Todd M. Palmer

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Gainesville, FL 32611
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Research Interests

Mutualism, plant-herbivore interactions, rangeland ecology, biological invasions

Education

Ph.D.	Ecology	University of California at Davis	2001
M.S.	Zoology	University of Wisconsin at Madison	1994
B.A.	Biology	Oberlin College	1989

Appointments

2018-present	Professor, Department of Biology, University of Florida
2012-2018	Associate Professor, Department of Biology, University of Florida
2006-2012	Assistant Professor, Department of Biology, University of Florida
2016-present	Affiliate Faculty, School for Natural Resources and the Environment, UF
2012-present	Affiliate Faculty, Center for African Studies, UF
2013-present	Subject Matter Editor, ***Ecology***
2001-2006	Post-doctoral Associate, Center for Population Biology, UC Davis
2001-2005	Adjunct Faculty, UC Santa Barbara (Director, The Kenya Wildlands Program)

Awards and Honors

- University of Florida Term Professor, 2018-2021.
- Colonel Allan R. and Margaret G. Crow Professor, 2016-2017.
- UF Student Council Excellence in Teaching Award, 2015-2016.
- Faculty Honoree, Excellence in Teaching, Anderson Scholars, UF, 2012, 2014, 2016.
- International Educator of the Year, College of Liberal Arts and Sciences, UF, 2008 and 2009.
- Associate Faculty Member (invited), Faculty of 1000 Biology, 2009-2016.
- First-authored research papers featured in seven popular biology and ecology textbooks.
- Excellence in Postdoctoral Research Award, UC Davis, 2006.
- Merton-Love Award—Best Dissertation in Ecology and Evolution, UC Davis, 2001.

Research Grants

- 2016-21: "Landscape-scale consequences of mutualism disruption: invasive ants threaten a widespread ant-plant mutualism in East Africa", **National Science Foundation, $1,216,860** (PI, with co-PIs Jacob Goheen and Corinna Riginos).

Research Grants (continued)

- 2012-19: "**CAREER award**—The ontogeny of mutualism: exploring variation in costs and benefits within an ant-plant symbiosis", **National Science Foundation**, **$650,000** (PI).

- 2005-11: "A mutualism in context: costs, benefits and conditionality in a multi-species ant-plant symbiosis", **National Science Foundation, $360,000** (PI, with co-PIs Maureen Stanton and Truman Young)

- 2005-10: "Interactions among keystone species: effects of termites and ungulates", **National Science Foundation, $770,000** (co-PI, multi-institution collaborative proposal with Alison Brody and Dan Doak)

- 2009-10: "Intraspecific genetic variation and the maintenance of biodiversity", **UF Singer Award, $10,000**

- 2005-06: "Elephants in rangelands: ecology in critical unprotected habitats", **U.S. Fish and Wildlife Service, $8570**

- 2001-04: "Testing multiple mechanisms of species coexistence in an African acacia-ant guild", **National Science Foundation, $311,000** (co-PI with Maureen Stanton and Truman Young)

- 1997-01: "Mechanisms of coexistence in an African acacia-ant guild", **National Science Foundation, $153,000** (co-author with Maureen Stanton and Truman Young)

Teaching

Instructor UF Dept. of Biology, How to Give the Best Talk of Your Life (Spring 2015, Spring 2016, 2018)

This is a 1-credit graduate-level seminar on the art of giving compelling scientific presentations, borrowing heavily from the business psychology literature.

Instructor, UF Dept. of Biology, Community Ecology (Spring 2008, 2010, 2012, 2016, 2018)

This is a 4-credit graduate-level course in community ecology that I developed, focusing on the history, theory and practice of community ecology.

Instructor, UF Dept. of Biology, Integrated Principles of Biology (Fall 2006-2012, 2014-2018)

I developed the "ecology" section of an introductory biology course with an enrollment of approximately 1000 students, which I teach each fall semester. I've consistently received very high evaluation scores in this course.

Instructor, UF International Center, Savanna Ecology Field Course (Summer 2009, 2013-19)

I developed a 6-credit summer field course which I taught in Kenya in Summers 2009 and 2013-2016, as well as through the UC system between 2001-2005. The course is focused on hands-on and experiential approaches to learning ecology and conservation in East Africa, along with participation in rural development projects.

Other Teaching Experience

2001-2005 **Instructor and Director**, Kenya Field Ecology Program, UC Santa Barbara.
1995, 1996 **Instructor**, Global Routes Program.
1991-1993 **Instructor**, UW Madison. Introductory Zoology
1991 **Teaching assistant**, UW Madison. Ecology.
1990-1991 **Instructor**, The School for Field Studies, Kenya.
1987 **Instructor**, Upward Bound Program of Cleveland. Biology.

Publications (Reprints available here)

1. Palmer, T. M., C. Riginos, P. D. Milligan, B. R. Hayes, A. G. Pietrek, N. J. Maiyo, S. Mutisya, B. Gituku, S. Musila, S. Carpenter and J. R. Goheen. Frenemy at the gate: invasion by the predatory ant *Pheidole megacephala* facilitates a competitively subordinate plant ant in Kenya. ***Ecology**, in press.*

2. Hays, B. R., C. Riginos, T. M. Palmer and J. R. Goheen. 2020. Using photography to estimate above-ground biomass of small trees. ***Journal of Tropical Ecology***, *in press*.

3. * Pringle, R. M., T. R. Kartzinel*, T. M. Palmer*, T. J. Thurman, K. Fox-Dobbs, T. C. Coverdale, J. H. Daskin, D. A. Evangelista, K. M. Gotanda, J. J. Kolbe, N Man in 't Veld, J. E. Wegener, C. C. Y. Xu, T. W. Schoener, D. A. Spiller, J. B. Losos and R. D. H. Barrett. 2019. Collapse of niche structure on islands with introduced top predators. ***Nature*** 570:58-64.

