

Michiel Pillet

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Summary

Conservation ecologist and Ph.D. candidate (ABD) at the University of Arizona, specializing in climate change impacts on biodiversity, with a focus on cacti. My interdisciplinary research integrates ecological theory, species distribution modeling, and quantitative methods to inform conservation planning and policy. I've published extensively, including first-author work in *Nature Plants*, and collaborate widely through the IUCN, Conservation International, and USFWS. My academic experience spans research, teaching, and mentorship, supported by strong public engagement and science communication. I bring a data-driven, collaborative, and applied approach to biodiversity research.

Education

- **University of Arizona** Tucson, AZ
Ph.D. candidate in Ecology and Evolutionary Biology (ABD) 2016 - 2025
- **Montana State University** Bozeman, MT
BSc Biology (highest honors; GPA: 4.0 upper division/graduate coursework) 2008 - 2014

Certificates

- **IUCN CPSG Ex Situ Conservation Assessment Training** ConservationTraining.org
Certificate of Achievement 2023
- **IUCN Red List Assessor Training** ConservationTraining.org
Certificate of Achievement 2023
- **Key Biodiversity Areas Advanced Practitioner** ConservationTraining.org
Certificate of Completion with Distinction 2023
- **Planning for Conservation: Using the Conservation Standards** ConservationTraining.org
Certificate of Completion 2023
- **Johns Hopkins University** Coursera
Data Science Specialization (with honors) 2015

Skills

- **Ecology and evolution:** ecosystem & climate modeling, population, community & landscape ecology, taxonomy, physiological ecology, conservation genetics, conservation ecology, conservation planning, trait ecology, phylogenetic comparative methods
- **Statistics:** theoretical and practical experience in topics ranging from spatial statistics to machine learning and Bayesian methods
- **Programming and IT:** R, Python, Matlab, Java/C++, web development, databases (SQL/XML), Git, Linux, high-performance computing

- **Field techniques:** species identification and surveys, experience with common technology (e.g. GPS)
- **Design:** Adobe InDesign
- **Wide knowledge of supporting sciences:** GIS (R/ArcGIS/QGIS), biogeochemistry, physics, soil science, hydrology, remote sensing, physiology
- **Mathematics:** strong background in numerical analysis, dynamical systems, traditional calculus, algorithms, with an emphasis on the use of mathematical models in ecology
- **Languages:** English, Dutch, French, Spanish

Work experience

Program Officer for the IUCN SSC Cactus and Succulent Plants Specialist Group . . . 2023-2025
 Researcher in the Department of Research, Conservation and Collections 2023-2025
 Desert Botanical Garden, Phoenix, AZ
 Field instructor for the Science Research Initiative at University of Utah 2023
 Owner of Prickly Prospects Cactus Nursery (ex-situ conservation nursery) 2021-
 Instructor at University of Arizona 2020-2023
 Nursery worker at Arid Lands Greenhouses 2019-2021
 Researcher in Enquist Lab at University of Arizona 2017-2025
 Researcher in Evans Lab at University of Arizona 2016-2018
 Research scientist in Poulter Ecosystem Dynamics Lab at Montana State University . . 2015-2016
 Research scientist in Hansen Landscape Biodiversity Lab at Montana State University . . . 2014
 University & private tutor in sciences 2012-
 Researcher and crew chief at Museum of the Rockies Paleontology Department 2008-2014

Volunteer experience

Conservation Committee Chair for the Tucson Cactus and Succulent Society, Tucson, AZ . 2024-
 Member of the IUCN Climate Crisis Commission 2024-
 Member of the IUCN SSC Succulent Plant Illegal Trade Task Force 2024-
 Cactus and Succulent Society of America Affiliate Representative 2024-
 for the Tucson Cactus and Succulent Society, Tucson, AZ
 Conservation Committee Member of Cactus and Succulent Society of America 2023-
 Member of the IUCN SSC Cactus and Succulent Plants Specialist Group 2022-
 Workshop assistant for Software Carpentry 2016
 Volunteer for Red Cross Disaster Action Team 2015-2016
 Volunteer greenhouse manager for succulent plants at Montana State Univ. 2014

Workshops

- **Planning Workshop for the Integrated Conservation of the Genus Copiapoa** Zoom
Participant and coauthor for species assessments 2022-2023

- **Integral Projection Modeling Workshop** Barcelona, Spain
Participant 2016
- **State-and-Transition Modeling Workshop** Fort Collins, CO
Participant 2014

