

20 July 2022

Statement of Past and Anticipated Involvement: Erin W. Rankin

Cooperating Faculty Appointment (Botany/Plant Sciences)

I am an associate professor in the Department of Entomology and am excited about the opportunity to participate in the Plant Biology graduate group as a cooperating faculty member. Given my area of research (invasive species ecology and trophic biology), my interests align with those of the Plant Biology program.

An ecologist by training, I am actively working in a variety of study systems, including painted lady butterfly use of native and non-native plants, invasive insects and plants in island systems, as well as hummingbird and insect-plant interactions in the California Floristic Province. My research integrates field ecology, molecular ecology and trophic theory in an invasion context. The lab currently has three main areas of research: (1) examining the trophic and ecological impacts of biological invasions, (2) examining the ecological and genetic basis of life history shifts in invasive social wasps, and (3) examining effects of drought on interactions among native-non-native species. I am excited by having graduate students through the plant biology program that could work on any aspect of invasive species ecology. I am pleased to currently serve as the major professor for Jolene Saldivar, a Plant Biology PhD candidate and GRFP Fellow. We just heard that the first chapter of her thesis on painted lady butterfly nectar plant use has been provisionally accepted for publication! In addition to serving as major professor, I have been involved in the graduate program through student committees: I have served on two qualifying exam committees and two dissertation committees. As a CFM, I hope to continue such participation on student committees and start new collaborations with its faculty. Please let me know if you require any additional information. Thank you!

Sincerely,

A handwritten signature in cursive script that reads "Erin Wilson Rankin".

Erin Wilson Rankin

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PROFESSIONAL PREPARATION.

Georgetown University, Washington, DC	Biology	BS	2002
Univ. California, San Diego	Biological Sciences	Ph.D.	2009

APPOINTMENTS.

2019-present	Associate Professor, Department of Entomology, Univ. California, Riverside
2013-2019	Assistant Professor, Dept. of Entomology, Univ. California, Riverside
2011-2013	Postdoctoral researcher, Dept. of Entomology, Univ. Maryland, College Park
2010	Postdoctoral researcher, Dept. of Entomology, Univ. California, Davis

RESEARCH AREA.

My broad area of research is community ecology with a strong focus on invasive species and trophic interactions.

HONORS AND AWARDS.

2022	Distinguished Achievement in Teaching, Pacific Branch Entomological Society of America
2021	Outstanding Faculty Mentor, Dept Entomology, UCR
2021	Academic Senate Distinguished Teaching Award (UCR)
2015-2016	Hellman Fund Fellow
2007-2009	ARCS Foundation Fellow
2006	Jeanne Marie Messier Memorial Fund Scholar

TEACHING.

2020-present	ENTM 130 <i>Invasion Ecology</i>
2019-present	ENTM 060W <i>SciComm: Exploring Effective Communication Methods in the Life Sciences</i> (co-taught)
2016-present	ENTM 257 <i>Pollination Ecology</i> (co-taught graduate seminar)
2014-present	ENTM 010 <i>Natural History of Insects</i> (non-majors course, enrollment ~320)
2015-2019	BIOL 5C <i>Introductory Biology: Ecology & Evolution</i> (the Ecology section of the introductory biology series, enrollment 220)

ADVISING.

Post-doctoral mentor to JA Hazlehurst (2016-2019), KJ Loope (2015-2018) and CS Sidhu (2014-2016)
Major graduate advisor to one Entomology PhD student (JM Cecala, PhD, 2021) and one Plant Biology PhD student (J. Saldivar, PhD exp 2024)
Major graduate advisor to four Entomology MS students: K Merrill (MS, 2015), MC Miner (MS, 2018), R. Norris (MS, 2020), and C. Allen (MS, 2022)

SYNERGISTIC ACTIVITIES.

1. Mentoring: Participation in mentoring programs aimed at providing under-represented groups opportunities to participate in research: NSF-funded graduate training grant in Computational Entomology (2017-present), Summer Bridge to Research (UCR 2015-present), Research in Science and Engineering (RISE) (UCR 2016-present), REU Site: Computational Entomology (UCR 2017), Pacific Internship Programs for Exploring Science (UH Hilo: 2012), and Opportunities for Research in the Behavioral Sciences (UC San Diego: 2004-2007). Served as judge for graduate posters and oral presentations Entomological Society of America (2018), AAAS meeting (2014) and annual meeting of

the Ecological Society of America (2012). Served as poster judge for Univ. of Maryland Bioscience Day (2011).

