

Zoe Rand
Curriculum Vitae

EDUCATION

- University of Washington**, Seattle, WA 2020-Present
PhD candidate, Quantitative Ecology and Resource Management
Advisor: Trevor A. Branch
Dissertation: Modeling the effects of whaling on blue whales and other baleen whales
Relevant coursework: Statistical Inference in Biometry, Mathematical Ecology, Decision Analysis, Demographic Estimation, Software Development for Data Scientists, Analysis of Ecological Data, Optimization Techniques, Stochastic Modeling, Ecology of Animal Movement, Modeling Complex Systems, Numerical Computing for Fisheries Assessment and Management
- University of St Andrews**, Scotland 2019- 2020
Masters of Science with Distinction, Marine Mammal Science
Advisor: Julie N. Oswald
Thesis: Effects of duty cycling in passive acoustic monitoring
- Oregon State University**, *Post-baccalaureate*, Fisheries and Wildlife Science 2018-2019
- Mount Holyoke College**, *Bachelor of Arts, Summa Cum Laude*, 2012-2016
Major: Latin American Studies; *Minor*: Music
- Augsburg College Social Change in Central America**, Guatemala, Costa Rica, Nicaragua 2014
Study abroad program focusing on social justice and change in Central America

PUBLICATIONS IN PREPARATION (4 total, 3 first-author)

- Rand Z. R.**, Koehn L. E., Morrigan, A. and Hanson, B. M. *In prep.* Increasing presence of Bigg's killer whales and changing seasonal distribution of endangered Southern Resident killer whale habitat use in Washington waters from 1978-2022.
- Rand Z. R.**, Branch, T.A. Olson, P.A., Double, M. C., and Findlay K. *In prep.* The endangered Antarctic blue whale population is increasing but is still far from pre-whaling levels. *Endangered Species Research*.
- Rand Z. R.**, Branch, T. A., Punt, A. E. *In prep.* Estimates of age-length relationships and natural survival for pygmy blue whales.
- Trickey, J. S., **Rand, Z. R.**, Brewer, A. M., Hanson, B. M., Emmons, C. K., Holt, M. M. *In prep.* The prevalence of ultrasonic antifouling: Unregulated acoustic devices contribute to rising levels of underwater noise to the high-frequency soundscape. *Journal of the Acoustical Society of America*.

PEER-REVIEWED PUBLICATIONS (8 total, 4 first-author)

- Rand Z. R.**, Branch, T. A. and Converse, S. J. (2025) Battle of the sexes: longer rorqual whale mothers have more female offspring. *Proceedings of the Royal Society B*. 292: 20251437.
- Branch, T.A., Monnahan, C.C., Leroy, E.C., ..., **Rand Z. R.**, et al. (2025). Separating historical catches among pygmy blue whale populations with the aid of recent song detections. *Marine Mammal Science*. e70003.
- Rand Z.R.**, Branch, T. A. and Jackson J. A. (2024). High historical movement rates of Antarctic blue whales (*Balaenoptera musculus intermedia*) on Southern Ocean feeding grounds estimated from Discovery marks. *Endangered Species Research*. 55: 109-128.

- Rand, Z. R.**, Ward, E. J., Zamon, J. E., Good, T. P., and Harvey, C. J. (2024). Using hidden Markov models to develop ecosystem indicators from non-stationary time series. *Ecological Modelling*, 495:110800. 10.1016/j.ecolmodel.2024.110800
- Battle L., Patil A., Branch T.A., **Rand Z. R.** (2023) Visualizing historical whaling voyages over time. *Interactions* 30:22-23
- Patil A., **Rand, Z.R.**, Branch, T.A., and Battle, L. (2023). WhaleVis: Visualizing the history of commercial whaling. *IEEE Visualization and Analytics (VIS)*, Melbourne, Australia, 96-100.
- Rand Z.R.**, Wood J., Oswald J. (2022). Effects of duty cycles on the passive acoustic monitoring of Southern Resident killer whale (*Orcinus orca*) occurrence and behavior. *Journal of the Acoustical Society of America*, 151(3): 1651-1660.
- Haver S., **Rand Z.R.**, Hatch L. *et al.* (2020) Seasonal trends and primary contributors to the low frequency soundscape of the Cordell Bank National Marine Sanctuary. *Journal of the Acoustical Society of America*, 148(2):845-858.

