

Sophie Preckler-Quisquater

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RESEARCH INTERESTS

Integrating traditional ecological field methods with genetic and genomic tools to investigate the natural and anthropogenic drivers of divergence, adaptation, and shifting range dynamics in mammalian wildlife.

EDUCATION

2016 – **Ph.D. in Ecology with an Emphasis in Ecological Genetics and Genomics**

2022 University of California at Davis. Davis, CA
Supervisor: Dr. Ben Sacks.

2008 – **B.S. in Evolution, Ecology, and Biodiversity**

2012 College of Biological Sciences
University of California at Davis. Davis, CA

RESEARCH EXPERIENCE

2022 – **Postdoctoral Research**, Mammalian Conservation and Ecology Unit, Veterinary Genetics Laboratory,
Present University of California, Davis. Exploring the effects of disease outbreaks on metapopulation connectivity, genetic diversity, and inbreeding-load in the San Joaquin kit fox (*Vulpes macrotis mutica*).

2016 – **Graduate Research**, Ecology Graduate Group, University of California, Davis, Davis, CA.

2022 Dissertation: Genomic Analysis of Divergence and Secondary Contact in Red Foxes (*Vulpes vulpes*) and Gray Foxes (*Urocyon cinereoargenteus*).

RESEARCH PUBLICATIONS

- In Review Quinn CB, **Preckler-Quisquater S**, Buchalski M, Sacks BN. *Whole genomes inform genetic augmentation strategy of montane red foxes in North America*. In Review. *Molecular Biology and Evolution*.
- In Review Ahrens K, Sacks BN, **Preckler-Quisquater S**, Buchalski M. *Development of a 96 SNP panel for fecal genotyping and individual identification of bobcats (*Lynx rufus*) in California*. In Review. *Conservation Genetics Resources*.
- 2024 **Preckler-Quisquater S**, Quinn CB, S. Sacks, BN. 2024. *Maintenance of a narrow hybrid zone between native and introduced red foxes (*Vulpes vulpes*) despite conspecificity and high dispersal capabilities*. *Molecular Ecology*. 33(13), e17418.
- 2024 Rando H, Alexander E, **Preckler-Quisquater S**, Quinn C, Stutchman J, Johnson J, Bastounes E, Horecka B, Black K, Robson M, Shepeleva D, Herbeck Y, Kharlamova A, Trut L, Pauli J, Kukekova A, Sacks B. 2024. *Missing History of a Modern Domesticated: Historical Demographics and Genetic Diversity in Farm-bred Red Fox Populations*. *Journal of Heredity*. 115(4):411–423.
- 2023 **Preckler-Quisquater S**, Kierepka E, Reding D, Piaggio A, Sacks BN. 2023. *Can demographic histories explain long-term isolation and recent pulses of asymmetric gene flow between highly divergent gray fox lineages?* *Molecular Ecology*. 32(19):5323–5337.
- 2023 Kierepka E, **Preckler-Quisquater S**, Reding D, Piaggio A, Riley S, Sacks BN. 2022. *Genomic analyses of gray fox lineages suggest ancient divergence and secondary contact in the southern Great Plains*. *Journal of Heredity*.
- 2022 Quinn CB, **Preckler-Quisquater S**, Akins JA, Cross P, Alden PB, Vanderzwan SL, Stephenson JA, Figura P, Green GA, Hiller T, Sacks BN. 2022. *Contrasting genetic trajectories of endangered and expanding red fox populations in the western U.S.* *Heredity*.
- 2021 Sacks BN, Mitchell KJ, Quinn CB, Hennelly LM, Sinding MHS, Statham MJ, **Preckler-Quisquater S**, Fain SR, Kistler L, Vanderzwan SL, Meachen JA, Ostrander EA, Frantz LAF. 2021. *Historical mitochondrial genomes reveal Pleistocene origin of the red wolf and insights for North American *Canis* phylogeography*. *Molecular Ecology*. 30:4292–4304.
- 2019 Black KM, **Preckler-Quisquater S**, Batter TJ, Anderson S, Sacks, BN. 2018. *Occupancy Modeling to Characterize Habitat Use and Population Size of the Sacramento Valley Red Fox*. *Journal of Wildlife Management*. 83:158-156.

- 2018 Agha M, Batter T, Bolas EC, Collins AC, Gomes da Rocha D, Monteza-Moreno CM, **Preckler-Quisquater S**, Sollman R. 2018. *A review of wildlife camera trapping trends across Africa*. African Journal of Ecology. 56(4):694-701. Authors ordered alphabetically with equal contribution.

