

CURRICULUM VITAE

Thomas A. Morrison

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Education

2004-2011 PhD Ecology and Evolutionary Biology, Dartmouth College, Hanover, USA
Dissertation title: *Demography and movement of a declining migratory population in Northern Tanzania*. Advisor: Douglas Bolger

1998-2002 B.Sc. Biology, Duke University, Durham, USA

Current Position

2019-present Research Fellow, Institute of Biodiversity, Animal Health and Comparative Medicine, University of Glasgow

Past Positions

2016-2019 Research Associate, University of Glasgow. *Environmental and physiological drivers of animal migration and consequences for ecosystem services*

2015-2016 & 2010-2012 Research Associate, Wyoming Cooperative Fish and Wildlife & Research Unit, Laramie, USA. Advisor: Matt Kauffman

- *Ungulate population monitoring and modelling in Wyoming*
- *Bighorn sheep spatial population dynamics in relation to disease*

2012-2014 Postdoctoral Research Associate, Wake Forest University. Serengeti National Park, Tanzania. Advisor: Michael Anderson. *Mechanisms for tree recruitment limitation across a soil moisture gradient*.

2002-2004 Field Technician, Duke University, Amboseli Elephant Project, Kenya. Supervisors: Beth Archie & Susan Alberts. *Genetic determinants of social behavior in African elephants*

Research Interests

Conservation biology, Demography, Migration, Savannah ecology, Spatial ecology

Publications

34. Kauffman MJ, Aikens EO, Esmaili S, Kaczensky P, Middleton A, Monteith KL, **Morrison TA**, Mueller T, Sawyer H and Goheen J. Causes, consequences and conservation of ungulate migration. *Annual Review in Ecology, Evolution and Systematics* - Accepted

33. **Morrison TA**, Merkle J, Hopcraft JGC, Aikens EO, Beck JL, Boone RB, Courtemanch A, Dwinnell SP, Fairbanks WS, Griffith B, Middleton AD, Monteith KL, Oates B, Riotte-Lambert L, Sawyer H, Smith K, Stabach JA, Taylor KL, Kauffman MJ. [Drivers of site fidelity in ungulates](#). *Journal of Animal Ecology*, 90, 4, 955-966.

