

Curriculum Vitae: Daniel F. Doak

Address:

Daniel F. Doak, Dept. of Environmental Studies, University of Colorado Boulder
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Education:

Swarthmore College, Swarthmore, PA. B.A. with Distinction in Biology, Phi Beta Kappa.
May 1983.

University of Washington, Department of Zoology, Seattle, WA. Ph.D. June 1990. P.
Kareiva, Advisor.

Professional Appointments:

Professor and Colorado Chair of Environmental Studies. Environmental Studies
Program, Univ. of Colorado, Boulder, CO. 2012-present

Professor, Dept. Zoology and Physiology. University of Wyoming, Laramie, WY. 2007-
2012

Professor, Ecology and Evolutionary Biology. University of California, Santa Cruz, July
2002 to 2007

Associate Professor, Ecology and Evolutionary Biology. University of California, Santa
Cruz, July 1999 to 2002

Associate Professor, Environmental Studies. University of California, Santa Cruz, July
1997 to July 1999

Assistant Professor, Environmental Studies. University of California, Santa Cruz, July
1991 to July 1997.

Lecturer. Winter 1991. Dept of Zoology, University of Washington.

Environmental Consultant. Sept. 1990 to Jan. 1991. Chambers Group, Santa Ana, CA.
Data analysis and viability modeling of desert tortoise populations.

Lecturer. Winter 1990. Dept of Zoology, University of Washington

Lecturer. Summers 1990, 1989, 1988. San Francisco State University, Wildlands Studies
Alaska Program.

Research Assistant. 1987-1990. University of Washington, Department of Zoology, with
P. Kareiva. Modeling and data analysis, including development of search theory for
conservation applications.

Research Assistant. 1982, 1983. University of Colorado, Institute of Arctic and Alpine
Research, with P.J. Webber.

Awards and Honors:

2020-2021 Outstanding Faculty Mentor Award, Graduate School, CU Boulder

Ecological Society of America Fellow (elected in 2019)

Colorado Chair of Environmental Studies, 2012-present

Fellow, The California Academy of Sciences. Elected October, 2003.

Pepper-Giberson Endowed Chair in Environmental Studies, 1996-1999.

Excellence in Teaching Award, University of California, Santa Cruz, 1995.

Excellence in Teaching Award, Honorable Mention, University of California, Santa Cruz,
2001.

Current Grants:

- UCSC subaward. 2021-2025. California Condor Bi-national Recovery and Reintroduction Program, United States and Mexico. \$46,998
- NPS 2021-2023. Assessing the vulnerability of plant populations in the alpine tundra of Rocky Mountain National Park. \$49,347.
- NSF 1753954. 2018-2023. Collaborative LTREB Research: How Will Local Adaptation and Climatic Extremes Shape Continental-Scale Changes in Distribution and Abundance Under Climate Change? CU budget \$224,995.

Recent Publications:

(*Graduate students in my lab, ^{pd}postdocs in my or other labs, ^{og}Graduates in other labs and universities with whom I have collaborated, ^{ug}undergraduates)

- Bakker, V., M. E. Finkelstein; D. F. Doak; S. Kirkland; J. Brandt; A. Welch, R. Wolstenholme, J. Burnett, A. Punzalan, and P. Sanzenbacher. 2024. Practical models to guide the transition of California condors from a conservation-reliant to a self-sustaining species. *Biological Conservation* *In press*
- Bakker, V. J., M. E. Finkelstein, D. F. Doak, R. Wohlstenholme, A. Welch, J. Burnett, A. Punzalan, J. Brandt, S. Kirkland, E. Sandhaus, E. Lehnert, and N. E. Seal Faith. *Accepted*. Anthropogenic threats and young age skew lower fertility in the first two decades of reintroduction for critically endangered California Condors in California. *Ornithological Applications*
- Carscadden K. A., D. F. Doak, M. F. Oldfather and N. C. Emery. 2023. Demographic responses of hybridizing cinquefoils to changing climate in the Colorado Rocky Mountains. *Ecology and Evolution* <http://doi.org/10.1002/ece3.10097>
- Goebel*, A. M., N. C. Kane, D. F. Doak, L. H. Rieseberg, and K. L. Ostevik. 2022. Adaptation to distinct habitats is maintained by contrasting selection at different life stages in sunflower ecotypes *Molecular Ecology* <https://doi.org/10.1111/mec.16785>
- Doak, D. F. E. Waddle*, R. E. Langendorf*, A. M. Louthan*, N. I. Chardon*, R. Dibner*, R. K. Shriver, C. Linares, M. B. Garcia, S. W. Fitzpatrick, W. F. Morris, and M. L. DeMarche^{pd}. 2022. A critical comparison of integral projection and matrix projection models for demographic analysis: Reply. *Ecology* DOI: 10.1002/ecy.3822
- Goebel*, A. M., D. F. Doak, and N. C. Kane. 2022. Empirical test of increasing genetic variation via inter-population crossing for native plant restoration in variable environments. *Restoration Ecology* doi: 10.1111/rec.13648
- Bakker, V., M. E. Finkelstein, J. D'Elia, D. F. Doak, and S. Kirkland. 2022. Genetically based demographic reconstructions require careful consideration of generation time. *Current Biology* 32, R341–R359.
- Carscadden*, K. A. D. F. Doak, and N. C. Emery. 2022. Climate variation influences flowering time overlap in a pair of hybridizing montane plants. *Western North American Naturalist* 82:128–145

