

# Stephanie Joy Galla, PhD

*Curriculum vitae*

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## Research Statement

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In collaboration with conservation practitioners and stakeholders, I design conservation genetic research that informs management of at-risk species and ecosystems. In particular, I use interdisciplinary approaches in genetics and modelling to understand demographics, interactions, and adaptive capacity in birds. I am the cofounder of the [Kindness in Science Initiative](#) and actively involved in approaches to bridge the gap between conservation research and practice.

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## Academic Qualifications

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2019, **PhD** (Evolutionary Biology), University of Canterbury (UC), New Zealand

2013, **MSc** (Biology), University of North Texas (UNT), United States of America

2009, **BSc** (Wildlife Biology), Murray State University (MSU), United States of America

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## Conservation Research and Practice

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**Postdoctoral Researcher, Boise State University (BSU), 2020 - Present:** I contribute towards three collaborative and interrelated projects, including the NSF EPSCoR Track I project GEM3 (Genes by Environment: Modelling, Mechanisms, Mapping), the Department of Defense Environmental Research Program (SERDP), and the NSF EPSCoR Track II project GUTT (Genomics Underlying Toxin Tolerance):

**GUTT (January 2021- Present)** – I use genomic data and models to understand complex interactions between plant communities and herbivores (e.g., Greater Sage-grouse (*Centrocercus urophasianus*), Icelandic Rock Ptarmigan (*Lagopus muta*)). Conservation outcomes include improved revegetation recommendations in sagebrush steppe ecosystems, co-developed with the Bureau of Land Management.

**SERDP (April 2020 - Present):** I develop methods to integrate genomics into individual-based models to forecast phenological changes in American Kestrels. Research outputs include a genetically-explicit models for lay date in American Kestrel, with application to potential conservation translocations in this small raptor.

**GEM3 (April-December 2020)** – Using a combination of genomic technologies and individual-based models, I investigate the genetic underpinnings of adaptive capacity to climate change in sagebrush (*Artemisia tridentata*). Research outputs include a co-developed pipeline for discovering genome-to-phenome interactions.

**Postdoctoral Researcher, University of Canterbury, 2020:** I used genomic estimates of relatedness to inform pedigree-based management in the critically endangered kākāpō (*Strigops habroptila*) and

kākāriki karaka (*Cyanoramphus malherbi*). Conservation outcomes include translocations strategies for kākāpō and kākāriki karaka, co-developed with the New Zealand Department of Conservation.

**PhD Candidate, University of Canterbury, 2015-2019:** Completed a dissertation entitled “Conservation genomic management of two critically endangered New Zealand birds”. I evaluated methods (pedigree – genetic – genomic) of estimating relatedness and making pairing recommendations in conservation breeding programmes, using the critically-endangered kakī/black stilt (*Himantopus novaeseelandiae*) and kākāriki karaka. Outcomes included conservation pairing and translocation recommendations for kakī and kākāriki karaka, co-developed with the New Zealand Department of Conservation.

**Habitat Conservation Coordinator, Texas Parks and Wildlife, 2013-2015:** Developed and implemented habitat management projects for the three World Birding Center State Parks in the Rio Grande Valley of Texas (Bentsen-Rio Grande Valley, Estero Llano Grande, and Resaca de la Palma). I wrote resource management plans, managed wetlands, managed invasive plant species through chemical and mechanical means, conducted base-line flora/fauna surveys, trained and supervised field staff and volunteers, and used GIS to map changes in habitat.

**MSc Researcher, University of North Texas, 2010-2013:** Conducted a master’s thesis entitled: “Exploring the evolutionary history of North American prairie grouse (Genus: *Tympanuchus*) using multi-locus coalescent analyses”. My co-authors and I conducted this work to determine the evolutionary distinctiveness of the critically endangered Attwater’s Prairie-chicken (*Tympanuchus cupido*). Outcomes included conservation translocation recommendations for Attwater’s Prairie-chicken, co-developed with the US Fish and Wildlife Service.