   *These authors contributed equally to this work.

   a. *Cover story, with press coverage in* NOVA, PBS, AFP *and other outlets*.

4. Tamashiro, R. A., P. D. Milligan and T. M. Palmer. 2019. Left out in the cold: temperature dependence of defense in an African ant-plant mutualism. ***Ecology*** 100:e02712.

   a. *Press coverage in* Futurity

5. Hu, J., A. M. Askary, T. J. Thurman, Dave Spiller, T. M. Palmer, R. M. Pringle, and R. D.H. Barrett. 2019. The epigenetic signature of colonizing new environments. ***Molecular Biology and Evolution*** 36:2165-2170.

6. Coverdale, T. C., I. J. McGeary, R. D. O'Connell, T. M. Palmer, J. R. Goheen, M. Sankaran, D. J. Augustine, A. T. Ford and R. M. Pringle. 2019. Strong but opposing effects of associational resistance and susceptibility on defense phenotype in an African savanna plant. ***Oikos*** 128:1772-1782.

7. Louthan, A., E. Valencia, D. J. Martins, T. Guy, J. R. Goheen, T. M. Palmer and D. F. Doak. 2019. Large mammals generate both top-down effects and extended trophic cascades, mediated through flowers, on floral visitor communities. ***Journal of Tropical Ecology***, in press.

8. Prior, K. M. and T. M. Palmer. 2018. Economy of scale: third partner strengthens a keystone ant-plant mutualism. ***Ecology***, 99:335-346.

   a. *Press coverage in* Science Daily.

9. Koerner, S.E., M.D. Smith, D.E. Burkepile, N. Hanan, M.L. Avolio, S.L. Collings, A.K. Knapp, N.P. Lemoine, E.J. Forrestel, S. Eby, Dave I. Thompson, G. Aguado-Santacruz, J.P. Anderson, M. Anderson, A. Angassa, S. Bagchi, E.S. Bakker, G. Bastin, L.E. Baur, K.H.

Beard, E.A. Beever, P.J. Bohlen, E.H. Boughton, D. Canestro, A. Cesa, E. Chaneton, J. Cheng, C.M. D'Antonio, C. Deleglise, F. Dembélé, J. Dorrough, D. Eldridge, B. Fernandez-Going, S. Fernández-Lugo, L.H. Fraser, B. Freedman, G. Garcia-Salgado, J.R. Goheen, L. Guo, S. Husheer, M. Karembé, J.M.H. Knops, T. Kraaij, A. Kulmatiski, M. Kytöviita, F. Lezama, G. Loucougaray, A. Loydi, D.G. Milchunas, S. Milton, J.W. Morgan, C. Moxham, K.C. Nehring, H.Olff, T. M. Palmer, S. Rebollo, C. Riginos, A.C. Risch, M. Rueda, M. Sankaran', T. Sasaki, K. Schoenecker, N.L. Schultz, M. Schütz, A. Schwabe, F. Siebert, C. Smit, K.A. Stahlheber, C. Storm, D.J. Strong, J. Su, Y.V. Tiruvaimozhi, C. Tyler, J. Val, M.L. Vandegehuchte', K.E. Veblen, L.T. Vermeire, D. Ward, J. Wu, T.P. Young', Q. Yu, T.J. Zelikova. 2018. Change in dominance determines herbivore effects on plant biodiversity. ***Nature Ecology & Evolution***. *https://doi.org/10.1038/s41559-018-0696-y*

10. Titcomb, G., B. F. Allen, L. Njoroge, T. Ainsworth, T. Hedulnd, J. R. Goheen, T. M. Palmer, R. M. Pringle, M. G. Campana, R. Fleischer, L. Henson, J. N. Mantas, and H. Young. 2018. What explains tick proliferation following large-herbivore exclusion? ***Proceedings of the Royal Society B*** 285:20180612.

11. Goheen, J. R., D. J. Augustine, K. Veblen, D. Kimuyu, T. M. Palmer, L. Ponsky, R. M. Pringle, J. Ratnam, M. Sankaram, A. M. Louthan, W. Odadi, T. Otieno, A. Wambua, H. Young, and T. P. Young. 2018. Conservation lessons from large-mammal manipulations in East African savannas: the KLEE, UHURU, and GLADE experiments. ***Annals of the New York Academy of Sciences*** 1429:31-49.

12. Coverdale, T. C., J. R. Goheen, T. M. Palmer and R. M. Pringle. 2018. Good neighbors make good defenses: associational refuges reduce defense investment in African savanna plants. ***Ecology*** 99: 1724-1736.

13. Giron, D., G. Dubreuil, A. Bennett, F. Dedeine, M. Dicke, L. Dyer, M. Erb, M. Harris, El. Huguet, I. Kaloshian, A. Kawakita, C. Lopez-Vaamonde, T. M. Palmer, T. Petanidou, and M. Poulsen. 2018. Promises and challenges in insect-plant-microbe interactions. ***Entomologia Experimentalis et Applicata*** 166: 319–343.

    a. *Among the most downloaded papers on Wiley in 2018*.

14. Palmer, T. M., C. Riginos, R. E. Damiani, N. Morgan, J. S. Lemboi, J. Lengingiro, J. C. Ruiz-Guajardo and R. M. Pringle. 2017. Influence of neighboring plants on the dynamics of an ant-acacia protection mutualism. ***Ecology*** 98:3034-3043.

15. Palmer, T. M., and T. P. Young. 2017. Integrating ecological complexity into our understanding of ant-plant mutualism: ant-acacia interactions in African savannas. Pages 200-222 *in* P. S. Oliveira and S. Koptur, editors. ***Ant-plant interactions in a changing world***. Cambridge University Press, Cambridge.