32. Kauffman et al. (91 co-authors). Mapping out a future for ungulate migrations. *Science*, 372, 6542, 566-569.
31. Kabalika Z, **Morrison TA**, McGill RAR, Munishi L, Ekwem D, Mahene WL, Haydon D, Newton J, Lobora A, Hopcraft JGC. 2020. Tracking animal movements using biomarkers in tail hairs: a novel approach for the geolocating from the Serengeti sulfur isoscape. *Movement Ecology* 8, 37. doi.org/10.1186/s40462-020-00222-w
30. Larsen F, Hopcraft JGC, Hanley N, Hongoa JR, Hynes S, Loibooki M, Mafuru G, Needham K, Shirima F, **Morrison TA**. 2020. Wildebeest migration drives tourism demand in the Serengeti. *Biological Conservation*, 248, 108688 doi.org/10.1016/j.biocon.2020.108688
29. Owen-Smith N, Hopcraft JGC, **Morrison TA**, Chamaille-Jammes S, Hetem R, Bennitt E, Van Langevelde. 2020. Movement ecology of large herbivores in African savannas: current knowledge and gaps. *Mammal Review*, 50, 3 252-266. doi.org/10.1111/mam.12193
28. Seeber PA, **Morrison TA**, Ortega A, East ML, Greenwood AD & Czirják GÁ. 2020. Immune differences in captive and free-ranging zebras (*Equus zebra* and *E. quagga*). *Mammalian Biology*. 100, 155–164. doi: [10.1007/s42991-020-00006-0](https://doi.org/10.1007/s42991-020-00006-0)
27. Veldhuis MP, Ritchie ME, Ogutu JO, **Morrison TA**, Beale CM, Estes AB, Mwakilema W, Ojwang GO, Parr CL, Probert J, Wargute PW, Hopcraft JGC, and Olf H. 2019. Cross-boundary human impacts compromise the Serengeti-Mara ecosystem. *Science*, 363 (6434), 1424-1428. doi: [10.1126/science.aav0564](https://doi.org/10.1126/science.aav0564)
26. Probert J, Parr CL, Holdo RM, Anderson TM, Archibald S, Courtney Mustaphi CJ, Dobson AP, Donaldson JE, Hempson GP, **Morrison TA**, & Beale CM. Anthropogenic modifications to fire regimes in the wider Serengeti-Mara ecosystem. 2019. *Global Change Biology*, 00:1-18 doi: [10.1111/gcb.14711](https://doi.org/10.1111/gcb.14711)
25. **Morrison TA**, Holdo RM, Rugemalila DM, Nzunda M & Anderson TM. 2019. Grass competition overwhelms effects of herbivores and precipitation on seedling establishment in Serengeti. *Journal of Ecology* 107, 216-228
24. Hodgkinson, JE, Kaplan, RM, Kenyon, F., Morgan, E.R., Park, A.W., Paterson, S, Babayan, SA, Beesley, NJ, Britton, C, Chaudhry, U, Doyle, SR, Ezenwa, VO, Fenton, A, Howell, SB, Laing, R, Mable, BK, Matthews, L, McIntyre, J, Milne, CE, **Morrison, TA**, Prentice, JC, Sargison, ND, Williams, DJL, Wolstenholme, AJ, Devaney, E, 2019. Refugia and anthelmintic resistance: Concepts and challenges. *International Journal for Parasitology: Drugs and Drug Resistance*, 10, 51-57. doi: [10.1016/j.ijpdr.2019.05.001](https://doi.org/10.1016/j.ijpdr.2019.05.001)
23. **Morrison TA**, Estes A, Mduma S, Maliti H, Frederick H, Kija H, Mwita M, Sinclair ARE, Kohi E. 2018. Informing aerial total counts with demographic models: population growth of Serengeti elephants not explained purely by demography. *Conservation Letters*, 11(3), 1–8. doi: 10.1111/conl.12413

22. Beale CM, Courtney-Mustaphi CJ, **Morrison TA**, Archibald S, Anderson TM, Dobson AP, Donaldson JE, Hempson GP, Probert J & Parr CL. 2018. Pyrodiversity interacts with rainfall to increase bird and mammal richness in African savannas. *Ecology Letters*, 21, 557-567.
21. Tucker et al. (114 co-authors). 2018. Moving in the Anthropocene: Global reductions in terrestrial mammalian movements. *Science*, 359 (6374), 466-469. doi: [10.1126/science.aam9712](https://doi.org/10.1126/science.aam9712)
20. Torney CJ, Hopcraft JGC, **Morrison TA**, Couzin ID, Levin SA. 2018. From single steps to mass migration: The problem of scale in movement ecology in the Serengeti wildebeest. *Proceedings of the Royal Society, B*. 373 (1746), 1-9.
19. Hempson GP, Parr CL, Archibald S, Anderson TM, Courtney Mustaphi CJ, Dobson AP, Donaldson JE, **Morrison TA**, Probert J, & Beale CM. 2018. Continental-scale drivers of African pyrodiversity. *Ecography*, 41: 889–899. doi: 10.1111/ecog.03109
18. Rugemalila DM, **Morrison TA**, Anderson TM, Holdo RM. 2017. Seed production, infestation, and viability in *Acacia tortilis* (synonym: *Vachellia tortilis*) and *Acacia robusta* (synonym: *Vachellia robusta*) across the Serengeti rainfall gradient. *Plant Ecology*. 218 (8), 909-922
17. Bond M, Bradley C, Kiffner C, **Morrison TA**, Lee D. 2017. A multi-method approach to delineate and validate migratory corridors. *Landscape Ecology*. 32 (8), 1705-1721.
16. **Morrison TA**, Link W, Newmark W, Foley C, Bolger DT. 2016. Tarangire revisited: population consequences of loss of migratory connectivity in a tropical ungulate. *Biological Conservation*. 197, 53-60.
15. **Morrison TA**, Holdo RM & Anderson TM. 2016. Elephant damage drives mortality in Serengeti trees. *Journal of Ecology*. 104, 409-418.
14. **Morrison TA**, Keinath D, Zumpff-Estes W, Crall J & Stewart C. 2016. Individual identification of the endangered Wyoming Toad *Anaxyrus baxteri* and implications for monitoring species recovery. *Journal of Herpetology*, 15, 44-49.
13. Anderson TM, **Morrison TA**, Rugemalila DM & Holdo RM. 2015 Compositional decoupling of savanna canopy and understory tree communities in Serengeti. *Journal of Vegetation Science*, 26, 385-394.
12. Holdo RM, Anderson TM, **Morrison TA**. 2014. Precipitation, fire and shifting demographic bottlenecks in Serengeti tree populations. *Landscape Ecology*, 29, 1613-1623.
11. **Morrison TA** & Bolger DT. 2014. Connectivity and bottlenecks in a migratory wildebeest population. *Oryx*, 48, 613-621.
10. Sawyer H, Kauffman MJ, Middleton AD, **Morrison TA**, Nielson, RM & Wyckoff, TB. 2013. A framework for understanding semi-permeable barrier effects on migratory ungulates. *Journal of Applied Ecology*, 50, 68-78.