TECHNICAL REPORTS

- April 2022 Sacks BN, Quinn CB, **Preckler-Quisquater S**. 2022. *Genomic markers for the Sierra Nevada red fox*. Report to the U.S. Fish and Wildlife Service, 30 April 2022.
- May 2019 Bellido F, Broad A, Gaffney S, Hernandez D, Holmes A, Lo V, Moore-O’Leary K, Peckney J, **Preckler-Quisquater S**, Schwartz M, Wiener J, Williamson M. *Climate Threats Assessment for the Kern and Pixley National Wildlife Refuges*. Report generated for USFWS. *Authors listed in alphabetical order
- Sep 2017 **Preckler-Quisquater, S.**, Anderson, S., Nguyen, C., Sacks, B.N. 2017. *Range-wide Occupancy Survey for the Sacramento Valley red fox*. Final Report to the California Department of Fish and Wildlife. September 30, 2017. pp.1-18.

AWARDS & FELLOWSHIPS

- Aug 2022 The Wildlife Society, Molecular Ecology Working Group Travel Grant (\$325)
- Feb 2022 Best Poster Presentation – Graduate Student Symposium in Ecology
- 2020-2021 Kit Rice Ecology Fellowship (\$4,000)
- 2020-2021 UC Davis Graduate Group in Ecology Fellowship (\$13,000)
- Feb 2020 Best Oral Presentation – The Wildlife Society Western Section
- 2019-2020 UC Davis Graduate Group in Ecology Fellowship (\$12,000)
- 2018-2019 William and Linda Sullivan Environmental Sciences Scholarship (\$2,000)
- 2017-2018 UC Davis Graduate Group in Ecology Fellowship (\$12,000)
- 2017-2018 UC Davis Ecology Student Endowment Award (\$1,500)

PROFESSIONAL PRESENTATIONS

- Nov 2023 **Preckler-Quisquater S**, Sanchez K, Cypher B, Rudd J, Clifford D, Vanderzwan S, Sacks BN (2023) *Characterizing the genomic effects of habitat fragmentation and disease outbreaks on metapopulation connectivity and inbreeding in the San Joaquin kit fox*. Oral Presentation. The Wildlife Society Annual Conference. Louisville, KY.
- Feb 2023 **Preckler-Quisquater S**, Sanchez K, Cypher B, Rudd J, Clifford D, Vanderzwan S, Sacks BN (2023) *Preliminary comparison of genetic diversity in the endangered San Joaquin Kit Fox (*Vulpes macrotis mutica*) before and after a mange outbreak*. Poster Presentation. The Western Section of The Wildlife Society Conference. Riverside, CA. Awarded 2nd Place Poster Presentation.
- Nov 2022 **Preckler-Quisquater S**, Kierepka E, Reding D, Piaggio A, Riley S, Sacks BN. (2022) *Whole-genome sequencing uncovers recent admixture pulses and selective introgression between highly divergent gray fox lineages*. Oral Presentation. The Wildlife Society National Conference. Spokane, WA.
- Feb 2022 **Preckler-Quisquater S**, Kierepka E, Reding D, Piaggio A, Riley S, Sacks BN. (2022) *Genomic sequencing across a zone of secondary contact uncovers complex demographic history and admixture between cryptic gray fox lineages*. Poster Presentation. The Western Section of The Wildlife Society Conference. Reno, NV
- Feb 2022 Quinn CB, **Preckler-Quisquater S**, Carlson J, Figura P, Akins J, Hiller T, Sacks BN. (2022) *Genomic consequences of population declines in the Sierra Nevada and Cascade red fox subspecies*. Poster Presentation. The Western Section of The Wildlife Society Conference. Reno, NV
- Feb 2022 **Preckler-Quisquater**, Kierepka E, Reding D, Piaggio A, Riley S, Sacks BN. (2022) *Genomic sequencing across a zone of secondary contact uncovers complex demographic history and admixture between cryptic gray fox lineages*. Poster Presentation. UC Davis Graduate Student Symposium in Ecology. Awarded Best Poster Presentation.
- Jan 2022 **Preckler-Quisquater S**, Kierepka E, Reding D, Piaggio A, Riley S, Sacks BN. (2022) *Genomic sequencing across a zone of secondary contact uncovers complex demographic history and admixture between cryptic gray fox lineages*. Poster Presentation. International Plant and Animal Genomics Conference. Virtual.
- Feb 2020 **Preckler-Quisquater S**, Sacks BN. (2020) *Do Reproductive Barrier Genes Contribute to the Maintenance of Distinct Red Fox (*Vulpes vulpes*) Populations across a Zone of Secondary Contact?* Oral Presentation. The Wildlife Society Western Section Conference. Redding, CA. Awarded Best Oral Presentation.

