

References

- Abadi, F., Gimenez, O., Arlettaz, R., Schaub, M., 2010a. An assessment of integrated population models: bias, accuracy, and violation of the assumption of independence. *Ecology* 91, 7–14.
- Abadi, F., Gimenez, O., Ullrich, B., Arlettaz, R., Schaub, M., 2010b. Estimation of immigration rate using integrated population modeling. *J. Appl. Ecol.* 47, 393–400.
- Aebischer, A., 2009. *Der Rotmilan*. Haupt Verlag, Bern.
- Altwegg, R., Schaub, M., Roulin, A., 2007. Age-specific fitness components and their temporal variation in the barn owl. *Am. Nat.* 169, 47–61.
- Altwegg, R., Wheeler, M., Erni, B., 2008. Climate and the range dynamics of species with imperfect detection. *Biol. Lett.* 4, 581–584.
- Anderson, D.R., Burnham, K.P., White, G.C., 1985. Problems in estimating age-specific survival rates from recovery data of birds ringed as young. *J. Anim. Ecol.* 54, 89–98.
- Anderson, D.R., Burnham, K.P., White, G.C., 1994. AIC model selection in overdispersed capture-recapture data. *Ecology* 75, 1780–1793.
- Andrewartha, H.G., Birch, L.C., 1954. *The Distribution and Abundance of Animals*. University of Chicago Press, Chicago, IL.
- Arlettaz, R., Schaub, M., Fournier, J., Reichlin, T.S., Sierro, A., Watson, J.E.M., et al., 2010. From publications to public actions: when conservation biologists bridge the gap between research and implementation. *BioScience* 60, 835–842.
- Arnason, A.N., 1972. Parameter estimates from mark-recapture experiments on two populations subject to migration and death. *Res. Pop. Ecol.* 13, 97–113.
- Arnason, A.N., 1973. The estimation of population size, migration rates and survival in a stratified population. *Res. Pop. Ecol.* 15, 1–8.
- Arnason, A.N., Schwarz, C.J., 1999. Using POPAN-5 to analyse banding data. *Bird Study* 46, 157–168.
- Bailey, L.L., Converse, S.J., Kendall, W.L., 2010. Bias, precision and parameter redundancy in complex multistate models with unobservable states. *Ecology* 91, 1598–1604.
- Baillie, S.R., 1991. Integrated population monitoring of breeding birds in Britain and Ireland. *Ibis* 132, 151–166.
- Baillie, S.R., Brooks, S.P., King, R., Thomas, L., 2009. Using a state-space model of the British song thrush *Turdus philomenos* population to diagnose the causes of a population decline. Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 541–561.
- Balmford, A., Green, R.E., Jenkins, M., 2003. Measuring the changing state of nature. *Trend. Ecol. Evol.* 18, 326–330.
- Barker, R.J., 1997. Joint modeling of live-recapture, tag-resight, and tag-recovery data. *Biometrics* 53, 666–677.
- Barry, S.C., Brooks, S.P., Catchpole, E.A., Morgan, B.J.T., 2003. The analysis of ring-recovery data using random effects. *Biometrics* 59, 54–65.
- Bayes, T., 1763. An essay towards solving a problem in the doctrine of chances. *Phil. Trans. R. Soc. A* 53, 370–418.
- Begon, M., Harper, J.L., Townsend, C.R., 1986. *Ecology: Individuals, Populations and Communities*. Blackwell, Oxford.

- Beissinger, S.R., 2002. Population viability analysis: past, present, future. In: Beissinger, S.R. (Ed.), *Population Viability Analysis*. The University of Chicago Press, Chicago, IL, pp. 5–17.
- Besbeas, P., Borysiewicz, R.S., Morgan, B.J.T., 2009. Completing the ecological jigsaw. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 513–539.
- Besbeas, P., Freeman, S.N., 2006. Methods for joint inference from panel survey and demographic data. *Ecology* 87, 1138–1145.
- Besbeas, P., Freeman, S.N., Morgan, B.J.T., 2005. The potential of integrated population modelling. *Aust. N. Z. J. Stat.* 47, 35–48.
- Besbeas, P., Freeman, S.N., Morgan, B.J.T., Catchpole, E.A., 2002. Integrating mark-recapture-recovery and census data to estimate animal abundance and demographic parameters. *Biometrics* 58, 540–547.
- Besbeas, P., Lebreton, J.D., Morgan, B.J.T., 2003. The efficient integration of abundance and demographic data. *App. Stat.* 52, 95–102.
- Bled, F., Royle, J.A., Cam, E., 2011a. Assessing hypotheses about nesting site occupancy dynamics. *Ecology* 92, 938–951.
- Bled, F., Royle, J.A., Cam, E., 2011b. Hierarchical modeling of an invasive spread: case of the Eurasian collared dove *Streptopelia decaocto* in the USA. *Ecol. Appl.* 21, 290–302.
- Bolker, B.M., 2008. *Ecological Models and Data in R*. Princeton University Press, Princeton, NJ.
- Bonner, S.J., Schwarz, C.J., 2006. An extension of the Cormack-Jolly-Seber model for continuous covariates with application to *Microtus pennsylvanicus*. *Biometrics* 62, 142–149.
- Borchers, D.L., Buckland, S.T., Zucchini, W., 2002. *Estimating Animal Abundance*. Springer, London.
- Borchers, D.L., Efford, M.G., 2008. Spatially explicit maximum likelihood methods for capture-recapture studies. *Biometrics* 64, 377–385.
- Borysiewicz, R.S., Morgan, B.J.T., Hénau, V., Bregnballe, T., Lebreton, J.D., Gimenez, O., 2009. An integrated analysis of multisite recruitment, mark-recapture-recovery and multi-site census data. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 579–591.
- Boulinier, T., Nichols, J.D., Sauer, J.R., Hines, J.E., Pollock, K.H., 1998. Estimating species richness: the importance of heterogeneity in species detectability. *Ecology* 79, 1018–1028.
- Boyce, M.S., MacKenzie, D.I., Manly, B.F.J., Haroldson, M.A., Moody, D.S., 2001. Negative binomial models for abundance estimation of multiple closed populations. *J. Wildl. Manage.* 65, 498–509.
- Brooks, S.P., 2003. Bayesian computation: a statistical revolution. *Phil. Trans. R. Soc. A.* 361, 2681–2697.
- Brooks, S.P., Catchpole, E.A., Morgan, B.J.T., 2000a. Bayesian animal survival estimation. *Stat. Sci.* 15, 357–376.
- Brooks, S.P., Catchpole, E.A., Morgan, B.J.T., Barry, S.C., 2000b. On the Bayesian analysis of ring-recovery data. *Biometrics* 56, 951–956.
- Brooks, S.P., Catchpole, E.A., Morgan, B.J.T., Harris, M.P., 2002. Bayesian methods for analysing ringing data. *J. Appl. Stat.* 29, 187–206.
- Brooks, S.P., Gelman, A., 1998. Alternative methods for monitoring convergence of iterative simulations. *J. Comput. Graph. Stat.* 7, 434–455.
- Brooks, S.P., King, R., Morgan, B.J.T., 2004. A Bayesian approach to combining animal abundance and demographic data. *Anim. Biodiv. Cons.* 27.1, 515–529.
- Brown, J.H., Maurer, B.A., 1989. Macroecology: the division of food and space among species on continents. *Science* 243, 1145–1150.
- Brownie, C., Anderson, D.R., Burnham, K.P., Robson, D.S., 1985. *Statistical Inference from Band Recovery Data: A Handbook*. US Fish and Wildlife Service, Resource Publication 156, Washington, DC.

