



# Eric Rexstad

## Curriculum Vitae

### Education

- 1991 **PhD. Wildlife Ecology**, *Colorado State University*.
- 1981 **M.S. Wildlife Biology**, *Utah State University*.
- 1979 **B.A. Computer Science**, *Luther College*.

### Experience

- 2005–Present **Senior Research Fellow**, *Centre for Research into Ecological and Environmental Modelling*, University of St Andrews.  
Detailed achievements:
  - Member Distance software development team
  - Organiser/lecturer international distance sampling training workshops
  - Head, Research Unit for Wildlife Population Assessment (RUWPA) 2008-2012
  - Lecturer:
    - Modelling ecological dynamics (MT5752)
    - Estimating animal abundance (MT5751)
    - Statistical modelling (MT5753)
    - Computing in statistics (MT4113/3607)
- 1991–2005 **Assistant/Associate Professor Wildlife Ecology**, *Dept. Biology and Wildlife/Institute of Arctic Biology*, University of Alaska Fairbanks.  
Detailed achievements:
  - Mentored 11 M.S. students
  - Oversaw numerous field investigations (e.g. microtine rodents, snowshoe hares, white-fronted geese)
  - Lecturer:
    - Wildlife management principles (WLF201)
    - Wildlife populations and their management (WLF410)
    - Analysis of vertebrate populations (WLF625)
    - Research design (BIOL/WLF602)
- 1990–1991 **Post-doctoral research fellow**, *Colorado Cooperative Fish & Wildlife Research Unit*, Colorado State University.  
Revised computer software package (CAPTURE) to incorporate additional closed-population abundance estimators.

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📄 [erex.github.io](https://github.com/erex)

1984-1990 **Doctoral candidate**, *Colorado Cooperative Fish & Wildlife Research Unit*, Colorado State University.

Detailed achievements:

- Dissertation: *Models of exploitation and heterogeneity in survival probabilities of banded waterfowl populations*
- Lecturer: Ecology (BY220)
- Teaching assistant: Sampling and analysis of vertebrate populations (FW663)

1982-1984 **Research assistant**, *Department of Fisheries and Wildlife*, Oregon State University.

Detailed achievements:

- Scientific crewmember, National Marine Fisheries Service Groundfish Survey, Vessel: Warrior II
- Lecturer: Dynamics of marine biological resources (FW431)

1979-1982 **Master of science candidate**, *Department of Wildlife*, Utah State University.

Detailed achievements:

- Teaching assistant: Quantitative analysis for natural resource management (NR360)
- Teaching assistant: Natural resources and man (NR101)

## Books published

- Buckland, S.T., E. Rexstad, T.A. Marques, C.S. Oedekoven. 2015. Distance sampling: methods and applications. Springer, 277pp.

## Refereed publications

42. Schmidt, J.H., E. Rexstad, C.A. Roland, C.L. McIntyre, M.C. MacCluskie, and M.J. Flamme. submitted. Weather-driven change in primary productivity explains variation in the amplitude of two herbivore population cycles in a boreal system. *Oikos*.
41. Williams, R., E. Ashe, K. Gaut, R. Gryba, J. Moore, E. Rexstad, D. Sandilands, J. Steventon, R. 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. doi: <https://doi.org/10.3354/esr00845>
40. Marques, T.A., L. Thomas, M. Kery, S.T. Buckland, D.L. Borchers, E. Rexstad, R. Fewster, D.I. Mackenzie, J.A. Royle and G. Guillera-Aroita, C. Handel, D. Pavlacky and R. Camp. 2017. Model-based approaches to deal with detectability: a comment on Hutto (2016). *Ecological Applications* 27:1694-1698. doi: <https://doi.org/10.1002/eap.1553>
39. Miller, D.L., E. Rexstad, L. Thomas, L. Marshall, J. Laake. submitted. Distance Sampling in R. *J. Stat. Soft.* currently on bioRxiv. doi: <https://doi.org/10.1101/063891>
38. Gimenez, S.T. Buckland, B.J.T. Morgan, N. Bez, S. Bertrand, R. Choquet, S. Dray, M-P. Etienne, R. Fewster, F. Gosselin, B. Merigot, P. Monestiez, J. Morales, F. Mortier, F. Munoz, O. Ovaskainen, S. Pavoine, R. Pradel, F.M. Schurr, L. Thomas, W. Thuiller, V. Trenkel, P. de Valpine, E. Rexstad. 2014. Statistical ecology comes of age. *Biology Letters* 10(12). DOI: 10.1098/rsbl.2014.0698
37. Winiarski, K., M.L. Burt, E. Rexstad, D. Miller, C. Trocki, P. Paton, and S. Williams. 2014. A density surface model of wintering common loons incorporating survey data from aerial and ship-based platforms. *The Condor* 116:149-161.

