

Eric Rexstad

SENIOR RESEARCH FELLOW

Centre for Research into Ecological and Environmental Modelling, University of St Andrews

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Education

Colorado State University

WILDLIFE BIOLOGY PHD. WILDLIFE ECOLOGY

Fort Collins CO

1984 - 1990

Utah State University

WILDLIFE MANAGEMENT M.S. WILDLIFE ECOLOGY

Logan UT

1979 - 1981

Luther College

COMPUTER SCIENCE B.A.

Decorah IA

1975 - 1979

Experience

Centre for Research into Ecological and Environmental Modelling

University of St Andrews

SENIOR RESEARCH FELLOW

2005-present

- Member- Distance software development team
- Organiser international distance sampling training workshops
- Head of Research Unit for Wildlife Population Assessment (2008-2012)
- Lecturer (2006-2017), e.g., Honours modules in statistical computing and post-graduate modules in estimating animal abundance

Institute of Arctic Biology and Dept. Biology and Wildlife

University of Alaska Fairbanks

ASSISTANT/ASSOCIATE PROFESSOR OF WILDLIFE BIOLOGY

1991-2005

- Mentored masters students
- Supervised field investigations (e.g., microtine rodents, snowshoe hares, white-fronted geese)
- Lecturer (e.g., undergraduate wildlife management and graduate-level vertebrate population analysis)

Colorado Cooperative Fish and Wildlife Research Unit

Colorado State University

POST-DOCTORAL RESEARCH FELLOW

1990-1991

- Programmer - Revised programme CAPTURE to incorporate additional estimators and provide graphic user interface

Colorado Cooperative Fish and Wildlife Research Unit

Colorado State University

DOCTORAL CANDIDATE

1984-1990

- Dissertation: Models of exploitation and heterogeneity in survival probabilities of banded waterfowl populations
- Teaching assistant: graduate-level vertebrate population analysis
- Lecturer: Introductory ecology

Department of Fisheries and Wildlife

Oregon State University

RESEARCH ASSISTANT

1982-1984

- Programmer and analyst of fisheries data
- Scientific crew member, National Marine Fisheries Service Groundfish Survey
- Lecturer: undergraduate marine fisheries course

Department of Wildlife

Utah State University

MASTERS DEGREE CANDIDATE

1979-1982

- Thesis title: Simplification techniques applied to a population bioenergetics model
- Teaching assistant: introductory natural resources
- Teaching assistant: natural resource quantitative analysis

Publications

REFEREED JOURNAL ARTICLES

1. Miller, D, E Rexstad, L Thomas, L Marshall, and J Laake (2019). Distance Sampling in R. *Journal of Statistical Software, Articles* **89**(1), 1–28.
2. Schmidt, JH, EA Rexstad, CA Roland, CL McIntyre, MC MacCluskie, and MJ Flamme (2018). Weather-driven change in primary productivity explains variation in the amplitude of two herbivore population cycles in a boreal system. *Oecologia* **186**(2), 435–446.
3. Marques, TA, L Thomas, M Kéry, ST Buckland, DL Borchers, E Rexstad, RM Fewster, DI MacKenzie, JA Royle, G Guillera-Arroita, et al. (2017). Model-based approaches to deal with detectability: a comment on Hutto (2016a). *Ecological Applications* **27**(5), 1694–1698.
4. Williams, R, E Ashe, K Gaut, R Gryba, JE Moore, E Rexstad, D Sandilands, J Steventon, and RR Reeves (2017). Animal Counting Toolkit: a practical guide to small-boat surveys for estimating abundance of coastal marine mammals. *Endangered Species Research* **34**, 149–165.