- Brownie, C., Hines, J.E., Nichols, J.D., 1986. Constant-parameter capture-recapture models. *Biometrics* 42, 561–574.
- Brownie, C., Hines, J.E., Nichols, J.D., Pollock, K.H., Hestbeck, J.B., 1993. Capture-recapture studies for multiple strata including non-Markovian transitions. *Biometrics* 49, 1173–1187.
- Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D.L., Thomas, L., 2001. *Introduction to Distance Sampling*. Oxford University Press, Oxford.
- Buckland, S.T., Newman, K.B., Fernandez, C., Thomas, L., Harwood, J., 2007. Embedding population dynamics models in inference. *Stat. Sci.* 22, 44–58.
- Buckland, S.T., Newman, K.B., Thomas, L., Koesters, N.B., 2004. State-space models for the dynamics of wild animal populations. *Ecol. Mod.* 171, 157–175.
- Burnham, K.P., 1993. A theory for combined analysis of ring recovery and recapture data. In: Lebreton, J.D. (Ed), *Marked Individuals in the Study of Bird Populations*. Birkhäuser, Basel, pp. 199–213.
- Burnham, K.P., Anderson, D.R., 2002. *Model Selection and Multimodel Inference: A Practical Information Theoretic Approach*. Springer, New York.
- Burnham, K.P., Anderson, D.R., White, G.C., Brownie, C., Pollock, K.H., 1987. Design and analysis methods for fish survival experiments based on release-recapture. *Am. Fish. Soc. Monogr.* 5, 1–437.
- Burnham, K.P., White, G.C., 2002. Evaluation of some random effects methodology applicable to bird ringing data. *J. Appl. Stat.* 29, 245–264.
- Calvert, A.M., Bonner, S.J., Jonsen, I.D., Mills Flemming, J., Walde, S.J., Taylor, P.D., 2009. A hierarchical Bayesian approach to multi-state mark-recapture: simulations and applications. *J. Appl. Ecol.* 46, 610–620.
- Cam, E., Link, W.A., Cooch, E.G., Monnat, J.Y., Danchin, E., 2002. Individual covariation in life-history traits: seeing the trees despite the forest. *Am. Nat.* 159, 96–105.
- Carlin, B.P., Louis, T.A., 2009. *Bayesian Methods for Data Analysis*. CRC Press/Taylor & Francis Group, Boca Raton, FL.
- Caswell, H., 1988. Theory and models in ecology: a different perspective. *Ecol. Mod.* 43, 33–44.
- Caswell, H., 2001. *Matrix Population Models. Construction, Analysis, and Interpretation*. Sinauer Associates, Sunderland, MA.
- Catchpole, A.E., Morgan, B.J.T., Tavecchia, G., 2008. A new method for analysing discrete life history data with missing covariate values. *J. R. Stat. Soc. B* 70, 445–460.
- Catchpole, E.A., Kgosi, P.M., Morgan, B.J.T., 2001. On the near-singularity of models for animal recovery data. *Biometrics* 57, 720–726.
- Catchpole, E.A., Morgan, B.J.T., 1997. Detecting parameter redundancy. *Biometrika* 84, 187–196.
- Caughley, G., 1994. Directions in conservation biology. *J. Anim. Ecol.* 63, 215–244.
- Celeux, G., Forbes, F., Robert, C.P., Titterton, D.M., 2006. Deviance information criteria for missing data models. *Bayesian Anal.* 1, 651–674.
- Chandler, R.B., King, D.I., 2011. Golden-winged warbler habitat selection and habitat quality in Costa Rica: an application of hierarchical models for open populations. *J. Appl. Ecol.* 48, 1038–1047.
- Chandler, R.B., King, D.I., Chandler, C.C., 2009a. Effects of management regime on the abundance and nest survival of shrubland birds in wildlife openings in northern New England, USA. *Forest Ecol. Manage.* 258, 1669–1676.
- Chandler, R.B., King, D.I., DeStefano, S., 2009b. Scrub-shrub bird habitat associations at multiple spatial scales in beaver meadows in Massachusetts. *Auk* 126, 186–197.
- Choquet, R., Lebreton, J.D., Gimenez, O., Reboulet, A.M., Pradel, R., 2009a. U-CARE: utilities for performing goodness of fit tests and manipulating CAPture-REcapture data. *Ecography* 32, 1071–1074.

- Choquet, R., Rouan, L., Pradel, R., 2009b. Program E-SURGE: a software application for fitting multievent models. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 845–865.
- Choquet, R., Reboulet, A.M., Pradel, R., Lebreton, J.D., 2001. U-CARE (Utilities-Capture-Recapture) User's Guide. CEFE/CNRS, Montpellier, France.
- Clark, J.S., 2005. Why environmental scientists are becoming Bayesians. *Ecol. Lett.* 8, 2–14.
- Clark, J.S., Björnstad, O.N., 2004. Population time series: process variability, observation errors, missing values, lags, and hidden states. *Ecology* 85, 3140–3150.
- Clark, J.S., Ferraz, G., Oguge, N., Hays, H., DiCostanzo, J., 2005. Hierarchical Bayes for structured, variable populations: from recapture data to life-history prediction. *Ecology* 86, 2232–2244.
- Clobert, J., Lebreton, J.D., 1991. Estimation of demographic parameters in bird populations. In: Perrins, C.M. (Ed.), *Bird Population Studies*. Oxford University Press, Oxford, pp. 75–104.
- Collier, B.A., Groce, J.E., Morrison, M.L., Newnam, J.C., Campomizzi, A.J., Farrell, S.L., et al., 2011. Predicting patch occupancy in fragmented landscapes at the rangewide scale for endangered species: an example of an American warbler. *Div. Dist.* (in press).
- Conn, P.B., Cooch, E.G., 2009. Multistate capture-recapture analysis under imperfect state observation: an application to disease models. *J. Appl. Ecol.* 46, 486–492.
- Conroy, M.J., Runge, J.P., Barker, R.J., Schofield, M.R., Fonnesebeck, C.J., 2008. Efficient estimation of abundance for patchily distributed populations via two-phase, adaptive sampling. *Ecology* 89, 3362–3370.
- Cormack, R.M., 1964. Estimates of survival from the sighting of marked animals. *Biometrika* 51, 429–438.
- Coull, B.A., Agresti, A., 1999. The use of mixed logit models to reflect heterogeneity in capture-recapture studies. *Biometrics* 55, 294–301.
- Crawley, M.J., 2005. *Statistics. An Introduction Using R*. Wiley, Chichester, West Sussex.
- Cressie, N., Calder, C.A., Clark, J.S., Ver Hoef, J.M., Wikle, C.K., 2009. Accounting for uncertainty in ecological analysis: the strengths and limitations of hierarchical statistical modeling. *Ecol. Appl.* 19, 553–570.
- Crosbie, S.F., Manly, B.F.J., 1985. Parsimonious modeling of capture-mark-recapture studies. *Biometrics* 41, 385–398.
- Dail, D., Madsen, L., 2011. Models for estimating abundance from repeated counts of an open population. *Biometrics* 67, 577–587.
- David, O., Garnier, A., Larédo, C., Lecomte, J., 2010. Estimation of plant demographic parameters from stage-structured censuses. *Biometrics* 66, 875–882.
- De Valpine, P., 2011. Frequentist analysis of hierarchical models for population dynamics and demographic data. *J. Ornithol.* (in press).
- De Valpine, P., Hastings, A., 2002. Fitting population models incorporating process noise and observation error. *Ecol. Monogr.* 72, 57–76.
- Dennis, B., 1996. Discussion: should ecologists become Bayesian? *Ecol. Appl.* 6, 1095–1103.
- Dennis, B., Munholland, P.L., Scott, J.M., 1991. Estimation of growth and extinction parameters for endangered species. *Ecol. Monogr.* 61, 115–143.
- Dennis, B., Ponciano, J.M., Lele, S.R., Taper, M.L., Staples, D.F., 2006. Estimating density dependence, process noise, and observation error. *Ecol. Monogr.* 76, 323–341.
- Dennis, B., Taper, M.L., 1994. Density dependence in time series observations of natural populations: estimation and testing. *Ecol. Monogr.* 64, 205–224.
- Dobson, A., Barnett, A., 2008. *An Introduction to Generalized Linear Models*. CRC/Chapmann & Hall, Boca Raton, FL.
- Dodd, C.K., Dorazio, R.M., 2004. Using counts to simultaneously estimate abundance and detection probabilities in salamander surveys. *Herpetologica* 60, 468–478.