9. Middleton AD, **Morrison TA**, Fortin JK, Kauffman MJ, Robbins CT, Proffitt KM, White PJ, McWhirter DE, Koel TM, Brimeyer D & Fairbanks WS. 2013. Grizzly bears link non-native trout to migratory elk in Yellowstone. *Philosophical Transactions of the Royal Society B-Biological Sciences*, 280: 20130870.
8. Bendik NF, **Morrison TA**, Gluesenkamp AG, O'Donnell LO & Sander M. 2013. Computer-assisted photo identification outperforms visible implant elastomers in a threatened *Eurycea* salamander. *PlosOne*, 8, 1-9.
7. **Morrison TA** & Bolger DT. 2012. Wet season range fidelity in a tropical migratory ungulate. *Journal of Animal Ecology*. 81, 543-552.
6. Bolger DT, **Morrison TA**, Vance, B, Lee, D & Farid, H. 2012. Development and application of a computer-assisted system for photographic mark-recapture analysis. *Methods in Ecology and Evolution*, 3, 813-822. *Journal cover image*
5. **Morrison TA**, Yoshizaki J, Bolger DT & Nichols JD. 2011 Estimating survival with computer-assisted identification and mark-recapture: the problem of misidentification error. *Methods in Ecology and Evolution*. 2, 454-463. *Journal cover image*
4. **Morrison TA**. 2010. Speaking out: weighing advocacy and objectivity as a junior scientist. *Frontiers in Ecology and the Environment*, 1:50-51.
3. Bolger DT, Newmark W, **Morrison TA** & Doak D. 2008. The need for integrative approaches to understand and conserve migratory ungulates. *Ecology Letters*. 11:63-77 *Journal cover image*
2. Archie E, **Morrison TA**, Foley C, Moss C & Alberts S. 2006. Rank relationships among wild female African elephants (*Loxodonta africana*). *Animal Behaviour*. 71: 117-127.
1. **Morrison TA**, Chiyo P, Moss C & Alberts S. 2005. Measures of dung bolus size for known age African elephants: implications for age estimation. *Journal of Zoology, (London)*. 266: 89-94.

