VALERIE STEEN

Ecologist

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EXPERIENCE

NATURAL RESOURCES SPECIALIST, COLORADO STATE UNIVERSITY, CENTER FOR THE ENVIRONMENTAL MANAGEMENT OF MILITARY LANDS

APRIL 2023 – CURRENT

- Managing projects including developing and evaluating work plans; hiring and managing staff; planning and running meetings; coordinating with personnel from military bases, and support staff; developing timelines and schedules; managing budgets.
- Writing reports to support natural resource management on military lands; conducting literature reviews for species to support management planning; navigating complexities including diverse land-use needs and future change in making management recommendations.
- Developing study designs; making recommendations on study designs; conducting power analyses to determine sample sizes needed for long-term monitoring; providing consultation on study design and data analyses.
- Analyzing avian, vegetation, mammal, and reptile datasets.

POSTDOCTORAL SCHOLAR, OREGON STATE UNIVERSITY

JUNE 2021 – OCTOBER 2022

- Collaborated with scientists and stakeholders at universities, government agencies and NGOs to improve the quality of inference from monitoring data for fish species.
- Used existing long-term monitoring data to estimate the abundance, distribution, and population dynamics of imperiled fish.
- Researched the ability of multistate occupancy models to estimate an 'abundant' state and detect a negative population trend using simulations; I led the writing of a manuscript on this work.
- Developed an integrated spatial dynamic multi-state occupancy model to describe abundance patterns for rare fish to be used as a decision support tool; led the writing of a manuscript based on this work.
- Wrote quarterly reports detailing progress; hosted meetings with collaborators and funders.

RESEARCH ASSOCIATE, UNIVERSITY OF RHODE ISLAND

FEBRUARY 2021 – MAY 2021

- Mapped bird distributions by utilizing counts from citizen science records, programmed in R, calculated spatially explicit vegetation and habitat covariates, assessed model accuracy, and produced graphics.

- Wrote and edited a report summarizing results of migration surveys and related analyses.
- Met regularly with Rhode Island Bird Atlas coauthors to communicate about statistical approaches and results.

DATA ANALYST, BIRD CONSERVATION NETWORK

JANUARY 2021 – MARCH 2021

- Analyzed multi-decadal bird survey data to assess bird population trends at natural areas around Chicago; summarized and organized data from a large database; produced population trend estimates using N-mixture models; produced associated graphics and tables showing summary statistics and population trends.
- Discussed the analysis at numerous meetings with a board of non-scientists.

POSTDOCTORAL RESEARCHER, UNIVERSITY OF RHODE ISLAND

JUNE 2018 – NOVEMBER 2019

- Designed and implemented all analyses for the Rhode Island Bird Atlas.
- Analyzed avian point-count count data for over 100 species to estimate populations and produce distribution maps.
- Assessed different modeling approaches to improve population estimates. I compared various distance models for addressing detectability in avian point-count data by running simulations.
- Modeled species distributions to create predictive distribution maps and assess habitat relationships. I utilized boosted regression trees and landcover data to create species distribution models to predict populations across the landscape.
- Utilized R for data management, statistical analyses, and graphics creation; utilized ArcGIS for vector and raster processing.
- Was coauthor on the Second Atlas of the Breeding Birds in Rhode Island.
- Regularly met with the PI and project lead field coordinator to explain and discuss the analysis.

POSTDOCTORAL RESEARCHER, UNIVERSITY OF CONNECTICUT

JUNE 2017 – MAY 2019

- Designed research projects to evaluate best practices for utilizing varied data sources to model species distributions.
- Provided analytical support for the planning stage of the second Connecticut Bird Atlas.
- Modeled distributions of over 100 bird species. I used bird survey data to predict abundance and occurrence probability across the landscape using models that included raster and vector datasets such as NLCD, DEM, coastal cover, and income.
- Used statistical sampling design methods for landscape-level inference, I selected bird survey locations.
- Led the writing of two papers on how to improve predictions from species distribution model models using citizen science data and best approaches for modeling distributions for rare species.