- Dorazio, R.M., 2007. On the choice of statistical models for estimating occurrence and extinction from animal surveys. *Ecology* 88, 2773–2782.
- Dorazio, R.M., Kéry, M., Royle, J.A., Plattner, M., 2010. Models for inference in dynamic metacommunity systems. *Ecology* 91, 2466–2475.
- Dorazio, R.M., Mukherjee, B., Zhang, L., Ghosh, M., Jelks, H.L., Jordan, F., 2008. Modeling unobserved sources of heterogeneity in animal abundance using a Dirichlet process prior. *Biometrics* 64, 635–644.
- Dorazio, R.M., Royle, J.A., 2003. Mixture models for estimating the size of a closed population when capture rates vary among individuals. *Biometrics* 59, 351–364.
- Dorazio, R.M., Royle, J.A., 2005. Estimating size and composition of biological communities by modeling the occurrence of species. *J. Am. Stat. Assoc.* 100, 389–398.
- Dorazio, R.M., Royle, J.A., Söderström, B., Glimskär, A., 2006. Estimating species richness and accumulation by modeling species occurrence and detectability. *Ecology* 87, 842–854.
- Dupuis, J.A., 1995. Bayesian estimation of movement and survival probabilities from capture-recapture data. *Biometrika* 82, 761–772.
- Dupuis, J.A., Schwarz, C.J., 2007. A Bayesian approach to the multistate Jolly-Seber capture-recapture model. *Biometrics* 63, 1015–1022.
- Duriez, O., Saether, S.A., Ens, B.J., Choquet, R., Pradel, R., Lambeck, R.H.D., et al., 2009. Estimating survival and movements using both live and dead recoveries: a case study of oystercatchers confronted with habitat change. *J. Appl. Ecol.* 46, 144–153.
- Efford, M., 2004. Density estimation in live-trapping studies. *Oikos* 106, 598–610.
- Efford, M.G., Borchers, D.L., Byrom, A.E., 2009a. Density estimation by spatially explicit capture-recapture: likelihood-based methods. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 255–269.
- Efford, M.G., Dawson, D.K., 2009. Effect of distance-related heterogeneity on population size estimates from point counts. *Auk* 126, 100–111.
- Efford, M.G., Dawson, D., Borchers, D.L., 2009b. Population density estimated from locations of individuals on a passive detector array. *Ecology* 90, 2676–2682.
- Elith, J., Leathwick, J.R., Hastie, T., 2008. A working guide to boosted regression trees. *J. Anim. Ecol.* 77, 802–813.
- Elliott, M.R., Little, R.J.A., 2000. A Bayesian approach to combining information from a census, a coverage measurement survey, and demographic analysis. *J. Am. Stat. Assoc.* 95, 351–362.
- Ellison, A.M., 2004. Bayesian inference in ecology. *Ecol. Lett.* 7, 509–520.
- Engen, S., Saether, B.E., Sverdrup-Thygesen, A., Grotan, V., Odegaard, F., 2008. Assessment of species richness from species abundance distributions at different localities. *Oikos* 117, 738–748.
- Fewster, R.M., Buckland, S.T., Siriwardena, G.M., Baillie, S.R., Wilson, J.D., 2000. Analysis of population trends for farmland birds using generalized additive models. *Ecology* 81, 1970–1984.
- Fiske, I.J., Chandler, R., 2011. Unmarked: An R package for the analysis of wildlife occurrence and abundance data. *J. Stat. Softw.* (in press).
- Fletcher, D., 1994. A mark-recapture model in which sighting probability depends on the number of sightings on the previous occasion. In: Fletcher, D., Manly, B.F.J. (Eds.), *Statistics in Ecology and Environmental Monitoring*. Otago University Press, Dunedin, pp. 105–110.
- Franklin, A.B., Anderson, D.R., Gutierrez, R.J., Burnham, K.P., 2000. Climate, habitat quality, and fitness in Northern spotted owl populations in Northwestern California. *Ecol. Monogr.* 70, 539–590.
- Freckleton, R.P., Watkinson, A.R., Green, R.E., Sutherland, B.J., 2006. Census error and the detection of density dependence. *J. Anim. Ecol.* 75, 837–851.

- Frederiksen, M., Bregnballe, T., 2000. Evidence for density-dependent survival in adult cormorants from a combined analysis of recoveries and resightings. *J. Anim. Ecol.* 69, 737–752.
- Gaillard, J.M., Viallefont, A., Loison, A., Festa-Bianchet, M., 2004. Assessing senescence patterns in populations of large mammals. *Anim. Biodiv. Cons.* 27.1, 47–58.
- Gardner, B., Reppucci, J., Lucherini, M., Royle, J.A., 2010. Spatially explicit inference for open populations: estimating demographic parameters from camera-trap studies. *Ecology* 91, 3376–3383.
- Gardner, B., Royle, J.A., Wegan, M.T., 2009. Hierarchical models for estimating density from DNA mark-recapture studies. *Ecology* 90, 1106–1115.
- Gaston, K.J., Blackburn, T.M., 2000. *Pattern and Process in Macroecology*. Blackwell Science, Oxford.
- Gauthier, G., Besbeas, P., Lebreton, J.D., Morgan, B.J.T., 2007. Population growth in snow geese: a modeling approach integrating demographic and survey information. *Ecology* 88, 1420–1429.
- Gauthier, G., Lebreton, J.D., 2008. Analysis of band-recovery data in a multistate capture-recapture framework. *Can. J. Stat.* 36, 59–73.
- Gelman, A., 2005. Analysis of variance: why is it more important than ever (with discussion). *Ann. Stat.* 33, 1–53.
- Gelman, A., 2006. Prior distributions for variance parameters in hierarchical models. *Bayesian Anal.* 1, 515–534.
- Gelman, A., 2008. Objections to Bayesian statistics (with discussion). *Bayesian Anal.* 3, 445–450.
- Gelman, A., Carlin, J.P., Stern, H.S., Rubin, D.B., 2004. *Bayesian Data Analysis*. CRC/Chapman & Hall, Boca Raton, FL.
- Gelman, A., Hill, J., 2007. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. Cambridge University Press, Cambridge.
- Gelman, A., Meng, X.-L., Stern, H.S., 1996. Posterior predictive assessment of model fitness via realized discrepancies (with discussion). *Stat. Sinica.* 6, 733–807.
- Geman, S., Geman, D., 1984. Stochastic relaxation, Gibbs distributions, and the Bayesian restoration of images. *IEEE Trans. Pat. Anal. Mach. Intell.* 6, 721–741.
- Gibbons, D.W., Donald, P.F., Bauer, H.G., Fornasari, L., Dawson, I.K., 2007. Mapping avian distributions: the evolution of bird atlases. *Bird Study.* 54, 324–334.
- Gilks, W.R., Thomas, A., Spiegelhalter, D.J., 1994. A language and program for complex Bayesian modelling. *Statistician* 43, 169–177.
- Gimenez, O., Bonner, S.J., King, R., Parker, R.A., Brooks, S.P., Jamieson, L.E., et al., 2009a. WinBUGS for population ecologists: Bayesian modeling using Markov Chain Monte Carlo methods. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 883–915.
- Gimenez, O., Choquet, R., Lebreton, J.D., 2003. Parameter redundancy in multistate capture-recapture models. *Biomet. J.* 45, 704–722.
- Gimenez, O., Covas, R., Brown, C.R., Anderson, M.D., Bomberger Brown, M., Lenormand, T., 2006a. Nonparametric estimation of natural selection on a quantitative trait using mark-recapture data. *Evolution* 60, 460–466.
- Gimenez, O., Crainiceanu, C., Barbraud, C., Jenouvrier, S., Morgan, B.J.T., 2006b. Semiparametric regression in capture-recapture modeling. *Biometrics* 62, 691–698.
- Gimenez, O., Morgan, B.J.T., Brooks, S.P., 2009b. Weak identifiability in models for mark-recapture-recovery data. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 1055–1067.
- Gimenez, O., Rossi, V., Choquet, R., Dehais, C., Doris, B., Varella, H., et al., 2007. State-space modelling of data on marked individuals. *Ecol. Mod.* 206, 431–438.
- Gimenez, O., Viallefont, A., Catchpole, A.E., Choquet, R., Morgan, B.J.T., 2004. Methods for investigating parameter redundancy. *Anim. Biodiv. Cons.* 27.1, 561–572.