- Hays^{og}, B., C. Riginos, T. Palmer, D. F. Doak, B. Gituku, N. Maiyo, Nelly, S. Mutisya, S. Musila, and J. Goheen. 2022. Demographic consequences of mutualism disruption: browsing and big-headed ant invasion drive acacia population declines. *Ecology* DOI: 10.1002/ecy.3655
- Reed^{og}, P. B. S. D. Bridgham, L. E. Pfeifer-Meister, M. L. DeMarche, B. R. Johnson, B. A. Roy, G. T. Bailes, A. A. Nelson, W. F. Morris, and D. F. Doak. 2021. Climate warming threatens the persistence of a community of disturbance-adapted native annual plants. *Ecology* <https://doi.org/10.1002/ecy.3464>
- Bakker, V., D. F. Doak, and F. Ferrara. 2021. Understanding extinction risk and resilience in an extremely small population facing climate and ecosystem change *Ecosphere* 12:e03724
- Castillo Vardaro, J, J. Bonachela, C. Baker, M. Pinsky, D. F. Doak, R. Pringle, and C. E. Tarnita. 2021. Resource availability and heterogeneity shape the self-organization of regular spatial patterning. *Ecology Letters* DOI: 10.1111/ele.13822
- Oldfather^{pd}, M., M. Koontz^{pd}, D. F. Doak, and D. Ackerly. 2021. Range Dynamics Mediated by Compensatory Life Stage Responses to Experimental Climate Manipulations. 2021. *Ecology Letters* 24: 772–780. doi: 10.1111/ele.13693
- Doak, D. F., M. B. Garcia, C. Linares, S. W. Fitzpatrick, W. C. Funk, M. L. Peterson^{pd}, E. Waddle*, R. K. Shriver*, and W. F. Morris. 2021. Testing Demographic Methods Using Field Studies of Five Dissimilar Species. *Bull Ecol Soc Am* 102(2):e01870. <https://doi.org/10.1002/bes2.1870>
- Doak, D. F., E. Waddle*, R. E. Langendorf*, A. M. Louthan*, N. I. Chardon*, R. Dibner*, D. Keinath*, E. Lombardi*, C. Steenbock*, R. K. Shriver*, C. Linares, M.B. Garcia, W. C. Funk, S. W. Fitzpatrick, W.F. Morris, and M. L. Peterson^{pd}. 2021. A critical comparison of integral projection and matrix projection models for demographic analysis. *Ecological Monographs*. <https://doi.org/10.1002/ecm.1447>
- Peterson, M. L., G. Bailes, L. Hendricks, L. Pfeifer-Meister, P. B. Reed, S. D. Bridgham, B. R. Johnson, R. Shriver, E. Waddle, H. Wroton, D. F. Doak, B. A. Roy, W. F. Morris. 2021. Latitudinal gradients in population growth do not reflect demographic responses to climate. *Ecological Applications* 31. <https://doi.org/10.1002/eap.2242>
- Reed, P. M. Peterson, L. Pfeifer-Meister, W. F. Morris, D. F. Doak, B.; Roy, B. Johnson, G. Bailes, A. Nelson, and S. Bridgham. 2021. Climate manipulations differentially affect plant population dynamics within versus beyond northern range limits. *Journal of Ecology* DOI: 10.1111/1365-2745.13494
- Doak, D. F. 2020. Contribution to remembrances of Michael Soule, *Conservation Biology*
- Oro, D. and D. F. Doak. 2020. Breeding transients in capture-recapture modeling and their consequences for local population dynamics. *Scientific Reports* <https://doi.org/10.1038/s41598-020-72778-x>
- Baker, C. M., J.A Castillo Vardaro, D. F Doak, J. Pansul, J. Puissant, R. M. Pringle, and C. E. Tarnita. 2020. Spatial patterning of soil microbial communities created by African fungus-farming termites. *Molecular Ecology* <https://doi.org/10.1111/mec.15585>

