

Blair Costelloe

Curriculum Vitae
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She/Her

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EDUCATION

- 2014 Ph.D. Princeton University, Ecology and Evolutionary Biology
Advisor: Daniel Rubenstein
- 2010 M.A. Princeton University, Ecology and Evolutionary Biology
Advisor: Daniel Rubenstein
- 2007 B.A. Washington University in St. Louis
Anthropology major, Spanish minor; *Summa Cum Laude*

EMPLOYMENT

- 2016 - present **Postdoctoral Fellow**
Dept. of Collective Behavior, Max Planck Institute of Animal Behavior
Centre for the Advanced Study of Collective Behaviour, University of Konstanz
Dept. of Biology, University of Konstanz
- Summer 2016 **Research Associate**
Rubenstein Lab, Dept. of Ecology and Evolutionary Biology, Princeton University
- Fall 2014 **Lecturer**
Dept. of Ecology and Evolutionary Biology, Princeton University
- Summer 2014 **Research Associate**
Rubenstein Lab, Dept. of Ecology and Evolutionary Biology, Princeton University
- Spring 2014 **Lecturer**
Department of Ecology and Evolutionary Biology, Princeton University

Employment breaks

- Sep 2020 - Dec 2021 **Maternity leave** (full leave Sep 2020-Feb 2021; part-time Mar-Dec 2021)
- Feb 2015 - May 2016 **Unpaid affiliation with Princeton EEB** (applied for postdocs and funding; learned R programming; revised dissertation chapters for publication)

GRANTS, AWARDS AND FELLOWSHIPS

- 2022 European Commission Marie Skłodowska-Curie Doctoral Network Grant €2,789,848
“[WildDrone: Autonomous drones for nature conservation missions](#)” – International interdisciplinary doctoral training network grant. I was a member of the core writing team, and the main representative of the wildlife ecology domain.
- 2022 Centre for the Advanced Study of Collective Behavior Small Project Grant €5000
“Documentary Palaces” - funding for a collaborative course with Merz Academy of Fine Arts
- 2022 Christiane Nüsseln-Volhard Stiftung Awardee €4800
Competitive stipend to support excellent early career scientists with children

2021	Animal Behavior Society Caregiver Award	
2020	Centre for the Advanced Study of Collective Behaviour small project grant "Combining drone-based behavioral observation with long-term data for deeper insights into collective processes" – collaborative project with J.T. Kerby (Aarhus University) and Guassa Gelada Research Project. Project delayed due to political conflict in Ethiopia.	€10,000
2017	European Commission Marie Skłodowska-Curie Individual Fellowship "Mechanisms of collective predator detection and information transfer in African ungulates"	€171,460
2017	University of Konstanz Zukunftskolleg Young Scholars Grant	€9973
2017	University of Konstanz Zukunftskolleg Investment Grant Funding to purchase a field vehicle in Kenya	€9375
2017	NVIDIA GPU Hardware Grant	
2014	Animal Behavior Society Warner Clyde Allee Competition Finalist	
2013	Princeton University Deans Fund Summer Travel Grant	
2013	American Society of Mammalogists Student Travel Grant	
2012	Princeton Research Symposium Poster Prize	
2012	Animal Behavior Society Student Research Grant	\$1000
2010	Philadelphia Explorers Club Stephen Chapman Schroeder Scholarship	\$1000
2010	National Science Foundation Graduate Research Fellowship Honorable Mention	
2009	Princeton University EEB Department Summer Research Grant	
2007	John W. Bennett Prize to the Outstanding Graduating Senior in Anthropology	

PUBLICATIONS *equal contribution; †student mentee

[Google Scholar profile](#)

