

# Drew Sauve

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## Employment

*Ontario Tech University*, Assistant Professor, Forensic Science 2026 - Present  
*African Lion Safari*, Manager of Research and Conservation 2024 - 2026  
*Université du Québec à Montréal*, MITACS Postdoctoral Fellow August 2023 - August 2025

## Service

*Canadian Journal of Zoology ECR Editorial Board*, Canadian Science Publishing 2025 - Present  
*Adjunct Assistant Professor*, Queen's University 2025 - Present  
*Special Graduate Faculty*, Trent University 2025 - Present

## Education

*Queen's University*, Ph.D. Evolutionary Ecology and Quantitative Genetics 2023  
*Queen's University*, MSc. Evolutionary and Ecological Genetics 2018  
*Queen's University*, B.Sc. (Hons) Biology 2016

## Summary

I am an interdisciplinary evolutionary ecologist that uses quantitative genomics to work at the interface of wild populations, zoological collections, and conservation. I have published 15 peer-reviewed papers, including in *Biological Conservation*, *Molecular Ecology*, and *Evolution Letters*. My work has been cited 179 times (h-index = 6), and I have secured over \$300,000 in research funding, including support from NSERC and MITACS.

## Publications

Names of students and mentored staff are italicized.

### In prep.

19. *Thompson, H.*, Reale, D., Morgan, A., Chabot, A. A, **Sauve, D.** Genomic assessment of an ex-situ population of the critically endangered Blue-throated macaw (*Ara glaucogularis*).

18. **Sauve, D.** Pelletier, F., & Reale, D. Fitness surfaces and heritability of life-history traits across the ex-situ:in-situ spectrum in big horn sheep.

### In review

18. *Green, A.*, **Sauve, D.**, Boccia, C., Friesen, V. L. 2024. Beware of overconfidence in population assignment with unequal detection probabilities. *Journal of Wildlife Management*

17. *Luzuriaga-Aveiga, V.*, Hess, H., Chabot, A. A., Mastro Monaco, G., Wheeler, H., **Sauve, D.** Fitness surface analysis of selection acting on breeding phenology across wild and managed populations of eastern loggerhead shrike. *Journal of Animal Ecology*

## Published

16. Thompson, H., Meads, L., Mackintosh, M., Reynolds, T., **Sauve, D.** No evidence of skewed or extra variable sex ratio in a Western burrowing owl (*Athene cunicularia hypugaea*) conservation breeding program. *Canadian Journal of Zoology*, in press.
15. Elliott, G. C., **Sauve, D.**, Thompson, H., Stanger-Guy, S. J., Hathaway, C. J., Moxley, K., Pearce, J., Sheridan, C., Vos, R., Chabot, A. A. Short-term storage of Gray Ratsnake (*Pantherophis spiloides*) sperm. *Zoo Biology*, in press.
14. Elliott, G. C., Smale, P., **Sauve, D.** 2025. Facilitating novice recovery of *Bombus* (Latreille) reproductive systems. *Journal of Applied Entomology*, 150(1), 37-45.
13. **Sauve, D.**, Chabot, A. A., Reale, D. 2025. Genetic adaptation in zoos and conservation breeding programs. *Biological Conservation*, 310, 111392.
12. **Sauve, D.**, Thompson, H., Chabot, A. A., Reale, D. 2025. Using fitness surfaces to better link conservation breeding programs with wild population recovery. *Molecular Ecology* 34, e17798.
11. **Sauve, D.**, Charland, D., Solecki, A., Hudecki, J., Wheeler, H., Thompson, H., Steiner, J., Friesen, V. L., Chabot, A. A. 2025. Disentangling the contributions to phenotypic evolution in conservation breeding: a case study of morphological change in a breeding program of an endangered migratory songbird. *Animal Conservation*, in press.
10. **Sauve, D.**, Charmantier A., Hatch, S. A., Friesen, V. L. 2024. The magnitude of selection on growth varies among years and increases under warming conditions in a subarctic seabird. *Evolution Letters* 8, 56-63.
9. **Sauve, D.**, Friesen, V. L., A, Hatch, S. A., Elliott, K. H., Charmantier A. 2023. Shifting environmental predictors of phenotypes under climate change: a case study of growth in high latitude seabirds. *Journal of Avian Biology* e03062.
8. Kerr, K. C., **Sauve, D.**, Winton, S. Thorne, T. J., Chabot, A. A. 2023. Examining the representation of locally threatened species in North American zoos. *Animal Conservation* 26, 625-632.
7. **Sauve, D.**, Hudecki, J., Steiner, J., Wheeler, H., Chabot, A. A. 2022. Improving species conservation plans under IUCN's One Plan Approach using quantitative genetic methods. *Peer Community Journal* 2, e50.
6. **Sauve, D.**, Charmantier, A., Hatch, S. A., Friesen V. L. 2022. Environmental conditions variably affect growth across the breeding season in a subarctic seabird. *Oecologia* 198, 307-318.
5. **Sauve, D.**, Friesen, V. L., Charmantier, A. 2021. The effects of weather on avian growth and implications in the context of climate change. *Frontiers in Ecology and Evolution* 9.
4. Friesen, V. L., Brunt, R., Morris-Pocock, J. A., **Sauve, D.**, Baker, A. J., Birt, T. P., Davidson, W. S., Elliott, K. H., Montevecchi, W. A. 2021. A test of mechanisms of population differentiation in gannets (genus *Morus*) using comparative phylogeography and morphometrics. *Marine Ornithology* 49, 275-291.
3. **Sauve, D.**, Dale, C. A., Tigano, A., Ratcliffe, L. M., and Friesen V. L. 2020. Do candidate genes for migration and behaviour explain migratory variation in bluebirds (*Sialia spp.*)? *The Wilson Journal of Ornithology* 132, 820-829.

