

VITA**DIANA F. TOMBACK****June 2022****Mailing address**

Department of Integrative Biology, CB 171
 University of Colorado Denver
 P.O. Box 173364
 Denver, CO 80217-3364
 (303) 315-7642
 E-mail: Diana.Tomback@ucdenver.edu

FIELDS OF INTEREST: Evolutionary ecology, forest ecology, and conservation biology. Specifically, the evolution, ecology, and population biology of bird-dispersed pines and their corvid dispersers; and, the conservation and restoration of five-needle white pines in western North America.

EDUCATION

| <u>Institution</u> | <u>Date</u> | <u>Degree</u> | <u>Major</u> |
|---|-------------|---------------|---------------------|
| University of California at Santa Barbara | 1972-1977 | Ph.D. | Biological Sciences |
| University of California at Los Angeles | 1971-1972 | M.A. | Zoology |
| University of California at Los Angeles | 1966-1970 | B.A. | Zoology |

PROFESSIONAL EXPERIENCE

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| 2016-present | Policy and Outreach Coordinator, Whitebark Pine Ecosystem Foundation, and Science Lead on the National Whitebark Pine Restoration Plan |
| 2015 | Bullard Fellow, Harvard Forest, Harvard University |
| 2012-2017 | Associate Chair, Department of Integrative Biology, Univ. of Colorado Denver |
| 2010-2012 | Acting Chair, Department of Integrative Biology, University of Colorado Denver |
| 2003-2005 | Chair, Department of Biology, University of Colorado at Denver |
| 2002 | Visiting Scientist, US Geological Survey; Learning Center, Glacier National Park |
| 2001-present | Professional Board-Certified Senior Ecologist, Ecological Society of America |
| 2001-2016 | Director, Whitebark Pine Ecosystem Foundation (founding member) (Missoula, MT) |
| 1999-2000 | Acting Chair, Department of Biology, University of Colorado at Denver |
| 1997-2000 | Research Associate, Denver Museum of Nature and Science |
| 1995-present | Professor of Biology, University of Colorado at Denver |
| 1991-1992 | Acting Director, Center for Environmental Sciences |
| 1990-1991 | Acting Director, M.S. in Environmental Sciences Program |
| 1986-2000 | Member, Whitebark Pine Research Team, organized by U.S. Forest Service |
| 1986-1995 | Associate Professor of Biology, Univ. of Colorado Denver (early promotion) |
| 1981-1986 | Assistant Professor of Biology, Univ. of Colorado Denver |
| 1979-1981 | Postdoctoral Fellow, Dept. of Zoology & Entomology, Colorado State University |
| 1978-1979 | Lecturer in Biology, University of California at Riverside |
| 1977-1978 | Visiting Assistant Professor of Zoology, Pomona College |
| 1977 | Postdoctoral Fellow and Instructor in Zoology, Brigham Young University |
| 1973-1976 | Teaching Associate, Dept. of Biological Sciences, Univ. of Calif., Santa Barbara |

1972 Teaching Assistant, Dept. of Biological Sciences, Univ. of Calif. at Santa Barbara

REFEREED PUBLICATIONS (JOURNALS) (83 papers)

- 2022 Tomback, D. F., R. E. Keane, R.A. Sniezko. 2022. Why this special issue is focused on the high elevation five-needle white pines. Commentary by the guest editors for special issue on *Ecology and Restoration of High Elevation Five-Needle White Pines*. *Forest Ecology and Management*, in press.
- 2022 Schoettle, A. W., K. S. Burns, S.T. McKinney, J. Krakowski, K.M. Waring, D. F. Tomback, M. Davenport. 2022. Integrating forest health condition and species adaptive capacities to infer and affect future trajectories of the high elevation five-needle pines. Special issue on *Ecology and Restoration of High Elevation Five-Needle White Pines Forest Ecology and Management*, in press.
- 2022 Tomback, D.F., and E. Sprague. 2022. The National Whitebark Pine Restoration Plan: restoration model for the high elevation five-needle white pines. Special issue on *Ecology and Restoration of High Elevation Five-Needle White Pines Forest Ecology and Management*, in press.
- 2022 Tomback, D. F., Keane, R. E., Schoettle, A.W., Sniezko, R.A., Jenkins, M. B., Nelson, C. R., Bower, A. D., DeMastus, C. R., Guiberson, E., Krakowski, J., Murray, M. P., Pansing, E. R., Shamhart, J. 2022. Tamm Review: Current and recommended management practices for the restoration of whitebark pine (*Pinus albicaulis* Engelm.), an imperiled high-elevation western North American forest tree. Special issue on *Ecology and Restoration of High Elevation Five-Needle White Pines Forest Ecology and Management*, in press.
- 2022 Gill, N.S., M. G. Turner, C. D. Brown, S. I. Glassman, S. L. Haire, W. D. Hansen, E. R. Pansing, S. B. St. Clair, and D. F. Tomback. 2022. More fire, fewer forest legacies, and the rising influence of propagule dispersal limitation. *BioScience* Published online 1/26/22.
<https://academic.oup.com/bioscience/advance-article-abstract/doi/10.1093/biosci/biab139/6512408>
- 2021 Keane, R. E., Schoettle, A. W., Tomback, D. F. 2021. Effective actions for managing resilient high elevation five-needle white pine forests in western North America at multiple scales under changing climates. *Forest Ecology and Management* 505, 119939. Published online 12/21
<https://doi.org/10.1016/j.foreco.2021.119939>
- 2021 Wheeler, B. E., A. J. Andrade, E. R. Pansing, and D. F. Tomback. 2021. Conifer canopy cover hinders digital estimation of understory plant cover in post-fire subalpine forests. *Applied Vegetation Science* [Post-fire conifer regeneration hinders digital estimation of understory plant cover in subalpine forest vegetation - Wheeler - - Applied Vegetation Science - Wiley Online Library](https://doi.org/10.1016/j.apvegsci.2021.119939)
- 2021 Andrade, A. J., D. F. Tomback, T. R. Seastedt, and S. Mellmann-Brown. 2021. Soil moisture regime and canopy closure structure subalpine understory development during the first three decades following fire. *Forest Ecology and Management*
<https://doi.org/10.1016/j.foreco.2020.118783>

