

RUTH ARABELLE HUFBAUER

Department of Bioagricultural Sciences and Pest Management
Graduate Degree Program in Ecology
Colorado State University
Fort Collins, CO 80523-1177

EDUCATION

- Ph.D., Department of Entomology, Cornell University, 1999.** The ecology and evolution of an aphid-parasitoid association: patterns in resistance and virulence. Chairs: Sara Via and Dick Root
- B.A., University of California, Berkeley, 1991.** Development studies.
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PROFESSIONAL EXPERIENCE

- Present Agropolis Foundation, Senior visiting scientist, Montpellier, France
- 2012-Present Full Professor, Colorado State University, Department of Bioagricultural Science and Pest Management (BSPM)
- 2006-2012 Associate Professor, Colorado State University, BSPM
- 2009-2010 Fulbright research fellow and National Institute of Agricultural Research (INRA) guest scientist.
- 2002-2008 Program for Interdisciplinary Mathematics, Ecology, and Statistics (PRIMES) NSF IGERT faculty participant
- 2001-present Graduate Degree Program in Ecology (GDPE) faculty member
- 2000-2006 Assistant Professor, Colorado State University, BSPM
- 1999-2000 Postdoctoral researcher with Dr. Richard Harrison, Cornell University. Population genetics of a parasitoid wasp.
- 1999 Postdoctoral research associate with Drs. John Losey and Linda Rayor, Cornell University. Effects of Bt corn on monarchs.
- 1992-1993 Laboratory Assistant II for Dr. Stephen Welter, Department of Entomology, UC Berkeley. Population dynamics and dispersal an herbivorous mite.
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FELLOWSHIPS, AWARDS, PRESS

- 2016 Charles N. Shepardson/NACTA **Meritorious Teaching Award**
Agropolis Foundation **Senior Visiting Scientist** (20,000 euros)
LabEX CeMEB Guest scientist (12,000 euros)
Faculty Institute for Inclusive Excellence award
- 2015 **The People behind the Science** – interview and podcast, episode 238
(<http://www.peoplebehindthescience.com/dr-ruth-hufbauer/>)

Interviewed for Science magazine for article on **bias in peer review**

(<http://news.sciencemag.org/funding/2015/02/little-bias-peer-review-scores-can-translate-big-money-simulation-finds>)

Inclusive Excellence Fellow - CSU

- 2009 **Fulbright Fellowship** (Franco-American commission)
French National Institute for Agricultural Research (INRA) Guest Scientist
- 2001 USDA NRI New Investigator award
- 1998 Whittaker Outstanding Presenter Award
- 1996 NSF Doctoral Dissertation Improvement Award
- 1993 National Science Foundation Graduate Research Fellowship (GRFP)
- 1988 Phi Beta Kappa, University of California, Berkeley

Awards to students and postdocs under my direct supervision

- 2015 NSF Postdoctoral Research Fellowship to Kathryn Turner
NSF Dissertation Improvement Grant to Stacy Endriss
- 2014 NSF Graduate Research Fellowship to Michael Koontz
USDA Postdoctoral Fellowship to Ellyn Bitume
- 2011 Swiss NSF Postdoctoral Fellowship to Sabrina Kumschick
- 2006 EPA STAR Fellowship to Amy Blair

REFEREED PUBLICATIONS

*graduate students and postdocs directly under my supervision

¥ undergraduate students

† graduate students in other labs

In press

77. Szűcs*, M, BA Melbourne, T Tuff, C Weiss-Lehman, RA **Hufbauer**. *In press*. Genetic and demographic founder effects have long-term fitness consequences for colonizing populations. **Ecology Letters**.
76. Fraimout, A, V Debat, S Fellous, RA **Hufbauer**, J Foucaud, P Pudlo, M-M Marin, DK Price, J Cattel, X Chen, M Deprá, PF Duyck, C Guedot, G Loeb, M Kenis, MT Kimura, I Martinez-Sañudo, M Pascual, MP Richmond, P Shearer, N Singh, K Tamura, A Xuéreb, J Zhang, A Loiseau, A Estoup. *In press*. Deciphering the routes of invasion of *Drosophila suzukii* by means of ABC random forest. **Molecular Biology and Evolution**.
75. Weiss-Lehman†, C, RA **Hufbauer**, BA Melbourne. *In press*. Rapid trait evolution drives increased speed and variance in experimental range expansions. **Nature Communications**.
74. Fettig*, CE, RA **Hufbauer**. *In press*. Reproductive strategy, performance and population dynamics of the introduced weed black henbane (*Hyoscyamus niger*). **Weed Science**.

2017

73. Rogalski†, M, C Gowler†, C Shaw, RA **Hufbauer**, M Duffy. 2017. Human drivers of ecological and evolutionary dynamics in emerging and disappearing infectious disease systems. **Philosophical Transactions of the Royal Society B**.

72. **Hufbauer, RA. 2017.** In focus: Admixture is a driver rather than a passenger in experimental invasions. **Journal of Animal Ecology**. doi: 10.1111/1365-2656.12600

2016

71. Estoup, A, V Ravigné, RA **Hufbauer**, R Vitalis, M Gautier, B Facon. **2016.** Is there a genetic paradox of biological invasions? **Annual Review of Ecology, Evolution and Systematics**. 47:51-72.
70. Lucy, FE, H Roy, A Simpson, JT Carlton, JM Hanson, K Magellan, ML Campbell, MJ Costello, S Pagad, CL Hewitt, J McDonald, P Cassey, SM Thomaz, S Katsanevakis, A Zenetos, E Tricarico, A Boggero, QJ Groom, T Adriaens, S Vanderhoeven, ME Torchin, RA **Hufbauer**, P Fuller, MR Carman, DB Conn, JRS. Vitule, J Canning-Clode, BS Galil, H Ojaveer, SA Bailey, TW Therriault, RClaudi, A Gazda, JTA Dick, J Caffrey, A Witt, M Kenis, M Lehtiniemi, H Helmisaari, VE Panov **2016.** INVASIVESNET towards an International Association for Open Knowledge on Invasive Alien Species. *Management of Biological Invasions* 7:131-139 doi: 10.3391/mbi.2016.7.2.01