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36. Marques, T.A., S.T. Buckland, D.L. Borchers, E. Rexstad, and L. Thomas. 2014. Distance Sampling. pp. 398 in M Lovric (ed.), International Encyclopedia of Statistical Science. Springer. DOI: 10.1007/978-3-642-04898-2\_214.
35. Miller, D.L., E. Rexstad, M.L. Burt and E. Rexstad. 2013. Spatial models for distance sampling data: recent developments and future directions. *Methods in Ecology and Evolution*. DOI: 10.1111/2041-210X.12105
34. Buckland, S., M.L. Burt, E. Rexstad, M. Mellor, A.E. Williams and R. Woodward. 2012. Aerial surveys of seabirds: the advent of digital methods. *Journal of Applied Ecology* 49:960-967.
33. Salgado Kent, C., C. Jenner, M. Jenner, P. Bouchet, and E. Rexstad. 2012. Southern hemisphere breeding stock "D" humpback whale population estimates from the North West cape, Western Australia. *Journal of Cetacean Research and Management* 12:29-38.
32. Thomas, L., S.T. Buckland, E. Rexstad, J.L. Laake, S. Strindberg, S.L. Hedley, J.R.B. Bishop, T.A. Marques and K.P. Burnham. 2010. Distance software: design and analysis of distance sampling surveys for estimating population size. *Journal of Applied Ecology* 47:5-14.
31. Newson, S.E., E. Rexstad, S.R. Baillie, S.T. Buckland, and N.J. Aebischer. 2010. Population changes of avian predators and grey squirrels in England: is there evidence for an impact on avian prey populations? *Journal of Applied Ecology* 47, 244-252.
30. Buckland, S.T., A.J. Plumptre, L. Thomas and E. Rexstad. 2010. Line transect sampling of primates: Can animal-to-observer distance methods work? *International Journal of Primatology* 31:485-499.
29. Buckland, S.T., A.J. Plumptre, L. Thomas and E. Rexstad. 2010. Design and analysis of line transect surveys for primates. *International Journal of Primatology* 31:833-847.
28. Schmidt, J.H., E.J. Taylor, and E. Rexstad. 2006. Survival of common goldeneye ducklings in Interior Alaska. *Journal of Wildlife Management* 70:792-798.
27. Burch, J.W., L.G. Adams, E.H. Follmann, and E. Rexstad. 2005. Evaluation of wolf density estimation from radiotelemetry data. *Wildlife Society Bulletin* 33:1225-1236.
26. McDonough, T.J., and E. Rexstad. 2005. Short-term demographic response of the red-backed vole to spruce beetle infestations in Alaska. *Journal of Wildlife Management* 69:246-254.
25. Schmidt, J.H., E.J. Taylor, and E. Rexstad. 2005. Incubation behaviors and patterns of nest attendance in common goldeneyes in Interior Alaska. *Condor* 107:167-172.
24. Parmenter, R. R., T. L. Yates, D. R. Anderson, K. P. Burnham, J. L. Dunnum, A. B. Franklin, M. T. Friggens, B. C. Lubo, M. Miller, G. S. Olson, C. A. Parmenter, J. Pollard, E. Rexstad, T. M. Shenk, T. R. Stanley, and G. C. White. 2003. Small-mammal density estimation: a field comparison of grid-based vs. web-based density estimators. *Ecological Monographs* 73:1-26.
23. Hastings, K.K, J.W. Testa, and E. Rexstad. 1999. Interannual variation in juvenile survival of Weddell seals in McMurdo Sound, Antarctica: effects of age, sex, and cohort. *Journal of Ecology* 248:307-324.

