Ryan A. Beshai

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Ecology & Evolutionary Biology
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Education

June 2025	**Ph.D.**, Ecology & Evolutionary Biology, University of California, Irvine Thesis: *New Around Here? The Assembly of Invasive Species and Effects of Range Expanding Species* Advisor: Dr. Cascade Sorte
May 2023	**M.S. Ecology & Evolutionary Biology**, University of California, Irvine
June 2017	**B.S. Ecology & Biodiversity** *Cum Laude,* University of Denver Thesis: *The Role of Enemy-Mediated Competition in Determining the Fitness of a Generalist Herbivore* Advisor: Dr. Shannon Murphy
2015	**Study Abroad**, University of Otago, Dunedin, New Zealand

Publications

Journal Articles

6. **Beshai, R.A.,** & Sorte, C.J.B. A General Framework for Predicting the Impacts of Marine Range-Expanding Species Worldwide. *In Review* at PNAS
5. **Beshai, R.A.**, Bourdeau, P.E., Ladah, L.B., Lorda, J., and Sorte, C.J.B. Applying invasion biology frameworks to predict the impacts of range expanding predators. *Ecology* 107(2), e70315.
4. Suen, K. J., **Beshai, R.A.**, & Sorte, C.J.B. The Impact of a Range-Shifting Predator Is Affected by Prey Preference and Composition. *Ecology & Evolution* 115(11), e72538.
3. Waite, H.R., **Beshai, R.A.**, and Sorte, C.J.B. (2023) On the edge: demography across latitudinal and elevational gradients for range-expanding whelks. *Marine Ecology Progress Series*. 728: 115-121.
2. **Beshai, R.A**., Truong, D.A., Henry, A.K., and Sorte, C.J.B. (2022). Invasional meltdown or biotic resistance? Diversity reduces invasibility but not exotic dominance in southern California fouling communities. *Biological Invasions.* 25(2) 533-549.
1. **Beshai, R.A.**, Barnes, E.E., and Murphy, S.M. (2019) The role of enemy-mediated competition in determining the fitness of a generalist herbivore*. Southwestern Entomologist* 44(1):69-77.

National Parks Service Reports

1. **Beshai, R.A.**, Katayama, T., and Pandori, L.M.M. Contextualizing Cabrillo National Monument Rocky Intertidal Population and Community Change Over 20 Years. *In Review* for NPS Datastore

Textbook Chapters **denotes equal contribution*

2. Sorte, C.J.B., ***Beshai, R.A.**, *Dean, L.S., *Fales, R.J., *Martin, E.L., and *Sherzai, S. (2024) Evolution, invasive, species, and. In: *Encyclopedia of Evolutionary Biology, 2nd Edition.*
1. Sorte, C.J.B., ***Beshai, R.A.**, *Henry, A.K., *Mahanes, S.A., *Rangel, R.E., and *Waite, H.R. (2023) Interactions between climate change and species invasions in the marine realm. *Invasive Species and Global Climate Change, 2nd Edition*, pp. 119-140.

Published & Publicized Teaching Materials

1. **Beshai, R.A.**, Sherzai, S., Ramsey, S., Suen, K., Magee, A., Nguyen, E., Sorte, C.J.B. (2024) PK-12 Resource Content Sheet on invasive species (information sheet for educators). *Environmental and Climate Change Literacy Projects*.

