DR. RYAN PEEK

Running water continues to fascinate and drive me to conduct open and applied research to better understand and manage our freshwater ecosystems. I have worked in many rivers ecosystems in the West, with particular interest in applied research across disciplines and scales using tools in ecology, genomics, and hydrology.

I am a strong advocate for open science, and giving voices, training, and space to those who support and foster community with diverse questions and views.

🎓 EDUCATION

Ph.D., Ecology (with certificate in Conservation Management)

UC Davis 📍 Davis, CA

2018 | 2014

· Linking watersheds with genomics: Population genetics of Foothill Yellow-legged frog (*Rana boylii*)

M.S., Biology

University of San Francisco 📍 San Francisco, CA

2010 | 2008

· Landscape Genetics of Foothill Yellow-legged Frogs (*Rana boylii*) in regulated and unregulated rivers: Assessing connectivity and genetic fragmentation

B.S., Wildlife, Fish & Conservation Ecology

UC Davis 📍 Davis, CA

2002 | 1998

· Emphasis in Behavioral Ecology

🖥 RESEARCH EXPERIENCE

Post-doctoral Researcher

Center for Watershed Sciences 📍 UC Davis

2022 | 2018

· Data scientist and aquatic ecologist. Projects include: Conservation genomics of threatened and endangered frogs in CA, NV, and AZ.
· Analysis of floodplain foodwebs for salmon at landscape scales to better understand connectivity and seasonal dynamics important for restoration.
· Linking functional flow concepts with ecological stream health for environmental flow management in California rivers.

Graduate Student Researcher

Center for Watershed Sciences 📍 UC Davis

2018 | 2014

· Research in amphibian/aquatic ecology, with particular focus on assessing ecological health with molecular techniques to inform conservation in river ecosystems.
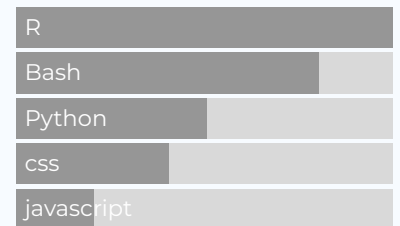
LANGUAGE SKILLS

R

Bash

Python

css

javascript

2014
|
2011

Junior Research Specialist
Center for Watershed Sciences   📍 UC Davis

· Research in stream ecology and montane aquatic ecosystems, with particular focus on ecosystem function and hydroclimatic impacts on regulated rivers in the Sierra Nevada.

2010
|
2009

Research Assistant
UC Berkeley   📍 Berkeley, CA

· Led field research crews for extensive field data collection as part of a California Energy Commission study of regulated flow effects on foothill yellow-legged frog (*Rana boylii*) breeding habitat.
· Collaborated with Sarah Yarnell and Amy Lind on field methodology and integration of conservation genomics with flow analyses.

2009

Research Assistant
UC Davis   📍 Davis, CA

· Research with Sarah Kupferberg and Alessandro Catenazzi of regulated flow effects on water temperatures and foothill yellow-legged frog (*Rana boylii*)
· Ran predation and tadpole growth experiments, field deployment of thermographs in various Sierran rivers throughout California.

🖥 AGENCY EXPERIENCE

2022

Drought Resiliency Coordinator, Wildlife Diversity Branch
CA Dept of Fish & Wildlife, Wildlife Branch   📍 West Sacramento

· Senior environmental scientist, lead coordinator for identifying and prioritizing drought response for sensitive wildlife, coordinating monitoring and assessment, vulnerability analysis, and reporting.

2010

Biological Science Technician
USDA Forest Service, Pacific Southwest Research Station   📍 Davis, CA

· Developed and designed website on ecology, river regulation and conservation of the foothill yellow-legged frog (*Rana boylii*), including GIS synthesis and development of a distribution map showing over 6,000 records from multiple sources (https://www.fs.fed.us/psw/topics/wildlife/herp/rana_boylii/).
· Conducted 1-D RHABSIM modeling and analysis. Coordinated field research, data collection, and writing.

