

Eric Rexstad

SENIOR RESEARCH FELLOW

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

☎ +44 (0)1334 461833 | ✉ eric.rexstad@st-andrews.ac.uk | 🏠 erex.github.io

Education

Colorado State University

PH.D. WILDLIFE ECOLOGY

Fort Collins CO

1984-1990

Utah State University

M.S. WILDLIFE ECOLOGY

Logan UT

1979-1981

Luther College

B.A. COMPUTER SCIENCE

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. Rexstad, E., Buckland, S., Marshall, L., & Borchers, D. (2023). Pooling robustness in distance sampling: Avoiding bias when there is unmodelled heterogeneity. *Ecology and Evolution*, 13(1), e9684. <https://doi.org/https://doi.org/10.1002/ece3.9684>
2. Miller, D., Rexstad, E., Thomas, L., Marshall, L., & Laake, J. (2019). Distance sampling in r. *Journal of Statistical Software, Articles*, 89(1), 1-28. <https://doi.org/10.18637/jss.v089.i01>
3. Schmidt, J. H., Rexstad, E. A., Roland, C. A., McIntyre, C. L., MacCluskie, M. C., & Flamme, M. J. (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. <https://doi.org/10.1007/s00442-017-4004-3>

4. Marques, T. A., Thomas, L., Kéry, M., Buckland, S. T., Borchers, D. L., Rexstad, E., Fewster, R. M., MacKenzie, D. I., Royle, J. A., Guillera-Aroita, G., et al. (2017). Model-based approaches to deal with detectability: A comment on hutto (2016a). *Ecological Applications*, 27(5), 1694–1698. <https://doi.org/10.1002/eap.1553>
5. Williams, R., Ashe, E., Gaut, K., Gryba, R., Moore, J. E., Rexstad, E., Sandilands, D., Steventon, J., & Reeves, R. R. (2017). Animal counting toolkit: A practical guide to small-boat surveys for estimating abundance of coastal marine mammals. *Endangered Species Research*, 34, 149–165. <https://doi.org/10.3354/esr00845>
6. Gimenez, O., Buckland, S. T., Morgan, B. J., Bez, N., Bertrand, S., Choquet, R., Dray, S., Etienne, M.-P., Fewster, R., Gosselin, F., et al. (2014). Statistical ecology comes of age. *Biology Letters*, 10(12), 20140698. <https://doi.org/10.1098/rsbl.2014.0698>
7. Winiarski, K. J., Burt, M. L., Rexstad, E., Miller, D. L., Trocki, C. L., Paton, P. W., & McWilliams, S. R. (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. <https://doi.org/10.1650/condor-13-085.1>
8. Miller, D. L., Burt, M. L., Rexstad, E. A., & Thomas, L. (2013). Spatial models for distance sampling data: Recent developments and future directions. *Methods in Ecology and Evolution*, 4(11), 1001–1010. <https://doi.org/10.1111/2041-210x.12105>
9. Buckland, S. T., Burt, M. L., Rexstad, E. A., Mellor, M., Williams, A. E., & Woodward, R. (2012). Aerial surveys of seabirds: The advent of digital methods. *Journal of Applied Ecology*, 49(4), 960–967. <https://doi.org/10.1111/j.1365-2664.2012.02150.x>
10. Salgado Kent, C., Jenner, C., Jenner, M., Bouchet, P., & Rexstad, E. (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. <https://doi.org/10.31230/osf.io/m94xh>
11. Buckland, S. T., Plumptre, A. J., Thomas, L., & Rexstad, E. A. (2010). Design and analysis of line transect surveys for primates. *International Journal of Primatology*, 31(5), 833–847. <https://doi.org/10.1007/s10764-010-9431-5>
12. Buckland, S. T., Plumptre, A. J., Thomas, L., & Rexstad, E. A. (2010). Line transect sampling of primates: Can animal-to-observer distance methods work? *International Journal of Primatology*, 31(3), 485–499. <https://doi.org/10.1007/s10764-010-9408-4>