2015

69. **Hufbauer**, RA, M Szűcs*, E Kasyon[‡], C Youngberg[‡], M Koontz*, C Richards, T Tuff[†], BA Melbourne. **2015.** Reply to Wootton and Pfister: The search for general context should include synthesis with laboratory model systems. **PNAS** 112: E5904. DOI 10.1073/pnas.151721011
68. Drew, JA, KA Amatangelo, RA **Hufbauer**. **2015.** Quantifying the human impacts on Papua New Guinea reef fish communities across space and time. **PLoS One**. 10(10): e0140682
67. **Hufbauer**, RA, M Szűcs*, E Kasyon[‡], C Youngberg[‡], M Koontz*, C Richards, T Tuff[†], BA Melbourne. **2015.** Three dimensions of rescue can avert extinction in a changing environment. **PNAS** 112: 10557–10562. DOI: 10.1073/pnas.1504732112
66. Tayeh, A, RA **Hufbauer**, A Estoup, V Ravigné, Léa Frachon, B Facon. **2015.** Biological invasion and biological control select for different life histories. **Nature Communications**. 6:7268
65. Barney, JN, DR Tekiel1, MN Barrios-Garcia, RD Dimarco, RA **Hufbauer**, P Leipzig-Scott*, MA Nuñez, A Pauchard, P Pyšek, M Vítková, BD Maxwell. **2015.** Global Invader Impact Network (GIIN): towards standardized evaluation of the ecological impacts of invasive plants. **Ecology and Evolution**. 5:2878-2889.
64. Migeon, A, P Auger, R **Hufbauer**, M Navajas. **2015.** Genetic traits leading to invasion: plasticity in cold hardiness explains current distribution of an invasive agricultural pest, *Tetranychus evansi* (Acari: Tetranychidae). **Biological invasions**. DOI 10.1007/s10530-015-0873-8

2014

63. Szűcs* M, B Melbourne, T Tuff[†], RA **Hufbauer**. 2014. The roles of demography and genetics in the early stages of colonization. **Proceedings of the Royal Society B** 281: 20141073. DOI: 10.1098/rspb.2014.1073
62. Turner[†], KG, RA **Hufbauer**, LH Rieseberg. 2014. Rapid evolution of an invasive weed. **New Phytologist** 202:309-321.

61. Alba* C, MD Bowers, D Blumenthal, RA **Hufbauer**. 2014. Chemical and mechanical defenses vary among maternal lines and leaf ages in *Verbascum thapsus* L. (Scrophulariaceae) and reduce palatability to a generalist insect. **PloS One** 9 (8): e104889.
60. Colautti, RI, SJ Franks, RA **Hufbauer**, PM Kotanen, M Torchin, JE Byers, P Pyšek, O Bossdorf. 2014. The Global Garlic Mustard Field Survey: challenges and opportunities of a unique, large-scale collaboration for invasion biology. **Neobiota** 21:29-47.
59. Fettig* CE, RA **Hufbauer**. 2014. Introduced N. American black henbane (*Hyoscyamus niger*) populations are biennial. **Invasive Plant Science and Management** DOI: 10.1614/IPSM-D-14-00015.1

2013

58. **Hufbauer**, RA, A Rutschmann[†], B Serrate, H Vermeil de Conchard, B Facon. 2013. Role of propagule pressure in colonization success: disentangling the relative importance of demographic, genetic and habitat effects. **Journal of Evolutionary Biology**. [†]Authors contributed equally to this work. 26:1691–1699. **F1000 recommended reading**
57. Parker, JD, ME Torchin, RA **Hufbauer**, NP Lemoine[†], C Alba[†], DM Blumenthal, O Bossdorf, JE Byers, AM Dunn, RW Heckman[†], M Hejda[†], V Jarošík, AR Kanarek, LB Martin, SE Perkins, P Pyšek, K Schierenbeck, C Schlöder, R van Klinken, KJ Vaughn[†], W Williams[†], LM Wolfe. 2013. Do invasive species perform better in their new ranges? **Ecology** 94:985-994. **F1000 prime recommended reading**
56. Kumschick* S, RA **Hufbauer** C Alba*, DM Blumenthal. Evolution of fast-growing and more resistant phenotypes in introduced common mullein (*Verbascum thapsus*). **Journal of Ecology** 101:378-387.
55. Wilbur*, HD, C Alba*, AP Norton, RA **Hufbauer**. 2013. The effect of insect herbivory on the growth and fitness of introduced *Verbascum thapsus*. **Neobiota**. 19:21-44.
54. Gaskin, JF, RA **Hufbauer**, SM Bogdanowicz. 2013. Microsatellite markers for Russian olive (*Elaeagnus angustifolia*; Elaeagnaceae). **Applications in Plant Sciences**. 1:1300013. doi: <http://dx.doi.org/10.3732/apps.1300013>
53. Zelikova TJ, RA **Hufbauer**, SC Reed, T Wertin, C Fettig*, and J Belnap. Eco-evolutionary responses of *Bromus tectorum* to climate change: Implications for biological invasions. **Ecology and Evolution**. 3:1374-1387.
52. Tayeh[†], A, A Estoup, RA **Hufbauer**, V. Ravigne, I Goryacheva, IA Zakharov, E Lombaert, B Facon. 2013. Investigating the genetic load of an emblematic invasive species: The case of the invasive harlequin ladybird *Harmonia axyridis*. **Ecology and Evolution** 3:864-871.