16. Titcomb, G., B. F. Allen, L. Njoroge, T. Ainsworth, T. Hedulnd, J. R. Goheen, T. M. Palmer, R. M. Pringle, M. G. Campana, R. Fleischer, L. Henson, J. N. Mantas, and H. Young. 2017. Interacting effects of wildlife loss and climate on ticks and tick-borne disease. ***Proceedings of the Royal Society B*** 284:20170475

17. Petipas, R. H., J. B. Gonzalez, T. M. Palmer, and A. K. Brody. 2017. Habitat-specific AMF symbioses enhance drought tolerance of a native Kenyan grass. ***Acta Oecologica*** 78:71-78.

18. Long, R. A., Wambua, A., J. R. Goheen, T. M. Palmer and R. M. Pringle. 2017. Climatic variation modulates the indirect effects of large herbivores on small-mammal habitat use. ***Journal of Animal Ecology*** 86:739-746.

19. Ruiz-Guajardo, J. C., D. Grossenbacher, R. Grosberg, T. M. Palmer and M. L. Stanton. 2017. Density influences aggression, expansion, and post-conflict survival of the acacia-ant *Crematogaster mimosae* (*Santschi*). ***Ecological Monographs*** 87:246-259. (doi: 10.1002/ecm.1245).

20. Young, H. S., D. J. McCauley, R. Dirzo, C. L. Nunn, M. G. Campana, B. Agwanda, E. R. Otarola-Castillo, E. R. Castilla, R. M. Pringle, K. E. Veblen, D. J. Salkeld, K. Stewardson, R. Fleischer, E. F. Lambin, T. M. Palmer and K. M. Helgen. 2017. Interacting effects of land use and climate on rodent-borne pathogens in central Kenya. ***Phil. Trans. Roy. Soc. Ser. B.*** 372:20160116.

21. Aslan, C., J. L. Bronstein, H. S. Rogers, K. Gedan, J. Brodie, T. M. Palmer and T. P. Young. 2016. Leveraging nature's backup plans to incorporate interspecific interactions and resilience into restoration. ***Restoration Ecology***, 24:434-440.

22. Abonyo, E. A., N. K. Maniania, C. M. Warui, E. D. Kokwaro, T. M. Palmer, D. F. Doak, and A. K. Brody. 2016. Effects of entomopathogenic fungus *Metarhizium anisopliae* on non-target ants associated with *Odontotermes* spp. (Isoptera: Termitidae) termite mounds in Kenya. ***International Journal of Tropical Insect Science*** 36:128-134.

23. Coverdale, T. C., T. R. Kartzinel, K. L. Grabowski, R. K. Shriver, A. A. Hassan, J. R. Goheen, T. M. Palmer and R. M. Pringle. 2016. Elephants in the understory: opposing direct and indirect effects of consumption and ecosystem engineering. ***Ecology*** 97: 3219-3230.

24. Milligan, P. D., K. M. Prior and T. M. Palmer. 2016. An invasive ant reduces diversity but does not disrupt a key ecosystem function in an African savanna. ***Ecosphere*** 7: e01502.

25. Pringle, R. M., K. M. Prior, T. M. Palmer, T. P. Young, and J. R. Goheen. 2016. Large herbivores promote habitat specialization and beta diversity of African savanna trees. ***Ecology*** 97:2640-2657.

26. Palmer, T. M., A. Stier, R. D. Holt and E. G. Pringle. 2015. Mutualism in a community context. Pages 159-180 *in* J. L. Bronstein, *ed.* **Mutualism**. Oxford University Press.

27. Ceballos, G, P. R. Ehrlich, A. Barnosky, A. García, R. M. Pringle, and T. M. Palmer. 2015. No excuse for complacency: we are entering the sixth mass extinction. ***Science Advances*** 1:e1400253

    a. *Press coverage in The New York Times, The Washington Post, Science, BBC, USA Today, Forbes, and National Geographic, The Guardian, Public Radio International, any many other media outlets.*
    b. *Featured in Discover Magazine as a "Top 100 Science Stories of the Year" for 2015.*
    c. *Rated by Faculty of 1000 Biology as a "Exceptionally Important" paper.*
    d. *Reported by > 100 news outlets, referenced in 4 Wikipedia pages.*
    e. *ISI Web of Science "Highly Cited Paper" (top 1% of field)*

28. Fraser, L. H., J. Pither, A. Schmidt, A. Jentsch, M. Sternberg, M. Zobel, D. Askarizadeh, S. Bartha, C. Beierkuhnlein, J. Bennett, A. Bittel, B. Boldgiv, I. Boldrin, E. Bork, L. Brown, M. Cabido, J. Cahill, C. N. Carlyle, G. Campetella, S. Chelli, O. Cohen, A. M. Csergo, S. Díaz, L. Enrico, D. Ensing, A. Fidelis, B. Foster, H. Garris, J. R. Goheen, H. A. L. Henry, S. Hoffmann, M. Hohn, M. Jouri, J. Klironomos, K. Koorem, A. Lkhagva, R. L. Lodge, R. Long, P. Manning, R. Mitchell, M. Moora, S. C. Müller, C. Nabinger, K. Naseri, G. E. Overbeck, T. M. Palmer, S. Parsons, M. Pesek, V. D. Pillar, R. M. Pringle, K. Roccaforte, Z. Shang, R. Stahlmann, G. Stotz, S. Sugiyama, S. Szentes, D. Thompson, R. Tungalag, S. Undrakhbold, M. van Rooyen, C. Wellstein, J. B. Wilson, T. Zupo. Unimodal relationship between grassland richness and biomass supported by worldwide experimental evidence. 2015. ***Science*** 349:302-305.

    a. *ISI Web of Science "Highly Cited Paper" (top 1% of field)*

29. Pringle, R. M., D. M. Kimuyu, R. L. Sensenig, T. M. Palmer, C. Riginos, K. E. Veblen and T. P. Young. 2015. Synergistic indirect effects of fire and elephants on arboreal fauna. ***Journal of Animal Ecology*** 84:1637-1645.