13. Newson, S. E., Rexstad, E. A., Baillie, S. R., Buckland, S. T., & Aebischer, N. J. (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. <https://doi.org/10.1111/j.1365-2664.2010.01771.x>
14. Thomas, L., Buckland, S. T., Rexstad, E. A., Laake, J. L., Strindberg, S., Hedley, S. L., Bishop, J. R., Marques, T. A., & Burnham, K. P. (2010). Distance software: Design and analysis of distance sampling surveys for estimating population size. *Journal of Applied Ecology*, 47(1), 5–14. <https://doi.org/10.1111/j.1365-2664.2009.01737.x>
15. Phillips, L. M., Powell, A. N., Taylor, E. J., & Rexstad, E. A. (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. <https://doi.org/10.2193/2005-636>
16. Hjältèn, J., Atlegrim, O., Sandström, F., Pettersson, R., & Rexstad, E. A. (2006). Occurrence of flat bugs (heteroptera: Aradidae) in burned and unburned forests. *Entomologica Fennica*, 17(2), 130. <https://doi.org/10.33338/ef.84299>
17. Phillips, L. M., Powell, A. N., & Rexstad, E. A. (2006). Large-scale movements and habitat characteristics of king eiders throughout the nonbreeding period. *The Condor*, 108(4), 887–900. <https://doi.org/10.1093/condor/108.4.887>
18. Schmidt, J. H., Taylor, E. J., & Rexstad, E. A. (2006). Survival of common goldeneye ducklings in interior alaska. *The Journal of Wildlife Management*, 70(3), 792–798. [https://doi.org/10.2193/0022-541x\(2006\)70%5B792:socgdi%5D2.0.co;2](https://doi.org/10.2193/0022-541x(2006)70%5B792:socgdi%5D2.0.co;2)
19. Burch, J. W., Adams, L. G., Follmann, E. H., & Rexstad, E. A. (2005). Evaluation of wolf density estimation from radiotelemetry data. *Wildlife Society Bulletin*, 33(4), 1225–1236. [https://doi.org/10.2193/0091-7648\(2005\)33%5B1225:eowdef%5D2.0.co;2](https://doi.org/10.2193/0091-7648(2005)33%5B1225:eowdef%5D2.0.co;2)
20. McDonough, T. J., & Rexstad, E. (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. [https://doi.org/10.2193/0022-541x\(2005\)069%3C0246:sdrot%3E2.0.co;2](https://doi.org/10.2193/0022-541x(2005)069%3C0246:sdrot%3E2.0.co;2)
21. Schmidt, J. H., Taylor, E. J., & Rexstad, E. A. (2005). Incubation behaviors and patterns of nest attendance in common goldeneyes in interior alaska. *Condor*, 167–172. <https://doi.org/10.1093/condor/107.1.167>
22. Parmenter, R. R., Yates, T. L., Anderson, D. R., Burnham, K. P., Dunnum, J. L., Franklin, A. B., Friggens, M. T., Lubow, B. C., Miller, M., Olson, G. S., et al. (2003). Small-mammal density estimation: A field comparison of grid-based vs. Web-based density estimators. *Ecological Monographs*, 73(1), 1–26. [https://doi.org/10.1890/0012-9615\(2003\)073%5B0001:smdeaf%5D2.0.co;2](https://doi.org/10.1890/0012-9615(2003)073%5B0001:smdeaf%5D2.0.co;2)
23. Hastings, K., Testa, J., & Rexstad, E. (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.
24. Zuercher, G. L., Roby, D. D., & Rexstad, E. A. (1999). Seasonal changes in body mass, composition, and organs of northern red-backed voles in interior alaska. *Journal of Mammalogy*, 80(2), 443–459. <https://doi.org/10.2307/1383292>
25. Kohira, M., & Rexstad, E. A. (1997). Diets of wolves, *canis lupus*, in logged and unlogged forests of southeastern alaska. *Canadian Field-Naturalist*, 111(3), 429–435.

