



[Google Scholar](#)

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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. Some of my research focuses on commonly understudied elements of the genome, including structural variation and transposable elements, in order to examine holistic patterns of genomic variation and adaptive potential.

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

EDUCATION

DOCTOR OF PHILOSOPHY (BIOLOGY) 2018-2022

University of New South Wales

Thesis Title: A genetic perspective on rapid adaptation in the globally invasive European starling (*Sturnus vulgaris*)

Supervisors: Lee A Rollins, Richard J Edwards, & William B Sherwin

BACHELOR OF SCIENCE (ADVANCED) (HONOURS) 2013-2017

University of Sydney

Thesis Title: Mechanisms generating geographic divergence in phenotypic traits within the invasive cane toad in Australia

Supervisors: Richard Shine & Gregory Brown

PROFESSIONAL APPOINTMENTS

Postdoctoral Research Fellow Sept 2024 - present
Macquarie University

Research Fellow May 2022 - Sept 2024
University of Auckland

Research Assistant 2020-2022
University of New South Wales

Research Assistant August 2017
Deakin University

GRANTS, SCHOLARSHIPS, & AWARDS

SCHOLARSHIPS & RESEARCH GRANTS

2024	Genomics Aotearoa ECR Grant	8,000 NZD
2024	UoA FoS Research Fellow Society Publishing Grant	1,000 NZD
2022	GSA Workshop Support Program	1,000 AUD
2022	AES ECR Networking Grant	2,000 AUD
2022	UNSW Science PhD Writing Grant	7,500 AUD

2019;2020	Holsworth Wildlife Research Endowment	6,375;7,500 AUD
2018-2022	Australian Government Research Training Program Scholarship	≈27,000 AUD p.a.

AWARDS

2023	Bioprotection Aotearoa/Genomics Aotearoa ECR Talk Prize	250 NZD
2022	Dean's Award for Outstanding PhD Theses	-
2022	SMBE Invasomics Conference Oral Presentation Award	250 NZD
2021	GSA 2021 Mayo Prize for best student presentation	-
2021	Outstanding E&ERC Postgraduate Researcher	-
2020	Australasian Evolution society student talk award (2 nd Place)	200 AUD
2019	The Outstanding Evolution and Ecology Presentation EERC talk	200 AUD
2018	COMBINE 2018 Symposium 3 rd place best oral presentation	50 AUD
2018	The Outstanding Evolution and Ecology Presentation EERC (2 nd place)	-

TRAVEL GRANTS

2024	UoA FoS Research Fellow Society Travel Fund	1000 NZD
2023	Genomics Aotearoa - He taonga tuku iho scholarship	600 NZD
2023	Queenstown Research Week's Genomics satellite scholarship	1180 NZD
2022	School of Biological Science support scheme	1,500 NZD
2022	SMBE Invasomics Conference	400 NZD
2022	University of Auckland FoS Research Fellow Society	500 NZD
2021	Postgraduate Research Student Support (PRSS) Scheme	1,000 AUD
2020	Genetic Society of Australia Smith-White Travel award	-
2018	ABACBS National Conference CSL travel award	200 AUD

PUBLICATIONS

PREPRINT & UNDER REVIEW/REVISION

19. Stuart KC, Tan HZ, Whibley A, Brekke P, Ewen JG, Santure AW, (2024) Lifetime fitness is correlated more strongly with structural variant than SNP mutational load in a threatened bird species, *Molecular Ecology*, under revision.
18. Atsawawaranunt K, Stuart KC, Whibley A, Ewart KM, Major RE, Johnson JN, Santure AW (2024) Parallel signatures of diet adaptation in the invasive common myna genome, *Molecular Ecology*, under revision.
17. Zhou J, Nelson TM, Lopez CR, Zhou SJ, Ward-Fear G, Stuart KC, Rollins LA (2021) Microbial function is related to behavior of an invasive anuran. *BioRxIV*, <https://doi.org/10.1101/2020.11.16.385690>

