

Curriculum Vitae  
**BENJAMIN N. SACKS**

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## EDUCATION

- **Ph.D. Ecology.** University of California, Davis, CA. 2002  
Dissertation topic: Ecology of canine heartworm in California coyotes  
Co-Advisors: Dr. Ed P. Caswell-Chen and Dr. Michael L. Johnson
- **M.S. Wildlife Biology.** University of California, Berkeley, CA. 1996  
Thesis topic: Ecology and behavior of coyotes in relation to sheep predation  
Advisor: Dr. Dale R. McCullough
- **B.S. Biology.** University of Maryland, College Park, MD. 1991

## PROFESSIONAL RESEARCH EXPERIENCE

**Asst. Professor**, Dept of Biological Sciences, California State University, Sacramento, August 2007—present.

**Assistant Adjunct Professor**, Dept. of Population Health and Reproduction, **Director**, Canid Diversity and Conservation Laboratory, Veterinary Genetics Laboratory, University of California, Davis, January 2008—present.

**Assistant Project Scientist, Director**, Canid Diversity and Conservation Project, Veterinary Genetics Laboratory, University of California, Davis, July 2006–December 2007.

**Assistant Project Scientist**, Wildlife and Ecology Research Unit, Veterinary Genetics Laboratory, University of California, Davis, July 2005–June 2006.

**Post-Doctoral Researcher, ecological genetics**, Wildlife and Ecology Research Unit, Veterinary Genetics Laboratory, University of California, Davis, September 2002–June 2005.

**Post-Graduate Researcher, population modeling**, John Muir Institute of the Environment, University of California, Davis, 1997.

**Post-Graduate Researcher, carnivore ecology**, University of California, Davis/USDA/APHIS/National Wildlife Research Center, 1996--1997. Field research at Hopland on coyote ecology and behavior in the context of sheep predation.

**Avian Researcher**, Department of Forestry and Resource Management, University of California, Berkeley, 1993.

## COLLEGE TEACHING

- (next semester) S2009: Instructor, BIO 221B -- Field Methods in Conservation Biology (graduate level) at California State University Sacramento, 2 unit course with 6 hours of field lab per week)
- F2008: Lecturer in PHR214 – Changing Patterns of Vector-borne Infections at University of California, Davis.
- F2008: Instructor, BIO 168 – Mammalogy (upper level undergraduate) at California State University Sacramento, 3 unit course with 1 hours of lecture and 6 hours of lab per week (25 students)
- F2007, S2008, S2009: Instructor, BIO 160 - General Ecology (upper level undergraduate) at California State University Sacramento, 3 unit course with 2 hours of lecture and 3 hours of lab per week (48 students in 3 laboratory sections per semester)

- S1999: Graduate Teaching Assistant, WFC110L - Biology & Conservation of Wild Mammals Laboratory at University of California, Davis.
- F1993: Graduate Teaching Assistant, “North American Birds and Mammals” at University of California, Berkeley

#### GRADUATE GROUP MEMBERSHIP

- Faculty member of UC Davis Graduate Group in Ecology (as of April 10, 2008)
- Faculty member of UC Davis Graduate Group in Comparative Pathology (as of June 12, 2008)