2. **Sauve, D.**, Divoky, G., and Friesen V. L. Phenotypic plasticity or evolutionary change? An examination of the phenological response of an Arctic seabird to climate change. 2019. (*Cepphus grylle mandtii*) *Functional Ecology* 33, 2180-2190.

1. **Sauve, D.**, Patirana, A., Chardine, J., and Friesen V. L. 2019. Mitochondrial DNA reveals genetic structure within Atlantic but not Pacific populations of a holarctic seabird *Marine Ornithology* 47, 199-208.

### **Non-peer reviewed technical reports**

Thompson, H., Sauve, D. 2025. Giraffe breeding recommendations to minimize mean kinship and inbreeding at African Lion Safari. Research and Conservation Department.

Sauve, D. and Chabot. A. A. 2025. Population analysis and breeding transfer plan for the Sable Antelope *Hippotragus niger*. Partnership for species.

### **Presentations**

#### *Invited*

**Sauve, D.** 2026. Using conservation programs to better understand the ecology and evolution of wildlife. Auburn University Evolutionary Ecology Seminar Series. Auburn, Alabama.

**Sauve, D.** 2025. Pushing ecological and evolutionary theory into conservation practice. Smithsonian Population Management Seminar Series.

**Sauve, D.**, Chabot, A. A., Reale, D. 2025. La contribution de la biologie évolutive aux programmes de conservation ex situ et de réintroduction. Quebec Centre for Biodiversit Science Annual Symposium. Presentation. Sherbrooke, Quebec, Canada.

**Sauve, D.**, Chabot, A. 2019. The value of quantitative genetics for managing captive breeding populations. *Loggerhead Shrike Recovery Meeting* African Lion Safari, Cambridge, Ontario, Canada.

#### *Conference*

Thompson, H., Reale, D., Chabot, A., **Sauve, D.** 2025. Using fitness surfaces to better link conservation breeding programmes with wild population recovery (with some ex situ examples). Species360 Conservation Science Alliance. *Competitive selection*

Luzuriaga-Aveiga, V., Hess, H., Chabot, A., Mastro Monaco, G., Wheeler, H., **Sauve, D.** 2025. Fitness surface analysis of selection acting on breeding phenology across wild and managed populations of Eastern Loggerhead Shrike. Presentation. Canadian Society for Ecology and Evolution, Sherbrooke, Quebec, Canada.

Thompson, H., Meads, L., Mackintosh, M., **Sauve, D.** 2025. Sex ratio is more variable than expected in a Western Burrowing Owl conservation breeding program. Poster. Canadian Society for Ecology and Evolution, Sherbrooke, Quebec, Canada.