PATHWAYS STUDENT & ECOLOGIST, U.S. GEOLOGICAL SURVEY

DEC 2010 – APRIL 2017

- Researched climate change impacts on migrating and breeding waterbirds in the Prairie Pothole Region as a USGS Ecologist and Pathways PhD student.
- Organized and led field surveys of waterbirds. Reviewed literature, selected survey sites, hired and trained technicians, coordinated with land managers, conducted surveys, and led data management.
- Conducted analyses to assess climate change impacts on waterbirds. Utilized various analytical approaches to model species relationships with habitats and climate. Used R and ArcGIS to conduct geospatial analyses to integrate climate datasets with habitat and species datasets and forecast species' future distributions.
- Collaborated with wildlife managers, scientists, and climate scientists at the Prairie Pothole Joint Venture, North Central Climate Science Center, and U.S. Fish and Wildlife Service. Participated in various workshops, partner meetings, and conferences associated with these collaborations.
- Led the writing of a manuscript looking at the uncertainty in forecasts of climate change impacts to waterbirds. Compared common sources of uncertainty of relevance to the broader scientific community interested in utilizing species distribution models to project climate change impacts to wildlife while providing insight on this topic to wildlife management questions in the Prairie Pothole Region.
- Led the writing of a manuscript that compared migrating shorebird distributions between historical wet and dry years at the landscape-scale. This provided insight into how (and if) shorebirds redistribute themselves to adapt to climate variability and informed management and conservation planning.
- Led the writing of two additional manuscripts that assessed potential climate change impacts on waterbirds.
- Collaborated with USGS researchers to combine remotely sensed spectral data with species distribution modeling approaches to map aspen and conifer distributions and track successional dynamics in the Wyoming Bighorn mountains; contributed to the writing of a manuscript based on this work.

CONTINENTAL DIVIDE RESEARCH LEARNING CENTER RESEARCHER, ROCKY MOUNTAIN NATIONAL PARK

JAN 2017 – FEB 2017

- Developed a grant proposal through communication with a National Park Service biologist to target ecological modeling questions of interest for Rocky Mountain National Park; was awarded funding to model the potential impacts of climate change on Boreal Toad (a state endangered species).
- Led a collaborative multidisciplinary research team of park managers, ecologists, and climate scientists to identify specific questions of high concern for management of the Boreal Toad.
- Assessed regional climate change vulnerability of Boreal Toad populations using a scenario forecasting approach and species-habitat models. This involved integrating species occurrence data with large climate datasets; and presenting the results to the Boreal Toad working group and at a conference to a mixed audience (park managers, the general public, and scientists) at Rocky Mountain National Park.

EDUCATION

DEC 2016

PHD ECOLOGY, COLORADO STATE UNIVERSITY

ADVISORS: DRS. BARRY NOON AND SUSAN SKAGEN

- Dissertation title: Impacts of climate change to breeding and migrating waterbirds in the Prairie Pothole Region.
- Coursework: Hierarchical modeling in ecology, Population ecology, Community ecology, Models for ecological data, Landscape ecology, Global carbon cycle, Mathematical statistics.

DEC 2010

MS WILDLIFE BIOLOGY, UNIVERSITY OF ALASKA FAIRBANKS

ADVISOR: DR. ABBY POWELL

- Thesis title: Waterbird distribution and habitat in the Prairie Pothole Region, USA
- Coursework: Predictive modeling, GIS analysis, ANOVA and linear regression, Survey sample design, Remote sensing, Analysis in biology, Occupancy modeling.
- Designed study; coordinated and managed field technicians for wetland surveys in grasslands and croplands; contacted landowners.
- Prepared reports for U.S. Fish and Wildlife Service.

MAY 1999

BS ECOLOGY, EVOLUTION, AND BEHAVIOR, UNIVERSITY OF MINNESOTA, TWIN CITIES

- Coursework: Ecology, Genetics, Biochemistry, Ornithology, Animal behavior, Animal physiology, Mammalogy.

