

Willa M. Lane

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RESEARCH PROFILE

Marine scientist and behavioral ecologist (2023 Gates Cambridge Scholar; PhD expected 2027) combining controlled experimental work with field sampling and computational analysis of large behavioral datasets. 2021 NOAA Hollings Scholar with estuarine fisheries and aquaculture experience; AAUS scientific diver. U.S. citizen.

EDUCATION

- 09/2023-present - PhD in Psychology**, St John's College, University of Cambridge (*expected 09/2027*)
*Behavioral and sensory ecology of cuttlefish (*Sepia officinalis*), focusing on visual processing and skin patterning (camouflage). Supervisor: **Prof. Nicola Clayton FRS.***
- 08/2019-05/2023 - Honors BS with Distinction in Marine Science**, University of Delaware
Magna cum laude (GPA 3.95); senior thesis in cnidarian-algal symbioses and thermal physiology.

RESEARCH EXPERIENCE

- 09/2023-present - PhD Candidate**, Comparative Cognition Lab, University of Cambridge
*Behavioral and sensory ecology of *Sepia officinalis* studied in collaborations with the Marine Biological Association (UK) and CEEC Lab (University of Caen, France).*
- Experimental design: designed and conducted controlled laboratory experiments with 400+ cuttlefish across 4 research visits to partner facilities.
 - Computational methods: developed and validated computer-vision pipelines to quantify skin patterning, converting 12 terabytes of footage to ~3.9 million frames across 1,440 trials for processing with custom DeepLabCut pose-estimation models and EfficientNet-B0 CNN classifiers (25,000-image training set; 95.8% accuracy, 1.44% critical false-positive rate).
 - Statistical analysis: analyzed behavioral data in R using frequentist, Bayesian, non-parametric, and simulation-based methods.
 - Project management: secured ethical approvals and independently coordinated access, scheduling, training, equipment, and accommodation across three institutions in two countries, including for multi-member research teams.
 - Research outputs: presented PhD results at 7 external venues, including 3 international scientific conferences, and contributed to 2 peer-reviewed empirical/theoretical publications during PhD, with 5 more in preparation.
 - Mentorship: mentored two MPhil students, co-authoring upcoming publications; supervised two final-year undergraduate research projects (both achieving Firsts), with two additional students in 2026-27; and led all training (2024-25) for incoming researchers working with the lab's corvid colony.
- 05/2023-08/2023 - Hatchery Technician**, Hale Lab Oyster Hatchery, Delaware Sea Grant
- Hatchery operations: supported production through algal culture, oyster spawning, record-keeping, and facilities maintenance at pilot-scale oyster hatchery, delivering over 400,000 spat to commercial aquaculture partners.
 - Stakeholder engagement: led biweekly outreach sessions for both public audiences and industry partners.
- 05/2022-08/2022 - NOAA Hollings Intern**, North Inlet-Winyah Bay National Estuarine Research Reserve
- Fisheries research: designed and led an independent study of how density and salinity affect penaeid shrimp population dynamics to inform regional fisheries management, including use of PIT tagging for individual identification, resulting in 2 conference presentations and a publication in PLOS One.
 - Field methods: conducted weekly seine, kick net, and cast net sampling of estuarine tidal creeks, identifying and measuring fish and invertebrates for a long-term dataset; assisted with maintenance of NOAA NERR System-Wide Monitoring Program (SWMP) water quality and meteorological stations.

RESEARCH EXPERIENCE (cont.)

- 11/2021-05/2023** - **Research Assistant**, Warner Lab, University of Delaware
*Led honors senior thesis research on how light and temperature affect fitness and symbiosis in thermally tolerant algae and cnidarian host *Ecaiptasia diaphana* using CBASS thermal stress assays and PAM fluorometry; recognized with departmental award for Outstanding Contributions to Marine Science.*
- 02/2021-08/2023** - **Lab Manager & Research Assistant**, Spatial Cognition Lab, University of Delaware
*Managed lab operations and independently led research on visual scene memory; built and ran experiments in PsychoPy with online recruitment of 406 participants via SONA and Pavlovia, resulting in first-author publication in *Journal of Experimental Psychology: General*.*
- 01/2021-05/2021** - **Research Assistant**, Soil and Water Quality Analytical Lab, University of Delaware
Prepared laboratory standards, substrate for white-rot fungi used in bioremediation experiments, and samples for total Kjeldahl nitrogen analyses.
- 06/2019-08/2019** - **Research Intern**, Behavioral Ecology Lab, Norwich University
Conducted field research on habitat differences in social behavior of brook stickleback, including mark-recapture methods using VIE tagging, resulting in first-author presentation at Animal Behavior Society 2020 Annual Meeting.