Elliott, G., **Sauve, D.**, Chabot, A., Lougheed, S. 2025. Reproductive phenology in managed snake populations. Presentation. Canadian Society for Ecology and Evolution, Sherbrooke, Quebec, Canada.

Lefebvre, J., Krauze, L. Stoops, M., **Sauve, D.** 2025. Seeing through the Gray: Using Infrared Thermography to Track Estrus in the Greater One-Horned Rhino. Rhino keepers Workshop. Presentation. Omaha, Nebraska, United States.

**Sauve, D.,** Chabot, A. A., Reale, D. 2024. Genetic adaptation in zoos and conservation breeding programs. Species360 Conservation Science Alliance Research Symposium 2024. Presentation. International. *Competitive selection*

**Sauve, D.,** Thompson, H., Chabot, A. A., Reale, D. Fitness surfaces help link conservation breeding programs to the populations they support. 2024. Société Québécoise pour l'Étude Biologique du Comportement. Presentation. Montreal, Quebec, Canada

**Sauve, D.,** Chabot, A. A., Reale, D. Genetic adaptation in zoos and conservation breeding programs. Symposium on Conservation Genetics Across Multiple Species at the joint Evolutionary Congress 2024. Presentation. Montreal, Quebec, Canada.

**Sauve, D.,** Chabot, A. A., Reale, D. Genetic adaptation in zoos and conservation breeding programs. Université du Québec à Montréal. Presentation. Montreal, Quebec, Canada.

**Sauve, D.,** Friesen, V. L., Teplitsky, C., Hatch, S. A., Charmantier, A. Food supplementation decreases additive genetic variation in nestling mass. *Wild Animal Modelling Biannual Meeting*. Presentation. Okehampton, England.

**Sauve, D.,** Friesen, V. L., Teplitsky, C., Hatch, S. A., Charmantier, A. Exploring the influence of food supplementation on variance components of early life traits of black-legged kittiwakes. *Evolution*. Presentation. Albuquerque, New Mexico.

**Sauve, D.,** Friesen, V. L., Teplitsky, C., Hatch, S. A., Charmantier, A. 2021. Impacts of fluctuating environmental conditions and experimental feeding on selection of growth in black-legged kittiwakes. *Virtual Evolution*. Presentation.

**Sauve, D.,** Friesen V. L., Divoky G. J., Hatch, S. A., Elliott, K. H., Gaston, A. J., Charamantier, A. 2020. Ecological and evolutionary impacts of climate change on the phenology and growth of seabirds. Presentation. *Seminars in Ecology and Evolution*. Presentation. Centre d'Ecologie Fonctionnelle & Evolutive, Montpellier, France.

**Sauve, D.,** Divoky, G., and Friesen V. L. 2018. Queen's University. *Biology Graduate Student Day*. Phenological change in Mandt's Black Guillemot is driven by phenotypic plasticity. Presentation. Kingston, Ontario, Canada.

**Sauve, D.,** Divoky, G., and Friesen V. L. 2018. Queen's University. *American Genetics Associations: Quantitative Genetics in the Wild*. Phenological change in Mandt's Black Guillemot is driven by phenotypic plasticity. Presentation. Toronto, Ontario, Canada.

**Sauve, D.,** Divoky, G., and Friesen V. L. 2017. Disentangling evolutionary and plastic change in the laying date of an Arctic seabird. *Wild Animal Modelling Biennial Meeting*. Presentation. Saint-Michel-Des-Saints, Quebec, Canada.

#### Posters

Thompson, H. Britt, M., Vos, R., Stanger-Guy, S.J., Leelaumari, S., Jones, S. Lougheed, S., **Sauve, D.,** Chabot, A. A. 2025. Poster. Assessing relatedness, genetic diversity, and inbreeding in the Eastern Massauga Rattlesnake conservation breeding program. Ontario Biodiversity Summit, Peterborough, Ontario, Canada.

Atkinson, M., Dales, J., Lefebvre, J., **Sauve, D.,** Morgan, G., Chabot, A. A. Vitamin E supplementation in red-tailed hawks (*Buteo jamaicensis*). 2024. American Association of Zookeepers. Poster. Omaha, Nebraska, United States.

Thompson, H., Chabot, A. A., **Sauve, D.** Investigating variation in fecundity in conservation breeding programs. Joint Evolutionary Congress 2024. Poster. Montreal, Quebec, Canada.