30. Ford, A. T., J. R. Goheen, D. J. Augustine, M. F. Kinnaird, T. G. O'Brien, T. M. Palmer, R. M. Pringle, and R. Woodroffe. 2015. Recovery of African wild dogs suppresses prey but does not trigger a trophic cascade. ***Ecology*** 96:2705-2714.

31. Riginos, C., M. A. Karande, D. I. Rubenstein, and T. M. Palmer. 2015. Disruption of a protective ant-plant mutualism by an invasive ant increases elephant damage to savanna trees. ***Ecology*** 96:654-661.

    a. Press coverage in The New York Times, Science, and CBC's Quirks and Quarks.

32. Young, H. S., D. J. McCauley, R. Dirzo, J. R. Goheen, B. Agwanda, C. Brook, A. W. Ferguson, F. Keesing, S. N. Kinyua, M. M. McDonough, T. M. Palmer, R. M. Pringle, D. R. Salkeld, T. P. Young and K. M. Helgen. 2015. Context-dependent effects of large wildlife declines on small mammal communities in central Kenya. ***Ecological Applications*** 25:348-360.

33. Ford, A. T., J. R. Goheen, T. O. Otieno, L. Bidner, L. A. Isbell, T. M. Palmer, D. Ward, R. Woodroffe and R. M. Pringle. 2014. Large carnivores make savanna tree communities less thorny. ***Science*** 346:346-349.

    a. *Press coverage in The New York Times, Science, the BBC News, ScienceDaily, Scientific American, and CBC's Quirks and Quarks.*

34. Tarnita, C. E., T. M. Palmer and R. M. Pringle. 2014. Colonization and competition dynamics can explain incomplete sterilization parasitism in ant-plant symbioses. ***Ecology Letters*** 17:1290-1298.

35. Pringle, R. M., J. R. Goheen, T. M. Palmer, G. K. Charles, E. DeFranco, R. Hohbein, A. T. Ford, B. Torto and C. E. Tarnita. 2014. Herbivory as a complex interaction: Direct, indirect, and net effects of browsers on *Solanum campylacanthum* in an African savanna. ***Proceedings of the Royal Society B*** 281:20132647

    a. Press coverage on Slate.com.

36. Kartzinel, T. R., J. R. Goheen, G. K. Charles, E. DeFranco, J. E. Maclean, T. Otieno, T. M. Palmer and R. M. Pringle. 2014. Plant and small-mammal responses to large-herbivore exclusion in an African savanna: five years of the UHURU experiment. ***Ecology*** 95:787.

37. Louthan, A. M., D. F. Doak, J. R. Goheen, T. M. Palmer and R. M. Pringle. 2014. Mechanisms of plant-plant interactions: concealment from herbivores is more important than abiotic-stress mediation in an African savanna. ***Proceedings of the Royal Society B*** 281:20132647.

38. Ngatia, L., R. K. Ramesh, P. K. R. Nair, R. M. Pringle, T. M. Palmer and B. Turner. 2014. Seasonal patterns in decomposition and nutrient release from East African savanna grasses grown under contrasting nutrient conditions. ***Agriculture, Ecosystems and Environment*** 188:12-19.

39. Palmer, T. M., M. L. Stanton, T. P. Young, J. S. Lemboi, J. R. Goheen, and R. M. Pringle. 2013. A role for indirect facilitation in supporting diversity in a guild of African acacia ants. ***Ecology*** 94:1531-1539.

40. Poulsen, J. R., C. J. Clark and T. M. Palmer. 2013. Ecological erosion of an Afrotropical forest and potential consequences for tree recruitment and forest biomass. ***Biological Conservation*** 163:122-130.

41. Louthan, A. M., D. F. Doak, J. R. Goheen, T. M. Palmer and R. M. Pringle. 2013. Climatic stress mediates the impacts of herbivory on plant population structure and components of individual fitness. ***Journal of Ecology*** 101:1074-1083.

42. Rudolph, K. E. and T. M. Palmer. 2013. Carbohydrates as fuel for defense, foraging and colony growth – a field test with the tropical plant-ant *Crematogaster nigriceps* in Laikipia, Kenya. ***Biotropica*** 45:620-627.

43. Palmer, T. M. and A. K. Brody. 2013. Enough is enough: the effects of symbiotic ant abundance on herbivory, growth and reproduction in an African acacia. ***Ecology*** 94:683-691.

44. Goheen, J. R., T. M. Palmer, G. K. Charles, K. M. Helgen, S. N. Kinyua, J. E. Maclean, H. S. Young, R. M. Pringle. 2013. Piecewise disassembly of a large-herbivore community across a rainfall gradient: the UHURU experiment. ***PLoS One*** 8(2): e55192. doi:10.1371/journal.pone.0055192

45. Rubin, B. E., R. M. Anderson, D. Kennedy, T. M. Palmer, M. L. Stanton, and I. R. Lovette. Polygyny in the nest-site limited acacia-ant *Crematogaster mimosae*. 2013. ***Insectes Sociaux*** DOI 10.1007/s00040-013-0287-5

46. Young, H. S., D. J. McCauley, K. M. Helgen, E. Otarola-Castillo, J. R. Goheen, T. M. Palmer, R. M. Pringle, T. P. Young and R. Dirzo. 2013. Effects of mammalian herbivore declines on plant communities: Observations and experiments in an African savanna. ***Journal of Ecology*** 101:1030-1041.

