CURRICULUM VITAE

KRISTEN CAMILLE RUEGG

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&
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Appointments

2018 – Present	Assistant Professor, Colorado State University
2013 – 2018	Research Professor, University of California, Santa Cruz
2016 – 2017	Research Fellow, Edward Grey Institute for Ornithology, Oxford University
2015 - Present	Assistant Adjunct Professor, Institute for the Environment & Sustainability, University of California, Los Angeles

Education

2010	Post-doctoral Researcher, Hopkins Marine Station, Stanford University
2007	Ph.D., Integrative Biology, University of California, Berkeley
2002	M.A., Ecology and Evolutionary Biology, San Francisco State University
1998	B.A. *with honors*, University of Oregon, Robert D. Clark Honors College

Research Grants / Awards

2020 - 2025

2020 – 2023 Building a framework to genetically characterize "feather spots" and understand demographic impacts of solar energy sites on migratory bird populations, Department of Energy & Office of Energy Efficiency and Renewable Energy (#DE-EE0009005), Total Award Amount: 1.5M, CSU Subcontract Award Amount: $550,755

2019 - 2021 Conservation Genomics of Burrowing Owls in Santa Clara Valley, Santa Clara Habitat Valley Habitat Agency (#14362), PI, CSU, Award Amount: $46,366

2019 - 2022 The Bird Genoscape Project - Latin American Exchange Program, Anonymous Donation, CSU Donation Amount: $20,000

2019 - 2021 Do genomic signals of local adaptation on the breeding grounds predice microclimate associations on the wintering grounds?," UC MEXUS-CONACYT Collaborative Research Grant with Dr. Richard Feldman, Recursos Naturales, Centro de Investigacion Cientifica de Yucatan, UCLA PI, Award Amount: $25,000

2018 - 2020 RoL: FELS EAGER - Linking physiology, morphology, and genomics to investigate adaptation to rapid environmental change, National Science Foundation (#1877940), Co-PI with Rachael Bay, UC Davis, CSU Award Amount (subcontract #A19-1612-S001): $105,371

2018 - 2020 The Bird Genoscape Project – Mapping the Flyways of the Americas, National Geographic Society (#WW-202R-17), UCSC PI, Award Amount: $104,600

2018 - 2019 The Bird Genoscape Project - Latin American Exchange Program, Anonymous Donation, CSU PI, Donation Amount: $20,000

2018 - 2020 Feathers in Flight: How DNA Is Revealing the Secrets of Bird Migration, National Geographic Society, Project Partner with PI Neil Losin, Days Edge Production

2017 - 2020 Variation in phenological shifts: How do annual cycles and genetic diversity constrain or enable responses to climate change? Department of Defense (#17 RC01-044), Total Award Amount $1.7M, UCLA PI, Award Amount: $147,579

2017 - 2019 Collaborating to Map Migration in Songbirds Sharing Mexican and US Habitats, UC MEXUS-CONACYT Collaborative Research Grant with Dr. Coro Arizmendi of National Autonomous University of Mexico, UCLA PI, Award Amount: $25,000

2017 – 2019 The Bird Genoscape Project - Mapping Adaptation Under Climate Change, Anonymous Donation, UCLA PI, Donation Amount: $200,000

2016 - 2019 Development of a genoscape framework for assessing the population-level impacts of renewable energy development on migratory bird species in California, California Energy Commission (#EPC-15-043), UCLA PI, Award Amount: $599,237

2015 - 2019 The Bird Genoscape Project – Mapping the migratory flyways of North American Birds, Anonymous Donation, Co-PI, UCLA Donation Amount: $350,000

2015 - 2019 Characterizing the impacts of solar energy development on migratory birds, University of California, Los Angeles, First Solar, co-author and project manager, Donation Amount: $600,000

2012 – 2014 Developing Innovative Tools to Assess and Monitor Impacts of Existing and Future Energy Facilities on Aerial Faunas in California, California Institute for

