Zoe Rand

EDUCATION

University of Washington, *PhD candidate,* Quantitative Ecology and Resource Management 2020-Present
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

HONORS AND AWARDS

- College of the Environment Graduate Dean's Medalist, University of Washington, May, 2025
- Best student presentation in 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-SeaGrant Population Dynamics Fellowship, September 2023
- Phi Beta Kappa, Mount Holyoke College, May 2016
- Sarah Williston Prize, Mount Holyoke College, May 2016, November 2015, 2014
- Latin American Studies Prize, Mount Holyoke College, May 2016
- Irving R. Eisley Prize, Mount Holyoke College, May 2016

GRANTS AND FELLOWSHIPS

- NMFS-SeaGrant Population Dynamics Fellowship, September 2023
- University of Washington Graduate School student travel grant, Fall 2024
- College of the Environment student travel grant, Fall 2024
- FINS graduate student travel awards Summer 2021, Summer 2022, Winter 2023
- Quantitative Ecology and Resource Management fellowship, September 2020
- R&A Ransome Scholar, University of St Andrews, September 2019
- Fritzell Diversity Award, Oregon State University, June 2018
- Mary Lyon Scholar, Mount Holyoke College, May 2016

RESEARCH

Modeling the population dynamics of exploited whales, University of Washington 2020-Present
Quantitatively analyze historical whaling data to study the population dynamics of whales affected by commercial whaling. Projects include estimating movement rates of Antarctic blue whales, analyzing whale sex ratios, extracting information from blue whale age data, and an assessment of the status of Antarctic blue whales.

Killer whale distribution modeling in the Puget sound, NOAA Western Regional Center 2024-Present
Develop quantitative indicators of killer whale presence in the Puget sound over time to assess ecosystem health integrating multiple data sources.

Effects of duty cycling on passive acoustic monitoring, University of St Andrews 2019-2020

Used automatic detector and manual verification to identify Southern resident killer whale calls and whistles in hydrophone data. Subsampled detections to mimic duty cycled recording and then used statistical models to analyze the effect of duty cycling.

Marine mammal acoustics in Cordell bank, Oregon State University 2018-2019
Manually identified marine mammal species present in the Cordell Bank National Marine Sanctuary using spectrogram characteristics and Raven Pro software. Compared recordings with visual survey data about marine mammal species in the area.

Acoustic inventory of national marine sanctuary, Cordell Bank National Marine Sanctuary 2018
Investigated and synthesized information about sound production and hearing capabilities in all species (mammals, fish, invertebrates, and birds) active in the sanctuary. Compiled data into a searchable document that can be used within the sanctuary to make management decisions and will be published on the website for public use.

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.* In review.

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, and T.A., 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.*

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.

TEACHING AND MENTORING

Guest lecture, Effects of whaling on cetacean populations 2025
Guest lab, Estimating marine mammal abundance
Evolution and Ecology of Marine Mammals, University of Washington

Guest lecture, Whaling and the IWC, 2025
Conservation and Management of Aquatic Resources, University of Washington

Guest lecture, Plotting techniques using ggplot2, 2024
Beautiful Graphics in R, University of Washington

Guest lecture, Adaptive sex ratio behavior in marine mammals 2024
Evolution and Ecology of Marine Mammals, University of Washington

Mentor, Identity Belonging and Inquiry in Science, University of Washington 2023-2024

- Mentor an undergraduate student in developing and executing a research project, providing guidance and supervision throughout the process.
- Complete mentorship training sessions focused on enhancing communication skills, adopting mentorship best practices, and integrating diversity, equity, and inclusion principles into mentorship approaches.
- Implement 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.

Reader/Grader, Q SCI 458 Advanced Ecological Modeling, University of Washington 2022 & 2023

- Delivered timely and helpful feedback to students on written assignments and code in R

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 and provided students with 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 Seminars

ACADEMIC SERVICE

- 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 Fisheries Sciences (University of Washington, September 2022 -May 2024).
- Organized the School of Aquatic and Fisheries Sciences Quantitative Seminar (University of Washington, June 2022-June 2023).
- Co-facilitated a workshop on using GitHub for Research at the School of Aquatic and Fisheries Science Graduate Student Symposium. (University of Washington, November 2021).
- 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).

TECHNICAL SKILLS

- Programming languages: R, Python, Julia, TMB, Stan, JAGS, NIMBLE
- GitHub and version control. Code for selected projects can be found at https://github.com/zoer27

MEMBERSHIPS

Society For Marine Mammalogy