**Ruffed Grouse Technician, University of Minnesota, 2010:** Monitored male Ruffed Grouse in the Cloquet Forestry Center using auditory triangulation methods. Research involved locating all active male grouse through auditory surveys, recording details about drumming structures, and studying vegetation composition surrounding active drumming structures.

**Biology Intern, Mississippi Sandhill Crane National Wildlife Refuge, 2009-2010:** Supported the refuge with all aspects of their wildlife management plan. I radio tracked Mississippi Sandhill Cranes, monitored crane behavior, trapped, handled and banded cranes, entered data using ArcGIS and Microsoft Access, assisted with soft-releases, and controlled invasive plant species.

**Coastal Waterbird Program Staff, Massachusetts Audubon, 2009:** Conducted daily nest surveys and monitored breeding behavior in Piping Plovers, Least Terns, and American Oystercatchers on South Beach, Massachusetts.

**Entomology Research Assistant, The Morton Arboretum, 2006-2009:** Studied fecundity, food preference, and range-expansion of invasive gypsy moths, Japanese beetles, and emerald ash borer in the greater Chicago area.

**Northeast Exotic Plant Management Team, Student Conservation Association, 2008:** Managed invasive plant species in several New England National Parks through applied herbicide, mechanical removal, and GIS mapping.

**BSc Research in Plant Taxonomy, Murray State University, 2006-2007:** Studied the molecular and natural history of a large-leaved mulberry native to the southeastern United States. Research resulted in the designation of a new mulberry species, *Morus murrayana* (Genus: Moraceae).

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Publications (In Review, Accepted, In Press, Published)

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14. Hauser SS, **Galla SJ**, Steeves TE, Latch EK (In Review). Comparing approaches for generating genomic-based estimates of relatedness for use in pedigree-based management. *Molecular Ecology Resources*. [BioRxiv Preprint here](#).
13. Melton A, Beck J, **Galla SJ**, Jenkins J, Handley L, Kim M, Grimwood J, Schmutz J, Richardson B, Serpe M, Novak S, Buerki, S (In Review) Reversing the genome-to-phenome research pipeline: a draft genome provides hypotheses on drought tolerance in a keystone plant species in western North America threatened by climate change. *Ecology and Evolution*.
12. Robb BC, Olsoy PJ, Mitchell JJ, Caughlin TT, Delparte DM, Fremgen-Tarantino MR, Nobler JD, Rachlow JL, Shipley LA, **Galla SJ**, Forbey JS (In Review) Near-infrared spectroscopy aids ecological restoration by classifying variation of taxonomy and phenology of a native shrub. *Restoration Ecology*.
11. Rohn TT, Beck JD, **Galla SJ**, Isho NF, Pollock TB, Suresh T, Kulkarni A, Sanghal T, Hayden EJ (Accepted) Fragmentation of apolipoprotein E4 is required for differential expression of inflammation and activation related genes in microglia cells. *International Journal of Neurodegenerative Disorders*.
10. **Galla SJ**, Brown L, Couch-Lewis Y, Cubrinovska I, Eason D, Gooley RM, Hamilton JA, Heath JA, Hauser SS, Latch EK, Matocq MD, Richardson A, Wold JR, Hogg CJ, Santure AW, Steeves TE (Accepted). The relevance of pedigrees in the conservation genomics era. *Molecular Ecology*. [Authorea Preprint here](#).
9. Forsdick NG, Adams CIM, Alexander, Clark AC, Collier-Robinson L, Cubrinovska I, Croll Dowgray M, Dowle EJ, Duntsch L, **Galla SJ**, Howell L, Magid M, Rayne A, Verry AJF, Wold JR, Steeves TE. (Accepted) Current applications and future promise of genetic/genomic data for conservation in an Aotearoa New Zealand context. Invited Submission to the New Zealand Department of Conservation Science for Conservation Series. [EcoEvoRxiv Preprint here](#).
8. Wold JR, Koepfli KP, **Galla SJ**, Eccles D, Hogg CJ, Le Lec M, Guhlin J, Santure A, Steeves TE (In Press) Expanding the conservation genomics toolbox: incorporating structural variants to enhance functional studies for species of conservation concern. *Molecular Ecology* (Invited Submission to the Special Issue on Whole Genome Sequencing), DOI: <https://doi.org/10.1111/mec.16141>.
7. Wojahn JMA, **Galla SJ**, Forbey J, Buerki S (2021) G2PMineR: A genome to phenome literature review approach. *Genes*, 12(2): 293, DOI: <https://doi.org/10.3390/genes12020293>
6. Overbeek AL and **Galla SJ** (co-first author), Brown L, Thyne C, Maloney RF, Steeves TE (2021) Pedigree validation using genetic markers in an intensively-managed taonga species, the critically endangered kakī (*Himantopus novaezelandiae*). *Notornis* (Invited Submission to Special Issue on Wading Birds), 67(4), 709-716.