- 2020 Pansing, E. R., D. F. Tomback, and M. B. Wunder. 2020. Novel fire regimes increase extirpation risk in an upper subalpine conifer species of management concern. *Ecosphere* 11(8): e03220 <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecs2.3220> .
- 2020 Sindewald, L. A., D. F. Tomback, and E. R. Neumeyer. 2020. Community structure and functional role of limber pine (*Pinus flexilis*) in treeline communities in Rocky Mountain National Park. *Forests* 11(8): <https://doi.org/10.3390/f11080838>
- 2020 Williams, T. J., D. F. Tomback, N. Grevstad, and K. Broms. 2020. Temporal and energetic drivers of seed resource use by Clark's nutcracker, keystone seed disperser of coniferous forests. *Ecosphere* 11(3): e03085. 10.1002/ecs2.3085 <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecs2.3085>
- 2019 Degrassi, A. L., S. Brantley, C. R. Levine, J. Mohan, S. Record, D. F. Tomback, and A. M. Ellison. 2019. Loss of foundation species revisited: conceptual framework with lessons learned from eastern hemlock and whitebark pine. *Ecosphere* 10(11):e02917. 10.1002/ecs2.2917 www.esajournals.org
- 2019 Pansing, E. R., and D. F. Tomback. 2019. Survival of whitebark pine seedlings grown from direct seeding: implications for regeneration and restoration under climate change. *Forests* 10, 677; doi: 10.3390/f10080677.
- 2018 Lea, M. V., J. Syring, T. Jennings, R. Cronn, L. P. Bruederle, J. Ramp Neale, and D. F. Tomback. 2018. Development of nuclear micro-satellite loci for *Pinus albicaulis* Engelm. (Pinaceae), a conifer of conservation concern. *PLOS one*. <https://doi.org/10.1371/journal.pone.0205423>
- 2018 Wagner, A. C., D. F. Tomback, L. M. Resler, and E. R. Pansing. 2018. Whitebark pine prevalence and ecological function in the treeline communities of the Greater Yellowstone Ecosystem, U.S.A.: Potential disruption by white pine blister rust. *Forests* 9: 635; doi: 10.3390/f9100635
- 2017 Pansing, E. R., D. F. Tomback, M. B. Wunder, J. P. French, and A. C. Wagner. 2017. Simulated seed dispersal reveals microsite- and community structure-based patterns of seed pilferage, germination, and seedling survival in whitebark pine. *Ecology and Evolution*. Doi: 10.1002/ece3.3421
- 2017 McLane, A. J., C. Semeniuk, G. J. McDermid, D. F. Tomback, T. Lorenz, and D. Marceau. 2017. Energetic behavioral-strategy prioritization of Clark's nutcrackers in whitebark pine communities: An agent-based modeling approach. *Ecological Modelling* 354:123-139. <http://www.sciencedirect.com/science/article/pii/S0304380017300741>
- 2017 Carver, A. R., J. D. Ross, D. J. Augustine, S. K. Skagen, A. M. Dwyer, D. F. Tomback, and M. B. Wunder. 2017. Weather radar data correlate to hail-induced mortality in grassland birds. *Remote Sensing in Ecology and Conservation*. Doi: 10.1002/rse2.41.
- 2017 Malanson, G. P., L. M. Resler, and D. F. Tomback. 2017. Ecotone response to environmental variability depends on stress gradient interactions. *Climate Change Responses*. Doi: 10.1186/S40665-017-0029-4

- 2016 Keane, R. E., L. M. Holsinger, M. R. Mahalovich, and D. F. Tomback. 2016. Evaluation of future success of whitebark pine ecosystem restoration under climate change using simulation modelling. *Restoration Ecology*.
<http://onlinelibrary.wiley.com/doi/10.1111/rec.12419/supinfo>
- 2016 Tomback, D. F., S. C. Blakeslee, A. C. Wagner, M. B. Wunder, L. M. Resler, J. C. Pyatt, S. Diaz. 2016. Whitebark pine facilitation at treeline: Potential interactions for disruption by an invasive pathogen. *Ecology and Evolution* <http://onlinelibrary.wiley.com/doi/10.1002/ece3.2198/full>.
- 2016 Pyatt, J. C., D. F. Tomback, S. C. Blakeslee, M. B. Wunder, L. M. Resler, L. A. Boggs, and H. Beveney. 2016. The importance of conifers for facilitation at treeline: Comparing biophysical characteristics of leeward microsites in whitebark pine communities. *Arctic, Antarctic, and Alpine Research* 48(2) 427-444. DOI: <http://dx.doi.org/10.165/AAAR 0015-055>. Online appendices DOI: <http://dx.doi.org/10.165/AAAR 0015-055a>.
- 2016 Tomback, D. F., L. M. Resler, R. E. Keane, E. R. Pansing, A. J. Andrade, and A. C. Wagner. 2016. Community structure, biodiversity, and ecosystem services in treeline whitebark pine communities: potential impacts from a non-native pathogen. *Forests* 7, 21: doi:10.3390/f7010021
- 2015 Leirfallom, S. B., R. E. Keane, D. F. Tomback, and S. Dubrowski. 2015. The effects of seed source health on whitebark pine (*Pinus albicaulis*) regeneration density after wildfire. *Canadian Journal of Forest Research* 45:1597-1606. DOI: <http://dx.doi.org/10.1139/cjfr-2015-0043>.
- 2014 Smith-McKenna, E. K., G. P. Malanson, L. M. Resler, L. W. Carstensen, S. P. Prisley, and D. F. Tomback. 2014. Cascading effects of feedbacks, disease, and climate change on alpine treeline dynamics. *Environmental Modelling and Software* 62:85-96.
- 2014 Card, D. C., D. R. Schield, J. Reyes-Velasco, M. K. Fujita, A. L. Andrew, S. J. Oyler-McCance, J. A. Fike, D. F. Tomback, R. P. Ruggiero, T. A. Castoe. 2014. Two low coverage bird genomes and a comparison of reference-guided versus *de novo* genome assemblies. *PloS one* 9(9) e106649. Doi: 10.1371/Journal.Pone.0106649_
- 2014 Resler, L. M., Y. Shao, D. F. Tomback, and G. P. Malanson. 2014. Predicting functional role and occurrence of whitebark pine (*Pinus albicaulis*) at alpine treeline: Model accuracy and variable importance. *Annals of the Association of American Geographers* 104 (4): 703-722. DOI: <http://dx.doi.org/10.1080/00045608.2014.910072>.
- 2014 Tomback, D. F., K. G. Chipman, L. M. Resler, E. K. Smith-McKenna, and C. M. Smith. 2014. Relative abundance and functional role of whitebark pine at treeline in the northern Rocky Mountains. *Arctic, Antarctic, and Alpine Research* 46(2):407-418. DOI: <http://dx.doi.org/10.1657/1938-4246-46.2.407>.
- 2013 Smith-McKenna, E. K., L. M. Resler, D. F. Tomback, H. Zhang, and G. P. Malanson. 2013. Topographic influences on the distribution of white pine blister rust in *Pinus albicaulis* treeline communities. *Écoscience* 20(3):215-229.
- 2013 Barker, F. K., S. Oyler-McCance, and D. F. Tomback. 2013. Blood from a turnip: tissue origin of