26. Sedinger, J. S., Lindberg, M. S., Rexstad, E. A., Chelgren, N. D., & Ward, D. H. (1997). Testing for handling bias in survival estimation for black brant. *The Journal of Wildlife Management*, 782–791. <https://doi.org/10.2307/3802185>
27. Ward, D. H., Rexstad, E. A., Sedinger, J. S., Lindberg, M. S., & Dawe, N. K. (1997). Seasonal and annual survival of adult pacific brant. *The Journal of Wildlife Management*, 773–781. <https://doi.org/10.2307/3802184>
28. Zuercher, G. L., Roby, D. D., & Rexstad, E. A. (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. <https://doi.org/10.4098/at.arch.97-38>
29. Lindberg, M. S., Sedinger, J. S., & Rexstad, E. A. (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. <https://doi.org/10.1080/02664769524577>
30. Schmutz, J. A., Ward, D. H., Sedinger, J. S., & Rexstad, E. A. (1995). Survival estimation and the effects of dependency among animals. *Journal of Applied Statistics*, 22(5-6), 673–682. <https://doi.org/10.1080/02664769524531>
31. Sedinger, J. S., & Rexstad, E. A. (1994). Do restrictive harvest regulations result in higher survival rates in mallards? A comment. *The Journal of Wildlife Management*, 571–577.
32. Burnham, K. P., & Rexstad, E. A. (1993). Modeling heterogeneity in survival rates of banded waterfowl. *Biometrics*, 1194–1208. <https://doi.org/10.2307/2532261>
33. Rexstad, E. A. (1992). Effect of hunting on annual survival of canada geese in utah. *The Journal of Wildlife Management*, 297–305. <https://doi.org/10.2307/3808826>
34. Rexstad, E. A., & Anderson, D. R. (1992). Heterogeneous survival rates of mallards (*anas platyrhynchos*). *Canadian Journal of Zoology*, 70(10), 1878–1885.
35. Rexstad, E. A., Anderson, D. R., & Burnham, K. P. (1991). Lack of sex-selectivity in harvest of mallards under the point system. *The Journal of Wildlife Management*, 586–592. <https://doi.org/10.2307/3809503>
36. Szymczak, M. R., & Rexstad, E. A. (1991). Harvest distribution and survival of a gadwall population. *The Journal of Wildlife Management*, 592–600. <https://doi.org/10.2307/3809504>
37. Rexstad, E. A., Miller, D. D., Flather, C. H., Anderson, E. M., Hupp, J. W., & Anderson, D. R. (1990). Questionable multivariate statistical inference in wildlife habitat and community studies: A reply. *The Journal of Wildlife Management*, 54(1), 189–193. <https://doi.org/10.2307/3808921>
38. Bond, C. E., Rexstad, E., & Hughes, R. M. (1988). Habitat use of twenty-five common species of oregon freshwater fishes. *Northwest Science*, 62(5).
39. Rexstad, E. A., Miller, D. D., Flather, C. H., Anderson, E. M., Hupp, J. W., & Anderson, D. R. (1988). Questionable multivariate statistical inference in wildlife habitat and community studies. *The Journal of Wildlife Management*, 52(4), 794–798. <https://doi.org/10.2307/3800948>
40. Rexstad, E. A., & Anderson, D. R. (1988). Effect of the point system on redistributing hunting pressure on mallards. *The Journal of Wildlife Management*, 89–94. <https://doi.org/10.2307/3801065>
41. Hughes, R. M., Rexstad, E., & Bond, C. E. (1987). The relationship of aquatic ecoregions, river basins and physiographic provinces to the ichthyogeographic regions of oregon. *Copeia*, 423–432. <https://doi.org/10.2307/1445780>
42. Rexstad, E. A., & Pikitch, E. K. (1986). Stomach contents and food consumption estimates of pacific hake, *merluccius productus*. *Fishery Bulletin*, 84(4), 947–956.
43. Rexstad, E., & Innis, G. S. (1985). Model simplification—three applications. *Ecological Modelling*, 27(1-2), 1–13. [https://doi.org/10.1016/0304-3800\(85\)90021-3](https://doi.org/10.1016/0304-3800(85)90021-3)
44. Innis, G., & Rexstad, E. (1983). Simulation model simplification techniques. *Simulation*, 41(1), 7–15. <https://doi.org/10.1177/003754978304100101>

