

Scott William Forrest

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Education

PhD (Mathematical Sciences)

Queensland University of Technology, CSIRO, Australia

Thesis: *Modelling animal movement with stochastic simulations and deep learning*

I am developing new methodologies for modelling animal movement, with a focus on simulating animal movement trajectories with existing statistical frameworks as well as emerging approaches such as deep learning. I am applying these methods to introduced water buffalo (*Bubalus bubalis*) and feral cattle (*Bos indicus*) in Northern Australia's tropical savannas.

2022-present

(expected completion August 2025)

Master of Science (Wildlife Management)

University of Otago, Dunedin, New Zealand

Thesis: *Operation Kākā Repopulation: Using GPS tracking and spatial modelling to restore a flagship species*

2020-2021

GPA: 9/9

Postgraduate Diploma (Wildlife Management)

University of Otago, Dunedin, New Zealand

2018-2019

GPA: 7.7/9

Bachelor of Engineering (Naval Architecture) (Hons) - GPA: 5.93/7 (Class IIA)

Australian Maritime College, Launceston, and Flinders University, Adelaide

Thesis: *Ship-generated solitons and the dynamic vessel response due to blockage*

2012-2016

GPA: 5.9/7 (Class IIA)

Teaching and Academic Employment

Queensland University of Technology

2025

Research Assistant

- Waterhole health check: Using computer vision to identify and assess waterholes in Northern Australia for ecosystem health

Queensland University of Technology

2023-2024

Research Assistant

- Using Value of Information Theory to Inform the Development of Crucial Indicators of Biodiversity Change in Antarctica

Queensland University of Technology

2023

Tutor - Work Integrated Learning for Applied and Computational Mathematics (MXB328)

University of Otago

2020-2021

Teaching Fellow

Animal Biology (BIOL112)

- Key tasks included creating fully online content for online teaching of six laboratory classes during COVID-19 lockdowns through the Open edX platform, xOtago. This included filming and video editing of dissections, experiments and museum exhibits.

University of Otago

2019-2021

Statistics Advisor for Postgraduate Students

- Projects included methods such as spatial ecology (home range estimation, resource selection, species distribution modelling), GLM/GLMM, model selection and multi-model inference, and animal growth data and nesting success.

University of Otago

2018-2021

Senior Demonstrator - Animal Biology (BIOL112)

Demonstrator - Biological Data Analysis and Computing (ZOOL316/WILM404),

Conservation Biology (ZOOL319), Animal Biology (BIOL112), Cell Biology (CELS191)

Peer-Reviewed Publications

Westaway, D. M., Cowan, M. A., **Forrest, S. W.**, & Nimmo, D. G. (*In Preparation*). Remnant native vegetation key for connectivity: movement ecology of shingleback lizards (*Tiliqua rugosa*) in a fragmented agricultural landscape.

Pike, K. N., **Forrest, S. W.**, McEvoy, J., Perry, J., Vanderduys, E., Arnould, P. Y., & Hoskins, A. J. (*In Preparation*). Seasonal Drivers of Feral Buffalo Resource Selection and Movement in the Northern Territory: Implications for Management.

Cowan, M. A., **Forrest, S. W.**, Setterfield, S. A., Dunlop, J. A., Gibson, L. A., Moore, H. A., & Nimmo, D. G. (*In Review*). The impact of mining on animal movement and landscape connectivity revealed through simulations and scenarios.