Awards, Grants & Honors

San Antonio Cactus and Xerophyte Society Legacy Project Award (conservation award)	2024
William A. Calder III Memorial Scholarship (Ph.D.)	2023
College of Science Galileo Circle Scholarship (Ph.D.)	2023
Faculty Opinions - top 20 influential conservation papers of 2022	2023
College of Science Galileo Circle Scholarship (Ph.D.)	2022
William A. Calder III Memorial Scholarship (Ph.D.)	2022
NSF Graduate Research Fellowship (NSF GRFP; Ph.D.)	2017-2022
Graduate Access Fellowship (Ph.D.)	2016-2017
GPSC Travel Grant (Ph.D.)	2016
Presidential Scholarship (BSc)	2008-2014
Undergraduate Scholars Program (BSc)	2009-2010
Dean's & President's List (BSc): 6 times	2008-2014

Publications and reviews

- Pillet, M., et al., in prep. **Evolutionary relatedness fails to predict range size changes for cacti under climate change.**
- Mendoza, E., et al., in prep. **The decline of our icon: genomic vulnerability of saguaro cactus (*Carnegiea gigantea*) under different climate change scenarios.**
- Reichenbacher, F. and Pillet, M., in prep. **Tumamoc Globeberry Surveys - 2024.** Report for *USDI Fish and Wildlife Service, Arizona Ecological Services.*
- Andrade, P., et al., in prep. **Saguaro Initiatives at Desert Botanical Garden: generating tools and resources to save threatened cactus species.**
- Pillet, M., et al., in review. **Accounting for severe droughts increases the extinction risk for cacti.** Submitted to *Nature*.
- Enquist, M., et al., in review. **BIEN: A biodiversity informatics ecosystem advancing open and reproducible workflows for plant observation, plot, and trait data.** Submitted to *Methods in Ecology and Evolution*.
- Goettsch, B., et al., 2025. **Plan de Acción para la Conservación Integrada del Género *Copiapoa*.** Chile. 66 pp.
https://iucn-cssg.org/assets/copiapoa/copiapoa_action_plan_en.pdf.
- Villalobo-Lopez, A., Pena, C., Varas-Myrik, A., Pillet, M., Jahnsen, P., Pliscoff, P., Goettsch, B., Guerrero, P., 2024. **Effects of trade and poaching pressure on extinction risk for cacti in the Atacama Desert.** *Conservation Biology*. <https://doi.org/10.1111/cobi.14353>.
- Pillet, M., 2024. **Het behoud van cactussen in een veranderende wereld - wat kunnen we doen?** *Succulenta*. 103(1), 13-17.

- Davis, T. and Pillet, M., 2023. **Don't tell me, show me: the importance of maintaining data in cultivated plants.** *Cactus and Succulent Journal*. <https://doi.org/10.2985/015.095.0313>.
- Villalobo, A., Pena, C., Varas-Myrik, Goettsch, B., Pillet, M., Jahnsen, P., Pliscoff, P., Guerrero, P., 2023. **Impulsores antropogenicos y abioticos del aumento del riesgo de extinción de *Copiapoa* (Cactaceae).** *Master's thesis, Universidad de Concepción, Chile*.
- Pillet, M., 2023. **Prickly prospects for cacti under climate change.** *TheScienceBreaker*. <https://doi.org/10.25250/thescbr.brk715>.
- Pillet, M., 2022. **Prickly prospects for cacti under climate change.** *British Cactus and Succulent Society December 2022 eNews*.
- Pillet, M., Goettsch, B., Merow, C., Maitner, B., Feng, X., Roehrdanz, P., Enquist, B., 2022. **Elevated extinction risk of cacti under climate change.** *Nature Plants*. <https://doi.org/10.1038/s41477-022-01130-0>.
- Feng, X., et al., 2022. **A review of the heterogeneous landscape of biodiversity databases: opportunities and challenges for a synthesized biodiversity knowledge base.** *Global Ecology and Biogeography*. <https://doi.org/10.1111/geb.13497>.
- Schultz, E., Hulsmann, L., Pillet, M., Hartig, F., Breshears, D., Record, S., Shaw, J., DeRose, J., Zuidema, P., Evans, M., 2021. **Climate-driven, but dynamic and complex? A reconciliation of competing hypotheses for species' distributions.** *Ecology Letters*. <https://doi.org/10.1111/ele.13902>.
- Enquist, B., et al., 2019. **The commonness of rarity: Global and future distribution of rarity across land plants.** *Science Advances*. <https://doi.org/doi:10.1126/sciadv.aaz0414>.
- Pillet, M., Joetzjer, E., Belmin, C., Chave, J., Ciais, P., Dourdain, A., Evans, M., Herault, B., Luyssaert, S., Poulter, B., 2018. **Disentangling competitive versus climatic effects on tropical forest mortality.** *Journal of Ecology*. <https://doi.org/10.1111/1365-2745.12876>.
- Joetzjer, E., Pillet, M., Ciais, P., Barbier, N., Chave, J., Schlund, M., Maignan, F., Barichivich, J., Luyssaert, S., Herault, B., von Poncet, F., Poulter, B., 2017. **Assimilating satellite-based canopy height within an ecosystem model to derive above ground forest biomass.** *Geophysical Research Letters*. <https://doi.org/10.1002/2017GL074150>.
- Hansen, A., Ireland, K., Legg, K., Keane, R., Barge, E., Jenkins, M., Pillet, M., 2016. **Complex challenges of maintaining whitebark pine in Greater Yellowstone under climate change: A call for innovative research, management, and policy approaches.** *Forests*. <https://doi.org/10.3390/f7030054>.
- **Reviewer for:** Acta Botanica Brasilica, American Journal of Botany, Journal of Arid Environments, Journal of Biogeography, Plant Ecology, PLOS ONE