2. Service to K-12 education: speaker to Women in Math and Science, middle school outreach in Riverside, CA. Participate in Touch-a-bug outreach events to K-12 students and organize public outreach activities involving species interaction networks. Working with renowned children's book artist, Ramon Shiloh, on illustrating a pollination activity book for K-6 (expected publication 6/2022)

3. Peer reviewer: *Publications*: more than 98 peer-reviewed manuscripts, including Ecology Letters, Ecology, Molecular Ecology, OIKOS, Behavioral Ecology, Annual Review of Entomology, Biological Conservation, Biological Invasions, BioScience, Ecology & Evolution, Journal of Applied Ecology, Restoration Ecology, PLoS One, Insectes Sociaux, Ecological Entomology, Ecological Applications, Insect Conservation and Diversity, Psyche, Journal of Apicultural Research, Pacific Science and Proceedings of the Hawaiian Entomological Society. *Grant Panels*: NSF Population and Community Ecology Review Panel, NSF Graduate Research Fellowship Program (Ecology & Organismal Biology panels), USDA AFRI Review Panel, UC Division of Agriculture and Natural Resources, UCR Hellman Fund Review Panel

4. Editorial service: Editorial Board Food Webs (2014-present)

5. Curriculum development: Developing expertise in outreach curriculum for K-6 children, through formal instruction and workshop training on active learning methods. Experience developing small educational modules for undergraduate and public audiences through continued involvement in the National Academies Summer Institute as participant and facilitator, conservation-based outreach and teaching of the non-majors Natural History of Insects course. Developing bilingual activity books for children to teach about pollinators and their associates. Developed two new undergraduate entomology courses (*Invasion Ecology* and *SciComm: Exploring Effective Communication Methods in the Life Sciences*), which both focus on critical skills for early career scientists, including writing and science communication as well as practical skills such as conducting species monitoring surveys, risk assessments and impact assessments. Developed and serve as faculty advisor for the new Combined BS+MS Program in Entomology, which allows students to obtain both a BS and MS degrees through an integrated 5-year plan of study. This program prepares students for careers that require knowledge of entomology and for pursuing subsequent medical or doctoral degrees. This program (started in Fall 2019) has graduated 2 MS students, with 3 more expected to graduate by Spring 2022 and 4 more in the last year of their Bachelor's degree program.

RESEARCH PUBLICATIONS. (53 publications total, 29 published since promotion to associate professor) [†] indicates an undergraduate co-author; ^{††} indicates a graduate student co-author

Accepted/In press

53. Sidhu, C., Lozano, GE, Miner, MC^{††}, Howe, E, **Wilson Rankin, E.E.** (In Press) Pollination ecology of island endemic plants: a case study on the California Channel Islands. *Western North American Naturalist*. [Accepted 21 June 2022]
52. Knowlton, JL, RE Crafford[†], BA Tinoco, PS Padron, and **EE Wilson Rankin.** (In Press) High foraging fidelity and plant-pollinator network dominance of non-native honey bees (*Apis mellifera*) in the Ecuadorian Andes. *Neotropical Entomology*. doi: 10.1007/s13744-022-00967-6

Published

51. Cecala, J. M. ^{††}, and **E. E. Wilson Rankin.** (2022). Diversity and turnover of wild bee and ornamental plant assemblages in commercial plant nurseries. *Oecologia* 198:773-783.
50. Rankin, DT, KJ Loope, and **EE Wilson Rankin.** (2022). Seasonal phenology and colony longevity patterns in a predatory social wasp. *Western North American Naturalist*. 82(1): e13