2012

51. Dunn, AM, ME Torchin, MJ Hatcher, PM Kotanen, DM Blumenthal, JE Byers, CAC Coon, VM Frankel, RD Holt, RA **Hufbauer**, AR Kanarek, KA Schierenbeck, LM Wolfe, SE Perkins. 2012. Indirect effects of parasites on invasions. **Functional Ecology**. 26:1262-1274.
50. Alba* C, MD Bowers, RA **Hufbauer**. 2012. Combining optimal defense theory and the evolutionary dilemma model to refine predictions regarding plant invasion. **Ecology** 93:1912-1921.

49. Alba* C, RA **Hufbauer**. 2012. A biogeographic comparison of *Verbascum thapsus* ecology reveals differences in performance, herbivory, and surrounding plant community. **Biological Invasions**. 14:2505-2518.
48. Roderick GK, RA **Hufbauer** and M Navajas. 2012. Evolution and biological control. **Evolutionary Applications**. 5:410-423
47. Fauvergue, X, E Vercken, T. Malausa, RA **Hufbauer**. 2012. The biology of small introduced populations, with special reference to biological control. **Evolutionary Applications** 5:424-443.
46. Wilbur*, HD, RA **Hufbauer**. 2012 Timing control efforts to limit seedset of common mullein (*Verbascum thapsus*). **Invasive Plant Science and Management**. 5:390-394
45. **Hufbauer**, RA, B Facon, V. Ravigné, J Turgeon, J Foucaud[†], CE Lee, O Rey, A Estoup. 2012. Anthropogenically-induced adaptation to invade (AIAI: Contemporary adaptation to human-altered habitats within the native range can promote invasions. **Evolutionary Applications**. 5:89-101.
44. Blair* AC and RA **Hufbauer**. 2012. Hybridization and invasion: An experimental test with diffuse knapweed (*Centaurea diffusa* Lam.). **Evolutionary Applications**. 5:17-28.

2011

43. Kumschick S, C Alba*, RA **Hufbauer**, W Nentwig. 2011. Weak or strong invaders? A comparison of impact between the native and invaded ranges of mammals and birds alien to Europe. **Diversity and Distributions**. 17:663-672.
42. Facon B, RA **Hufbauer**, A. Tayeh[†], A. Loiseau, E. Lombaert, R. Vitalis, T. Guillemaud, JG Lundgren, A. Estoup. 2011. Inbreeding depression is purged in the invasive insect *Harmonia axyridis*. **Current Biology**. 21:424-427.
41. Gaskin JG, M-C Bon, MJW Cock, M Cristofaro, A De Biase, R De Clerk-Floate, CA Ellison, HL Hinz, RA **Hufbauer**, MH Julien, R Sforza. 2011. Applying molecular-based approaches to classical biological control of weeds. **Biological Control**. 58:1-21.
40. Kühn I, et al. (editorial board). 2011. Open minded and open access: introducing NeoBiota, a new peer-reviewed journal of biological invasions. **NeoBiota**. 9:1-12.
39. Alba* C, RA **Hufbauer**, MD Bowers and DM Blumenthal. 2011. Evolution of growth but not structural or chemical defense in *Verbascum thapsus* (common mullein) following introduction to North America. **Biological Invasions**. 13:2379-2389.
38. Rauth* S, HL Hinz, E Geber, RA **Hufbauer**. 2011. The benefits of pre-release population genetics: A case study using *Ceutorhynchus scrobicolis*, a candidate agent of garlic mustard, *Alliaria petiolata*. **Biological Control**. 56:65-75.

2010

37. Blair*, AC, and RA **Hufbauer**. 2010. Hybridization and invasion: one of North America's most devastating invasive plants shows evidence for a history of hybridization. **Evolutionary Applications**. 3:40-51.
36. Bodo Slotta[†], TA, ME Foley, S Chao, RA **Hufbauer**, DP Horvath. 2010. Assessing genetic diversity of Canada thistle (*Cirsium arvense*) in North America with microsatellites. **Weed Science** 58:387- 394.

2009

35. Rauth* S, and RA **Hufbauer**. 2009. PCR-RFLP assays for discerning three weevil stem feeders (*Ceutorhynchus* spp.) (Col.: Curculionidae) on garlic mustard (*Alliaria petiolata*). **Biocontrol Science and Technology**. 9:999-1005.
34. Duke SO, FE Dayan, J Bajsa, KM Meepagala, RA **Hufbauer** and AC Blair*. 2009. The case against (-)-catechin involvement in allelopathy of *Centaurea stoebe* (spotted knapweed). **Plant Signaling and Behavior**. 4:422-424.
33. Blair* AC, and RA **Hufbauer**. 2009. Geographic patterns of interpecific hybridization between spotted knapweed (*Centaurea stoebe stoebe*) and diffuse knapweed (*C. diffusa*). **Invasive Plant Science and Management**. 2:55-69.
32. Blair* AC, LA Weston, SJ Nissen, GR Brunk, RA **Hufbauer**. 2009. The importance of analytical techniques in allelopathy, with the reported allelochemical catechin as an example. **Biological Invasions**. 11:325-332.

2008

31. **Hufbauer** RA. 2008. Biological Invasions: Paradox lost and paradise gained. **Current Biology**. 18:R246-R247.
30. **Hufbauer**, RA and R Sforza. 2008 Multiple introductions of two invasive *Centaurea* taxa into North America. **Diversity and Distributions**. 14:252-261.
29. Marrs* RA, R Sforza, RA **Hufbauer**. 2008. Evidence for multiple introductions of *Centaurea stoebe micranthos* (spotted knapweed, Asteraceae) to North America. **Molecular Ecology**. 17:4197-4208.
28. Kao* RH, CS Brown, RA **Hufbauer**. 2008. High phenotypic and molecular variation in downy brome (*Bromus tectorum*). **Invasive Plant Science and Management**. 1:216-225.
27. Blair* AC, U Schaffner, P Häfliger[†], SK Meyer[‡], RA **Hufbauer**. 2008. How do biological control and hybridization affect enemy escape? **Biological Control**. 46:358-370.
26. Marrs* RA, R Sforza, RA **Hufbauer**. 2008. When invasion increases population genetic structure: A study with *Centaurea diffusa*. **Biological Invasions**. 10:561-572.
25. Steltzer, H, RA **Hufbauer**, JM Welker, M Casalis[‡], PF Sullivan and R. Chimner. 2008. Frequent sexual reproduction and high intraspecific variation in *Salix arctica*: implications for a terrestrial feedback to climate change in the High Arctic. **Journal of Geophysical Research – Biogeosciences**. 113:G03S10.
24. Lau[†], JA, K. Puliafico[†], M Schwarzlaender, JA Kopshever, H Steltzer, EP Jarvis[‡], SY Strauss, and RA **Hufbauer**. 2008. Experimental artifacts of activated carbon on plant growth complicate the inference of allelopathic effects. **New Phytologist**. 178:412-423.