Energy and Environment (#POEA01-Z01), Co-PI, UCSC Award Amount: $150,000

2005 - 2007 The role of migration in the process of speciation in the Swainson's thrush, *Catharus ustulatus*, Doctoral Dissertation Improvement Grant, National Science Foundation, Award Amount: $12,000

2006 International Society for Behavioral Ecology Travel Grant, Award Amount: $900

2005 Department of Integrative Biology Student Research Grant, UC Berkeley, Award Amount: $1600

2004 Beim Award for Field Research, UC Berkeley, Award Amount: $4000

2004 American Ornithologists Union, Student Research Award, Award Amount: $1600

2004 Society for Integrative and Comparative Biology, Student Research Award Award Amount: $1000

2004 Carl B. Koford Memorial Student Research Award, Museum of Vertebrate Zoology, UC Berkeley, Award Amount: $1600

2003 Annie Alexander Student Research Award, Museum of Vertebrate Zoology, UC Berkeley, Award Amount: $2000

2003 *Sigma Xi* Student Research Grant, Berkeley Chapter, Award Amount: $500

2001 Mewaldt-King Student Research Award, Cooper Ornithological Society, Award Amount: $3000

Publications in review / pending revision

Funk, Erik R., G.M. Spellman, K. Winker, J.J. Withrow, **K.C. Ruegg**, E. Zavaleta, S.A. Taylor. *in review.* Phylogenomic data reveal widespread introgression across continental islands in an alpine specialist. *Systematic Biology*.

Ashley T. Sendell-Price, **K.C. Ruegg**, S.M. Clegg. *in review.* Rapid morphological divergence following a human-mediated introduction: the role of drift and directional selection. *Journal of Heredity.*

K.C. Ruegg, Ryan J. Harrigan, J.F. Saracco, T.B. Smith, C.M. Taylor. *pending revision*. A genoscape-network model for conservation prioritization in migratory species. *Conservation Biology*.

Miller, C.A., G.C.T. Taboue, E.B. Fokam, K. Morgan, Y. Zhen, R.J. Harrigan, V.L. Underwood, **K.C. Ruegg**, P.R.S. Clee, S. Ntie, P. Mickala, T. Fuller, B. Zimkus, N.M. Anthony. *in*

review. Environmental variation predicts patterns of phenotypic and genomic variation in an African tropical forest frog. *PNAS.*

Morgan, K., J.F. Mboumba, S. Ntie, P. Mickala, C.A. Miller, Y. Zhen, Ryan J. Harrigan, V.L. Underwood, **K.C. Ruegg**, P.R.S. Clee, T. Fuller, N.M. Anthony. *pending revision.* Predicting capacity to respond to climate change using geospatial modeling of genomic and craniometric data from a Central African forest mouse. *Molecular Ecology*.

Ashley T. Sendell-Price, **K.C. Ruegg**, E.C. Anderson, C.S. Quilodrán, B.M. Van Doren, V.L. Underwood, T. Coulson & S.M. Clegg. *pending revision*. The Genomic Landscape of Divergence Across the Speciation Continuum in an Island-colonising Bird. *Evolution.*

Publications

Quilodrán, C.S., T. Coulson, E. Anderson, **K. Ruegg**, A.T. Sendell-Price, S. Clegg. *in press.* The many population genetic and demographic routes to islands of genomic divergence. *Methods in Ecology and Evolution.*

vonHoldt, B.M., R.Y. Kartzinel, C.D. Huber, V.L. Underwood, Y. Zhen, **K. Ruegg**, K.E. Lohmueller, T.B. Smith. 2018. Genetic variation at insulin-like growth factor 1 is associated with the bill size polymorphism in an African finch (*Pyrenestes ostrinus*). ***Nature Ecology and Evolution***, 9(1):4855, DOI:10.1038/s41467-018-07374-9

Bay, R. A., R. J. Harrigan, W. Beurmann, V. L. Underwood, H. L. Gibbs, T. B. Smith, and **K. C. Ruegg**. 2018. Response to comment on "Genomic signals of selection predict climate-driven population declines." ***Science,*** 361(6401): 1-2, DOI: 10.1126/science.aat7956

Ruegg, K. C., R. A. Bay, E. C. Anderson, J. Saracco, R. J. Harrigan, M. Whitefield, E. H. Paxton, T. B. Smith. 2018. Ecological genomics predicts climate vulnerability in an endangered southwestern songbird. ***Ecology Letters***, 21(7): 1085 – 1096.