49. Olimpi, E. M., K. Garcia^{††}, D. J. Gonthier, C. Kremen, W. E. Snyder, **E. E. Wilson-Rankin**, and D. S. Karp. (2022). Semi-natural habitat surrounding farms promotes multifunctionality in avian ecosystem services. *Journal of Applied Ecology* 59:898-908.
48. Smith, O.M. ^{††}, Olimpi, E.M., Navarro-Gonzalez, N., Cornell, K.A., Frishkoff, L.O., Northfield, T.D., Bowles, T.M., Edworthy, M., Eilers, J., Fu, Z., Garcia, K. ^{††}, Gonthier, D.J., Jones, M.S., Kennedy, C.M., Latimer, C.E., Owen, J.P., Sato, C., Taylor, J. ^{††}M., **Wilson-Rankin, E.E.**, Snyder, W.E. and Karp, D.S. (2022), A trait-based framework for predicting foodborne pathogen risk from wild birds. *Ecological Applications*. 32(2): e2523.
47. Taylor, J. ^{††}, OM Smith^{††}, M. Edworthy, CM Kennedy, CE Latimer, JP Owen, **E Wilson Rankin** and WE Snyder. (2022). Bird predation and landscape context shape arthropod communities on broccoli. *Ornithological Applications*. doi:10.1093/ornithapp/duac005
46. Smith, O^{††}; Kennedy, CM.; Echeverri, A; Karp, D; Latimer, C; Taylor, J^{††}; **Wilson-Rankin, EE** ; Owen, J; Snyder, WE. (2022) Complex landscapes stabilize farm bird communities and their expected ecosystem services. *Journal of Applied Ecology*. 59(4): 927-941.
45. Cecala, JM^{††} & **EE Wilson Rankin**. (2022). Petals and leaves: quantifying the use of nest building materials by the world's most valuable solitary bee. *Ecology*. 103(2): e03584 doi:10.1002/ecy.3584
44. Spence, AR^{††}, **EE Wilson Rankin**, and MW Tingley. 2022. DNA metabarcoding reveals broadly overlapping diets in three sympatric North American hummingbirds. *Ornithology* (formerly known as *The Auk*). 139 (1): ukab074
43. Cecala, J.M. ^{††} & **E.E. Wilson Rankin**. 2021. Pollinators and plant nurseries: how irrigation and pesticide treatment of native ornamental plants impact solitary bees. *Proc Roy Soc B*. 288(1955): e2021187
42. Scarparo, G.; Sankovitz, M^{††}; Loope, KJ; **Wilson-Rankin, EE**; Purcell, J. 2021. Early queen joining and long-term queen associations in polygyne colonies of an invasive wasp revealed by longitudinal genetic analysis. *Evolutionary Applications*. 14: 2901-2914.
41. Rothman, J^{††}; Loope, KJ; McFrederick, QS; and **Wilson Rankin, EE**. Microbiome of the wasp *Vespula pensylvanica* in native and invasive populations, and associations with Moku virus. *PLoS One*. 16(7):e0255463
40. Loope, KJ and **EE Wilson Rankin**. (2021) Viral load, not food availability or temperature, predicts colony longevity in an invasive eusocial wasp with plastic life history. *Sci Reports*. 11: Article number: 10087.
39. Muletz-Wolz CR, **Wilson Rankin E**, McGrath-Blaser S, Venkatraman M^{††}, Maldonado JE, Gruner DS and Fleischer RC (2021) Identification of novel bacterial biomarkers to detect bird scavenging by invasive rats. *Ecology and Evolution*. 11: 1814-1828.
38. Cecala, J.M. ^{††} and **E.E. Wilson Rankin**. (2021). Wild bee functional diversity and plant associations in native and conventional plant nurseries. *Ecological Entomology*. 46: 1283-1292
37. **Wilson Rankin E.E.** (2021) Emerging patterns in social wasp invasions. *Current Opinion in Insect Science*, 46: 72–77.
36. Hazlehurst, J.A., D.T. Rankin, C.J. Clark, Q.S. McFrederick, and **E.E. Wilson Rankin**. (2021). Macroecological patterns of resource use in resident and migratory hummingbirds. *Basic Appl. Ecol.* 51: 71-82.
35. Barney SK[†], Fukami T, Flaspohler DJ, Giardina CP, Gruner DS, Leopold DR, Knowlton JL, Pitt WC, **Wilson Rankin EE**. 2021 Successful management of invasive rats across a fragmented landscape. *Environmental Conservation*, 48(3), 200-207
34. Kim, A.Y.[†], Rankin, D.T., **Wilson Rankin, E.E.** (2021) What is that smell? Hummingbirds avoid foraging on resources with defensive insect compounds. *Behav Ecol Sociobiol* 75: e132 10.1007/s00265-021-03067-4
33. **Wilson Rankin EE**, Barney SK[†] and Lozano GE[†] (2020) Reduced water negatively impacts social bee survival and productivity via shifts in floral nutrition. *J Ins Sci*. 20: 10.1093/jisesa/ieaa1114
32. Phan P[†], Purcell J and **Wilson Rankin EE** (2020) *Formica francoeuri* responds to pheromones and defensive chemical cues of social bees. *Ins Soc* 67: 547-556