**Sauve, D.**, Charmantier, A., Divoky, G., Hatch, S. A., Elliott, K., Gaston, A. J., Friesen V. L. 2019. *Evolution*. Variation in chick growth in response to climate change in three high latitude seabird species. Poster. Providence, Rhode Island, United States.

**Sauve, D.**, Divoky, G., and Friesen V. L. 2017. Phenotypic plasticity drives phenological change in Mandt's Black Guillemot. *ArcticNet*. Poster. Quebec City, Quebec, Canada.

**Sauve, D.**, Dale, C. A., Tigano, A., Ratcliffe, L. M., and Friesen V. L. An investigation into the genetic basis of partial migration in Western Bluebirds (*Sialia mexicana*) using candidate genes 2016. *North American Ornithological Conference*. Poster. Washington, DC, United States.

## **Research Skills**

### *Statistics and Bioinformatics*

I am an experienced statistician and aim to develop statistical models that capture the data generating process for any given analysis. I'm comfortable building a broad range of models in Python, R, & STAN. I am familiar with population management software Vortex and PMx. I am proficient using bioinformatic pipelines and navigating and submitting jobs on a UNIX computer cluster.

### *Fieldwork*

I am familiar with operating and conducting research on long-term field monitoring projects. I have spent three field seasons working with numerous seabird species in Northern Alaska, Newfoundland, and the Gulf of Alaska. I have worked with both small and large teams under difficult weather conditions to collect blood samples, make field observations, and capture and record morphometrics. I led the field team on Middleton Island for part of the 2019 field season. I have worked with teams in France to help maintain long-term data sets on great and blue tits near Montpellier and Corsica.

### *Labwork*

I am proficient in DNA extraction, PCR, microsatellite analysis, and preparing DNA samples for next-generation sequencing. I have basic training in extracting, preserving, and culturing primordial germ cells from avian embryos.

## **Teaching**

### *Teaching Fellowship*

I taught a ~300 student undergraduate course on evolutionary genetics. The course is a required biology course at Queen's University and introduces population genetics, quantitative genetics, and evolutionary genomics.

### *Teaching Assistanceships*

I've helped to teach five biology courses at Queen's University, topics included introductory genetics, evolutionary genetics, conservation biology, and evolutionary biology. I designed and taught a custom tutorial on quantitative genetics and conservation for an upper-year genetics course.

### *Mentorship*

I am an experienced mentor, currently supporting four staff at African Lion Safari in developing their own research programs. I am currently supervising one PhD student and I have previously supervised one MSc student and four undergraduate students.

*Hana Thompson - African Lion Safari & Trent University* Genomics, plasticity, and selection in ex situ and in situ conservation programs. 2023-Present. Hana is funded by African Lion Safari and is working on her PhD at Trent University co-supervised by Dr. Michelle DiLeo.

*Mary Atkinson - African Lion Safari* Age related changes in blood parameters of Asian elephants and early detection of elephant herpes virus using thermography. 2024-2026. Mary is a biologist in charge of coordinating research on Asian elephants at African Lion Safari.

*Ginger Elliott - African Lion Safari* Reproductive timing and artificial insemination of ex situ and in situ wildlife. 2024-2026. Ginger is the research biologist in charge of coordinating research on endocrinology at African Lion Safari & beyond.

*Janel Lefebvre - African Lion Safari* Thermography of health and reproduction in ex situ wildlife populations. 2025-2026. Janel is the research biologist in charge of running and coordinating thermography research at African Lion Safari & beyond.

*Alyssa Green - Queen's University* Beware of overconfidence in population assignment with unequal detection probabilities. 2023. Alyssa was a undergraduate summer research student and is now a Master's student at the Genomic Medicine CERC Program at McGill University.

*Dominique Charland - Queen's University* Measuring unintentional selection in a captive breeding program for the Eastern loggerhead shrike (*Lanius ludovicianus migrans*). 2022. Dominique is now a JD candidate at the University of Ottawa.

*Haley Turcotte - Queen's University* Phenotypic plasticity of parental investment in early-life growth traits within black-legged kittiwakes (*Rissa tridactyla*). 2021. Haley is now a Laboratory Attendant for Forensic Services with the RCMP.