BOOKS

1. Buckland, S., Rexstad, E., Marques, T., & Oedekoven, C. (2015). *Distance sampling: Methods and applications*. Springer. <https://doi.org/10.1007/978-3-319-19219-2>

TECHNICAL REPORTS

1. Scott-Hayward, L., Oedekoven, C., Mackenzie, M., Walker, C., & Rexstad, E. (2014). *Using the MRSea package (v0. 1.2)*.
2. Paxton, C. G., Scott-Hayward, L. A. S., & Rexstad, E. A. (2014). *Review of available statistical approaches to help identify marine protected areas for cetaceans and basking shark*. Scottish Natural Heritage, Policy; Advice Directorate.
3. Scott-Hayward, L., Oedekoven, C., Mackenzie, M., & Rexstad, E. (2013). *Using the MRSea package*.

4. Mackenzie, M., Scott-Hayward, L., Oedekoven, C., Skov, H., Humphreys, E., & Rexstad, E. (2013). Statistical modelling of seabird and cetacean data: Guidance document. In *Report SB9 (CR/2012/05)*, Centre for Research into Ecological and Environmental Modelling, University of St Andrews, St Andrews.
5. Oedekoven, C., Mackenzie, M., Scott-Hayward, L., & Rexstad, E. (2013). Statistical modelling of seabird and cetacean data: Literature review. In *Report SB9 (CR/2012/05)*. St Andrews: Centre for Research into Ecological and Environmental Modelling, University of St Andrews.
6. Rexstad, E., & Buckland, S. (2012). *Displacement analysis: Boat surveys kentish flats*.
7. Petersen, I. K., MacKenzie, M. L., Rexstad, E., Wisz, M. S., & Fox, A. D. (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*. University of St Andrews.
8. Paxton, C., Mackenzie, M., Burt, M., Rexstad, E., & Thomas, L. (2011). Phase II data analysis of joint cetacean protocol data resource. In *Report to Joint Nature Conservation Committee Contract (No. C11-0207; p. 0421)*.
9. Burt, L., Rexstad, E., & Buckland, S. (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. In *COWRIE Ltd. ISBN (pp. 978–970)*.
10. Burt, L., Rexstad, E., & Buckland, S. (2009). Comparison of visual and digital aerial survey results of avian abundance for round 3, norfolk region. In *Draft report to Cowrie Ltd*.
11. Rexstad, E., & Buckland, S. T. (2009). *Comparison of aerial survey methods for estimating abundance of common scoters*. CREEM, University of St Andrews.
12. Thomas, L., Borchers, D. L., Rexstad, E., Buckland, S. T., Bravington, M. L., Wood, S. N., Hedley, S. L., Gordari, J., Gillespie, D., Matthews, J., et al. (2008). *Development of new methods and software for distance sampling surveys of cetacean populations*. University of St Andrews.
13. Rexstad, E. (2007). *Non-uniform coverage estimators for distance sampling*. CREEM, University of St Andrews.
14. Rexstad, E. (2007). Point and interval estimates of abundance using multiple covariate distance sampling: An example using great bustards. In *CREEM Technical Report*. CREEM, University of St Andrews.
15. Powell, A. N., Phillips, L. M., Rexstad, E. A., & Taylor, E. J. (2003). Importance of the alaskan beaufort sea to king eiders (*somateria spectabilis*). In *Annual Report No. 11 (p. 12)*. University of Alaska Fairbanks.
16. Rexstad, E., & Debevec, E. (2001). Small mammal monitoring at the landscape scale: Denali national park and preserve. In *2001 Annual Report. Institute of Arctic Biology, University of Alaska, Fairbanks. 27pp*.
17. Rexstad, E., & Debevec, E. (1999). *Draft study plan for synthesis and integration: Denali long-term ecological monitoring*.
18. Rexstad, E., & Debevec, E. (1999). *Scaling up of small mammal research in denali national park and preserve*.
19. Furtch, P., & Rexstad, E. A. (1993). *Establishment of sampling protocol for small mammal monitoring in denali national park and preserve*. University of Alaska–Fairbanks.
20. Cook, J. A., & Rexstad, E. A. (1992). *Sampling protocol for small mammal monitoring in denali national park and preserve*. University of Alaska–Fairbanks.