ASSESSMENT DOCUMENTS (6 total, 4 first-author)

- Rand Z. R.**, Branch, T. A. (2024). Updated historical catch series for Antarctic blue whales. *IWC Paper SC/69B/IA/01*.
- Rand Z. R.**, Branch, T. A. (2024). Preliminary results from an updated population assessment of Antarctic blue whales. *IWC Paper SC/69B/IA/05*.
- Branch, T.A., Monnahan, C.C., Leroy, E.C., Shabangu, ..., **Rand, Z.R.**, *et al.*, (2023). Further revisions to the historical catch separation of pygmy blue whale populations using contemporary song detections. *IWC Paper SC/69A/SH/09*.
- Patil, A., **Rand, Z.R.**, Branch, T.A., Battle, L., (2023). WhaleVis: A new visualization tool for the IWC catch database. *IWC Paper SC/69A/GDR/04*.
- Rand, Z.R.**, Branch, T.A., (2023). Fetal sex misidentification and adaptive sex ratio behavior in large whales. *IWC Paper SC/69A/SH/06*.
- Rand Z.R.**, Branch, T., Jackson, J. (2022) Movement rates of Antarctic blue whales from Discovery marks. *IWC Paper 68D/SH/13*.

FUNDED RESEARCH SUPPORT

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| • University of Washington Graduate School student travel grant, Fall 2024 | \$500 |
| • College of the Environment student travel grant, Fall 2024 | \$1,500 |
| • NMFS-Sea Grant Population Dynamics Fellowship, September 2023-Present | \$174,670 |
| • FINS graduate student travel awards, Summer 2021, Summer 2022, Winter 2023 | \$1,400 |
| • Quantitative Ecology and Resource Management fellowship, September 2020 | \$31,000 |
| • R&A Ransome Scholar, University of St Andrews, September 2019 | \$56,000 |

HONORS AND AWARDS

- College of the Environment Graduate Dean's Medalist for outstanding academic achievement, leadership, and service, University of Washington, May, 2025
- Best student presentation from North America, 25th Biennial Conference on the Biology of Marine Mammals, Perth, 2024
- Best student poster presentation, Pacific Seabird Group Annual Meeting, Seattle, 2024
- NMFS-Sea Grant Population Dynamics Fellowship, for graduate students in population dynamics and stock assessment, August 2023
- Fritzell Diversity Award, Oregon State University, June 2018

TEACHING AND MENTORING

- Guest lecture and lab**, Population effects of whaling and estimating marine mammal abundance 2025
Evolution and Ecology of Marine Mammals, 12 students, University of Washington
- Guest lecture**, Whaling and the IWC, 2025
Conservation and Management of Aquatic Resources, 90 students, University of Washington
- Guest lecture**, Plotting techniques using ggplot2, 2024
Beautiful Graphics in R, 25 students, University of Washington
- Guest lecture**, Adaptive sex ratio behavior in marine mammals 2024
Evolution and Ecology of Marine Mammals, 25 students, University of Washington
- Mentor**, Identity Belonging and Inquiry in Science, University of Washington 2023-2024
- Mentored an undergraduate student in developing and executing a research project, providing guidance and supervision throughout the process.
 - Completed mentorship training sessions focused on enhancing communication skills, adopting mentorship best practices, and integrating diversity, equity, and inclusion principles into mentorship approaches.
 - Implemented knowledge gained from mentorship training to foster an inclusive and supportive environment for mentee, ensuring diverse perspectives are valued and included.
 - This research resulted in two poster presentations by my mentee, one at the University of Washington undergraduate research symposium and the other at the SACNAS conference in Phoenix, AZ in 2024.
- Workshop facilitator**, Writing Personal Statements, University of Washington 2023
- Developed and led workshop for 25 undergraduate students in the College of the Environment that introduced students to the process of writing personal statements for fellowships and graduate school and gave them hands-on practice with writing their own personal statements.
- Reader/Grader**, Q SCI 458 Advanced Ecological Modeling, University of Washington 2022-2023
- Delivered timely and helpful feedback to ~15 students each quarter on written assignments and code in R
- Workshop facilitator**, Using GitHub for Research, University of Washington 2021
- Developed and led workshop for 20 graduate students that introduced GitHub and version control and provided hands-on experience with using it for ecological research
- Educator**, Oregon Coast Aquarium, Newport OR 2018-2019
- Presented publicly about species in the aquarium with relevant conservation messaging.
 - Interpreted exhibits for guests and taught principles of biology and ecology.
 - Engaged guests and community stakeholders with entertaining and informational activities that inspired love for ocean life and fostered understanding about the need for ocean conservation.
- Undergraduate Writing Consultant**, Oregon State University, 2018-2019
- Taught writing skills one-on-one with undergraduate and graduate students and provided strategies to succeed in college academic writing.
 - Maintained the writing studio as an inclusive space and collaborated with coworkers to meet each student's individual needs.
- Speaking Arguing and Writing Center Mentor**, Mount Holyoke College 2013-2016
- Taught strategies such as brainstorming, outlining, and revising, while working with students one-on-one as well as led writing and public speaking workshops for large groups of students.
 - Collaborated with professors to support the writing progress of their students in first-year seminar