- low-coverage shotgun sequencing libraries affects recovery of mitogenome sequences. *Mitochondrial DNA*. DOI: 10.3109/19401736.2013.840588
- 2012 Oyler-McCance, S. A., J. A. Fike, T. A. Castoe, D. F. Tomback, M. B. Wunder, and T. D. Schaming. 2012. Development and characterization of thirteen microsatellite loci in Clark's nutcracker (*Nucifraga columbiana*). *Conservation Genetics Resources* doi 10.1007/s 12686-012-9789-0
- 2012 Barringer, L., D. F. Tomback, M. B. Wunder, and S. T. McKinney. 2012. Whitebark pine stand condition, tree abundance, and cone production as predictors of visitation by Clark's Nutcracker. *PLoS one* 7(5): e37663. doi: 10.1371/journal.pone.0037663
- 2012 Castoe, T.A., A. W. Poole, A. P. de Koning, K. L. Jones, D. F. Tomback, S. J. Oyler-McCance, E. N. Smith, and D. D. Pollock. 2012. Rapid microsatellite identification from Illumina paired-end genomic sequencing in two birds and a snake. *PLoS one* 7(2): e30953. doi: 10.1371/journal.pone.0030953
- 2011 Wenny, D. G., T. L. DeVault, M. D. Johnson, D. Kelly, Ç. Şekercioğlu, D. F. Tomback, and C. J. Whelan. 2011. On the need to quantify ecosystem services provided by birds. *Perspectives in Ornithology. The Auk* 128:1-14.
- 2010 Murray, M. P., and D. F. Tomback. 2010. Clark's Nutcrackers harvest sugar pine seeds from cones. *Western North American Naturalist* 70 (3):413-414.
- 2010 Tomback, D. F., and P. Achuff. 2010. Blister rust and western forest biodiversity: Ecology, values, and outlook for white pines. Invited contribution for special issue. *Forest Pathology* 40:186-225.
- 2009 McKinney, S. T., C. E. Fiedler, and D. F. Tomback. 2009. Invasive pathogen threatens bird-pine mutualism: implications for sustaining a high-elevation ecosystem. *Ecological Applications* 19:597-607.
- 2008 Tillman-Sutela, E., A. Kauppi, K. Karppinen, and D. F. Tomback. 2008. Variant maturity in seed structures of *Pinus albicaulis* (Engelm.) and *Pinus sibirica* (Du Tour): key to an unusual soil seed bank? *Trees* 22:225-236 (published online in 2007)
- 2008 Resler, L. M., and D. F. Tomback. 2008. Blister rust prevalence in krummholz whitebark pine: Implications for treeline dynamics. *Arctic, Antarctic, and Alpine Research* 40: 161-170.
- 2007 Malanson, G. P., D.R. Butler, D. B. Fagre, S. J. Walsh, D. F. Tomback, L. D. Daniels, L. Resler, W. K. Smith, D. J. Weiss, D. L. Peterson, A. G. Bunn, C. A. Hiemstra, D. Liptzin, P. S. Bourgeron, Z. Shen, and C. Millar. 2007. Alpine treeline in western North America: linking organism-to-landscape dynamics. Invited contribution for special issue on alpine treeline. *Physical Geography* 28: 378-396.
- 2007 Tomback, D. F., and L. M. Resler. 2007. Invasive pathogens at treeline: consequences for treeline dynamics. Invited contribution for special section on alpine treeline. *Physical Geography* 28 (5):397-418. <https://www.tandfonline.com/doi/abs/10.2747/0272-3646.28.5.397>
- 2007 McKinney, S. T., and D. F. Tomback. 2007. The influence of white pine blister rust on seed

- dispersal in whitebark pine. *Canadian Journal of Forest Research* 37:1044-1057.
- 2005 Tomback, D. F., A. S. Schoettle, K. E. Chevalier, and C. A. Jones. 2005. Life on the edge for limber pine: seed dispersal within a peripheral population. *Écoscience* 12:519-529.
- 2003 Samano, S., and D. F. Tomback. 2003. Cone opening phenology, seed dispersal, and seed predation in southwestern white pine (*Pinus strobiformis*) in southern Colorado. *Écoscience* 10:319-326.
- 2001 Tomback, D. F., A. J. Anderies, K. S. Carsey, M. L. Powell, and S. Mellman-Brown. 2001. Delayed seed germination in whitebark pine and regeneration patterns following the Yellowstone fires. *Ecology* 82:2587-2600.
- 1999 Feldman, R., D.F. Tomback, and J. Koehler. 1999. Cost of mutualism: competition, tree morphology, and pollen cone production in limber pine clusters. *Ecology* 80:324-329.
- 1998 Johnson, S.A., L.P. Bruederle, and D.F. Tomback. 1998. A mating system conundrum: hybridization in *Apocynum* (Apocynaceae). *American Journal of Botany* 85:1316-1323.
- 1998 Bruederle, L.P., D.F. Tomback, K.K. Kelly, and R.C. Hardwick. 1998. Population genetic structure in a bird-dispersed pine, *Pinus albicaulis* Engelm. (Pinaceae). *Canadian Journal of Botany* 76: 83-90.
- 1998 Tomback, D.F. 1998. Clark's Nutcracker (*Nucifraga columbiana*). In *The Birds of North America*, No. 331, A. Poole and F. Gill (eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, DC, 24 pp. Reprinted in 2020, Birds of the World Website.
- 1996 Torick, L.L., D.F. Tomback, and R. Espinoza. 1996. Occurrence of multi-genet tree clusters in "wind-dispersed" pines. *American Midland Naturalist* 136:262-266.
- 1996 Fleck, D.C. and D.F. Tomback. 1996. Tannin and protein in the diet of a food-hoarding granivore, the Western Scrub Jay. *Condor* 98:474-482.
- 1995 Tomback, D.F. 1995. Possible breeding record for Clark's Nutcracker in northwestern Nebraska in 1987. *The Nebraska Bird Review* 63:114-115.
- 1995 Tomback, D.F., J.K. Clary, J. Koehler, R.J. Hoff, and S.F. Arno. 1995. The effects of blister rust on post-fire regeneration of whitebark pine: the Sundance Burn of northern Idaho. *Conservation Biology* 9:654-664.
- 1994 Carsey, K.S., and D.F. Tomback. 1994. Growth form distribution and genetic relationships in tree clusters of *Pinus flexilis*, a bird-dispersed pine. *Oecologia* 98:402-411.
- 1993 Tomback, D.F., F.-K. Holtmeier, H. Mattes, K.S. Carsey, and M.L. Powell. 1993. Tree clusters and growth form distribution in *Pinus cembra*, a bird-dispersed pine. *Arctic and Alpine Research* 25:374-381.