#### PUBLICATIONS

- Aubry, K. A., M. J. Statham, **B. N. Sacks**, J. D. Perrine, and S.M. Wisely. *Submitted*. Quaternary zoogeography of the red fox: isolation and specialization in a generalist carnivore. *Molecular Ecology*.
- Sacks, B. N.**, D. L. Bannasch, B. B. Chomel, and H. B. Ernest. 2008. Coyotes demonstrate how habitat specialization by individuals of a generalist species can diversify populations in a heterogeneous ecoregion. *Molecular Biology and Evolution* 25:1384-1394.
- Hull, J. M., C. A. Hull, **B. N. Sacks**, J. P. Smith, H. B. Ernest. 2008. Landscape characteristics influence morphological and genetic differentiation in a widespread raptor (*Buteo jamaicensis*). *Molecular Ecology* 17:810-824.
- Sacks, B. N.**, and S. Louie. 2008. Using the dog genome to find SNPs in red foxes and other distantly related members of the Canidae. *Molecular Ecology Resources* 8:35-49.
- Sacks, B. N.**, and J. C. C. Neale. 2007. Coyote abundance, sheep predation, and wild prey correlates illuminate Mediterranean trophic dynamics. *Journal of Wildlife Management* 71:2404-2411.
- Perrine, J. D., J. P. Pollinger, **B. N. Sacks**, R. H. Barrett, and R. K. Wayne. 2007. Genetic evidence for the persistence of the critically endangered Sierra Nevada red fox in California. *Conservation Genetics* 8: 1083-1095.
- Neale, J. C. C., **B. N. Sacks**, and K. M. Blejwas. 2007. Coyote movements relative to territory boundaries: An experiment in the field. *American Midland Naturalist* 158:162-167.
- Takekawa, J. Y., **B. N. Sacks**, I. Woo, M. L. Johnson, and G. D. Wylie. 2006. Tidal marsh fragmentation and persistence of San Pablo song sparrows (*Melospiza melodia samuelis*): assessing benefits of wetland restoration in San Francisco Bay. *Studies in Avian Biology* 32:238-246.
- Sacks, B. N.**, H. B. Ernest, and E. E. Boydston. 2006. San Francisco’s Golden Gate: A bridge between historically distinct coyote (*Canis latrans*) populations? *Western North American Naturalist* 66:263-264.
- Sacks, B. N.**, B. R. Mitchell, C. L. Williams, and H. B. Ernest. 2005. Coyote movements and social structure along a cryptic population genetic subdivision. *Molecular Ecology* 14:1241-1249.
- Sacks, B. N.** 2005. Reproduction and body condition in California coyotes (*Canis latrans*). *Journal of Mammalogy* 86:1036-1041..
- Padgett, K. A., S. A. Nadler, L. Munson, **B. N. Sacks**, and W. M. Boyce. 2005. Systematics of *Mesocestoides* (Cestoda: Mesocestoididae): Evaluation of molecular and morphological variation among isolates. *Journal of Parasitology* 91:1435-1443.

- Foley, J. E., E. V. Queen, **B. N. Sacks**, P. Foley. 2005. GIS-facilitated spatial epidemiology of tick-borne diseases of coyotes (*Canis latrans*) in northern and coastal California. *Comparative Immunology, Microbiology, & Infectious Diseases* 28:197-212.
- Beldomenico, P. E., B. B. Chomel, J. E. Foley, **B. N. Sacks**, C. J. Baldi, R. W. Kasten, I. A. Gardner. 2005. Environmental factors associated with *Bartonella vinsonii* subsp. *berkhoffii* seropositivity in free-ranging coyotes from northern California. *Vector Borne and Zoonotic Diseases* 5:110-119.
- Sacks, B. N.**, S. K. Brown, and H. B. Ernest. 2004. Population structure of California coyotes corresponds to habitat-specific breaks and illuminates species history. *Molecular Ecology* 13:1265-1275.
- Sacks, B. N.**, B. B. Chomel, and R. W. Kasten. 2004. Modeling the distribution and abundance of the nonnative parasite, canine Heartworm, in California coyotes. *Oikos* 105:415-425.
- Sacks, B. N.**, D. L. Woodward, and A. E. Colwell. 2003. A long-term study of non-native-heartworm transmission among coyotes in a Mediterranean ecosystem. *Oikos* 102:478-490.
- Sacks, B.N.**, and E. P. Caswell-Chen. 2003. Reconstructing the spread of *Dirofilaria immitis* in California coyotes. *Journal of Parasitology* 89:319-323.
- Hoar, B. R., B. B. Chomel, D. L. Rolfe, C. C. Chang, C. L. Fritz, **B. N. Sacks**, and T. E. Carpenter. 2003. Spatial analysis of *Yersinia pestis* and *Bartonella vinsonii* subsp. *berkhoffii* seroprevalence in California coyotes (*Canis latrans*). *Preventive Veterinary Medicine* 56:299-311.
- Sacks, B.N.**, B. B. Chomel, R. W. Kasten, C. C. Chang, R. K. Sanders, and S. D. Leterme. 2002. Validation for use with coyotes (*Canis latrans*) of a commercially available enzyme-linked immunosorbent assay for *Dirofilaria immitis*. *Veterinary Parasitology* 109:45-58.
- Sacks, B. N.**, and J. C. C. Neale. 2002. Foraging strategy of a generalist predator toward special prey: sheep in the coyote diet. *Ecological Applications* 12:299-306.
- Blejwas, K. M., **B. N. Sacks.**, M. M. Jaeger, and D. R. McCullough. 2002. The effectiveness of selective removal of breeding coyotes in reducing sheep predation. *Journal of Wildlife Management* 66:451-462.
- Jaeger, M.M., K.M. Blejwas, **B.N. Sacks**, J.C.C. Neale, M.C. Conner, and D. R. McCullough. 2001. Targeting alphas can make coyote control more effective and socially acceptable. *California Agriculture* 55:32-36.
- Neale, J. C. C., and **B. N. Sacks**. 2001. Food habits and space use of gray foxes in relation to sympatric coyotes and bobcats. *Canadian Journal of Zoology* 79:1794-1800.
- Sacks, B. N.** and J. C. C. Neale. 2001. Does paternal care of pups benefit breeding female coyotes (*Canis latrans*)? *Southwestern Naturalist* 46:121-126.
- Neale, J. C. C., and **B. N. Sacks**. 2001. Resource utilization and interspecific relations of sympatric bobcats and coyotes. *Oikos* 94:236-249.
- Sacks, B. N.**, and K. M. Blejwas. 2000. Effects of canine heartworm (*Dirofilaria immitis*) on body condition and activity of free-ranging coyotes (*Canis latrans*). *Canadian Journal of Zoology* 78:1042-1051.
- Sacks, B. N.**, M. M. Jaeger, J. C. C. Neale, and D. R. McCullough. 1999. Territoriality and breeding status of coyotes relative to predation on sheep. *Journal of Wildlife Management* 63:593-605.
- Sacks, B. N.**, K. M. Blejwas, and M. M. Jaeger. 1999. Relative vulnerability of coyotes to removal methods on a northern California ranch. *Journal of Wildlife Management* 63:939-949.
- Sacks, B. N.** 1998. Increasing prevalence of heartworm in coyotes from California. *Journal of Wildlife Diseases* 34:386-389.
- Neale, J. C. C., **B. N. Sacks**, M. M. Jaeger, and D. R. McCullough. 1998. A comparison of bobcat and coyote predation on lambs. *Journal of Wildlife Management* 62:700-706.