5. Winiarski, KJ, ML Burt, E Rexstad, DL Miller, CL Trocki, PW Paton, and SR McWilliams (2014). Integrating aerial and ship surveys of marine birds into a combined density surface model: A case study of wintering Common Loons. *The Condor* **116**(2), 149–161.
6. Gimenez, O, ST Buckland, BJ Morgan, N Bez, S Bertrand, R Choquet, S Dray, MP Etienne, R Fewster, F Gosselin, et al. (2014). Statistical ecology comes of age. *Biology Letters* **10**(12), 20140698.
7. Miller, DL, ML Burt, EA Rexstad, and L Thomas (2013). Spatial models for distance sampling data: recent developments and future directions. *Methods in Ecology and Evolution* **4**(11), 1001–1010.
8. Buckland, ST, ML Burt, EA Rexstad, M Mellor, AE Williams, and R Woodward (2012). Aerial surveys of seabirds: the advent of digital methods. *Journal of Applied Ecology* **49**(4), 960–967.
9. Salgado Kent, C, C Jenner, M Jenner, P Bouchet, and E Rexstad (2012). Southern Hemisphere breeding stock'D'humpback whale population estimates from North West Cape, Western Australia. *Journal of Cetacean Research and Management* **12**(1), 29–38.
10. Thomas, L, ST Buckland, EA Rexstad, JL Laake, S Strindberg, SL Hedley, JR Bishop, TA Marques, and KP Burnham (2010). Distance software: design and analysis of distance sampling surveys for estimating population size. *Journal of Applied Ecology* **47**(1), 5–14.
11. Buckland, ST, AJ Plumptre, L Thomas, and EA Rexstad (2010). Design and analysis of line transect surveys for primates. *International Journal of Primatology* **31**(5), 833–847.
12. Buckland, ST, AJ Plumptre, L Thomas, and EA Rexstad (2010). Line transect sampling of primates: can animal-to-observer distance methods work? *International Journal of Primatology* **31**(3), 485–499.
13. Newson, SE, EA Rexstad, SR Baillie, ST Buckland, and NJ Aebischer (2010). Population change of avian predators and grey squirrels in England: is there evidence for an impact on avian prey populations? *Journal of Applied Ecology* **47**(2), 244–252.
14. Phillips, LM, AN Powell, EJ Taylor, and EA Rexstad (2007). Use of the Beaufort Sea by king eiders breeding on the North Slope of Alaska. *The Journal of Wildlife Management* **71**(6), 1892–1898.
15. Phillips, LM, AN Powell, and EA Rexstad (2006). Large-scale movements and habitat characteristics of king eiders throughout the nonbreeding period. *The Condor* **108**(4), 887–900.
16. Schmidt, JH, EJ Taylor, and EA Rexstad (2006). Survival of common goldeneye ducklings in interior Alaska. *The Journal of Wildlife Management* **70**(3), 792–798.
17. Hjältén, J, O Atlegrim, F Sandström, R Pettersson, and EA Rexstad (2006). Occurrence of flat bugs (Heteroptera: Aradidae) in burned and unburned forests. *Entomologica Fennica* **17**(2), 130.
18. McDonough, TJ and E Rexstad (2005). Short-term demographic response of the red-backed vole to spruce beetle infestations in Alaska. *The Journal of Wildlife Management* **69**(1), 246–254.
19. Burch, JW, LG Adams, EH Follmann, and EA Rexstad (2005). Evaluation of wolf density estimation from radiotelemetry data. *Wildlife Society Bulletin* **33**(4), 1225–1236.
20. Schmidt, JH, EJ Taylor, and EA Rexstad (2005). Incubation behaviors and patterns of nest attendance in Common Goldeneyes in interior Alaska. *Condor*, 167–172.
21. Parmenter, RR, TL Yates, DR Anderson, KP Burnham, JL Dunnum, AB Franklin, MT Friggens, BC Lubow, M Miller, GS Olson, et al. (2003). Small-mammal density estimation: a field comparison of grid-based vs. web-based density estimators. *Ecological Monographs* **73**(1), 1–26.
22. Hastings, K, J Testa, and E Rexstad (1999). Interannual variation in survival of juvenile Weddell seals (*Leptonychotes weddellii*) from McMurdo Sound, Antarctica: effects of cohort, sex and age. *Journal of Zoology* **248**(3), 307–323.
23. Zuercher, GL, DD Roby, and EA Rexstad (1999). Seasonal changes in body mass, composition, and organs of northern red-backed voles in interior Alaska. *Journal of Mammalogy* **80**(2), 443–459.
24. Ward, DH, EA Rexstad, JS Sedinger, MS Lindberg, and NK Dawe (1997). Seasonal and annual survival of adult Pacific brant. *The Journal of Wildlife Management*, 773–781.
25. Kohira, M and EA Rexstad (1997). Diets of wolves, *Canis lupus*, in logged and unlogged forests of southeastern Alaska. *Canadian Field-Naturalist*. **111**(3), 429–435.
26. Sedinger, JS, MS Lindberg, EA Rexstad, ND Chelgren, and DH Ward (1997). Testing for handling bias in survival estimation for Black Brant. *The Journal of Wildlife Management*, 782–791.
27. Zuercher, GL, DD Roby, and EA Rexstad (1997). Validation of two new total body electrical conductivity (TOBEC) instruments for estimating body composition of live northern red-backed voles *Clethrionomys rutilus*. *Acta Theriologica* **42**(4), 387–397.
28. Lindberg, MS, JS Sedinger, and EA Rexstad (1995). Estimating nest site fidelity of adult female black brant with multi-state modeling and geographic information systems. *Journal of Applied Statistics* **22**(5-6), 725–736.
29. Schmutz, JA, DH Ward, JS Sedinger, and EA Rexstad (1995). Survival estimation and the effects of dependency among animals. *Journal of Applied Statistics* **22**(5-6), 673–682.
30. Sedinger, JS and EA Rexstad (1994). Do restrictive harvest regulations result in higher survival rates in mallards? A comment. *The Journal of Wildlife Management*, 571–577.

