

# Samuel J. L. Gascoigne

## EDUCATION

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**University of Oxford**, Oxford, UK  
*DPhil in Zoology, Pembroke College*

Expected Graduation: May 2024

**Lake Forest College**, Lake Forest, IL, USA  
*Bachelor of Arts in Biology and Neuroscience, Magna Cum Laude*

Graduated: May 2020  
**GPA: 3.86/4.0**

## RESEARCH EXPERIENCE

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**SalGo Team & Fly Lab** | (*Population Ecology & Life-History Theory*)  
*DPhil Student*

**University of Oxford**  
October 2020 – present

- o Analyzing the impact of environmental stochasticity on population dynamics and life history evolution using structured population models (i.e., matrix population models and integral projection models) from across the tree of life.
- o Performing research into the effects of stochastic environments on demographic strategies *in vivo* (*Drosophila melanogaster*) and *in silico*.

**Barbosa Lab** | (*Life-History Theory*)  
*Research Associate*

**Lake Forest College**  
July 2018 – May 2020

- o Performing independent research directed at understanding the ultimate and proximate trade-offs in *Callosobruchus maculatus* that generate the dispersal and non-dispersal morphs.

**Jefferis Lab** | (*Behavioural Neuroscience*)  
*Research Assistant*

**MRC-LMB, Cambridge University**  
June 2019 – September 2019

- o Completed a project elucidating the role of asp-g neurons in female aggression and courtship receptivity via optogenetic manipulations in *Drosophila melanogaster*.

**Conrad Lab** | (*Molecular Biology*)  
*Student Researcher*

**Lake Forest College**  
August 2018 – December 2018

- o Performed research looking at the effect of the hypomethylating agent decitabine on the promoter region of *engrailed 1* in the colorectal cancer cell line HCT116.

**Shingleton Lab** | (*Eco, Evo, Devo*)  
*Research Associate*

**Lake Forest College, University of Illinois at Chicago**  
October 2016 – July 2018

- o Developed and led independent projects researching the developmental mechanisms that mediate the reduction in body size and increase in developmental time in response to hypoxia in *Drosophila melanogaster*. This project was funded by the NSF (IOS-1406547).
- o Researched the relative plasticity of tissues in response to changes in temperature and how increased plasticity can be explained by the canalization of cell proliferation during development.

**Anandappa Lab** | (*Microbiology and Food Science*)  
*Collaborator*

**University of Nebraska at Lincoln**  
November 2017 – June 2018

- o Conducted data acquisition and analysis in a project linking algal bloom expansion to increased rates of cyanotoxin related illness.

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**PEER REVIEWED PUBLICATIONS (19 total: 7 under review, 1 in press 11 published; \* = co-first author)**

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See [Google Scholar](#) and [Research Gate](#) for more details.

**UNDER REVIEW:**

19. Tuljapurkar SD, Jaggi H, **Gascoigne SJL**, Zuo W, Kajin M, Salguero-Gómez R. From disturbances to nonlinear fitness and back. *Ecology*. Under review. ([preprint available](#))
18. **Gascoigne SJL**, Rosen R, Sanghvi K, Compagnoni A, Steiner UK, Bocedi G, Sepil I. Current perspectives and future directions in animal life history evolution. *Journal of Animal Ecology*. Under review. ([preprint available](#))
17. Uwera Nalukwago D, **Gascoigne SJL**, DeFoe D, Barbosa F. A proximate mechanism for evolutionary trade-offs in the bean beetle *Callosobruchus maculatus*. *Evolution*. Under review.
16. **Gascoigne SJL**, Kajin M, Tuljapurkar SD, Santos GS, Compagnoni A, Steiner UK, Vinton AC, Jaggi H, Sepil I, Salguero-Gómez R. Structured demographic buffering: A framework to explore the environment drivers and demographic mechanisms underlying demographic buffering. *Ecology Letters*. Under review. ([preprint available](#))
15. Sanghvi K, Vega-Trejo R, Nakagawa S, **Gascoigne SJL**, Johnson S, Salguero-Gómez R, Pizzari T, Sepil I. No consistent declines in ejaculate traits with advancing male age across animals: a meta-analysis. *Nature Communications*. Under review. ([preprint available](#))
- 14\*. Santos GS\*, **Gascoigne SJL\***, Dias ATC, Kajin M, Salguero-Gómez R. A unified framework to identify demographic buffering in natural populations. *Ecology Letters*. Under review. ([preprint available](#))
13. Veit W, **Gascoigne SJL**, Salguero-Gómez R. Evolution, complexity, and life history theory. *Biological Theory*. Under review. ([preprint available](#))

**IN PRESS:**

12. **Gascoigne SJL**, Kajin M, Salguero-Gómez R. Criteria for buffering in ecological modelling. *Trends in Ecology & Evolution*. In press.