- 1993 Tomback, D.F., S.K. Sund, and L.A. Hoffmann. 1993. Post-fire regeneration of *Pinus albicaulis*: height-age relationships, age structure, and microsite characteristics. *Canadian Journal of Forest Research* 23:113-119.
- 1990 Tomback, D.F., and Y.B. Linhart. 1990. The evolution of bird-dispersed pines. *Evolutionary Ecology* 4:185-219.
- 1990 Keane, R.E., S.F. Arno, J.K. Brown, and D.F. Tomback. 1990. Modelling stand dynamics in whitebark pine forests. *Ecological Modelling* 51:73-95.
- 1990 Tomback, D.F., M.A. Wachtel, J.W. Driscoll, and M. Bekoff. 1989. Measuring dominance and constructing hierarchies: an example using mule deer. *Ethology* 82:275-286.
- 1987 Thompson, D.B., D.F. Tomback, M.A. Cunningham, and M.C. Baker. 1987. Seed selection by Dark-eyed Juncos (*Junco hyemalis*) - Optimal foraging with nutrient constraints. *Oecologia* 74:106-111.
- 1986 Bunch, K.G. and D.F. Tomback. 1986. Bolus recovery by gray jays: an experimental analysis. *Animal Behaviour* 34:754-762.
- 1986 Tomback, D.F. 1986. Post-fire regeneration of krummholz whitebark pine: a consequence of nutcracker seed caching. *Madroño* 33:100-110.
- 1986 Tomback, D.F. 1986. Observations on the behavior and ecology of the Mariana Crow. *Condor* 88:398-401.
- 1985 Linhart, Y.B. and D.F. Tomback. 1985. Seed dispersal by Clark's nutcrackers causes multi-trunk growth form in pines. *Oecologia* 67:107-110.
- 1985 Baker, M.C., D.F. Tomback, D.B. Thompson, and M.A. Cunningham. 1985. Reply to Hafner and Petersen. *Evolution* 39:1177-1179.
- 1985 Burnell, K.L. and D.F. Tomback. 1985. Steller's Jays steal Gray Jay caches: field and laboratory observations. *Auk* 102:417-419.
- 1984 Tomback, D.F. and M.C. Baker. 1984. Assortative mating by female White-crowned sparrows at song dialect boundaries. *Animal Behaviour* 32:465-469.
- 1984 Baker, M.C., D.F. Tomback, D.B. Thompson, T.C. Theimer, and D.C. Bradley. 1984. Behavioral consequences of song learning: discrimination of song types by male White-crowned sparrows. *Learning and Motivation* 15:428-440.
- 1984 Baker, M.C., A.E.M. Baker, M.A. Cunningham, D.B. Thompson, and D.F. Tomback. 1984. Reply to "Allozymes and song dialects: a reassessment". *Evolution* 38:449-451
- 1983 Tomback, D.F., D.B. Thompson, and M.C. Baker. 1983. Dialect discrimination in White-crowned sparrows: reactions to near and distant dialects. *Auk* 100:452-460.

- 1983 Bunch, K.G., G.S. Sullivan, and D.F. Tomback. 1983. Seed manipulation by Clark's Nutcracker. *Condor* 85:372-373.
- 1982 Baker, M.C., M.A. Cunningham, G.S. Sherman, D.B. Thompson, and D.F. Tomback. 1982. Allozyme frequencies in a linear series of song dialect populations. *Evolution* 36:1020-1029.
- 1982 Tomback, D.F. 1982. Dispersal of whitebark pine seeds by Clark's Nutcracker: a mutualism hypothesis. *Journal of Animal Ecology* 51:451-467.
- 1982 Tomback, D.F. and B.B. DeWolfe. 1982. Foraging behavior of a cross-billed nutcracker. *Western Birds* 12:137-138.
- 1981 Tomback, D.F. and J.R. Murphy. 1981. Food deprivation and temperature regulation in nestling Ferruginous Hawks. *Wilson Bulletin* 93:92-97.
- 1981 Tomback, D.F. 1981. Notes on cones and vertebrate-mediated seed dispersal of *Pinus albicaulis* (Pinaceae). *Madroño* 28:91-94.
- 1980 Collins, C.T., D.F. Tomback, and G.E. Woolfenden. 1980. Additional host records for the Bronzed Cowbird in Texas. *Bulletin of the Texas Ornithological Society* 13:40-51.
- 1980 Tomback, D.F. and K.A. Kramer. 1980. Limber pine seed harvest by Clark's Nutcracker: timing and foraging behavior. *Condor* 82:467-468.
- 1980 Tomback, D.F. 1980. How nutcrackers find their food stores. *Condor* 82:10-19.
- 1978 Tomback, D.F. 1978. Pre-roosting flight of the Clark's Nutcracker. *Auk* 95:554-562.
- 1978 Tomback, D.F. 1978. Foraging strategies of Clark's Nutcracker. *Living Bird* 16:123-161.
- 1976 Tomback, D.F. 1976. A late nesting attempt by Clark's Nutcracker. *Wilson Bulletin* 88:499-500.
- 1975 Tomback, D.F. 1975. An emetic technique to investigate food preferences. *Auk* 92:581-583.

EDITED VOLUMES AND PEER-REVIEWED SPECIAL JOURNAL ISSUES (4)

- 2022 Tomback, D. F., R. E. Keane, and R. A. Sniezko, editors. 2021-2022. Ecology and Restoration of High-elevation Five-needle White Pines. Special issue for *Forest Ecology and Management*, Elsevier, Netherlands.
- 2019 Tomback, D. F., editor. 2019. *Biodiversity and Conservation in Forests*. With Preface written by D. F Tomback (Book reprint of special issue published by *Forests*). MDPI, Basel, Switzerland.
- 2016 Tomback, D. F., editor. 2015-2016. *Biodiversity and Conservation in Forests*. Invited special issue for *Forests* MDPI, Basel, Switzerland.
- 2001 Tomback, D. F., S. F. Arno, and R. E. Keane, editors. 2001. *Whitebark Pine Communities: Ecology and Restoration*. Island Press, Washington, D.C. (also see chapters by Tomback below)

BOOK CHAPTERS (17)