SKILLS

- Analytical techniques: generalized linear models, random forests, boosted regression trees, Bayesian models, occupancy models, multistate occupancy models, dynamic occupancy models
- Software: R, JAGS, ArcGIS, Microsoft Office (Word, Excel)
- Climate science knowledge; forecasting impacts to species
- Species distribution modeling; species-habitat modeling; predictive modeling; habitat selection; home range estimation; movement analysis
- Model-based inference on important variables
- Fish and wildlife population modeling and estimation; population trend estimation
- Study design: studies of management impacts, population trend, and distributions
- Data management
- Project leadership and management
- Interpersonal communication; communicating science across backgrounds; writing and publishing papers
- Collaborating with personnel from federal agencies, NGOs, and universities; working with private landowners
- Group leadership and emotional intelligence trainer as a certified life coach, nature-based meditation teacher, and leader of Authentic Relating Fort Collins.

TEACHING EXPERIENCE

Teaching Assistant, *Public Relations in Natural Resources,* Colorado State University, Fort Collins, Spring 2015

Teaching Assistant, *Introduction to Biology*, Department of Biology and Wildlife, University of Alaska, Fairbanks, Fall 2009

PUBLICATIONS

Elphick, C.S., Tingley, M.T., Merker, S., **Steen, V.A**., Repasz, C., and Huang, M. *In prep*. The second Connecticut bird atlas.

Michel, N, A. Fournier, B. Bateman, S. Saunders, **V.A. Steen**, S. Albert, J. Priam, W. Shacklewitz, J. Alexander, T. Sanchez, and G. Le Baron. *In prep*. Citizen science for conservation and management.

Ray, A.J., J. Barsugli, D. Ojima, A. Symstad, H. Sofaer, **V.A. Steen**, L. Perry, D. Bachelet, M.P. van der Berg, and R. Sojda. *In prep*. The logic of collaborations: Improving outcomes in climate-ecological research. Target journal: Global Change Biology

Steen, V.A., J.T. Peterson, and A. Duarte. 2025. Spatially dynamic abundance patterns for a rare fish species. Ecosphere. 16(7), e70326.

Clarkson, C.A., J.E. Osenkowski, **V.A. Steen**, R.J. Duhaime, and P.W.C. Paton. 2023. The second atlas of breeding birds in Rhode Island. RI Department of Environmental Management.

Steen, V.A., A. Duarte, and J.T. Peterson. 2023. An evaluation of multistate occupancy models for estimating relative abundance and population trends. Ecological Modelling. 478, 110303.

Steen, V.A., Tingley, M.T., Paton, P.W.C., and Elphick C.S. 2021. Spatial thinning and class balancing: key choices lead to variation in the performance of species distribution models. Methods in Ecology and Evolution. 12(2): 216-226.

Assal, T.J., **V.A. Steen**, T. Caltrider, T. Cundy, C. Stewart, N. Manning, and P.J. Anderson. 2021. Monitoring long-term riparian vegetation trends to inform local habitat management in a mountainous environment. Ecological Indicators. 127, 107807.

Steen, V.A., C.S. Elphick, and M.T. Tingley. 2019. An evaluation of stringent filtering to improve species distribution models from citizen science data. Diversity and Distributions. 25(12): 1857– 1869.

Sofaer, H.R., S.K. Skagen, C. Flather, **V.A. Steen**, and B.R. Noon. 2019. Grouping species for surrogate-based management under climate change. Diversity and Distributions 25(8): 1246– 1258.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2018. Preparing for an uncertain future: Assessing responses of migrating shorebirds to historic climatic fluctuations in the Prairie Pothole Region. Ecosphere 9(2).

Steen, V.A., H.R. Sofaer, S.K. Skagen, A.R. Ray, and B.R. Noon. 2017. Projecting vulnerability to climate change: which uncertainty sources matter most and extrapolate best. Ecology and Evolution 7(21): 8841-8851.

Steen, V.A., S.K. Skagen, and C. Melcher. 2016. Implications of climate change for wetland-dependent birds in the Prairie Pothole Region. Wetlands 36(2): 445-459.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2014. Vulnerability of breeding waterbirds to climate change in the Prairie Pothole Region, USA. Plos One 9(6): e96747.