- Zonana*, D. M., J. M. Gee, M. D. Breed, and D. F. Doak. 2020. Dynamic shifts in social network structure and composition within a breeding hybrid population. *Journal of Animal Ecology*. <https://doi.org/10.1111/1365-2656.13314>
- Bakker, V., T. S. Sillett, B. Cohen, W. Reisen, D. F. Doak, S. A. Morrison, T. W. Vickers, W. Boyce, M. Hallworth. 2020. Translocation with targeted vaccination is the most effective strategy to protect an island endemic bird threatened by West Nile virus. *Diversity and Distributions*. DOI: 10.1111/ddi.13109
- Smith, A. B. et. al. (68 coauthors, including D. F. Doak). 2019. Alternatives to genetic affinity as a context for within-species response to climate. *Nature Climate Change* **9**:787–794.
- Chardon*, N. I., S. Pironon, M. L. Peterson^{pd}, and D. F. Doak. 2019. Incorporating intraspecific variation into species distribution models improves distribution predictions, but cannot predict species traits for a wide-spread plant species. *Ecography* <https://doi.org/10.1111/ecog.04630>.
- Louthan*, A. L., E. Valencia, D. J. Martins, T. Guy, J. Goheen, T. 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* <https://doi.org/10.1017/S0266467419000142>
- Peterson^{pd}, M., W.F. Morris, C. Linares, and D. F. Doak. 2019. Improving structured population models with more realistic representations of non-normal growth. *Methods in Ecology and Evolution*. doi:10.1111/2041-210X.13240
- Langendorf*, R. and D. F. Doak. 2019. Can community structure causally determine dynamics of constituent species? A test using a host-parasite community. *American Naturalist*
- Chardon*, N. I., C. Rixen, S. Wipf, and D. F. Doak. 2019. Human trampling disturbance exerts different ecological effects at contrasting elevational range limits. *Journal of Applied Ecology*. DOI: 10.1111/1365-2664.13384
- Zonana*, D.M., J. M. Gee, E. S. Bridge, M. D. Breed, and D. F. Doak. 2019. Assortative behavior structures social networks in a quail hybrid zone. *American Naturalist*
- Waddle^{ug}, E., L. Piedrahita^{ug}, E. Hall^{ug}, G. Kendzierski^{ug}, W. F. Morris, M. L. Peterson^{pd}, and D. F. Doak. 2019. Asynchrony in individual and subpopulation fecundity stabilizes reproductive output of an alpine plant. *Ecology* e02639. doi.org/10.1002/ecy.2639
- Montero-Serra^{og}, I., J. Garrabou, D. F. Doak, J. Ledoux, and C. Linares. 2019. Marine protected areas enhance structural complexity but do not buffer the detrimental consequences of ocean warming for an overexploited precious coral. *J. Applied Ecology* 56:1063–1074. DOI: 10.1111/1365-2664.13321
- Dibner*, R., M. L. Peterson^{pd}, A. L. Louthan*, and D.F. Doak. 2019. Comparative effects of multiple mechanisms conferring stability to isolated populations of a rare endemic plant. *Ecological Monographs* 89 <http://dx.doi.org/10.1002/ecm.1360>
- Peterson^{pd}, M. L., D. F. Doak, and W. F. Morris. 2019. Incorporating local adaptation into forecasts of species' distribution and abundance under climate change. *Global Change Biology*. <http://dx.doi.org/10.1111/gcb.14562>