Abstracts and posters

- Mendoza Galindo, E., et al. **Genomic vulnerability of the Saguaro cactus under climate change.** Abstract at *Botany 2025*.

- Foncerrada-Elizondo, P., et al. **Genomic insights into the evolutionary history and population structure of the Saguaro cactus across its natural range.** Abstract at *Botany 2025*.
- Enquist, B., et al. **The commonness of rarity: Global and future distribution of rarity across land plants.** Abstract at *Ecological Society of America 2020 Annual Meeting*.
- Enquist, B., Merow, C., Hannah, L., et al. **Forecasting future global biodiversity: Predicting current and future global plant distributions, community structure, and ecosystem function.** Abstract at *American Geophysical Union 2019 Fall Meeting*.
- Schultz, E., Huelsmann, L., Pillet, M., Breshears, D., Zuidema, P., Hartig, F., DeRose, J., Shaw, J., Evans, M. **Demographic range modeling reveals that climate and competition are insufficient to explain a species distribution.** Abstract at *Ecological Society of America 2019 Annual Meeting*.
- Evans, M., Huelsmann, L., Pillet, M., Breshears, D., Hartig, F., Record, S., Shaw, J., Zuidema, P., DeRose, J., 2018. **A demographic perspective on the ecological niche and the geographic distribution: a range-wide analysis of climate and competition as factors limiting vital rates of *Pinus edulis*.** Abstract at *MtnClim 2018*.
- Pillet, M., DeRose, J., Record, S., Shaw, J., Evans, M., 2018. **Demographic range modeling reveals that climate is insufficient to explain species distributions.** Abstract at *Ecological Society of America 2018 Annual Meeting*.
- Poulter, B., Pederson, N., Ciais, P., Pillet, M., Joetzjer, E., Calle, L., Luyssaert, S., 2017. **Implementing forest age- and size-structured dynamics within Earth system models.** Abstract at *Ecological Society of America 2017 Annual Meeting*.
- Evans, M., DeRose, J., Arizpe, A., Aragon, J., Grey, A., Pillet, M., Shaw, J., Klesse, S., Dietze, M., 2017. **Assimilation of FIA tree-ring and remeasurement data to quantify multiple influences on tree growth - an analysis of *Pinus ponderosa* in northern Arizona.** Abstract at *2017 FIA Stakeholder Science Meeting*.
- Evans, M., DeRose, J., Arizpe, A., Aragon, J., Grey, A., Pillet, M., Shaw, J., Klesse, S., Dietze, M., 2017. **Assimilation of tree-ring and forest inventory data to understand the influences of climate, tree size, and stand density on tree growth - a regional analysis of *Pinus ponderosa* in northern Arizona.** Abstract at *Ecological Society of America 2017 Annual Meeting*.
- Poulter, B., Ballantyne, A., Bastos, A., Calle, L., Chatterjee, A., Canadell, P., Ciais, P., Frank, D., Ott, L., Pillet, M., Sitch, S., 2017. **Enabling teleconnection-based seasonal forecasts of global terrestrial carbon cycle dynamics.** Poster at *10th International Carbon Dioxide Conference*.
- Poulter, B., Ciais, P., Joetzjer, E., Luyssaert, S., Maignan, F., Pillet, M., 2015. **Reducing uncertainty for estimating forest carbon stocks and dynamics using integrated remote sensing, forest inventory and process-based modeling.** Poster at *American Geophysical Union 2015 Fall Meeting*.