2001

Biological Science Technician
National Park Service   📍 Sequoia & Kings Canyon, CA

· Backcountry position conducting Sierra yellow-legged frog surveys in mountain lakes, as well as habitat assessment, data collection, and non-native fish removal.
· This position involved extensive backpacking and hiking experience while living in remote and rugged terrain at 10,000-12,000 feet for multiple weeks at a time. Required the ability to work independently, efficiently, and safely.
· Initial year of a conservation/restoration project targeting the federally threatened Sierra/Mountain yellow-legged frog (*Rana sierrae*)

OPEN SOURCE CONTRIBUTIONS

All projects available at `github.com/ryanpeek/<name>`

www.r4wrds.com: R course for water resources data science

`{aggiedown}`: R package for writing dissertations at UC Davis

R-DAVIS: grad course in data science and visualization

Mapping-in-R: short course for spatial/GIS topics

💼 INDUSTRY EXPERIENCE

2011
|
2002

Fish & Wildlife Biologist

Stillwater Sciences 📍 Davis CA

- Conducted research in aquatic, terrestrial, and riparian ecosystems as a field lead and project manager. Developed restoration, conservation, and management strategies in various watersheds throughout California and Oregon for amphibian and fisheries related projects.
- Extensive experience completing watershed analyses. Successfully worked independently and collaboratively on various projects including leading field crews, managing budgets, conducting meetings, analyzing data, and writing comprehensive reports.
- Watershed Experience: Alameda Creek (San Francisco Public Utilities Commission), Upper American River (Sacramento Municipal Utility District), South Fork Feather River (South Feather Water & Power), Yuba River (North, Middle, and South) (CH2MHill), Napa River and Floodplain (US Army Corp of Engineers), Santa Clara River (California State Coastal Conservancy), McKenzie River (Eugene Water and Electric Board), Upper Merced River (Merced Alliance), Butte Creek and West Branch Feather River (PG&E), McCloud and Pit Rivers (PG&E)

📕 JOURNAL ARTICLES

2022

Application of flow ecology analysis to inform prioritization for stream restoration and management actions

Frontiers in Environmental Science, 9 📍 DOI: 10.3389/fenvs.2021.787462

- Irving, K., Taniguchi-Quan, K.T., Aprahamian, A., Rivers, C., Sharp, G., Mazor, R.D., Theroux, S., Peek, R.A., Stein, E.D.

2022

Identifying functional flow linkages between stream alteration and biological stream condition indices across California

Frontiers in Environmental Science, 9, 638-652

📍 DOI: 10.3389/fenvs.2021.790667

- Peek, R.A., Irving, K., Yarnell, S.M., Lusardi, R.A., Stein, E.D., Mazor, R.

2022

Functional Flows in Groundwater– Influenced Streams: Application of the California Environmental Flows Framework to Determine Ecological Flow Needs

Frontiers in Environmental Science, 9 📍 DOI: 10.3389/fenvs.2021.788295

- Yarnell, S.M., Willis, A., Obester, A., Peek, R.A., Lusardi, R.A., Zimmerman, J., Grantham, T., Stein, E.D.

2021

The use of umbrella fish species to provide a more comprehensive approach for freshwater conservation management in California

Aquatic Conservation: Marine and Freshwater Ecosystems. 1-17.

📍 DOI: 10.1002/aqc.3746

- Obester, A., R. Lusardi, N. Santos, R. Peek, S. Yarnell

2021   **Classifying California's stream thermal regimes for cold-water conservation**

PLoS ONE 16(8): e0256286. 📍 DOI: 10.1371/journal.pone.0256286

· Willis, A.D., R.A. Peek, A.L. Rypel

2021   **Actinemys marmorata (Northwestern Pond Turtle) Feeding on Dicamptodon tenebrosus (Coastal Giant Salamander)**

Northwestern Naturalist, 102 (3), 261-264.

📍 DOI: 10.1898/1051-1733-102.3.261

· Peek, R.A. , S.J. Kupferberg, A.C., Catenazzi, P. Georgakakos, M. E. Power

2021   **Flow regulation associated with decreased genetic health of a river-breeding frog species**

Ecosphere, 12 (5). 📍 DOI: 10.1002/ecs2.3496

· Peek, R.A., S.M. O'Rourke, M.R. Miller.