- Hall^{ug}, E. S., L.R. Piedrahita^{ug}, G. Kendziorski^{ug}, E. Waddle^{ug}, D. F. Doak, and M. L. Peterson^{pd}. 2018. Climate and synchrony with conspecifics determine the effects of flowering phenology on reproductive success in *Silene acaulis*. *Arctic, Alpine, and Antarctic Research* 50. e1548866. DOI: 10.1080/15230430.2018.1548866
- Brodie, J. F., K. H. Redford, and D. F. Doak. 2018. Ecological Function Analysis: Incorporating species roles into conservation. *Trends in Ecology and Evolution* 33:840-850. DOI: 10.1016/j.tree.2018.08.013
- Louthan*, A.M. and D.F. Doak. 2018. Measurement error of state variables creates substantial bias in results of demographic population models. *Ecology* 99: 2308–2317. <https://doi.org/10.1002/ecy.2455>
- Chardon*, N., S. Wipf, C. Rixen, Christian, A. Beilstein, and D.F. Doak. 2018. Local trampling disturbance effects on alpine plant populations and communities: negative implications for climate change vulnerability. *Ecology and Evolution* 8:7921–7935. DOI: 10.1002/ece3.4276
- Montero-Serra^{og}, I., C. Linares, D.F. Doak, J. B. Ledoux, and J. Garrabou. 2018. Strong linkages between depth, longevity and demographic stability across marine sessile species. *Proceedings of the Royal Society B*: DOI: 10.1098/rspb.2017.2688
- Bakker, V., M. Finkelstein, D. F. Doak, L. Young, E. VanderWerf, J. Arata, P. Sievert, C. Vanderlip. 2018. The albatross of assessing and managing risk for long-lived pelagic yet terrestrial breeding species. *Biological Conservation* 217:83-95. 285: 20172688. <http://dx.doi.org/10.1098/rspb.2017.2688>
- Louthan*, A.M., R.M. Pringle, J.R. Goheen, T.M. Palmer, W.F. Morris, and D.F. Doak. 2017. Aridity weakens population-level effects of multiple species interactions in *Hibiscus meyeri*. *Proceedings of the National Academy of Sciences* doi:10.1073/pnas.1708436115 (early online publication)
- Peterson^{pd}, M.L., D.F. Doak, and W.F. Morris. 2017. Both life history plasticity and local adaptation will shape range-wide responses to climate warming in the tundra plant *Silene acaulis*. *Global Change Biology* DOI: 10.1111/gcb.13990
- Dibner*, R. M.E. Murphy, and D.F. Doak. 2017. Discrepancies in occupancy and abundance approaches to identifying and protecting habitat for at-risk species. *Ecology and Evolution* DOI: 10.1002/ece3.3131
- Irons, R.D.^{ug}, A. Harding Scurr, A.P. Rose, J.C. Hagelin, T. Blake, and D.F. Doak. 2017. Wind and rain are the primary climate factors driving changing phenology of an aerial insectivore. *Proceedings of the Royal Society B* 284: 20170412. <http://dx.doi.org/10.1098/rspb.2017.0412>
- Genovart, M., D.F. Doak, J.M. Igual, S. Sponza, J. Kralj, and D. Oro. 2017. Varying demographic impacts of different fisheries on three Mediterranean seabird species. *Global Change Biology* DOI: 10.1111/gcb.13670
- Abbott, R., D.F. Doak, M. Peterson^{pd}. 2017. Portfolio effects, climate change, and the persistence of small populations: analyses on the rare plant *Saussurea weberi*. *Ecology* 98:1071-1081
- Montero-Serra^{og}, I, J. Garrabou, D. F. Doak, L. Figuerola, B. Hereu, J. Ledoux, and C. Linares. 2017. Accounting for life-history strategies and timescales in marine restoration. *Conservation Letters* DOI: 10.1111/conl.12341