- Feb 2020 Davis, TM, **Preckler-Quisquater S**, Sacks BN. (2020) *Optimizing tissue sampling and extraction protocols for next-generation genomic sequencing*. Poster Presentation. The Wildlife Society Western Section Conference. Redding, CA. Awarded Best Poster Presentation.
- Feb 2020 Serrano M, Owen JD, **Preckler-Quisquater S**, Vanderzwan S, Sacks BN. (2020) *San Francisco Urban Coyote Repopulation: A Noninvasive Genetic Perspective*. Poster Presentation. The Wildlife Society Western Section Conference. Redding, CA.
- Jan 2020 **Preckler-Quisquater S**, Sacks BN. (2020) *Do Reproductive Barrier Genes Contribute to the Maintenance of Distinct Red Fox (*Vulpes vulpes*) Populations across a Zone of Secondary Contact?* Poster Presentation. International Plant and Animal Genomics Conference. San Diego, CA.
- Sep 2019 **Preckler-Quisquater S**, Sacks BN. (2019) *Does Natural Selection Affect Gene Flow Between Nonnative and Native Red Fox Populations?* Oral Presentation. The Wildlife Society National Conference. Reno, NV.
- Feb 2018 **Preckler-Quisquater S**, Anderson S, Buchalski M, Sacks BN. (2018) *Assessing selective introgression of nonnative red fox genes into the genomic background of the native Sacramento Valley red fox*. Poster Presentation. The Wildlife Society Conference Western Section Conference. Santa Rosa, CA.
- Nov 2017 **Preckler-Quisquater S**, Anderson S, Buchalski M, Sacks BN. (2017) *Assessing selective introgression of nonnative red fox genes into the genomic background of the native Sacramento Valley red fox*. Poster Presentation. CA Dept. of Fish & Wildlife Science Symposium.
- Nov 2017 **Preckler-Quisquater S**, Anderson S, Miles K, Batter TJ, Sacks BN. (2017) *Occupancy estimation as a tool to test and refine a predictive species distribution model for the Sacramento Valley red fox (*Vulpes vulpes patwin*)*. Poster Presentation. CA Dept. of Fish & Wildlife Science Symposium.
- Jun 2017 **Preckler-Quisquater S**, Anderson S, Miles K, Batter TJ, Sacks BN. (2017) *California Native Species Presentation: Sacramento Valley red fox (*Vulpes vulpes patwin*)*. Oral Presentation. California Natural Diversity Database Branch. Sacramento, CA.
- Mar 2017 **Preckler-Quisquater S**, Anderson S, Miles K, Batter TJ, Sacks BN. (2017) *Summary of Results on a three-year State Wildlife Grant funded study on the Sacramento Valley red fox (*Vulpes vulpes patwin*)*. Oral Presentation. California Dept. of Fish & Wildlife. Rancho Cordova, CA.
- Nov 2017 **Preckler-Quisquater S**, Anderson S, Miles K, Batter TJ, Sacks BN. (2017) *Occupancy estimation as a tool to test and refine a predictive species distribution model for the Sacramento Valley red fox*. Poster Presentation. CA Dept. of Fish & Wildlife Science Symposium.
- Feb 2017 **Preckler-Quisquater S**, Miles K, Batter TJ, Anderson S, Sacks BN. (2017) *Occupancy estimation as a tool to test and refine a predictive species distribution model for the Sacramento Valley red fox*. Oral Presentation. The Wildlife Society Western Section Conference. Reno, NV.
- Feb 2017 **Preckler-Quisquater S**, Miles K, Batter TJ, Anderson S, Sacks BN. (2017) *Occupancy estimation as a tool to test and refine a predictive species distribution model for the Sacramento Valley red fox*. Oral Presentation. UC Davis Graduate Student Symposium in Ecology, UC Davis. Davis, CA
- Feb 2016 **Preckler-Quisquater S**, Batter TJ, Anderson S, Sacks BN. (2016) *Increasing distribution of nonnative red fox haplotypes within the range of the native Sacramento Valley red fox*. Poster Presentation. The Wildlife Society Western Section Conference. Pomona, CA.

TEACHING

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- 1 semester **Invited Guest Lecturer**. Conservation Biology. American River College. Sacramento, CA. Fall 2020
- 3 semesters **Invited Guest Lecturer**. Ecology. American River College. Sacramento, CA. Fall 2020-2023
- 1 semester **Invited Guest Lecturer**. Wildlife Biology. American River College. Sacramento, CA. Spring 2020
- 3 semesters **Invited Guest Lecturer**. Mammalogy. Sacramento State University. Sacramento, CA. Fall 2017-2019.
- 1 quarter **Teaching Assistant**. Field Methods in Wildlife, Fish, & Conservation Biology. UC Davis, CA.
- 4 quarters **Teaching Assistant**. Introduction to Evolution. Biological Sciences Department. UC Davis, CA.
- 5 quarters **Teaching Assistant**. Introductory Biology: Principles of Ecology and Evolution. Biological Sciences Department. UC Davis. Davis, CA.
- March 2019 **Software Carpentry Instructor Training**. Trained in evidence-based pedagogy for teaching foundational computational and data science skills to diverse groups of researchers.
- Fall 2020 **Teaching Methods in Science and Society**. Training in mentorship, teaching methods, and course design