5. **Galla SJ**, Moraga R, Brown L, Cleland S, Hoepfner MP, Maloney RF, Richardson A, Slater L, Santure AW, Steeves TE (2020) A comparison of pedigree, genetic, and genomic estimates of relatedness for informing pairing decisions in two critically endangered birds: Implications for conservation breeding programmes worldwide. *Evolutionary Applications*, 13(5), 991-1008, DOI: <https://doi.org/10.1111/eva.12916>.
4. **Galla SJ**, Forsdick NJ, Brown L, Hoepfner MP, Knapp M, Maloney RF, Moraga R, Santure AW, Steeves TE (2019) Reference genomes from distantly related species can be used for discovery of single nucleotide polymorphisms to inform conservation management. *Genes*, 10 (1), DOI: <https://doi.org/10.3390/genes10010009>.
3. **Galla SJ**, Buckley TR, Elshire R, Hale ML, Knapp M, McCallum J, Moraga R, Santure AW, Wilcox P, Steeves TE (2016) Building strong relationships between conservation genetics and primary industry leads to mutually beneficial genomic advances. *Molecular Ecology*, 25, 5267-5281, DOI: <https://doi.org/10.1111/mec.13837>.
2. **Galla SJ**, Johnson JA (2015) Influence of differential introgression and effective size of marker type on phylogenetic inference of a recently divergent group of polygynous grouse. *Molecular Phylogenetics and Evolution*, 84: 1-13, DOI: 10.1016/j.ympev.2014.12.012.
1. **Galla SJ**, Viers BL, Gradie PE, Saar DE (2009) *Morus murrayana* (Moraceae): A new mulberry from eastern North America. *Phytologia* 91(1): 105-116.

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### Select Academic Presentations

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- 2021, International Congress for Conservation Biology, Speaker  
 Title: “Integrating multiple data types for personalized management of at-risk herbivores: case studies in North America and Iceland.”
- 2021, International Congress for Conservation Biology, Symposium and Roundtable Organizer  
 Title: “Pathways to trusted and meaningful relationships between conservation geneticists and practitioners.”
- 2021, International Raptor Research Foundation Conference, Invited Speaker  
 Title: “Creating a genetically explicit individual-based model to understand climate-driven laydate shifts in American Kestrels (*Falco sparverius*).”
- 2021, Idaho EPSCoR GUTT Meeting, Invited Speaker  
 Title: “Creating a genetically explicit individual-based model to study migratory bird responses to climate driven phenology shifts.”
- 2020, Idaho EPSCoR GEM3 Annual Meeting, Speaker  
 Title: “A meta-analysis of genes underlying adaptive capacity of plants towards drought.”
- 2019, Brookfield Zoo, Invited Seminar Speaker  
 Title: “Conservation genomic management of critically endangered New Zealand birds: pedigrees and beyond.”
- 2019, Smithsonian Institution Seminar, Invited Speaker

Title: “A matchmaker’s guide for critically-endangered New Zealand birds.”

2019, AZA Molecular Scientific Advisory Group, Speaker

Title: “Conservation genomic management of critically-endangered New Zealand birds.”

2018, 2nd International Wildlife Reintroduction Conference, Speaker

Title: “Choosing the best individuals for pairing in conservation translocation breeding programmes: a Proof of Concept in a critically endangered New Zealand bird.”