- 2023 Tomback, D. F. T. H. McLaren, W. Wehtje, L.E. Walker, and D.W. Smith. Clark's Nutcrackers of Yellowstone National Park: conserving an iconic mutualism. Douglas W. Smith, Lauren E. Walker, Katie Duffy (eds.) *Yellowstone Birds*, Princeton University Press, in press.
- 2016 Whelan, C. J., D. F. Tomback, D. Kelly, and M. D. Johnson. Trophic interaction networks and ecosystem services. Chapter 3, Pages 49-72 in: *Why Birds Matter. Avian Ecological Functions and Ecosystem Services*. Cagan H. Şekercioğlu, Daniel G. Wenny, Christopher J. Whelan (eds.). The University of Chicago Press, Chicago, Illinois.
- 2016 Tomback, D. F. Seed dispersal by corvids: birds that build forests. Chapter 7, Pages 197-234 in: *Why Birds Matter. Avian Ecological Functions and Ecosystem Services*. Cagan H. Şekercioğlu, Daniel G. Wenny, Christopher J. Whelan (eds.). The University of Chicago Press, Chicago, Illinois.
- 2011 McKinney, S. T., and D. F. Tomback. Altered community dynamics in Rocky Mountain whitebark pine forests and the potential for accelerating declines. Pages 45-78 in: *Mountain Ecosystems: Dynamics, Management and Conservation*. K.E. Richards (ed.) Nova Science Publishers, Inc., Hauppauge, N.Y.
- 2005 Tomback, D. F. The impact of seed dispersal by Clark's nutcracker on whitebark pine: multi-scale perspective on a high mountain mutualism. Pages 181-201 in: *Mountain Ecosystems: Studies in Treeline Ecology*. G. Broll and B. Keplin (eds.), Springer.
- 2002 Tomback, D. F., and K. C. Kendall. Rocky road in the Rockies: challenges to biodiversity. Pages 153-180 in: *Rocky Mountain Futures: an Ecological Perspective*, J.S. Baron (ed). Island Press, Washington, D. C. Preface by Paul Ehrlich.
- 2001 Tomback, D.F., S. F. Arno, and R. E. Keane. The compelling case for management intervention, chapt. 1. Pages 3-25 in: *Whitebark Pine Communities: Ecology and Restoration*, D.F. Tomback, S.F. Arno, and R.E. Keane (eds). Island Press, Washington, D.C.
- 2001 Tomback, D.F. Clark's nutcracker: agent of regeneration, chapt.5. Pages 89-104 in: *Whitebark Pine Communities: Ecology and Restoration*, D.F. Tomback, S.F. Arno, and R.E. Keane (eds.). Island Press, Washington, D. C.
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- 2020 Tomback, D.F. and E. Sprague. *Whitebark Pine Restoration*: 5 presentations. Tomback and Sprague, NWPRP Background and Status. Annual Science and Management Meeting, virtual

- meeting, Whitebark Pine Ecosystem Foundation, September 16, 2020.
- 2017 Sprague, E., D. F. Tomback, and D. Gwaze. National Whitebark Pine Summit: Strategic Planning for Range-wide Restoration. Sponsored by American Forests, the Whitebark Pine Ecosystem Foundation, and the U.S. Forest Service, November 7-9, 2017, Hilton Garden Inn, Missoula, MT.
- 2016 Whelan, C. J., D. F. Tomback, M. D. Johnson, C. H. Şekercioğlu, D. G. Wenny. Organizers of symposium: Bird ecosystem services: New approaches and future directions. 10 talks and panel discussion. North American Ornithological Conference, Washington Hilton, Washington D.C., August 16-20, 2016.
- 2010 Tomback, D. F. Organizer of keynote and plenary presentations. *“High-Five Symposium: The future of high-elevation five-needle white pines in Western North America.”* University of Montana, June 28 to 30, 2010. Whitebark Pine Ecosystem Foundation and USDA Forest Service, Missoula, MT.
- 2009 Tomback, D. F. Organizer. *“150 years after On the Origin of Species: Darwin’s Magnificent Legacy.”* University of Colorado Denver, Downtown Denver Campus, King Recital Hall, February 12, 2009. A joint Anschutz Medical Campus and Downtown Denver Campus event, celebrating Darwin’s bicentennial birthday.
- 2004 Tomback, D.F. Chief organizer. *“Monitoring whitebark pine for blister rust: a methods workshop.”* Whitebark Pine Ecosystem Foundation. West Yellowstone, Montana, June 2004. Conceived and organized by the Whitebark Pine Ecosystem Foundation. Sponsored by the Greater Yellowstone Coordinating Committee; NPS Rocky Mountain Cooperative Ecosystems Studies Unit; USDA Forest Service Northern Region, Forest Health Protection; and USDA FS Fire Sciences Laboratory, Rocky Mountain Research Station.
- 2002 Tomback, D. F. Invited Program Chair and Speaker for *“Endangered species in mountain habitats, “ 4 speakers, for conference, Ecological and earth sciences in mountain areas, The Banff Centre for Mountain Culture, Banff, Alberta, Canada, Sept. 6 to 10, 2002.*
- 2002 Tomback, D. F., A. W. Schoettle, and G. I. McDonald, co-organizers *“ The rapid decline of white pine ecosystems of the West: Causes, consequences, and restoration strategies”* 8 papers, annual meeting, Ecological Society of America, Tucson, Arizona, Aug. 4-9, 2002. Sponsored by the Rocky Mountain Chapter of the ESA and Whitebark Pine Ecosystem Foundation.
- 1998 Tomback, D.F. Program Chair for Symposium: *“Restoring whitebark pine ecosystems”*, 20 papers, Sept. 9-12, 1998, Holiday Inn, Missoula, Montana. Organized by the Fire Sciences Laboratory, USDA Forest Service, Rocky Mountain Research Station. Missoula, MT, Sept. 9-12, 1998.
- 1986 Tomback, D.F. and C.M. Herrera, co-convenors, *“Plant-bird mutualisms”* 5 speakers, for XIX International Ornithological Congress, Ottawa, Canada, July, 1986.
- 1983 Tomback, D.F. and R.P. Balda, co-convenors, *“Behavior and ecology of food specialization in corvids,”* 5 speakers, for centennial meetings of the American Ornithologists' Union, American Museum of Natural History, New York, Aug., 1983.

CONFERENCE, SYMPOSIUM, LECTURE, OR WORKSHOP PARTICIPATION - INVITED SPEAKER OR PRESENTOR

- 2021 Tomback, D.F., E. Sprague. The National Whitebark Pine Restoration Plan: Restoration model for the high five pines. Invited plenary talk. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021.
- 2021 Tomback, D.F. Seminal research: Foraging strategies of Clark's nutcracker. Invited talk for Session: Historical Whitebark Pine Research, Organizer/Moderator R.E. Keane. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021.
- 2021 Andrade, A.J., D.F. Tomback, T.R. Seastedt, and S. Mellmann-Brown. Soil moisture regime and canopy closure structure subalpine understory development over 30 years following stand-replacing fire. Session: Fire, Organizer/Moderator A. Cansler. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021.
- 2021 McLaren, T., D. Tomback, N. Grevstad, W. Wehtje, D. Smith, and L. Walker. Clark's nutcracker conifer resource use in Yellowstone National Park: A hierarchical distance sampling approach. Session: Clark's nutcrackers, Organizer/Moderator T. McLaren and T. Williams. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021.
- 2021 Nelson, C. R., D. Tomback, and B. Keane. Effective monitoring and evaluation of whitebark pine restoration treatments—key to adaptive management and future applications. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021.
- 2021 Pansing, E, and D. Tomback. Whitebark pine regeneration densities, niche, and dynamics three decades after the 1988 Yellowstone Fires. Session: Fire, Organizer/Moderator. A. Cansler. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021.
- 2021 Schoettle, A.W., K.S. Burns, J. Krakowski, S. T. McKinney, K.M. Waring, D.F. Tomback, and M. Davenport. Invited keynote. Taking the long view: Ecology, condition, and outlook for the High-Elevation Five-Needle Pines. Invited keynote.
- 2021 Schaming, T., T. Lorenz, P. Singleton, J. Ransom, D. Tomback, T. McLaren, and L. Walker. Satellite-tracking Clark's nutcrackers to investigate space use in declining whitebark pine habitats. Session: Nutcracker Interactions, Organizers/Moderators T. McLaren and T. Williams. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021.
- 2021 Tomback, D.F., E.R. Pansing, and T. Chang. Do whitebark pine regeneration trends support predicted distributional shifts under climate change? Examples from the GYE. Session: Fire,

