected to be an ASA Fellow, August 7, 1990 (ceremony at the 1990 ASA annual meeting), this is a lifetime “appointment;” only a small percent of ASA members ever become Fellows.

Special achievement award received August 21, 1990 (award certificate dated Aug. 12, 1990) from the USFWS for analytical work performed related to the Northern Spotted Owl issue (in support of the FWS effort to decide the listing, or not, of this species as threatened).

On the Scientific Organizing committee for the third EURING conference to be held in Montpellier, France April 7 to 11, 1992 (a committee of 7 people from 5 countries). This conference is formally titled as “The Use of Marked Individuals in the Study of Bird Population Dynamics: Models, methods and Software.”

Participate in the Study Integration Workshop in Boise (re BLM Snake River Birds of Prey research) Sept. 18-20, 1990 (They combined previous studies 5 & 6, made new study 6 the GIS effort; studies 1, 2, 3, 4 are the same.) This was the first hard effort to see that all these studies would be coordinated. I am officially an advisor to the BLM Snake River Birds of Prey Research Office in Boise, ID on studies 4 and 5, and I also provide reviews on study 3. My main involvement is with all aspects of study 4: Townsend's ground squirrels.

On the 1991 WNAR Nominating Committee which is responsible for the names put on the 1991 ballot to elect the WNAR President-elect, Secretary-Treasurer, Program Coordinator (for the annual WNAR Spring meeting), and at least 4 nominees for 2 positions on RECOM (the Regional Committee of WNAR, which is something like a board of trustees).

On the Committee on Fellows and Awards of the ASA Section for Statistics and the Environment, Chaired by G. P. Patil, for 1991-1992. This committee is to annually review the Section's membership, choose several members who merit nomination as ASA Fellows, find a sponsor for each or otherwise see that the necessary documents are prepared and transmitted to the SAS Committee on Fellows.

Participated in the second meeting of the Quality Review Board on the Minerals Management Service contract (to EBASCO) “Oregon and Washington Marine Mammal and Seabird Surveys,” in Bellvue, WA, August 28-29, 1991. This time the field work was all done as well as most of the data analysis, and we critiqued the draft final report.

Co-instructor of a 1 week intensive, advanced workshop on the analysis of marked animal resampling data, held in Fort Collins, 23-27 Sept., 1991. This was in international workshop, in composition of attendees and instructors; emphasis was on program SURGE and advanced survival models (Jolly-Seber model as a starting point). Instructors were Drs. David Anderson, Jean-Dominique Lebreton, me and Mr. Roger Pradel.

Invited review panel member at the November 18-21, 1991, workshop on Status of Porpoise Stocks (SOPS) at the Southwest Fisheries Research Center, NMFS, La Jolla, California. My participation involved the review of 13 papers that which would provide the basis for a NMFS report to Congress in Feb. 1992 regarding status of and management of porpoise stocks in the ETP.

Co-instructor of the repeat of a 1 week intensive, advanced workshop on the analysis of marked animal resampling data, held in Fort Collins, 13-17 Jan., 1992. This was in international workshop, in composition of attendees and instructors; emphasis was on program SURGE and advanced survival models (Jolly-Seber model as a starting point). Instructors were Drs. David Anderson, me and Jean Clobert.

Invited by the Oregon State University Statistics Department to present a seminar in their regular seminar series, Feb. 17, 1992. I did so (talk was "On a unified theory for release-resampling of animal populations"). I got my Ph.D. from there and finished it in late Feb. 1972 (20 years before).

Invited panel member at a workshop on harbor porpoise ("Harbor Porpoise in Eastern North America: Status and Research needs"), held May 5-8, 1992, in Woods Hole, MA; sponsored by NMFS, Northeast Fisheries Science Center. The key objective of the workshop was to make a recommendation to managers concerning the need (if any) for action regarding the by-catch (kill) of harbor porpoise by the fisheries fleet. (About 20 people total were there).

Special achievement award received September 6, 1992, from the U.S. Fish and Wildlife Service for superior performance in appraisal year 1992 (upper 2% of USFWS employees).

Promoted by the USFWS (effective Nov. 15, 1992), via the Research Grade Evaluation Process (RGEP), to a GS 14 (from GS 13). This is a long process; it started in May 1992.

Participate in the BLM/IDARNG Integration Workshop in Boise, ID (Nov. 17-19, 1992) as regards the 5 ongoing studies, on the Snake River Birds of Prey Area, (funded by BLM and ID Army National Guard).

The Colorado Cooperative F&W Research Unit received the 1992 Director's Award for Outstanding Science (Unit Scientific personnel are D. R. Anderson, E. P. Bergersen and myself). This Award, from the director of the Coop Units Program, FWS, was started in 1989 and is given to only 1 Unit each year (there are about 37 Units). This award was established to recognize annually the Cooperative Unit that demonstrates consistent leadership at the cutting edge of science.

Co-instructor of the third presentation a 1 week intensive, advanced workshop on the analysis of marked animal resampling data; this time it was held in Montpellier, France, Feb. 15-19, 1993. This was in international workshop (11 countries represented), in composition of attendees and instructors; emphasis was on program SURGE and advanced survival models (Cormack-Jolly-Seber model as a starting point). Instructors were Drs. Jean-Dominique Lebreton, Jean Clobert, David Anderson, me and Ms. Anne Viallefont (a Ph.D. student of Dr. Lebreton).

Invited participant at the NMFS Status of California Cetacean Stocks (SOCCS 1993) workshop held March 31, April 1 & 2, 1993, in La Jolla, CA (at the Southwest fisheries Science Center, NMFS). The workshop dealt mostly with abundance estimates of cetaceans in California waters (out to 200 miles) using line transect sampling and was done in preparation for the 1993 congressional re-authorization of the Marine Mammal Protection act.

Received a Distinguished Achievement Medal from the ASA Section on Statistics and the Environment at that sections meeting during the (August) 1993 Joint Statistics Meetings in San Francisco (SAS, IMS, ENAR, WNAR); along with the bronze medal is a certificate, saying, in part, “in recognition of outstanding contributions to the development of methods, issues, concepts and applications of environmental statistics.”

Co-instructor of two, 1-week intensive international workshops on distance sampling (line and point transects): “Design and Analysis of Distance Sampling Data: Theory and Application.” The same workshop was presented Oct. 25-29, then again Nov. 1-5, 1993 (because of demand), 17 people were at the first workshop, there were 27 at the second workshop. These workshops were held in Fort Collins, and were planned and organized by David Anderson and me. At the first one the instructors were David, me and Jeff Laake. At the second one, Steve Buckland replaced Jeff. The workshops dealt with the subject of our book (Buckland, S. T., D. R. Anderson, K. P. Burnham, and J. L. Laake. 1993. Distance Sampling: Estimating Abundance of Biological Populations. Chapman & Hall, London. 446pp) and the associated computer program DISTANCE.

Special Achievement Award received November, 1993 from the U.S. Fish and Wildlife Service for outstanding performance (i.e., Level 5) in appraisal year 1993.

