Philip T. **Patton**

Ph.D. Candidate in Marine Biology, NOAA QUEST Fellow

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Education

Ph.D. Marine Biology — *Kāneʻohe, Hawaiʻi*

Hawaiʻi Institute of Marine Biology at the University of Hawaiʻi, Mānoa — *Aug 2021 - May 2025*

- Chair: Lars Bejder

M.S. Fisheries, Wildlife, and Conservation Biology — *Raleigh, NC, USA*

North Carolina State University — *Aug 2014 - Dec 2016*

- Chair: Krishna Pacifici
- Minor in Statistics

B.S. Conservation Biology — *Syracuse, NY, USA*

SUNY College of Environmental Science and Forestry — *Jan 2011 - May 2013*

- Minor in Applied Statistics

Research Experience

Marine Mammal Research Program, Hawaiʻi Institute of Marine Biology — *Kāneʻohe, Hawaiʻi*

Graduate Research Assistant — *Aug 2021 - May 2025*

- Integrated spatial data, e.g., telemetry and GPS tracks, with spatial capture-recapture data to estimate dolphin density
- Supported colleagues and lab members by writing scripts for processing data and running analyses

Pacific Islands Fisheries Science Center, NOAA Fisheries — *Honolulu, Hawaiʻi*

Quantitative Ecology and Socioeconomic Training (QUEST) Fellow — *Aug 2021 - May 2025*

- Developed quantitative tools for improving population assessments of island-associated dolphins in Hawaiʻi
- Found optimal strategy, via simulation, for generating capture-histories with identification algorithms by jointly minimizing estimation error and labor effort

Quantitative Ecology Lab, University of Washington — *Seattle, WA, USA*

Graduate Research Assistant — *Jan 2017 - Sep 2017*

- Explored the effect of misspecifying animal movement models in spatial capture-recapture via a simulation study

Quantitative Ecology Lab, North Carolina State University — *Raleigh, NC, USA*

Graduate Research Assistant — *Aug 2014 - Dec 2016*

- Designed and executed multi-year detection/non-detection survey of the Puerto Rican bird community
- Estimated community-level occurrence across different land-uses with Bayesian hierarchical occupancy models
- Estimated co–occurrence and tested interaction hypotheses between an invasive brood parasite and a community of hosts

Professional Experience

Health Services, Deschutes County — *Bend, OR, USA*

Data Analyst — *Oct 2020 - May 2021*

- Coordinated with physicians and therapists to wrangle and visualize behavioral health data for vulnerable rural youth

Supply Chain AI & Machine Learning, Starbucks Coffee Company — *Seattle, WA, USA*

Data Analyst — *Dec 2018 - Jul 2019*

- Suggested and tested improvements of a forecasting, optimization, and inventory estimation algorithm that automatically restocked 34 stores.
- Integrated novel data and processes to improve inventory estimation using Bayesian particle filter in Python

Seattle City Light, City of Seattle — *Seattle, WA, USA*

Quantitative Analyst — *Dec 2017 - Dec 2018*

- Estimated influence of income on electricity usage with regularized hierarchical regression, identifying customers for policy intervention

Publications

Brijs, J., Moore, C., Schakmann, M., Souza, T., Grellman, K., Tran, L.L., **Patton, P.T.**, and Johansen, J.L. (2025) Eat more, often: The capacity of piscivores to meet increased energy demands in warming oceans. *Science of the Total Environment*, 973, 179105.

Patton, P. T., Pacifici, K., Baird, R. W., Oleson, E. M., Allen, J. B., Ashe, E., Athayde, A., Basran, C. J., Cabrera, E., Calambokidis, J., Cardoso, J., Carroll, E. L., Cesario, A., Cheney, B. J., Cheeseman, T., Corsi, E., Currie, J. J., Durban, J. W., Falcone, E. A., …Bejder, L. (2025). Optimizing automated photo identification for population assessments. *Conservation Biology*, e14436

Patton, P. T., Cheeseman, T., Abe, K., Yamaguchi, T., Reade, W., Southerland, K., Howard, A., Oleson, E. M., Allen, J. B., Ashe, E., Athayde, A., Baird, R. W., Basran, C., Cabrera, E., Calambokidis, J., Cardoso, J., Carroll, E. L., Cesario, A., Cheney, B. J. …Bejder, L. (2023). A deep learning approach to photo-identification demonstrates high performance on two dozen cetacean species. *Methods in Ecology and Evolution*, 14, 2611–2625. *Featured on cover*

Vivier, F., Wells, R.S., Hill, M.C., Yano, K.M., Bradford, A.L., Leunissen, E.M., Pacini, A., Booth, C.G., Rocho-Levine, J., Currie J.J., **Patton, P.T.**, & Bejder, L. (2023) Quantifying the age-structure of free-ranging delphinid populations: testing the accuracy of Unoccupied Aerial System-photogrammetry. *Ecology and Evolution,* 13, e10082.