Grants, Honors & Awards

2025	Graduate Dean's Dissertation Fellowship	$5,000
2025	Ralph Waldo Gerard Endowed Prize for Excellence	$2,000
2024	Brian G. Atwood '74 & Lynne H. Edminster Graduate Studies Endowment	$5,000
2023	Graduate Assistance in Areas of National Need (GAANN) Fellow 2023-24	$26,012
2023	GAANN Research Funding (2022-23)	$2,000
2022	GAANN Fellow 2022-23	$20,061
2022	University of California, Irvine Student Travel Award	$500
2022	Allergran Foundation Graduate Award	$1000
2022	NSF GRFP Honorable Mention	
2022	GAANN Research Funding (2021-22)	$550
2021	GAANN Fellow 2021-22	$11,183
2017	Allan Bryce Henry Memorial Scholarship	$1,000
2013-2017	Dean's List (7x)	
2016	Partners in Scholarship (PinS) Summary Research Grant	$3,500
2016	Hornbeck Scholar	
2015	Cherrington Global Scholarship	$1,200
2013	Dean Scholarship	$26,000 x 4 years

Research Experience

2025- ***Postdoctoral Scholar**, University of California, Santa Cruz, Raimondi-Carr Lab*

- Examine how rocky intertidal communities across the northeastern United States are responding to long-term climatic stressors with the goal of informing climate vulnerability assessments and guiding conservation planning

2020-2025 ***Ph.D. Student**, University of California, Irvine, Sorte Lab*

Thesis summary: Investigating the community dynamics of invasive species and impacts of range-shifting species on recipient ecosystem populations and communities

- Conducting a global analysis of 350+ range-shifting marine species to create a general framework for predicting impacts on recipient communities
- Led rocky intertidal diversity survey teams (110+ personnel from the US and Mexico over 125 field days) at 23 sites along the California, USA, and Baja California, Mexico, coastline to assess current distribution and population structures of range-expanding predators
- Leveraged a manipulative caging experiment to assess and predict impacts of range-expanding predators along the California, USA, and Baja California, Mexico, coastline
- Contributed to revisions for two textbook chapters discussing global change and evolution in invasive species
- Identified species and analyzed settlement patterns of southern CA fouling communities to assess invasive species dynamics

2024-2024 ***Scientists in Parks Graduate Internship**, National Parks Service, Cabrillo National Monument, San Diego, CA*

- Developed 2 new reports to be published in the National Parks DataStore that inventory Cabrillo National Monument's intertidal natural resources, assess "vital signs" to monitor community health, and contextualize changes in community composition with sites across southern California and northern Baja California, Mexico
- Created reproducible R scripts (2) to accompany the annual and trend report

- Conducted Multi-Agency Rocky Intertidal Network (MARINe) surveys within and outside of Cabrillo NM as part of long-term survey efforts across the Pacific coast

2018-2020 ***Biological Science Technician**, U.S. Geological Survey (WERC), Fremont, CA*

- Collaborated with primary investigator to ensure sampling schemes would meet project objectives
- Led sample collection across station projects, requiring operation of motorized and non-motorized watercraft
- Obtained precision elevation data via Real Time Kinematic (RTK) and bathymetric surveys to inform benthic invertebrate community analyses
- Organized water quality data collection and monitoring (depth, temperature, and salinity)
- Identified benthic, aquatic, and terrestrial macroinvertebrates

2017-2018 ***Benthic Invertebrate Intern**, Moss Landing Marine Labs, Fremont, CA*

- Collected benthic cores to determine invertebrate community structure
- Identified benthic and aquatic macroinvertebrates from benthic cores
- Conducted salt marsh vegetation identifications and density assessments

2016-2017 ***Undergraduate Researcher**, Murphy Lab, University of Denver*

- Examined the role of indirect interactions in determining insect population fitness
- Disseminated the results via publication and multiple presentations (oral and poster)
- Prepared nutrient pulse/press samples for stable isotope analysis

2016 ***Laboratory Technician**, Barrett Lab, University of Denver*

- Studied interactive effects of anoxia and ocean acidification on urchin larvae development
- Collected gametes and prepared fertilization assays
- Maintained adult urchins in flow-through tanks

2016 ***Independent Study**, Nichols Lab, University of Denver*

- Tested the efficacy of various staining techniques on gemmule cells and developed a fluorescence microscopy technique for tracking cell motility

Presentations

Talks marked with †, posters with *, undergraduate students mentored with ‡

Primary Presenter

2024† **Beshai, R.A.,** Bourdeau, P.E., Ladah, L.B., Lorda J., & Sorte, C.J.B. Population Impacts of Two Range-Expanding Predators Along the Northeast Pacific Coast. *Ecological Society of America*. Long Beach, CA.