PRESENTATIONS (8 total)

- Rand Z. R.**, Branch, T., (2025). Bayesian models reveal endangered Antarctic blue whale population is increasing but still far from pre-whaling levels. Seminar Presentation. *SAFS Quantitative Seminar*, University of Washington, Seattle, WA. February 21, 2025.
- Rand Z. R.**, Koehn, L., Morrigan, A., Hanson, B. (2024). Spatiotemporal modeling of killer whale presence in the Salish Sea. Workshop presentation. *Orca Occupancy Indicator Workshop*, Seattle, WA. December 4, 2024.
- Rand Z. R.**, Branch, T., Converse, S. (2024). Longer mothers tend to have more female calves: evidence for adaptive sex ratio behavior in rorqual whales. Poster presentation. *25th Biennial Conference on the Biology of Marine Mammals*, Perth, WA, Australia.
- Rand Z. R.**, Ward, E. J., Zamon, J. E., Good, T. P., Harvey, C. J. (2024). Hidden Markov models identify regime shift from seabird at-sea-density in the Northern California Current. Poster presentation. *Pacific Seabird Group Annual Meeting*, Seattle, WA.
- Rand Z.R.**, Branch T., Jackson J. (2023) High movement rates of Antarctic blue whales (*Balaenoptera musculus intermedia*) on Southern Ocean feeding grounds estimated from historic mark-recovery data. Contributed oral presentation. *Ecological Society of America Annual Meeting*, Portland, OR.
- Rand Z.R.**, Branch T., Jackson J. (2022) Movement rates of Antarctic blue whales from historical data using Bayesian models. Seminar Presentation. *SAFS Quantitative Seminar*, University of Washington, Seattle, WA. October 21, 2022.
- Rand Z.R.**, Wood J. A., Oswald, J.N. (2022). Effects of Duty Cycles on the Passive Acoustic Monitoring of Southern Resident Killer Whale (*Orcinus orca*) Occurrence and Behavior. Poster presentation. *Society for Marine Mammalogy Biennial Conference*, Palm Beach, FL.
- Rand Z.R.** and Haver S. (2018). Identification of marine mammal species in the Cordell Bank National Marine Sanctuary using passive acoustic data. Conference Presentation. *Research and Advances in Fisheries, Wildlife and Ecology*, Corvallis, OR. April, 2018.

TECHNICAL SKILLS

- *Population modeling*: integrated population models, assessments of endangered species, matrix population models, mark-recapture models, estimating demographic rates
- *Statistics*: Bayesian statistical methods, maximum likelihood methods, generalized linear and generalized linear mixed models (GLM, GLMM), generalized additive models (GAM), species distribution models, hidden Markov models; model fitting, diagnostics, selection, validation, and predictive skills testing; simulation testing
- *Programming languages*: R (including ggplot and tidyverse), Julia, Python, TMB (C++) Stan, JAGS, NIMBLE
- GitHub workflow and version control. Code for selected projects can be found at <https://github.com/zoer27>
- Technical writing and communicating to technical and non-technical audiences

ACADEMIC SERVICE AND OUTREACH

- Reviewer:
 - Proceedings of the Royal Society B (1 paper, since 2024)
 - PLOS One (1 paper, since 2024)
 - Science Advances (1 paper, since 2025)
- Graduate student representative on the search committee for the Center for Quantitative Science (CQS) director (University of Washington, November 2023 – May 2024).
- Student Advisory Council Representative for the College of the Environment (University of Washington, September 2022-May 2024).
- Curriculum committee graduate student representative for the School of Aquatic and Fishery Sciences (University of Washington, September 2022 -May 2024).
- Organized the School of Aquatic and Fishery Sciences Quantitative Seminar (University of Washington, June 2022-June 2023).
- Board Member and Lesson Committee Lead of Students Experience Aquatic Sciences (SEAS), an organization that supports aquatic science outreach events in K-12 classrooms. (University of Washington, September 2021-August 2022).

MEMBERSHIPS

Society For Marine Mammalogy