31. Burnham, KP and EA Rexstad (1993). Modeling heterogeneity in survival rates of banded waterfowl. *Biometrics*, 1194–1208.
32. Rexstad, EA (1992). Effect of hunting on annual survival of Canada geese in Utah. *The Journal of Wildlife Management*, 297–305.
33. Rexstad, EA and DR Anderson (1992). Heterogeneous survival rates of mallards (*Anas platyrhynchos*). *Canadian Journal of Zoology* **70**(10), 1878–1885.
34. Szymczak, MR and EA Rexstad (1991). Harvest distribution and survival of a gadwall population. *The Journal of Wildlife Management*, 592–600.
35. Rexstad, EA, DR Anderson, and KP Burnham (1991). Lack of sex-selectivity in harvest of mallards under the point system. *The Journal of wildlife management*, 586–592.
36. Rexstad, EA, DD Miller, CH Flather, EM Anderson, JW Hupp, and DR Anderson (1990). Questionable multivariate statistical inference in wildlife habitat and community studies: a reply. *The Journal of Wildlife Management* **54**(1), 189–193.
37. Rexstad, EA and DR Anderson (1988). Effect of the point system on redistributing hunting pressure on mallards. *The Journal of Wildlife Management*, 89–94.
38. Bond, CE, E Rexstad, and RM Hughes (1988). Habitat use of twenty-five common species of Oregon freshwater fishes. *Northwest Science* **62**(5).
39. Rexstad, EA, DD Miller, CH Flather, EM Anderson, JW Hupp, and DR Anderson (1988). Questionable multivariate statistical inference in wildlife habitat and community studies. *The Journal of Wildlife Management* **52**(4), 794–798.
40. Hughes, RM, E Rexstad, and CE Bond (1987). The relationship of aquatic ecoregions, river basins and physiographic provinces to the ichthyogeographic regions of Oregon. *Copeia*, 423–432.
41. Rexstad, EA and EK Pikitch (1986). Stomach contents and food consumption estimates of Pacific hake, *Merluccius productus*. *Fishery Bulletin* **84**(4), 947–956.
42. Rexstad, E and GS Innis (1985). Model simplification—three applications. *Ecological Modelling* **27**(1-2), 1–13.
43. Innis, G and E Rexstad (1983). Simulation model simplification techniques. *Simulation* **41**(1), 7–15.

