

# Takuji Usui

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## PROFESSIONAL POSITIONS

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**Frederickson Lab, University of Toronto** | 2023 – current

Postdoctoral Researcher

Supervisor: Prof. Megan Frederickson

**Interdisciplinary Eco-Evolution Lab, University of New South Wales** | 2016 – 2017

Research Studentship

Supervisor: Prof. Shinichi Nakagawa

**Phillimore Group, University of Edinburgh** | 2015 – 2016

Research Studentship

Supervisor: Prof. Ally Phillimore

**Hadfield Group, University of Edinburgh** | 2015 – 2016

Field Assistant

Supervisor: Prof. Jarrod Hadfield

## EDUCATION

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**University of British Columbia** | 2017 – 2023

PhD, Botany (*Excellence in Doctoral Research Award*)

Dissertation: Experimental evolution of species ranges and coexistence

Supervisor: Prof. Amy Angert

**University of Edinburgh** | 2011 – 2015

BSc, Evolutionary Biology (*First Class Honours with Ashworth Medal*)

Thesis: Temporal shifts and temperature sensitivity of spring migratory phenology

Supervisor: Prof. Ally Phillimore

## PUBLICATIONS

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### *In review*

11. Usui, T. & Angert, A.L. (2023) Range expansion is both slower and less predictable across a spatial gradient in temperature. *Ecology Letters*. Manuscript #ELE00923-2023 (Preprint: doi.org/10.1101/2023.09.14.557841).

### *Published*

10. Usui, T., Lerner, D., Angert, A.L., Eckert, I., Garroway, C.J., Hargreaves, A.L., Lancaster, L.T., Lessard, J-P., Riva, F., Schmidt, C., van der Burg, K. & Marshall, K. (2023) The evolution of plasticity at geographic range edges. *Trends in Ecology & Evolution*, 38, 831-842.

9. Usui, T., Senior, A., MacLeod, M., McCann, S. & Nakagawa, S. (2021) Meta-analysis of variation suggests that embracing heterogeneity improves both replicability and generalizability in preclinical research. *PloS Biology*, 19(5), e3001009.

8. Bontrager, M., Usui, T., Lee-Yaw, J.A., Anstett, D.N., Branch, H.A., Hargreaves, A.L. & Angert, A.L. (2021) Adaptation across geographic ranges is consistent with strong selection in marginal climates and legacies of range expansion. *Evolution*, 75, 1316-1333.

7. Germain, R.M., Angert, A.L., Bassar, R.D., Henao Diaz, F.L., Hart, S.P., Otto, S.P., Rolland, J., Sakarchi, J., Schluter, D., Siepielski, A.M., Turcotte, M.M., Usui, T. & Waters, M. (2020) On the origin of coexisting species. *Trends in Ecology & Evolution*, 36, 284-283.

6. Miller, T.E.X., Angert, A.L.A., Brown, C.D., Lee-Yaw, J.A., Lewis, M., Lutscher, F., Marculis, N.G., Melbourne, B.A., Shaw, A.K., Szűcs, M., Tabares, O., Usui, T., Weiss-Lehman, C. & Williams, J.L. (2020) Eco-evolutionary dynamics of range expansion. *Ecology*, 101, e03139.

5. Baur, J., Laurentino, T.G., Usui, T. & Eichhorn M. (2019) Liana abundance and relationships to sapling and tree hosts in an East African primary forest. *African Journal of Ecology*, 57, 130-136.

4. Usui, T. & Angert, A.L.A. (2018) *Species Ranges*. Elsevier Reference Module in Life Sciences.

3. **Usui, T.**, Noble, D.W.A., O'Dea, R.E., Fangmeier, M.L., Lagisz, M., Hesselson, D. & Nakagawa, S. (2018) The French Press: a repeatable and high-throughput approach to exercising zebrafish (*Danio rerio*). *PeerJ*, e4292.

2. Fangmeier, M., Noble, D.W.A., O'Dea, R.E., **Usui, T.**, Lagisz, M., Hesselson, D. & Nakagawa, S. (2018) Computer animation technology in behavioral sciences: a sequential, automatic, and high-throughput approach to quantifying personality in zebrafish (*Danio rerio*). *Zebrafish*, 15, 206–210.

