

Hyun Seok Yoon

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Education

University of Tennessee, Knoxville Knoxville, TN
Ph.D. in Ecology and Evolutionary Biology 05/2024
GPA: 3.89 — Committee: Paul Armsworth (Advisor), Louis Gross, Mona Papes, Charles Sims, Henriette Jager

Cornell University Ithaca, NY
Bachelor of Science in Biology, Minor in Natural Resources 05/2017
Magna cum laude — GPA: 3.82 — Dean's List — Advisor: Irby Lovette

Professional Appointment

Postdoctoral

IGCB Postdoctoral Fellow at the University of Michigan

Advisor: Kai Zhu, Neil Carter, Thiago Souza

2026 - current

Developing a spatiotemporal conservation decision-making tool under future climate change uncertainty using deep reinforcement learning and finance theory.

Instructor

Instructor of Record for Conservation Decision-making (EEB 423) and Landscape Ecology (EEB 422) at the University of Tennessee Knoxville

Employer: Jennifer Schweitzer

2026 Jan - May

Postdoctoral

Postdoctoral Researcher at the USGS Cooperative Unit in New Mexico State University

PI: Charles Yackulic, Kasey Pregler

2024 - 2025

Implementing structured decision-making for the conservation of Rio Grande Silvery Minnow with AI modeling.

Publications

Peer-Reviewed Journal Articles

- Hyman, A. A., Yoon, H. S., Barve, N., Jantz, S. M., Cho, S., Armsworth, P. R. (2026). Time horizons over which conservation outcomes will be evaluated influence today's land protection priorities. (in review at *Environmental Conservation*).
- Jager, H., Yoon, H. S. (2025). Data centers: an emerging threat to U.S. freshwater biodiversity. *Water Biology and Security*. Featured in media: *Fly Fisherman*, *Coastwatch*, *Anadolu Agency* (Turkish national news agency)
- Hallinger, K., Pegan, T. M., Andersen, M. J., Ardia, D. R., Belmaker, A., Chang van Oordt, D., Ferretti, V., Forsman, A. M., Gaul, J. R., Llambias, P. E., Orzechowski, S. C.,

Shipley, J. R., Stager, M., Taff, C. C., Uehling, J. J., Verhoeven, M. A., Vitousek, M. N., Wilson, M., Yoon, H. S., Wrege, P. H., Winkler, D. W. (2025). Comparing tree swallow dispersal strategies in a continuous mainland environment. *Ecology*.

- Yoon, H. S., Mingie, J., Cho, S., Barve, N., Armsworth, P. R. (2025). Land market feedback from land acquisition influences the prioritization of protected area networks in the Southeastern United States. *Ambio*.
- Armsworth, P. R., Fovargue, R., Hyman, A., Iacona, G., Sims, C., Yoon, H. S. (2025). Strategically timing land protection decisions to enhance biodiversity benefits. *Conservation Biology*.
- Yoon, H. S., Armsworth, P. R. (2025). The role of wealth inequality in community management of common-pool resources through voluntary sanctioning. *Natural Resource Modeling*.
- Yoon, H. S., Corsi, F., Miara, A., Welch, J., Jager, H. (2024). Climate-driven shifts in freshwater biodiversity will impact mitigation costs for hydropower. *The Science of the Total Environment*, 954(1). [management use]: cited in drafting the 2025 Tennessee State Wildlife Action Plan
- Jager, H., Manning, K., Welch, J. N., Corsi, F., Miara, A., Yoon, H. S., McManamay, R. A., Kao, S., Kusnierz, P. C., Gangrade, S. (2024). Indicators of thermal alteration in US waters reveal patterns of climate risk at the energy-water nexus. *Ecological Indicators*, 159, 111755.
- Yoon, H. S., Vijay, V., Armsworth, P. R. (2022). Accounting for spatial heterogeneity in the added conservation value of land protection when prioritizing protected areas. *Conservation Biology*, 36(5).
- Yoon, H. S., & Armsworth, P. R. (2022). Timing land protection to exploit favorable market conditions. *Biological Conservation*, 270.
- Gibson, N. L., Green, E. A., Herrera, R. G. A., Love, S. J., Turner, S. C., Weatherton, M., Faidiga, A. S., Luo, A. R., Ngho, M. L., Shershen, E., Yoon, H. S., Blum, M. J. (2021). Toward an ecology of disasters: a primer for the pursuit of ecological research on disasters. *Ecology and Society*, 26(4).
- Winkler, D. W., Hallinger, K. K., Pegan, T. M., Taff, C. C., Verhoeven, M. A., Chang van Oordt, D., Stager, M., Uehling, J. J., Vitousek, M. N., Andersen, M. J., Ardia, D. R., Belmaker, A., Ferretti, V., Forsman, A. M., Gaul, J. R., Llambias, P. E., Orzechowski, S. C., Shipley, J. R., Wilson, M., Yoon, H. S. (2020). Full lifetime perspectives on the costs and benefits of lay-date variation in tree swallows. *Ecology*, 101(9).
- Getz, W. M., Salter, R., Muellerklein, O., Yoon, H. S., Tallam, K. (2018). Modeling epidemics: A primer and Numerus Model Builder implementation. *Epidemics*, 25, 9-19.