Co-organized (with David Anderson), conducted a workshop and data analysis effort, and wrote the report (with Anderson and Gary White) on a comprehensive statistical analysis of the demographic data on the Northern Spotted Owl (in the period Nov. 8, 1993, to January 12, 1994). These data were the capture recapture and fecundity data from 11 study areas in northern CA, OR and WA collected from 1985 to (end of Summer) 1993. This effort was assigned to the CO Unit by supervisors in Washington DC on about Oct. 26, 1993. The data analysis results were relevant to the White House-level decision on Forestry/NSO management issues, in the Pacific Northwest, to be made in early 1994, and in general to ongoing issues of forest ecosystem management vis-a-vis the Threatened Northern Spotted Owl subspecies. The total effort included about 22 biologists being in Fort Collins from Dec. 10<sup>th</sup> until Dec. 23<sup>rd</sup> and David and me working with them this entire time (plus all the planning before hand). A formal workshop was taught by (mostly) me and David all three days, Dec. 13-15 on capture-recapture data analysis theory and practice, and on demographic analysis of vital rates. Data analysis was Dec. 16-22. After that the report was written, being finished Jan. 12<sup>th</sup> (Burnham, K. P., D. R. Anderson, and G. C. White. 1994. Estimation of vital rates of the Northern Spotted Owl), and became Appendix J in the Feb. 1994 SEIS on old-growth forest management.

Co-instructor (with D. R. Anderson) at the University of Canberra (Canberra, Australia) of our 1-week workshop on distance sampling (line and point transects): “Design and Analysis of Distance Sampling Data: Theory and Application.” Presented April 19-22, 1994, to 14 people. This workshop was arranged by the Applied Ecology Research Group at University of Canberra.

Presented an invited seminar May 3, 1994, to the Statistics Department, University of Hong Kong, on distance sampling theory.

Special Achievement Award, May 1994, from the National Biological Survey; below is the text of the award statement:

During the fall of 1993 the Office of the Secretary requested Dr. Kenneth Burnham and Dr. David Anderson to conduct a detailed and comprehensive analysis of a Nationally significant issue, i.e., demographic data on the threatened Northern spotted Owl. This enormous and nearly impossible task involved the analysis of 14 study areas across the range of the northern subspecies and capture-recapture surveys on each over the past 4-9 years. Dr. Burnham and Dr. Anderson assembled over 50 people during December 1993 to conduct a 12 day analysis of this data. The results of this workshop have had direct use in the Clinton/Gore Timber Summit resolution and the court-ordered USFWS EIS. Dr. Burnham and Dr. Anderson are to be commended for their outstanding efforts and significant findings regarding Northern Spotted Owl Demographics.

Co-instructor (with D. R. Anderson and S. T. Buckland) at Hedmark College, Evanstad Norway of our 1-week workshop on distance sampling (line and point transects): "Design and Analysis of Distance Sampling Data: Theory and Application." Presented June 13-17 1994, to 17 people. We were invited to present this workshop, which was arranged by the Nordic Council for Wildlife Research and organized by, and held at, a special wildlife/forestry teaching and research facility of Hedmark College, Norway.

Received a Distinguished Statistical Ecologist Award (25 were given) from INTECOL (International Congress of Ecology), given at the international meeting, Manchester, UK, 1994 (the meetings were August 21-26, I reluctantly decided I could not go as classes at CSU started that week and I was teaching a course). This award is from the Statistical Ecology Group within INTECOL.

On the Scientific Program Committee for the fourth EURING conference held at Patuxent Wildlife Research Center, Laurel Maryland, USA, September 20-24, 1994 (a committee of 8 people from 4 countries); I also organized and chaired a session. Also on the Finance Committee for EURING 94. This conference is formally titled "State-of-the-Art Data Analysis for Studies of Marked Birds."

Co-instructor (with D. R. Anderson and S. T. Buckland) at the University of St. Andrews, Scotland, our 1-week workshop on distance sampling, presented September 26-30 1994, to 20 people from 12 countries. Steve Buckland is on the Faculty of U. of St. Andrews. This was the fifth time we gave this workshop.

Invited participant, Population Estimation Conference Feb. 16-17, 1995, at the University of Nevada, Reno (Cosponsored by UNR and US Fish and Wildlife Service), to discuss existing and potential methods for population estimation and monitoring of the desert tortoise.

Co-instructor (with D. R. Anderson) at the University of Natal, at Pietermaritzburg, South Africa of our 1-week workshop on distance sampling (line and point transects): "Design and Analysis of Distance Sampling Data: Theory and Application." Presented June 26-30 to 28, 1995, people from 8 countries (mostly African countries). We arranged this workshop ourselves with the considerable help of the Department of Statistics and Biometry at U. of Natal, Pietermaritzburg. Distance sampling methods are used a lot in Africa to estimate abundance of the wildlife there (walking and aerial for line transects, on the ground for point transects; point transects have been used for rhinos, hence not just for birds)

Took a two-day SAS sponsored short course (given in Fort Collins, November 6-7, 1995) entitled “Multivariate Statistical Methods: Practical Applications.” It dealt with how to use SAS to do a variety of multivariate statistical analyses.

Overseas examiner on the Ph.D. thesis of Richard Barker (Massey University, New Zealand) (Dec. 1995) about capture-recapture theory in extended Jolly-Seber models to include sightings between capture periods.

Overseas examiner on the Ph.D. thesis of David Borchers (University of Cape Town, South Africa) (June 1996) about line transect theory extended to joint estimation of  $g(0)$  and  $f(0)$  with covariates for both components.

Invited visit to Montana State University, arranged jointly by the Statistics Program and Wildlife Program there, October 31-November 1, 1996, to discuss model selection (and other matters). Presented an invited seminar: “Information theory based model selection and model selection uncertainty.”

Invited key participant in a two day workshop to provide guidance to the Desert Tortoise Research Council on how to design a range-wide monitoring study of desert tortoise population abundance and trends during the next 25 years; held November 20-21, 1996 in Laughlin, Nevada.

In an invited cooperative effort with Dave Otis (Leader, Clemson, SC Coop Unit), David Anderson and me worked with the Endangered Species management branch (of Environmental Services) at Fort Bragg, NC (US Army) on some issues about the red-cockaded woodpecker (RCW) on the 65 square miles of Fort Bragg (visited there February 26-28, 1997). Main issue was study design of possible future experiments or quasi-experiments on the effect of military activities at Fort Bragg on the RCW.

Accepted an invitation to be an Associate Editor of Biometrics, starting May, 1997, until mid 2000.

Co-instructor (with David Anderson and Gary White) of a 2.5 day workshop (June 17-19, 1997 at USGS headquarters in Reston, VA) on the analysis of striped bass tag recovery data. An introduction to principles of such data analysis and models and to program MARK, was presented to 18 fisheries biologists (14 state, 4 Federal) involved in the striped bass tagging program in eastern US coastal waters.