Patton, P. T., Pacifici, K., & Collazo, J. A. (2022). Modeling and estimating co-occurrence between the invasive Shiny Cowbird and its Puerto Rican hosts. *Biological Invasions*, 24, 2951-2960

Presentations

Patton, P.T., et al. Evaluating trade-offs between automation and bias in population assessments relying on photo-identification. Paper presented, at the Biennial Conference on the Biology of Marine Mammals in Perth, Australia. November 2024.

Patton, P.T., et al. Evaluating trade-offs between automation and bias in population assessments relying on photo-identification. Poster presented at the International Statistical Ecology Conference. Swansea, Wales. July 2024. ***Best Student Poster: 2nd Place***

Patton, P.T. Some hierarchical and machine learning models for wildlife science. Invited talk at University of Natural Resources and Life Sciences (BOKU), Vienna, Austria. July 2023.

Patton, P.T., et al. The effect of fully automated photo-identification on mark-recapture estimates. Paper presented at the EURING Analytical Meeting. Montpellier, France. April 2023

Patton, P.T. Assessing populations of resident cetaceans. HIMB Scholarship Symposium. Kāneʻohe, Hawaiʻi. April 2022.

Patton, P. T. & Gardner, B. Misspecifying movement models in spatial capture recapture studies. Paper presented at The Ecological Society of America Conference. Portland, OR, USA. August 2017

Patton, P. T., Pacifici, K., & Collazo, J. A. Modeling and estimating co-occurrence between generalist brood parasites and host communities. Paper presented at the EURING Analytical Meeting. Barcelona, Spain. June 2017

Patton, P. T., Pacifici, K., & Collazo, J. A. Multi-species occupancy models that incorporate false positive and false negative sampling errors. Paper presented at The Wildlife Society Conference. Raleigh, NC, USA. October 2016

Patton, P. T., Pacifici, K., & Collazo, J. A. Joint host-parasite occurrence models can improve predictions and reveal ecological traps. Paper presented at the International Statistical Ecology Conference. Seattle, WA, USA. July 2016

Grants, Awards, & Fellowships

2025	**Peter Castro Graduate Student Research Fund,** Hawaiʻi Institute of Marine Biology	*$1,100*
2025	**Colonel Willys E. & Sandina L. Lord Endowed Scholarship,** Hawaiʻi Institute of Marine Biology	*$500*
2024	**Best Student Poster: 2nd Place,** International Statistical Ecology Conference	*$50*
2023	**Peter Castro Graduate Student Support Fund for Travel,** Hawaiʻi Institute of Marine Biology	*$500*
2023	**Linda and Jim Collister Scholarship,** Hawaiʻi Institute of Marine Biology	*$1,000*
2023	**Achievement Scholarship,** Marine Biology Graduate Program	*$500*
2022	**Colonel Willys E. & Sandina L. Lord Endowed Scholarship,** Hawaiʻi Institute of Marine Biology	*$2,000*
2021	**Quantitative Ecology and Socioeconomic Training Fellowship,** NOAA Fisheries	*$160,000*
2017	**Student Travel Award,** Graduate School Fund for Excellence and Innovation, University of Washington	*$500*
2017	**Student and Postdoc Travel Award,** Environmental and Forest Sciences, University of Washington	*$750*
2017	**Travel Award,** Quantitative Ecology and Resource Management Program, University of Washington	*$500*
2015	**Global Change Fellowship,** US Geological Survey	*$12,000*
2012	**Tutor of the Semester,** Academic Support Services, SUNY College of Environmental Science and Forestry	

Skills

General	Python, R, Git, LaTeX, C++
ML	PyTorch, scikit-learn, timm, HuggingFace, TensorFlow, ultralytics, PyTorchLightning
Spatial	GeoPandas, rasterio, xarray, terra, sf, QGIS
Stats	PyMC, BUGS/JAGS, Stan, secr, statsmodels, lme4, unmarked, mgcv, NIMBLE
Visual	Matplotlib, Seaborn, ggplot2, Tableau