47. Seifert, A. W., S. G. Kiama, M. G. Seifert, J. R. Goheen, T. M. Palmer and M. Maden. 2012. Skin shedding and tissue regeneration in African spiny mice (*Acomys*). ***Nature*** 489: 561-565.

    a. *Press coverage on MSNBC, BBC News, NPR, ScienceNow, Nature, Los Angeles Times, CBS News, US News and World Report, and New Scientist.*

48. Kiers, E. T., M. Duhamel, Y. Beesetty, J. A. Mensah, O. Franken, E. Verbruggen, C. Fellbaum, G. A. Kowalchuk, M. M. Hart, A. Bago, T. M. Palmer, S. A. West, P. Vandenkoornhuyse, J. Jansa and H. Bücking. 2011. Reciprocal rewards stabilize cooperation in the mycorrhizal symbiosis. ***Science*** 333:880-882.

    a. *Subject of a* Perspectives *piece in the same issue of Science*
    b. *Articles about this paper appeared in Science News, The Scientist, and New Scientist*
    c. *Rated by Faculty of 1000 Biology as a "Must Read" (rating of 8)*
    d. *ISI Web of Science "Highly Cited Paper"*

49. Maclean, J. E., J. R. Goheen, T. M. Palmer and T. P. Young. 2011. Cryptic herbivores mediate the strength and form of ungulate impacts on a long-lived savanna tree. ***Ecology*** 92:1626-1636.

    a. *Rated by Faculty of 1000 Biology as a "Recommended" paper (rating of 6)*

50. Stanton, M. L. and T. M. Palmer. 2011. The high cost of mutualism: effects of four species of East African ant symbionts on their myrmecophyte host tree. ***Ecology*** 92:1073-1082.

51. Pringle, R. M., T. M. Palmer, D. J. McCauley and F. Keesing. 2010. Ecological importance of large herbivores in the Ewaso ecosystem. *In* N. J. Georgiadis *ed.* Conserving wildlife in African landscapes: Kenya's Ewaso ecosystem. Smithsonian Institution Scholarly Press.

52. Palmer, T. M., D. F. Doak, M. L. Stanton, T. P. Young, J. L. Bronstein, J. R. Goheen and R. M. Pringle. 2010. Synergy of multiple partners, including "freeloaders" increases host fitness in a multi-species mutualism. ***Proceedings of the National Academy of Sciences*** 107:17234-17239.

    a. *Featured with commentary as the primary highlighted paper "In this issue" in PNAS. Also featured online at Nature.com, National Geographic blogs, and elsewhere.*
    b. *Articles about this paper appeared in two Dutch newspapers (Bionieuws)*
    c. *Rated by Faculty of 1000 Biology as an "Exceptionally Important Paper" (rating of 12)*

53. Kiers, E. T., T. M. Palmer, A. R. Ives, J. Bruno, and J. L. Bronstein. 2010. Mutualisms in a changing world: an evolutionary perspective. ***Ecology Letters***. 13:1459-1474.

a. *Selected by Faculty of 1000 Biology as a "Must Read" paper (rating of 9)*

54. **Goheen, J. R. and T. M. Palmer. 2010. Defensive plant-ants stabilize megaherbivore-driven landscape change in an African savanna. ***Current Biology*** 20:1768-1772 (**authors contributed equally to this paper).

    a. *Cover article for this issue, with a companion perspective piece written by T. Michael Anderson, "Community ecology: top-down turned upside-down".*
    b. *Video abstract of paper appeared on Current Biology homepage for a month*
    c. *Featured in articles in The New York Times, BBC, The London Daily Telegraph, MSNBC, Scientific American, Science magazine's ScienceNow, and Discover Magazine.*
    d. *Radio interviews with BBC's "The World Tonight", BBC Scotland, and Voice of America*
    e. *Selected by Faculty of 1000 Biology as a "Must Read" paper (rating of 8)*

55. Pringle, R. M., D. F. Doak, A. K. Brody, R. Joque and T. M. Palmer. 2010. Spatial pattern enhances ecosystem function. ***PLoS Biology*** 8:1000377.

    a. *Subject of a "Primer" article in same issue of PLoS Biology by Os Schmitz*
    b. *Paper featured in Nature's Research Highlights and Science Magazine's ScienceNow*
    c. *Featured in articles in The New York Times, USA Today, ABC News, National Geographic, Discovery, the London Daily Telegraph, Der Spiegel and others.*
    d. *Radio interviews with the BBC and the Canadian Broadcasting Company's "Quirks and Quarks", podcast interview with AAAS/Science Magazine's ScienceNow.*

56. Fox-Dobbs, K., D. F. Doak, A. K. Brody and T. M. Palmer. 2010. Termites create spatial structure and govern ecosystem function by affecting nitrogen fixation in an East African savanna. ***Ecology*** 91:1296-1307.

57. Kuria, S. K., M. H. Villet, T. M. Palmer and M. L. Stanton. 2010. A comparison of two sampling methods for surveying herbivore impacts on beetle communities in the canopy of *Acacia drepanolobium*. ***African Journal of Ecology*** 18:87-98.

58. Goheen, J. R., T. M. Palmer, F. Keesing, C. Riginos and T. P. Young. 2010. Large herbivores facilitate savanna tree establishment via diverse and indirect pathways. ***Journal of Animal Ecology*** 79:372-382

59. Brody, A. K., T. M. Palmer, K. Fox-Dobbs and D.F. Doak. 2010. Termites, vertebrate herbivores and the fruiting success of *Acacia drepanolobium*. ***Ecology*** 91:399-407.

60. Palmer, T. M., M. L. Stanton, T. P. Young, J. R. Goheen, R. Pringle and R. Karban. 2008. Putting ant-acacia mutualisms to the fire. ***Science*** 319: 1759-1761.

61. Palmer, T. M., M. L. Stanton, T. P. Young, J. R. Goheen, R. Pringle and R. Karban. 2008. Breakdown of an ant-plant mutualism follows the loss of large herbivores from an African savanna. ***Science*** 319:192-195

    a. *Cover story and highlighted paper for this issue of* Science.
    b. *Articles featuring this paper appeared in The New York Times, NPR, BBC, Voice of America, New Scientist, Nature News, Scientific American, The Los Angeles Times, Forbes, National Geographic, Discovery Channel News, The San Francisco Chronicle, Conservation Magazine, The Daily Telegraph (London), and The Associated Press.*
    c. *Radio interviews on NPR's "All Things Considered", Voice of America, and the BBC World Service.*
    d. *Selected by Faculty of 1000 Biology, ranked as a "Must Read" paper.*

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77. Gadd, M. E., T. P. Young, and T. M. Palmer. 2001. Effects of simulated shoot and leaf herbivory on vegetative growth and plant defense in *Acacia drepanolobium*. ***Oikos*** 92:515-521.