- Gimenez, O., Viallefont, A., Charmantier, A., Pradel, R., Cam, E., Brown, C.R., et al., 2008. The risk of flawed inference in evolutionary studies when detectability is less than one. *Am. Nat.* 172, 441–448.
- Gotelli, N.J., McGill, B.J., 2006. Null versus neutral models: what's the difference? *Ecography* 29, 793–800.
- Gould, W.R., Nichols, J.D., 1998. Estimation of temporal variability of survival in animal populations. *Ecology* 79, 2531–2538.
- Grosbois, V., Gimenez, O., Gaillard, J.M., Pradel, R., Barbraud, C., Clobert, J., et al., 2008. Assessing the impact of climate variation on survival in vertebrate populations. *Biol. Rev.* 83, 357–399.
- Grosbois, V., Harris, M.P., Anker-Nilssen, T., McCleery, R.H., Shaw, D.N., Morgan, B.J.T., et al., 2009. Modeling survival at multi-population scales using mark-recapture data. *Ecology* 90, 2922–2932.
- Guillera-Aroita, G., Ridout, M.S., Morgan, B.J.T., 2010. Design of occupancy studies with imperfect detection. *Meth. Ecol. Evol.* 1, 131–139.
- Guisan, A., Thuiller, W., 2005. Predicting species distribution: offering more than simple habitat models. *Ecol. Lett.* 8, 993–1009.
- Hagemeijer, W., Blair, M., 1998. *The EBCC Atlas of European Breeding Birds*. T. & A.D. Poyser, London.
- Hanski, I., 1994. A practical model for metapopulation dynamics. *J. Anim. Ecol.* 63, 151–162.
- Hanski, I., 1998. Metapopulation dynamics. *Nature* 396, 41–49.
- Hargrove, J.W., Borland, C.H., 1994. Pooled population parameter estimates from mark-recapture data. *Biometrics* 50, 1129–1141.
- Harper, J.L., 1977. *Population Biology of Plants*. Academic Press, London.
- Harvey, A.C., 1989. *Forecasting, Structural Time Series Models and Kalman Filter*. Cambridge University Press, Cambridge.
- Hastie, T.J., Tibshirani, R.J., 1990. *Generalized Additive Models*. Chapman & Hall/CRC, Boca Raton, FL.
- Hastings, W.K., 1970. Monte Carlo sampling methods using Markov chains and their applications. *Biometrika* 57, 97–109.
- Hendriks, I.E., Deudero, S., Basso, L., Cabanellas-Reboredo, M., Alvarez, E., 2011. Growth rates of juvenile and adult *Pinna nobilis* around Majorca (Mediterranean, Spain). (in prep.).
- Hestbeck, J.B., Nichols, J.D., Malecki, R.A., 1991. Estimates of movement and site fidelity using mark-resight data of wintering Canada Geese. *Ecology* 72, 523–533.
- Hines, J.E., 2006. PRESENCE2: Software to estimate patch occupancy and related parameters. USGS-PWRC, Laurel, MD.
- Hines, J.E., Nichols, J.D., Royle, J.A., MacKenzie, D.I., Gopalaswamy, A.M., Samba Kumar, N., et al., 2010. Tigers on trails: occupancy modeling for cluster sampling. *Ecol. Appl.* 20, 1456–1466.
- Hooten, M.B., Wikle, C.K., Dorazio, R.M., Royle, J.A., 2007. Hierarchical spatiotemporal matrix models for characterizing invasions. *Biometrics* 63, 558–567.
- Hubbell, S.P., 2001. *A Unified Theory of Biodiversity and Biogeography*. Princeton University Press, Princeton, NJ.
- Huntley, B., Green, R.E., Collingham, Y.C., Willis, S.G., 2007. *A Climatic Atlas of European Breeding Birds*. Lynx Edicions, Barcelona.
- Hurlbert, S.H., 1984. Pseudoreplication and the design of ecological field experiments. *Ecol. Monogr.* 54, 187–211.
- Jetz, W., Rahbek, C., 2002. Geographic range size and the determinants of vaian species richness. *Science* 297, 1548–1551.
- Joe, M., Pollock, K.H., 2002. Separation of survival and movement rates in multi-state tag-return and capture-recapture models. *J. Appl. Stat.* 29, 373–384.
- Jolly, G.M., 1965. Explicit estimates from capture-recapture data with both death and immigration-stochastic model. *Biometrika* 52, 225–247.

- Joseph, L.N., Elkin, C., Martin, T.G., Possingham, H., 2009. Modeling abundance using N-mixture models: the importance of considering ecological mechanisms. *Ecol. Appl.* 19, 631–642.
- Kadane, J.B., Lazar, N.A., 2004. Methods and criteria for model selection. *J. Am. Stat. Assoc.* 99, 279–290.
- Kalman, R.E., 1960. A new approach to linear filtering and prediction problems. *J. Basic Eng.* D 82, 35–45.
- Karanth, K.U., Nichols, J.D., Kumar, N.S., Hines, J.E., 2006. Assessing tiger population dynamics using photographic capture-recapture sampling. *Ecology* 87, 2925–2937.
- Kendall, W.L., 1999. Robustness of closed capture-recapture methods to violations of the closure assumption. *Ecology* 80, 2517–2525.
- Kendall, W.L., Conn, P.B., Hines, J.E., 2006. Combining multistate capture-recapture data with tag recoveries to estimate demographic parameters. *Ecology* 87, 169–177.
- Kendall, W.L., Hines, J.E., Nichols, J.D., 2003. Adjusting multistate capture-recapture models for misclassification bias: manatee breeding proportions. *Ecology* 84, 1058–1066.
- Kendall, W.L., Nichols, J.D., 2002. Estimating state-transition probabilities for unobservable states using capture-recapture/resighting data. *Ecology* 83, 3276–3284.
- Kendall, W.L., Nichols, J.D., Hines, J.E., 1997. Estimating temporary emigration using capture-recapture data with Pollock's robust design. *Ecology* 78, 563–578.
- Kendall, W.L., White, G.C., 2009. A cautionary note on substituting spatial subunits for repeated temporal sampling in studies of site occupancy. *J. Appl. Ecol.* 46, 1182–1188.
- Kéry, M., 2002. Inferring the absence of a species—a case study of snakes. *J. Wildl. Manage.* 66, 330–338.
- Kéry, M., 2004. Extinction rate estimates for plant populations in revisitation studies: importance of detectability. *Conserv. Biol.* 18, 570–574.
- Kéry, M., 2008. Estimating abundance from bird counts: binomial mixture models uncover complex covariate relationships. *Auk* 125, 336–345.
- Kéry, M., 2010. Introduction to WinBUGS for Ecologists. A Bayesian Approach to Regression, ANOVA, Mixed Models and Related Analyses. Academic Press, Burlington, MA.
- Kéry, M., 2011a. Species richness and community dynamics—a conceptual framework. In: O'Connell, A.F., Nichols, J.D., Karanth, K.U. (Eds.), *Camera Traps in Animal Ecology: Methods and Analyses*. Springer, Tokyo, pp. 207–231.
- Kéry, M., 2011b. Towards the modeling of true species distributions. *J. Biogeogr.* 38, 617–618.
- Kéry, M., Dorazio, R.M., Soldaat, L., van Strien, A., Zuiderwijk, A., Royle, J.A., 2009a. Trend estimation in populations with imperfect detection. *J. Appl. Ecol.* 46, 1163–1172.
- Kéry, M., Gardner, B., Monnerat, C., 2010a. Predicting species distributions from checklist data using site-occupancy models. *J. Biogeogr.* 37, 1851–1862.
- Kéry, M., Gardner, B., Stoeckle, T., Weber, D., Royle, J.A., 2011. Use of spatial capture-recapture modeling and DNA data to estimate densities of elusive animals. *Conserv. Biol.* 25, 356–364.
- Kéry, M., Gregg, K.B., 2003. Effects of life-state on detectability in a demographic study of the terrestrial orchid *Cleistes bifaria*. *J. Ecol.* 91, 265–273.
- Kéry, M., Gregg, K.B., 2004. Demographic analysis of dormancy and survival in the terrestrial orchid *Cypripedium reginae*. *J. Ecol.* 92, 686–695.
- Kéry, M., Gregg, K.B., Schaub, M., 2005a. Demographic estimation methods for plants with unobservable life-states. *Oikos* 108, 307–320.
- Kéry, M., Madsen, J., Lebreton, J.D., 2006. Survival of Svalbard pink-footed geese *Anser brachyrhynchus* in relation to winter climate, density and land-use. *J. Anim. Ecol.* 75, 1172–1181.
- Kéry, M., Royle, J.A., 2008. Hierarchical Bayes estimation of species richness and occupancy in spatially replicated surveys. *J. Appl. Ecol.* 45, 589–598.