2007

23. Blumenthal, D and RA **Hufbauer**. 2007. Genetic differences in size among 14 invasive plant species. **Ecology**. 88:2758-2765.
22. MacKinnon*, DK, RA **Hufbauer**, AP Norton. 2007 Evaluating host use of an accidentally introduced herbivore on two invasive toadflaxes. **Biological Control**. 41:184-189.

21. Morris, WF, RA **Hufbauer**, AA Agrawal, JD Bever, GS Gilbert, JL Maron, CE Mitchell, IM Parker, AG Power, EW Seabloom, ME Torchin, DP Vázquez. 2007. Direct and interactive effects of enemies and mutualists on plant performance: a meta-analysis. **Ecology**. 88:1021-1029.

2006

20. Mitchell, CE, AA Agrawal, JD Bever, GS Gilbert, RA **Hufbauer**, JN Klironomos, JL Maron, WF Morris, IM Parker, AG Power, EW Seabloom, ME Torchin, DP Vázquez. 2006. Biotic interaction and plant invasions. **Ecology Letters**. 9:726-740.
19. Blair* AC, SJ Nissen, GR Brunk, RA **Hufbauer**. 2006. Lack of evidence for an ecological role of the putative allelochemical (+/-)-catechin in spotted knapweed invasion success. **Journal of Chemical Ecology**. 32:2327-2331.
18. Marrs*, RA, RA **Hufbauer**, SM Bogdanowicz, R Sforza. 2006. Nine polymorphic microsatellite markers in *Centaurea stoebe* L. [subspecies *C. s. stoebe* and *C. s. micranthos* (S. G. Gmelin ex Gugler) Hayek] and *C. diffusa* Lam (Asteraceae). **Molecular Ecology Notes**. 6:897-899.

2005

17. Blair*, AC, BG Hanson, GR Brunk, RA Marrs, P Westra, SJ Nissen, RA **Hufbauer**. 2005. New techniques and findings in the study of a candidate allelochemical implicated in invasion success. **Ecology Letters**. 8: 1039-1047.
16. **Hufbauer**, RA and GK Roderick. 2005. Microevolution in biological control: mechanisms, patterns and processes. **Biological Control**. 35:227-239
15. MacKinnon*, DK, RA **Hufbauer**, AP Norton. 2005. Host-plant preference of an inadvertently introduced biological control agent. For: **Entomologia Experimentalis et Applicata**. 116: 183-189.
14. Lloyd*, CJ, RA **Hufbauer**, AK Jackson, SJ Nissen, and AP Norton. 2005. Pre- and post-introduction patterns in neutral genetic diversity in the leafy spurge gall midge. **Biological Control** 33:153-164.

2004

13. **Hufbauer**, RA, SM Bogdanowicz, and RG Harrison. 2004. The population genetics of a biological control introduction: microsatellite and mtDNA variation in native and introduced populations of *Aphidius ervi*, a parasitoid wasp. **Molecular Ecology**. 13:337-348.
12. Lloyd*, CJ, AP Norton, RA **Hufbauer**, SM Bogdanowicz 2004. Microsatellites isolated from the gall midge *Spurgia capitigena* (Diptera: Cecidomyiidae), a biological control agent of leafy spurge. **Molecular Ecology Notes** 4: 605-607.
11. **Hufbauer**, RA. 2004. Observations of sagebrush gall morphology and emergence of *Rhopalomyia pomum* (Diptera: Cecidomyiidae) and its parasitoids. **Western North American Naturalist**. 64(3): 324-330.
10. **Hufbauer**, RA 2004. Population and ecological genetics of invasions: can we link neutral loci to ecology and management? **Weed Technology** 18:1522-1527.

2003 and earlier

9. Losey, JE, RA **Hufbauer**, RG Hartzler. 2003. Enumerating lepidopteran species associated with maize as a first step in risk assessment. **Environmental Biosafety Research**. 2:247-263.
8. **Hufbauer**, RA and RB Root. 2002. Interactive effects of different types of herbivore damage: *Trirhabda* beetle larvae and *Philaenus* spittlebugs on goldenrod (*Solidago altissima*). **American Midlands Naturalist**. 147:204-213.
7. Bais, HP, TS Walker, FR Stermitz, RA **Hufbauer**, and JM Vivanco*. 2002. Enantiomeric dependent phytotoxic and antimicrobial activity of (\pm)-catechin; a rhizosecreted racemic mixture from *Centaurea maculosa* (spotted knapweed). **Plant Physiology**. 128:1173-1179.
*Corresponding author **RETRACTED**.
6. **Hufbauer**, RA. 2002. Aphid resistance and parasitoid virulence among host races of the pea aphid: evidence for evolution following a biological control introduction. **Ecological Applications**. 12(1) 66-78.
5. **Hufbauer**, RA. 2001. Aphid population dynamics: Does resistance to parasitism influence population size? **Ecological Entomology**. 27:25-32 .
4. **Hufbauer**, RA, SM Bogdanowicz, L Peres[¥] and RG Harrison. 2001. Isolation and characterization of microsatellites in *Aphidius ervi* (Hymenoptera: Braconidae) and their applicability to related species. **Molecular Ecology Notes**. 1:197-199.
3. Tschenn, J, JE Losey, L Hansen, JJ Obrycki, **R Hufbauer**. 2001. Effects of corn plants and corn pollen on monarch butterfly oviposition behavior. **Environmental Entomology**. 30: 495-500.
2. **Hufbauer**, RA. 2001. Pea aphid-parasitoid interactions: Have parasitoids adapted to differential resistance? **Ecology**. 82(3):717-725.
1. **Hufbauer**, RA and S Via. 1999. Evolution of an aphid-parasitoid association: variation in resistance to parasitism among aphid populations specialized on different plants. **Evolution**. 53:1435-1445.