31. **Wilson Rankin EE**, Cecala JM^{††}, Hernandez Pineda N[†], Lu QY[†], Pelayo E[†] and Choe D-H (2020) Differential feeding responses of several bee species to sugar sources containing iridomyrmecin, an Argentine ant trail pheromone component. *J Ins Behav.* 33: 83-90
30. Olimpi EM^{††}, Garcia K^{††}, Gonthier DJ, De Master KT, Echeverri A, Kremen C, Sciligo AR, Snyder WE, **Wilson-Rankin EE** and Karp DS (2020) Shifts in species interactions and farming contexts mediate net effects of birds in agroecosystems. *Ecol Appl.* 10.1002/eap.2115: e02115.
29. Harrop TWR, Guhlin J, McLaughlin GM, Permina E, Stockwell P, Gilligan J, Le Lec MF, Gruber MAM, Quinn O, Lovegrove M, Duncan EJ, Remnant EJ, Van Eeckhoven J, Graham B, Knapp RA, Langford KW, Kronenberg Z, Press MO, Eacker SM, **Wilson-Rankin EE**, Purcell J, Lester PJ and Dearden PK (2020) High-quality assemblies for three invasive social wasps from the *Vespula* genus. *G3: Genes|Genomes|Genetics* 10: 3479-3488
28. Cecala JM^{††} and **Wilson Rankin EE** (2020) Mark–recapture experiments reveal foraging behavior and plant fidelity of native bees in plant nurseries. *Ecology.* 101: e03021
27. Cecala JM^{††}, Baronia DA[†] and **Wilson Rankin EE** (2020) Sugar content of diet does not buffer against chronic oral imidacloprid exposure in the alfalfa leafcutting bee (Hymenoptera: Megachilidae). *J Econ Entomol.* 10.1093/jee/toaa194
26. Bodden J[†], Hazlehurst JA and **Wilson Rankin EE** (2019) Floral traits predict frequency of defecation on flowers by foraging bumble bees. *J Ins Sci.* 19: e2
25. Loope, K. J., Baty, J. W., Lester, P. J., & **Wilson Rankin, E. E.** (2019). Pathogen shifts in a honeybee predator following the arrival of the *Varroa* mite. *Proc Roy Soc B.* 286(1894), 20182499.
24. Miller SE, Blucher SE, Bell E, Cini A, Silva RCD, de Souza AR, Gandia KM, Jandt J, Loope K, Prato A, Pruitt JN, Rankin D, **Wilson Rankin E**, Southon RJ, Uy FMK, Weiner S, Wright CM, Downing H, Gadagkar R, Lorenzi MC, Rusina L, Sumner S, Tibbetts EA, Toth A & Sheehan MJ (2018). WASPnest: a worldwide assessment of social Polistine nesting behavior. *Ecology.* doi: 10.1002/ecy.2448
23. Merrill KC^{††}, Boser CL, Hanna C, Holway DA, Naughton I^{††}, Choe D & **Wilson Rankin EE.** (2018) Argentine Ant (*Linepithema humile*, Mayr) eradication efforts on San Clemente Island, CA, USA. *West N Amer Nat.* 78:e32.
22. Melgarejo V[†], **Wilson Rankin EE** & Loope KJ (2018) Do queen cuticular hydrocarbons inhibit worker reproduction in *Bombus impatiens*? *Ins Soc.* doi: 10.1007/s00040-018-0651-6
21. Rankin DT, Clark CJ & **Wilson Rankin EE** (2018) Hummingbirds use taste and touch to discriminate against nectar resources that contain Argentine ants. *Behav Ecol Sociobiol* 72:e44.
20. Johnston CA^{††}, **Wilson Rankin EE** & Gruner DS (2018) Foraging connections: Patterns of prey use linked to invasive predator diel movement. *PLoS One.* 13:e0201883.
19. Loope KJ, Millar JG & **Wilson Rankin EE** (2018) Weak nestmate discrimination behavior in native and invasive populations of a yellowjacket wasp (*Vespula pensylvanica*). *Biol Inv.* doi: 10.1007/s10530-018-1783-3
18. **Wilson Rankin EE**, Knowlton JL, Flaspohler DJ, Buckhardt A[†], Fukami T, Giardina CP, Gruner DS & Pitt WC (2018) Hawaiian forest birds show vertical niche partitioning via behavioral plasticity in response to invasive rats across a gradient of forest patch size. *PLoS One.* 13: e0202869.
17. Sidhu CS & **Wilson Rankin EE** (2018) Distribution and characterization of wild bee nesting sites on San Clemente Island, California Channel Islands. *West N Amer Nat.* 78: 811-819.
16. Levan KE^{††}, Barney SK[†] & **Wilson Rankin EE** (2018) Introduced ants reduce interaction diversity in a multi-species, ant-aphid mutualism. *OIKOS.* 127:1132-1141.
15. Knowlton JL, Flaspohler DJ, Paxton EH, Fukami T, Giardina CP, Gruner DS & **E.E. Wilson-Rankin.** (2017) Movement behavior of native Hawaiian birds in a naturally fragmented landscape. *J Avian Biology.* 48:921-931.
14. Dobelmann J^{††}, Loope KJ, **Wilson Rankin E.E.**, Quinn O, Baty JW, Gruber M & Lester PJ. (2017) Fitness in invasive social wasps: the role of variation in viral load, immune response and paternity in predicting nest size and reproductive output. *OIKOS.* 126:1208-1218.