BOOKS

1. Buckland, S, E Rexstad, T Marques, and C Oedekoven (2015). *Distance sampling: methods and applications*. Springer.

TECHNICAL REPORTS

1. Scott-Hayward, L, C Oedekoven, M Mackenzie, C Walker, and E Rexstad (2014). *Using the MRSea Package (v0. 1.2)*. Tech. rep.
2. Paxton, CG, LAS Scott-Hayward, and EA Rexstad (2014). *Review of available statistical approaches to help identify Marine Protected Areas for cetaceans and basking shark*. Tech. rep.
3. Scott-Hayward, L, C Oedekoven, M Mackenzie, and E Rexstad (2013). *Using the MRSea Package*. Tech. rep.
4. Mackenzie, M, L Scott-Hayward, C Oedekoven, H Skov, E Humphreys, and E Rexstad (2013). *Statistical Modelling of Seabird and Cetacean data: Guidance Document*. Tech. rep.
5. Oedekoven, C, M Mackenzie, L Scott-Hayward, and E Rexstad (2013). *Statistical Modelling of Seabird and Cetacean data: Literature Review*. Tech. rep.
6. Rexstad, E and S Buckland (2012). *Displacement analysis: boat surveys Kentish Flats*. Tech. rep.
7. Petersen, IK, ML MacKenzie, E Rexstad, MS Wysz, and AD Fox (2011). *Comparing pre-and post-construction distributions of long-tailed ducks *Clangula hyemalis* in and around the Nysted offshore wind farm, Denmark: a quasi-designed experiment accounting for imperfect detection, local surface features and autocorrelation*. Tech. rep.
8. Paxton, C, M Mackenzie, M Burt, E Rexstad, and L Thomas (2011). *Phase II Data Analysis of Joint Cetacean Protocol Data Resource*. Tech. rep. C11-0207, p. 0421.
9. Burt, L, E Rexstad, and S Buckland (2010). *Comparison of design-and model-based estimates of seabird abundance derived from visual, digital still transects and digital video aerial surveys in Carmarthen Bay St*. Tech. rep., pp. 978–.
10. Burt, L, E Rexstad, and S Buckland (2009). *Comparison of visual and digital aerial survey results of avian abundance for Round 3, Norfolk Region*. Tech. rep.
11. Rexstad, E and ST Buckland (2009). *Comparison of aerial survey methods for estimating abundance of common scoters*. Tech. rep.
12. Rexstad, E and S Buckland (2008). *Review on sea turtle impacts from Hawaiian longline fisheries*. Tech. rep. Center for Independent Experts (CIE).
13. Thomas, L, DL Borchers, E Rexstad, ST Buckland, ML Bravington, SN Wood, SL Hedley, J Gordari, D Gillespie, J Matthews, et al. (2008). *Development of new methods and software for distance sampling surveys of cetacean populations*. Tech. rep. University of St Andrews.
14. Rexstad, E (2007). *Non-uniform coverage estimators for distance sampling*. Tech. rep.
15. Rexstad, E (2007). *Point and interval estimates of abundance using multiple covariate distance sampling: an example using great bustards*. Tech. rep.