PEER REVIEWED ARTICLES

16. Thompson B, Atsawawaranunt K, Nehmens M, Pearman W, Perkins E, Tan HZ, Whibley A, Santure AW, Stuart KC (2024) Population genetics of the invasive European Starling across Aotearoa, New Zealand, *Molecular Ecology*, Accepted.
15. Tan HZ, Scherer P, Stuart KC, Bailey S, Lee KD, Brekke P, Ewen JG, Whibley A, Santure AW (2024) A high-density linkage map allows investigation of fine-scale heterochiasmy in an avian system, *Heredity*, 1-14, <https://doi.org/10.1038/s41437-024-00711-3>
14. Stuart KC, Atsawawaranunt K, Johnson R, Major R, Ewart KM, Rollins LA, Santure AW, Whibley A (2024) The genome of a globally invasive passerine, the common myna (*Acridotheres tristis*), *DNA Research*, 31 (2), dsae005, <https://doi.org/10.1093/dnares/dsae005>
13. McGaughran A, Dhami MK, Parvizi E, Vaughan AL... Stuart KC,... (2024) Genomic tools in biological invasions: current state and future frontiers, *Genome Biology and Evolution*, 16: evad230 <https://doi.org/10.1093/gbe/evad230>

12. 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 (2024). Concurrent invasions by European starlings (*Sturnus vulgaris*) suggest selection on shared genomic regions even after genetic bottlenecks. *Molecular Ecology*, <https://doi.org/10.1111/mec.17195>
11. Miller SM, Stuart KC, Burke NW, Rollins LA, Bonduriansky R (2024) Genetic and phenotypic consequences of local transitions between sexual and parthenogenetic reproduction in the wild. *American Naturalist*, 203, <https://doi.org/10.1086/727511>
10. Li-Williams S[†], Stuart KC[‡], Comte S, Forsyth DM, Dawson M, Sherwin WB, Rollins LA. (2023) Genetic analysis reveals spatial structure in an expanding introduced rusa deer population, *Wildlife Research*, WR22128. <https://www.publish.csiro.au/WR/WR22128> († indicates joint first authorship)
9. Stuart KC, Edwards, RJ, Sherwin WB, Rollins, LA. (2023) Contrasting patterns of single nucleotide polymorphisms and structural variations across multiple invasions. *Molecular Biology and Evolution*, 40(3): msad046. <https://doi.org/10.1093/molbev/msad046>
8. Stuart KC[†], Hofmeister NR[†], Zichello JM, Rollins LA. (2023) Global invasion history and native decline of the common starling: insights through genetics, *Biological Invasions*. <https://doi.org/10.1007/s10530-022-02982-5> († joint first author)
7. Stuart KC, Sherwin WB, Edwards RJ*, Rollins LA* (2023) Evolutionary genomics: Insights from the invasive European starlings, *Frontiers in Genetics* (* indicates joint last authorship). <https://doi.org/10.3389/fgene.2022.1010456>
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 (2022). Transcript- and annotation-guided genome assembly of the European starling. *Molecular Ecology Resources*, <https://doi.org/10.1101/2021.04.07.438753> † joint first author
5. Stuart KC, Sherwin WB, Cardilini APA, Rollins LA (2022). Genetics and plasticity are responsible for climate induced ecogeographical patterns in a recent invasion. *Frontiers in Genetics* DOI: <https://doi.org/10.3389/fgene.2022.824424>.
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*, 31(6):1836-1852, <https://doi.org/10.1111/mec.16353>.
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*, 30(6):1419-1434, <https://doi.org/10.1111/mec.15601> († indicates joint first authorship, * indicates joint last authorship)
Featured in *Molecular Ecology News and Views*: <https://doi.org/10.1111/mec.15794>
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>
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>

PEER REVIEWED BOOK CHAPTERS

2. Stuart KC, Santure AW, Rollins LA. (2024) Structural variants and transposable elements as facilitators of rapid evolutionary change in invasive populations. in Rius, M., *Invasion Genomics. In Review*.