22. Zuercher, G. L., D.D. Roby, and E. Rexstad. 1999. Seasonal changes in body mass, composition and organs of northern red-backed voles in interior Alaska. *Journal of Mammalogy* 80:443-459.
21. Zuercher, G. L., D.D. Roby, and E. 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* 42:387-398.
20. Kohira, M., and E. Rexstad. 1997. Diets of wolves on Prince of Wales Island, southeastern Alaska. *Canadian Field Naturalist* 111:429-435.
19. Sedinger, J.S., M.S. Lindberg, E. Rexstad, N. Chelgren, and D.H. Ward. 1997. Testing for handling bias in survival estimation for black brant. *Journal of Wildlife Management* 61:782-791.
18. Ward, D.H., E. Rexstad, J.S. Sedinger, M.S. Lindberg, and N.K. Dawe. 1997. Seasonal and annual survival of adult Pacific brant. *Journal of Wildlife Management* 61:773-781.
17. Lindberg, M.S., J.S. Sedinger, and E. Rexstad. 1995. Estimating nest site fidelity of adult female black brant with multistate modeling and geographic information systems. *Journal of Applied Statistics* 22:725-735.
16. Schmutz, J.A., D.H.Ward, J.S. Sedinger, and E. Rexstad. 1995. Survival estimation and the effects of dependency among animals. *Journal of Applied Statistics* 22:673-681.
15. Rexstad, E. 1994. Detecting differences in wildlife populations across time and space. Pages 219-228 in 59th North American Natural Resource and Wildlife Conference.
14. Sedinger, J. S., and E. Rexstad. 1994. Do restrictive harvest regulations result in higher survival rates in mallards? Reply to Smith and Reynolds (1992) *Journal of Wildlife Management* 58(3):571-577.
13. Burnham, K. P., and E. Rexstad. 1993. Modeling heterogeneity in survival rates of banded waterfowl. *Biometrics* 49:1194-1208.
12. Rexstad, E., and D. R. Anderson. 1992. Heterogeneous survival rates of mallards (*Anas platyrhynchos*). *Canadian Journal of Zoology* 70:1878-1885.
11. Rexstad, E. 1992. Effect of hunting on the annual survival rate of Canada geese banded in Utah. *Journal of Wildlife Management* 56(2):295-303.
10. Rexstad, E., D. R. Anderson, and K. P. Burnham. 1991. Lack of sex-selectivity in harvest of mallards under the point system. *Journal of Wildlife Management* 55(4):586-592.
9. Szymczak, M. and E. Rexstad. 1991. Harvest distribution and survival of a gadwall population. *Journal of Wildlife Management* 55(4):592-600.
8. Rexstad, E., D. D. Miller, C. H. Flather, E. M. Anderson, J. W. Hupp, and D. R. Anderson. 1990. Questionable multivariate statistical inference in wildlife habitat and community studies a reply. *Journal of Wildlife Management* 54(1):189-193.
7. Rexstad, E., D.D. Miller, C.H. Flather, E.M. Anderson, J.W. Hupp, and D.R. Anderson. 1988. Questionable multivariate statistical inference in wildlife habitat and community studies. *Journal of Wildlife Management* 52(4):794-798.

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6. Bond, C.E., E. Rexstad, and R.M. Hughes. 1988. Habitat use patterns of twenty-five common species of Oregon freshwater fish. *Northwest Science* 62(5):223-232.
5. Rexstad, E. and D.R. Anderson. 1988. Effect of the point system on redistributing hunting pressure in mallards. *Journal of Wildlife Management* 52(1):89-94.
4. Hughes, R.M., E. Rexstad, and C.E. Bond. 1987. The relationship of aquatic ecoregions, river basins and physiographic provinces to the ichthyogeographic regions of Oregon. *Copeia* 1987(2):423-432.
3. Rexstad, E. and E.K. Pikitch. 1986. Stomach contents and estimates of food consumption of Pacific hake (*Merluccius productus*). *Fishery Bulletin* 84(4):947-956.
2. Rexstad, E. and G.S. Innis. 1985. Model simplification - Three applications. *Ecological Modelling* 27(1-2):1-13.
1. Innis, G.S. and E. Rexstad. 1983. Simulation model simplification techniques. *Simulation* 41(1):7-15.

## Book chapters

- Buckland, S.T., D.L. Miller and E. Rexstad. in prep. Distance sampling. pp. xx-xx in: Brennan, L., B. Marcot and A. Tri (Eds.), *Quantitative Analysis in Wildlife Science*, Johns Hopkins Univ. Press.
- Buckland, S.T., E. Rexstad, L. Thomas, and D.L. Borchers. 2016. Distance sampling surveys of population size: Enabling better decision-making by wildlife managers. pp. 45-51 in: Aston, P.J., Mulholland, A.J., Tant, K.M.M. (Eds.), *UK Success Stories in Industrial Mathematics*. Springer International Publishing. DOI: 10.1007/978-3-319-25454-8\_6.
- Marques, T.A., S.T. Buckland, D.L. Borchers, E. Rexstad and L. Thomas. 2014. Distance sampling. Pp 398-400 in Lovric, M. (Ed.), *International Encyclopedia of Statistical Science*, Springer-Verlag, Berlin.
- Rexstad, E., and K. Kielland. 2006. Mammalian herbivore population dynamics in the Alaskan boreal forest. Pages 121-132 in F.S. Chapin, M.W. Oswood, K. van Cleve, L.A. Viereck, and D.L. Verbyla (Eds.) *Alaska's changing boreal forest*. Oxford Univ. Press.
- Lindberg, M. S. and E. Rexstad. 2001. Capture-recapture sampling designs. In A.H. El-Shaarawi and W.W. Piegorsch (eds.) *Encyclopedia of Environmetrics*. John Wiley & Sons.
- Oakley, K. L., E. M. Debevec, and E. Rexstad. 1999. Development of a Long-Term Ecological Monitoring program in Denali National Park and Preserve, Alaska (USA). In C. Aguirre-Bravo & C. R. Franco (Eds.), *North American Science Symposium: Toward a unified framework for inventorying and monitoring forest ecosystem resources*, (Vol. RMRS-P-12, pp. 307-314). Fort Collins, CO: USDA Forest Service, Rocky Mt. Research Station.
- Furtch, P.R., and E. Rexstad. 1994. Characteristics of a population of *Clethrionomys rutilus* during and increase and decline. Pages 50-62 in R.H. Meehan, V. Sergienko, and G. Weller (eds.) *Bridges of science between North America and the Russian Far East*. 45th Arctic Science Conference.
- Anderson, D. R., M. A. Wotawa, and E. Rexstad. 1993. Trends in the analysis of recovery and recapture data. Pages 373-386 in J.-D. Lebreton and P. M. North (eds.) *The study of bird population dynamics using marked individuals*. Birkhauser Verlag Publishers.