16. Powell, AN, LM Phillips, EA Rexstad, and EJ Taylor (2003). *Importance of the Alaskan Beaufort Sea to king eiders (Somateria spectabilis)*. Tech. rep., p. 12.
17. Rexstad, E and E Debevec (2001). *Small mammal monitoring at the landscape scale: Denali National Park and Preserve*. Tech. rep.
18. Rexstad, E and E Debevec (1999). *Draft Study Plan for Synthesis and Integration: Denali Long-term Ecological Monitoring*. Tech. rep.
19. Rexstad, E and E Debevec (1999). *Scaling up of small mammal research in Denali National Park and Preserve*. Tech. rep.
20. Furtch, P and EA Rexstad (1993). *Establishment of sampling protocol for small mammal monitoring in Denali National Park and Preserve*. Tech. rep.
21. Cook, JA and EA Rexstad (1992). *Sampling Protocol for Small Mammal Monitoring in Denali National Park and Preserve*. Tech. rep.

BOOK CHAPTERS AND PROCEEDINGS

1. Buckland, S, DL Miller, and E Rexstad (Aug. 2019). "Distance Sampling". In: *Quantitative Analyses in Wildlife Science*. Ed. by L Brennan, B Marcot, and A Tri. Johns Hopkins University Press. Chap. 6, pp.97–112.
2. Buckland, ST, E Rexstad, L Thomas, and DL Borchers (2016). "Distance sampling surveys of population size: enabling better decision-making by wildlife managers". In: *UK Success stories in industrial mathematics*. Springer, Cham, pp.45–51.
3. Marques, TA, ST Buckland, DL Borchers, E Rexstad, and L Thomas (2011). "Distance sampling". In: *International Encyclopedia of Statistical Science*. Springer, Berlin, Heidelberg, pp.398–400.
4. Laake, J and E Rexstad (2010). "RMark—an alternative approach to building linear models in MARK". In: *Program MARK: a gentle introduction*. Ed. by E Cooch and G White, pp.C1–C113.
5. Chapin, FS, D McGuire, RW Ruess, MW Walker, RD Boone, ME Edwards, BP Finney, LD Hinzman, JB Jones, GP Juday, et al. (2006). "Summary and synthesis: Past and future changes in the Alaskan boreal forest." In: *Alaska's Changing Boreal Forest*. Ed. by FS Chapin, MW Oswood, K van Cleve, LA Viereck, and DL Verbyla. Oxford University Press.
6. Rexstad, E and K Kielland (2006). "Mammalian herbivore population dynamics in the Alaskan boreal forest". In: *Alaska's Changing Boreal Forest*. Ed. by FS Chapin, MW Oswood, K van Cleve, LA Viereck, and DL Verbyla. Oxford University Press, pp.121–132.
7. Lindberg, M and E Rexstad (2002). "Capture-recapture sampling designs". In: *Encyclopedia of Environmetrics*. Vol. 1, pp.251–262.
8. Oakley, KL, EM Debevec, and EA Rexstad (1999). Development of a long-term ecological monitoring program in Denali National Park and Preserve, Alaska (USA). In: *North American Science Symposium: Toward a Unified Framework for Inventorying and Monitoring Forest Ecosystem Resources*. US Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO, pp.307–314.
9. Rexstad, E (1994). Detecting differences in wildlife populations across time and space. In: *Transactions of the North American Natural Resources and Wildlife Conference*. Vol. 59, pp.219–228.
10. Li, HW, C Schreck, C Bond, and E Rexstad (1987). "Community and evolutionary ecology of North American stream fishes". In: University of Oklahoma Press, Norman. Chap. Factors influencing changes in fish assemblages of Pacific Northwest streams, pp. 193–202.

SOFTWARE

1. Miller, DL, E Rexstad, L Burt, MV Bravington, S Hedley, and A Model (2018). *Package 'dsm'*.
2. Thomas, L (2009). *Distance 6.0. Release 2*. Research Unit for Wildlife Population Assessment, University of St. Andrews.
3. Thomas, L, J Laake, S Strindberg, F Marques, S Buckland, D Borchers, D Anderson, K Burnham, S Hedley, J Pollard, et al. (2006). *Distance 5.0. Release*.
4. Rexstad, E and KP Burnham (1991). *User's guide for interactive program CAPTURE*. Colorado Cooperative Fish and Wildlife Research Unit.