13. Rust, MK, Choe D, **Wilson Rankin, EE**, Campbell K, Kabashima J & Dimson M. (2016) Controlling yellowjackets with fipronil-based protein baits in urban recreational areas. *International Journal of Pest Management*. 63:234-241.
12. Sidhu, CS & **Wilson Rankin EE**. (2016) Honey bees avoiding ant harassment at flowers using scent cues. *Environmental Entomology*. 45:420-426.
11. Sidhu, CS, Calloway SM, Barney SK & **Wilson Rankin EE**. (2016) Host records of *Grammia ursina* Schmidt, 2009 on San Clemente Island and its potential effect on rare plant restoration (Lepidoptera: Noctuidae: Arctiinae). *Pan Pacific Entomologist*. 92(3):151-6.
10. **Wilson Rankin, EE**. (2015) Level of experience modulates individual foraging strategies of an invasive predatory wasp. *Behavioral Ecology & Sociobiology*. 69(3): 491-499.
9. **Wilson Rankin, EE**. (2014) Context-dependent recruitment behavior in an invasive social wasp. *Behavioral Ecology & Sociobiology*. 68(7): 1151-1161.
8. **Wilson, EE*** & Wolkovich EM. (2011) Scavenging: how carnivores and carrion structure communities. *Trends in Ecology and Evolution*. 26: 129-135.
7. **Wilson, EE***, Sidhu CS[†], LeVan KE & Holway DA. (2010) Pollen foraging behaviour of solitary Hawaiian bees revealed through molecular pollen analysis. *Molecular Ecology*. 19:4823-4829.
6. **Wilson, EE*** & Holway DA. (2010) Multiple mechanisms underlie displacement of solitary Hawaiian Hymenoptera by an invasive social wasp. *Ecology*. 91:3294-3302.
5. **Wilson, EE***, Young CV[†] & Holway DA. (2010) Predation or scavenging? Thoracic muscle pH and rates of water loss reveal cause of death in arthropods. *Journal of Experimental Biology*. 230: 2640-2646.
4. **Wilson, EE***, Mullen LM & Holway DA. (2009) Life history plasticity magnifies the ecological effects of a social wasp invasion. *Proceedings of National Academy of Sciences*. 106: 12809-12813.
3. Eckles, MA, **Wilson EE***, Nieh JC & Holway DA. (2008) The social yellowjacket, *Vespula pensylvanica*, regulate body temperature in response to protein resource quality. *Naturwissenschaften*. 95:787-92.
2. **Wilson, EE***, Holway DA & Nieh JC. (2006) Cold anesthesia decreases foraging recruitment in the New World bumblebee, *Bombus occidentalis*. *J Apicultural Research*. 45:169-172.
1. Weiss, MR, **Wilson EE*** & Castellanos I. (2004) Predatory wasps learn to overcome the shelter defenses of their larval prey. *Animal Behaviour*. 68:45-54.

Manuscripts Under Review.

1. Sankovitz, M., KJ Loope, **EE Wilson Rankin** & J Purcell. Cheating early in a social transition: insights from invasive yellowjacket wasps. *In Review. American Naturalist*
2. Saldivar, J., A. Romero[†], and **E.E. Wilson Rankin**. Community science reveals high diversity of nectaring plants visited by painted lady butterflies (*Vanessa cardui*). *In Review (provisionally accepted pending minor revision). Environmental Entomology*.
3. M. Argueta-Guzmán, M. West, M.P. Gaiarsa, C.W. Allen, J.M. Cecala, L. Gedlinske, Q.S. McFrederick, A.C. Murillo, M.Sankovitz, and **E.E. Wilson Rankin**. Words matter: how ecologists discuss managed and non-managed bees and birds. *In Review. Scientometrics*.
4. García, K, EM Olimpi, L M'Gonigle; DS Karp; **EE Wilson-Rankin**; C Kremen; DJ Gonthier. Semi-natural habitats on organic strawberry farms and in surrounding landscapes promote bird biodiversity and pest control potential. *In Review. Agricultural Ecosystems & Environment*.
5. **Wilson Rankin, EE** and DT Rankin. Secondary nectar robbing by Lycaenidae and Riodinidae: opportunistic but not infrequent. *In Review. Ecology*.

* Before 2014, I published as Erin E Wilson