Bay, R. A., R. J. Harrigan, V. L. Underwood, H. L. Gibbs, T. B. Smith, and **K. C. Ruegg**. 2018. Genomic signals of selection predict climate-driven population declines. ***Science,*** 359: 83-86.

Contina, A., R.A. Bay, V. L. Underwood, T. Smith, J. Kelly, E. Bridge, **K.C. Ruegg.** 2018. Characterization of SNP markers for the Painted Bunting (Passerina ciris) and their relevance in population differentiation and genome evolution studies. ***Conservation Genetics Resources,*** 1-6.

Contina, A., J. L. Alcantara, E. Bridge, J. D. Ross, W. F. Oakley, J. Kelly, **K.C. Ruegg.** 2018. Genetic structure of the Painted Bunting and its implications for conservation of migratory populations. ***IBIS***.

Albert, Steven**, K. Ruegg,** R. Siegel. 2018. El uso de marcadores intrinsecos y extrinsecos para enlazar poblaciones de aves a traves de las Americas. ***Zeledonia: Boletin de la Asociacion Ornithologica de Costa Rica***, 22:1: 8 – 20.

Ruegg, K. C., Anderson, E. C., Harrigan, R. J., Paxton, K. L., Kelly, J. F., Moore, F. and Smith, T. B. 2017. Genetic assignment with isotopes and habitat suitability (GAIAH), a migratory bird case study. ***Methods in Ecology and Evolution,*** 8(10): 1241-1252, http://doi:10.1111/2041-210X.12800

Bay, R. A. and **K. C. Ruegg**. 2017. Genomic islands of divergence or opportunities for adaptive introgression. ***Proceedings of the Royal Society of London: Series B,*** 284(1850): 20162414, doi: 10.1098/rspb.2016.2414

Zhen, Y., R. J. Harrigan, **K. C. Ruegg**, E. C. Anderson, T. Ng, S. Lao, K. E. Lohmueller, T. B. Smith. 2017. Genomic divergence across ecological gradients in a Central African songbird (*Andropadus virens*). ***Molecular Ecology***, 26(19): 4966-4977, doi: 10.1111/mec.14270

Frick, Winifred, J. Kelly, J. R. Shipley and **K. C. Ruegg**. 2016. University of California, Santa Cruz. Analytic Tools to Assess and Monitor Impacts of Existing and Future Energy Facilities on Aerial Faunas in California. ***California Energy Commission***. Publication Number: CEC-500-2016-071.

Ruegg, K. C., E. C. Anderson, K. L. Paxton, *V. Apkenas, S. Lao, R. B. Siegel, D. F. DeSante, F. Moore and T. B. Smith. 2014. Mapping migration in a songbird using high-resolution genetic tags. ***Molecular Ecology***, 23(23): 5726-5739. DOI: 10.1111/mec.12977.

Ruegg, K. C., E. C. Anderson, J. Boone, **J. Pouls, and T.B. Smith. 2014. A role for migration-linked genes and genomic islands in divergence of a songbird. ***Molecular Ecology,*** 23(19); 4757-4769. doi: 10.1111/mec.12842.

Rundel, C., M. B. Wunder, A. H. Alvarado, **K. C. Ruegg**, R. Harrigan, A. Schuh, J. F. Kelly, R. B. Siegel, D. F. Desante, T. B. Smith, J. Novembre. 2013. Novel statistical methods for integrating genetic and isotopic methods to study migratory connectivity. ***Molecular Ecology*****,** 22(16):4163-76.