Invited panel member on a team of external reviewers of the St. Marys River Assessment Plan. This plan was produced by the Sea Lamprey Integration Committee of the (USA/Canadian) Great lakes Fishery Commission as part of a long-term control effort on sea lampreys, already ongoing but to be much expanded in 1999 and 2000. The “Plan” was about sampling and data analysis, including capture-recapture, to assess the efficacy of the new (and expensive) sea lamprey control efforts. This effort involved the panel holding a 1-day meeting in Detroit (June 12, 1998) and then producing a report of our evaluation as well as individual technical suggestions. (The review panel: Jim Bence, Michigan State University; Mark Ebener, COTFMA: Chippewa/Ottawa Treaty Fishery Management Authority; Randall Peterman, Simon Fraser University; and Brian Shuter, University of Toronto).

Co-instructor (with David Anderson and Gary White) of a 4 day international workshop (August 10-13, 1998 at the University of St. Andrews, Scotland) on the analysis of animal tagging data using program MARK (written by Dr. Gary White). The workshop formal title was “Survival estimation from data on populations of marked animals;” however, we also dealt some with abundance estimation. The workshop was an introduction to principles of data analysis for capture-encounter data using models such as Cormack-Jolly-Seber (for live captures), tag (band) recovery data (harvested animals), joint live-dead encounter data, and robust-design capture data. This was an intermediate level workshop. The 22 participants were from the countries of Scotland, Britain, France, Norway, USA, Denmark, Mexico, Belgium, Canada, Netherlands, Republic of Singapore, and Hong Kong.

Co-instructor of the workshop “Line transect sampling methods for desert tortoise abundance estimation,” October 4-8, 1998, in Las Vegas, NV (instructors were David Anderson, me, Bruce Lubow and Len Thomas). This workshop was tailored to issues of field methods required to meet the assumptions for line transect sampling of desert tortoises. There were about 40 participants; exactly 36 persons were in 12 three-person teams for a full day field exercise sampling a population of styrofoam tortoises. With much help we set up this training course of “tortoises” in the 3 days before the workshop started. The motivation for this workshop is the required long term, range wide monitoring of the Mohave Desert population of desert tortoises. This is an important issue, it will involve many land management agencies and will not be easy to do. The only practical method to use is line transect based monitoring combined with radio telemetry into some sort of standardized field protocols range-wide; that message was a key aspect of the workshop.

Co-leader (with Gary White, Alan Franklin, Bob Anthony) of a data analysis workshop on the demographic capture-recapture and fecundity data for the northern spotted owl. The workshop was held December 7-15, 1998, at Oregon State University, Corvallis, OR. This effort was very much like the NSO workshop held in Dec. 1993 in Fort Collins; the objectives were the same, also. However, now we had five more years of data, more study areas, and a lot more methodology and tools for the data analysis: MARK, AIC book, general bootstrap-based goodness-of-fit, random effects method, Pradel reparameterized Jolly-Seber models for direct estimation of  $\lambda$ . This was a major effort, involving about 40 people. The product was a final report sent to the sponsors that paid the costs (BLM, FWS and FS): Franklin, A. B., K. P. Burnham, G. C. White, R. C. Anthony, E. D. Forsman, C. Schwarz, J. D. Nichols, and J. Hines. 1999. Range-wide status and trends in Northern Spotted Owl populations. 71pp.

Invited expert for the NMFS Southwest Fisheries Science Center (January 21, 1999, in La Jolla, CA) for a one day meeting to review line transect monitoring data, taken by intensive shipboard surveys in 1998, on dolphin abundance in the Eastern Tropical Pacific (ETP). Analysis methods, issues and problems, were reviewed as regards preliminary abundance estimates (by stocks) and suggestions were made for improved data analysis before the final results are produced and go to Congress (where they are used in formulating regulations on the ETP tuna fishery).

Invited (with David Anderson) to a one-day meeting in Las Vegas (January 25, 1999) of the desert tortoise Technical Advisory Group overseeing design and implementation of a large-scale, 25 year monitoring program for the endangered (under ESA) Mohave desert tortoise. The monitoring program will be based on distance sampling; we were providing inputs to survey design.

In late April, 1999, the Ninth Lukacs Symposium was held at Bowling Green State University (Bowling Green, Ohio); Eugene Lukacs (1906-1987) was an influential mathematical statistician (born in Hungary) in the USA from 1939 until 1987. The Symposium title: "Frontiers of environmental and ecological statistics for the 21st century: synergistic challenges, opportunities and directions for statistics, ecology, environment, and society." I was one of 26 recipients of following award: Twentieth Century Distinguished Service Award for Outstanding Contribution to Environmental Statistics.

Co-instructor (with Gary White and David Anderson) of a 5 day international workshop (June 7-11, 1999 held on the campus of Colorado State U.) on the analysis of animal tagging data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models (CJS, recoveries, joint and extended models, closed models, robust design, multi-strata, Pradel models). The workshop formal title: "Analysis of encounter data from marked animal populations." There were 29 participants from 5 countries.

Co-instructor, with David Anderson, of a five day international workshop (June 27-July 2, 1999) held on the Chiromo campus (the science campus) of the University of Nairobi, in Nairobi, Kenya. The workshop local organizer and host was the Mathematics Department at U. of N., which has a very strong statistics program. Indeed, the Department Chairman, Dr. John W. Odhiambo, is a statistician; he was the main contact, organizer, and local host. The workshop title: Statistical methods for studying animal populations. Sunday night, June 26 was a formal opening ceremony, Monday was on model selection (i.e., our book), Tuesday, Wed. and Thursday until Noon was on capture-recapture, emphasis on models in and use of program MARK. There were hands on sessions on use of MARK. Thursday Noon to Friday 1PM was on distance sampling; Program DISTANCE V3.5 was shown (no hands on use). Friday evening there was a formal closing ceremony, certificates for attendees, and a Kenyan diner. Twenty-four persons completed the workshop, all Africans from mostly Kenyan universities, mostly statisticians.

A Department of Interior Special Thanks for Achieving Results (STAR) Award June, 1999 for participation in a panel of USGS-BRD scientists that reviewed several detailed study plans for long-term studies of the Ecological Synthesis Team of the National Water-Quality Assessment Program, USGS-WRD (part of the objective of this work was to foster a dialog between scientists in BRD and WRD of USGS).

Invited by the University of Wyoming Statistics Department to present a seminar in their regular seminar series, Oct. 8 1999. I did so; seminar title: "The foundations of AIC and its use in multi-model inference."

Invited participant, November 18-19, 1999, at Oregon State University (Corvallis, OR) in a workshop (title: Modeling demography of spotted owls in relation to habitat characteristics) organized by the Oregon Coop Unit as part of a large funded project to that Unit (P.I. Bob Anthony) on Northern Spotted Owls (Gail Olson is a Post Doc on this project).