11. Koger B[†], Hurme E, **Costelloe BR**, O'Mara MT, Wikelski M, Kays R, and Dechmann DKN. An automated approach for counting groups of flying animals applied to one of the world's largest bat colonies. *Accepted – Ecosphere*.
Participated in fieldwork and data collection, data processing and writing and editing of manuscript.
10. Chen J, Hu M, **Costelloe BR**, Beery S, Rohrbach A, and Elhoseiny M. MammalNet: A large-scale benchmark for mammal recognition and behavior understanding. *Accepted – Conference on Computer Vision and Pattern Recognition 2023*.
I served as the domain expert for animal behavior and ecology. I ensured the project aligned with the needs of behavioral and wildlife researchers and contributed to writing and revising the manuscript. Only 25% of papers were accepted to this conference.
9. Koger B[†], Deshpande A, Kerby JT, Graving JM, **Costelloe BR***, and Couzin ID*. 2023. [Quantifying the movement, behavior, and environmental context of group-living animals using drones and computer vision](#). *Journal of Animal Ecology*.
Co-senior author. I provided the scientific motivation, field data, and partial funding to develop this method. Along with the first author, I processed the data, refined the method and wrote and revised the manuscript.
8. Tuia D*, Kellenberger B*, Beery S*, **Costelloe BR***, Zuffi S, Risse B, Mathis A, Mathis M, Van Langevelde F, Burghardt T, Kays R, Klinck H, Wikelski M, Couzin ID, van Horn G, Crofoot M, Stewart C, and Berger-Wolf T. 2022. [Perspectives in machine learning for wildlife conservation](#). *Nature Communications* 13: 792.
As the only lead author from the ecology domain, I provided much of the ecological perspective in this piece. I created the figures and contributed significantly to the writing and revision of the manuscript.
7. Graving JM, Chae D, Naik H, Li L, Koger B[†], **Costelloe BR**, and Couzin ID. 2019. [DeepPoseKit, a](#)

[software toolkit for fast and robust animal pose estimation using deep learning](#). *eLife* 8: e47994.

I provided the scientific motivation and data necessary to apply DeepPoseKit to drone footage. This is the first demonstration of pose estimation from such imagery.

6. **Costelloe BR** and Rubenstein DI. 2018. [Temporal structuring of vigilance behaviour by female Thomson's gazelles with hidden fawns](#). *Animal Behaviour* 145: 87-97.
5. **Costelloe BR**. 2018. [Participation by a male Grant's gazelle in the defense of a fawn](#). *African Journal of Ecology* 56: 378-380.
4. **Costelloe BR** and Rubenstein DI. 2015. [Coping with transition: offspring risk and maternal behavioral changes at the end of the hiding phase](#). *Animal Behaviour* 109: 217-225.
3. **Roberts BA** and Rubenstein DI. 2014. [Maternal tactics for mitigating offspring risk during the postpartum period in Thomson's gazelle](#). *Behaviour* 151: 1229-1248.
2. **Roberts BA**. 2012. [An attack by a warthog, *Phacochoerus africanus*, on a newborn Thomson's gazelle, *Gazella thomsonii*](#). *African Journal of Ecology* 50: 507-508.
1. **Roberts BA**. 2012. [Perinatal behavior of a Grevy's zebra \(*Equus grevyi*\) mare and foal](#). *Journal of Ethology* 30: 205-209.

TEACHING EXPERIENCE

Merz Academy of Fine Arts

Collaborating Scientist Documentary Palaces (Summer 2022)

I collaborated with Merz Academy faculty to deliver a course on story-telling with scientific data. Students drew on my research to produce original projects using diverse media, including print-making, textiles, and virtual reality. I delivered lectures on my research, consulted individually with students, and provided feedback during project development.

University of Konstanz

Team Instructor Animal Behaviour (Summer 2018, 2019, 2020)
Advanced Masters Course on Collective Animal Behaviour (2018, 2019, 2022)

Princeton University

Instructor of Record Integrative Dynamics of Animal Behavior (Fall 2014)
Evolution and Behavior of the Sexes (Spring 2014)

Assistant Instructor Animal Behavior (Spring 2012 & 2013)
Evolution and Behavior of the Sexes (Spring 2009)

Writing Instructor Junior Writing Tutorial (Fall 2010)

Princeton Prison Teaching Initiative

Team Instructor Environmental Science (Spring 2014)