Ruegg, K. C., H. C. Rosenbaum, E. C. Anderson, M. Engel, A. Rothschild, S. C. Baker, and S. R. Palumbi. 2013. Long-term population size of the North Atlantic humpback whale within the context of the worldwide population structure. ***Conservation Genetics***, 14(1): 103-114.

Ruegg, K. C., E. C. Anderson, H. Slabbekoorn. 2012. Differences in the timing of migration and response to sexual signaling drive asymmetric hybridization across a migratory divide. ***Journal of Evolutionary Biology,*** 25(9): 1741-50.

Hare, M.P., L. Nunney, M.K. Schwartz, D.E. Ruzzante, M. Burford, R.S. Waples, **K. C. Ruegg**, and F. Palstra. 2011. Understanding and estimating effective population size for practical application in marine species management. ***Conservation Biology,*** 25(3): 438-49.

Ruegg, K. C., E. C. Anderson, S. C. Baker, M. Vant, J. Jackson and S. R. Palumbi. 2010. Are Antarctic Minke whales unusually abundant because of 20th century whaling? ***Molecular Ecology,*** 19: 281-291.

Ruegg, K. 2008. Genetic, morphological and ecological characterization of a hybrid zone that spans a migratory divide. ***Evolution***, 62(2): 452-466.

Ruegg, K. 2007. Divergence between subspecies groups of Swainson's thrush (*Catharus ustulatus ustulatus and C. u. swainsoni*). ***Ornithological Monographs***, 63: 67-77.

*Svensson, L. M. E., **K. C. Ruegg,** C. H. Sekercioglu, R. N. M. Sehgal. 2007. Widespread and sturctured distributions of blood parasite haplotypes across a migratory divide of the Swainson's thrush (*Catharus ustulatus*). ***Journal of Parasitology***, 93(6): 1488-1495.

Ruegg, K., H. Slabbekoorn, S. Clegg and T.B. Smith. 2006. Divergence in mating signals correlates with ecology in a migratory songbird the Swainson's thrush, *Catharus ustulatus*. ***Molecular Ecology***, 15: 3147-3156.

Ruegg, K., R. Hijmans, and C. Moritz. 2006. Climate change and the origin of migratory pathways in the Swainson's thrush, *Catharus ustulatus*. ***Journal of Biogeography***, 33: 1172 - 1182.

Kelly, J., **K. Ruegg** and T.B. Smith. 2005. Combining isotopic and genetic probes to examine breeding origins of a long-distance migrant. ***Ecological Applications***, 15(5): 1487-1494.

Smith, T. B., S. M. Clegg, M. Kimura, **K. Ruegg**, B. Mila and I. Lovette. 2005. Molecular genetic approaches to linking breeding and overwintering areas in five Neotropical migrant passerines, edited by P. Marra and R. Greenberg. Smithsonian Press.

Ruegg, K. and T.B. Smith. 2002. Not as the crow flies: an historical explanation for circuitous migration in the Swainson's Thrush (*Catharus ustulatus*). ***Proceedings of the Royal Society of London: Series B***, 269: 1375-1381.

Armbruster, P., ***K. Ruegg**, W. E. Bradshaw and C. M. Holzapfel. 2001. Geographic variation and the evolution of reproductive allocation in the pitcher-plant mosquito, *Wyeomyia smithii*. ***Evolution***, 55(2): 432-444.

** undergraduate/ post-graduate mentee*
*** high school student mentee*
**** my undergraduate honors thesis*

Technical Reports and Other Publications

T. B. Smith, S. Beissinger, W. Erickson, V. Fthenakis, T. Fuller, L. George, **K. Ruegg**, R. Siegel. 2016. Defining Research Questions and Methodological Approaches for Addressing Potential Impacts of PV Solar Plants on Bird Populations. *Avian Solar Working Group Research Panel Report.*

