Christopher L. Crawford

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Summary

AAAS Science & Technology Policy Fellow and conservation scientist applying my interdisciplinary expertise in **biodiversity metrics, nature-based climate solutions, and agricultural land use change**, quantitative and technical skills in **geospatial analysis and data visualization,** and practical experience translating across disciplines and **collaborating with the business, agricultural, and environmental communities** to make durable progress across a range of environmental and sustainability challenges.

Education

Princeton University PhD in Science, Technology, & Environmental Policy *Princeton, NJ | 2016 – 2022*
School of Public and International Affairs

- Dissertation: "Agriculture in flux, biodiversity in the balance: conservation implications of agricultural expansion & abandonment."
- Adviser: David S. Wilcove, Professor of Ecology and Evolutionary Biology and Public Affairs, Princeton University
- Dean's Completion Fellowship 2022; Princeton Energy & Climate Scholar; GPA: 3.95; GRE: 169/170 verbal, 167/170 quantitative

University of Michigan BS (with distinction) in Ecology & Evolutionary Biology, Minor in Physics *Ann Arbor, MI | 2008 – 2012*

- GPA: 3.82; Phi Beta Kappa Society; University Honors for Academic Excellence: 2008-2012; James B. Angell Scholar: 2012

Research and Professional Experience

U.S. Department of Agriculture AAAS Science & Technology Policy Fellow *Washington, DC | Sept. 2023 – present*
Office of the Chief Scientist

- Leveraging my background in ecology, biodiversity, and conservation science to support agricultural science-policy at the USDA through diverse projects on climate-smart agriculture, animal agriculture sustainability, protein innovation and diversification, infectious disease risk, and accelerating agricultural innovation and advanced manufacturing to meet environmental challenges.
- Supporting pollinator research and conservation efforts across the USDA, including the development of a Pollinator Data Portal and interagency efforts to reconcile Monarch Butterfly conservation and agricultural production.

Princeton University Postdoctoral Researcher *Princeton, NJ | June 2022 – Aug. 2023*
Graduate Researcher & PhD Candidate *Sep. 2016 – May 2022*

- Developed expertise in biodiversity metrics by showing that commonly used methods for measuring biodiversity produce radically different land-use recommendations for both biodiversity protection and agricultural conversion, resulting in a peer-reviewed article informing how biodiversity is incorporated into spatial land use prioritization and planning decisions.
- Evaluated the environmental impacts of the emerging agricultural land use trend of cropland abandonment, producing quantitative assessments of the impact of cropland abandonment and recultivation on carbon storage and biodiversity by leveraging a high-resolution land cover time series alongside biodiversity and carbon accumulation datasets.
- Developed R and shell scripts to process hundreds of millions of pixels of data on Princeton's computing clusters and quantify the persistence of cropland abandonment through time, producing a high-impact peer-reviewed article illuminating the potential for abandonment to help meet carbon and biodiversity goals.
- Combined high-resolution land cover data with distribution and habitat data for over 2,000 bird and mammal species to produce the first detailed analysis of how cropland abandonment, secondary succession, and recultivation affect the amount of habitat available for individual mammal and bird species through time.
- Conducted ecological field research to investigate methods to increase the sustainability of livestock grazing in Kenya's savanna ecosystems, producing one of the first quantifications of the behavioral and environmental consequences of rotational grazing.
- Served as an Assistant in Instruction (TA) for two semesters of SPI/ENV 350 – The Environment: Science and Policy (2019, 2020), leading three weekly discussion sections on environmental policy issues including natural resource management, biodiversity, wildlife trade, climate change, and ecosystem services, contributing to lesson planning, and grading student papers and exams.

Sustainable Conservation Project Manager *San Francisco, CA | Jan. – May 2016*
Project Associate *July 2013 – 2015*

- Mapped all restorable areas along California's Mokelumne River and quantified the corresponding costs and ecosystem service benefits of restoration, producing a cost-benefit analysis and report informing watershed-wide conservation planning.