In revision or prep

Stewart[¥], GS, MR Morris[¥], AB Genis[¥], BA Melbourne, M Szűcs*, SJ Tavener, RA Hufbauer. The power of evolutionary rescue is constrained by genetic load. *In revision* for **Evolutionary Applications**. (decision of “reject and invite”)

Szűcs, M, M Vahsen, C Hoover, C Weiss-Lehman, BA Melbourne and RA Hufbauer. Rapid evolution facilitates the growth and spread of colonizing populations. *In prep* for submission to Nature Ecology and Evolution (manuscript available on request)

PEER REVIEWED PROCEEDINGS

Hufbauer, RA and DK MacKinnon*. **2008**. Population structure of an inadvertently introduced biological control agent of toadflaxes: *Brachypterolus pulicarius* in North America. In Proceedings of the XII International Symposium on Biological Control of Weeds (eds Julien, M.H., Sforza, R., Bon, M.C., Evans, H.C., Hatcher, P.E., Hinz, H.L. & Rector, B.G.), pp. 418-421. CAB International Wallingford, UK.

Hufbauer, RA, RA Marrs*, AK Jackson, R Sforza, HP Bais, JM Vivanco and SE Carney. **2004**. Population structure, ploidy levels and allelopathy of spotted and diffuse knapweed Pp. 121-126 *in*

North America and Eurasia. Proceedings of the XI International Symposium on Biological Control of Weeds, JM Cullen, DT Briese, DJ Kriticos, WM Lonsdale, L Morin, JK Scott *eds.* CSIRO Entomology, Canberra, Australia.

McClay, AS, MD Crisp, HC Evans, T. Heard, **RA Hufbauer**, T-K Qin and R. Shaw. **2004**. Centres of origin: do they exist, can we identify them, does it matter? Pp. 619-620 *in* Proceedings of the XI International Symposium on Biological Control of Weeds, JM Cullen, DT Briese, DJ Kriticos, WM Lonsdale, L Morin, JK Scott *eds.* CSIRO Entomology, Canberra, Australia.

REFEREED CHAPTERS IN BOOKS AND ENCYCLOPEDIAS

Hufbauer, RA and ME Torchin. **2007**. Integrating Ecological and Evolutionary Theory of Biological Invasions. Pp. 79-96 *in* Biological Invasions: Ecological Studies, Vol 193. Springer-Verlag Berlin Heidelberg.

Losey, JE, JJ Obrycki, and RA **Hufbauer**. **2004**. Biosafety Considerations For Transgenic Insecticidal Plants: Non-Target Herbivores, Detritivores, and Pollinators. Pp. 153-155 *in* Encyclopedia of Plant & Crop Science. Marcel Dekker, Inc. New York.

Losey, JE, JJ Obrycki and RA **Hufbauer**. **2004**. Biosafety Considerations For Transgenic Insecticidal Plants: Non-Target Predators and Parasitoids. Pp. 156-159 *in* Encyclopedia of Plant & Crop Science. Marcel Dekker, Inc. New York.

Losey, JE, JJ Obrycki, and RA **Hufbauer**. **2001**. Impacts of genetically-engineered crops on non-target herbivores: Bt-corn and monarch butterflies as a case study. *In* D. K. Letourneau and B. E. Burrows *eds.* Genetically Engineered Organisms: Assessing Environmental and Human Health Effects. Pp. 143-166.

PROFESSIONAL AFFILIATIONS

Ecological Society of America
Entomology Society of America
Society for the Study of Evolution

RESEARCH GRANTS AWARDED

		Amount
Total in external funding		2.37 million
2015	Dissertation Research: Exploiting seasonality and differences in herbivory to create a novel framework for testing optimal defense theory. NSF DEB DDIG co-PI: Andrew Norton, Stacy Endriss	19,239
2014	The role of genetic variation and hybridization in rapid evolution, local adaptation, and establishment of a biological control agent USDA NIFA Postdoctoral Fellowship to Ellyn Bitume	149,817
2014	The role of hybridization in biological control of weeds USDA NIFA Controlling Weedy and Invasive Plants, Co-PI: M Szucs	\$500,000
2012	REU Supplement: The roles of demography, genetics and stochasticity in colonization NSF DEB REU	\$7,598