Manuscripts (available upon request)

Anderson, T.M., Hepler, S.A., Holdo, R.M., Donaldson, J.E., Erhardt, R.J., Hopcraft, J.G.C. Hutchinson M. C., Huebner, S. E. , **Morrison, T.A.**, Muday, J., Munuo, I. N., Palmer, M. S., Pansu, J., Pringle, R. M., Sketch, R., Packer, C. Body-size dependent grazing during migration generates facilitation and promotes savanna stability. In review - *Science*

Decker C, Hanley N, Lankaster F, Keyyu J, Munishi L, Czajkowski M, **Morrison TA**, Cleaveland S. Predicting uptake of a malignant catarrhal fever vaccine by pastoralists in northern Tanzania: opportunities for improving livelihoods and ecosystem health. In revision – *Environmental Economics*

Ekwem D, **Morrison TA**, Reeve R, Enright J, Buza J, Shirima G, Mwajombe JK, Lembo T, Hopcraft JGC. Tracking livestock movements to understand the patterns and risks of disease spread in traditionally managed systems in East Africa. In review - *Scientific Reports*

Buchanan C, **Morrison TA**, Masoy J, Shamanche J, Fyumagwa R, Evans NP, Hopcraft JGC. Linking GPS telemetry with physiological profiles: determinants of chronic stress in Serengeti wildebeest revealed by cortisol in tail hair. In prep for *Functional Ecology*

Donaldson J, Holdo R, **Morrison TA**, Griffith D, Anderson, TM. The Serengeti National Park meteorological and soil moisture data. Submitted to *Ecology*

Brown, M. R. C., **Morrison, T. A.**, McDevitt, H., Lichtenfeld, L., Ukio, I. G., Tosi, R., & Kissui, B. M. Community-based protected areas modify African lion habitat selection in a fragmented landscape in northern Tanzania. Submitted to *Frontiers in Conservation Practice*

Lohay GC, Riggio J, Lobora AL, Kissui BM, **Morrison TA**. Wildlife movements and landscape connectivity in the Tarangire-Manyara Ecosystem. In: *Human-Wildlife Interactions in the Tarangire Ecosystem* (eds: Kiffer C, Lee D, Bond M). Springer Press.

Grants

- 2020 NSF Ecology and Evolution of Infectious Disease (PI). *US-UK Collab: Disentangling transport and trophic effects of animal movement on infectious disease* (BBSRC £968,645)
- 2020 Global Challenges Research Fund, Scottish Funding Council (PI): *Facilitating sustainable livestock-wildlife production systems in East Africa* (£28,745)
- 2020 UKRI GCRF Sustainable Enhancement of Agriculture and Aquaculture Production (Research co-I). *Cattle vaccination against malignant catarrhal fever: balancing pastoral livelihoods, food security and ecosystem integrity in the Serengeti, Tanzania* (£249,997)
- 2019 Global Challenges Research Fund, Scottish Funding Council (co-applicant): *Developing regional south-south-north capacity to study long distance migrations in South Sudan* (£49,010)
- 2018 Biotechnology and Biological Sciences Research Council Travel Grant (PI). *Development of joint research proposal on the role of wildlife migration in the parasite dynamics of large herbivores* (£1,045)
- 2018 Global Challenges Research Fund, Scottish Funding Council (Lead applicant): *Developing ecologically sustainable infrastructure in sub-Saharan Africa: Integrating animal movement data into national infrastructure plans* (£29,059)
- 2018 Global Challenges Research Fund, Scottish Funding Council (Co-applicant): *Managing the boundaries of protected areas to ensure sustainable ecosystem services: A meeting to develop new conservation strategies for the Serengeti ecosystem* (£15,700)
- 2017 NERC Industrial CASE PhD Studentship (co-PI): *Balancing ecological integrity and infrastructure development in Sub-Saharan Africa* (£89,114)

