KATARINA STUART
Curriculum vitae

Evolution & Ecology Research Centre
School of Biological Earth and Environmental Sciences
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RESEARCH INTERESTS

My interests are in evolutionary genomics and exploring the proximate mechanisms that facilitate local adaptation. Most of my research is conducted on introduced species, as successful invasives provide an important opportunity to observe rapid evolution within a species as it responds to a new ecosystem. Understanding rapid adaptation within invasive populations has applications in many scientific fields, including but not limited to pest control, conservation, organism response to climate change, and evolutionary mechanisms. Most of my research is focused on the invasive starling population in Australia and focuses on identifying adaptive genetic shifts post invasion.

My projects and interests cover a range of fields, including genomics, bioinformatics, ecological statistics, and field ecology

EDUCATION

Doctor of Philosophy (Biology) - University of New South Wales 2018-2022

Bachelor of Science (Advanced) (Honours) - University of Sydney 2013-2017
Thesis Title: *Mechanisms generating geographic divergence in phenotypic traits within the invasive cane toad in Australia*
Supervisors: Professors Richard Shine & Gregory Brown

PUBLICATIONS

-Preprint-

7. Hofmeister NR, Stuart KC, Warren WC, Werner SJ, Bateson M, Ball GF, Buchanan KL, Burt DW, Cardilini APA, Cassey P, De Meyer T, George J, Meddle SL, Rowland HM, Sherman CDH, Sherwin WB, Berghe WV, Rollins LA, Clayton DF (2021). Concurrent invasions by European starlings (Sturnus vulgaris) suggest selection on shared genomic regions even after genetic bottlenecks. *BioRXIV*, *https://doi.org/10.1101/2021.05.19.442026*

6. Stuart KC†, Edwards RJ†, Cheng Y, Warren WC, Burt DW, Sherwin WB, Hofmeister NR, Werner SJ, Ball GF, Bateson M, Brandley MC, Buchanan KL, Cassey P, Clayton DF, De Meyer T, Meddle SL, Rollins LA (2021). Transcript- and annotation-guided genome assembly of the European starling. *BioRXIV*, https://doi.org/10.1101/2021.04.07.438753 † joint first author.

5. Zhou J, Nelson TM, Lopez CR, Zhou SJ, Ward-Fear G, Stuart KC, Rollins LA (2020) Microbial function is related to behavior of an invasive anuran. *BioRXIV*, https://doi.org/10.1101/2020.11.16.385690

-2022-

4. Stuart KC, Sherwin WB, Austin JJ, Bateson M, Eens M, Brandley MC, Rollins LA (2022). Historical museum samples enable the examination of divergent and parallel evolution during invasion. *Molecular Ecology* accepted.

-2021-

3. Stuart KC[†], Cardilini APA[†], Cassey P, Richardson MF, Sherwin W, Rollins LA[*], Sherman CDH[*]. (2021) Signatures of selection in a recent invasion reveal adaptive divergence in a highly vagile invasive species. *Molecular Ecology*, https://doi.org/10.1111/mec.15601 ([†] indicates joint first authorship, [*] indicates joint last authorship)

-2019-

2. Stuart KC, Brown GP, Shine R. (2019) Proximate mechanisms underlying the rapid modification of phenotypic traits in cane toads (*Rhinella marina*) across their invasive range within Australia. *Biol J Linnean Soc*. 126(1):68-79, https://doi.org/10.1093/biolinnean/bly150

-2018-

1. Hudson CM, Brown GP, Stuart KC, Shine R. (2018) Sexual and geographical divergence in head widths of invasive cane toads, *Rhinella marina* (Anura: Bufonidae), is driven by both rapid evolution and plasticity. *Biol J Linnean Soc*. 124(2):188-99, https://doi.org/10.1093/biolinnean/bly040

GRANTS, SCHOLARSHIPS, & AWARDS

Scholarships

UNSW Science PhD Writing Scholarship ($7,500)	2022
Australian Government Research Training Program Scholarship	2018-2022

Grants

Holsworth Wildlife Research Endowment ($6,375; $7,500)	2019, 2020

Awards

GSA 2021 Mayo Prize for best student presentation	2021
Outstanding E&ERC Postgraduate Researcher	2021
Australasian Evolution society student talk award (2nd Place) ($200)	2020
The Outstanding Evolution and Ecology Presentation EERC talk ($200)	2019
COMBINE 2018 Symposium 3rd place best oral presentation ($50)	2018
The Outstanding Evolution and Ecology Presentation EERC talk runner up	2018