BOOK CHAPTERS AND PROCEEDINGS

1. Buckland, S., Miller, D. L., & Rexstad, E. (2019). Distance sampling. In L. Brennan, B. Marcot, & A. Tri (Eds.), *Quantitative analyses in wildlife science* (pp. 97–112). Johns Hopkins University Press.
2. Buckland, S. T., Rexstad, E., Thomas, L., & Borchers, D. L. (2016). Distance sampling surveys of population size: Enabling better decision-making by wildlife managers. In *UK success stories in industrial mathematics* (pp. 45–51). Springer, Cham. https://doi.org/10.1007/978-3-319-25454-8_6
3. Marques, T. A., Buckland, S. T., Borchers, D. L., Rexstad, E., & Thomas, L. (2011). Distance sampling. In *International encyclopedia of statistical science* (pp. 398–400). Springer, Berlin, Heidelberg.
4. Laake, J., & Rexstad, E. (2010). RMark—an alternative approach to building linear models in MARK. In E. Cooch & G. White (Eds.), *Program MARK: A gentle introduction* (pp. C1–C113).
5. Chapin, F. S., McGuire, D., Ruess, R. W., Walker, M. W., Boone, R. D., Edwards, M. E., Finney, B. P., Hinzman, L. D., Jones, J. B., Juday, G. P., et al. (2006). Summary and synthesis: Past and future changes in the alaskan boreal forest. In F. S. Chapin, M. W. Oswood, K. van Cleve, L. A. Viereck, & D. L. Verbyla (Eds.), *Alaska's changing boreal forest*. Oxford University Press.
6. Rexstad, E., & Kielland, K. (2006). Mammalian herbivore population dynamics in the alaskan boreal forest. In F. S. Chapin, M. W. Oswood, K. van Cleve, L. A. Viereck, & D. L. Verbyla (Eds.), *Alaska's changing boreal forest* (pp. 121–132). Oxford University Press. <https://doi.org/10.1093/oso/9780195154313.003.0013>

7. Lindberg, M., & Rexstad, E. (2002). Capture-recapture sampling designs. In *Encyclopedia of environmetrics* (Vol. 1, pp. 251–262).
8. Li, H. W., Schreck, C., Bond, C., & Rexstad, E. (1987). Community and evolutionary ecology of north american stream fishes. In *Community and evolutionary ecology of North American stream fishes*. University of Oklahoma Press, Norman (pp. 193–202). University of Oklahoma Press, Norman.

SOFTWARE

1. Miller, D. L., Rexstad, E., Burt, L., Bravington, M. V., Hedley, S., & Model, A. (2018). Package “dsm”.
2. Thomas, L. (2009). Distance 6.0. Release 2. In <http://www.ruwpa.st-and.ac.uk/distance>. Research Unit for Wildlife Population Assessment, University of St. Andrews.
3. Thomas, L., Laake, J., Strindberg, S., Marques, F., Buckland, S., Borchers, D., Anderson, D., Burnham, K., Hedley, S., Pollard, J., et al. (2006). *Distance 5.0*. Release.
4. Rexstad, E., & Burnham, K. P. (1991). *User's guide for interactive program CAPTURE*. Colorado Cooperative Fish; Wildlife Research Unit.

The end _____