Invited participant at a meeting in Smithtown, Long Island NY, February 29 and March 1, 2000. The meeting dealt with issues of analysis of tag-recovery data from the northeastern USA striped bass tagging program, with virtual population analysis (VPA) of striped bass harvest data, and with issues of why the two sources of information are producing different inferences as regards management of the striped bass stocks. The meeting was an official activity of the Atlantic States Marine Fisheries Commission. Day one was a meeting of the Striped Bass Tagging Group and day two was a meeting of the Stock Assessment Subcommittee to consider the tagging vs. VPA issue.

By request from the Reston office (mid-March, 2000), USGS-BRD, I provided a technical review of a population dynamics model on wild horses (Wild Horse Population Model Version 3.2, by S. H. Jenkins, U. of Nevada at Reno). This model was funded by BLM and is used by BLM in their wild horse management program. The review request came to BRD from BLM and was motivated by concerns of Congress about the wild horse management program on BLM lands in the west.

March 28, 2000, I was visiting the Wisconsin Coop Unit, so voluntarily presented a seminar entitled Model Testing and Selection in Wildlife Data Analysis, which was actually about the problems and flaws of significance testing as compared to a likelihood basis for analysis and model selection.

Invited seminar presented (May 8, 2000) at Patuxent Wildlife Research Center (Laurel, Maryland): "The foundation of AIC and its use in multi-model inference." This seminar was sponsored by the Washington Statistical Society (WSS), Methodology Section, and the USFWS (WSS is a chapter of the American Statistical Association, this was an official WSS activity).

Workshop Co-instructor (with David Anderson, Doug Johnson, Bill Link [those 3 all from USGS] and Andy Royle [USFWS]) in a two day workshop held May 22-23, 2000 (at Aspen Lodge, Estes Park, CO); the audience was mostly Coop Unit scientists, but also some persons from USFWS and USGS labs (25 participants, plus lecturers). The workshop subject and title: "New quantitative techniques for applied ecological problem solving." Day one was an introduction to information-theoretic model selection; also, each participant received a copy of the Burnham and Anderson (1998) "model selection" book. On day two of the workshop Bill and Andy presented an introduction to Bayesian data analysis; each participant received a copy of the BUGS software (Bayesian analysis using Gibbs sampling).

Co-instructor (with Gary White and David Anderson) of a 5 day international workshop (June 5-9, 2000 held on the campus of Colorado State U.) on the analysis of animal tagging data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models (CJS, recoveries, joint and extended models, closed models, robust design, multi-strata, Pradel models). The workshop formal title: "Analysis of encounter data from marked animal populations." There were 23 participants from 4 countries.

Co-instructor, with David Anderson and Richard Barker (U. of Otago, New Zealand), of a five day international workshop (July 3-7, 2000) held on the St. Lucia campus the University of Queensland in Brisbane, Australia. The workshop local organizer and host was the Centre for Conservation Biology; the event official designation was “International Workshop on Wildlife Population Assessment.” Sunday night, July 2 was a social get-acquainted event. Monday was on model selection (i.e., our book). Tuesday and Wednesday were on distance sampling. Thursday and Friday were on capture-recapture, emphasis on open models in, and use of, program MARK. There were hands on sessions on use of DISTANCE 3.5 and MARK. We had evening computer sessions Tue, Wed. and Thu. We handed out a lot of printed material (e.g., Buckland et al. 1993) and a CDROM with 600M of files and programs. There were 29 participants from 4 countries.

Member of the Technical Advisor Group (TAG) to the CITES MIKE program (September 2000 to July 2006). CITES: The Convention on International Trade in Endangered Species of wild flora and fauna (an international program now 25 years old). MIKE: Monitoring the Illegal Killing of Elephants (a long-term elephant monitoring program. The CITES program is administered out of Geneva, Switzerland under the umbrella of the United Nations Environmental Program (and IUCN), although it is not really a UN program, but rather is based on a treaty among party nations). The last TAG meeting I am aware of was in early July, 2006 after which the entire program seems to have collapsed, alas.

Co-instructor, with David Anderson, of a 1-day workshop (September 12, 2000) on our model selection book. The workshop title was “Information-theoretic methods: Alternatives to statistical null hypothesis testing.” This workshop was held as part of the annual meeting of The Wildlife Society, held in 2000 in Nashville, Tennessee. We had 98 registrants; the workshop went from 8AM to 5:20PM, with a 1 hour lunch break. We covered the basic ideas of K-L based model selection, including multi-model inference.

Co-instructor (with Gary White and David Anderson) of a 5 day international workshop (June 4-8, 2001 held on the campus of Colorado State U.) on the analysis of capture-recapture (and related) data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models (CJS, recoveries, joint and extended models, closed models, robust design, multi-strata, Pradel models). The workshop formal title: Analysis of encounter data from marked animal populations. There were 25 participants from 3 countries.

Invited participant at the 53rd meeting (July, 2001 in London, UK) of the Scientific Committee of the International Whaling Commission (IWC); I participated in a sub-committee meeting: Review of Southern Hemisphere Minke Whale Abundance Estimates (chaired by David Borchers; there were about 40 people in attendance). This sub-committee meet only on July 3-4 (two 12 hour days), whereas the full IWC meeting went from (officially) July 4 to 16, 2001. The sub-committee results went to the full committee (but I left before then).

Assisted with the “Introduction to Distance Sampling Workshop” held July 25-27, 2001, at the University of St. Andrews, Scotland (just before ICODS), organized and taught by RUWPA (i.e., Steve Buckland, David Borchers, Len Thomas + assistants that included me and Jeff Laake). The

workshop had 30 paid participants from 13 countries. My role was just to help answer questions and provide individual help to participants.

Coauthor of the publication that won The Wildlife Society's 2001 Wildlife Publication Award in Outstanding Monograph Category: "Climate, habitat quality, and fitness in northern spotted owl populations in northwestern California," in *Ecological Monographs* 70:539-590, by Alan Franklin, David Anderson, Rocky Gutierrez, and Ken Burnham. (Awarded at the annual TWS meeting, last week of Sept., 2001 in Reno, NV).

CRU Science Excellence Award, presented February 5, 2002 (but dated November, 2001) at the Cooperative Research Units (CRU) "all hands" meeting held Feb. 4-7, 2002, in San Antonio, TX. The Cooperative Research Units are a national program within the US Geological Survey; CRU has an internal awards program, including excellence in science, and in science leadership. Technically, this is "... the Award for Science Excellence. This award is to be given annually to individuals in CRU who make outstanding contributions to science." It is given by peer nomination and review.

Attended a MIKE TAG meeting May 27-29, 2002 at the Frensham Ponds Hotel (near Farnham, England). Most of the TAG were there, plus Nigel Hunter (MIKE director), plus some staff of MIKE and some contractors. It went well.

Co-instructor (with Gary White and David Anderson) of a 5 day international workshop (June 3-7, 2002 held on the campus of Colorado State U.) on the analysis of capture-recapture (and related) data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models (CJS, recoveries, joint and extended models, closed models, robust design, multi-strata, Pradel models). The workshop formal title: "Analysis of encounter data from marked animal populations." There were 37 participants from 4 countries. (We wanted to cap it at 30 but we forgot to do this and went over 30, at which point we did turn people away).