Skagen, S.K., M. Anderson, L.E. Burris, G. Clow, J. Fontaine, J. Friedman, R.A. Gleason, D. Granfors, C.P. Melcher, N. Niemuth, J. Stamm, **V.A. Steen** and B.A. Tangen. 2013. Wetland-dependent birds, land use, and climate change in the Prairie Pothole Region: A synthesis of the linkages. Draft Document.

Steen, V.A. and A.N. Powell. 2012. Potential effects of climate change on the distribution of waterbirds in the Prairie Pothole Region, USA. Waterbirds 35(2): 217-229.

Steen, V.A. and A.N. Powell. 2012. Wetland selection by breeding and foraging Black Terns in the Prairie Pothole Region of the United States. Condor 114(1): 155-165.

Steen, V.A. and A.N. Powell. 2010. Habitat selection by Black Terns (*Chlidonias niger suranimensis*) in the Prairie Pothole Region and potential survey bias. Final report to U.S. Fish and Wildlife Service, Alaska Cooperative Fish and Wildlife Research Unit, Fairbanks, AK. 36 pp.

Steen, V.A. and A.N. Powell. 2008. Landscape-scale habitat associations of Black Terns. Annual report to U.S. Fish and Wildlife Service, Alaska Cooperative Fish and Wildlife Research Unit, Fairbanks, AK. 3 pp.

Schuetz, J.G., M.J. Whitfield, and **V.A. Steen**. 2006. Winter distribution of the Willow Flycatcher (Empidonax traillii) in Guatemala and Mexico. Report to U.S. Bureau of Reclamation, Boulder City, AZ. 44 pp.

SCIENTIFIC PRESENTATIONS

Invited presentations:
Steen, V.A., C.S Elphick, and M.W. Tingley. 2018. High resolution bird distributions from citizen science data. Invited talk in symposium titled “Advances in the Use of Citizen Science Data for Conservation and Management”. American Ornithological Society meeting. Tucson, Arizona.

Steen, V.A., C.S. Elphick, and M.W. Tingley. 2018. Building better species distribution models for birds from citizen science data. Post-doc symposium. Ecology and Evolutionary Biology Department, University of Connecticut, Storrs, CT.

Steen, V.A., C.S. Elphick, and M.W. Tingley. 2017. Getting better bird maps out of citizen science data. Species Distribution Modeling Symposium. Department of Ecology and Evolutionary Biology, Yale University, New Haven, CT.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2017. Climate Change Impacts Assessment of Boreal Toad (Anaxyrus boreas boreas). Rocky Mountain National Park’s Biennial Research Conference. Estes Park, CO.

Skagen, S.K., **V.A. Steen**, H.R. Sofaer, and B.R. Noon. 2015. Implications of climate change for wetland-dependent birds in the prairie pothole region. Invited talk in symposium titled "Midcontinent Prairie Pothole Wetlands: Influence of a Changed Climate". Society of Wetland Scientists, Providence, RI.

Noon B.R., H.R. Sofaer, **V.A. Steen**, S.K. Skagen, and C.H. Flather. 2014. Algorithms to identify candidate surrogate species. Invited talk in symposium titled "Read-world Applications of Surrogate Species: Insights and Lessons Learned". Annual meeting of The Wildlife Society, Pittsburg, PA.

Skagen, S.K., B.R. Noon, H.R. Sofaer, **V.A. Steen**, J. Stamm, and B. Rashford. 2013. Surrogate species for wetland-dependent birds in the Prairie Pothole Region: selection, evaluation, and management application in the face of climate change. North Central Climate Science Center meeting, Fort Collins Science Center, Fort Collins, CO.

Steen, V.A., A.N. Powell, and S.K. Skagen. 2011. Potential Effects of Climate Change on the Distribution of Wetland-associated Birds in the Prairie Pothole Region, U.S.A. The Waterbirds Society, 34th annual meeting, Grand Island, NE.