Forrest, S. W., Pagendam, D., Hassan, C., Drovandi, C., Potts, J. R., Bode, M., & Hoskins, A. J. (2025). Predicting animal movement with deepSSF: a deep learning step selection framework. In *bioRxiv* (p. 2025.02.13.638055). <https://doi.org/10.1101/2025.02.13.638055>

Forrest, S. W., Pagendam, D., Bode, M., Drovandi, C., Potts, J. R., Perry, J., Vanderduys, E., & Hoskins, A. J. (2024). Predicting fine-scale distributions and emergent spatiotemporal patterns from temporally dynamic step selection simulations. *Ecography*. <https://doi.org/10.1111/ecog.07421>

Forrest, S. W., Rodríguez-Recio, M., & Seddon, P. J. (2024). Home range and dynamic space use reveals age-related differences in risk exposure for reintroduced parrots. *Conservation Science and Practice*, e13119. <https://doi.org/10.1111/csp2.13119>

Forrest, S. W., Rodríguez-Recio, M., & Seddon, P. J. (2022). Moving wildlife tracking forward under forested conditions with the SWIFT GPS algorithm. *Animal Biotelemetry* 2022 10:1, 10(1), 1–11. <https://doi.org/10.1186/S40317-022-00289-9>

Grants and Funding

total to date approx. \$189,334 AUD

Research Training Program (RTP) PhD scholarship	\$107,659	2022-present
CSIRO PhD top-up scholarship	\$30,000	2022-present
Waterhole health check: Using computer vision to identify and assess waterholes in Northern Australia for ecosystem health, QUT Centre for Data Science First Byte	\$10,000	2025
Travel funding for research visits in Europe and ISEC 2024 attendance, QUT Centre for Data Science	\$2,000	2024
Travel funding for Ecological Society of Australia and MODSIM conferences, and PhD fieldwork in Arnhem Land, QUT Centre for Data Science	\$2,000	2023
Australian Mathematical Sciences Institute Summer School Travel Funding	\$1,551	2023
Travel funding for Ecological Society of Australia / Society for Conservation Biology Oceania conference attendance, QUT Centre for Data Science	\$2,000	2022
Integrating MOOC platform xOtago into the teaching of Zoology papers for future flexibility and resilience, University of Otago Teaching and Development Grant	\$10,124	2021-2022
GPS tracking kākā from Orokonui Ecosanctuary, Dunedin City Council Parks and Reserves	\$15,000	2020
GPS tracking kākā from Orokonui Ecosanctuary, OSPRI	\$7,000	2020
GPS tracking kākā from Orokonui Ecosanctuary, High Country Contracting	\$2,000	2020

Awards

Student presentation award - Applied Mathematical Ecology Group Symposium, Brisbane, Australia	2025
Runner-up student poster award - QUT Centre for Data Science Showcase, Brisbane, Australia	2024
Student presentation award - International Statistical Ecology Conference, Wales, UK	2024
Runner-up student presentation award - International Biologging Society Conference (BLS7), online	2021

Presentations and Workshops

International Congress for Conservation Biology (ICCB 2025), Brisbane, Australia, workshop presenter	June 2025
evokeAG Next generation robotics and AI, Brisbane, Australia	2025
Applied Mathematical Ecology Group Symposium, Brisbane	2025
Ecological Society of Australia Conference, Melbourne, Australia	2024
QUT Centre for Data Science Showcase, Brisbane, Australia, <i>presentation and poster</i>	2024
International Society for Behavioural Ecology Congress, Melbourne, Australia, <i>poster</i>	2024
Max Planck Institute of Animal Behaviour Research Visit, Konstanz, Germany	2024
University of Zurich Research Visit, Zurich, Switzerland	2024
ETH Zurich Research Visit, Zurich, Switzerland	2024
IFREMER Research Visit, Brest, France	2024
International Statistical Ecology Conference, Wales, UK, <i>presentation and poster</i>	2024
University of Potsdam Research Visit, Potsdam, Germany	2024
University of Göttingen Research Visit, Göttingen, Germany	2024
QUT Centre for Data Science Bayesian Research and Applications Group	2024
Queensland and New Zealand Institute of Applied Mathematics Conference, Brisbane, Australia	2024
QUT Resilience Centre and UQ Centre for Biodiversity and Conservation Science ECR event, Brisbane, Australia	2024
Geospatial Share Workshop - Animal Movement Modelling, workshop presenter	2024
QUT Time-Series Modelling Workshop, organiser and presenter , Brisbane, Australia	2024
International Biologging Society Conference (BLS8), online, <i>poster</i>	2024
Applied Mathematical Ecology Group Symposium, Brisbane	2024
Australasian Ornithological Conference, Brisbane, Australia	2023
QUT Centre for Data Science Bayesian Research and Applications Group	2023
CSIRO Living Landscapes Science Hour, online	2023
International Congress on Modelling and Simulation Conference (MODSIM), Darwin, Australia	2023
Ecological Society of Australia Conference, Darwin, Australia	2023
Applied Mathematical Ecology Group Symposium, Brisbane, Australia	2023
Ecological Society of Australia / Society for Conservation Biology Oceania Conference, Wollongong, Australia	2022
QUT Centre for Data Science Bayesian Research and Applications Group	2022
International Biologging Society Conference (BLS7), online	2021
University of Otago Zoology Departmental Seminar	2021
Birds NZ Conference, Thames, New Zealand	2021
Australasian Wildlife Management Society Conference, online	2020
Otago Postgraduate Research Symposium, Dunedin, New Zealand	2019