2020   **Understanding community assembly rules in managed floodplain food-webs**

Ecosphere, 12 (2). 📍 DOI: 10.1002/ecs2.3330

· Corline, Nicholas J., Ryan A. Peek, Jacob Montgomery, Jacob V.E. Katz and Carson A. Jeffres.

2020   **A functional flows approach to selecting ecologically relevant flow metrics for environmental flow applications**

River Research and Applications, 36 (2), 318-324. 📍 DOI: 10.1002/rra.3575

· Yarnell, S. M., Stein, E. D., Webb, J. A., Grantham, T., Lusardi, R. A., Zimmerman, J., Peek, R. A., Lane, B. A., Howard, J., & Sandoval-Solis, S.

2019   **Hybridization between two sympatric ranid frog species in the northern Sierra Nevada**

Molecular Ecology, 28 (20), 4636–4647. 📍 DOI: 10.1111/mec.15236

· Peek, R., M. Bedwell, S. O'Rourke, G. Wengert, C. Goldberg, M. Miller.

2019   **A Lentic Breeder in Lotic Waters: Sierra Nevada Yellow-legged Frog (*Rana sierrae*) Habitat Suitability in Northern Sierra Nevada Streams.**

Copeia, 107(4), 676–693. 📍 DOI: 10.1643/CH-19-213

· Yarnell, S.M., R.A. Peek, N. Keung, B.D. Todd, S. Lawler, C. Brown

2018   **The ecological importance of unregulated tributaries to benthic invertebrate communities in a regulated river**

Hydrobiologia, 829, 291–305. 📍 DOI: 10.1007/s10750-018-3840-4

· Milner, V.S., S.M. Yarnell, R.A. Peek.

2018 **A Freshwater Blueprint for California: Prioritizing freshwater habitat for conservation in California to maximize biodiversity and leverage existing protected areas.**
Freshwater Science, 37 (2), 417-431.   DOI: 10.1086/697996

· Howard, J.K., K.R. Klausmeyer, K.A. Fesenmyer, J. Furnish, T. Gardali, T. Grantham, J.V. Katz, S. Kupferberg, P. McIntyre, P.B. Moyle, P.R. Ode, R. Peek, R.M. Quinones, A.C. Rehn, N. Santos, S. Schoenig, L. Serpa, J.D. Shedd, J. Slusark, J.H. Viers, A. Wright and S.A. Morrison.

2018 **Associating Metrics Of Hydrologic Variability With Benthic Macroinvertebrate Communities In Regulated And Unregulated Snowmelt–Dominated Rivers.**
Freshwater Biology 63 (8), 844-858.   DOI: 10.1111/fwb.12994.

· Steel, A.E., R.A. Peek, R.A. Lusardi, S.M. Yarnell.

2016 **Management of the Spring Snowmelt Recession in Regulated Systems.**
JAWRA Journal of the American Water Resources Association 52(3), 723-736.
 DOI: 10.1111/1752-1688.12424

· Yarnell, S., R. Peek, G. Epke and A. Lind.

2016 **Missing the boat on freshwater fish conservation in California.**
Conservation Letters 10(1), 77–85.   DOI: 10.1111/conl.12249

· Grantham, T., K. Fesenmeyer, R. Peek, E. Holmes, A. Bell, R. Quiñones, N. Santos, J. Howard, J. Viers, P. Moyle.

2015 **Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California.**
PLoS One 10(7): e0130710.   DOI: 10.1371/journal.pone.0130710

· Howard, J.K., K.R. Klausmeyer, K.A. Fesenmyer, J. Furnish, T. Gardali, T. Grantham, J.V. Katz, S. Kupferberg, P. McIntyre, P.B. Moyle, P.R. Ode, R. Peek, R.M. Quinones, A.C. Rehn, N. Santos, S. Schoenig, L. Serpa, J.D. Shedd, J. Slusark, J.H. Viers, A. Wright and S.A. Morrison.

📈 SELECTED DATA SCIENCE WRITING

2021 **Dammed Hot: California's regulated streams fail coldwater ecosystems**
California Water Blog   Center for Watershed Sciences

· Story about classification of thermal regimes in CA and coldwater management concerns.