Contributed presentations:

Steen, V.A., C.S Elphick, P.W.C. Paton, C.E. Clarkson, and M.W. Tingley. 2019. Comparing approaches for modeling bird distributions from imbalanced and spatially biased data. American Ornithological Society meeting. Anchorage, Alaska. Poster Presentation.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2016. Preparing for an Uncertain Future: Assessing Responses of Migrating Shorebirds to Climatic Fluctuations in the Prairie Pothole Region. North American Ornithological Congress. Washington, D.C.

Steen, V.A., S.K. Skagen, H.R. Sofaer, and B.R. Noon. 2015. Modeled impacts of climate change to waterbirds in the Prairie Pothole Region: uncertainty in projections of range change. American Ornithologists' Union and Cooper Ornithological Society meeting. Norman, OK.

Steen, V.A., S.K. Skagen, H.R. Sofaer, and B.R. Noon. 2015. Impacts of climate and land-use change on waterbirds in the Prairie Pothole Region. North Central Climate Science Center Open Science Conference. Fort Collins, CO. Poster presentation.

Sofaer, H.R., Skagen, S.K., Flather, C.H., **Steen, V.A.**, and B.R. Noon. 2015. Grouping species for surrogate-based management under climate change. North Central Climate Science Center Open Science Conference. Fort Collins, CO.

Steen, V.A., S.K. Skagen, H.R. Sofaer, and B.R. Noon. 2015. Resilience of freshwater wetlands for migrating shorebirds under climate change. Annual meeting of the International Biogeography Society, Bayreuth, Germany. Poster presentation.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2014. Climate Impacts on the habitat relationships and distribution patterns of migrating shorebirds in the Prairie Potholes. American Ornithologists' Union, Cooper Ornithological Society, and Society for Canadian Ornithologists Joint Meeting. Estes Park, CO.

Sofaer, H.R., **V.A. Steen**, S.K. Skagen, C.H. Flather, J.A. Hoeting, B.R. Noon. 2014. Frameworks for selecting surrogate species in a changing climate. American Ornithologists' Union, the Cooper Ornithological Society, and the Society for Canadian Ornithologists. Estes Park, CO.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2014. Vulnerability of Breeding Waterbirds to Climate Change in the Prairie Pothole Region, USA. Plains and Prairie Potholes Landscape Conservation Cooperative Meeting. Bismarck, ND.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2013. Waterbirds and Climate Change in the Prairie Pothole Region, USA. Poster Presentation. International Biogeography Society meeting. Miami, Florida.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2013. Impacts of Climate on the Distribution and Habitat Use by Migrating Shorebirds in the Prairie Pothole Region. 2013. Western Hemisphere Shorebird Group Meeting. Poster Presentation. Santa Marta, Colombia.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2012. Climate Change and Waterbirds in the Prairie Pothole Region, USA: vulnerability, distribution shifts, and model sensitivity. Plains and Prairie Potholes Landscape Conservation Cooperative Meeting. Bismarck, ND.

Steen, V.A., S.K. Skagen, and B.R. Noon. 2012. Potential Effects of Climate Change on Wetland-associated Birds in the Prairie Pothole Region, USA. North American Ornithological Congress. Vancouver, Canada.

Steen, V.A., A.N. Powell. 2010. Habitat Selection by Black Terns in the Prairie Pothole Region. COS/AOU/SCO Joint Meeting, San Diego, CA.

Steen, V.A., A.N. Powell. 2009. Habitat Selection by Black Terns in the Prairie Pothole Region. The Waterbirds Society, 33rd annual meeting, Cape May, NJ.