- Organizer/Moderator, A. Cansler. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7,
- 2021 Williams, T.J., and D.F. Tomback. Clark's nutcracker seed resource use and limber pine metapopulation structure in Rocky Mountain National Park. Session: Clark's nutcrackers, Organizer/Moderator T. McLaren and T. Williams. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021.
- 2021 Wheeler, B.E., A.J. Andrade, E.R. Pansing, and D.F. Tomback. Conifer regeneration hinders digital estimation of understory plant cover in post-fire whitebark pine communities. Poster paper. H5II Conference: The Second Conference on the Research and Management of the High Elevation Five Needle Pines, Virtual Conference, October 4-7, 2021. Poster presentation.
- 2020 Tomback, D.F., E. Karau, R.E. Keane, and J. Shamhart. Draft National Whitebark Pine Restoration Plan Region 1 core area nominations. Fall meeting, Whitebark Pine Subcommittee of the Greater Yellowstone Coordinating Committee. Zoom meeting: October 27, 2020.
- 2020 Tomback, D.F. and E. Sprague. National Whitebark Pine Restoration Plan: Background and status. Annual Science and Management Meeting, virtual meeting, Whitebark Pine Ecosystem Foundation, September 16, 2020.
- 2020 Tomback, D. F. 2020. Whitebark pine restoration plans and practices. Invited talk. Workshop: Whitebark Pine Experts Strategy Meeting. February 12-13, 2020, Pacific Southwest Research Station, Institute of Forest Genetics, Placerville, CA.
- 2019 Tomback, D. F. The National Whitebark Pine Restoration Plan: A multi-agency collaborative effort to rescue a high elevation foundation and keystone species—Update. Whitebark Pine Ecosystem Foundation, Annual Science and Management Workshop, Pablo MT, September 13-14, 2019.
- 2019 Tomback, D. F., and E. R. Pansing. Animals as seed dispersers: Avian seed dispersal in post-fire landscapes. Invited for organized paper session: Altered fire regimes and dispersal into post-fire landscapes. Ecological Society of America, Louisville KY, August 11-16, 2019.
- 2019 Tomback, D. F. An update on the National Whitebark Pine Restoration Plan. Western International Forest Disease Work Conference (WIFDWC). Estes Park, CO, June 3-7, 2019.
- 2018 Tomback, D. F., and D. G. Malone. Colorado and gray wolf restoration: habitat, prey base, and connectivity. Invited presentation, Durango Wolf Symposium. Is there a future for wolves in Colorado: the science and ecology of *Canis lupus*. Ft. Lewis College, Durango, Co, November 29, 2018. Followed by evening panel question and answer session. Sponsored by the Southern Ute Museum, Rocky Mountain Wolf Project, and Colorado Chapter of the Sierra Club.
- 2018 Tomback, D. F., E. Sprague, R. E. Keane, D. Gwaze, and L. Weldon. The National Whitebark Pine Restoration Plan: A multi-agency collaborative effort to rescue a high elevation foundation and keystone species. Invited keynote, Whitebark Pine Ecosystem Foundation, Annual Science and

Management Workshop, Stanley, ID, September 20-22, 2018.

- 2018 Pansing, E. R., D. F. Tomback, and M. B. Wunder. Managing whitebark pine under climate-altered fire regimes: Assessing extirpation risk in the Greater Yellowstone using a demographic projection model. Invited presentation, Whitebark Pine Ecosystem Foundation, Annual Science and Management Workshop, Stanley, ID, September 20-22, 2018.
- 2018 Tomback, D. F. Why whitebark pine might be listed under the ESA. Tenth Montana Plant Conservation Conference. Montana Native Plant Society. Montana Fish, Wildlife & Parks, Montana Wild Center, Helena, MT, February 21-22, 2018.
- 2018 Tomback, D. F. and students A. J. Andrade and E. R. Pansing. Invited Presentation and discussion on whitebark pine (~ 1 hr) for the North American Dendroecological Fieldweek. Beartooth Plateau, Clay Butte Overlook, MT, July 22, 2018.
- 2017 Tomback, D. F. National Whitebark Pine Summit: Strategic Planning for Range-wide Restoration. Sponsored by American Forests, the Whitebark Pine Ecosystem Foundation, and the U.S. Forest Service, November 7-9, 2017, Hilton Garden Inn, Missoula, MT. Invited presentations:
 Tomback, D. F. Introduction to whitebark pine. Plenary presentation.
 Tomback, D. F., and R. E. Keane. Strategic plan approach and vision
 Tomback, D. F., and R. E. Keane. Restoration plan in-depth.
 Tomback, D. F., and E. Jungck. Other key plan elements.
- 2017 Tomback, D. F. National restoration plan overview. Invited presentation. Whitebark Pine Ecosystem Foundation, Annual Science and Management Workshop. Jasper National Park, Alberta, Canada, September 21-23. 2017.
- 2017 Tomback, D. F. Whitebark pine 101: Why is whitebark pine important, why is it in trouble, and what can we do? Community evening presentation at the Firehall, Jasper National Park, September 20, 2017. Sponsored by Parks Canada.
- 2016 Tomback, D. F., L. M. Resler, and G. P. Malanson. Functional role of whitebark pine at treeline across its Rocky Mountain Range, with focus on the Crown. Invited presentation. Whitebark Pine Ecosystem Foundation, Annual Science and Management Workshop. O'Shaughnessy Cultural Arts Center, Whitefish, MT, September 16-18, 2016.
- 2016 Tomback, D. F. Representing the Whitebark Pine Ecosystem Foundation: Whitebark pine in peril. Invited presentation. USDA Forest Service, Dorena Genetic Resource Center, 50th Anniversary, 1966-2016, August 25, 2016.
- 2016 Şekercioğlu, Ç. H., M. D. Johnson, D. F. Tomback, D. G. Wenny, and C. J. Whelan. Why birds matter: an overview of bird ecosystem services. In symposium: Bird ecosystem services: New approaches and future directions. North American Ornithological Conference, Washington Hilton, Washington D.C., August 16-20, 2016.
- 2016 McLane, A. J., D. Marceau, G. J. McDermid, C. Semeniuk, and D. F. Tomback. Agent-based modelling of Clark's Nutcracker foraging behavior to determine thresholds for whitebark pine