2010	REU Supplement: The roles of demography, genetics and stochasticity in colonization NSF DEB REU	\$7,538
2009	Collaborative Research: The roles of demography, genetics and stochasticity in colonization. NSF DEB , Co-PI: B Melbourne	\$451,766
2006	The role of interspecific hybridization in biological invasions: an experimental study with <i>Centaurea maculosa</i> and <i>C. diffusa</i> NSF DEB DDIG Co-PI: A Blair	\$11,951
	Integrating the ecology and evolution of invasions: a predictive framework and collaborative approach NSF DEB RCN CoPI Dr. Mark Torchin (Smithsonian Institute for Tropical Research)	\$500,000
2005	Hybridization and invasion: the interaction between novel variation and novel continents - a seed grant. NSF DEB CoPIs Drs. DM Blumenthal (USDA ARS) and U Schaffner (CABI Switzerland).	\$75,000
	The role of hybridization in biological invasions: A study with <i>Centaurea maculosa</i> and <i>C. diffusa</i> Center for Invasive Pest Management	\$4,884
	Origins, hybridization and allelopathy of diffuse and spotted knapweeds. USDA NRI . PI: RA Hufbauer. Co-PIs: SE Carney, JM Vivanco.	\$255,000
2001	The genetic and environmental basis for host-plant specificity in a biocontrol agent of toadflaxes. USDA NRI New Investigator Award. PI: RA Hufbauer. Co-PI: AP Norton.	\$160,516
	Genetics and hybridization of invasive <i>Centaurea</i> species. Invasive Plant Species on Public and Private Land , Colorado Experiment Station. PI: RA Hufbauer. Co-PI: SE Carney.	\$145,000
	Genetic character of knapweeds in Eurasia. USDA ARS Cooperative Agreement . PI: RA Hufbauer. Co-PI: SE Carney.	\$66,000
1997	The evolution of a host-parasitoid association: the importance of habitat, geography and history. NSF Doctoral Dissertation Improvement Grant co-PIs: RA Hufbauer, S Via, RB Root	\$8,400
	Miscellaneous graduate research and travel grants (Sigma Xi, Andrew Mellon , etc. between 1994 and 1997).	\$4,300

SELECTED PRESENTATIONS

- 2016 The Almost Flipped Classroom. Master Teacher Workshop Series, Colorado State University
Eco-evolutionary dynamics of small populations in novel habitats. Invited Seminar. SEEM
CEFE CNRS, Montpellier, France
- The paradox of invasions: how do they do it? **Invited Public Lecture** E. Paul Catts
Memorial Lecture hosted by **Washington** State University

- Small populations in novel habitats: extinction risk, inbreeding depression, and adaptation
Invited Seminar. Washington State University
- Diversity in academia where we are, why it matters, and some paths forward. **Invited Seminar**, Departmental of Soil and Crop Sciences. **Colorado** State University
- Diversifying academia: (white) women and underrepresented minorities. **Invited Seminar**, Departmental of Biology. **Colorado** State University
- 2015 Small populations in novel habitats: extinction risk, inbreeding depression and adaptation: insights from a model system **Invited Seminar**, INRA, **Sophia-Antibes**, France
- Diversifying academia: (white) women and underrepresented minorities. Departmental seminar. Colorado State University
- Rescuing populations from extinction using genetics and demographic inputs: insights from a model system. **Invited seminar**. University of **Wyoming**.
- 2014 Running a grass roots network. **Invited talk**. **Cary Institute of Ecosystem Science**, NY.
- Rescuing populations from extinction using genetics and demographic inputs: insights from a model system. **Invited seminar**. University of **Toronto**.
- Rescuing populations from extinction using genetics and demographic inputs: insights from a model system. **Invited seminar**. University of **Denver**.
- 2013 So you want to found a population? A how-to guide. Invited **IGNITE** CSU.
- Genetic, demographic and evolutionary rescue. **Invited seminar**. University of **Arkansas**, Fayetteville.
- 2011 The consequences of inbreeding and propagule size for the founding of populations. RA Hufbauer, M Szucs, B Facon. International Symposium on the Biological Control of Weeds, 2011. Contributed talk.
- Inbreeding, outbreeding and biological invasions. RA Hufbauer. **Invited seminar**. University of **California, Davis**.
- Inbreeding depression and the purging of deleterious alleles: Consequences for population founding and biological invasions. RA Hufbauer, B Facon, A Estoup, M Szücs. **Invited seminar**. University of **Colorado, Boulder**
- 2010 My sabbatical year in France: inbreeding, invasions, and incredible wine. **Invited seminar**. **Colorado** State University
- A tale of two knapweeds on two continents: hybridization, invasion and plant-insect interactions. **Invited Seminar**, Bern, **Switzerland**.
- Hybridization, invasion and biological control: a tale of two knapweeds. **Invited seminar**, **Sophia, France**
- A tale of two knapweeds: exploring the consequences and causes of biological invasions. **Invited Seminar**, **Montpellier, France**
- 2009 Invasions as drivers of evolutionary change: the case of *Centaurea stoebe* and *C. diffusa*. Co-Authors RA Hufbauer, AC Blair, RA Marrs, R Sforza, European Society of Evolutionary Biology

- 2008 Hybridization and invasion: the interaction between novel variation and novel environments. Co-Authors RA Hufbauer and AC Blair. **Invited seminar**, University of **Kentucky**, Lexington.
- A tale of two knapweeds: population genetics reveal opposite effect of introduction. Co-authors RA Hufbauer, RA Marrs, and R Sforza. **Invited talk**. Neobiota conference, **Prague**.
- Spotted knapweed and the mystery of the missing weapons of mass destruction. Invited talk, organized oral session. Ecological Society of America annual meeting
- Hybridization and the invasions of diffuse and spotted knapweed. Co-author A.C. Blair. **Invited talk**. Invasive species in natural areas: A conference on impacts and management. Missoula **Montana**
- 2007 Population genetics of diffuse and spotted knapweed (*Centaurea diffusa* and *C. stoebe*). Contributed talk. XII International Symposium on the Biological Control of Weeds, La Grande Motte, **France**.
- Invasive knapweeds: Where are the weapons of mass destruction? **Invited seminar**. University of **Idaho**
- Host use by an inadvertently introduced insect herbivore of yellow and Dalmatian toadflax. **Invited seminar**. Universities of **Idaho and Washington** joint seminar
- 2006 Do knapweeds provide evidence for the novel weapons hypothesis? **Invited seminar**. University of **Maryland**
- Do knapweeds provide evidence for the novel weapons hypothesis? **Invited talk**. Western Conference on Biological Control (USDA Committee W1185). **Colorado**
- Direct and interactive effects of enemies and mutualists on plant performance: a meta-analysis. **Departmental seminar**. Co-author W. Morris. **Colorado** State University
- 2005 Trials, tribulations, and techniques for studying a candidate allelochemical of spotted knapweed. Contributed talk. Co-authors AC Blair, SJ Nissen, GR Brunk, BC Hanson, P Westra. Ecology Society of America Annual Meeting, Montreal.
- Evolutionary ecology of biological invasions and biological control. **Invited Seminar**. University of **California, Riverside**.
- 2004 Uncertainties and protocols related to evolution in biological control systems. **Invited symposium talk**, Science and decision making in biological control of weeds. Denver, **Colorado**
- The evolutionary ecology of species interactions and invasions. **Invited Seminar**. Department of Environmental Science Policy and Management, University of **California, Berkeley**.
- Relationships between native and introduced diffuse and spotted knapweed inferred from cpDNA sequences. Contributed talk. Western Society of Weed Science, Colorado Springs, CO.
- Population and ecological genetics of invasions and biological control. **Invited seminar**. **Colorado** State University