FIELD EXPERIENCE

- Project Leader, 2011, U.S. Geological Survey, Prairie Potholes, ND/SD/MN
    - Surveyed for migrating waterbirds and shorebirds; hired and trained field crew; organized field season; conducted wetland vegetation surveys
- Project Leader, 2008-2009, University of Alaska, Prairie Potholes, ND/SD
    - Surveyed for Black Terns at wetlands; conducted surveys via kayaks to confirm nesting; hired and trained large crews; managed day to day activities of crew; communicated with wildlife biologists and managers at National Wildlife Refuges; communicated with landowners to gain land access to croplands and rangelands; conducted wetland vegetation surveys
- Crew Leader, 2006-2007, Southern Sierra Research Stations, Kern River, CA
    - Surveyed, nest-searched, mist-netted, and banded Southwestern Willow Flycatchers; trained field crew and organized field activities, managed data and database; identified collected insects to order; conducted vegetation surveys
- Seabird Field Technician, 2004, U.S. Fish and Wildlife Service, Barren Islands, AK
    - Monitored breeding bird colonies, and chick growth for Common Murres, Black-legged Kittiwakes, Tufted Puffin, and Fork-tailed Storm-Petrels
- Research Technician, 2004, USDA Forest Service, Port Angeles, WA
    - Sea-captured, radio-tagged, and nest-searched for Marbled Murrelets
- Bird Bander, 2003 & 2005, Northern Arizona University, Roosevelt Lake, AZ
    - Mist-netted, banded, and resighted Southwestern Willow Flycatchers
- Research Technician, 2002, U.S. Geological Survey, Wind Cave National Park, SD
    - Conducted behavioral observations of Prairie Dogs in western rangelands; captured prairie dogs

- Research Intern, 2002, Cornell University, Rio Lagartos, Mexico
    - Mist-netted, banded, and conducted behavioral observations for Turquoise-browed Motmots
- Field Assistant, 2001, Sustainable Ecosystems Institute, Donnelly, ID
    - Nest-searched and nest-monitored for breeding birds in the Rocky Mountains; conducted vegetation surveys
- Volunteer Field Assistant, 2001, U.S. Geological Survey, Sonoita, AZ
    - Conducted surveys for wintering grassland birds in western rangelands; conducted vegetation surveys
- Field Technician, 2000, University of Georgia, Dublin, GA
    - Conducted surveys for Bobwhite Quail in agricultural fields
- Senior Intern, 2000, Point Blue Conservation Science, Vallejo, CA
    - Nest-searched, nest-monitored, territory-mapped, mist-netted, and banded Tidal Marsh Song Sparrows; trained other interns in nest-searching, territory mapping, mist-netting, and banding;
      conducted vegetation surveys
- Volunteer Bird Bander, 1999, Thunder Cape Bird Observatory, Thunder Cape, Ontario
    - Ran mist-nets and banded birds (including hawks, owls, and songbirds) during fall migration
- Field Assistant, 1999, U.S. Geological Survey, Crookston, MN
    - Nest-searched for grassland birds; conducted vegetation surveys

AWARDS AND GRANTS

- Robert May Prize shortlist, 2021
- Bird Conservation Network research contract, $7,200, 2020
- Post-doc travel award. American Ornithological Society, 2018
- AAAS membership award, 2017-2018
- Continental Divide Research Learning Center Researcher award, $6,000, 2017
- Travel award. American Ornithologists' Union, 2016
- Travel award. International Biogeography Society, 2014
- Lynd Jones prize, Wilson Ornithological Society poster award, 2011
- John P. Marooney Scholarship, 2010
- American Ornithologists' Union student membership award, 2010
- Cooper Ornithological Society student membership award, 2009-10

SELECTED PROFESSIONAL SERVICE

- *Mentor*, 2017-2018, UConn Connects program for undergraduates on academic probation
- *Student Representative*, 2014-2016, Cooper Ornithological Society
- *Workshop Organizer*, 2016, Introduction to Bird Conservation Policy Workshop, North American Ornithological Congress
- *Surveyor*, 2012-2015, North American Breeding Bird Survey
- *Mentor*, 2014, Colorado State University undergraduate honors project
- *Reviewer* (ad-hoc), for Avian Conservation and Ecology, Biological Conservation, Diversity and Distributions, Ecography, Ecosphere, European Journal of Wildlife Research, International Journal of

Aquatic Science, Methods in Ecology and Evolution, Natural Areas Journal, Northwest Science, & Plos One