PUBLICATIONS

Peer-reviewed

- **Lane, WM**, V Ajuwon, J Dols Ferrez, & NS Clayton. (2026). Mirror, mirror, on the... surface? Mirror-guided learning in octopuses. *Journal of Experimental Psychology: Animal Learning and Cognition*. DOI: 10.1037/xan0000445 [commentary]
- **Lane, WM**, & NS Clayton. (2026). Dimensional welfare beyond pain: Extending the precautionary principle in Birch's "The Edge of Sentience". *Animal Sentience*, 38(6). DOI: 10.51291/2377-7478.1937. [commentary]
- **Lane, WM**, V Ajuwon, & NS Clayton. (2025). Cephalopod consciousness on "their own terms": Who are "they"? *Animal Sentience*, 37(6). DOI: 10.51291/2377-7478.1910. [commentary]
- Cornero, FM, **WM Lane**, & NS Clayton. (2025). Can an old rook learn new tricks? Vocal command comprehension and obedience in rooks (*Corvus frugilegus*). *Animal Cognition*, 28(81). DOI: 10.1007/s10071-025-02002-8. [empirical]
- **Lane, WM**, & NS Clayton. (2025). Towards an integrated study of camouflage and cognition in cephalopods. *Psychological Topics*, 34(1), pp. 25-51. DOI: 10.31820/pt.34.1.2. [review]
- **Lane, WM**, B Singh, S Mournani, & H Intraub. (2025). "Reading" a visual scene: The effect of spatially grounded expectations on memory. *Journal of Experimental Psychology: General*. DOI: 10.1037/xge0001789. [empirical]
- Dunn, RP, ME Kimball, BW Pfirrmann, AS Bruck, & **WM Lane**. (2024). Temporal habitat partitioning and resource competition between congeners: Testing for density-dependent growth and mortality in estuarine shrimp. *PLOS One*, 19(12), e0316219. DOI: 10.1371/journal.pone.0316219. [empirical]

In preparation (publicly presented)

- **Lane, WM**, P Chen, FM Cornero, & NS Clayton. Evidence for object permanence in an invertebrate. *Oral presentation, ECBB 2026*.
- **Lane, WM**, BS Lemaire, C Jozet-Alves, & NS Clayton. Movement, visual field use, and lateralised cue integration during camouflage in hatchling cuttlefish. *Oral presentation, Cephalopod Neuroscience GRC 2026*.
- **Lane, WM**, M Alam, R Jugdaohsingh, A Harvey, J Feasey-Kemp, & NS Clayton. Altered eye-use lateralisation in cuttlefish coinciding with subchronic low-level zinc exposure. *Poster, ISBE 2026*.

TECHNICAL SKILLS & CERTIFICATIONS

- **Computational & statistical:** R (frequentist, Bayesian, non-parametric, and simulation-based methods); Python for applied computer vision and image analysis (DeepLabCut, SegmentAnything, fine-tuned EfficientNet-B0 and VGG19 with ImageNet backbone), including pipeline design, code review, output validation, and LLM-assisted implementation; BORIS behavioral video annotation; PsychoPy; ArcGIS; management of multi-terabyte image and video datasets
- **Field:** AAUS scientific diver (drysuit, nitrox; 60+ logged dives); small-boat operations; seine, kick net, and cast net sampling; fish and invertebrate identification and measurement; PIT and VIE tagging; SWMP water quality and meteorological station maintenance; CTD sensors; dissolved oxygen probes; Satlantic HyperPro profilers
- **Laboratory:** cryostat microtome; CBASS thermal stress assays; fluorometry (PAM, FRe, Turner); respirometry; flow cytometry; spectrophotometry; PCR and gel electrophoresis; algal culture; seawater system operation and troubleshooting
- **Animal husbandry & ethics:** FELASA Function A certificate; 7 years experience in husbandry of marine invertebrates (cephalopods, bivalve molluscs, cnidarians, crustaceans), fish, and birds; 3 years experience in livestock husbandry (goats); aquaculture hatchery production; ethical approvals including through IACUC (USA), AWERB (UK), and CEEA (France)
- **Certifications & training:** AAUS scientific diver; FELASA Function A certificate; NOAA NMFS/Rutgers/NJ Sea Grant fisheries management course (10-day intensive, 2022); Delaware Boater Safety course; St John Ambulance Emergency First Aid course

SELECTED AWARDS, GRANTS, & SCHOLARSHIPS

- 2024-present** - **Fieldwork Grant**, Department of Psychology, University of Cambridge; £10,400
Competitive annual funding awarded to support PhD research and fieldwork costs.
- 2023-present** - **Gates Cambridge Scholarship**, Gates Cambridge Trust; £225,000
Internationally competitive (approx. 75 awards annually) fully-funded postgraduate degree scholarship.
- 2023** - **Outstanding Contributions to Marine Science**, University of Delaware; non-monetary
Recognition of one outstanding graduate for research and academic contributions.
- 2023** - **Scientific Diving Training Grant**, University of Delaware; \$4,500
Departmental grant supporting scientific diver training.
- 2022** - **Rutgers Fisheries Course Scholar**, NOAA NMFS/Rutgers University/NJ Sea Grant; \$7,000
Fully funded 10-day intensive course on fisheries management.
- 2021-2023** - **Ernest F. Hollings Scholarship**, National Oceanic & Atmospheric Administration; \$40,000
Nationally competitive (approx. 120 awards annually) 2-year academic scholarship and NOAA internship.