- restoration. In symposium: Bird ecosystem services: New approaches and future directions. North American Ornithological Conference, Washington Hilton, Washington D.C., August 16-20, 2016.
- 2016 Pansing, E. R., D. F. Tomback, M. B. Wunder, J. P. French, and A. C. Wagner. Efficacy of Clark's nutcracker dispersal varies with community type and geographic region. In symposium: Bird ecosystem services: New approaches and future directions. North American Ornithological Conference, Washington Hilton, Washington D.C., August 16-20, 2016.
- 2016 Tomback, D. F. Rocky Mountain high elevation five-needle white pine communities: wildlife habitat under threat. Plenary talk. The Wildlife Society: Central Mountains and Plains Section. Steamboat Springs, August 8-11, 2016.
- 2016 Tomback, D. F., E. R. Pansing, L. M. Resler, and G. P. Malanson. Forest health threats cascade upward: whitebark pine treeline communities and ecosystem functions in the Rocky Mountains. In symposium: Changing forests, imperiled habitats: the roles arthropods play. Organized by L. Dodd and L. Rieske-Kinney. North American Forest Insect Work Conference, Washington, D. C., May 31-June 3, 2016.
- 2016 Tomback, D. F. Restoring the Crown jewels: The High Five pines and why we need them. Evening keynote. (representing the Whitebark Pine Ecosystem Foundation). Crown Managers Partnership workshop: *We need the needles: Coordinating action to conserve 5-needle pine forests in the Crown of the Continent*. Fernie, British Columbia, Canada, March 15-16, 2016.
- 2015 Tomback, D. F. Whitebark pine in peril: Why do we care and what we can do. Public evening program. *Whitebark Pine Science and Management Workshop*. Whitebark pine Ecosystem Foundation, 16-20 September 2015, Southern Oregon University, Ashland, Oregon.
- 2015 Tomback, D. F. Keynote: The high-fives: Foundational roles and restoration issues. *Whitebark Pine Science and Management Workshop*. Whitebark pine Ecosystem Foundation, 16-20 September 2015, Southern Oregon University, Ashland, Oregon.
- 2014 Tomback, D. F., L. M. Resler, G. P. Malanson, E.K. Smith-McKenna, S. C. Blakeslee, J. C. Pyatt, and A. C. Wagner. Blister rust alters whitebark pine ecology at treeline: implications for treeline response to climate change. *Whitebark Pine Science and Management Workshop: Fifteen years of Whitebark Pine Restoration*. Whitebark Pine Ecosystem Foundation, 18-19 September 2014, Panhandle National Forest Supervisor's Office, Coeur d'Alene, Idaho. Contributed paper.
- 2014 Pansing, E. R., A. C. Wagner, and D. F. Tomback. Germination and first year survival of whitebark pine direct seeding trials in the Central and Northern Rocky Mountains. *Whitebark Pine Science and Management Workshop: Fifteen years of Whitebark Pine Restoration*. Whitebark Pine Ecosystem Foundation, 18-19 September 2014, Panhandle National Forest Supervisor's Office, Coeur d'Alene, Idaho. Contributed paper.
- 2014 Tomback, D. F. Whitebark pine and climate change: Compelling reasons for restoration. Invited keynote. Region 6, U.S. Forest Service, Whitebark Pine Restoration Workshop. March 11-13, 2014.

- 2014 Tomback, D. F. Corvids—the birds that build forests. Invited presentation. Monthly meeting, Denver Field Ornithologists, February 24, 2014, Denver Museum of Natural and Science
- 2013 Tomback, D. F., S. C. Blakeslee, J. C. Pyatt, and L. M. Resler. Whitebark pine as a tree island initiator: understanding its role in facilitation. *Whitebark Pine Science and Management Workshop. Challenges of Whitebark Pine Restoration: Issue and Solutions*. Whitebark Pine Ecosystem Foundation, 19-20 September, 2013, Montana State University, Bozeman, MT. Contributed paper.
- 2013 Pansing, E. ., A. C. Wagner, and D. F. Tomback. Role of microsite type, cache pilferage, and elevation ins whitebark pine regeneration in the northern Ricky Mountains: Implications for restoration and climate change. Whitebark Pine Science and Management Workshop. Challenges of Whitebark Pine Restoration: Issue and Solutions. Whitebark Pine Ecosystem Foundation, 19-20 September, 2013, Montana State University, Bozeman, MT. Contributed paper.
- 2012 Tomback, D. F. Seed dispersal by corvids. In Symposium 08: Why do birds matter? Birds' ecological functions and ecosystem services. Organizers: D. Wenny, C. J. Whelan, C. H. Sekercioglu. *4th International EcoSummit Ecological Sustainability: Restoring the Planet's Ecosystem Services*. Columbus, OH, September 30-October 5, 2012.
- 2012 Tomback, D. F. Forest health challenges in the Rocky Mountain West. In Symposium 09: *Rocky Mountain futures: preserving, utilizing, and sustaining Rocky Mountain ecosystems*, organizer: Jill Baron. 97th annual meeting, Ecological Society of America, Portland, OR, August 5-10, 2012.
- 2012 Tomback, D.F., M. B. Wunder, S. T. McKinney, and L. E. Barringer. Mountain pine beetle and white pine blister rust in whitebark pine (*Pinus albicaulis*) ecosystems: cone production decline impacts seed dispersal by nutcrackers. Symposium and Webinar: "Vertebrate Responses to Bark Beetles," University of Wyoming, USDA Forest Service, Region 2, April 5-6, 2012.
- 2011 Tomback, D. F. Collaborative efforts to protect and restore high-elevation 5-needle pines. Panel #4: Collaborative efforts on various non-native forest insects and disease—successes, failures, and opportunities. Continental Dialogue on Non-native Forest Insects & Diseases, Seventh Dialogue Meeting. Millennium Harvest House, Boulder, October 5-6, 2011.
- 2011 Tomback, D. F. and Shawn T. McKinney. Invasive pathogen in whitebark pine ecosystems: trophic cascades and functional losses. *Symposium on Secondary effects of exotic invasions—cascades of ecological change*. North American Forest Insect Work Conference, May 9-12, 2011, Portland, OR.
- 2010 Tomback, D. F., P. Achuff, A. W. Schoettle, and R. Mastrogiuseppe. The magnificent high-elevation five-needle white pines: Ecological roles and future outlook. Plenary presentation: *High-Five symposium: The future of high-elevation five-needle white pines in western North America*. University of Montana, June 28 to 30, 2010. Sponsored by the Whitebark Pine Ecosystem Foundation, Missoula, MT.
- 2010 Tomback, D. F., S. Samano, A. W. Schoettle, and E. L. Pruett. Seed dispersal in limber and southwestern white pine: comparing core vs. peripheral populations. Invited presentation for