Lynn, S., M. L. Morrison, A. J. Kuenzi, J. C. C. Neale, **B. N. Sacks**, R. Hamlin, and L. S. Hall. 1998. Bird use of riparian vegetation along the Truckee River, California and Nevada. *Great Basin Naturalist* 58:328-343.

## GRANTS AND CONTRACTS

- **Status assessment of the native Sacramento Valley red fox.** California Department of Fish and Game, 2008--2010 (\$161,940). PI: B. N. Sacks (submitted 4/15/08; finalized 9/5/08).
- **Pilot study on the status of the native Sacramento Valley red fox.** California Department of Fish and Game, Resource Assessment Program Dec 2007--July 2009 (\$187,500). PI: B. N. Sacks, Co-PI: H. Wittmer.
- **Identification of Sierra Nevada red foxes and other forest mammals from fecal DNA.** California Department of Fish and Game, Northern Region, 12/1/2008—5/31/2009 (\$9,880). PI: B. N. Sacks (pending).
- **“Developing SNPs for the red fox (*Vulpes vulpes*) : a tool to assess taxonomic designations and hybridization and displacement of the native by the nonnative red fox in North America”** Academic Federation Research Grant Program--Innovative Development Awards 2005-2007 (\$10,000). PI: B. N. Sacks.
- **Red fox SNP assay development.** UC Davis Genome Center Core Facility Pilot Project Grant. PI: B. N. Sacks (submitted 5/28/08; funded 7/16/08) (\$2,000)
- **A SNP assay to survey the genomic diversity of native Sacramento Valley red foxes relative to native (but allopatric) Sierra Nevada red foxes and nonnative (but parapatric) red foxes.** Biological Survey grant of the Goethe Bequest (\$2,500). PI: B. N. Sacks (submitted 4/21/08; funded 6/10/08)
- **Determination of inbreeding and population of origin of Shemya Island Arctic foxes (*Alopex lagopus*) using mitochondrial and nuclear microsatellite markers.** Colorado State University (\$1,485). PI: B. N. Sacks, Co-PI: Paula White, Terry Spraker (September 2008).
- **Undergraduate research: Use of noninvasive genetic sampling to directly assess inbreeding in native Sacramento Valley red foxes, Project Grant,** College of Natural Sciences and Mathematics, California State University, Sacramento, summer 2008 (\$500). PI: B.N. Sacks, Undergraduate researcher: Deborah Lytle.
- **University Enterprises, Incorporated Faculty Grant.** Page charges (\$1000) for manuscript submitted to *Molecular Biology and Evolution*.
- University of California, Davis, Academic Federation Travel Grant for "The Wildlife Society 13<sup>th</sup> Annual Conference" in Anchorage, AK. September 2006 (\$800).
- **Canid genetic resource collection.** Genetic Resources Conservation Program 2004-2005 (\$1000). Co-PI: B. N. Sacks, PI: H. B. Ernest.
- **"Canid genetic resource collection."** Genetic Resources Conservation Program 2003-2004 (\$750); Co-PI: B. N. Sacks, PI: H. B. Ernest.
- **"Canid genetic resource collection."** Genetic Resources Conservation Program 2002-2003 (\$1900); Co-PI: B. N. Sacks, PI: H. B. Ernest.
- **"Can geographic range of an invasive macroparasite be predicted based on physiography? Test of an approach using heartworm in California coyotes as a model system."** National Science Foundation invasion biology IGERT research grant 2002 (\$4,500); Student Investigator: B. N. Sacks.
- University of California, Davis, Graduate Group in Ecology Travel Grant for "Carnivores 2002" conference in Monterey, California. November 2002 (\$700); Student Investigator: B. N. Sacks.