STAR Award (Special Thanks for Achieving Results), August 2002 from USGS for the finding that AIC can be easily justified and derived as a Bayesian result if one uses a savvy prior on models. Thus, the perceived wide gulf between BIC as Bayesian and AIC as frequentist is an illusion. This changes the focus of the debate to be on target models and priors on models.

Invited visit and seminar at the University of Chicago, January 29-30, 2003, under the auspices of the Center for Integrating Statistical and Environmental Science (P.I. on the main grant for the center is Michael Stein of the Statistics Department). My seminar talk was "Model selection: Understanding AIC and multimodel inference, with contrasts to BIC." While there I talked with a number of faculty, postdocs and graduate students about their work and statistical aspects thereof (esp. M. Stein, Greg Dwyer, Bret Elder, Kathy Pfister), from the Department of Statistics, Department of Ecology and Evolution.

Invited visit and seminars at the University of California at Santa Barbara, February 10 and 11, 2003, (full days, both day; travel was on the 9th and 12th). My main host was Dr. Allan Stewart-Oaten (statistician in the EEMB Department). On the 10th I visited in the Ecology, Evolution and Marine Biology Department (EEMB) and presented the seminar (in their regular departmental series) “Advances in capture-recapture: parameters as random effects.” I talked to a number of faculty, postdocs, and graduate students that day. I also met and talked with people associated with NCEAS (National Center for Ecological Analysis and Synthesis). On the 11th I visited in the statistics department (Statistics and Applied Probability) and presented the seminar (in their regular departmental series): “Model selection: AIC, BIC and Multimodel Inference.” Again, that day I talked with a variety of faculty and graduate students.

Attended a CITES-MIKE TAG meeting April 28-29, 2003 at the Bay View Hotel, Accra Ghana (Africa) (2 miles from the airport in Accra). Most of the TAG were there, plus this time the representative from the India area was there (but not the China representative, due to SARS); there were about 14 attendees total. A variety of technical issues were dealt with, for example how to interpret data, on illegal activities, recorded by the enforcement patrols. Some sort of catch-per-unit-effort approach is needed, but what to use for “effort.” I left April 25 and arrived back April 30 (30 hours in air, 15,000 miles). I had a Unit Coordinating Committee meeting April 23 and David's retirement May 2 or else I would have stayed longer in Ghana. (MIKE vision statement: “The MIKE is a programme adopted by the CITES Conference of the Parties in April 2000 with the main purpose of the provision of information needed for elephant range States to make appropriate management and enforcement decisions, and to build institutional capacity within the range States for the long-term management of their elephant populations”).

Co-instructor (with Gary White and David Anderson) of a 5 day international workshop (June 2-5, 2003 held on the campus of Colorado State U.) on the analysis of capture-recapture (and related) data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models (CJS, recoveries, joint and Barker extended models, closed models, robust design, multi-strata, Pradel models, occupancy models). The workshop formal title: Analysis of encounter data from marked animal populations. There were 31 participants from 4 countries; there were graduate students, faculty, state and federal people, private sector people; from the USA there were folks from all over, including Hawaii and Alaska. It went well.

STAR Award (Special Thanks for Achieving Results), June 2003 from USGS for my recent role on the MIKE TAG Team, especially the hurried trip to the 2 day TAG meeting in Accra, Ghana (Africa) wherein I spent 1+ day each way in travel to be there April 28-29 and I had to squeeze that trip in between critical meetings here April 23 and May 2.

Participated in the full 3-day CITES/MIKE sponsored “Mike Dung Count Task Force Meeting” October 27-29, 2003, in Washington, DC (Arlington, Virginia, actually), held USFWS headquarters (sponsor: Division of International Conservation). This meeting initiated the formal establishment of standards (for MIKE sites that will use) for population surveys based on elephant dung count (line transects) surveys combined with decay rate studies and defecation studies. The ultimate result will be guidelines and protocols for design, implementation and field conduct of such studies in Central and Western Africa and India and Southeast Asia.

In 2003, re-appointed to MIKE-ETIS TAG (nominally these are 2 year appointments). The Mike Tag has been expanded to also cover ETIS: Elephant trade information system (which has ties to TRAFFIC).

Attended the TAG meeting in Windhoek, Namibia, Dec. 9-10, 2003. This was no easy feat as I was in New Zealand then. December 6 (7AM) I flew from Christchurch-Auckland-Hong Kong-Johannesburg (SA)-Windhoek (took 42 hours). Return started at 11AM Dec. 11, same routing back to Wellington NZ, arrived there at 4PM Dec. 13th (total 29,000 miles).

Visited Dr. Shirley Pledger at Victoria University of Wellington (New Zealand), December 15-17, 2003. Shirley has done (and is doing) important work on mixture models for capture-recapture data (especially closed models). While there I gave an invited seminar (Dec. 17) on “Model selection: AIC, BIC and multimodel inference.”

Participant in the third workshop on the comprehensive analysis of northern spotted owl demography data (“Northern Spotted Owl Demography Workshop”). It was held on the campus of Oregon State University, arranged and hosted by the Oregon Coop Unit, January 4-11, 2004. We had about 50 people there at first. A few left when the detailed data analysis started on Wednesday (7th). There were 14 sites with data (capture-recapture and fecundity and some covariates and habitat data). As with the other 2 workshops this was a major effort; the report will be submitted to Wildlife Monographs.

Elected to WNAR Regional committee (RECOM, the “board of directors” of WNAR) by a general vote in Dec. 2003, to be served for three years: 2004, 2005, 2006. WNAR is the Western North American Region of the International Biometrics Society (IBS).

Workshop participant (May 11-13, 2004): “Chronic wasting disease risk analysis workshop: An integrative approach.” Held in Fort Collins (at USGS Fort Collins Science Center). There were about 25 participants (many Veterinarians and wildlife biologists, government, industry, tribes were represented). I was on the steering committee of this effort, which is part of a project to produce a product for states to use to assess risk of CWD (project leader is Joshua Dein, DVM, USGS National Wildlife Health Center, Madison, Wisconsin).

Co-instructor (with Gary White, David Anderson and Paul Doherty) of a 5 day international workshop (June 14-18, 2004, held on the campus of Colorado State U.) on the analysis of capture-recapture (and related) data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models (CJS, recoveries, known fate, joint and Barker extended models, closed models, robust design, multi-strata, Pradel models, occupancy models). The workshop formal title: Analysis of encounter data from marked animal populations. There were 36 participants (“students”) from 4 countries; there were graduate students, faculty, state and federal people, private sector people; from the USA there were folks from all over, including Hawaii and Alaska. We had four instructors and seven helpers. It went well.