2020 **Drawing Boundaries with DNA to Improve Conservation**
California Water Blog   Center for Watershed Sciences

· Story about using genetics to draw boundaries for conservation management

I enjoy writing about data science, rivers, R, making maps, and frogs ryanpeek.org

2016 ● **Cue the Frogs! Water signatures, environmental cues and climate change**

California Water Blog   📍 Center for Watershed Sciences

· Story about environmental cues for amphibians in rivers

2015 ● **Time Lapse Photos Expose Nature in the Raw**

California Water Blog   📍 Center for Watershed Sciences

· Story about using game cameras to monitor the environment

👨‍🏫 TEACHING EXPERIENCE

2022 | 2021

R for Water Resources Data Sciences (R4WRDS)
State Water Resources Boards (SWRB)   📍 SWRB

- Created and co-instructed R4WRDS Courses, Intro and Intermediate levels for State Water Board employees. Focus on how to import different datasets, create visualizations, conduct exploratory data analysis, and clean and tidy water data. Taught as a virtual course.
- (www.r4wrds.com)

2022 | 2016

Data Carpentry Workshops
Various

- Teach researchers in science, engineering, medicine, and related disciplines the computing skills they need to get more done using open source and reproducible tools. Specifically, have taught genomics/ecology/geospatial workshops at Stanford, UC Davis, UC Berkeley, and University of Rhode Island Coastal Institute. (http://software-carpentry.org/) (http://www.datacarpentry.org/)

2021 | 2020

California Aquatic Bioassessment Workgroup & CA Society of Freshwater Sciences R Workshop
UC Davis   📍 UC Davis

- Created and co-instructed a short workshop teaching introductory R using bioassessment data for CABW-SFS conference, focused on how to import different datasets, create visualizations to explore basic data trends, and create maps in R to explore/report spatial patterns.
- Two short 2-hour sessions. https://ucd-cws.github.io/CABW2020_R_training/

2020 | 2019

Strategies & Techniques for Analyzing Microbial Population Structures (STAMPS)
Marine Biological Laboratory   📍 Woods Hole, MA

- Research facilitator/teacher for the STAMPS course on analysis of metagenomic data. Provided interdisciplinary bioinformatic and statistical training to practitioners of molecular microbial ecology and genomics.
- Topics covered included acquisition and organization of next generation sequence data; principles of quality control of sequence data and data management; methods of taxonomic assignment and clustering of targeted gene data. Also an introduction to the Linux command-line and R statistical environments. (https://www.mbl.edu/education/courses/stamps/)

2019 | 2017

R for Data Analysis and Visualization in Science
UC Davis   📍 Davis, CA

- Lead instructor and creator of graduate course teaching R and version control for 25+ students. Course designed to train students in toolsets applicable to the entire process of reproducible data-driven research and encourage the use of open-source tools.
- Built website and made course materials openly available on github. (https://gge-ucd.github.io/R-DAVIS/).
- Now a required graduate course in Ecology Grad Group

I am passionate about education, and strive to continue learning how to be a better teacher. I am a proud Carpentries Instructor, and the community they represent.

2018

Foothill Yellow–Legged Frog Ecology, Management, and Regulation

Humboldt State
 Arcata, CA

- One of three main instructors for workshop designed to cover the natural history and management of the foothill yellow-legged frog.
- Three days of lecture followed by a field day covered ecological requirements of the species, mitigation, restoration, and permitting requirements

2018

Intro to Genomics (Data Carpentry)

DIBSI
 Davis, CA

- Co-instructor. DIBSI at UC Davis is a series of two-day or week-long workshops for biologists to learn bioinformatics and data science. The Intro to R course was built as an interactive, week-long introduction to the programming language R. Following Carpentry workshop content, taught basics of R by live-coding with participants
- (https://dib-lab.github.io/2018-06-27-DIBSI-Genomics/)

2017

Intro to R

Data Intensive Biology Summer Institute (DIBSI)
 Davis, CA

- Co-Instructor. DIBSI at UC Davis is a series of two-day or week-long workshops for biologists to learn bioinformatics and data science. The Intro to R course was built as an interactive, week-long introduction to the programming language R. Following Carpentry workshop content, taught basics of R by live-coding with participants
- (https://mikoontz.github.io/data-carpentry-week/)