Ruegg, K. 2012. Feature article: Connecting the Wintering and Breeding Sites of Migratory Songbirds Using New Isotopic and Genetic Methods. *MAPS Chat, The annual newsletter of the Monitoring Avian Productivity and Survivorship (MAPS) program*, Volume 12 (www.birdpop.org/downloaddocuments/MAPS_Chat_Mar_2012.pdf)

Ruegg, K. 2011. Feature article: Migratory Songbirds and Connectivity. *The Seed: UCLA Institute of the Environment and Sustainability & the Center for Tropical Research bi-annual newsletter* (http://www.environment.ucla.edu/ctr/news/article.asp?parentID=12915)

Ruegg, K. 2010. Selected shorebirds: factors that control distribution and abundance in Pacific Coast estuaries and a case study of Elkhorn Slough, California, *Elkhorn Slough National Estuarine Research Reserve*, Technical Report Series 2010: 5 (http://library.elkhornslough.org/research/bibliography/Ruegg_shorebirds_technicalreport_2010.pdf)

Ruegg K., E. C. Anderson, S. C. Baker, M. Vant, J. Jackson and S. R. Palumbi. 2010. Have Antarctic minke whales increased in abundance because of 20th century whaling? *International Whaling Commission Report,* SC/61/EM1 (http://www.iwcoffice.org/_documents/sci_com/sc61docs/SC-61-EM1.pdf)

Mila, B., S. M. Clegg, M. Kimura, **K. Ruegg**, I. Lovette, and T. B. Smith. 2005. Linking Breeding and Overwintering Areas of Five Nearctic-Neotropical Migratory Passerines Using Molecular Genetic Markers. *USDA Forest Service Gen. Tech. Rep*.: PSW-GTR-191

Teaching

Lecturer

2015, 2017	CanMove - Animal Movement and Migration Course, Lund, Sweden
2017	Case Studies in Reproducible Research, University of California, Santa Cruz
2011 - 2014	Evolution, University of California, Santa Cruz
2006	Vertebrate Natural History, University of California, Berkeley

Guest Lecturer

2013 - 2015	Conservation Biology, University of California, Los Angeles
2011	Animal Ecology & Conservation, University of California, Santa Cruz
2008 - 2009	Molecular Ecology, Stanford University
2006	Ornithology, San Francisco State University
2005	Ecology, Cabrillo Junior College

Graduate Student Instructor

2004	Animal Behavior, University of California, Berkeley
2003	Molecular Ecology, University of California, Berkeley
2000	Introductory Biology, San Francisco State University

Mentoring

Students Advised / Mentored

2019 - present Taylor Bobowski, Colorado State University (advisor)
2019 - present Marina Rodriguez, Colorado State University (advisor)
2019 - present Matthew DeSaix, Colorado State University (advisor)
2019 - present Fabiola Grissel Rodriguez Vasquez, Tulane University (committee member)
2018 – present Monica Scroggin, Colorado State University (committee member)
2016 – present Kelly Barr, University of California, Los Angeles (co-advisor)
2016 – 2018 Michaela Brinkmeyer, Boise State University (co-advisor)
2017 Theadora Block, University of California, Santa Cruz (committee member)
2014-2016 Emily Moffit, San Jose State University Masters student (committee member)
2014 Allison Nelson, San Francisco State Masters student (committee member)
2014 Alexander Rinkert, UC Santa Cruz undergraduate (honors thesis advisor)
2013 Chelsea Holman, UC Santa Cruz undergraduate (honors thesis advisor)
2007 Maria Svenson, UC Berkeley (honors thesis advisor)

Service

2019 - present *American Ornithological Society Council Member*

Associate Editor for Journals

2015 – present *Ecology Letters, Associate Editor*
2015 – 2019 *The Auk: Ornitological Advances, Associate Editor*

Reviewer for Journals: *Science, American Naturalist, Trends in Ecology and Evolution, Biology Letters, Biological Journal of the Linnean Society, Ecology, Evolution, PLoSONE, Molecular Ecology, Journal of Evolutionary Biology, Molecular Phylogenetics and Evolution, Oecologia, Journal of Avian Biology, Ecology Letters, and Journal of Heredity*