1. Stuart KC, Woolnough AP, Rollins LA. (2023) Invasive species detection and management using genomic methods. in Holleley, C.E., Berry, O. and Jarman, S. Applied Ecological Genetics. CSIRO Publishing, Canberra

TEACHING EXPERIENCE

UNDERGRADUATE COURSES - LECTURES

- 2024 **BIOSCI210: Evolution and the Origin of Life** *UoA, New Zealand*
Guest lecturer

UNDERGRADUATE COURSES - TUTOR

- 2023 **BIOSCI322: Evolution of Genes, Populations and Species** *UoA, New Zealand*
Lead for the populations genetics and simulating evolution lab for a third year undergraduate course.
- 2018-2022 **BABS3291: Genes, Genomes and Evolution** *UNSW Sydney, AUS*
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.
- 2021 **BIOC2201: Principles of molecular biology** *UNSW Sydney, AUS*
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
- 2019-2021 **BABS2204: Genetics** *UNSW Sydney, AUS*
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 processes to students, and assisting with experimental procedures.
- 2021 **BIOC2101: Principles of Biochemistry** *UNSW Sydney, AUS*
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.

POSTGRADUATE & OTHER

- 2022-2024 **Workshop - Genetic Outlier Analysis** *New Zealand & Australia*
Developed [materials](#) for a two-day workshop, and successfully hosted six workshops to-date, with over 150 attendees over this time. This workshop covers the basics of PCAdapt, Fst, BayeScan, and BayPass, as well as key discussion around selection analysis on genomic data. Some workshops were hosted in-person and allowed for attendees to bring and analyse their own data. Press release from [Australian BioCommons](#).
- 2022-2023 **Genomics Aotearoa Workshop Helper** *New Zealand*
Assisted with coding workshops as a facilitator/helper. Courses included 'Introduction to Shell & Unix', and 'Introduction to RNA-seq' workshops.
- 2020 **Science and Engineering Indigenous Preparatory Program** *UNSW Sydney, AUS*
Project Developer and Instructor for the Science and Engineering Indigenous Preparatory Program. Prepared and delivered 3 hours (lectures and tutorials) of first year university level biology teaching content for incoming and prospective first year university students.
- 2019 **Workshop - Data Intensive Biology Summer Institute ANGUS 2019** *UC Davis, USA*

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

- 2024- **PhD co-supervisor (external) - Neve Kelly**
I am an external co-supervisor to a Ph D student at the University of New South Wales, commencing in mid-2024. Neve will be continuing research from my Ph D into the genomic basis of starling evolution and success.
- 2023- **Summer student primary supervisor - Bryan Thompson**
2024 Supervised a 3rd year undergraduate student of a 10 week summer period. Introduced the student to genomics using R and the UNIX command line. Student completed SNP variant calling and population genomics exploration of a reduced representation SNP dataset. Bryan's project has been published in the University of Auckland [Scientific](#).
- 2021- **Masters student unofficial supervisor - Scarlett Li-Williams**
2022 Project involved reduced representation sequencing of invasive deer in conjunction with the NSW Department of Primary Industries.
- 2019 **NSW Year 12 (high school) Extension Science Project Supervisor**
Primary supervisor for final high school year student on an extension science project. Work covered developing 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.

SCIENTIFIC PRESENTATIONS

INVITED SEMINARS

- | | | |
|------|--|---------------------------|
| 2024 | University of Rennes, Ecobio department seminar Rapid evolution & adaptive potential: perspectives from genomes, invasive species, & history. | <i>Rennes, France</i> |
| 2024 | The University of Sheffield, Ecology and Evolutionary Biology department seminar Rapid evolution & adaptive potential: perspectives from genomes, invasive species, & history. | <i>Sheffield, England</i> |
| 2023 | Zoology Seminar - Otago University Invasive species, and the secrets they can teach us about the genetics of local adaptation. | <i>Virtual</i> |
| 2023 | Sydney Bioinformatics Seminar Series - University of Sydney A genetic perspective on rapid adaptation in the globally invasive European starling (<i>Sturnus vulgaris</i>) | <i>Virtual</i> |
| 2021 | Queensland Technologies and Innovations group seminar talk - University of Queensland The draft genome assembly of the globally invasive common starling, <i>Sturnus vulgaris</i> | <i>Virtual</i> |