2015

Ecogeomorphology

UC Davis
 Davis, CA

- Co-instructor. Taught multidisciplinary collaborative watershed and stream analysis through combined laboratory and field study of a selected stream system (Tuolumne River). Educated students from diverse backgrounds to work in research teams to collect and analyze field data from the Tuolumne River system. Helped collect and develop virtual hike of Tuolumne Meadow with University of Worcester, UK
- Serve as rafting guide, as well as lectured, and taught in classroom, lab, and field, including a 3 day rafting trip on the Tuolumne River. (https://watershed.ucdavis.edu/education/classes/)

2010

Geospatial Analysis

University of San Francisco
 San Francisco, CA

- Teaching Assistant
- Lab instructor for undergraduate geospatial analysis course using ArcGIS; planned and conducted lab activities and led discussions for one semester

⊞ SELECTED PRESS (ABOUT)

2021 ● **Dams Ineffective for Cold-water Conservation**
UC Davis 📍 UC Davis

· Press release on recent research about thermal regimes in CA streams.

2013 ● **Cool and Collected**
College of Agricultural and Environmental Sciences Outlook, Spring
📍 UC Davis

⊞ SELECTED PRESS (BY)

2020 ● **Tips for Souping of RMarkdown Documents**

· Top ten tips for making RMarkdown better

2019 ● **The Aggie Brickyard. A Student Run Magazine**
| Co-Founder & Design Editor 📍 UC Davis
2015

⊟ OTHER PUBLICATIONS

2013 ● **Management of the Spring Snowmelt Recession: An Integrated Analysis of Empirical, Hydrodynamic, and Hydropower Modeling Applications**
Final Report. California Energy Commission. Publication number: CEC-500-2013. 137 pp.

· Yarnell, S.M, R.A. Peek, D.E. Rheinheimer, A.J. Lind, and J.H. Viers

2013 ● **Montane Meadows in the Sierra Nevada: Changing Hydroclimatic Conditions and Concepts for Vulnerability Assessment**
Center for Watershed Sciences Technical Report (CWS-2013-01), University of California, Davis. 63 pp.

· Viers, J.H., SE Purdy, R.A. Peek, A. Fryoff-Hung, N.R. Santos, J.V.E. Katz, J.D. Emmons, D.V. Dolan, and S.M. Yarnell.

2011 ● **Validation of Regional Habitat Suitability Criteria and Instream Flow Modeling Applications for the Foothill Yellow-Legged Frog (*Rana boylii*)**
Final Report. California Energy Commission, PIER. Publication number: CEC-500-2011.

· Yarnell, S., A. Lind, C. Bondi, R. Peek, and J. Mount. 2011.

2010 Landscape Genetics of Foothill Yellow-legged Frogs (*Rana boylii*) in regulated and unregulated rivers: Assessing connectivity and genetic fragmentation.

Master's Thesis, Biology Department. University of San Francisco, CA. 69 pp.

· Peek, R. A.

📖 ACKNOWLEDGED ARTICLES

2017 Variation in thermal niche of a declining river-breeding frog: From counter-gradient responses to population distribution patterns.

Freshwater Biology 62(7):1255–1265. DOI: 10.1111/fwb.12942

· Catenazzi, A., S. J. Kupferberg.

2016 California Amphibian and Reptile Species of Special Concern.

University of California Press

· Thomson, R.C., A.N. Wright, H.B. Shaffer.

2013 Frogs of the United States and Canada, 2-vol. set.

Baltimore: The Johns Hopkins University Press.

· Dodd, C.K.J.

2013 Transferability of habitat suitability criteria for a stream breeding frog (*Rana boylii*) in the Sierra Nevada, California.

Herpetological Conservation and Biology 8(1):88-–103.

· Bondi, C.A., S.M. Yarnell, and A.J. Lind. 2013.

2012 Effects of Flow Regimes Altered by Dams on Survival, Population Declines, and Range-Wide Losses of California River-Breeding Frogs.

Conservation Biology 26(3): 513–524. 📍 DOI: 10.1111/j.1523-1739.2012.01837.x

· Kupferberg, S.J., W.J. Palen, A.J. Lind, S. Bobzien, A. Catenazzi, J. Drennan, and M.E. Power.