In review

- Jager, H., Yoon, H. S. (2026). Where Are Fisheries Threatened by Data Centers? (in review at *Fisheries*).
- Yoon, H. S., Yackulic, C. B., Lawson, A. J., Wagnon, C. (2026). Bridging Ecological Inference and Decision Optimization for Conservation Using Artificial Intelligence. *BioRxiv*. (submitted to *Nature Ecology and Evolution*)

- Yoon, H. S., Yackulic, C. B., Archdeacon, T. P. (2026). Near-optimal species management under uncertainty using noisy ecological data and deep reinforcement learning (submitted to *Journal of Applied Ecology*)

Other Publications

- Bonilla, G., Conduff, L., Gibson, N., Love, S. J., Rogers, A., Walton, J., Yoon, H. S., & Armsworth, P. R. (2021). Associations between social vulnerability and environmental quality in the southeastern United States. White paper published in *Southeast Climate Adaptation Center*.
- Carlson, C. J., Muellerklein, O. C., Phillips, A. J., Burgio, K. R., Castaldo, G., Cizauskas, C. A., Cumming, G., Dallas, T. A., Doi, J., Miao, Z., Proctor, H., Yoon, H. S., & Getz, W. M. (2017). The Parasite Extinction Assessment & Red List: An open-source, online biodiversity database for neglected symbionts. *BioRxiv*, 192351.
- Yoon, H. S. (2011). Boy asks for the path on a tideland - essay on the perspective of a youth on Saemangeum tideland conservation movement against the land reclamation project. Ddein-dol. (Korean Publication)

Grants and Fellowships

- Institute for Global Change Biology (IGCB) Fellowship, University of Michigan (Oct 2025); \$161,493
- Graduate Advancement & Training Education (GATE) Fellowship, University of Tennessee–Oak Ridge Innovation Institute (May 2022); Fall 2022–Spring 2024. Tuition, health insurance, and stipend (\$60,000). Awarded for a research proposal subsequently published as Yoon et al. (2024) in *STOTEN*.
- Graduate Student Research Award, U.S. Department of the Interior Southeast Climate Adaptation Science Center (Jan 2022); \$1,500.
- Graduate Research Assistantship, Oak Ridge National Laboratory (Jan 2022); tuition and stipend, Spring 2022.
- Departmental Research Grant, Department of Ecology and Evolutionary Biology, University of Tennessee (May 2021); \$2,447.
- Graduate Student Senate Travel Award, University of Tennessee (Apr 2021); \$960.
- Graduate Student Senate Travel Award, University of Tennessee (Aug 2020); \$750.

Awards

- Outstanding Dissertation Award, Department of Ecology and Evolutionary Biology, University of Tennessee (May 2024)
- Tom Hallam Award for “Outstanding Graduate Student with Interest in Mathematical Ecology or Environmental Ecology”, Department of Ecology and Evolutionary Biology, University of Tennessee (May 2022)
- People Who Brightened the World, Korea Green Foundation (Dec 2011)
- Minister’s Award, Korea Ministry of Oceans and Fisheries (Mar 2009)

Presentations and Workshops

Contributed

- (Presentation) Yoon, H., Yackulic, C., Archdeacon, T. *Near-Optimal Species Management Under Uncertainty Using Noisy Ecological Data and Deep Reinforcement Learning*. Ecological Society of America Annual Meeting; July 2026; Salt Lake City, UT.
- (Presentation) Yoon, H., Welch, J., Miara, A., Corsi, F., Jager, H. *Shift in Freshwater Biodiversity and Its Impact on Environmental Mitigation Cost for Hydropower Plants in a Changing Climate*. Association of Southeastern Biologists; March 2024; Chattanooga, TN.
- (Presentation) Yoon, H., Vijay, V., Armsworth, P. *Spatial Heterogeneity in the Added Conservation Value from Protecting Land Influences Protected Area Priorities*. North American Congress for Conservation Biology; July 2022; Reno, NV.
- (Poster) Yoon, H., Vijay, V., Armsworth, P. *Deciding When to Acquire Land for Conservation*. North American Congress for Conservation Biology; July 2020; Remote.