- **Combating the illegal trade in cacti and succulents through stakeholder participation.** Presented for *IrisBG Coffee Chat*, July 2025.
- **Conservation through propagation.** Presented for *Central Arizona Cactus and Succulent Society Propagation Education Group*, November 2024.
- **Combating the illegal trade in cacti and succulents through stakeholder participation.** Presented for *IrisBG Coffee Chat*, November 2024.
- **The illegal trade in cacti from the Americas.** Presented for *A guide to monitoring the illegal plant trade on eBay*, September 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *Gates Cactus and Succulent Society*, July 2024.
- **Learning from cacti: a field course through southern Utah and northern Arizona.** Presented for *San Francisco Succulent and Cactus Society*, May 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *Monterey Bay Area Cactus and Succulent Society*, May 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *San Diego Cactus and Succulent Society*, April 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *Michigan Cactus and Succulent Society*, March 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *Austin Cactus and Xerophyte Society*, January 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *Fort Worth Cactus and Succulent Society*, January 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *San Antonio Cactus and Xerophyte Society*, January 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *Central Texas Cactus and Succulent Society*, January 2024.
- **Common-sense cactus conservation in the 21st century.** Presented for *Desert Garden Club*, January 2024.
- **Climate Change Conversations: Common Sense Cactus Conservation in the 21st Century.** Presented for *Tucson Botanical Gardens*, December 2023.
- **Prickly Prospects for Cacti in the 21st Century.** Presented for *The University of Arizona Galileo Circle Scholars Celebration*, October 2023.
- **Assessing Climate Change Impacts on Cacti: Challenges and Opportunities.** Presented for *U.S. Fish and Wildlife Service Southwest Region*, October 2023.
- **Assessing Climate Change Impacts on Cacti: Challenges and Opportunities.** Presented for *The Huntington Library, Art Museum, and Botanical Gardens*, September 2023.
- **Common-sense cactus conservation in the 21st century.** Presented for *Maricopa County Master Naturalists*, August 2023.

- **Common-sense cactus conservation in the 21st century.** Presented for *Tucson Cactus and Succulent Society*, July 2023.
- **Common-sense cactus conservation in the 21st century.** Presented for *Central Arizona Cactus and Succulent Society*, June 2023.
- **Common-sense cactus conservation in the 21st century.** Presented for *Cactus and Succulent Society of America*, May 2023.
- **Elevated extinction risk of cacti under climate change.** Presented for *International Cactaceae Academic Network*, September 2022.
- **Species distribution models for *Copiapoa* spp. under climate change.** Presented for *Planning Workshop for the Integrated Conservation of the Genus *Copiapoa**, August 2022.
- **Planning for Uncertainty: Conserving Cacti in a World of Change.** Presented for *Tucson Cactus and Succulent Society*, August 2022.
- **Prickly prospects for cacti under climate change.** Presented for *Arizona Senior Academy*, August 2022.
- **Elevated extinction risk of cacti under climate change.** Interviewed for various media outlets, including *The New York Times*, *CBS*, *ABC*, *NBC*, *Swedish Television*, *TRT World*, *Yale Climate Connections*, April 2022-.
- **Prickly prospects for cacti under climate change: An analysis of uncertainty in range forecasts.** Presented for *Ecological Society of America Annual Meeting*, August 2020.
- **Sowing Cacti: where Art and Science meet.** Presented for *Tucson Cactus and Succulent Society*, June 2018.
- **Prickly prospects for cacti under climate change.** Presented for *Tucson Chapter of Arizona Native Plant Society*, May 2018.
- **Prickly prospects for cacti under climate change.** Presented for *Tucson Cactus and Succulent Society*, May 2017.

References

- **Dr. Brian Enquist**, University of Arizona and Santa Fe Institute: benquist@arizona.edu
- **Dr. Lucas Majure**, IUCN SSC Cactus and Succulent Plants Specialist Group and University of Florida: lmajure@floridamuseum.ufl.edu
- **Dr. Barbara Goettsch**, IUCN SSC Cactus and Succulent Plants Specialist Group: cssg.barbara@gmail.com
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