2007 Removal of nonnative fish results in population expansion of a declining amphibian (mountain yellow-legged frog, *Rana muscosa*).

Biological Conservation 135(1): 11–20. 📍 DOI: 10.1016/j.biocon.2006.09.013

· Knapp, R.A., D.M. Boiano, V.T. Vredenburg.

🎤 SELECTED PRESENTATIONS

2022

From Ponds to Puddles & Rivers to Rivulets: Using DNA for Freshwater Conservation

Guest Lecture, Watsonville Wetlands Watch. May 10.

· Peek, Ryan.

2022

Using Conservation Genetics with Functional Flows: Letting Rivers Flow

Guest Lecture, Ecogeomorphology

· Peek, Ryan.

2021

Conservation: Connecting Puddles to Pools

Guest Lecture, American River College NATR 302 Wildlife Biology, Feb 1.

· Peek, Ryan.

2019

Bridging Troubled Waters: Merging disciplines for conservation in freshwater ecosystems.

Invited Ecology Seminar Speaker, UNLV. Las Vegas, NV. 8 Dec.

· Peek, Ryan.

2019

Using Benthic Macroinvertebrate Data to Assess and Inform Flow Management Recommendations in California

California Aquatic Bioassessment Workgroup/California Society for Freshwater Science Meeting, Davis, 24 Oct.

· Peek, Ryan, A. Obester, S. Yarnell, R. Lusardi, N. Santos.

2019

Hybridization between two parapatric ranid frog species in the northern Sierra Nevada, California

Amphibian Population Task Force (APTF), Arcata, 9–11 Jan.

· Peek, R., M. Bedwell, S. O'Rourke, G. Wengert, C. Goldberg, M. Miller.

2017

Plasticity in timing of hydrologic spawning cues for the foothill yellow–legged frog (*Rana boylii*) under Mediterranean climate extremes in Sierra Nevada rivers

Society for Freshwater Science (SFS) Annual Meeting, Raleigh, NC, 5–8 Jun.

· Peek, R., S. Yarnell

🤝 SERVICE & LEADERSHIP

**2022
|
2020**

Web Designer and Maintainer

California-Nevada Amphibian Population Task Force Website

· https://www.canvamphibs.org

I am a strong advocate and supporter of building an inclusive and open community, and strive to learn from, support, and adapt to whatever community I am a part of.

2021 | 2019

Conference Planning Committee, Web Designer and Maintainer

CA Chapter Society for Freshwater Sciences & CA Bioassessment Working Group Conference

· https://cal-sfs.github.io/CABW-conference/index.html

2021 | 2015

Coordinator

Davis R-Users Group

· https://d-rug.github.io/

2021 | 2016

Software & Data Carpentry Instructor

Carpentries

· https://carpentries.org/instructors/

2021 | 2016

Data Lab Affiliate

UC Davis Data Lab

· https://datalab.ucdavis.edu/affiliated-students-and-postdocs/

2021 | 2020

National Center for Ecological Analysis and Synthesis (NCEAS) workgroup

Bay Delta Science Program

· Collaborative multi-agency and academic workgroup formed to focus on data synthesis of long-term trends in the San Francisco Estuary food webs critical to supporting multiple endemic fish species of conservation concern.

2020 | 2019

Center for Watershed Science Executive Committee

UC Davis

· Liaison between researchers and academic faculty conducting research, representative for postdocs and non-academic senate researchers.

AFFILIATIONS & TRAININGS

2019 | 2005

River Rescue Certification, Sierra Rescue/Rescue 3 International, Coloma CA

2012

Rare Pond Species (Western Pond Turtle, California Red–Legged Frog, and California Tiger Salamander) Survey Techniques Workshop (Laguna Foundation)

2007

Biology and Management of the California Red Legged Frog Workshop, Santa Cruz County Resource Conservation and Elkhorn Slough Coastal Training Program, Santa Cruz, CA

- **Society for Study of Amphibians and Reptiles (SSAR)**

- **Ecology Society of America (ESA) | Society for Freshwater Science (SFS)**

- **Whitewater Rafting Guide, Outdoor Adventures, UC Davis**