- **"Does canine heartworm (*Dirofilaria immitis*) reduce survival and reproductive output of coyotes (*Canis latrans*)?"** Jastro-Shields Research Grant 2001 (\$3,000) ; Student Investigator: B. N. Sacks.
- **"Serosurveillance of Canine Heartworm in California Coyotes: Validation of an ELISA test and Nobuto ® Strips for Blood Collection."** Wildlife Health Center, Research Grant, 2001 (\$3,333); Co-Investigator: B. N. Sacks; PI: B. B. Chomel.
- University of California, Davis, Graduate Studies Travel Grant for "Canid Biology and Conservation" conference in Oxford, UK. September 2001 (\$600).
- **"Spatio-temporal distribution of canine heartworm (*Dirofilaria immitis*) in its vector (mosquito; *Aedes sierrensis*) population: implications for transmission among coyotes (*Canis latrans*)."** Jastro-Shields Research Grant 2000 (\$2,971); Student Investigator: B. N. Sacks.
- United States Geological Survey Golden Gate Field Station. Contract to perform genetic analyses on coyotes and foxes in the Presidio, San Francisco. September 2003 (\$320).

#### RECENT UNFUNDED GRANT PROPOSALS

- **Undergraduate research: Use of noninvasive genetic sampling to directly assess inbreeding in native Sacramento Valley red foxes, Student Stipend,** College of Natural Sciences and Mathematics, California State University, Sacramento, summer 2008 (\$5,000). PI: B.N. Sacks, Undergraduate researcher: Deborah Lytle.
- **"Collaborative Research: coat-color genetics and the phenotypic shift in North American red foxes: a molecular genetic analysis of museum specimens (1850—1950)"** U. S. National Science Foundation 2006-2008 (\$299,227); PI: BN Sacks, Co-PI: R. K. Wayne (UCLA)

#### FELLOWSHIPS

- National Science Foundation invasion biology IGERT fellowship 2002 (\$4,500)
- Fletcher-Jones Fellowship 2001(\$15,833)
- University of California, Davis, Graduate Fellowship 1998--2002 (\$41,000)

#### ACADEMIC AWARDS AND HONORARIA

- Jones & Bartlett Publishers, Honorarium (\$100) for the review of Mammalian Ecology and Behavior chapters of textbook "Mammalogy, 5<sup>th</sup> Ed.", by Vaughan, Ryan, and Czaplewski' (Dec. 2008)
- National Wildlife Research Center 1999 Award for Outstanding Publication (Sacks et al. 1999a).
- Jack H. Berryman Institute Research Award 1999 (to project PIs) for 4 papers, including Sacks et al. (1999a), Sacks et al. (1999b), and Neale, Sacks et al. (1998).

#### RECENT OR FUTURE SYMPOSIA, INVITED LECTURES, AND PUBLIC COMMUNICATIONS

- 1/09. (submitted abstract). "Use of nuclear DNA microsatellites to determine evidence of interbreeding between the native Sacramento Valley red fox and the nonnative red fox." Moore M, Brown S, Statham M, Wittmer H, Sacks B. 2009 Western Section of the Wildlife Society Annual Conference, Sacramento, CA.
- 4/2/08. Invited speaker (host: Pam Helmke), California Parks Conference, Lake Tahoe. "History and current research on California red fox populations: Disentangling the roles of biogeography and human introductions."
- 2/6/08. Chair of Carnivores session in 2008 Western Section of the Wildlife Society Annual Conference, Redding, CA.