- Kéry, M., Royle, J.A., 2009. Inference about species richness and community structure using species-specific occupancy models in the national Swiss breeding bird survey MHB. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*, Springer, New York, pp. 639–656.
- Kéry, M., Royle, J.A., 2010. Hierarchical modeling and estimation of abundance in metapopulation designs. *J. Anim. Ecol.* 79, 453–461.
- Kéry, M., Royle, J.A., Plattner, M., Dorazio, R.M., 2009b. Species richness and occupancy estimation in communities subject to temporary emigration. *Ecology* 90, 1279–1290.
- Kéry, M., Royle, J.A., Schmid, H., 2005b. Modeling avian abundance from replicated counts using binomial mixture models. *Ecol. Appl.* 15, 1450–1461.
- Kéry, M., Royle, J.A., Schmid, H., Schaub, M., Volet, B., Häfliger, G., Zbinden, N., 2010b. Site-occupancy distribution modeling to correct population-trend estimates derived from opportunistic observations. *Conserv. Biol.* 24, 1388–1397.
- Kéry, M., Schmidt, B.R., 2008. Imperfect detection and its consequences for monitoring for conservation. *Comm. Ecol.* 9, 207–216.
- King, R., Brooks, S.P., 2002. Bayesian model discrimination for multiple strata capture-recapture data. *Biometrika* 89, 785–806.
- King, R., Brooks, S.P., 2004. Bayesian analyses of the Hector's dolphin data. *Anim. Biodiv. Cons.* 27.1, 343–354.
- King, R., Morgan, B.J.T., Gimenez, O., Brooks, S.P., 2010. *Bayesian Analysis for Population Ecology*. Chapman & Hall, Boca Raton, FL.
- Knape, J., 2008. Estimability of density dependence in models of time series data. *Ecology* 89, 2994–3000.
- Knape, J., Jonzén, N., Sköld, M., 2011. On observation distributions for state space models of population survey data. *J. Anim. Ecol.* (in press).
- Krebs, C.J., 2001. *The Experimental Analysis of Distribution and Abundance*. Benjamin Cummings, San Francisco, CA.
- Krebs, C.J., Davies, N.B., 1993. *An Introduction to Behavioural Ecology*. Blackwell Scientific, Oxford.
- Lande, R., 2002. Incorporating stochasticity in population viability analysis. In: Beissinger, S.R. (Eds.), *Population Viability Analysis*. The University of Chicago Press, Chicago, IL, pp. 18–40.
- Lande, R., Engen, S., Saether, B.E., 2003. *Stochastic Population Dynamics in Ecology and Conservation*. Oxford University Press, Oxford.
- Lebreton, J.D., 2009. Assessing density-dependence: where are we left? In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 19–42.
- Lebreton, J.D., Almeras, T., Pradel, R., 1999. Competing events, mixtures of information and multistratum recapture models. *Bird Study* 46, 39–46.
- Lebreton, J.D., Burnham, K.P., Clobert, J., Anderson, D.R., 1992. Modeling survival and testing biological hypothesis using marked animals: a unified approach with case studies. *Ecol. Monogr.* 62, 67–118.
- Lebreton, J.D., Morgan, B.J.T., Pradel, R., Freeman, S.N., 1995. A simultaneous survival rate analysis of dead recovery and live recapture data. *Biometrics* 51, 1418–1428.
- Lebreton, J.D., Nichols, J.D., Barker, R.J., Pradel, R., Spendelov, J.A., 2009. Modeling individual animal histories with multistate capture-recapture models. *Adv. Ecol. Res.* 41, 87–173.
- Lebreton, J.D., Pradel, R., 2002. Multistate recapture models: modelling incomplete individual histories. *J. Appl. Stat.* 29, 353–369.
- Le Cam, L., 1990. Maximum likelihood – an introduction. *ISI Rev.* 58, 153–171.
- Lee, Y., Nelder, J.A., 2000. Two ways of modeling overdispersion in non-normal data. *App. Stat.* 49, 591–598.

- Lee, Y., Nelder, J.A., 2006. Double hierarchical generalized linear models. *App. Stat.* 55, 139–185.
- Lele, S.R., Dennis, B., Lutscher, F., 2007. Data cloning: easy maximum likelihood estimation for complex ecological models using Bayesian Markov chain Monte Carlo methods. *Ecol. Lett.* 10, 551–563.
- Lindley, D.V., 1983. Theory and practice of Bayesian statistics. *Statistician* 32, 1–11.
- Lindley, D.V., 2006. *Understanding Uncertainty*. Wiley, Hoboken, NJ.
- Lindley, S.T., 2003. Estimation of population growth and extinction parameters from noisy data. *Ecol. Appl.* 13, 806–813.
- Link, W.A., 1999. Modeling pattern in collections of parameters. *J. Wildl. Manage.* 63, 1017–1027.
- Link, W.A., 2003. Nonidentifiability of population size from capture-recapture data with heterogeneous detection probabilities. *Biometrics* 59, 1123–1130.
- Link, W.A., Barker, R.J., 2005. Modeling association among demographic parameters in analysis of open population capture-recapture data. *Biometrics* 61, 46–54.
- Link, W.A., Barker, R.J., 2010. *Bayesian Inference with Ecological Applications*. Academic Press, London.
- Link, W.A., Nichols, J.D., 1994. On the importance of sampling variance to investigations of temporal variations in animal population size. *Oikos* 69, 539–544.
- Link, W.A., Royle, J.A., Hatfield, J.S., 2003. Demographic analysis from summaries of an age-structured population. *Biometrics* 59, 778–785.
- Link, W.A., Sauer, J.R., 1996. Extremes in ecology: avoiding the misleading effects of sampling variation in summary analyses. *Ecology* 77, 1633–1640.
- Link, W.A., Sauer, J.R., 1998. Estimating population change from count data: application to the North American breeding bird survey. *Ecol. Appl.* 8, 258–268.
- Link, W.A., Sauer, J.R., 2002. A hierarchical analysis of population change with application to Cerulean warblers. *Ecology* 83, 2832–2840.
- Link, W.A., Yoshizaki, J., Bailey, L.L., Pollock, K.H., 2010. Uncovering a latent multinomial: analysis of mark-recapture data with misidentification. *Biometrics* 66, 178–185.
- Little, R.J.A., 2006. Calibrated Bayes: A bayes/frequentist roadmap. *Am. Stat.* 60, 213–223.
- Liu, J.S., Wu, Y.N., 1999. Parameter expansion for data augmentation. *J. Am. Stat. Assoc.* 94, 1264–1274.
- Lukacs, P.M., Burnham, K.P., 2005. Estimating population size from DNA-based closed capture-recapture data incorporating genotyping error. *J. Wildl. Manage.* 69, 396–403.
- Lunn, D.J., Spiegelhalter, D., Thomas, A., Best, N., 2009. The BUGS project: evaluation, critique and future directions. *Stat. Med.* 28, 3049–3067.
- Lunn, D.J., Thomas, A., Best, N., Spiegelhalter, D., 2000. WinBUGS—a Bayesian modelling framework: concepts, structure, and extensibility. *Stat. Comput.* 10, 325–337.
- MacKenzie, D.I., 2005. What are the issues with presence-absence data for wildlife managers? *J. Wildl. Manage.* 69, 849–860.
- MacKenzie, D.I., 2006. Modeling the probability of resource use: the effect of, and dealing with, detecting a species imperfectly. *J. Wildl. Manage.* 70, 367–374.
- MacKenzie, D.I., Nichols, J.D., Hines, J.E., Knutson, M.G., Franklin, A.B., 2003. Estimating site occupancy, colonization, and local extinction when a species is detected imperfectly. *Ecology* 84, 2200–2207.
- MacKenzie, D.I., Nichols, J.D., Lachman, G.B., Droege, S., Royle, J.A., Langtimm, C.A., 2002. Estimating site occupancy rates when detection probabilities are less than one. *Ecology* 83, 2248–2255.
- MacKenzie, D.I., Nichols, J.D., Royle, J.A., Pollock, K.H., Hines, J.E., Bailey, L.L., 2006. *Occupancy Estimation and Modeling: Inferring Patterns and Dynamics of Species Occurrence*. Elsevier, San Diego, CA.

- MacKenzie, D.I., Nichols, J.D., Seamans, M.E., Gutierrez, R.J., 2009. Modeling species occurrence dynamics with multiple states and imperfect detection. *Ecology* 90, 823–835.
- Marra, P.P., Griffing, S., Caffrey, C., Kilpatrick, A.M., McLean, R., Brand, C., et al., 2004. West Nile virus and wildlife. *BioScience* 54, 393–402.
- Marshall, M.R., Diefenbach, D.R., Wood, L.A., Cooper, R.J., 2004. Annual survival estimation of migratory songbirds confounded by incomplete breeding site-fidelity: study designs that may help. *Anim. Biodiv. Cons.* 27.1, 59–72.
- Martin, J.E., Royle, J.A., Gardner, B., MacKenzie, D.I., Edwards, H.H., Kéry, M., 2011. Accounting for non-independent detection when estimating abundance of organisms with a Bayesian approach. *Meth. Ecol. Evol.* (in press).
- Martin, T.E., Clobert, J., Anderson, D.R., 1995. Return rates in studies of life history evolution: are biases large? *J. Appl. Stat.* 22, 863–875.
- Maunder, M.N., 2004. Population viability analysis based on combining Bayesian, integrated, and hierarchical analyses. *Acta Oecol.* 26, 85–94.
- McCarthy, M.A., 2007. *Bayesian Methods for Ecology*. Cambridge University Press, Cambridge.
- McCarthy, M.A., Masters, P., 2005. Profiting from prior information in Bayesian analyses of ecological data. *J. Appl. Ecol.* 42, 1012–1019.
- McClintock, B.T., Nichols, J.D., Bailey, L.L., MacKenzie, D.I., Kendall, W.L., Franklin, A.B., 2010. Seeking a second opinion: uncertainty in disease ecology. *Ecol. Lett.* 13, 659–674.
- McCullagh, P., Nelder, J.A., 1989. *Generalized Linear Models*. Chapman & Hall, London.
- Metropolis, N., Rosenbluth, A.W., Rosenbluth, M.N., Teller, A.H., Teller, E., 1953. Equation of state calculations by fast computing machines. *J. Chem. Phys.* 21, 1087–1092.
- Millar, R.B., 2009. Comparison of hierarchical Bayesian models for overdispersed count data using DIC and Bayes' factors. *Biometrics* 65, 962–969.
- Miller, D.A., Nichols, J.D., McClintock, B.T., Grant, E.H.C., Bailey, L.L., Weir, L., 2011. Improving occupancy estimation when two types of observational errors occur: non-detection and species misidentification. *Ecology* 92, 1422–1428.
- Moilanen, A., 2002. Implications of empirical data quality to metapopulation model parameter estimation and application. *Oikos* 96, 516–530.
- Monneret, R.-J., 2006. *Le faucon pèlerin*. Delachaux and Niestlé, Paris.
- Moritz, C., Patton, J.L., Conroy, C.J., Parra, J.L., White, G.C., Beissinger, S.R., 2008. Impact of a century of climate change on small mammal communities in Yosemite National Park, USA. *Science* 322, 261–264.
- Newman, K.B., Buckland, S.T., Lindley, S.T., Thomas, L., Fernandez, C., 2006. Hidden process models for animal population dynamics. *Ecol. Appl.* 16, 74–86.
- Newton, I., 1998. *Population Limitation in Birds*. Academic Press, London.
- Nichols, J.D., Blohm, R.J., Reynolds, R.E., Trost, R.E., Hines, J.E., Bladen, J.P., 1991. Band reporting rates for Mallards with reward bands of different Dollar values. *J. Wildl. Manage.* 55, 119–126.
- Nichols, J.D., Boulenger, T., Hines, J.E., Pollock, K.H., Sauer, J.R., 1998a. Estimating rates of local species extinction, colonization, and turnover in animal communities. *Ecol. Appl.* 8, 1213–1225.
- Nichols, J.D., Boulenger, T., Hines, J.E., Pollock, K.H., Sauer, J.R., 1998b. Inference methods for spatial variation in species richness and community composition when not all species are detected. *Conserv. Biol.* 12, 1390–1398.
- Nichols, J.D., Hines, J.E., Lebreton, J.D., Pradel, R., 2000. Estimation of contributions to population growth: a reverse-time capture-recapture approach. *Ecology* 81, 3362–3376.
- Nichols, J.D., Hines, J.E., MacKenzie, D.I., Seamans, M.E., Gutierrez, R.J., 2007. Occupancy estimation and modeling with multiple states and state uncertainty. *Ecology* 88, 1395–1400.