Workshop Attendance

Introduction to Machine Learning and Deep Learning (with Professor Benoit Liquet)	2025
GAMs for animal movement, International Statistical Ecology Conference, Wales, UK	2024

Australian Mathematical Sciences Institute Summer School, Melbourne, Australia - Spatial Statistics (equivalent of an Honours-level class)	2023
Dynamic models in behavioural ecology, Ecological Society of Australia Conference, Wollongong, Australia	2022
Practical Deep Learning for Coders (a UQ collaboration with fast.ai), Brisbane, Australia	2022

Academic Leadership

Ecological Society of Australia Movement Ecology Special Interest Network (co-founder)	2025-present
Bayesian Research and Applications Seminar Series (co-chair)	2022-2023
I have reviewed manuscripts for the <i>Journal of Animal Ecology</i> , <i>Movement Ecology</i> and <i>Animal Biotelemetry</i>	

Volunteering, Outreach and Community Engagement

CSIRO and Queensland University of Technology: PhD fieldwork, Arnhem Land, Australia	2023
University of Otago: MSc fieldwork, Orokonui Ecosanctuary, Dunedin, New Zealand	2020-2021
Orokonui Ecosanctuary: Education Outreach Team, Dunedin, New Zealand	2020-2021
University of Otago: Zoology Tertiary Open Day Coordinator, Dunedin, New Zealand	2020
Otago Museum: Science Fair Judge, Dunedin, New Zealand	2020
Department of Conservation: Kākā (<i>Nestor meridionalis</i>) Recovery Team, Fiordland National Park, New Zealand	2019
Department of Conservation: Kākāpō (<i>Strigops habroptilus</i>) Recovery Team, Whenua Hou (Codfish Island), New Zealand	2019
Department of Conservation: Takahē (<i>Porphyrio hochstetteri</i>) Recovery Team, Kahurangi National Park, New Zealand	2018
Montana Fish, Wildlife and Parks: Gray Wolf (<i>Canis lupus</i>) Program, Western Montana, USA	2017
Comunidad Inti Wara Yassi (CIWY): Puma/Jaguar Caretaker, Parque Ambue Ari, Bolivia	2014

References

Dr Michael Bode Professor School of Mathematical Sciences Queensland University of Technology	PhD Supervisor	michael.bode@qut.edu.au
Dr Daniel Pagendam Senior Research Scientist Data61, CSIRO	PhD Supervisor	dan.pagendam@data61.csiro.au
Dr Andrew Hoskins Senior Research Scientist Environment, CSIRO	PhD Supervisor	andrew.hoskins@csiro.au
Dr Christopher Drovandi Professor and ARC Future Fellow School of Mathematical Sciences Queensland University of Technology	PhD Supervisor	c.drovandi@qut.edu.au