**PUBLISHED:**

**2023**

11. Wood A, **Gascoigne SJL**, Gambetta G, Jeffers L, Coulson T. Seasonal climate impacts wine quality in Bordeaux. *iScience*, 26(107954). ([link](#), also see media coverage: [The Times](#), [The Independent](#), [Evening Standard](#), [Daily Mail](#), [National Geographic](#), [New Scientist](#) and many more)
10. **Gascoigne SJL**, Rolph S, Sankey D, Nidadavolu N, Stell Pičman AS, Hernandez CM, Philpott MER, Salam A, Bernard C, Fenollosa E, Lee YJ, McLean J, Hetti Achchige Perera S, Spacey OG, Kajin M, Vinton AC, Archer CR, Burns JH, Buss DL, Caswell H, Che-Castaldo JP, Childs DZ, Capdevila P, Compagnoni A, Crone E, Ezard THG, Hodgson D, Knight TM, Jones OR, Jongejans E, McDonald J, Tenhumberg B, Thomas CC, Tyre AJ, Ramula S, Stott I, Tremblay RL, Wilson P, Vaupel JW, Salguero-Gómez R. 2023. A standard protocol to report discrete stage-structured demographic information. *Methods in Ecology & Evolution*, 14(8), 2065-2083. ([link](#))

9. Bernard C, Santos GS, Deere J, Rodriguez-Caro R, Capdevila P, Kusch E, **Gascoigne SJL**, Jackson J, Salguero-Gómez R. 2023. MOSAIC: A unified trait database to complement structured population models. *Scientific Data*, 10(335). ([link](#))
8. Vinton AC, **Gascoigne SJL**, Sepil I, Salguero-Gómez R. 2023. The importance of spatial and temporal structure in determining the interplay between plasticity and evolution. *Trends in Ecology & Evolution*, 38(3), 221-223. ([link](#))

## 2022

7. Vinton AC, **Gascoigne SJL**, Sepil I, Salguero-Gómez R. 2022. Plasticity's role in adaptive evolution depends on environmental change components. *Trends in Ecology & Evolution*, 37(12), 1067-1078. ([link](#))
6. Kapali GP, Callier V, **Gascoigne SJL**, Harrison JF, Shingleton AW. 2022. A steroid hormone regulates growth in response to oxygen availability. *Scientific Reports*, 12(1), 1-10. ([link](#))
5. **Gascoigne SJL**, Uwera Nalukwago D, Barbosa F. 2022. Larval density, sex, and allocation hierarchy affect life-history trait covariances in a bean beetle. *The American Naturalist*, 199(02). ([link](#))

## 2021

4. Salguero-Gómez R, Jackson J, **Gascoigne SJL**. 2021. Four key challenges in the open-data revolution. *Journal of Animal Ecology*, 90(9), 2000-2004. ([link](#))

## 2020

3. Sandler A, Anderson J, Balaram A, Ganey Y, **Gascoigne SJL**, Gimondo C, Palmero B, Quraishi A, Rodriguez A, Said OS, Conrad W. 2020. Decitabine Treatment Demethylates Vast Majority of High-Confidence Differentially Methylated Regions In HCT-116 Colorectal Cancer. *F1000 Research*, 9(886). ([link](#))

## 2018

2. McDonald JMC, Ghosh SM, **Gascoigne SJL**, Shingleton AW. 2018. Plasticity through canalization: The contrasting effect of temperature on trait size and growth in *Drosophila*. *Frontiers in Cell and Developmental Biology*, 6(156). ([link](#))
1. Abeyasiriwardena NM, **Gascoigne SJL**, Anandappa A. 2018. Algal bloom expansion increases cyanotoxin risk in food. *Yale Journal of Biology and Medicine*, 91(2), 129-142. ([link](#))