- Nichols, J.D., Hines, J.E., Pollock, K.H., 1984. Effects of permanent trap response in capture probability on Jolly-Seber capture-recapture model estimates. *J. Wildl. Manage.* 48, 289–293.
- Nichols, J.D., Kendall, W.L., Hines, J.E., Spendelow, J.A., 2004. Estimation of sex-specific survival from capture-recapture data when sex is not always known. *Ecology* 85, 3192–3201.
- Nichols, J.D., Pollock, K.H., 1983. Estimation methodology in contemporary small mammal capture-recapture studies. *J. Mamm.* 64, 253–260.
- Nichols, J.D., Pollock, K.H., 1990. Estimation of recruitment from immigration versus in situ reproduction using Pollock's Robust design. *Ecology* 71, 21–26.
- Nichols, J.D., Thomas, L., Conn, P.B., 2009. Inferences about landbird abundance from count data: recent advances and future directions. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 201–235.
- Norris, K., 2004. Managing threatened species: the ecological toolbox, evolutionary theory and declining-population paradigm. *J. Appl. Ecol.* 41, 413–426.
- Ntzoufras, I., 2009. *Bayesian Modeling Using WinBUGS*. Wiley, Hoboken, NJ.
- O'Hara, R.B., Sillanpää, M.J., 2009. A review of Bayesian variable selection methods: what, how and which. *Bayesian Anal.* 4, 85–118.
- Orme, C.D.L., Davies, R.G., Burgess, M., Eigenbrod, F., Pickup, N., Olson, V.A., et al., 2005. Global hotspots of species richness are not congruent with endemism or threat. *Nature* 436, 1019.
- Otis, D.L., Burnham, K.P., White, G.C., Anderson, D.R., 1978. Statistical inference from capture data on closed animal populations. *Wildl. Monogr.* 62, 1–135.
- Pagel, J., Schurr, F.M., 2011. Forecasting species ranges by statistical estimation of ecological niches and spatial population dynamics. *Global Ecol. Biogeogr.* (in press).
- Pearman, P.B., Weber, D., 2007. Common species determine richness patterns in biodiversity indicator taxa. *Biol. Cons.* 138, 109–119.
- Pellet, J., Schmidt, B.R., 2005. Monitoring distributions using call surveys: estimating site occupancy, detection probabilities and inferring absence. *Biol. Cons.* 123, 27–35.
- Péron, G., Crochet, P.-A., Doherty, P.F., Lebreton, J.D., 2010. Studying dispersal at the landscape scale: efficient combination of population surveys and capture-recapture data. *Ecology* 91, 3365–3375.
- Phillips, S.J., Dudik, M., 2008. Modeling of species distributions with Maxent: new extensions and a comprehensive evaluation. *Ecography* 31, 161–175.
- Pigliucci, M., 2002. *Denying Evolution: Creationism, Scientism, and the Nature of Science*. Sinauer Associates, Sunderland, MA.
- Pledger, S., 2000. Unified maximum likelihood estimates for closed capture-recapture models using mixtures. *Biometrics* 56, 434–442.
- Pledger, S., Efford, M., 1998. Correction of bias due to heterogeneous capture probability in capture-recapture studies of open populations. *Biometrics* 54, 888–898.
- Pledger, S., Efford, M., Pollock, K., Collazo, J., Lyons, J., 2009. Stopover duration analysis with departure probability dependent on unknown time since arrival. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 349–363.
- Pollock, K.H., 1982. A capture-recapture design robust to unequal probability of capture. *J. Wildl. Manage.* 46, 752–757.
- Pollock, K.H., Nichols, J.D., Brownie, C., Hines, J.E., 1990. Statistical inference for capture-recapture experiments. *Wildl. Monogr.* 107, 1–97.
- Post van der Burg, M., Bly, B., Vercauteren, T., Tyre, A.J., 2011. Making better use of monitoring data from low density species using a spatially explicit modeling approach. *J. Appl. Ecol.* 48, 47–55.
- Powell, L.A., 2007. Approximating variance of demographic parameters using the delta method: a reference for avian biologists. *Condor* 109, 949–954.

- Pradel, R., 1993. Flexibility in survival analysis from recapture data: handling trap-dependence. In: Lebreton, J.D. (Ed.), *Marked Individuals in the Study of Bird Population*. Birkhäuser-Verlag, Basel, pp. 29–37.
- Pradel, R., 1996. Utilization of capture-mark-recapture for the study of recruitment and population growth rate. *Biometrics* 52, 703–709.
- Pradel, R., 2005. Multievent: an extension of multistate capture-recapture models to uncertain states. *Biometrics* 61, 442–447.
- Pradel, R., Hines, J.E., Lebreton, J.D., Nichols, J.D., 1997. Capture-recapture survival models taking account of transients. *Biometrics* 53, 60–72.
- Pradel, R., Lebreton, J.D., 1999. Comparison of different approaches to the study of local recruitment of breeders. *Bird Study* 46, 74–81.
- Pradel, R., Wintrebert, C.M.A., Gimenez, O., 2003. A proposal for a goodness-of-fit test to the Arnason-Schwarz multistate capture-recapture model. *Biometrics* 59, 43–53.
- Purvis, A., Hector, A., 2000. Getting the measure of biodiversity. *Nature* 405, 212–219.
- R Development Core Team, 2004. *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna.
- Reid, J.M., Bignal, E.M., Bignal, S., McCracken, D.I., Monaghan, P., 2003. Environmental variability, life-history covariation and cohort effects in the red-billed chough *Pyrrhocorax pyrrhocorax*. *J. Anim. Ecol.* 72, 36–46.
- Reif, J., Storch, D., Simova, I., 2008. The effect of scale-dependent habitat gradients on the structure of bird assemblages in the Czech Republic. *Acta Ornithol.* 43, 197–206.
- Rexstad, E., Burnham, K.P., 1991. *User's Guide for Interactive Program CAPTURE*. Colorado Cooperative Fish & Wildlife Research Unit, Colorado State University, Fort Collins, CO.
- Risk, B.B., De Valpine, P., Beissinger, S.R., 2011. A robust-design formulation of the incidence function model of metapopulation dynamics applied to two rail species. *Ecology* 92, 462–474.
- Robinson, R.A., Green, R.E., Baillie, S.R., Peach, W.J., Thomson, D.L., 2004. Demographic mechanisms of the population decline of the song thrush *Turdus philomelos* in Britain. *J. Anim. Ecol.* 73, 670–682.
- Rota, C.T., Fletcher Jr., R.J., Dorazio, R.M., Betts, M.G., 2009. Occupancy estimation and the closure assumption. *J. Appl. Ecol.* 46, 1173–1181.
- Roth, T., Amrhein, V., 2009. Estimating individual survival using territory occupancy data on unmarked animals. *J. Appl. Ecol.* 47, 386–392.
- Royle, J.A., 2004a. Generalized estimators of avian abundance from count survey data. *Anim. Biodiv. Cons.* 27.1, 375–386.
- Royle, J.A., 2004b. Modeling abundance index data from anuran calling surveys. *Conserv. Biol.* 18, 1378–1385.
- Royle, J.A., 2004c. N-mixture models for estimating population size from spatially replicated counts. *Biometrics* 60, 108–115.
- Royle, J.A., 2006. Site occupancy model with heterogeneous detection probabilities. *Biometrics* 62, 97–102.
- Royle, J.A., 2008. Modeling individual effects in the Cormack-Jolly-Seber model: a state-space formulation. *Biometrics* 64, 364–370.
- Royle, J.A., 2009. Analysis of capture-recapture models with individual covariates using data augmentation. *Biometrics* 65, 267–274.
- Royle, J.A., Dorazio, R.M., 2006. Hierarchical models of animal abundance and occurrence. *JABES* 11, 249–263.
- Royle, J.A., Dorazio, R.M., 2008. *Hierarchical Modeling and Inference in Ecology. The Analysis of Data from Populations, Metapopulations and Communities*. Academic Press, New York.
- Royle, J.A., Dorazio, R.M., 2011. Parameter-expanded data augmentation for Bayesian analysis of capture-recapture models. *J. Ornithol.* (in press).