INVITED CONFERENCE TALKS

- | | | |
|------|---|--------------------|
| 2023 | Genomics Aotearoa Annual Meeting A whole genome perspective on genetic variation and rapid adaptation. | <i>Dunedin, NZ</i> |
|------|---|--------------------|

2023	Queenstown Research Week: He taonga tuku iho - Bioprotection Aotearoa A whole genome perspective on genetic variation and rapid adaptation.	Queenstown, NZ
2020	Genetics Society of AustralAsia Award Symposium Whole transcripts in genome assembly, annotation, and assessment: the draft genome assembly of the globally invasive common starling, <i>Sturnus vulgaris</i>	Virtual
SELECT TALKS		
2024	3rd Joint Congress on Evolutionary Biology Structural variants and transposable elements as hidden components of whole genome variation	Montreal, Canada
2024	Genetics society of Australasia Structural variants and transposable elements as hidden components of whole genome variation	Sydney, Australia
2023	International Congress of Genetics A whole genome perspective on genetic variation and rapid adaptation.	Melbourne, Australia
2022	Australasian Evolution Society National Conference Genetics and plasticity are responsible for ecogeographical patterns in a recent invasion.	ANU, Australia
2022	NZ Molecular Ecology Conference Contrasting patterns of single nucleotide polymorphisms and structural variations across multiple invasions.	Auckland, NZ
2022	SMBE Invasomics Conference Contrasting patterns of single nucleotide polymorphisms and structural variations across multiple invasions.	UoW, NZ
2022	ComBio/Genetics Society of Australasia Genetics and plasticity are responsible for ecogeographical patterns in a recent invasion.	UoM, Australia
2021	Australasian Evolution Society Conference A genetic perspective on rapid adaptation in the globally invasive European starling (<i>Sturnus vulgaris</i>).	Virtual
2021	Genetics Society of AustralAsia Conference A genetic perspective on rapid adaptation in the globally invasive European starling (<i>Sturnus vulgaris</i>).	Virtual
2020	Australasian Evolution Society Conference Rapid Adaptation in invasive species: Using historical museum samples to examine evolution in an invasive passerine.	Virtual
2020	Postgraduate Research Forum Investigating evolution using invasive species and historical museum samples.	Virtual
2020	ABACBS Virtual Conference Whole transcripts in genome assembly, annotation, and assessment: the draft genome assembly of the globally invasive common starling, <i>Sturnus vulgaris</i> .	Virtual
2019	Postgraduate Research Form Evolution in invasive species: exploring adaptive divergence and selection across the Australian landscape.	UNSW, Australia
2019	Australasian Evolution Society National Conference Local signatures of founding populations confound identification of adaptive divergence in invasive populations.	UNSW, Australia
2018	COMBINE Symposium Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (<i>Sturnus vulgaris</i>) introduction across Australia.	UMelb, Australia
2018	Postgraduate Research Form, University of New South Wales Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (<i>Sturnus vulgaris</i>) introduction across space and time.	UNSW, Australia

POSTERS

2022	Lorne Genome Conference A genetic perspective on rapid adaptation in the globally invasive European starling (<i>Sturnus vulgaris</i>).	Lorne, AUS
2019	GIW/ABACBS International Conference Using genomics to reveal drivers of invasion success.	USYD, AUS
2019	COMBINE/AYRCOB Symposium Using genomics to reveal drivers of invasion success.	USYD, AUS
2018	ABACBS National Conference Evolution in invasive populations: using genomics to reveal drivers of invasion success in the Australian European starling (<i>Sturnus vulgaris</i>) introduction across Australia.	UM, AUS