1. **Usui, T.**, Butchart, S.H.M. & Phillimore, A.B. (2017) Temporal shifts and temperature sensitivity of avian spring migration phenology: a phylogenetic meta-analysis. *Journal of Animal Ecology*, 86, 250–261.

Selected press coverage:

- Birds migrating earlier as temperatures rise (BBC News)
- Climate change driving birds to migrate early (The Guardian)

## AWARDS & SCHOLARSHIPS

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- 2023 Excellence in Doctoral Research Award, CSEE (\$600 CAD)
- 2023 Graduate Student Travel Award, UBC (\$500 CAD)
- 2022 Student Travel Award, ESA Plant Population Ecology Section (\$600 USD)
- 2022 President's Academic Excellence Initiative PhD Award, UBC (\$540 CAD)
- 2021 President's Academic Excellence Initiative PhD Award, UBC (\$1030 CAD)
- 2021 Faculty of Science Graduate Award, UBC (\$100 CAD)
- 2021 Student Research Award, American Society of Naturalists (\$2000 USD)
- 2020 President's Academic Excellence Initiative PhD Award, UBC (\$1000 CAD)
- 2019 GREG Lewontin Award, Society for the Study of Evolution (\$2000 USD)
- 2018 Vladimir J Krajina Prize in Plant Ecology, UBC (\$2000 CAD)
- 2017 International Doctoral Fellowship, UBC (\$138,000 CAD; Accepted)
- 2017 Scientia PhD Scholarship, UNSW (\$200,000 AUD; Declined)
- 2017 Graduate Research Scholarship, UCL (£52,660 GBP; Declined)
- 2017 Overseas Research Scholarship, UCL (£78,480 GBP; Declined)
- 2017 NERC Science and Solutions for a Changing Planet Doctoral Training Partnership, Imperial College London (£62,935 GBP; Declined)

- 2015 Ashworth Medal and Prize 2015 for highest grade in Evolutionary Biology Honours, University of Edinburgh (£250 GBP)
- 2015 Undergraduate Summer Studentship, University of Edinburgh (£2500 GBP)
- 2015 Travel Bursary for National Biodiversity Network Conference 2015, Institute of Evolutionary Biology, University of Edinburgh
- 2015 Travel Grant, British Ecological Society (£400 GBP)

## INVITED PRESENTATIONS

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**CSEE Doctoral Award Symposium, Winnipeg, MN | 2023**

On the origins of coexistence (and the curious paradox of the duckweed)

**Duckweeds: A new frontier in symbiosis research, University of Toronto | 2022**

The evolution of coexistence and range expansion

**Metascience Conference, Centre for Open Science | 2021**

How can we embrace heterogeneity to improve replicability?

## CONTRIBUTED PRESENTATIONS

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† Poster ‡ Talk

**Department of EEB Seminar Series, University of Toronto | 2023**

Experimental evolution of species ranges and coexistence<sup>‡</sup>

**Botany Department Seminar Series, UBC | 2023**

The eco-evolutionary dynamics of species ranges and coexistence<sup>‡</sup>

**Conference of the Society of American Naturalists, Asilomar | 2023**

The evolution of coexistence across the species boundary<sup>‡</sup>

**CSEE & ESA Conference, Montreal, QC | 2022**

Competition and temperature stress drive the evolution of range limits<sup>‡</sup>

**Botany & Zoology Conference, UBC | 2021**

Range expansion across ecological gradients (*Best Talk Award*)<sup>‡</sup>

**Blackendale Ecology & Evolution Retreat, BC | 2019**

Eco-evolutionary Dynamics of Range Expansions<sup>‡</sup>

### **Blackendale Ecology & Evolution Retreat, BC | 2018**

The Role of Evolution in Predicting Range Expansion Across Spatially Heterogeneous Landscapes (*Best Poster Award*)<sup>†</sup>

### **Blackendale Ecology & Evolution Retreat, BC | 2017**

Are Range-Edge Populations Maladapted? A Synthesis of Transplant Experiments<sup>†</sup>

## **SYNERGISTIC ACTIVITIES**

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### **Member of working group: Plasticity Across Species' Ranges, UBC | 2023**

PI: Katie Marshall (UBC) and Jean-Philippe Lessard (Concordia University)

### **Member of workshop: Bayesian Modelling in JAGS, UBC | 2023**

PI: Anne Bjorkman (University of Gothenburg)

