

A. Bradley Duthie

I am an evolutionary ecologist and ecological modeller with broad interests in developing theory across the biological and environmental sciences. My research primarily uses mathematical and individual-based models to understand complex interactions in populations, communities, and social-ecological systems. I am especially interested in applying these modelling approaches to questions concerning the evolution and maintenance of biodiversity, and the management of populations under conservation conflict.

Professional Appointments

- **Leverhulme Trust Early Career Fellow**, Nov. 2017 – Oct. 2020 Biological and Environmental Sciences, University of Stirling
- **ERC Postdoctoral Research Assistant**, Nov. 2016 – Oct. 2017 Biological and Environmental Sciences, University of Stirling
- **ERC Postdoctoral Research Fellow**, Jun. 2013 – Oct. 2016 School of Biological Sciences, University of Aberdeen

Education

- **Ph.D. Ecology and Evolutionary Biology**, Spring 2013. Iowa State University
 - *Graduate Minor*: Statistics
 - *Certificate*: Graduate Student Teaching Certificate
- **B.S. Biology** (Magna cum laude), Spring 2007. Southern Illinois University Edwardsville
 - *Specialisation*: Ecology, Evolution, Environment
- **B.S. Philosophy** (Magna cum laude), Spring 2007. Southern Illinois University Edwardsville
 - *Minor*: Chemistry

Publications

21. Duthie, AB. Component response rate variation drives stability in large complex systems. *PLoS Comput. Biol.* *In review*.
20. Duthie, AB, et al. GMSE: an R package for generalised management strategy evaluation. *Method. Ecol. Evol.* *In press*.
19. Cusack, JJ, et al. Time series analysis reveals synchrony and asynchrony between conflict management effort and increasing large grazing bird populations in northern Europe. *Conserv. Lett.* *In press*.
18. Paine, CET., et al. 2018. Towards general mechanistic predictions of community dynamics. *Funct. Ecol.* 32 (7):1681-1692.
17. Redpath, SM, et al. 2018. Games as tools to address conservation conflicts. *Trends Ecol. Evol.* 33 (6):415-426.
16. Duthie, AB, et al. 2018. Evolution of pre-copulatory and post-copulatory strategies of inbreeding avoidance and associated polyandry. *J. Evol. Biol.* 31:31-45.
15. Duthie, AB, et al. 2016. Inbreeding parents should invest more resources in fewer offspring. *Proc. R. Soc. B.* 282:20161845.
14. Duthie, AB, et al. 2016. Evolution of inbreeding avoidance and inbreeding preference through mate choice among interacting relatives. *Am. Nat.* 188 (6):651-667.
13. Duthie, AB, et al. 2016. Plant connectivity underlies plant-pollinator-exploiter distributions in *Ficus petiolaris* and associated pollinating and non-pollinating fig wasps. *Oikos*. 125 (11):1597-1606.
12. Duthie, AB, et al. 2016. When does female multiple mating evolve to adjust inbreeding? Effects of inbreeding depression, direct costs, mating constraints, and polyandry as a threshold trait. *Evolution*. 70 (9):1927-1943.
11. Frater, PN & AB Duthie. 2016. Power scaling, vascular branching patterns, and the golden ratio. *Ideas Ecol. Evol.* 9:15-18.
10. Reid, JM, et al. 2016. Variation in parent-offspring kinship in socially monogamous systems with extra-pair reproduction and inbreeding. *Evolution*. 70 (7):1512-1529.

9. Reid, JM, et al. 2015. Resolving the conundrum of inbreeding depression but no inbreeding avoidance: estimating sex-specific selection on inbreeding by song sparrows (*Melospiza melodia*) *Evolution*. 69 (11):2846-2861.
8. Duthie, AB, et al. 2015. Trade-offs and coexistence in fluctuating environments: evidence for a key dispersal-fecundity trade-off in five nonpollinating fig wasps. *Am. Nat.* 186 (1):151-158.
7. Reid, JM, et al. 2015. Demographic mechanisms of inbreeding adjustment through extra-pair reproduction. *J. Anim. Ecol.* 84 (4):1029-1040.
6. Duthie, AB & JM Reid. 2015. What happens after inbreeding avoidance? Inbreeding by rejected relatives and the inclusive fitness benefit of inbreeding avoidance. *PLoS One*. 10 (4):e0125140.
5. Duthie, AC & AB Duthie. 2015. Do music and art influence one another? Measuring cross-modal similarities in music and art. *Polymath*. 5 (1):1-22.
4. Reid, JM, et al. 2015. Quantifying inbreeding avoidance through extra-pair reproduction. *Evolution*. 69 (1):59-74.
3. Duthie, AB, et al. 2014. Trade-offs and coexistence: A lottery model applied to fig wasp communities. *Am. Nat.* 183 (6):826-841.
2. Duthie, AB & MR Falcy. 2013. The influence of habitat autocorrelation on plants and their seed-eating pollinators. *Ecol. Modell.* 251:260-270.
1. Duthie, AB. 2004. The fork and the paperclip: A memetic perspective. *J. Memetics*. 8 (1).

Grants and Fellowships

Scottish Natural Heritage Tender (Co-PI; 2018)	9,947 GBP
Leverhulme Trust Early Career Fellowship (2017)	88,650 GBP
NSF Postdoctoral Research Fellowship in Biology (2013; award declined)	138,000 USD
NSF Doctoral Dissertation Improvement Grant (2010)	13,411 USD
Biotechnology Graduate Fellowship (ISU; 2007)	20,000 USD

Leadership

Manuscript reviewer: *Acta Oecologica*, *American Naturalist*, *Arthropod-Plant Interactions*, *Behavioral Ecology and Sociobiology*, *Biology Letters* (5), *BMC Evolutionary Biology*, *Ecology and Evolution*, *Evolution* (3), *the Journal of Animal Ecology*, *the Journal of Applied Ecology* (2), *the Journal of Theoretical Biology* (3), *Landscape Ecology*, *Molecular Ecology* (2), *Oikos*, *PLoS One*, *Proceedings of the Royal Society B*, *Royal Society Open Science*, and *Symbiosis*

Grant reviewer: National Science Foundation (USA)

Conference organiser: Midwest Ecology & Evolution Conference at Iowa State University (2010)

Workshop organiser: European Congress of Conservation Biology in Jyväskylä, Finland (2018)

Representative: Post-doctoral researchers (organiser at UoS; 2017-2018), Graduate and Professional Student Senate (Senator at ISU; 2011-2013), and Graduate Research in Evolutionary Biology and Ecology (Vice President at ISU; 2009-2010)

Relevant Computer Skills

- Experience in statistical analysis, mathematical & individual-based modelling, genetic algorithms, and computer programming in C, R, and MATLAB
- Use of Linux, git, and high performance computing clusters
- Knowledge of HTML, Markdown, L A TEX, and MS Office Suite

Software Developed

Listed software is publicly available on the Comprehensive R Archive Network (CRAN) and GitHub.

- **GMSE** v0.3.1.9. 2017. Generalised Management Strategy Evaluation Simulator. Written in R and C.
 - R package link: < <http://CRAN.R-project.org/package=GMSE> >
 - Website link: < <https://confoobio.github.io/gmse/> >
- **gamesGA** v1.1.3.2. 2017. Genetic Algorithm for Sequential Symmetric Games. Written in R and C.
 - R package link: < <http://CRAN.R-project.org/package=gamesGA> >