- 2003 Population and ecological genetics of invasions: can we link neutral loci to ecology and management? **Invited symposium talk**, Invasive Plants in Natural and Managed Systems, **Florida**
- Population structure, ploidy levels and allelopathy of native and introduced spotted and diffuse knapweed. Contributed talk. XI Int. Symp. on Biological Control of Weeds, Canberra, Australia. Co-authors: RA Marrs, AK Jackson, R Sforza, HP Bais, JM Vivanco and SE Carney
- Population genetic and molecular approaches to centers of origin. **Invited speaker & panel member**. XI Int. Symp. on Biological Control of Weeds, Canberra, **Australia**.
- 2002 Evolution in biological control: the basics and a brief review. Symposium opening and talk W1185, Biological Control in Pest Management Systems of Plants, Boulder CO
- Population and ecological genetics of biological control: effects of introductions and invasions on insect-parasitoid and plant-insect interactions. **Invited seminar**. Dept. of Entomology, University of **Wisconsin**
- Population structure and host use of *Brachyterolus pulicarius*, an inadvertently introduced biological control agent of toadflaxes. International Organization for Biological Control Conference on The Role of Genetics and Evolution in Biological Control, Montpellier France.
- Population and ecological genetics of biological control: effects of introductions and invasions on insect-parasitoid and plant-insect interactions. **Invited seminar**. University of **Arizona**, Tucson.
- 2001 The ecology of an aphid-parasitoid association: evidence for evolution following a biological control introductions. **Invited seminar**. USDA ARS European Biological Control Laboratory, Montpellier **France**.
- The ecology of an aphid-parasitoid association: evidence for evolution following a biological control introductions. Invited seminar. USDA ARS European Biological Control Laboratory, Montpellier France.
- Molecular markers and biological control of invasive plants: the state of the art. **Invited talk**, Rocky Mountain Plant Biotechnology and Molecular Biology Symp. **Colorado**.
- The evolution and ecology of an introduced aphid-parasitoid association. **Invited seminar**. Department of Biology, **Colorado** State University.

ADVISING AND MENTORING

Undergraduate:

My department, which combines the historic disciplines of entomology, plant pathology, and weed science, does not have an undergraduate program. I thus actively seek out teaching and mentoring opportunities. I have advised several honors thesis projects, over 15 students have done independent study projects in my lab in addition to over 40 other lab and field assistants have worked with me.

I focus on providing students with sound career advice and support, and pride myself in personalized and meaningful letters of recommendation. Students leave my lab to go to professional schools (e.g. medical, dental, pharmacy), graduate school in the sciences, and natural resource management. Publishing with students is a priority. I have published with three undergraduates – two NSF REU students and one other. Another two undergraduates and I are in the process of finalizing another publication. I have mentored diverse students including Hispanic, African American, Native American and white women and men.

Graduate:

Completed Masters Students and their current positions:

Erin Borgman, Natural Park Service

Michael Koontz, PhD program, University of California, Davis

Peter Leipzig-Scott, PhD program, Colorado State University

Cassandra Lloyd, completed PhD at University of California, Riverside, now is teaching high school science

Daniel MacKinnon, worked with USDA for several years, and currently for the Office of Surface Mining Reclamation and Enforcement

Hannah Wilbur, Colorado Natural Heritage Program

Completed Ph.D. Students and their current positions:

Amy Blair, Associate Professor at Saint Ambrose University

Robin Marrs, grade school teacher

Steven Rauth, scientist with Monsanto

Christina Alba, postdoctoral fellow, University of Florida (Flory lab)

Susan Salafsky, Fish and Wildlife

Christa Fettig, Instructor, University of Colorado, Boulder

MS students in progress:

Megan Vahsen

Ph.D. students in progress:

Stacy Biddlecomb

Committees: 9 currently, with students from my home department, Biology, and Forestry, and Fisheries and Wildlife Biology, and the Graduate Degree Program in Ecology

Postdoctoral Scholars:

Rebecca Kao – currently at Denver Botanical Gardens

Sabrina Kumschick – currently a Staff Scientist, Center for Invasion Biology, South Africa

Marianna Szucs – currently in my lab as a research scientist

Ellyn Bitume – current USDA postdoctoral fellow

Kathryn Turner – current NSF postdoctoral fellow

TEACHING

Current courses

Ecology (~120-140 undergraduate students, annually) with Honors Ecology (~10 students, annually)

The Ecology course is required for pre-vet, pre-med, and all agriculture and natural resource students. As such, the class, ideally for juniors, attracts enthusiastic freshman as well as last-semester seniors who have postponed it and resent having to take it. Calculus is a prerequisite. I teach a mathematically rigorous course, and I win the students over so that they are open to learning, and work hard to do so. I lead students through the modeling step-by-step so that I do not lose them, focusing on active learning. I work hard to demonstrate the relevance of all I cover to the fields the students are in, including disease, agricultural, and natural resource examples. Despite this being required and math-intensive, course evaluations are excellent.

Below is an example of course evaluation scores from 2013. The averages are from a raking scale from 1 (poor) to 5 (excellent).