2024† **Beshai, R.A.,** Bourdeau, P.E., Ladah, L.B., Lorda J., & Sorte, C.J.B. Population Impacts of Two Range-Expanding Predators Along the Northeast Pacific Coast. *International Young Researcher's Conference on Invasive Species.* Virtual. <u>*Awarded best oral communication*</u>

2023† **Beshai, R.A.,** Bourdeau, P.E., Ladah, L.B., Lorda J., & Sorte, C.J.B. Population Impacts of Two Range-Expanding Predators Along the Northeast Pacific Coast. *Western Society of Naturalist's 104th Annual Meeting*. Monterey, CA.

2023* **Beshai, R.A.,** Cameron, C.T., Ladah, L.B., Lorda J., Bourdeau P.E., & Sorte, C.J.B. Population and Community Impacts of Two Range-Expanding Predators, the whelks *Acanthinucella spirata* and *Mexacanthina lugubris*, along the Pacific Coast. *Ecological Society of America*. Portland, OR.

2022† **Beshai, R.A.**, Truong, D.A., Henry, A.K., & Sorte, C.J.B. Invasional meltdown or biotic resistance? Diversity reduces invasibility but not exotic dominance in southern California fouling communities. *NEOBIOTA 12th International Conference on Biological Invasions*. Tartu, Estonia.

2021* **Beshai, R.A.**, Truong, D.A., Henry, A.K., & Sorte, C.J.B. Invasional meltdown or biotic resistance? Diversity reduces invasibility but not exotic dominance in southern California fouling communities. *InvasiBES 4th Interim Meeting*. Virtual.

2021* **Beshai, R.A.**, Truong, D.A., Henry, A.K., & Sorte, C.J.B. Invasional meltdown in southern California marine communities: could greater community diversity facilitate invader dominance? *2021 ISCBC Invasive Species Research Conference*. Virtual.

2021* **Beshai, R.A.**, Truong, D.A., Henry, A.K., & Sorte, C.J.B. Invasional meltdown in southern California marine communities: could greater community diversity facilitate invader dominance? *Ecological Society of America*. Virtual.

2019* Woo, I., **Beshai, R.A.**, Fisher, A.C., Steed, K., Chan, W., & De La Cruz, S.W. Establishing a pre-restoration benthic invertebrate community baseline for the Tule Red Tidal Restoration Project. *14th Biennial State of the San Francisco Estuary Conference*. Oakland, CA.

2017* **Beshai R.A**., Barnes, E.E., and Murphy, S.M. The role of enemy-mediated competition in determining the fitness of a generalist herbivore. *University of Denver Undergraduate Research Symposium*. Denver, CO.

2017* **Beshai R.A**., Barnes, E.E., and Murphy, S.M. The role of enemy-mediated competition in determining the fitness of a generalist herbivore. *University of Denver Biological Sciences Research Symposium*. Denver, CO.

2016† **Beshai, R.A**., Barnes, E.E., and Murphy, S.M. The role of enemy-mediated competition in determining the fitness of a generalist herbivore. *27th Annual Meeting of the High-Country Lepidopterist's Society*. Boulder, CO.

Contributing Presenter

2026 Goodsell, C., Collings, J., **Beshai, R.A.**, Monuki, K., Diez, J., and Sorte C.J.B. Growing at a snail's pace: Integral projection models of range-expanding whelks indicate demographic drivers of population growth rates. *Western Society of Naturalists*. San Diego, CA.

2025* Magee, A.N.‡, Mazon, R.M.M.‡, Djan., K.Y‡, **Beshai, R.A.,** & Sorte, C.J.B. Predicting the effects of range-shifting species: adapting impact assessments for a changing ocean. *Southern California Academy of Sciences (SCAS) Annual Meeting*. San Marcos, CA.