Travel Awards

Postgraduate Research Student Support (PRSS) Scheme ($1,000)	2021
Genetic Society of Australia Smith-White Travel award	2020
ABACBS National Conference CSL travel award ($200)	2018

SCIENTIFIC PRESENTATIONS

Invited Talks:

Queensland Technologies and Innovations group seminar talk, virtual, Feb 2021
The draft genome assembly of the globally invasive common starling, Sturnus vulgaris

Genetics Society of AustralAsia Award Symposium, virtual, Oct 2020
Whole transcripts in genome assembly, annotation, and assessment: the draft genome assembly of the globally invasive common starling, Sturnus vulgaris.

Talks:

Australasian Evolution Society Virtual Conference, virtual, Dec 2021
A genetic perspective on rapid adaptation in the globally invasive European starling (Sturnus vulgaris).

Genetics Society of AustralAsia Virtual Conference, virtual, Oct 2021
A genetic perspective on rapid adaptation in the globally invasive European starling (Sturnus vulgaris).

Australasian Evolution Society Virtual Conference, **v**irtual, Dec 2020
Rapid Adaptation in invasive species: Using historical museum samples to examine evolution in an invasive passerine.

Postgraduate Research Form, **v**irtual, Nov 2020
Investigating evolution using invasive species and historical museum samples.

ABACBS Virtual Conference, **v**irtual, Nov 2020
Whole transcripts in genome assembly, annotation, and assessment: the draft genome assembly of the globally invasive common starling, Sturnus vulgaris.

Postgraduate Research Form, University of New South Wales, Australia, October 2019
Evolution in invasive species: exploring adaptive divergence and selection across the Australian landscape.

Australasian Evolution Society National Conference, UNSW, Australia, November 2019
Local signatures of founding populations confound identification of adaptive divergence in invasive populations.

COMBINE Symposium, University of Melbourne, Victoria, Australia, November 2018
Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (Sturnus vulgaris) introduction across Australia.

Postgraduate Research Form, University of New South Wales, Australia, October 2018
Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (Sturnus vulgaris) introduction across space and time.

Posters:

GIW/ABACBS International Conference, University of Sydney, Australia, December 2019
Using genomics to reveal drivers of invasion success.

COMBINE/AYRCOB Symposium, University of Sydney, Australia, December 2019
Using genomics to reveal drivers of invasion success.

ABACBS National Conference, University of Melbourne, Victoria, Australia, November 2018
Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (Sturnus vulgaris) introduction across Australia.

TEACHING EXPERIENCE

BABS2204 – Genetics *(UNSW Sydney)* 2019 - 2021
Laboratory demonstrator for a second-year biotechnology and biomolecular sciences subject. Duties include supervising classes to ensure safely protocols are adhered to, marking assignments, and supervising assessable tasks. I was responsible for motivating constructive discussion among students, as well as explaining biological processed to students, and assisting with experimental procedures.

BIOC2201 – Principles of molecular biology 2021
Laboratory demonstrator and tutor for a second-year biochemistry subject, with key topics including an introduction to modern molecular biology, molecular mechanisms of gene expression, and fundamental aspects of recombinant DNA technology

BABS3291 – Genes, Genomes and Evolution *(UNSW Sydney)* 2018 - 2021
Laboratory demonstrator for a third-year biotechnology and biomolecular sciences subject, teaching students with a range of biological and coding knowledge. Key topics include introduction to evolutionary bioinformatics, fundamental genomic principles, and investigation into recent advancements in the field.

BIOC2101 - Principles of Biochemistry 2021
Laboratory demonstrator for a second-year biochemistry subject, with key topics including and introduction to modern biochemistry, and covers fundamental aspects of the structure-function relationships of proteins and an overall coverage of intermediary metabolism.

Science and Engineering Indigenous Preparatory Program 2020
Project Developer and Instructor for the Science and Engineering Indigenous Preparatory Program. Prepared and delivered 3 hours of first year university level biology teaching content for incoming and prospective first year university students.