- How well did class sessions increase your understanding of the subject? Mean 4.63
- How well did course assignments increase your understanding of the subject? Mean 4.23
- How do you rate this course? Mean 4.54
- How do you rate instructor's knowledge of subject? Mean 4.91
- How well did the instructor organize the course? Mean 4.65
- How prepared was the instructor for class sessions? Mean 4.75
- How well did the instructor an atmosphere that was respectful of student opinions, ideas, and differences? Mean 4.82
- How do you rate this instructor? Mean 4.83

BSPM Foundations (annually)

In this class, my co-instructor and I help new graduate students hit the ground running with tools to thrive in graduate school, including grappling with ethical issues, managing advisors, curating data, and writing grant and fellowship proposals.

Graduate seminar (annually)

My seminar topic changes frequently, and often is driven by graduate student interests.
2015 Spring Women in Science

Former courses

Biological Control (graduate level)

Invasion Ecology (undergraduate)

Graduate seminars (examples of previous topics):

- On the Origin of Species

- Writing Manuscripts and Proposals

- Plant-insect Interactions

- Programming in R

Guest lectures in other courses:

- Restoration Ecology, Principles of Plant Health, Invasion Ecology, Biology and Control of Weeds, Integrated Pest Management, Biocomplexity, Ecology, Global Change Ecology

Ongoing training – I strive continue to develop my teaching and mentoring

Workshop: Doing the Scholarship of Teaching and Assessment as if Learning Matters Most

Workshop: The Teacher as Actor

Partook in graduate seminar on how to mentor students effectively.

Fellow, Institute for Inclusive Excellence (faculty trained to create classrooms that welcome a diverse set of students)

UNIVERSITY SERVICE

Departmental:

Current: Education Committee, Chair

Executive Committee

Strategic Vision Committee, Chair

Previous: Executive Committee, Education Committee, Faculty meeting minutes recorder,

Search Committee for Invasive Plant Ecologist and Evolutionary Geneticist positions,

Undergraduate Curriculum Committee

College of Agriculture:

Diversity Task Force

Graduate Degree Program in Ecology:

Current: Academic Committee

Previous: Executive Committee, Faculty Advisor to the Front Range Student Ecology

Symposium Committee, Academic Committee, Executive Committee

PRIMES (Math, Statistics, Biology training grant):

Previous: Steering Committee, Protected Class Committee, Seminar Committee

Department of Biology:

Previous: Search Committees: Quantitative Evolutionary Ecologist, Plant Evolutionary Biologist

University Wide:

Current: Standing Committee on the Status of Women Faculty

Previous: Faculty Honors Council, Faculty Advisor to the Women's Ultimate Club Sports Team

University Strategic Planning Process Discovery Working Group

Life Sciences Curriculum Committee

Committee on Scholarship, Research and Graduate Education, College of Agricultural Sciences

Student Affairs Committee

Search Committee for the Assistant Director of the Agricultural Experiment Station

PROFESSIONAL SERVICE AND ACTIVITIES

Global Invasion Research Coordination Network: Leader.

I was lead PI on this NSF-supported research coordination network. Our program helped a sometimes combative group of scientists trust each other, thus facilitating excellent research. A sampling of our activities includes:

- Initiation and support of the Global Garlic Mustard field survey, with over 300 scientists, field ecology classes, and citizens contributing data
- Symposium support for: Evolutionary ecology of adaptation during plant invasion. International Botanical Congress, lead by Rob Colautti and others

- Symposium support for: Parasites and Invasions, lead by Allison Dunn and Sarah Perkins
- over 50 research exchanges supported, largely supporting graduate students and early-career scientists
- multiple collaborative publications stemmed from the group, including papers in PNAS, Ecology, Ecology Letters

Powell Center Working Group Member – High-Impact Insect Invasions (2015-2017)

Associate Editor:

Current: Ecological Applications, NeoBiota

Previous: Invasive Plant Science and Management (2008 to 2013)

Guest Associate Editor: Special issue of Evolutionary Applications

Editorial Board: Biological Control

Manuscript referee - Journals: American Naturalist, Annual Review of Entomology, Applied Ecology, Biological Control, Bulletin of Entomological Research, Ecology, Ecological Applications, Ecological Entomology, Ecology Letters, Environmental Entomology, Evolution, Evolutionary Applications, Molecular Ecology, Oecologia, Restoration Ecology, Nature, PNAS

Manuscript referee - Other: Genetics and Evolution in Biological Control (edited book), Invasion Ecology (textbook), Economy of Nature (textbook)

Grant referee for: National Science Foundation, USDA NRICGP, Oregon and Idaho Experiment Stations, National Environment Research Council of the UK, Israel Science Foundation.

Panel Member: NSF GRFP, USDA NIFA Biotechnology Risk panel, USDA NIFA Food Security Program, Fulbright, USDA NRICGP Biology of Weedy and Invasive Plants; NSF DEB Dissertation Improvement Grant, NSF GRFP panel, and have had to turn down other invitations from NSF due to schedule conflicts

Panel Leader: USDA ARS Biological Control of Weeds

Evolution Society: Committee member organizing Evolution 2004 in Fort Collins, CO

NCEAS: National Center for Ecological Analysis and Synthesis working group: The roles of natural enemies and mutualists in plant invasions

IOBC-NRS: former Member-at-large.

Symposium organizer: Evolution and biological control, Entomological Society of America annual meeting (2011), co-organized with G Roderick (lead, UC Berkeley), M Navajas (INRA, France), M. Szucs (CSU)

PUBLIC SERVICE AND EXTENSION

Boulder County GMO Advisory Board: guest expert and speaker

Colorado Weed Management Association: short courses on the biology of invasive plants

Colorado Department of Agriculture Competitive Grants Panel member

Local schools and daycare centers:

Math tutoring (1-2 times/week over the last three school years)

Biology and entomology presentations, particularly bringing in the “insect zoo” for hands-on lesson about arthropod biology (many times), also demonstrating my research

Science fair judging (3 times)