- Royle, J.A., Dorazio, R.M., Link, W.A., 2007a. Analysis of multinomial models with unknown index using data augmentation. *J. Comput. Graph. Stat.* 16, 67–85.
- Royle, J.A., Dubovsky, J.A., 2001. Modeling spatial variation in waterfowl band-recovery data. *J. Wildl. Manage.* 65, 726–737.
- Royle, J.A., Gardner, B., 2011. Hierarchical spatial capture-recapture models for estimating density from trap-arrays. In: O'Connell, A.F., Nichols, J.D., Karanth, K.U. (Eds.), *Camera Traps in Animal Ecology—Methods and Analyses*. Springer, New York, pp. 163–190.
- Royle, J.A., Karanth, K.U., Gopalaswamy, A.M., Kumar, N.S., 2009a. Bayesian inference in camera trapping studies for a class of spatial capture-recapture models. *Ecology* 90, 3233–3244.
- Royle, J.A., Kéry, M., 2007. A Bayesian state-space formulation of dynamics occupancy models. *Ecology* 88, 1813–1823.
- Royle, J.A., Kéry, M., Gauthier, R., Schmid, H., 2007b. Hierarchical spatial models of abundance and occurrence from imperfect survey data. *Ecol. Monogr.* 77, 465–481.
- Royle, J.A., Kéry, M., Guélat, J., 2011. Spatial capture-recapture models for search-encounter data. *Meth. Ecol. Evol.* (in press).
- Royle, J.A., Link, W.A., 2005. A general class of multinomial mixture models for anuran calling survey data. *Ecology* 86, 2505–2512.
- Royle, J.A., Link, W.A., 2006. Generalized site occupancy models allowing for false positive and false negative errors. *Ecology* 87, 835–841.
- Royle, J.A., Nichols, J.D., 2003. Estimating abundance from repeated presence-absence data or point counts. *Ecology* 84, 777–790.
- Royle, J.A., Nichols, J.D., Karanth, K.U., Gopalaswamy, A.M., 2009b. A hierarchical model for estimating density in camera-trap studies. *J. Appl. Ecol.* 46, 118–127.
- Royle, J.A., Nichols, J.D., Kéry, M., 2005. Modelling occurrence and abundance of species when detection is imperfect. *Oikos* 110, 353–359.
- Royle, J.A., Young, K.G., 2008. A hierarchical model for spatial capture-recapture data. *Ecology* 89, 2281–2289.
- Rue, H., Martino, S., Chopin, N., 2009. Approximate Bayesian inference for latent Gaussian models by using integrated nested Laplace approximations (with discussion). *J. R. Stat. Soc. B* 71, 319–392.
- Ruiz-Gutierrez, V., Zipkin, E.F., 2011. Detection biases yield misleading patterns of species persistence and colonization in fragmented landscapes. *Ecosphere* 2, Article 61.
- Russell, R.E., Royle, J.A., Saab, V.A., Lehmkuhl, J.F., Block, W.M., Sauer, J.A., 2009. Modeling the effects of environmental disturbance on wildlife communities: avian responses to prescribed fire. *Ecol. Appl.* 19, 1253–1263.
- Saether, B.E., Bakke, O., 2000. Avian life history variation and contribution of demographic traits to the population growth rate. *Ecology* 81, 642–653.
- Saracco, J.F., Royle, J.A., DeSante, D.F., Gardner, B., 2010. Modeling spatial variation in avian survival and residency probabilities. *Ecology* 91, 1885–1891.
- Sauer, J.R., Link, W.A., 2002. Hierarchical modeling of population stability and species group attributes from survey data. *Ecology* 86, 1743–1751.
- Schaub, M., 2009. Estimation of cause-specific mortality rates from ring recovery data: a Bayesian evaluation. In: Thomson, D.L., Cooch, E.G., Conroy, M.J. (Eds.), *Modeling Demographic Processes in Marked Populations*. Springer, New York, pp. 1081–1097.
- Schaub, M., Abadi, F., 2011. Integrated population models: A novel analysis framework for deeper insights into population dynamics. *J. Ornithol.* (in press).
- Schaub, M., Aebischer, A., Gimenez, O., Berger, S., Arlettaz, R., 2010. Massive immigration balances high human induced mortality in a stable eagle owl population. *Biol. Cons.* 143, 1911–1918.
- Schaub, M., Gimenez, O., Schmidt, B.R., Pradel, R., 2004a. Estimating survival and temporary emigration in the multistate capture-recapture framework. *Ecology* 85, 2107–2113.

- Schaub, M., Gimenez, O., Sierro, A., Arlettaz, R., 2007. Use of integrated modeling to enhance estimates of population dynamics obtained from limited data. *Conserv. Biol.* 21, 945–955.
- Schaub, M., Liechti, F., Jenni, L., 2004b. Departure of migrating European robins, *Erithacus rubecula*, from a stopover site in relation to wind and rain. *Anim. Behav.* 67, 229–237.
- Schaub, M., Pradel, R., 2004. Assessing the relative importance of different sources of mortality from recoveries of marked animals. *Ecology* 85, 930–938.
- Schaub, M., Reichlin, T.S., Abadi, F., Kéry, M., Jenni, L., Arlettaz, R., 2011. The demographic drivers of local population dynamics in two rare migratory birds. *Oecologia* (in press).
- Schaub, M., Ullrich, B., Knötzsch, G., Albrecht, P., Meisser, C., 2006. Local population dynamics and the impact of scale and isolation: a study on different little owl populations. *Oikos* 115, 389–400.
- Schaub, M., Zink, R., Beissmann, H., Sarrazin, F., Arlettaz, R., 2009. When to end releases in reintroduction programmes: demographic rates and population viability analysis of bearded vultures in the Alps. *J. Appl. Ecol.* 46, 92–100.
- Schlossberg, S., King, D.I., Chandler, R.B., Mazzei, D.A., 2010. Regional synthesis of habitat relationships in shrubland birds. *J. Wildl. Manage.* 74, 1513–1522.
- Schmid, H., Luder, R., Naef-Daenzer, B., Graf, R., Zbinden, N., 1998. Schweizer Brutvogelatlantlas. Schweizerische Vogelwarte, Sempach, Switzerland.
- Schmid, H., Zbinden, N., Keller, V., 2004. Überwachung der Bestandsentwicklung häufiger Brutvögel in der Schweiz. Schweizerische Vogelwarte, Sempach, Switzerland.
- Schmidt, B.R., 2005. Monitoring the distribution of pond-breeding amphibians when species are detected imperfectly. *Aquat. Conserv.: Mar. Freshw. Ecosyst.* 15, 681–692.
- Schmidt, B.R., Feldmann, R., Schaub, M., 2005. Demographic processes underlying population growth and decline in *Salamandra salamandra*. *Conserv. Biol.* 19, 1149–1156.
- Schofield, M.R., Barker, R.J., 2008. A unified capture-recapture framework. *JABES* 13, 458–477.
- Schofield, M.R., Barker, R.J., MacKenzie, D.I., 2009. Flexible hierarchical mark-recapture modeling for open populations using WinBUGS. *Environ. Ecol. Stat.* 16, 369–387.
- Schorcht, W., Bontadina, F., Schaub, M., 2009. Variation of adult survival drives population dynamics in a migrating forest bat. *J. Anim. Ecol.* 78, 1182–1190.
- Schwarz, C.J., 2002. Real and quasi-experiments in capture-recapture studies. *J. Appl. Stat.* 29, 459–473.
- Schwarz, C.J., Arnason, A.N., 1996. A general methodology for the analysis of capture-recapture experiments in open populations. *Biometrics* 52, 860–873.
- Schwarz, C.J., Schweigert, J.F., Arnason, A.N., 1993. Estimating migration rates using tag recovery data. *Biometrics* 49, 177–193.
- Scott, J.M., Heglund, P.J., Haufler, J.B., Morrision, M., Raphael, M.G., Wall, W.B., et al., 2002. *Predicting Species Occurrence: Issues of Accuracy and Scale*. Island Press, Covelo, CA.
- Seber, G.A.F., 1965. A note on the multiple recapture census. *Biometrika* 52, 249–259.
- Seber, G.A.F., 1982. *The Estimation of Animal Abundance and Related Parameters*. Charles Griffin & Company Ltd, London.
- Seber, G.A.F., Wild, C.J., 2003. *Nonlinear Regression*. Wiley, Hoboken, NJ.
- Servanthy, S., Choquet, R., Baubet, E., Brandt, S., Gaillard, J.M., Schaub, M., et al., 2010. Assessing whether mortality is additive using marked animals: a Bayesian state-space modeling approach. *Ecology* 91, 1916–1923.
- Service, P.M., 2000. Heterogeneity in individual mortality risk and its importance for evolutionary studies of senescence. *Am. Nat.* 156, 1–13.
- Shefferson, R.P., Sandercock, B.K., Proper, J., Beissinger, S.R., 2001. Estimating dormancy and survival of a rare herbaceous perennial using mark-recapture models. *Ecology* 82, 145–156.
- Sibly, R.M., Calow, P., 1986. *Physiological Ecology of Animals: An Evolutionary Approach*. Blackwell Scientific, Oxford.