## SELECTED PRESENTATIONS (13 total: \* = primary presenter (8 total); § = poster, otherwise oral)

## 2023

- 13\*. MEE Live Webinar; 2023, Oct 24; Online. **Gascoigne SJL**. Enhancing reproducibility in population ecology, and further benefits for macroecology
- 12\*§. EvoDemoS; 2023, Mar 29-31; Paris, France. **Gascoigne SJL**, Kajin M, Santos GS, Vinton AC, Sepil I, Salguero-Gómez R. Structured demographic buffering: Analysing drivers from environment to vital rate.
11. EvoDemoS; 2023, Mar 29-31; Paris, France. Kajin M, **Gascoigne SJL**, Salguero-Gómez R. Redefining demographic strategies to cope with environmental variability.

## 2022

- 10\*.** **British Ecological Society Annual Conference**; 2022, Dec 18-21; Edinburgh, UK. **Gascoigne SJL**, Kajin M, Santos GS, Vinton AC, Sepil I, Salguero-Gómez R. Structured demographic buffering: Analysing drivers from environment to vital rate.
- 9.** **British Ecological Society Annual Conference**; 2022, Dec 18-21; Edinburgh, UK. Sanghvi K, Vega-Trejo R, Nakagawa S, **Gascoigne SJL**, Johnson S, Salguero-Gómez R, Pizzari T, Sepil I. No consistent declines in ejaculate traits with advancing male age across animals: a meta-analysis.
- 8§.** **British Ecological Society Annual Conference**; 2022, Dec 18-21; Edinburgh, UK. Vinton AC, **Gascoigne SJL**, Sepil I, Salguero-Gómez R. Plasticity's role in adaptive evolution depends on environmental change components.

## 2021

- 7\*.** **Ecology Across Borders 2021**; 2021, Dec 12-15; Liverpool, UK. **Gascoigne SJL**. Environment-vital rate relationships determine winning life-history strategies in stochastic environments.
- 6.** **Ecology Across Borders 2021**; 2021, Dec 12-15; Liverpool, UK. Vinton AC, **Gascoigne SJL**, Sepil I, Salguero-Gómez R. Tradeoffs between developmental time, survival and reproduction determine thermal performance of *Drosophila melanogaster*.
- 5\*.** **British Ecological Society Quantitative Ecology Special Interest Group**; 2021, Jul; Online. **Gascoigne SJL**, Sepil I, Salguero-Gómez R. Environment-vital rate relationship determine winning life history strategies in stochastic environments.
- 4.** **British Ecological Society Quantitative Ecology Special Interest Group**; 2021, Jul; Online. Vinton AC, **Gascoigne SJL**, Sepil I, Salguero-Gómez R. The environment-dependent nature of plasticity and its ability to facilitate adaptive evolution.
- 3\*.** **Behaviour, Ecology, and Evolution student conference**; 2021, May; Oxford, UK. **Gascoigne SJL**, Sepil I, Salguero-Gómez R. Staying fit in a random world: testing the effects of the r-K continuum and environmental stochasticity on life-history strategies *in silico*.

## 2019

- 2\*§.** **56<sup>th</sup> Annual Conference of the Animal Behaviour Society**; 2019, Jul 23-27; Chicago, IL. **Gascoigne SJL**, Uwera DN, Barbosa F. Evolutionary trade-offs between dispersal and sexually-selected traits in the bean beetle.

## 2018

- 1\*§.** **77<sup>th</sup> Annual Meeting of the Society for Developmental Biology**; 2018, Jul 20-24; Portland, OR. **Gascoigne, SJL**, McDonald, JMC, Ghosh SM, Shingleton AW. Plasticity through canalization: The contrasting effect of temperature on trait size and growth in *Drosophila*. *\*Co-presented with JMCM*.

## ORGANISED WORKSHOPS (5 total: \* = organizer/co-organizer (3 total))

- 5\*.** **SORTEE**; 2023, Oct 17-20; Open data for state-structured population ecology.
- 4\*.** **EvoDemoS**; 2023, Mar 29-31; Paris, France. Analysis and interpretation of stage-structured population models via RCOMPADRE, Rage, and ipmR.

- 3\*. **British Ecological Society Annual Conference**; 2022, Dec 18-21; Edinburgh, UK. Comparative demography with stage-based models.
2. **Ecology Across Borders 2021**; 2021, Dec 12-15; Liverpool, UK. Analysis and interpretation of stage-structured population models via RCOMPADRE, Rage, and ipmR.
1. **Ecological Society of America**; 2021, Aug-Sep 31-3; California, USA. Introduction to COMPADRE and COMADRE matrix population model repositories: Data submission, database use, and demographic analyses in R.