### **Member of working group: Coexistence Across Evolutionary Scales, UBC | 2019**

PI: Rachel Germain (UBC) and Adam Siepielski (University of Arkansas)

### **Member of working group: Eco-Evo Dynamics of Range Expansion, UBC | 2018**

PI: Tom Miller (Rice University) and Jennifer Williams (UBC)

### **Member of tropical field research course: Kibale National Park, Uganda | 2015**

Group: Tropical Biology Association (University of Cambridge)

## **TEACHING & MENTORING**

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### **Teaching Assistant, UBC | 2020 – 2023**

BIOL 121: Genetics, Ecology & Evolution

BIOL 300: Biostatistics

BIOL 336: Fundamentals of Evolution (Lead/Senior TA, 2021 and 2023)

BIOL 406: Plant Ecology (Lead in R tutorials redesign, 2021)

### **Undergraduate Mentorship, UBC | 2018 – current**

Joshua Dyer, UBC (NSERC Undergraduate Student Research Award, 2023–current)

Amy Wong (Work-learn, 2022 & 2023)

Burak Ozkan (Volunteer, 2022)

Kenzie Chute (Volunteer, 2022)

Sourena Oveisi (Work-learn, 2022)

Vicky Kim (Volunteer, 2022)

Emma Pflanz (Indigenous Undergraduate Research Mentorship Program, 2022)

Graydon Gillies (NSERC Undergraduate Student Research Award, 2020 & 2021)

Chris Spangenberg (Work-learn research experience, 2020 & 2021)

Hafsa Ahmed, UBC (Work-learn research experience, 2019)

Emma Menchions, UBC (Work-learn research experience, 2018)

## SERVICE & OUTREACH

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**Peer Reviewer for:** *American Journal of Botany, American Naturalist, Ecography, Evolution, Global Change Biology, Journal of Animal Ecology, Journal of Avian Biology, Journal of Biogeography*

**Memberships:** American Naturalist Society; Botanical Society of America; Canadian Society for Ecology & Evolution; National Biodiversity Network; Society for the Study of Evolution; Tropical Biology Association

**Workshop lead,** Make your own origami model organism with Botany/Zoology Wellness Initiative, UBC | 2023

**Mentor,** Indigenous Undergraduate Research Mentorship Program, UBC | 2022–2023

**Conference Planning Committee,** Canadian Society for Ecology & Evolution | 2021

**Graduate Student Representative,** Biodiversity Postdoctoral Fellowship Search, UBC | 2020

**Selection Committee,** Annual Evolution Lecture, UBC | 2020

**Botany Department Peer Mentor** for starting graduate students, UBC | 2020

**Researchers Revealed,** UBC. A video series for the Beaty Biodiversity Museum | 2020

**Co-director,** Annual Zoology/Botany Huts Skit & Show, UBC | 2019

**Symposium Organizer and Host,** Annual Evolution Lecture, UBC | 2019

**Member,** STEM Culture, UBC. A cross-departmental action group on STEM issues | 2018

**Member**, People & Planet, University of Edinburgh. An environmental discussion & action group | 2015

**Volunteer**, Navdanya Biodiversity Conservation Farm, India. A sustainable farming initiative | 2014

## OUTREACH

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Usui, T. (2023) Using experimental evolution of duckweeds to understand spatiotemporal patterns of biodiversity. *International Duckweed Forum*, 11, 92–134. Link: [www.ruduckweed.org/uploads/1/0/8/9/10896289/duckweed\\_forum\\_issue\\_42.pdf](http://www.ruduckweed.org/uploads/1/0/8/9/10896289/duckweed_forum_issue_42.pdf)

- A feature on the global newsletter on duckweed research and applications.

Usui, T., Dall’Alba, G. & Goedhart, C. (2022) Teaching Spotlight: Getting to know diverse scientists. *Bio News*, University of British Columbia. Link: <https://blogs.ubc.ca/bionews/2022/03/02/teaching-spotlight-getting-to-know-diverse-scientists-in-biol-336/>

- A feature on the UBC newsletter on the importance of diversity in EEB

Usui, T. (2020) How species distributions are moving in response to climate change. *Researchers Revealed*, University of British Columbia.

- A feature on my research for a video series at the Beaty Biodiversity Museum

Usui, T. (2016) Bird migration and global warming, *World Service News*, BBC.

- A radio interview on my work on the consequences of climate change and the timing of spring bird migrations