- Sibly, R.M., Hone, J., 2002. Population growth rate and its determinants: an overview. *Phil. Trans. R. Soc. B* 357, 1153–1170.
- Smith, A.F.M., Gelfand, A., 1993. Bayesian statistics without tears. *Am. Stat.* 46, 84–88.
- Smout, S., King, R., Pomeroy, P.P., 2011. Integrating heterogeneity of detection and mark loss to estimate survival and transience in UK grey seal colonies. *J. Appl. Ecol.* 48, 364–372.
- Spiegelhalter, D.J., 1998. Bayesian graphical modelling: a case-study in monitoring health outcomes. *App. Stat.* 47, 115–133.
- Spiegelhalter, D.J., Best, N.G., Carlin, B.P., van der Linde, A., 2002. Bayesian measure of model complexity and fit. *J. R. Stat. Soc. B* 64, 583–639.
- Stearns, S.C., 1992. *The Evolution of Life Histories*. Oxford University Press, Oxford.
- Sturtz, S., Ligges, U., Gelman, A., 2005. R2WinBUGS: a package for running WinBUGS from R. *J. Stat. Softw.* 12, 1–16.
- Sutherland, B.J., Dolman, P.M., 1994. Combining behaviour and population dynamics with applications for predicting consequences of habitat loss. *Proc. R. Soc. Lond. B* 255, 133–138.
- Talley, T.S., Fleishman, E., Holyoak, M., Murphy, D.D., Ballard, A., 2007. Rethinking a rare-species conservation strategy in an urban landscape: the case of the valley elderberry longhorn beetle. *Biol. Cons.* 135, 21–32.
- Tanner, M.A., Wong, W.H., 1987. The calculation of posterior distributions by data augmentation. *J. Am. Stat. Assoc.* 82, 528–540.
- Tavecchia, G., Besbeas, P., Coulson, T., Morgan, B.J.T., Clutton-Brock, T.H., 2009. Estimating population size and hidden demographic parameters with state-space modeling. *Am. Nat.* 173, 722–733.
- Tavecchia, G., Pradel, R., Gossmann, F., Bastat, C., Ferrand, Y., Lebreton, J.D., 2002. Temporal variation in annual survival probability of the Eurasian woodcock *Scolopax rusticola* wintering in France. *Wildl. Biol.* 8, 21–30.
- Thomas, C.D., Lennon, J.J., 1999. Birds extend their ranges northwards. *Nature* 399, 213.
- Thomas, L., Buckland, S.T., Newman, K.B., Harwood, J., 2005. A unified framework for modelling wildlife population dynamics. *Aust. N. Z. J. Stat.* 47, 19–34.
- Thompson, D.K., 2007. Use of site-occupancy models to estimate prevalence of *Myxobolus cerebralis* infection in trout. *J. Anim. Health* 19, 8–13.
- Thompson, S.K., 2002. *Sampling*. Wiley, New York.
- Tingley, M.W., Beissinger, S.R., 2009. Detecting range shifts from historical species occurrences: new perspectives on old data. *Trend. Ecol. Evol.* 24, 625–633.
- Tingley, M.W., Monahan, W.B., Beissinger, S.R., Moritz, C., 2009. Birds track their Grinnellian niche through a century of climate change. *Proc. Nat. Acad. Sci. USA* 106, 19637–19643.
- Tyre, A.J., Tenhumberg, B., Field, S.A., Niejalke, D., Parris, K., Possingham, H.P., 2003. Improving precision and reducing bias in biological surveys: estimating false-negative error rates. *Ecol. Appl.* 13, 1790–1801.
- van de Pol, M., Verhulst, S., 2006. Age-dependent traits: a new statistical model to separate within- and between-individual effects. *Am. Nat.* 167, 766–773.
- van Strien, A.J., van Swaay, C.A.M., Kéry, M., 2011. Metapopulation dynamics in the butterfly *Hipparchia semele* changed decades before decline in the Netherlands. *Ecol. Appl.* (in press).
- Ver Hoef, J.M., Jansen, J.K., 2007. Space-time zero-inflated count models of harbour seals. *Environmetrics* 18, 697–712.
- Weber, D., Hintermann, U., Zangger, A., 2004. Scale and trends in species richness: considerations for monitoring biological diversity for political purposes. *Glob. Ecol. Biogeo.* 13, 97–104.
- Webster, R.A., Pollock, K.H., Simons, T.R., 2008. Bayesian spatial modeling of data from avian point surveys. *JABES* 13, 121–139.
- Welham, S., Cullins, B., Gogel, B., Gilmour, A., Thompson, R., 2004. Prediction in linear mixed models. *Aust. N. Z. J. Stat.* 46, 325–347.

- Wenger, S.J., Freeman, M.C., 2008. Estimating species occurrence, abundance, and detection probability using zero-inflated distributions. *Ecology* 89, 2953–2959.
- White, G.C., Burnham, K.P., 1999. Program MARK: survival estimation from populations of marked animals. *Bird Study* 46, 120–139.
- White, G.C., Garrott, R.A., 1990. *Analysis of Wildlife Radio-Tracking Data*. Academic Press, London.
- Wikle, C.K., 2003. Hierarchical Bayesian models for predicting the spread of ecological processes. *Ecology* 84, 1382–1394.
- Williams, B.K., Nichols, J.D., Conroy, M.J., 2002. *Analysis and Management of Animal Populations*. Academic Press, San Diego, CA.
- Wright, J.A., Barker, R.J., Schofield, M.R., Frantz, A.C., Byrom, A.E., Gleeson, D.M., 2009. Incorporating genotype uncertainty into mark-recapture-type models for estimating abundance using DNA samples. *Biometrics* 65, 833–840.
- Yamaura, Y., Royle, J.A., Kubio, K., Tada, T., Ikeno, S., Makino, S., 2011. Modelling community dynamics based on species-level abundance models from detection/nondetection data. *J. Appl. Ecol.* 48, 67–75.
- Yoshizaki, J., Pollock, K.H., Brownie, C., Webster, R.A., 2009. Modeling misidentification errors in capture-recapture studies using photographic identification of evolving marks. *Ecology* 90, 3–9.
- Zheng, C., Ovaskainen, O., Saastamoinen, M., Hanski, I., 2007. Age-dependent survival analyzed with Bayesian models of mark-recapture data. *Ecology* 88, 1970–1976.
- Zipkin, E.F., DeWan, A., Royle, J.A., 2009. Impacts of forest fragmentation on species richness: a hierarchical approach to community modelling. *J. Appl. Ecol.* 46, 815–822.
- Zipkin, E.F., Royle, J.A., Dawson, D.K., Bates, S., 2010. Multi-species occurrence models to evaluate the effects of conservation and management actions. *Biol. Cons.* 143, 479–484.

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