Reviewer for funding agencies

National Science Foundation – Evolutionary Ecology & Evolutionary Process Programs
National Science Foundation – DDIG Evolutionary Process Program – Panelist
National Geographic Society

Society Membership (past and present)

2018 – present Elective Member – American Ornithological Union

Society for Conservation Biology, Society for the Study of Evolution, American Ornithologist Union, Cooper Ornithological Society, Sigma Xi, Ecological Society of America

Other Synergistic Activities

2015 – Present Co-Science Advisor for the Avian Solar Working Group
2014 Student Award Reviewer, American Ornithological Union, Estes Park, CO

Invited Talks and Working Groups

2018

"The Bird Genoscape Project - Using genetics to link bird conservation efforts across the Western Hemisphere." National Audubon Society, Migration Science Day, Naples FL

UC Mexus Workshop - Hosted a workshop with Dra. Maria del Coro Arizmendi of National Autonomous University of Mexico an 50 Mexican ornithologists and field station operators on the Bird Genoscape Project and avian migration monitoring in Mexico

2016
"The Bird Genoscape Project" Invited presentation at the National Geographic Society, Washington DC

"High-resolution molecular tags for tracking migratory birds," invited lecture at Boise State University, Boise, ID

2015
"From Genes to Populations to Species – An Integrative Approach Avian Evolution, Ecology, and Conservation" invited lecture at the Edward Grey Institute for Ornithology, Oxford University

"High-resolution molecular tags for tracking migratory birds," invited lecture at the Museum of Vertebrate Zoology, University of California, Berkeley, Berkeley, CA

2014
"The causes and consequences of migratory connectivity" symposium on the future of migratory connectivity at the American Ornithological Union, Estes Park, CO

"Population genomics of a migratory divide" Department of Biology, Lund University, Lund, Sweden

"Connecting the dots in songbird conservation: how high-resolution molecular tags will replace bird banding for tracking migratory birds on a broad scale" Department of Wildlife Biology, Humboldt State University, Arcata, CA

"Applications of high resolution molecular tags for tracking migratory birds" US Fish and Wildlife Service Webinar, Region 8

2013
"Identifying migratory connections using genetic and isotopic methods," keynote speaker, National Audubon Society meeting, Atherton, CA

2012
"The genetic architecture underlying adaptive divergence in a migratory songbird," symposium on the use of Next-Generation Sequencing in Ornithological Research, North American Ornithological Congress, Vancouver, British Columbia

"Identifying migratory connections using genetic and isotopic methods," expert panelist at National Audubon Society bi-annual board meeting, Palo Alto, CA

"Islands of divergence within the Swainson's thrush (*Catharus ustulatus*) genome revealed through genome-wide sequencing," Museum of Vertebrate Zoology, University of California, Berkeley

2011
"Connecting the dots in migratory songbird conservation using feathers, isotopes, and genetic analysis," symposium on Aeroecology, Ecological Society of America, Austin, TX

"Migration and Speciation in the Swainson's thrush, *Catharus ustulatus*," Department of Ecology and Evolutionary Biology, University of California, Santa Cruz

2010
"How genetics can help solve migration mysteries and inform debates over whaling in the Antarctic," Department of Environmental Studies, University of California, Santa Cruz

Participant in MIGRATE, an NSF Research Coordination Network, the Data fusion working group, Constance, Germany

"Migratory connectivity in the Swainson's thrush and beyond," Department of Ecology and Evolutionary Biology, University of California, Los Angeles, CA

2009
"Are Antarctic minke whales unusually abundant because of whaling?," symposium on effective population size for marine conservation and management, International Marine Conservation Congress, Washington, DC

"Effective population size in baleen whales and its implications for whaling," American Cetacean Society, Monterey Chapter, Pacific Grove, CA

"The role of migratory behavior in the process of avian speciation," Hopkins Marine Station, Stanford University, Pacific Grove, CA