- 2017 Global Challenges Research Fund, Scottish Funding Council (Co-applicant) *Identifying GCRF challenges for sustainable agriculture and ecosystem services in Tanzania's livestock sector* (£39,000)
- 2011 US Fish and Wildlife Service grant, (co-PI) *Development of photo identification techniques for the endangered Wyoming toad* (\$5000)
- 2009 Neukom Institute, *Wildebeat*, Interactive Digital Art grant (co-creator) (\$8000)
- 2009 Tarangire migration corridor research; GPS collars funded by WCS-Tarangire Elephant Project, Tembo Foundation and Dartmouth College (\$14,000)
- 2008 National Science Foundation, Biological Instruments grant (Co-written with Drs. DT Bolger and H Farid) *Software development for an individual identification system of species with variable natural markings* (\$211,000)
- 2008 Earthwatch Institute, (co-PI) *Saving the Tarangire Migration* (\$104,000)
- 2008 Dartmouth Arts and Sciences Graduate Alumni Research Award (\$1000)
- 2008 Gilman Fellowship Award, Dartmouth College (\$1500)
- 2008 Dartmouth NASA Space Grant, student award (\$2000)
- 2007 Ecological Society of America, Graduate Student Policy Award
- 2006 Wildlife Conservation Society, Research Fellowship Program (PI) *Where the antelope once roamed: the demography and movement patterns of a migratory ungulate population in a human-altered landscape* (\$14,500)

Awards

- 2012 Wyoming Excellence in Wildlife Conservation Award; annual award to recognize organizations and individuals for exceptional efforts in conservation of Wyoming wildlife and wildlife habitats, Wyoming Game and Fish Department
- 2009 Switzer Fellowship, Robert and Patricia Switzer Foundation

PhD Student advising

- 2020-present Dennis Minja, Primary supervisor, PhD student, University of Glasgow, *Human impacts on Serengeti cheetah*.
- 2020-present Laura Sessions, Primary supervisor, PhD student, University of Glasgow, *Using remote imaging and machine learning tools to quantify ecological effects of red deer (Cervus elephas) in Scotland*. (Funding: NERC DTP-Programme)
- 2019-present Zabibu Kabalika, Co-supervisor, PhD student, University of Glasgow, *Using isotopes to understand wildlife movement in East Africa*
- 2018-present Heather McDevitt, Co-supervisor, PhD student, University of Glasgow, *Balancing ecological integrity and infrastructure development: optimizing the UK's contribution to sustainable development goals in Sub-Saharan Africa*
- 2018-2020 Callum Buchanan, Co-supervisor, PhD student, University of Glasgow, *Linking physiology with animal movement in Serengeti wildebeest*

Teaching

- 2019 & 2020 Course coordinator: *Protected Area Management*, MSc-level 10-credit course, University of Glasgow

- 2017-2020 Tutorial for mini-projects, 3rd year Zoology undergraduate programme, University of Glasgow
- 2016 Led *Introductory Statistics* practicals for students in MSc in Quantitative Conservation and Epidemiology, University of Glasgow
- 2013 Co-led *Models and data in R* workshop, a week-long training for 20 Tanzanian graduate students and wildlife professionals
- 2010 Teaching assistant, *Field Methods in Ecology*, Dartmouth College
- 2009 Teaching assistant, *Tropical Biology*, 2.5-month undergraduate field course, Dartmouth College
- 2008 Teaching assistant, *Animal Behavior*, 2.5-month undergraduate field course, Dartmouth College
- 2007 & 2008 Teaching assistant, *Conservation of Biodiversity*, Undergraduate course, Dartmouth College
- 2005 & 2006 Teaching assistant, *Vertebrate Zoology*, Undergraduate course, Dartmouth College
- 2005 Teaching assistant, *Introductory Ecology and Evolution*, Undergraduate course, Dartmouth College

Guest lecturer

- 2018-2021 *Radiation of African bovids*, 2nd year Undergrad Zoology, University of Glasgow
- 2020-2021 *Inferring Animal Behaviour from GPS Telemetry*, 4th year Undergrad Zoology, University of Glasgow
- 2020-2021 *Population management*, 4th year Undergrad Zoology, University of Glasgow
- 2014-2018 Various lectures, Undergraduate study abroad, School for Field Studies, Tz
- 2013 Stanford University, Environmental Science field course, Tz
- 2012 University of Wyoming, Wildlife Management course
- 2009 Swarthmore College, Mathematical Biology course
- 2008 Colby-Sawyer College, Research seminar series