Participated in the “Stephen's kangaroo rat monitoring workshop for MCB Camp Pendleton,” July 19-20, 2004, in San Diego, CA. It was organized by the San Diego Field Station of the Western Ecological Research Center (USGS-BRD). The purpose was to come up with a outlines of a monitoring program for these k-rats on Camp Pendleton (with follow-up on details). For this purpose there was a 4 -person Scientific Peer Review Panel to make the recommendations. I was (am) on that panel. To quote from workshop documents “The purpose of this workshop is to develop a scientifically valid effective, and cost-effective monitoring program for Stephen's kangaroo rat (*Dipodomys Stephensi*, SKR) on the Marine Corps Base Camp Pendleton (MCBCP).”

Promotion: effective 8 August 2004 I was promoted to Senior Scientist. This means being moved off (“above”) the General pay Schedule (GS) to the SL/ST pay schedule. Now GS has 15 grades (I was a GS15); it used to go to GS18 with GS16-17-18 being considered super grades. In effect I have been promoted to a super grade (like a GS16). This SL/ST pay schedule is noted as for “ ... employees in senior-level (SL) and scientific or professional (ST) positions.” This promotion to ST is a big deal since there is (now) a cap of 42 such positions, with 36 filled, in all of DOI (mostly in USGS, out of about 5,000 USGS scientists). I know of only 4 others in BRD (there may be more - there seems not to be a list of us anywhere).

During Fall semester, 2004 at Colorado State University I sat in on the course ST675K Bayesian Statistics, taught by Jennifer Hoeting. This was mostly about MCMC methods such as Gibbs sampling and Metropolis-Hastings. It was worthwhile. There was some material on WinBUGS.

March 1-3, 2005 I attended an “all-hands” meeting of the Coop Units program (travel was Feb. 28 and March 5). It was in Jacksonville, Florida. To the best we can figure it out this was the 8<sup>th</sup> such meeting:

- Salt Lake City in 1973 (year uncertain)
- New Orleans in 1978
- Raleigh, North Carolina in 1989
- Las Cruces, New Mexico in 1992 (but for Unit Leaders only)
- San Diego, California in 1999
- San Antonio, Texas in 2002
- Jacksonville, Florida in 2005

Invited participant in a workshop “Protecting Apes from Ebola,” held March 10-11, 2005, in Arlington Virginia (“DC”) at FWS headquarters offices. This was an international workshop, organized by the Max-Planck Institute for Anthropology (Germany). It will lead to more efforts by this group to help the great apes of Central Africa (ebola seems to be killing many of them).

Co-instructor (with Gary White, David Anderson and Paul Doherty) of a 5-day international workshop (June 6-10, 2005, held on the campus of Colorado State U.) on the analysis of capture-recapture (and related) data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models (CJS, recoveries, known fate, joint and Barker extended models, closed models, robust design, multi-strata, Pradel models, occupancy models). The workshop formal title: *Analysis of Encounter Data from Marked Animal Populations*. There were 36 participants (“students”) from 3 countries; there were graduate students, faculty, state and federal people, private sector people; from the USA there

were folks from 19 states, including Hawaii. We had four instructors and six helpers. It went very well.

Provided technical assistance to the USFWS Wetlands Status and Trends project in a 2 day meeting on the current update of the national monitoring plots to provided a status and trends report to Congress for the period 1997 to 2004. I was invited to do this by the Project manager; the meeting was in La Crosse, Wisconsin, June 14-15, 2005, and the USFWS offices in La Crosse. These plots (about 4,400 now) are based on a stratified random probability sampling design dating to 1979.

Assumed the position and duties of President-elect of WNAR in 2006 (having been so elected by a general vote of the WNAR membership in Dec. 2005; WNAR: **W**estern **N**orth **A**merican **R**egion of the International Biometrics Society). Becomes President in 2007, past president in 2008.

Invited participant in the “San Clemente Island Fox Monitoring Planning Workshop” held in San Diego, CA, January 12-14, 2006. The Channel Islands have unique foxes on them, several hundred on San Clemente Island (SCI); they are threatened but not yet legally so designated. SCI is 100% Navy property and is heavily used for training. The workshop was funded by the Navy, through TNC and a local (in San Diego) conservation think tank (Conservation Biology Institute). January 12 we visited the island (flew over and back that day). The sit-down workshop was January 13-14; it had about 15 people on the panel and another 8 interested persons (including a USFWS representative who is a graduate of CSU). Great progress was made regarding consensus on revised, practical, monitoring methods (some monitoring has been ongoing on SCI since 1988).

For 2006-2007, re-appointed to MIKE-ETIS TAG. The MIKE budget was almost nonexistent in 2004, 2005 so there were no TAG meetings. But the program got a lot of funding in early 2006 so revitalized the TAG. (but MIKE seems to have died, anyway).

Invited participant in the MBI Workshop 5: Uncertainty in Ecological Analysis, April 3-6, 2006, at the Ohio State University, Columbus, Ohio. Hosted by the Mathematical Biosciences Institute, with collaboration from the Department of Statistics. I was a discussant on one set of talks about heterogeneity in capture-recapture.

Presented an invited workshop on AIC-model selection (along with Bill Link speaking on the Bayesian perspective) to the graduate students in the Center for Population Biology at the University of California, Davis, CA, May 12-13, 2006. The workshop was all day, each day. Their internal announcement is given below:

The CPB student-organized spring workshop will be held on Friday, May 12 and Saturday, May 13, 2006. Our Spring workshop will be a two-day intensive workshop devoted to a single topic: *Model Selection and Multi-model Inference from both information theory (i.e., Akaike Information Criterion (AIC)) and Bayesian perspectives*. These approaches are rather different from the p-value, hypothesis-testing approach to model selection traditionally used.

Co-instructor (with Gary White, David Anderson, and Paul Doherty, Bill Kendall and Evan Cooch, plus 5 helpers [M. Conner, C. Bishop, B. McClintock, P. Conn, S. Dinsmore]) of a 5-day international workshop (June 5-9, 2006, held on the campus of Colorado State U.) on the analysis of capture-recapture (and related) data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models of some type (CJS, recoveries, known fate, joint and Barker extended models, closed models, robust design, multi-strata, Pradel models, occupancy models). The workshop formal title: *Analysis of Encounter Data from Marked Animal Populations*. There were 40 participants (“students”) from 5 countries; there were graduate students, faculty, state and federal people and private sector people. It went very well.

Serving on an interagency Avian Influenza (AI) monitoring committee that met in Fort Collins most of June 12-13 (2006). (A name for it that has been used is The Interagency National Risk Analysis Working Group). This is one of several meetings to formalize a sampling plan for surveillance monitoring of environmental AI virus (the highly pathogenic strains, esp. of H5N1) as regards their likely appearance in the USA via wild waterfowl (AI is spreading around the world). Sampling will be of feces and water at places of high waterfowl densities during the fall migration and wintering periods. The “committee” is funded by a support-contract to CSU from the program coordinating the data collection: **Research, Surveillance, Monitoring, and Response for Wildlife Diseases, USDA/APHIS- National Wildlife Research Center, Fort Collins**. More meetings (full days) were July 18-20 and July 25-27, August 1 (3 hours), and August 24 (2 hours). More: The committee met for about 2 hours on February 8<sup>th</sup> 2007 to (1) look at some summary results of the fecal sampling done in 2006 (mostly in Aug. to the end of Dec.); (2) consider refining the sampling recommendations for fecal AL surveillance for 2007 in light of experience in 2006; and (3) consider a publication strategy for your thoughts and results. We also meet for 2 hours on February 15, 2007, to talk to officials that provided the funding and are overseeing the USDA program monitoring avian influenza in wild birds.