- 2/6/08. Co-Chair Symposium at the 2008 Western Section of the Wildlife Society Annual Conference, Redding, CA.: “Managing California’s Native Red Fox: Recent Findings and Implications”
- 2/6/08. Speaker at the 2008 Western Section of the Wildlife Society Annual Conference, Redding, CA.: “Native red foxes in the Sacramento Valley: Research update and implications”
- 2/6/08. Co-author on talk at the 2008 Western Section of the Wildlife Society Annual Conference, Redding, CA.: “Assessing the conservation status of the native Sacramento Valley red fox”
- 3/26/07. Filmed interview on coyote movements at multiple scales for a documentary on Migration as part of the Natural History Series of the Los Angeles County Museum of Natural History.
- 2/14/07. Invited speaker for the UC Berkeley Museum of Vertebrate Zoology Seminar Series. Talk: “**History of California (and other North American) red fox populations: Disentangling the roles of biogeography and human introductions.**”
- 2/2/07. Presentation in the The Wildlife Society, Western Section Annual Conference, Monterey, CA. Talk: “**Is the Sacramento Valley red fox an overlooked native population?**”
- 11/13/06. Lecture to Natural Resources class, American River College, topic: **Wildlife Management**, hosted by Professor Jennifer Neale.
- 11/8/06. Presentation for the Dept. of Biological Sciences, California State University, Sacramento, “**Using genetic methods to study how mammals confront landscapes on ecological and evolutionary time scales.**”
- 10/30/06. Invited speaker, UC Davis, Department of Animal Science Seminar Series. Talk: “**Is the Sacramento Valley red fox an overlooked native population?**”
- 10/25/06. Presentation in the Natural Resources Symposium, Sacramento-Shasta chapter of The Wildlife Society, CSU Sacramento. Talk: “**Is the Sacramento Valley red fox an overlooked native population?**”
- 10/18/06. Lecture to Conservation Biology class, American River College, topic: **Applications of Genetics in Conservation Biology**, hosted by Professor Jennifer Neale.
- 9/25/06. Invited participant: Applications of Landscape Genetics to Wildlife Management Symposium organized by Professors Lisette Waits and Kim Scribner, held at the Wildlife Society Meeting in Anchorage, Alaska, September 23-27, 2006. Talk: 9/25, 10:30 am, “**Habitat specialization in a generalist species, the coyote, diversifies populations in a heterogeneous landscape.**”
- 2002. Seminar, Hosted by Professor Gary Roemer. New Mexico State University, Las Cruces. "Are coyotes on a sheep ranch like kids in a candy store? and other stories from California."
- 2002. Seminar, University of California, Davis. Community Ecology seminar series. "Are coyotes on a sheep ranch like kids in a candy store? and Coyotes, sheep, and wild prey: a model system for vertebrate trophic relationships in Mediterranean climates."
- 1999. Invited lecture, Hosted by Professor Dirk VanVuren. University of California, Davis. Application of ecological principles toward wildlife damage problems: a case study of coyotes and sheep depredation.
- **Teaching Assistant.** 1999. University of California, Davis. Laboratory Instructor for upper division undergraduate course, WFCB 110, "Ecology and Conservation of Wild Mammals."
- 1997. Invited lecture, Hosted by Professor Dirk VanVuren. University of California, Davis. Lecture on wildlife damage management.

#### **ELEMENTARY TEACHING EXPERIENCE**

- **Science Teacher/Naturalist**, Los Angeles County Office of Education, Wrightwood, CA, 1991–1993.

- **Environmental Education Director**, Linwood-MacDonald Environmental Education Center, Branchville, NJ, 1989–1990.
- **Science Teacher**, Orange County Office of Education, Costa Mesa, CA, 1989.

#### **ACADEMIC AND COMMUNITY SERVICE**

- California interagency Red Fox Working Group (2006—present).
- Graduate Committee, CSUS, Dept. Biological Sciences (Fall 2008)
- Science II building planning committee, CSUS, College of Natural Sciences and Mathematics (Fall 2008)
- Van pool committee Chair, CSUS, College of Natural Sciences and Mathematics (Spring 2008)
- Presentation to the Veterinary Genetics Laboratory, UC Davis, Annual Retreat (Mar 10, 2005)
- Presentation to the Genetic Resources Conservation Program—California State Parks—Genetic Monitoring Workshop (Feb 16, 2005)
- Moderator Conservation Genetics Session of Bay Area Conservation Biology Symposium (1/31/04)
- National Science Foundation proposal reviewer
- University of California, School of Veterinary Medicine, Wildlife Health Center, competitive grants committee 2002
- Reviewer for the following scientific journals: Proceedings of the Royal Society of London Series B, Molecular Ecology, Journal of Applied Ecology, Journal of Mammalogy, Acta Theriologica, Canadian Journal of Zoology, Journal of Wildlife Management, Western North American Naturalist, Comparative Parasitology, Southwestern Naturalist, Journal of Zoology, Folia Zoologica, Journal of Wildlife Diseases, Biological Conservation, Genetica