Popular Media

- 2021 National Geographic magazine – Serengeti Ecosystem special issue (due February 2022)
- 2019 National Geographic television – One Strange Rock, Collective wildebeest behaviour (Scientific advisor)
- 2018 CNN – [Focus on Africa](#), Serengeti Mara wildebeest migration (Scientific advisor)
- 2017 BBC World Service Radio Series – Living with Nature (Scientific advisor)
- 2011 BBC Documentary, *The Wildebeest Migration* (Scientific advisor)
- 2008 Discovery Channel: *Raging Nature: Stampedes and Swarms*, Oct 2008
- 2008 Sunday Observer, UK: *Saved by their stripes: Africa's vanishing herds*, p16-17. Nov 9

Recent Scientific Talks

- 2020 Eurodeer Annual Meeting, “Drivers of Site Fidelity in Ungulates”
- 2019 British Ecological Society, annual meeting (Belfast), “Dramatic changes in the Serengeti wildebeest migration”
- 2018 University of Glasgow (invited) “Regional cooperation for ecological sustainability: protecting migratory species in East Africa and South America”

- 2018 Savanna Network Meeting, Kruger NP, South Africa “Changes in the Serengeti-Mara wildebeest migration over time and implications for management”
- 2017 Tanzanian Wildlife Research Institute (TAWIRI) conference, “Changes in the Serengeti-Mara wildebeest migration over time and implications for management”
- 2017 University of Victoria, New Zealand (invited), “Individual movements and population dynamics of migratory ungulates in changing landscapes: insights from the Serengeti and Wyoming”
- 2017 Massay University, New Zealand (invited), “Individual movements and population dynamics of migratory ungulates in changing landscapes: insights from the Serengeti and Wyoming”
- 2016 British Ecological Society, annual meeting (Liverpool), “Site fidelity constrains the movements of migratory ungulates”
- 2016 The Wildlife Society, annual meeting (USA), “Site fidelity constrains the movements of migratory ungulates”
- 2015 University of York, UK (invited), “Tree cover in Serengeti: Grass competition in small trees and disturbance of large trees”

Professional Service

- **Referee** for 44 articles in 33 international and regional peer-reviewed journals: *African Journal of Ecology* (2), *African Journal of Wildlife Research* (1), *Animal Behaviour* (2), *Animal Conservation* (1), *Biodiversity and Conservation* (2), *Biological Conservation* (2), *Biological Reviews* (1), *Conservation Science and Practice* (1), *Ecological Applications* (2), *Ecological Monographs* (1), *Ecological Modelling* (1), *Ecology* (1), *Ecology Letters* (1), *Ecology and Evolution* (3), *European Journal of Wildlife Research* (1), *Forest Ecology and Management* (1), *Frontiers in Ecology and the environment* (1), *Global Change Biology* (1), *The Herpetological Journal* (1), *Journal of Animal Ecology* (2), *Journal of Mammalogy* (2), *Journal of Wildlife Management* (1), *Journal of Zoology* (1), *Oecologia* (1), *Plant Ecology* (1), *Nature Scientific Data* (1), *Plant Ecology* (1), *PlosOne* (3), *Scientific Data* (1), *Southwestern Naturalist* (1), *Transactions in GIS* (1), *Wildlife Research* (1), *Wildlife Society Bulletin* (1)
- **Co-organizer:** Serengeti Stakeholder Meeting (planned April 2019)
- **Co-organizer** of weekly institute seminar series for IBAHCM (2017-present)
- **Advisor:** USAID: Biodiversity and Tropical Forestry Assessment Tanzania 2019-2024

Professional Affiliations

- Greater Serengeti Conservation Society (Treasurer), US-Tanzania-registered NGO supporting wildlife conservation in East Africa
- GreenStand (Co-founder, board member) US-registered NGO developing transparency and mapping tools for tree-planting and reforestation projects. www.greenstand.org
- British Ecological Society, member

Languages:

Kiswahili and Spanish (Conversational)