Participated (June 14-16, 2006) in the PRIMES *Workshop on Bayesian Methods in Wildlife Population Monitoring*, held at CSU (PRIMES is the Program for Interdisciplinary Mathematics, Ecology, and Statistics). There were about 40 participants, about ½ graduate students and ½ post-Ph.D. persons. Participants came mostly from the USA, but the UK, Canada, New Zealand were also represented. I “facilitated” a discussion of goodness-of-fit, both Bayesian P-value and frequentist.

Invited by the Department of Zoology (Dr. Ingo Schlupp), University of Oklahoma (Norman, OK), to present a seminar (60 minutes talk on Wed. Oct. 4<sup>th</sup>) on data-based model selection in ecology and a short workshop on model selection (4 hours, Thursday Oct. 5<sup>th</sup>) at U. of OK. I also met with several faculty and graduate students to talk about science, research and statistics. I was at U. of OK all day Oct. 4<sup>th</sup> and 5<sup>th</sup> (traveled on 3<sup>rd</sup> and 6<sup>th</sup>). Seminar title: *Model based inference in ecology: recent extensions to likelihood theory*. About 100 people came to the seminar and about 25 to the workshop.

With regard to the paper:

Burnham, K. P., and D. R. Anderson. 2001. Kullback-Leibler information as a basis for strong inference in ecological studies. *Wildlife Research* 28:111-119.

In 2006 this paper was proclaimed to be one of 32 Landmark papers published by *Wildlife Research* in the past 50 years. Landmark papers are so designated based on their high rate of citation. See <http://www.publish.csiro.au/nid/145/aid/7836.htm>

The Meritorious Service Award, from the Department of the Interior, was awarded to me at the 2006 annual awards ceremony, November 9, 2006 at the USGS headquarters in Reston, VA. This is an “Honor award.” The first sentence of the citation: [awarded] “*In recognition of his outstanding contributions to the U.S. Department of the Interior in the science and management of wildlife and natural resources.*” (then follows a longer citation). Below is some relevant information.

**Meritorious Service Award (MSA):** The Meritorious Service Award was established in 1948. It is the Department's second highest honor award that is granted to career employees of the Department. This award may be granted for an important contribution to science or management; a notable career; superior service in administration; initiative in devising new and improved work methods and procedures; superior accomplishments in equal employment opportunity; or contributions to energy conservation. The MSA is approved by an Assistant Secretary in DOI. Recognition of a MSA includes an engraved silver medal, silver pin, and a certificate and citation signed by the Secretary. The MSA is normally presented at an appropriate ceremony at the Regional or Washington Office level, whichever is applicable.

Assumed the position and duties of President of WNAR on January 1, 2007 (having been so elected by a general vote of the WNAR membership in Dec. 2005; WNAR: **Western North American Region** of the International Biometrics Society).

In January 2007, I received the Douglas L. Gilbert Award for 2006. This is an award presented by the Colorado Chapter of The Wildlife Society for “Outstanding Achievements in Wildlife Science.” It was presented at the chapter’s annual winter meeting (18 Jan. 2007) – which I could not attend. To put it in some context the past chairs of the CSU wildlife department (official ones, not acting or interim) are:

Jack V. K. Wagar  
Gus A. Swanson (an Aldo Leopold winner)  
Douglas L. Gilbert  
Robert S. Cook  
Alan P. Covich  
H. Randall Robinette

In the “wildlife world” Swanson and Gilbert were notable.

I was notified in mid February, 2007, that I have been elected to membership in the International Statistical Institute (ISI). From the ISI web site:

*To become an ISI member, you must be nominated by three existing (elected or Honorary) members. A nomination form is downloaded or sent on request, filled in, and then submitted to the ISI Permanent Office. ISI members are elected by virtue of their distinguished contributions to the development or application of statistical methods, or to the administration of statistical services, or the development and improvement of statistical education. Elections take place twice a year, under the authority of the ISI Elections Committee, whose recommendations are subject to the approval of the ISI Executive Committee.*

*By joining the elected membership of ISI, you become a part of the largest international professional organization in statistics. This membership is restricted to the most prominent statisticians of the world, and it is an honor to be a part of such an organization.*

Further information about ISI is at <http://isi.cbs.nl/index.htm>

March 15<sup>th</sup>, 2007, I presented two invited talks on the campus of the University of California at San Diego (UCSD); this activity was in relationship to Hirotugu Akaike winning a 2006 Kyoto Prize. Some background is needed:

The Kyoto Prize is an international award honoring those who have contributed significantly to humankind's scientific, cultural, and spiritual development. The prize is presented annually in three categories: Advanced Technology, Basic Sciences, and Arts and Philosophy. Consisting of academic honors, a commemorative gold medal and a cash gift of 50 million yen (approximately \$450,000), it is Japan's highest private award for human achievement. See <http://www.kyotoprize.org/symposium.htm>

San Diego's Kyoto Laureate Symposium is a three-day celebration of the lives and works of those receiving the Kyoto Prize, a lifetime achievement award presented annually to individuals and groups worldwide. Each year, the Symposium features addresses by the latest Kyoto Prize Laureates and responses by esteemed scholars in the Laureates' fields.

March 15<sup>th</sup> was devoted to Akaike, and included as a side event, a workshop (9am to 3pm) organized by UCSD. From 4pm to 6pm there was a tribute to Akaike, where he also spoke. The workshop was titled "Model Selection and Statistical Learning, in honor of Hirotugu Akaike receiving the Kyoto Prize." It was billed as "The first UC San Diego Workshop in Statistics, Biostatistics and Bioinformatics." I was an invited, featured speaker, and presented the first talk, "Data, truth, models ( $f$ ,  $g$ ) and AIC versus BIC model selection."

At the Kyoto Laureate Symposium event itself, that afternoon, to a large international audience, I gave, as an "invited scholar" (one of two), a ten-minute formal talk on the significance of Akaike's AIC; essentially this was a tribute to Akaike. (The invitation to do this talk was from UCSD.)

Continued to serve on the APHIS funded Avian Influenza (AI) monitoring committee from spring 2006. We met for almost 2 hours on March 22<sup>nd</sup>, and again on March 29<sup>th</sup> (2007) for 1.5 hours, to consider wise allocation of 25,000 waterfowl fecal samples to be taken in 2007, mostly in the fall. The issue is where and when to take these environmental samples.