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79. Stanton, M. L., T. M. Palmer, T. P. Young, A. Evans, and M. L. Turner. 1999. Sterilization and canopy modification of a swollen thorn acacia tree by a plant-ant. ***Nature*** 401:578-581.

80. Young, T. P., B. D. Okello, D. Kinyua and T. M. Palmer. 1998. KLEE: a long-term multi-species herbivore exclusion experiment in Laikipia, Kenya. ***African Journal of Range and Forage Science*** 14:94-102.

81. Ives, A.R., J. Foufopoulos, E. Klopfer, J. Klug and T. M. Palmer. 1995. Bottle or big-scale experiments: how do we study ecology? ***Ecology***: 77(3):681-685.

82. Palmer, T. M. 1995. The influence of spatial heterogeneity on the behavior and growth of two herbivorous stream insects. ***Oecologia***: 104:476-486.

83. Cooper, S. M. and T. M. Palmer. 1994. Observations on the dietary choice of free-ranging juvenile ostriches. ***Ostrich*** 65(3-4):251-255.

84. Palmer, T. M. and M. Zimmerman. 1994. Pollen competition and sporophyte fitness in *Brassica campestris*: Does intense pollen competition result in individuals with better pollen? ***Oikos*** 69:80-86.

Manuscripts in Review/in Prep

1. Prince, K. D., S. M. Crotty, A. Cetta, J. J. Delfino, T. M. Palmer, N. D. Denslow and C. Angelini. Mussels drive PCB biomagnification in a coastal food web. ***Scientific Reports***, *submitted*.

2. Pietrek, A. G., J. R. Goheen, C. Riginos, N. Jepkurui and T. M. Palmer. Density dependence and the spread of invasive big-headed ants (*Pheidole megacephala*) in an East African savanna. ***Oecologia***, *in second review*.

3. Louthan, A., E. Lombardi, R. M. Pringle, J. R. Goheen, T. M. Palmer and D. Doak. Trees facilitate *Hibiscus meyeri*, a common savanna forb, by alleviating water stress and browsing. ***PLoS ONE****, in revision.*

4. Coverdale, T.C., R. D. O'Connell, M. C. Hutchinson, A. Savagian, T. R. Kartzinel, T. M. Palmer, J. R. Goheen, D. J. Augustine, M. Sankaran, C. E. Tarnita, and R. M. Pringle. Megaherbivores prevent harmful liana infestation in an African savanna. *In prep*.

5. Guy, T. J., M. C. Hutchinson, K. C. R. Baldock, B. Baiser, J. R. Goheen, R. M. Pringle and T. M. Palmer. Large herbivores restructure plant-pollinator networks. *In prep*.

6. Radujkovic, D., S. Vicca, E. Verbruggen, I. Janssens, D. Camptella, T. Palmer, L. Yonghong, P. D. Milligan, R. Lodge, M. Hohn, H. Henry, K. Reinhart, C. A. Hill, R. Beck, M. Jouri, L. Enrico, L. Brown, P. Wilfahrt, B. Sandor, C. Brown, Z. Zimmerman, A. M. Csergo and K. Van Sundert. Soil physicochemical properties as key predictors of local and global variability in grassland biomass production. *In prep.*

Published abstracts and presentations

Goheen, J.R., F. Keesing, T. M. Palmer, R. M. Pringle and T. P. Young. 2007. Contrasting the impacts of megaherbivores and small mammals on the demography of an African acacia: an analysis of life table response experiments. Abstract, Annual Meeting of the American Society of Mammalogists.

Goheen, J.R., T. P. Young, T. M. Palmer, C. Riginos, F. Keesing, and R. M. Pringle. 2007. From local herbivory to regional pattern: Net effects of native and domestic megaherbivores on tree population dynamics along a precipitation gradient in central Kenya. Abstract, Annual Meeting of the Ecological Society of America.

Goheen, J.R., T. P. Young, T. M. Palmer, C. Riginos, F. Keesing, and R. M. Pringle. 2007. Contrasting the impacts of megaherbivores and small mammals on the demography of an

African *Acacia*: an analysis of life table response experiments. Abstract, Annual Meeting of the Ecological Society of America.

Doak, D.F., T. M. Palmer, M. L. Stanton and T. P. Young. 2007. Multiple partners confer higher lifetime fitness to host plants in an African ant-plant mutualism. Abstract, Annual Meeting of the Ecological Society of America.

Palmer, T. M., D. F. Doak, M. L. Stanton, T. P. Young, J. R. Goheen and R. M. Pringle. Ants, plants and elephants: long-term dynamics of an ant-plant mutualism. Abstract, Annual Meeting of the Entomological Society of America.

Alison K. Brody, Todd M. Palmer, and Dan F. Doak. 2008. Trait-mediated effects of termites and vertebrate herbivores in East-African savannas. Abstract, International Congress of Entomology.

Jacob R. Goheen, Todd M. Palmer, and Janet E. Maclean. 2009. David and Goliath: ant symbionts force demographic trade-offs in host trees and buffer against megaherbivore-driven landscape change in an African savanna. Abstract, Annual Meeting of the Ecological Society of America.

Amelia A. Wolf, Todd M. Palmer, Peter M. Vitousek. 2009. Divergent effects of different ant partners on host trees in a Kenyan ant-plant mutualism. Abstract, Annual Meeting of the Ecological Society of America.