ANGUS 2019 - Data Intensive Biology Summer Institute *(UC Davis)* July, 2019
Teaching assistant at the ANGUS summer course held through the Data Intensive Biology Summer Institute and the Lab for Data Intensive Biology at UC Davis. Taught learners from varied backgrounds (undergraduate to professorial) genomic practices for analysing big shotgun sequencing data sets over the intensive two-week course, as well as working one on one with learners on their own data sets.

SUPERVISION EXPERIENCE

NSW Year 12 Extension Science Project Supervisor 2019
Primary supervisor for a year 12 student from Elderslie high school, undertaking with them a project looking into environment and phenotype correlations across the cane toads' Australian range. Worked one on one with the student to develop coding, analytical, writing, and general scientific skills to help them produce a report in fulfillment of their course outcomes. Assisted student in preparing a conference presentation, which they gave at the 2019 Australasian Evolution Conference.

ADDITIONAL RESEARCH AND FIELD EXPERIENCE

Research Volunteer - *Deakin University* December 2017
Species collection and transportation to field station.

Research Assistant - *Deakin University* August 2017
Animal husbandry and data collection for a PhD project located at a regional Northern Territory research station.

Honours Research - *University of Sydney* August 2016 – February 2017
Based at a remote research station in Northern Territory, Australia for 6 months while collecting data for completion of my honours thesis.

PROFESSIONAL DEVELOPMENT & TRAINING

UNSW Women in Maths and Science Champions Program (2020)

Sessional Staff Development Program, BABS, UNSW (2020)

Code of Conduct Incident Response Workshop, UC Davis California, Otter Tech (2019)

Bioconductor Hands-on Training Day, 4th Bioconductor Asia meeting, University of Melbourne, Victoria, Australia (2018)

Sample Size and Power Calculations, Stats Central, UNSW, New South Wales, Australia (2018)

ANGUS – Analysing Sequencing Data, Data Intensive Biology Summer Institute, UC Davis, California, USA (2018)

Software Carpentry Workshop – R, Unix shell, Git, Curtin University, Perth, Australia (2018)

SERVICE AND OUTREACH

GSA 2021 Virtual Conference Committee July 2021 – Oct 2021
Assisted with the organisation of the 2021 Genetics Society of AustralAsia Virtual Conference.

Sydney Society for Conservation Biology – *President*, *Communications* Oct 2018 – Feb 2020
Responsible for managing the society board committee, overseeing finances and event organisation and execution. Additionally, responsible for maintaining the social media pages (Facebook and Twitter), and organised and wrote a monthly newsletter for society members.

COMBINE General Committee - *Symposium Coordinator* Dec 2018 – Feb 2020
I was responsible for assembling the 2019 COMBINE symposium committee, supervising the organisation of all aspects of the event. Key roles include meeting outcome deadlines, ensuring budget restraints were met and invoiced, and assisting to organise the assembly of a guest careers panels.

E&ERC Postgraduate Committee Jan 2019 – Jan 2020
My job is to provide a lively, inclusive, fun and academically enriching experience for all postgraduates in the E&ERC. I organise formal and informal centre gatherings, two seminar speakers, encourage student participation in centre activities and help integrate new students.

GIW/ABACBS 2019 Conference Committee – *COMBINE representative* Feb 2019 – Dec 2019
Liaised between the ABACBS conference committee and COMBINE symposium committee to ensure budget and time restraints were met.

AES 2019 Conference Committee April 2019 – Nov 2019
Assisted with the organisation of the 2019 Australasian Evolution Society Conference.

Australian National Museum - *Volunteer* Aug 2014 – Aug 2019
Assisting with running events and demonstration, chaperoning school groups, and general communications and operational duties during Australian Science Week.

Friends of Fogg Dam - *Invited Speaker* October 2016
Gave a talk to a community ecology and restoration group on the developing aspects of my honours research.

PROFESSIONAL MEMBERSHIP

Australian Bioinformatics and Computational Biology Society (2018-2021)
AustralAsian Evolution Society (2019-2021)
Genetics Society of AustralAsia (2021)
Ecological Society of Australia (2018-2021)

REFERENCES

Professor Richard Shine | Professor rick.shine@mq.edu.au
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Associate Professor Lee Ann Rollins | Scientia Fellow l.rollins@unsw.edu.au
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