- Keinath, D.A.*, D.F. Doak, K.E. Hodges, L.R. Prugh, W. Fagan, C.H. Sekercioglu, S.H.M. Burchart, and M. Kauffman. 2017. A global analysis of traits predicting species sensitivity to habitat fragmentation. *Global Ecology and Biogeography* 26:115-127
- Novak, M., J.D. Yeakel, A.E. Noble, D.F. Doak, M. Emmerson, J.A. Estes, U. Jacob, M.T. Tinker, and J.T. Wootton. 2016. Characterizing species interactions to understand press perturbations: What is the community matrix? *Annual Review of Ecology, Evolution, and Systematics* 47:409-432
- Winchell, E.W., R.S. Anderson, E.M. Lombardi, D.F. Doak. 2016 Gophers as geomorphic agents in the Colorado Front Range subalpine zone. *Geomorphology* 264:41-51
- Estes, J.A., A. Burdin, and D.F. Doak. 2016. Sea otters, kelp forests, and the extinction of Steller's sea cow. *Proceedings of the National Academy of Sciences* 113:880-885.
- Louthan*, A.M., D.F. Doak, and A.L. Angert. 2015. Where and when do species interactions set range limits? *Trends in Ecology and Evolution* 30:780-792.
- Villellas^{pd}, J., D.F. Doak, M.B. García, and W.F. Morris. 2015. Demographic compensation among populations: what is it, how does it arise, and what are its implications? *Ecology Letters* 18: 1139–1152
- Yandow*, L.H., A.D. Chalfoun, and D.F. Doak. 2015. Climate tolerances and habitat requirements jointly shape the elevational distribution of the American pika (*Ochotona princeps*) with implications for climate change effects. *PLOS One* 10(8):e0131082. doi:10.1371/journal.pone.0131082
- Dibner, R.*, E. Lombardi, and D.F. Doak. 2015. An ecological engineer maintains consistent spatial patterning, with implications for community-wide effects. *Ecosphere* 6:art151. <http://dx.doi.org/10.1890/ES14-00415.1>
- Pardo^{pd}, I., D.F. Doak, R. García-González, D. Gómez, M.B. García. 2015. Long-term response of plant communities to herbivore exclusion at high elevation grasslands. *Biodiversity and Conservation* 24: 3033–3047
- Doak D.F., Bakker, V. J., Goldstein, B. E., and Hale, B. 2015. What is the future of conservation? In G. Wuerthner, E. Crist & T. Butler (Eds.), *Protecting the Wild: Parks and Wilderness, the Foundation for Conservation* (pp. 27-35). San Francisco: Foundation for Deep Ecology. [reprint of a slightly modified version of Doak et al. 2014]
- Raventós, J., E. González, E. Mújica, and D.F. Doak. 2015. Population viability analysis of the epiphytic orchid *Dendrophylax lindenii*. *Biotropica* 47: 179–189
- Doak, D.F., G.K. Himes Boor, V.J. Bakker, W.F. Morris, A. Louthan*, S.A. Morrison, A. Stanley, and L. Crowder. 2015. Recommendations for Improving Recovery Criteria under the US Endangered Species Act. *Bioscience* 65:189-99.
- Pironon, S.^{og}, J. Villellas^{pd}, W.F. Morris, D.F. Doak, and M.B. García. 2014. Do geographic, climatic or historical ranges differentiate the performance of central versus peripheral populations? *Global Ecology and Biogeography*. doi: 10.1111/geb.12263

- Doak, D.F. and K. Cutler*. 2014. Van Manen et al. doth protest too much: new analyses of the Yellowstone Grizzly population confirm the need to reevaluate past population trends. *Conservation Letters* 7:332–333.
- Doak, D.F., V.J. Bakker, B.E. Goldstein, and B. Hale. 2014. Moving forward with effective goals and methods for conservation: a reply to Marvier and Kareiva. *Trends in Ecology and Evolution* 29:132-133.
- Doak, D.F., and W.F. Morris. 2014. Life and Times of Alaska's Tundra Plants: How Long Do They Live, and How Are They Responding to Changing Climate? *Alaska Park Science* 12(1).
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- 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 savannah. *Proceedings of the Royal Society B*. B 281:20132647. <http://dx.doi.org/10.1098/rspb.2013.2647>
- Loso*, M., D.F. Doak, and R. Anderson. 2014. Lichenometric dating of Little Ice Age glacier moraines using explicit demographic models of lichen colonization, growth, and survival. *Geografiska Annaler: Series A, Physical Geography* 96:21-41
- Doak, D.F., V.J. Bakker, B.E. Goldstein, and B. Hale. 2013. What is the future of conservation? *Trends in Ecology and Evolution* 29:77-81.
- Crone, E.E., M. Ellis, A. Stanley, W.F. Morris, T. Bell, P. Bierzychudek, D.F. Doak, J. Ehrlén, T. Kaye, T. Knight, P. Lesica, E. Menges, G. Oostermeijer, P. Quintana-Ascencio, T. Valverde, T. Ticktin, and J. Williams. 2013. Ability of Matrix Models to Explain the Past and Predict the Future of Plant Populations. *Conservation Biology* 27:968-978.
- Doak, D.F. and K. Cutler*. 2013. Re-Evaluating evidence for past population trends and predicted dynamics of Yellowstone grizzly bears. *Conservation Letters* *early view*.
- Louthan*, A., 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.
- Doak, D.F., V.J. Bakker^{pd}, and W. Vickers. 2013. Assessing alternative strategies to minimize disease threats to an endangered carnivore using population viability criteria. *Conservation Biology* 27:303-314.