Rubin, B. E., T. M. Palmer, M. Stanton and I. J. Lovett. 2009. Polygyny and competition in the acacia-ant, *Crematogaster mimosae*. Abstract, Annual Meeting of the Ecological Society of America.

Jacob R. Goheen, Todd M. Palmer, and Janet E. Maclean. 2009. David and Goliath: ant symbionts force demographic trade-offs in host trees and buffer against megaherbivore-driven landscape change in an African savanna. Abstract, Annual Meeting of the American Society of Mammalogists.

J. E. Maclean, J. R. Goheen, D. F. Doak, T. M. Palmer and T. P. Young. Rodents as buffers to tree encroachment following ungulate extinction. Abstract, Annual Meeting of the British Ecological Society.

Goheen, Jacob R. and Todd M. Palmer. 2010. David and Goliath: Ant symbionts buffer against megaherbivore-driven landscape change in a savanna ecosystem. Abstract, 90th Annual Meeting of the American Society of Mammalogists.

Palmer, T. M. and M. L. Stanton. 2011. The high cost of mutualism: effects of four species of East African ant symbionts on their myrmecophyte host tree. Abstract, Annual Meeting of the Ecological Society of America.

Doak, D. F., K. Rudolph, K. Fox-Dobbs, A. K. Brody, T. M. Palmer and R. M. Pringle. 2011. Using spatially structured population processes to elucidate community functioning: demographic responses of a dominant African Acacia tree mediate community-wide effects of termites. European Ecological Federation Congress.

Rudolph, K. E. and Palmer, T.M. 2011 The expense of ant defense: relating positive and negative interaction impacts on *Acacia drepanolobium*. Joint meeting of Association of Tropical Biology and Conservation and Society of Conservation Biology (Africa chapter) – Arusha, Tanzania

Goheen, Jacob R. and Todd M. Palmer. 2012. Ant symbionts buffer against megaherbivore-driven landscape change in a savanna ecosystem. Abstract, 90th Annual Meeting of the Ecological Society of America.

Fraser, L. and the Global HBM Network. 2013. Is there a unimodal relationship between species richness and biomass in herbaceous plant communities? A global, multi-scale investigation. Abstract, International Association of Vegetation Scientists, Estonia.

Ford, A. T., J. R. Goheen, D. J. Augustine, T. O'Brien, T. M. Palmer, R. M. Pringle, and R. Woodroffe. 2014. Trophic repatriation of a savanna ecosystem. Abstract, Annual Meeting of the American Society of Mammalogists, Oklahoma City.

Riginos, C., T. M. Palmer, D. I. Rubenstein and M. E. Karande. 2014. Disruption of a protective ant-plant mutualism by an invasive ant increases elephant damage to savanna trees. Abstract, 92nd Annual Meeting of the Ecological Society of America, Sacramento.

Callis, K., D. J. Levey, T. M. Palmer and E. M. Bruna. 2014. Is herbivory greater at tropical latitudes? 92nd Annual Meeting of the Ecological Society of America, Sacramento.

Louthan, A., J. R. Goheen, T. O. Otieno, R. M. Pringle, T. M. Palmer and D. F. Doak. 2014. Sensitivity of population growth to biotic interactions varies systematically with abiotic stress: drivers of small mammal population dynamics in a Kenyan savanna. 92nd Annual Meeting, Ecological Society of America, Sacramento.

Palmer, T. M., C. Riginos, M. E. Karande, and D. I. Rubenstein. 2014. A mutualism disrupted: invasive big-headed ants threaten a widespread ant-plant symbiosis in East Africa. Annual Meeting of the Entomological Society of America, Portland.

Guy, T., T. M. Palmer, and K. Baldock. 2015. Effects of herbivore extinction and climate change on pollination in an African savanna. Ecological networks: theory, empiricism and practice in a changing world, Bristol, U.K.

Prior, K. M. and T. M. Palmer. 2016. Third partner strengthens a keystone ant-plant mutualism. Annual Meeting of the Ecological Society of America, Ft. Lauderdale, Florida.

Milligan, P. D., K. M. Prior, and T. M. Palmer. 2016. An invasive ant reduces diversity but does not disrupt ecosystem function in an African savanna. Annual Meeting of the Ecological Society of America, Ft. Lauderdale, Florida.

Ruiz-Guajardo, J. C., M. L. Stanton and T. M. Palmer. 2016. Host quality impacts colony-level aggression, survival, and the effectiveness of the defensive mutualism between *Crematogaster mimosae* (Santschi) and its host tree *Acacia drepanolobium.* Annual Meeting of the Ecological Society of America, Ft. Lauderdale, Florida.

Palmer, T. M. 2016. Friends with ~~benefits~~ costs: why a high-performing partner may not always be a mutualist's best friend. International Congress of Entomology, Orlando, Florida.

Milligan, P. D., and T. M. Palmer. 2016. Big-headed ants invade a Kenyan savanna: a threat to decomposers? Student Conference on Conservation Science, American Museum of Natural History, New York City, NY

Hays, B., J. R. Goheen, C. Riginos, A. Pietrek and T. M. Palmer. 2017. Native ant-acacia mutualism disruption by invasive big headed ants. Nairobi Science Week, Nairobi, Kenya.

Palmer, T. M. 2017. Keynote address: Costs, benefits and the community ecology of mutualism. 16th Annual Symposium on Insect-Plant Interactions, Tours, France.

Milligan, P. D., T. M. Palmer and T. A. Martin. 2017. Invaders and the bottom line - an invasive ant indirectly reduces photosynthesis of a key savanna tree species. UF Wildlife Graduate Student Association Suds and Science Night, First Magnitude Brewery, Gainesville FL

Milligan, P. D., E. G. Pringle, T. Martin, and T. M. Palmer. 2019. Short-term gains and long-term losses for an east African myrmecophyte, triggered by a biological invasion. Annual Meeting of the Ecological Society of America, Louisville, Kentucky.