MENTORING AND SUPERVISION

PhD students

2022 **Benjamin Koger**, International Max Planck Research School & University of Konstanz
Co-supervised with Iain Couzin
Dissertation title: "Using computer vision to study animal behavior in natural environments"
Current position: Washington Research Foundation Postdoctoral Fellow, University of Washington

Masters students

- 2019 **Felicita Oehler**, University of Konstanz
Thesis title: “Structure and associations within plains and Grevy’s zebra herds during a disturbance”
Current position: PhD student, Wildlife Research Unit of Baden-Württemberg & University of Vienna
- 2019 **Sven Lauke**, University of Konstanz
Thesis title: “Behavioral responses to UAVs by wild ungulate herds”
Current position: PhD student, Justus Liebig University

Undergraduate students (Senior thesis fieldwork supervision)

- 2016 **Jennifer Zhao**, Princeton University
Thesis title: “Horsing around: quantifying the resilience of the social networks of *Equus caballus*”
- 2012 **Youngin Lim**, Princeton University
Thesis title: “Collective vigilance and risk management: anti-predator vigilance behavior in Thomson’s gazelle (*Eudorcas thomsonii*)”
- 2010 **Sully Carmona**, Princeton University
Thesis title: “The effects of predation risk on maternal behavior of the Thomson’s gazelle”
- 2009 **Zackory Burns**, Princeton University
Thesis title: “The interaction of leadership, risk assessment and information exchange in plains zebra (*Equus burchelli*)”

Dissertation committees

Felicita Oehler, University of Vienna

PRESENTATIONS

Invited talks

- 2023 Symposium – The Relative Contributions of Social Bonds to the Movement of Ungulate Herds. 13th International Mammalogical Conference. Anchorage, AK. *Meeting in July 2023*.
Workshop - Using Drones and Computer Vision to Study Animal Movement and Behavior in the Wild. Animal Behavior Society Annual Meeting. Portland, OR. *Meeting in July 2023*.
- 2022 Department seminar – Department of Biological Sciences, East Tennessee State University, Johnson City, TN.
Plenary – AniMove Summer School. Radolfzell, Germany.
- 2021 Symposium – Weaving the Future of Animal Behavior: Technological Advances to Reveal the Secret Lives of Animals. Animal Behavior Society Annual Meeting. Online.
Symposium – The Determinants of Movement for Large Social Ungulates. American Society of Mammalogists Annual Meeting. *Meeting canceled due to Covid-19*.
- 2020 Thematic session – Capturing Ecology Across Scales Using New Technology. British Ecological Society Annual Meeting. Online.
- 2019 Workshop – Machine Learning in the Behavioral Sciences. Association for the Study of Animal Behaviour Summer Meeting. Konstanz, Germany.
Seminar – Linking Individual Behavior to Community Responses in Changing Landscapes. Max Planck-Yale Center for Biodiversity Movement and Global Change. New Haven, CT.
Department seminar – Department of Biology, Dartmouth College. Hanover, NH.

- 2018 Seminar – Wildlife Tracking from Unmanned Aerial Vehicles with Machine Learning. Wageningen University. Wageningen, Netherlands.
- 2014 Symposium – Allee Symposium for Graduate Research. Animal Behavior Society Annual Meeting. Princeton, NJ.
Department seminar – Department of Biology, University of Pennsylvania. Philadelphia, PA.

Contributed talks

- 2020 Animal Behavior Society Annual Meeting. Online.
- 2019 Behavior 2019. Chicago, IL.
Association for the Study of Animal Behaviour Summer Meeting. Konstanz, Germany.
- 2018 Animal Behavior Society Annual Meeting. Milwaukee, WI.
- 2015 Animal Behavior Society Annual Meeting. Anchorage, AK.
- 2013 Animal Behavior Society Annual Meeting. Boulder, CO.
American Society of Mammalogists Annual Meeting. Philadelphia, PA.