2018, Society for Conservation Biology – Oceania Conference, Speaker

Title: “Can genomes from distantly related species be used as a reference to inform conservation management?”

2017, New Zealand Molecular Ecology Conference, Speaker

Title: “Chasing the perfect pedigree: a New Zealand perspective.”

2017, Australasian Ornithological Conference, Geelong, Australia, Speaker

Title: “Estimating relatedness in captive breeding for translocation programmes to enhance species recovery.”

2017, International Congress for Conservation Biology, Speaker

Title: “Estimating relatedness in captive breeding for translocation programmes to enhance species recovery.”

2017, e-Research Conference, Invited Speaker

Title: “Building interdisciplinary relationships for improved genomic outcomes: highlighting synergies between conservation genetics and primary industry.”

2016, Queenstown Research Week (MapNet), Invited Speaker

Title: “A conservation genomic approach for maximising genetic diversity in a critically endangered New Zealand bird.”

2016, Braided River Workshop, Invited Speaker

Title: “Black stilt/kakī: a brief history of conservation genetic management and goals for genomic research.”

2016, Texas Chapter of the Wildlife Society Meeting, Speaker

Title: “Exploring the evolutionary distinctiveness of the Attwater's prairie-chicken using multi-locus coalescent analyses.”

2012, North American Ornithological Conference, Speaker

Title: “Exploring the evolutionary distinctiveness of the critically endangered Attwater's Prairie-chicken using coalescent multi-locus analyses.”

2011, International Evolution Conference, Poster Presenter

Title: “A multi-locus approach to investigate the demographic history of prairie grouse (Genus: Tympanuchus).”

- SJ Galla, funding recipient from the American Kestrel Partnership, 2022, Project title:  
 “Using Genome-wide Single Nucleotide Polymorphisms to Detect Past Population Demographics and Current Effective Population Sizes in Five Genetically Distinct Populations of American Kestrel (*Falco sparverius*),” \$21,808.00 US
- Galla SJ, listed as key researcher in 2021 Endeavour Fund Smart Ideas Grant by TE Steeves, entitled  
 “Building an integrative genomics framework to mitigate maladaptive reproductive traits in endangered species, “ \$1,000,000 NZD
- SJ Galla, recipient of an UC PhD Scholarship and Departmental 6-month Continuation Scholarship (Stipend + Tuition + Fees), 2015-2019, \$99,000 NZ
- SJ Galla and TE Steeves, Brian Mason Technical Trust Research Award, 2015-2018, \$14,061 NZ
- SJ Galla, recipient of the UNT Tuition Scholarship (Stipend + Tuition + Fees), 2010-2013 \$65,000 US
- SJ Galla, recipient of a UNT Graduate Student Support Travel Grant for the 2012 North American Ornithological Conference, Vancouver BC, \$600 US
- SJ Galla, recipient of a Travel Grant for the 2012 Species Tree Workshop at the Ohio State University, \$500 US
- SJ Galla and DE Saar, co-recipients of the 2007 Marcia Athey Research Fund through the Kentucky Academy of Science, \$500 US

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### Select Awards and Honours

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- UC Annual Biological Conference, **Science Communication Award**, 2020
- Society for Conservation Biology Oceania, **Best Student Paper**, 2019
- UC Annual Biological Conference, **‘Best in Show’ Research Talk**, 2016, 2019
- UC College of Science Three Minute Thesis, **First Place**, 2018
- Australasian Ornithological Conference, **Outstanding Student Talk**, 2017
- UC Annual Biological Conference, **Honorable Mention for Journal Article**, 2017
- Society for Conservation Biology Oceania, **Best Research Talk**, 2017
- MapNet, **Early Career Researcher Award (1<sup>st</sup> Place) for Research Talk**, 2016
- Texas Chapter of the Wildlife Society, **Cottom Award (1<sup>st</sup> Place) in Research Talk**, 2014
- UNT Graduate Research Day, **2<sup>nd</sup> Place in Poster Presentation**, 2013
- UNT **Outstanding TA Award**, Spring 2013
- Murray State University **Wildlife Student of the Year**, 2008
- Murray State University Sigma Xi, **Best Poster in Biology**, 2008

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### Teaching and Mentoring Experience

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**Mentor & Teacher, VIP Research Program, 2022:** Co-developing two Vertically Integrated Programs: “C3: Characterizing Complex Communities in Natural Systems” and “Ecology & Evolution of Migratory Birds.”