Invited/Organized

- (Seminar Presentation) Yoon, H. *Investing in Nature in a Changing World*. Department of Biology, University of Michigan, Flint; October 2026; Flint, MI.
- (Conference Presentation) Yoon, H., Yackulic, C., Archdeacon, T., Lawson, A., Turner, T., Osborne, M., Wagnon, C., Pregler, K. *Using Dynamic Programming with Deep Reinforcement Learning to Inform Hatchery Supplementation Strategies for Rio Grande Silvery Minnow*. Biennial Conference, Northern Arizona University; September 2025; Flagstaff, AZ.
- (Workshop) Yoon, H., Yackulic, C., Wagnon, C., Pregler, K., Lawson, A. *Environmental Flows for Rio Grande Silvery Minnow Structured Decision Making Workshop*. July 2025. Organized and facilitated a structured decision-making workshop with ~20 stakeholders on environmental flow strategies to support conservation of the Rio Grande Silvery Minnow.
- (Seminar Presentation) Yoon, H. *Making Smarter Conservation Actions*. Department of Biological Sciences, University of Texas at El Paso; April 2025; El Paso, TX.
- (Seminar Presentation) Yoon, H. *Making Smarter Conservation Actions*. Department of Fish, Wildlife, and Conservation Ecology, New Mexico State University; November 2024; Las Cruces, NM.
- (Workshop) Yoon, H. *Ecological Niche Modeling and Maxent*. Kangwon National University; August 2023; Chuncheon, South Korea. Organized and taught a workshop on the methods and theory of ecological niche modeling and the Maxent algorithm, with a hands-on exercise running Maxent in R; about 20 attendees.
- (Seminar Presentation) Yoon, H. *Strategizing Landscape Conservation over Space and Time*. Keep It Colorado (nonprofit land trust organization); March 2023; Remote.

Teaching and Mentoring Experience

University of Michigan

- **Undergraduate Research Opportunity Program Mentor:** Mentoring five undergraduates and one master's student on research reframing the interpretability of AI decision models in conservation. Students collect simulation data, conduct analyses, and contribute to writing.
- **Research Project Advisor:** Advising an undergraduate on an independent research project quantifying exchange rates of conservation value across countries.

University of Tennessee, Knoxville

- **Instructor of Record**
 - EEB 422 Landscape Ecology (Spring 2026): 16 students; asynchronous online. Student ratings: 4.53/5 average across evaluation items.
 - EEB 423 Conservation Decision-Making (Spring 2026): 6 students; synchronous online.
- **Teaching Assistant**
 - BIOL 240 General Genetics (Spring 2022): 100 students
 - EEB 484 Conservation Biology (Fall 2021, Spring 2020): 40 students
 - BIOL 150 Introduction to Biology (Fall 2019): 100 students
- **Undergraduate Mentor,** Ecology and Evolutionary Biology Undergraduate Mentoring Program (2019–2021): mentored two students.

Cornell University

- **Teaching Assistant:** PHYS 1101 General Physics (Fall 2016): 120 students

Outreach and Service

- Refereed for *Nature Sustainability*, *Nature Communications*, *Communications Earth & Environment*, *Conservation Science and Practice*, *Conservation Biology*, *Ecological Economics*, *Environment Systems and Decisions*, *Discover Sustainability*, *IPBES Spatial Planning and Ecological Connectivity Assessment*.
- Reviewed applications for the Transaction Cost Assistance Program sponsored by the land trust organization called Keep It Colorado.
- Projected mollusk species range distributions in the state of Tennessee from Yoon et al. (2024), published in *Science of the Total Environment*, were used and referenced in drafting the 2025 Tennessee State Wildlife Action Plan.
- Developed a web-based decision tool called *Stockminnow* that aids the augmentation management decisions for the endangered Rio Grande Silvery Minnow (<https://stockminnow.onrender.com/>).

Other Research Experience

- **Oak Ridge National Lab Graduate Student Opportunity (GSO) Program**

Intern (2021)

Started research on the effect of power plants and climate change in the distribution shift of freshwater species. Gathered species occurrence data and environmental data to run species distribution modeling that would predict the distribution of freshwater fish and mussel. Also communicated with collaborators at CUNY to obtain and process the environmental data.

- **Getz Lab, University of California, Berkeley**

Research Assistant (2017)

Developed a web application that featured the Parasite Extinction Application and Red List (PEARL) research. Also created online video tutorials for Numerus Model Builder, a model building and analysis software tool for prototyping, classroom teaching, and optimization.

- **Yuseob Kim Lab, Ewha Womans University**

Research Assistant (2017 - 2019)

Worked in a theoretical population genetics lab studying the evolution of sexual reproduction in RNA viruses.

- **Winkler Lab, Cornell University**

Undergraduate Research Assistant (2013 - 2016)

Participated in a longitudinal study capturing and recording various morphological features and collected blood samples from Tree Swallows (*Tachycineta bicolor*) at an experimental field station under the supervision of Dr. David Winkler.