Posters

- 2019 Gordon Research Conference on Movement Ecology of Animals. Barga, Italy.
- 2018 International Society of Behavioral Ecology Conference. Minneapolis, MN.
- 2017 Behaviour 2017. Estoril, Portugal.
- 2012 Princeton Research Symposium. Princeton, NJ. *Poster prize winner.*

SERVICE

Grant Management and Administration

- 2023 - 2026 Conservation Exploitation Manager - [WildDrone Project](#)
I communicate the findings and technological developments of the project to practitioners in the wildlife conservation sphere in order to encourage uptake of our results and maximize the impact of the WildDrone project.
- Acting Coordinator for Ecology and Conservation Theme - [WildDrone Project](#)
I coordinate PhD student recruitment and research projects within the Ecology and Conservation theme.

Diversity, Equity and Inclusion

- 2022 - present Co-Chair – Max Planck Institute of Animal Behavior Diversity, Equity and Inclusion Working Group
- 2014 - 2016 Leader and founding member – Princeton EEB Women in Science Partnership

Grant and Peer Review

- 2016 - present Grant Review College member – British Ecological Society
- 2015 - present Student Grant reviewer – Animal Behavior Society
- Peer review: African Journal of Ecology, The American Naturalist, Animal Behaviour, Animal Cognition, Behavioral Ecology, Behavioral Processes, Biology Letters, Communications Biology, Current Zoology, International Journal of Biodiversity and Conservation, ISPRS Journal of Photogrammetry and Remote Sensing, Journal of Ethology, Journal of Neuroscience Methods, Oikos, Scientific Reports

Societies and Conferences

- 2019 Organizing Committee member – Association for the Study of Animal Behavior (ASAB)

- Summer Conference
- Workshop leader – ASAB Summer Conference
- Session moderator – ASAB Summer Conference
- 2015 Session moderator – Animal Behavior Society Annual Meeting
- 2016 - 2017 Mammal Biodiversity Committee – American Society of Mammalogists
- 2011 - 2017 Informatics Committee – American Society of Mammalogists

PROFESSIONAL DEVELOPMENT AND CERTIFICATIONS

Certifications

- Certified Remote Pilot (A1/A3) – European Aviation Safety Agency
- Certified Remote Pilot – United States Federal Aviation Administration

Workshops

- 2022 A.I. for Science Bootcamp, Max Planck Computing and Data Facility
- 2018 Social Networking Analysis Workshop, Max Planck Institute for Ornithology
- 2016 Data and Modeling in Collective Behavior Workshop, New Jersey Institute of Technology
- 2014 NextProf Science Diversity Workshop, University of Michigan

Professional Skills Development

- 2020 Negotiation and Conflict Management, Max Planck Society Training Seminar
- 2017 SenseFly Drone Operator Training
- 2013 Talking About Your Teaching, McGraw Center for Teaching and Learning, Princeton University
- Classroom Observation and Feedback, McGraw Center, Princeton University
- Understanding How Students Learn, McGraw Center, Princeton University
- 2012 Designing a Course, McGraw Center, Princeton University
- Graduate Student Writing in the Sciences, McGraw Center, Princeton University
- 2008 Assistant Instructor Training, McGraw Center, Princeton University

SOCIETY MEMBERSHIP

- International Society of Behavioral Ecology (since 2018)
- Association for the Study of Animal Behaviour (since 2017)
- International Bio-Logging Society (since 2017)
- British Ecological Society (since 2015)
- Animal Behavior Society (since 2009)
- American Society of Mammalogists (2009 to 2018)

OUTREACH

- 2017 - present Curator, Animal behavior YouTube channel (>38,000 subscribers)
- 2016 - present Manager of department Twitter account (@CollectiveBehav)
- 2019 Guest curator – @RealScientists Twitter account

- 2018 Public research lecture – Max Planck Day
- 2016 Guest curator – @BioTweeps Twitter account
Presenter – “A Day in Digitopolis” Public Science Day, Arts Council of Princeton
- 2015 Visiting scientist – Monmouth Junction Elementary School Science Fair