Co-instructor (with Gary White, David Anderson, and Paul Doherty, and Bill Kendall plus 6 helpers (Evan Cooch, Brett McClintock, Paul Conn, Steve Dinsmore, Sarah Converse, Kate Huyvaert) of a 5-day international workshop (June 4-8, 2007, held on the campus of Colorado State U.) on the analysis of capture-recapture (and related) data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models of some type (CJS, recoveries, known fate, joint and Barker extended models, closed models, robust design, multi-strata, Pradel models, occupancy models). The workshop formal title: *Analysis of Encounter Data from Marked Animal Populations*. There were 41 participants (“students”) from 4 countries (quite a few from Canada); there were graduate students, faculty, state and federal people and private sector people. It went very well.

By letter (dated June 23, 2007) and certificate, the American Statistical Association recognized my 40 years of ASA membership: “... Certificate of Recognition of the 40<sup>th</sup> Anniversary of your ASA Membership.”

Invited participant (June 29 and 30, 2007) in the 50<sup>th</sup> anniversary Celebration of the Oregon State University Department of Statistics. I was one of four graduates on the panel “OSU and environmental statistics.” I gave a 20-minute talk on my role in capture-recapture theory and applications in the past 40 years. Others talked on different subjects (e.g., EPA’s EMAP). Then the audience got to ask questions. (This invited talk falls under the category of an “honor.”)

Invited participant at the University of Reading, UK, July 11-13, 2007, to co-teach a short course on capture-recapture (July 11) and then speak at a conference July 12-13. The short course covered aspects of capture-recapture as applied to issues in epidemiology, sociology and criminology, as well as wildlife and ecology. My role was to give an overview of open-models in capture-recapture as applied in wildlife and ecology. The conference was “Recent developments in capture-recapture methods and their applications.” I presented a 30 minute invited talk entitled “Challenges and opportunities for analysis of capture-recapture data.”

Invited participant on the six-member Scientific Peer Review Panel as part of the Pacific Pocket Mouse (PPM) Monitoring Workshop for Marine Corps Base Camp Pendleton (MCBCP), held in San Diego, September 6-7, with a half-day trip the 7<sup>th</sup> to MCBCP to see the only occupied substantial PPM habitat still extant. The workshop was organized by the USGS, Western Ecological Research Center (funds for monitoring are from the MCBCP military). There were about 30 persons at the workshop on day 1 (6<sup>th</sup>), which was for information exchange. On day 2 (7<sup>th</sup>) about 12 people met for the deliberations on a monitoring design. The role of the review panel is to evaluate existing monitoring designs and recommend a monitoring program to meet the needs of the PPM recovery program. The PPM is endangered under the ESA.

In fall 2007 I served on one USGS Research Grade Evaluation Panel (a substantial amount of effort, at least 40 hours work).

Co-taught (with David Anderson) a 3-day workshop on AIC-based model selection, November 5-7, 2007 in Finland. We were invited to do this by the Department of Biological and Environmental Science, University of Jyväskylä, Jyväskylä, Finland (a city about 250 miles north of Helsinki). I left Oct. 31, and got back Nov. 9 (there is a lot of travel time to get to Jyväskylä). There were 47 students. This was an international workshop with people from Finland, Sweden, Estonia, and students and Post-Docs at the University but from Switzerland, France, and China (at least; the country of origin of some participants is unknown to us). I focused my lecture time on issues of model selection when the model has random effects. For photos from the workshop see

<http://ambientscapes.smugmug.com/gallery/3792272>

(although this photo gallery may be up for only a few months).

On January 3, 2008 Dr. White and me received the message below:

Your paper, [White and Burnham] "Program MARK: survival estimation from populations of marked animals" (*Bird Study* 46: 120-39, Suppl. S., 1999), has been designated a Highly Cited Paper in the field of Plant & Animal Science by *Essential Science Indicators* (ESI).

ESI is a Web-based compilation of science indicators and trend data derived from Thomson Scientific's databases, focusing on highly cited papers, authors, organizations, journals, and nations. It combines these data with editorial content to highlight important results. Being highly cited generally reflects the high regard in which your work is held by your fellow scientists, and its value to the scientific community as a whole.

This seems to be the modern version of the "old" citation classic award.

Taught on March 7, 2008, by myself, a one day short course (or call it a workshop) on AIC-based model selection. It was given on the campus of UC at San Diego, 30 people attended. I was invited to do this by the San Diego chapter of the American Statistical Society. See

<http://www.sdasa.org/>

<http://www.sdasa.org/events/courses/2008/sdasa-ann-20080115.pdf>

It was a success.

Co-instructor (with Gary White, David Anderson, and Paul Doherty and Bill Kendall plus 5 helpers (Evan Cooch, Steve Dinsmore, Mary Connor, Josh Dooley and Jake Ivan) of a 5-day international workshop (June 1-6, 2008, held on the campus of Colorado State U.) on the analysis of capture-recapture (and related) data using program MARK. This was an intermediate level workshop; attendees had to already have had decent experience with CR type data and models of some type (CJS, recoveries, known fate, joint and Barker extended models, closed models, robust design, multi-strata, Pradel models, occupancy models). The workshop formal title: *Analysis of Encounter Data from Marked Animal Populations*. There were 41 participants ("students") originating from several countries (1 person came directly from and returned to Canada, and another directly from/to

Australia; 2 people were from Papua New Guinea but were already in the USA studying at the University of Missouri; one person was from Brazil but in the USA for an extended visit. We do not know where others were from originally – most were US citizens); there were graduate students, faculty, state and federal people and private sector people. It went very well.

From 2 e-mails received June 30, 2008:

*Dear Dr. Burnham and Dr. Anderson,*

*Attached please find an excerpt from Sage Publications' 2008 Publisher's Report. This part of the Report identifies the most-cited articles in SMR in 2006. Your article, **Multimodel Inference: Understanding AIC and BIC in Model Selection**, was the most cited article in 2006 from the previous two years of publication, with a total of 27 cites. We hope this is exciting news.*

*All the best,*

*Genevieve Butler  
Assistant to Professors Orlando Patterson,  
Robert Sampson & Christopher Winship  
Managing Editor, Sociological Methods and Research  
Sociology Department, Harvard University*

And

*Dear Dr. Burnham and Dr. Anderson,*

*Attached is an excerpt from the 2008 Sage Publications Publisher's Report. This part of the Report lists the most frequently accessed articles for the year 2007-8 (April to April). Your article, **Multimodel Inference: Understanding AIC and BIC in Model Selection**, was also among the most frequently accessed, with 1,723 total full-text accesses.*

*Congratulations!*

*Genevieve Butler*

At ISEC (a conference, July 9-11, 2008, at the University of St. Andrews, Scotland) I received a surprise honor: a poster highlighting my science-accomplishments, especially publications in statistical ecology. This poster was unveiled at the Wednesday night poster session in a little ceremony lead by Byron Morgan. It was a total surprise to me. I was the only one of the 200 participants so honored.

**RETIREMENT from Federal service: at 5pm, January 2, 2009, I retired from the USGS, to pursue other opportunities (and waste no more time with the increasingly dysfunctional Federal Bureaucracy). At 5:01 I left for Las Vegas to celebrate (and hopefully, win).**