SERVICE, OUTREACH & MEDIA

SERVICE

2024-	Genetics Society of Australasia - <i>ECR representative</i>	
2023- 2024	Landscape Genomics Journal Club - <i>Lead</i> Organising a fortnightly discussion group which discusses key papers within the field of landscape genomics.	
2023- 2024	Centre for Computational Evolution - <i>Seminar Series Organiser</i> Co-running the CCE seminar series at the University of Auckland and a hybrid in-person and online seminar series.	
2023	International Congress of Genetics conference 2023 - <i>Symposia Organiser and Chair</i> Organised and chaired the 'Invasion Genomics' session, which included appointing a co-chair, inviting international speakers, and appraising abstracts for inclusion into the scientific program.	
2021	GSA 2021 Virtual Conference Committee - <i>Committee Member</i> Assisted with the organisation of the 2021 Genetics Society of AustralAsia Virtual Conference.	
2018- 2020	Sydney Society for Conservation Biology - <i>President, Communications</i> 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.	
2019	COMBINE General Committee - <i>Symposium Coordinator</i> 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.	
2019- 2020	E&ERC Postgraduate Committee - <i>Committee Member</i> My job was 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.	
2019	GIW/ABACBS 2019 Conference Committee - <i>COMBINE Representative</i> Liaised between the ABACBS conference committee and COMBINE symposium committee to ensure budget and time restraints were met.	
2019	AES 2019 Conference Committee - <i>Committee Member</i> Assisted with the organisation of the 2019 Australasian Evolution Society Conference.	

OUTREACH & MEDIA

- 2020, 2022 **Boiling Point Science Podcast - Guest**
Guest on EastSide 89.7 FM science podcast Boiling Point ([August 2020](#), [May 2022](#))
- 2014-2019 **Australian National Museum - Volunteer**
Assisting with running events and demonstration, chaperoning school groups, and general communications and operational duties during Australian Science Week.
- 2016 **Friends of Fogg Dam - Invited Speaker**
Gave a talk to a community ecology and restoration group on the developing aspects of my honours research.

PROFESSIONAL DEVELOPMENT & TRAINING

- 2022 **Carpentries Instructor Training and Certification** *University of Auckland, NZ*
- 2020 **UNSW Women in Maths and Science Champions Program** *UNSW Sydney, AUS*
- 2020 **Sessional Staff Development Program** *UNSW Sydney, AUS*
- 2018 **Bioconductor Hands-on Training Day** *University of Melbourne, AUS*
4th Bioconductor Asia meeting
- 2018 **Sample Size and Power Calculations** *UNSW Sydney, AUS*
Stats Central
- 2018 **ANGUS - Analysing Sequencing Data** *UC Davis, USA*
Data Intensive Biology Summer Institute
- 2018 **Software Carpentry Workshop - R, Unix shell, Git** *Curtin University, AUS*

PROFESSIONAL MEMBERSHIP & REVIEWS

MEMBERSHIP

- 2022- **Society for Molecular Biology and Evolution (SMBE)**
- 2020- **Genetics Society of AustralAsia (GSA)**
- 2019- **AustralAsian Evolution Society (AES)**
- 2018-2024 **Australian Bioinformatics and Computational Biology Society (ABACBS)**
- 2018-2021 **Ecological Society of Australia (ESA)**

REVIEWS

Biological Conservation, Biological Invasions, Biological Reviews, Ecology and Evolution, European Journal of Wildlife Research, Evolutionary Applications, Molecular Ecology, Molecular Ecology Resources, PeerJ, Scientific Reports

REFERENCES

Associate Professor Anna Santure

School of Biological Sciences, University of Auckland, Auckland, NZ

Details on request

Associate Professor Lee Ann Rollins | Scientia Fellow

School of Biological, Earth and Environmental Sciences, University of New South Wales, Sydney NSW 2052

Details on request

Dr Rich Edwards | Ocean Genomes Laboratory Lead

Minderoo OceanOmics Centre, University of Western Australia.

Details on request