

BIOL 823 DEMOGRAPHIC METHODS - FALL 2006

Useful texts on reserve in Hale Library

Mark-recapture statistics

Armstrup, S.C., T.L. McDonald, and B.F.J. Manly. 2005. Handbook of capture-recapture analysis. Princeton University Press, Princeton, New Jersey.

Williams, B.K., J.D. Nichols, and M.J. Conroy. 2002. Analysis and management of animal populations: modeling, estimation, and decision making. Academic Press, San Diego, California.

Matrix models

Caswell, H. 2001. Matrix population models: construction, analysis, and interpretation. Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts.

Ebert, T.A. 1999. Plant and animal populations: methods in demography. Academic Press, San Diego, USA.

Morris, W.F., and D.F. Doak. 2002. Quantitative conservation biology: theory and practice of population viability analysis. Sinauer Associates, Sunderland, Massachusetts.

Week 1. Introduction to mark-recapture statistics

Nichols, J.D. 1992. Capture-recapture models. Using marked animals to study population dynamics. *Bioscience* 42:94-102.

Sandercock, B.K. 2003. Estimation of survival rates for wader populations: a review of mark-recapture methods. *Wader Study Group Bulletin* 100:163-174.

Sandercock, B.K. 2006. Estimation of demographic parameters from live encounter data: a summary review. *Journal of Wildlife Management*, in press.

Week 2. Model selection

Johnson, J.B., and K.S. Omland. 2004. Model selection in ecology and evolution. *Trends in Ecology and Evolution* 19:101-108.

Paton, P.W.C. 1994. Survival estimates for Snowy Plovers breeding at Great Salt Lake, Utah. *Condor* 96:1106-1109.

Stephens, P.A., S.W. Buskirk, G.D. Hayward, and C. Martínez del Río. 2005. Information theory and hypothesis testing: a call for pluralism. *Journal of Animal Ecology* 42:4-12.

Week 3. Model fitting

Lebreton, J.-D., K.P. Burnham, J. Clobert, and D.R. Anderson. 1992. Modeling survival and testing biological hypotheses using marked animals: a unified approach with case studies. *Ecological Monographs* 62:67-118.

Week 4. Advanced models

Sandercock, B.K., and S.R. Beissinger. 2002. Estimating rates of population change for a neotropical parrot with ratio, mark-recapture and matrix methods. *Journal of Applied Statistics* 29:589-607.

Shefferson, R.P., J. Proper, S.R. Beissinger, and E.L. Simms. 2003. Life history trade-offs in a rare orchid: the costs of flowering, dormancy, and sprouting. *Ecology* 84:1199-1206.

Week 5. Testing for overdispersion

Anderson, D.R., K.P. Burnham, and G.C. White. 1994. AIC model selection in overdispersed capture-recapture data. *Ecology* 75:1780-1793.

Week 6. *No reading*

Week 7. Model averaging and variance components

Gould, W.R., and J.D. Nichols. 1998. Estimation of temporal variability of survival in animal populations. *Ecology* 79:2531-2538.

White, G.C., K.P. Burnham, and D.R. Anderson. 2001. Advanced features of Program Mark. Pages 368-377 in *Wildlife, land, and people: priorities for the 21st century* (R. Field, R.J. Warren, H. Okarma, and P.R. Sievert, Eds.). The Wildlife Society, Bethesda, MD.

Weeks 8 and 9. *No reading*

Week 10. Introduction to demographic models

Beissinger, S.R., and M.I. Westphal. 1998. On the use of demographic models of population viability in endangered species management. *Journal of Wildlife Management* 62:821-841.

Week 11. Life cycle diagrams and projection matrices

de Kroon, H., J. van Groenendael, and J. Ehrlén. 2000. Elasticities: a review of methods and model limitations. *Ecology* 81:607-618.

Sæther, B.-E., and Ø. Bakke. 2000. Avian life history variation and contribution of demographic traits to the population growth rate. *Ecology* 81:642-653.

Week 12. Analytical estimation of sensitivity and elasticity

Brault, S., and H. Caswell. 1993. Pod-specific demography of killer whales (*Orcinus orca*). *Ecology* 74:1444-1454.

Hiraldo, F., J.J. Negro, J.A. Donázar, and P. Gaona. 1996. A demographic model for a population of the endangered Lesser Kestrel in southern Spain. *Journal of Applied Ecology* 33:1085-1093.

Week 13. Loop analysis and lower-level elasticities

Wardle, G.M. 1998. A graph theory approach to demographic loop analysis. *Ecology* 79:2539-2549.

Week 14. *No readings.*

Week 15. Life-stage simulation analyses (LSA) and life-table response experiments (LTRE)

Caswell, H. 1996. Analysis of life table response experiments. II. Alternative parameterizations for size- and stage-structured models. *Ecological Modelling* 88:73-82.

Wisdom, M.J., L.S. Mills, and D.F. Doak. 2000. Life-stage simulation analysis: estimating vital-rate effects on population growth for conservation. *Ecology* 81:628-641.

Week 16. Stochastic matrix models and variance of population growth

Fieberg, J., and S.P. Ellner. 2001. Stochastic matrix models for conservation and management: a comparative review of methods. *Ecology Letters* 4:244-266.

Kaye, T.N., and D.A. Pyke. 2003. The effect of stochastic technique on estimates of population viability from transition matrix models. *Ecology* 84:1464-1476.