## HONOURS AND ACHIEVEMENTS

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|---|--|
| <b>Dean of Graduates Fund</b><br>£970   | <b>Pembroke College, University of Oxford</b><br>November 2023 |
| <ul style="list-style-type: none"> <li>o Awarded for travel expenses to the British Ecological Society's annual meeting in Belfast, NIR.</li> </ul>   |  |
| <b>Finalist for the SORTEE Open Science Student Award</b>   | <b>SORTEE</b><br>October 2023                                  |
| <ul style="list-style-type: none"> <li>o Awarded to graduate students who have made major contributions to openness, reliability and transparency in ecology and evolutionary biology.</li> </ul>                     |  |
| <b>Shortlisted for the Sidnie Manton Award</b>  | <b>Journal of Animal Ecology</b><br>October 2023               |
| <ul style="list-style-type: none"> <li>o Awarded to early career researchers submitting reviews/long-term studies to Journal of Animal Ecology. The selection process for this award is currently ongoing.</li> </ul> |  |
| <b>Biology Eurofins Foundation Award</b><br>£540  | <b>Eurofins Foundation</b><br>July 2021                        |
| <ul style="list-style-type: none"> <li>o Awarded for travel expenses to Ecology Across Borders 2021 in Liverpool, UK.</li> </ul>  |  |
| <b>Elizabeth Hannah Jenkinson Fund</b><br>£2,000  | <b>University of Oxford</b><br>May 2021                        |
| <ul style="list-style-type: none"> <li>o Awarded for promising research on the topic of developmental biology.</li> </ul>   |  |
| <b>David D. Towle Award</b>   | <b>Lake Forest College</b><br>May 2020                         |
| <ul style="list-style-type: none"> <li>o Awarded to a graduating senior for their outstanding research accomplishments.</li> </ul>  |  |
| <b>Barry M. Goldwater Scholarship</b><br>\$7,500  | <b>National (USA)</b><br>May 2019                              |
| <ul style="list-style-type: none"> <li>o The most prestigious undergraduate national scholarship in science, mathematics, and engineering.</li> </ul>   |  |
| <b>Presidential Scholarship</b><br>\$120,000  | <b>Lake Forest College</b><br>August 2016 – May 2020           |
| <ul style="list-style-type: none"> <li>o Awarded to students exhibiting extraordinary academic potential and talent from across the United States.</li> </ul>   |  |

**Reid Music Scholarship**

\$8,000

- o Awarded to students exhibiting extraordinary music potential and talent.

Lake Forest College

August 2016 – May 2020

**Richter Scholar**

\$2,000 stipend

- o A 10-week research opportunity awarded to students who show academic excellence in their freshman year and are interested in academic research.
- o Undertaken with Dr. Alexander W. Shingleton.

Lake Forest College

August 2016 – May 2020

**Dean's List**

- o Celebrates students who have received distinguished academic awards throughout the full school year and maintain a grade point average of at least 3.60 for two consecutive semesters.

Lake Forest College

December 2016 – May 2020

## TEACHING EXPERIENCE

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**Introduction to Life History Theory**

*Post-Graduate Lecturer*

- o Course: [OxNet](#)
- o Give an introductory lecture on the topic of life history theory to passionate secondary school students from the North-West of England in Pembroke College's OxNet program. Subsequently, set an essay and run Oxford-style tutorials on the topic of life history theory and structure population models.

Pembroke College, University of Oxford

May 2023 – August 2023

**Research Methods Teaching**

*Assistant Lecturer*

- o Course: [M.Sc. Biodiversity and Conservation Management](#)
- o Guide students through lecture material by holding weekly study sessions, holding office hours, and working with the instructor to evaluate their progress.

School of Geography and Environment at the University of Oxford

January 2023 – April 2023

**Cell & Molecular Biology Teaching**

*Teacher's Assistant*

- o Course: BIOL 221, Molecules, Genes, and Cells (bio core class).
- o Guide students through lecture material by holding weekly study sessions, holding office hours, and working with the instructor to evaluate their progress.