**Research Mentor, EPSCoR Track II Grant, GUTT, 2021:** Mentoring masters and post-masters researchers in microbial community research at Boise State University and University of Wyoming.

**Mentor & Teacher, VIP Research Program, 2020:** Co-mentored a student through the Vertically Integrated Program “Genome-2-Phenome Research” at Boise State University, with outcomes including co-authorship of a research paper (in prep).

**Research Mentor, SARE Research Program, 2020:** Mentored two students through the Summer Authentic Research Experience Program at Boise State University, with outcomes including co-authorship of a research paper (in prep).

**Fixed-term Lecturer, University of Canterbury, 2018-2019:** Prepared course materials, taught lectures, and graded exams and reports in BIOL271 (Evolution) and labs in BIOL112 (Ecology, Evolution, and Conservation).

**Demonstrator, University of Canterbury, 2016-2018:** Prepared lab exercises, implemented coursework, and graded exams and reports for BIOL112 (Ecology, Evolution, and Conservation) and BIOL113 (Diversity of Life) labs.

**Research Mentor, University of Canterbury, 2015-2018:** Mentored two undergraduate researchers two projects: “Calculating relatedness using genome-wide single nucleotide polymorphisms (SNPs) in domestic chicken (*Gallus gallus*) with application to captive breeding for translocation programmes” and “You’re the only one for me? An assessment of extra pair parentage in a critically-endangered bird with implications for conservation”). Outcomes include a co-first authored paper in *Notornis*.

**Teaching Assistant, University of North Texas, 2010-2013:** Taught BIOL: 3452 (Genetics Laboratory), proctored BIOL: 1711 (Principles of Biology), and proctored BIOL1132 (Environmental Science).

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### Service to the Scientific Community

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Symposium and Roundtable Organizer, International Congress for Conservation Biology 2021, Title “Pathways to trusted and meaningful relationships between conservation geneticists and practitioners.”

Chair for the Society for Conservation Biology Conservation Genetics Working Group, 2020-Present.

Professional member of the Association of Zoos & Aquariums (AZA) [Molecular Data for Population Management Scientific Advisory Group](#).

Reviewer for articles in: *The Auk* - *Biological Conservation* - *Diversity* - *Ecology and Evolution* - *Molecular Ecology Resources* - *Marine Ornithology* – *Notornis* - *Scientific Reports* - *Zoo Biology*.

Conference Chair for The University of Canterbury Annual Biological Sciences Conference, 2016, 2017, 2018, and 2019.

Lead Organizer for the University of North Texas Graduate Research Day, 2012.

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### Other Forms of Outreach, Advocacy and Dissemination

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Co-founder of the [Kindness in Science Collective](#)

- Co-founder/writer of the [Kindness in Science Sciblogs series](#)
- Profiled in the *Nature Careers* feature “[Should we steer clear of the winner-takes -all approach?](#)”

Science Communication and Outreach

- [UC Thesis in Three](#)
- School Outreach, e.g., conservation genomics of tuturuatu/shore plover outreach events at Te One and Kaingaroa Schools (ages 6-13), Chatham Islands, New Zealand
- Organizer of three [Bird of the Year](#) campaigns for kakī (2016, 2017, 2018)

Conservation and Science Fundraising

- Designer of [2020 American Kestrel Partnership campaign t-shirt](#) (10K USD raised for the American Kestrel Partnership)
- Designer of 2020 [Tūturuatu RocketLab Mission Patch](#) (6K NZD Raised for Tūturuatu Conservation)
- Organiser, [2016 Braided River Awareness & Fundraising Art Auction](#) (10K NZD Raised for the Kakī Recovery Programme)

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*Professional References Available on Request*

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