2024* Ramsey, S.M. ‡, **Beshai, R.A.,** & Sorte, C.J.B. The potential for coexistence between the range-expanding dark unicorn whelk and a native southern California whelk species. *SCAS Annual Meeting*. Orange, CA.

2024* Suen, K.J. ‡, **Beshai, R.A.,** & Sorte, C.J.B. Evaluating whether mussels provide a refuge for prey of a range-shifting predator in southern California. *SCAS Annual Meeting*. Orange, CA.

2023* Sherzai, S.‡, **Beshai, R.A.**, & Sorte, C.J.B. (2023) Assessing the impacts of a range-shifting whelk, *Mexacanthina lugubris*, on its prey species across native and expanded ranges. *SCAS Annual Meeting*. Santa Barbara, CA.

Teaching and Undergraduate Mentorship

Teaching

2025 E120: Marine Biology, *Teaching Assistant*

2023, 2022 (2x), 2021	BIO186L: Population & Community Ecology Lab, *Teaching Assistant*
2021	BIO94: Organisms to Ecosystems, *Teaching Assistant*
2021	BIO93: DNA to Organisms, *Teaching Assistant*
2020	BIO97: Genetics, *Teaching Assistant*

Undergraduate Mentorship (and Mentee Awards)

†UCI Undergrad Research Opportunities funding, *Summer Undergraduate Research funding, #Undergraduate Excellence in Research Award

2024-Present	Rizelle Mazon†	2023-2024	Kyle Suen†#
2024-Present	Kelsey Djan†	2023	Jonathan Reyes
2024-Present	Alexa Magee†*	2023	James Sungmin Kim
2023-2024	Edward Nguyen	2022-2023	Safa Sherzai†*
2023-2024	Soffia Ramsay†		

Skills, Certifications, and Coursework

Technical/Analytical

R & R Studio Programming
JMP Statistical Software
RTK Surveying & Data Processing
SQL Database Querying
ESRI ArcGIS & QGIS
Water Quality Monitoring

Field and Laboratory

Intertidal Invertebrate Identification
Intertidal Algal Identification
Macroinvertebrate Identification
Research Permit Application and Management
Stable Isotope Sample Preparation
Chlorophyll Extraction
Fluorescence Microscopy

Certifications

DOI Motorboat Operator Certified (via USGS)
Field Safety: Sexual Harassment (via UCI)
Excellence in Mentorship (via UCI)
First Aid and CPR Certification (via Red Cross)
Open Water Diver Certification (via PADI)

Relevant Coursework

Graduate*:* Quantitative Methods, Advanced Research Methods, Graduate Writing, General Ecology, Plant Physiological Ecology, General Evolution, Ecology & Evolutionary Bio Teaching Methods (3x)

Undergraduate: Marine Invertebrate Ecology/Biology, Global Change Biology, Geographic Information Systems, Geographic Information Analysis, Biostatistics

Service, Volunteering, Press and Outreach

2024-Present	*Volunteer*: Beach Cleanups (various, across Orange County)
2024	*Presenter*: Range-Shifts and Grad School FAQ for American Fisheries Society UCI
2024	*Presenter*: Earth Day Awareness Booth for Climate Change and Coastal Ecosystems
2023	*Graduate Mentor*: UCI Noyce Transfer-to-Teaching Program
2023	*Interviewee*: *Office Hours* with Newton Hood (KUCI 88.9 FM)
2021	*Peer Reviewer*: *NeoBiota* Journal Articles
2021	*Volunteer*: Monthly Marine Life Inventories at Newport Back Bay Science Center
2020-Present	UCI Ecology & Evolutionary Biology departmental services, including: organizing graduate recruitment and other graduate events, assisting with graduate program reorganization, facilitating rooftop receptions

References

Available upon request