- Managed PlantRight's annual Spring Nursery Survey to track the retail market for invasive plants in California, coordinating and training more than 150 volunteers each year to survey more than 250 stores, and using the results on horticultural prevalence to update PlantRight's list of commonly sold invasive plants and non-invasive alternatives annually.
- Developed strong collaborations across diverse sectors and industries in order to solve environmental problems and facilitate restoration projects, including businesses (e.g., retail garden centers recruited as "PlantRight Partners"), landowners, farmers, public utilities, industry groups, volunteer groups, academics, and conservation NGOs.

Michigan State University Data Quality Controller *Western Province, Zambia | May – July 2012*

- Trained, supervised, and managed survey teams as part of the 2012 Rural Agricultural Livelihoods Survey, a nationally representative economic survey of 8,500 Zambian farm households.

University of Michigan Biological Station NSF Research Experience for Undergraduates *Pellston, MI | June – Aug. 2011*

- Designed and conducted two-month research project studying patterns of song interaction in two migratory populations of birds in northern Michigan, establishing baseline data to inform further science and co-authoring a peer-reviewed journal article.

Technical Skills

- Geospatial analysis in R, Google Earth Engine, ArcGIS, and QGIS.
- Programming languages: R (advanced), linux/unix/bash (moderate), Python (beginner), JavaScript (beginner); skills in data visualization with ggplot2, cluster computing with SLURM, version control with Github, reproducible research with Markdown.
- R package expertise: tidyverse, data.table, terra, raster, sf, arrow.

Leadership, Teamwork, and Outreach

- Communicated research findings to academic and public audiences, presenting at 4 academic and industry conferences, giving 2 invited undergraduate course lectures, and getting press coverage from *BioScience*, Bloomberg, and The Hill.
- Conducted outreach on environmental issues such as climate change (meeting with congressional staff and providing 2 lectures to local high schoolers) and invasive plants (including 7 presentations to garden groups in California and 6 online webinars).
- Provided invited peer reviews for academic journals such as *Science*, *BioScience*, and *International Journal of Ecology.*

Publications

Peer-reviewed (see Google Scholar)

1. Zeng Y, Senior RA, **Crawford CL**, & Wilcove DS. (In Press). Gaps and weaknesses in the global protected area network for safeguarding at-risk species. *Science Advances*.
2. Ma L, Conradie SR, **Crawford CL**, Gardner AS, Kearney MR, Maclean IMD, McKechnie AE, Mi CR, Senior RA, & Wilcove DS. (2023). Global Patterns of Climate Change Impacts to Desert Bird Communities. *Nature Communications,* 14, 211. https://doi.org/10.1038/s41467-023-35814-8
3. **Crawford CL**, Yin H, Radeloff VC, & Wilcove DS. (2022). Rural land abandonment is too ephemeral to provide major benefits for biodiversity and climate. *Science Advances*, 8(21). https://doi.org/10.1126/sciadv.abm8999
4. **Crawford CL,** Estes LD, Searchinger TD, & Wilcove DS. (2021). Consequences of under-explored variation in biodiversity indices used for land-use prioritization. *Ecological Applications*, 31(7): e02396. https://doi.org/10.1002/eap.2396
5. **Crawford CL*,** Volenec ZM*, Sisanya M, Kibet R, & Rubenstein DI. (2018). Behavioral and Ecological Implications of Bunched, Rotational Cattle Grazing in East African Savanna Ecosystem. *Rangeland Ecology & Management*, 72(1):204-209. https://doi.org/10.1016/j.rama.2018.07.016 (*Co-lead author.)
6. Price JJ, & **Crawford CL**. (2013). Use and characteristics of two singing modes in Pine Warblers. *The Wilson Journal of Ornithology*, 125(3):552-561. https://doi.org/10.1676/13-006.1

Manuscripts in review

1. **Crawford CL,** Wiebe RA, Yin H, Radeloff VC, & Wilcove DS. Cropland abandonment benefits more birds and mammals than it harms but rarely compensates for habitat loss.

Reports

1. Sustainable Conservation. (2015). Lower Mokelumne River Restoration Assessment. http://suscon.org/mokelumne-river-restoration-assessment/ **(Lead author of report.)**

Interests

- Perfecting my sourdough technique, looking for birds, listening to Swedish music, taking photos of clouds, & cooking spicy food.