*Ferris Nowlan - Queen's University* Estimation of effective population size from demographic and genomic data for an Arctic seabird (*Cepphus grylle*). 2020. Ferris is now a PhD student at the University of Toronto.

### **External Evaluations**

External examination for MSc Candidates:

*Mariana Sáenz Ramírez* 2025. Advancing group-based population management: Dedicated individual based modeling to improve genetic health of endangered species, Ghent University, Flanders, Belgium.

### **Media**

The Wildlife Society Coverage of 2025 Animal Conservation Paper <https://wildlife.org/why-do-captive-bred-loggerhead-shrikes-look-different/>

Recommendation of 2022 Quantitative Conservation Genetics Paper <https://zool.peercommunityin.org/articles/rec?id=126>

Sixty Second Seabird Science Youtube Series <https://www.youtube.com/watch?v=sNLRlqPfnFE>

Spotlight Article in Functional Ecology <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2435.13430?af=R>

National Geographic Coverage of 2019 Functional Ecology Paper <https://www.nationalgeographic.com/environment/2019/08/many-animals-can-adapt-climate-change-just-not-fast-enough-/>

Blog post on Proteus (Storytelling for a blue planet). <https://proteussci.com/2018/08/15/long-term-data-collection-serves-many/>

## **Service**

*Conservation Planning Specialist Group - Group Management Simulations Team* 2023-Present

*Contributor to the Wild Animal Modelling Website* 2023-Present

*International quantitative genetics journal club organizer* 2019-Present

*IUCN Species Conservation Planning Team for Eastern Loggerhead Shrike* 2019-Present

*Advisor for Creation of an Online Resource Library for Inclusive Science Communication* 2021-2024

*SciNapse Undergraduate Case Study Judge* 2021-2022

*OE3C 2017 Organizing Committee* 2016-2017

*Queen's University Biology Graduate Student Co-Chair* 2016-2017

## **Awards & Funding**

Mitacs Elevate Postdoctoral Research Fellowship 2023-2025 **\$160,000CAD**

NSERC Michael Smith Foreign Study Supplement 2022 **\$6,000CAD**

NSERC Alexander Graham Bell Canada Graduate Scholarship 2020-2023 **\$105,000CAD**

Haldane Prize Shortlist - Best Early Career Paper in Functional Ecology 2020

TD Fellowship in Arctic Environmental Issues 2019-2020 **\$30,000CAD**

Northern Studies Training Program. Canadian Polar Commission. 2019. **\$2,343CAD**

Northern Studies Training Program. Canadian Polar Commission. 2018. **\$2,890CAD**

Society for the Study of Evolution Travel Grant. Society for the Study of Evolution. 2018. **\$500USD**

Northern Studies Training Program. Canadian Polar Commission. 2017. **\$2,263CAD**

Canadian Society for the Study of Ecology and Evolution Travel Grant. 2016. **\$750CAD**

Undergraduate Student Research Award. NSERC. 2016. **\$4,500CAD**

North American Bluebird Society Grant. North American Bluebird Society. 2015. **\$1,000USD**

## **Reviewing Experience**

I am an experienced early career reviewer for 25 publications spanning evolutionary ecology, conservation, and ornithological journals. I take pride in conducting critical well thought out reviews and have been recognized for providing an outstanding and thorough review (American

Naturalist). I have reviewed manuscripts for the following journals: Acta Ornithologica, American Naturalist, Animal Behaviour, Conservation Biology, Ecological Applications, Ecology and Evolution (x3), Evolution Letters, Frontiers in Ecology and Evolution, IBIS (x2), Journal of Animal Ecology, Journal of Evolutionary Biology, Marine Biology (x2), Oecologia, Ornithology, Ornithological Applications, Peer Community In Evolutionary Biology, PloS one (x2), Proceedings of the Royal Society B (x2), Science Advances, & Scientific Reports(x3).

### **Certifications & Courses**

<i>MITACs Elevate Courses in Leadership, Research, EDI, and Industry Careers</i>	2023 - 2025
<i>Breeding Program Modelling with AlphaSimR</i>	2022
<i>Wilderness First Responder</i>	2022
<i>Basic Life Support Certification/CPR-C</i>	2022
<i>Pleasure Craft Operator Card:18032589508</i>	2016
<i>Canadian Firearms Safety Course</i>	2016