Biology Department at Lake Forest College

August 2018 – December 2018

**Introductory Neuroscience Teaching**

*Teacher's Assistant*

- o Course (2017): FIYS 106, Medical Mysteries of the Mind (neuro elective)
- o Course (2019): BIOL 130, Deadly Shapes and Hostage Brains (bio & neuro elective)
- o Guide students through lecture material by holding weekly study sessions, holding office hours, and working with the instructor to evaluate their progress.

Neuroscience Department at Lake Forest College

August 2017 – December 2017, January 2019 – May 2019

**General Chemistry Laboratory Teaching**

*Teacher's Assistant*

- o Course: CHEM 116X, General Chemistry II (chem core class).
- o Guide chemistry students engaging in experiments and answer their questions.

Chemistry Department at Lake Forest College

January 2018 – April 2018

- Help students run different machinery such as gas chromatograph and online Chemistry software.

#### **Tutor for the Life Sciences**

#### **Quantitative Resource Center at Lake Forest College**

*Tutor*

August 2017 – May 2020

- Courses tutored: MATH 108 (calc I), BIOL 120 (organismal bio), CHEM115 (gen chem I), CHEM 116 (gen chem II).
- Help struggling clients through the material in one-hour weekly meetings.

### **OUTREACH, LEADERSHIP & COMMUNITY INVOLVEMENT**

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#### **Introduction to Life History Theory**

#### **Pembroke College, University of Oxford**

*Post-Graduate Lecturer*

May 2023 – August 2023

- Course: [OxNet](#)
- Give an introductory lecture on the topic of life history theory to passionate secondary school students from the North-West of England in Pembroke College's OxNet program. Subsequently, set an essay and run Oxford-style tutorials on the topic of life history theory and structure population models.

#### **COMPADRE and COMADRE databases**

#### **University of Oxford**

*Chief Compadrino*

October 2021 – present

- Lead the digitizing effort for the [COMPADRE and COMADRE databases](#).
- Run workshops at international conferences introducing matrix methods in demography, the COMPADRE and COMADRE database and how to analyze MPMs in R.

#### **Student Academic Advisory Committee (SAAC)**

#### **Lake Forest College**

*Elected Member for the Biology Department and Neuroscience Program*

August 2019 – May 2020

- Aid in the hiring of a new tenure track Biology faculty member.
- Review the efficacy and success for both Biology and Neuroscience programs along with other SAAC board members.

#### **Nu Rho Psi**

#### **Lake Forest College**

*Inducted Member*

March 2017 – May 2020

- Wrote the Brain Bee Exam (Brain Bee, February 2017) and helped organize the event.

#### **Synapse Club: Neuroscience Outreach Club**

#### **Lake Forest College**

*Project Manager*

August 2016 – May 2019

- Help organize Brain Awareness Week outreach and other outreach events.
- Collaborate with clubs from other majors to create events and projects that demonstrate the interdisciplinary nature of Neuroscience.

#### **Grades K-6 Outreach**

#### **Lake Forest College**

*Volunteer*

November 2017, May 2018

- Taught K-6 graders the parts of the brain necessary for movement and action and about how the brain works to sense, integrate and act.

## INVITED REVIEWER FOR THE FOLLOWING JOURNALS

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*Ecology Letters* (x2), *Methods in Ecology & Evolution*, *Functional Ecology*, *Annals of Botany Plants*, *Peer Community in Ecology*

## ACADEMIC SOCIETIES

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**British Ecological Society (BES)**  
Since 2020

**Evolutionary Demography Society**  
Since 2022

**SORTEE**  
Since 2022

## HONOURS SOCIETIES

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**Nu Rho Psi**  
Inducted: March 2017  
Neuroscience honorary

**Omicron Delta Kappa**  
Inducted: February 2019  
Leadership honorary

**Beta Beta Beta**  
Inducted: April 2019  
Biology honorary

## SKILLS

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### LAB TECHNIQUES

Fly pushing  
Epistatic analysis  
Larval dissections  
NMR and IR spectroscopy  
Gas chromatography  
PCR and Gel electrophoresis

### DATA ANALYSIS

R  
Julia  
JMP Pro  
SPSS

### IMAGING

ImageJ  
ImagePro

### DESIGN

Adobe Illustrator

### DEMOGRAPHIC METHODS

Matrix population models (MPMs)  
Integral projection models (IPMs)  
Individual based models  
Stochastic modelling