CONFERENCE PRESENTATIONS

- **Lane, WM**, P Chen, FM Cornero, & NS Clayton. Out of sight, not out of mind? Object permanence, camouflage, and information-seeking behaviour in cuttlefish. *European Conference for Behavioural Biology*, September 2026; Cambridge, UK.
- **Lane, WM**, M Alam, R Jugdaohsingh, A Harvey, J Feasey-Kemp, & NS Clayton. Poster. Altered eye-use lateralisation in cuttlefish coinciding with subchronic low-level zinc exposure. *International Society for Behavioural Ecology*, July 2026; Turin, Italy.
- **Lane, WM**, BS Lemaire, C Jozet-Alves, & NS Clayton. Oral presentation. Split decisions: Social and environmental brightness matching in hatchling *Sepia officinalis*. *Cephalopod Neuroscience Gordon Research Conference*, February 2026; Galveston, TX, USA.
- **Lane, WM**, AS Bruck, I Hubbard, BW Pfirrmann, ME Kimball, & RP Dunn. Oral presentation. Experimental evidence of density-dependent growth (but not mortality) for juvenile penaeid shrimp. *Benthic Ecology Meeting*, April 2023; Miami, FL, USA.
- **Lane, WM**, AS Bruck, I Hubbard, BW Pfirrmann, ME Kimball, & RP Dunn. Poster. Does conspecific density affect juvenile shrimp from southeastern U.S. estuaries? *Western Society of Naturalists*, November 2022; Oxnard, CA, USA.
- **Lane, WM**, & SP Pearish. Oral presentation. Habitat differences in schooling in brook stickleback. *Animal Behavior Society*, July 2020; Virtual Meeting due to COVID-19 pandemic.

INVITED TALKS & WORKSHOPS

- Hatchling cuttlefish camouflage. *Cambridge Cephalopod Seminar*, April 2026, Medical Research Council Laboratory of Molecular Biology, Cambridge, UK.
- Clever crows and curious cuttlefish. *CamBrain NeuroTalks Series*, January 2026; Cambridge Neuroscience Interdisciplinary Research Centre, Cambridge, UK.
- Cephalopod re-presentation: Pixels, pointillism, and embodied perception. *New Perspectives on Animal Camouflage and Human Image-making*, November 2025; Scuola Normale Superiore, Pisa, Italy.
- Evolutionary perspectives on camouflage and cognition in cephalopods. *Disguise and Deception: New Perspectives on Camouflage and Mimicry*, May 2025; King's College, Cambridge, UK.

TEACHING & SERVICE

- 09/2026-present - Peer Reviewer**
Current Zoology & Springer Books; reviewed 1 scientific manuscript and 1 book proposal to date.
- 10/2024-present - Teaching Supervisor**, Departments of Psychology & Zoology, University of Cambridge
Deliver weekly small-group teaching for approximately 50 undergraduate students per academic year, providing individualized written feedback on essay writing and critical analysis. Courses taught: Evolution & Behaviour, Applied Ecology, Behavioural & Cognitive Neuroscience, and Psychology of the Family.
- 10/2024-present - Project Supervisor**, Department of Psychology, University of Cambridge
Supervised 4 final-year undergraduate research projects, advising on research design, statistical analysis, and scientific writing.

OUTREACH & SCIENCE COMMUNICATION

- 08/2023-present - International Media Coverage**
Research and commentary featured by outlets including: [Deutschlandfunk Kultur](#), [BBC Newsround](#), [New Scientist](#), [Marine Biological Association of the UK](#), [Gates Cambridge News](#), [UDaily News](#), and Delaware Beach Life.
- 02/2022-present - Outreach Speaker**
Deliver marine biology and STEM careers presentations to high school audiences, with 14 presentations completed to date.

ADDITIONAL RELEVANT EXPERIENCE

- 08/2025-present - Data Analyst**, Sidney Sussex College, University of Cambridge
Integrate and analyze sensitive student wellbeing and demographic data spanning multiple years, translating findings into recommendations to inform EDI initiatives and student wellbeing service provision (including redesigning data collection methodology).
- 09/2025 & 09/2026 - Alumni Relations Assistant**, Telethon Team, St John's College (Cambridge, UK)
Directly contacted over 40 alumni as part of a fundraising campaign for the Dobson Free Places Fund student-access scheme, personally securing £30,258 over two weeks in 2025; 2026 campaign is ongoing.
- 05/2024-09/2024 - Logistics Coordinator**, Orientation Team, Gates Cambridge Trust (Cambridge, UK)
Managed end-to-end logistics including food, accommodation, and activity scheduling for a 4-day orientation program for 75 international postgraduate students, including a weekend retreat in the UK's Peak District.