MENTORSHIP

- 2022 – 2023 **NSF REU Mentor** to Katelyn Sanchez. Ecological and Evolutionary Response to Rapid Environmental Change (EERREC) Research Experience for Undergraduates (REU). National Science Foundation. Hosted at UC Davis. Independent research project: *Genetic Diversity of the San Joaquin Kit Fox*.
- 2020 – 2021 **Career Discovery Group Mentor** to 21 first-year, UC Davis undergraduate students. Working to guide them throughout the 2020-2021 school year as they assess their skills, interests, and values, and the role in which these play in successfully choosing a major and building a career.
- 2019 – 2021 **Graduate Student Mentor** to Stephanie Oleksy. Undergraduate Animal Biology Research Practicum: *Museum skull specimens offer insight into ecologically relevant body size differences between closely related montane and lowland red fox subspecies*.
- 2018 – 2019 **Graduate Student Mentor** to Taylor Davis. Independent research project: *Optimizing tissue sampling and extraction protocol for next-generation genomic sequencing*.
- 2017 – 2018 **Graduate Student Mentor** to Emma Sutphin. Undergraduate Animal Biology Research Practicum: *Comparison of photographic and genetic determination of abundance of Sacramento Valley Red Foxes (*Vulpes vulpes patwin*) at den sites*.
- 2016 – 2017 **Graduate Student Mentor** to Nicole Gonzalez. Undergraduate Animal Biology Research Practicum: *Contrasting Relative Abundance Indices between Designated and Non-Designated Wildlife Areas*.

PROFESSIONAL AFFILIATIONS

UC Davis DataLab – Postdoctoral Affiliate
The Wildlife Society – member
Society of Conservation Biology – member
Molecular Ecology Working Group (TWS) – member
Western Section of The Wildlife Society – member

PROFESSIONAL SERVICE

- 2022 – present **Board Member** – Molecular Ecology Working Group of The Wildlife Society
- 2019, 2020 **Co-Chair** – Graduate Student Symposium in Ecology
- 2017, 2019 **Committee Member** – UC Davis Graduate Group in Ecology Admissions
- 2017, 2018 **Committee Member** – Graduate Student Symposium in Ecology
- 2016, 2017 **Meeting Representative** – Graduate Student Association

PUBLIC SERVICE & OUTREACH

- Fall 2021 **Preckler-Quisquater S.** (2021) *Trappers help fill the knowledge gap in North American red fox history*. Saskatchewan Trappers Association Magazine. Fall 2021. Popular science publication written as part of a broader coordinated effort to obtain genetic samples from trappers throughout Canadian provinces.
- Dec 2020 **Preckler-Quisquater S.** (2020) *Peaks, Valleys, and Farms: Insights into the complex heritage of western red foxes*. Yolo Basin Foundation Flyway Nights Speaker Series, **Invited Speaker**.
- 2017 – 2022 UC Davis Girls Outdoor Adventure in Leadership and Science (GOALS). **Founding member**. Developed a free, immersive summer science program for high school girls and gender-expansive youth.
- Apr 2016 **Preckler-Quisquater S.** (2021) *Current status of the Sacramento Valley red fox in light of a proposed RV Campsite development at a sensitive denning site*. CA State Parks Commission. **Invited Speaker**.

PRIOR FIELD & LAB EXPERIENCE

- Jun 2015 – **Field Technician**. Sacramento Valley red fox project. UC Davis – California Department of Fish and Wildlife. P.I. Sacks BN. Davis, CA.
- Nov 2013 – **Biological Science Technician**. Fisher Research Project, Pacific Southwest Research Station, US Forest Service. P.I. Thompson C. Oakhurst, CA.
- Apr 2013 – **Biological Science Technician**. Sierra Nevada Adaptive Management Project – Pacific Fisher Monitoring, UC Berkeley. P.I. Roller G. Oakhurst, CA.
- Jan 2012 – **Field Technician**. Mendocino Deer and Mountain Lion Project. UC Davis – California Department of Fish and Wildlife. P.I. Forrester T. Mendocino National Forest, CA.
- Sep 2010 – **Research Intern**. Giraffe Research Project. UC Davis – Kenya Wildlife Service. P.I. Vanderwaal K. Davis, CA – Ol' Pejeta Nature Conservancy, Nanyuki, Kenya.
- Dec 2010 – **Research Intern**. Chimpanzee Research Project. UC Davis. P.I. Sharpe N. Oakland Zoo, Oakland, CA
- Jun 2011 – Ol' Pejeta Nature Conservancy, Nanyuki, Kenya.