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- Rexstad, E., K.P. Burnham, and D.R. Anderson. 1990. Design and analysis of survival experiments with marked animals: a case study. *American Fisheries Society Symposium* 7:581-587.

## Technical reports

- Burt, M.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. COWRIE Ltd. ISBN: 978-0-9565843-1-1.
- Burt, M.L., E. Rexstad, and S. Buckland. 2009. Comparison of visual and digital aerial survey results of avian abundance for Round 3, Norfolk Region. COWRIE Ltd. ISBN: 978-0-9561404-6-3
- Rexstad, E., and S. Buckland. 2009. Comparison of aerial survey methods for estimating abundance of common scoters. Technical Report 2009-1. Centre for Research into Ecological and Environmental Modelling, St. Andrews University.
- Rexstad, E. 2007. Point and interval estimates of abundance using multiple covariate distance sampling: An example using great bustards. Technical Report 2007-2, Centre for Research into Ecological and Environmental Modelling, St. Andrews University.
- Rexstad, E. 2007. Non-uniform coverage estimators for distance sampling. Technical Report 2007-1, Centre for Research into Ecological and Environmental Modelling, St. Andrews University.
- Rexstad, E., and K. P. Burnham. 1991. Users' guide for interactive program CAPTURE: Abundance estimation of closed animal populations. Colorado Cooperative Fish & Wildlife Research Unit. 29pp.
- Rexstad, E. 1988. Computer database and cartographic system for museum collections. *Science Software* 3(4):295-300.
- Rexstad, E. 1982. BIRD Model - Version III, Description and Documentation. Dept. of Fisheries and Wildlife Report Series. Utah State University, Logan UT. 74 pp.

## Service to profession

Software editor **Wildlife Society Bulletin, 1989-1992.**

Associate editor **Journal of Wildlife Management, 1997-1999.**

Reviewer **Reviewed manuscripts for following journals.**

Methods in Ecology and Evolution	Ecology	Ecological Applications
Journal of Wildlife Management	Biometrics	BioScience
Wildlife Society Bulletin	Journal of Applied Ecology	Journal of Ornithology
Journal of Mammalogy	The Auk	Condor
Journal of Environmental Management	Wildlife Biology	Global Ecology and Biogeography
Oryx	Animal Conservation	Endangered Species Research
African Journal of Wildlife Research	PLOS ONE	

Scientific conference organisation **Involved in creation of international statistical ecology conference.**

- Chair, Scientific committee, International Statistical Ecology Conference (ISEC) 2012 (Norway), 2014 (France)
- Member, Scientific committee, ISEC2018 (Scotland), ISEC2016 (USA), ISEC2010 (England), ISEC2008 (Scotland)

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## Software packages development

Involved with teams of researchers in development of following software:

- DISTANCE** **Density estimation from distance sampling surveys**, *Developed while at University of St Andrews*, Version 6 released 2007, Version 7 released 2016, Thomas, L., S.T. Buckland, E. Rexstad, J.L. Laake, S. Strindberg, S.L. Hedley, J.R.B. Bishop, T.A. Marques and K.P. Burnham. 2010. Distance software: design and analysis of distance sampling surveys for estimating population size. *Journal of Applied Ecology* 47:5-14.
- CAPTURE** **Mark-recapture closed population abundance estimation**, *Developed while at Colorado State University*, Released 1990, Rexstad, E., and K. P. Burnham. 1991. Users' guide for interactive program CAPTURE: Abundance estimation of closed animal populations. Colorado Cooperative Fish & Wildlife Research Unit. 29pp.
- BIRDIII** **Avian bioenergetics software**, *Developed while at Utah State University*, Released 1982, Rexstad, E. 1982. BIRD Model - Version III, Description and Documentation. Dept. of Fisheries and Wildlife Report Series. Utah State University, Logan UT. 74 pp.