Hayes, B., J. R. Goheen, C. Riginos and T. M. Palmer. 2019. Using UAV remote sensing to measure ant-elephant induced shifts in savanna tree cover. Annual Meeting of the Association for Tropical Biology, Madagascar.

Brown, B., J. R. Goheen, L. Malingati, T. M. Palmer, and T. Kartzinel. 2019. Evolutionary history predicts microbiome composition for orders, but not species, of co-occurring mammals. Evolution (Annual Meeting), Providence, Rhode Island.

Mizell, G., T. M. Palmer and E. G. Pringle. 2020. The carbon dynamics of mutualism disruption: invasive ants reduce carbon storage by East African acacia trees. Annual Meeting of the Ecological Society of America (online).

Post-doctoral associates

- Dr. Alejandro Pietrek (2016 – 2018); currently a Research Scientist at CONICET Argentina.
- Dr. Kirsten Prior (2013-2014); currently an Assistant Professor at SUNY Binghamton.
- Dr. Michael Stastny (2010-2011); currently a Forest Insect Ecologist at the Canadian Forest Service.
- Dr. John Poulsen (2009); currently an Assistant Professor of Tropical Ecology at Duke University.
- Dr. Jacob Goheen (2006-2007); currently an Associate Professor of Zoology at the University of Wyoming.

Graduate Students

- Patrick Milligan, Ph.D. student, expected date of completion: Fall 2020. Patrick is conducting his research on the ecosystem-level impacts of the invasive ant *P. megacephala* in Kenya.
- Harrison Jones, Ph.D. student, expected date of completion: Spring 2020. Harry is working on how habitat fragmentation affects foraging flock dynamics in the tropical forests of Colombia.
- Travis Guy, MS, 2017. NSF Graduate Research Fellowship Awardee. Travis is currently a research scientist at the NSF McMurdo Antarctic Research Station.
- Kathleen Rudolph, Ph.D., 2012. NSF Graduate Research Fellowship Awardee. Currently funded by the National Geographic Society, Kathleen is continuing her work on ant chemical communication.
- Megan Gittinger, Ph.D., 2013. NSF Graduate Research Fellowship Awardee. Megan has accepted a 3-year postdoctoral fellowship at the University of Kentucky.
- Co-advisor for four Kenyan graduate students and post-docs: John Kagori Mugo (M.Sc., U. Nairobi), Dr. Simon Kuria Kamande (Ph.D., Rhodes University), Dr. Charles Warui (post-doc, National Museums of Kenya), Esther Abonyo (MSc, International Centre for Insect Physiology and Ecology, Nairobi).

Professional Affiliations

- The Ecological Society of America, American Association for the Advancement of Science, The Society for Conservation Biology, Laikipia Wildlife Forum, East African Wildlife Society, Association for Tropical Biology

Invited Seminars (partial list)

- Stanford University, Harvard University, University of Chicago, University of California at Santa Barbara, University of Colorado at Boulder, University of Arizona, Colorado State University Ft. Collins, University of British Columbia, University of Montana, McGill University, University of Massachusetts Amherst, Gordon Research Conference on Plant-Herbivore Interactions, University of Oklahoma, University of Vermont, University of Wyoming, Wake Forest University, University of Louisiana at Lafayette, Clemson University, Florida State University, Skidmore College, Rice University, Bristol Zoological Gardens, University of Tours (France), Universidad Nacional Autónoma de México, Symposium on Insect-Plant Interactions (France), Rocky Mountain Biological Laboratory, Southeastern Conference on Ecology and Evolutionary Biology

Professional Service

- *Subject Matter Editor*, Ecology & Ecological Monographs, 2013-present
- *Reviewer,* The National Geographic Society, 2018
- *Ad-hoc reviewer,* National Science Foundation, 2017
- *Panelist,* National Science Foundation, Division of Environmental Biology, 2015
- *Panelist,* National Science Foundation, Division of Environmental Biology, 2009
- *Panelist*, National Science Foundation, Division of Environmental Biology, 2007
- *Panelist,* National Science Foundation, Division of Environmental Biology, 2005
- *Ad-hoc reviewer* for The National Science Foundation 2006-2015.
- *Reviewer,* The National Geographic Society, 2011-2012
- *Reviewer,* Portugal National Council on Science and Technology, Spring 2011, Fall 2012
- *Reviewer* for Science, Ecology Letters, Proceedings of the Royal Society Series B, Ecology, Ecological Monographs, The American Naturalist, Functional Ecology, Plant Ecology, Oecologia, Oikos, Ecoscience, Journal of Ecology, Behavioral Ecology, PLoS One, Insectes Sociaux, Biotropica, Journal of Tropical Ecology, Ecography, Biological Journal of the Linnean Society, Biotropica,
- *Member,* Scientific Advisory Board, Mpala Research Centre, Kenya
- *Scientific Advisor,* BBC Films "Africa" series
- *Scientific Advisor, SkyTV, UK, for a nature series narrated by Sir David Attenborough*
- *Scientific Advisor,* World Book Encyclopedia
- Invited member, NCEAS, "Ecological Stoichiometry" Working Group
- *Co-founder*, Aldo Leopold Chapter, Society for Conservation Biology, UW Madison
- *Review committee member*, National Forest Service Spotted Owl Management Proposal.
- *Organizer*, 17th Midwest Conference on Population Biology
- *Grant Proposal Reviewer*, Council for Earth and Life Sciences, Netherlands

Other Service and Outreach

- *Founder, Fundraiser and Principal Contractor*, Matangini Secondary School, Ithanga, Kenya
- *Founder, Fundraiser and Principal Contractor*, St. Maurice-Mwira School, Mumias, Kenya

- *Organizer*, with Dr. Laurence Frank, Predator Control Initiatives for Masai Pastoralists, Laikipia, Kenya.
- *Regular speaker*, Rotary Club of St. Augustine