- session on Wildlife and High-elevation White Pines. *High-Five symposium: The future of high-elevation five-needle white pines in western North America*. University of Montana, June 28 to 30, 2010. Sponsored by the Whitebark Pine Ecosystem Foundation, Missoula, MT.
- 2010 Tomback, D. F., A. W. Schoettle, M. Perez, K. M. Grompone, and S. Mellmann-Brown. Regeneration and survival of whitebark pine after the 1988 fires. Invited presentation for session on Restoration Studies and Activities. *High-Five symposium: The future of high-elevation five-needle white pines in western North America*. University of Montana, June 28 to 30, 2010. Sponsored by the Whitebark Pine Ecosystem Foundation, Missoula, MT.
- 2010 McKinney, S. T., C. Fiedler, and D. F. Tomback. Stand-level whitebark pine basal area and cone production as predictors of Clark's nutcracker seed dispersal. Invited presentation for session on Wildlife and High-elevation White Pines. *High-Five symposium: The future of high-elevation five-needle white pines in western North America*. University of Montana, June 28 to 30, 2010. Sponsored by the Whitebark Pine Ecosystem Foundation, Missoula, MT.
- 2010 Barringer, L., D. F. Tomback, and M. B. Wunder. The relationship between whitebark pine health, cone production, and nutcracker occurrence across four national parks. Invited presentation for session on Wildlife and High-elevation White Pines. *High-Five symposium: The future of high-elevation five-needle white pines in western North America*. University of Montana, June 28 to 30, 2010. Sponsored by the Whitebark Pine Ecosystem Foundation, Missoula, MT.
- 2010 Scott, J., D. F. Tomback, M. B. Wunder, and M. Maier. Determining Clark's nutcracker use of whitebark pine communities in the Waterton-Glacier Peace Park. Invited presentation for session on Wildlife and High-elevation White Pines. *High-Five symposium: The future of high-elevation five-needle white pines in western North America*. University of Montana, June 28 to 30, 2010. Sponsored by the Whitebark Pine Ecosystem Foundation, Missoula, MT.
- 2010 Tomback, D. F. The role of seed-dispersing corvids in forest regeneration and development. Invited contribution for symposium: *Birds and Ecosystem Services*. Joint meeting of the Cooper Ornithological Society, American Ornithologists' Union, and Society of Canadian Ornithologists, San Diego, CA, February 7-11, 2010.
- 2009 Tomback, D. F. Whitebark pine as a foundation and keystone species: functional roles and community interactions. Invited contribution for symposium: *Climate Change and Whitebark Pine*, Seventh North American Forest Ecology Workshop, Utah State University, June 22-26.
- 2009 Tomback, D. F. Whitebark pine and limber pine: ecology and status. Invited presentation to the Resource managers of the National Park Service, Rocky Mountains Cooperative Ecosystem Studies Unit, February 18, 2009.
- 2009 Tomback, D. F. Invited talk: Proposed listing of whitebark pine: implications and issues. Central Rockies White Pine Health Working Group, April 8, 2009.
- 2007 Tomback, D. F. Whitebark pine: uncertain future for the high elevation keystone. Invited introductory keynote. Workshop: *Whitebark Pine in Western Canada*. August 21-24, Whistler, B.C., Canada. Sponsored by British Columbia Ministry of Forests and Range.

- 2007 Resler, L. M. and D. F. Tomback. Blister rust in krummholz whitebark pine and implications for treeline dynamics. (Paper - Invited session participant, Alpine Treeline I.) Association of American Geographers, April 19, 2007, San Francisco, CA.
- 2006 Tomback, D. F. Overview of whitebark pine ecosystems: ecological importance and future outlook. Invited introductory keynote. Symposium-- *Whitebark Pine: A Pacific Coast Perspective*. August 27- 31, 2006, Southern Oregon University, Ashland, Oregon.
- 2006 Tomback, D. F. Updates on whitebark pine projects. Invited speaker and participant. *Central Rocky Mountains White Pine Health Working Group and West Wide Blister Rust Planning Meeting*. U.S. Forest Service-sponsored meeting. Natural Resources Center, Arapaho/Roosevelt National Forest Office, Ft. Collins, Colorado.
- 2005 Tomback, D. F. Mountain pine beetle in whitebark pine ecosystems: implications for restoration. Invited speaker and participant. *Bark Beetle Workshop*. Ecology Center, Utah State University-host institution, November 15 to 18, Snowbird, Utah.
- 2005 Tomback, D. F. Whitebark pine in the Northern Rocky Mountains: Ecology and the spread of blister rust. Invited speaker and participant. *Pacific Coast Whitebark Pine Workshop*. U.S. Forest Service-sponsored workshop, October 4 to 6, Crater Lake National Park, Oregon.
- 2005 Tomback, D. F. Whitebark pine regeneration: dispersal, germination, and establishment. Invited speaker and participant. *Treeline Workshop*, USGS-sponsored conference. September 12-16, Glacier National Park, West Glacier, Montana.
- 2005 Tomback, D. F. Whitebark pine restoration concepts. Invited speaker. Annual meeting of the Whitebark Pine Subcommittee of the Greater Yellowstone Coordinating Committee. June 14 and 15, 2005, Gardiner, MT.
- 2004 Tomback, D. F. Whitebark pine regeneration in the northern Rocky Mountains: examining the effects of declining seed sources. *Treeline in Mountain and Northern Ecosystems*. University of Münster, Germany, October 21-22, organized by Prof.-Dr. Gabriele Broll, on the occasion of the retirement of Prof.-Dr. F.-K. Holtmeier.
- 2003 Tomback, D. F. Panel participant. "*Claiming high ground: contested landscapes in the mountain west?*" 2003 Bonfils Stanton Lecture Series: Loving our Mountains to Death, organized by Tom Clark, UCD. Denver Botanic Gardens, April 26.
- 2003 Tomback, D. F. Whitebark pine and limber pine in the Crown of the Continent: status, trends, and strategies. *Crown of the Continent Managers' Partnership*. Pincher Creek, Alberta, Canada, April 7-9. Invited banquet speaker.
- 2003 Tomback, D. F. Whitebark pine: Status, trends, strategies in the U.S.A. *Parks Canada Whitebark/Limber Pine Workshop*. Calgary, Alberta, Canada, Feb. 18-19, 2003.
- 2002 Tomback, D. F. The rapid decline of whitebark pine communities: ecological and biodiversity consequences. Invited symposium paper: *Endangered species in mountain habitats*. Ecological

- and Earth Sciences in Mountain Areas. The Banff Centre for Mountain Culture, Banff, Alberta Canada, Sept. 5-9, 2002.
- 2002 Tomback, D. F. A century of blister rust and fire suppression in white pine ecosystems: biodiversity consequences. Invited paper for symposium: The rapid decline of white pine ecosystems of the West: Causes, consequences, and restoration strategies. Annual meeting, Ecological Society of America, Tucson, Arizona, Aug. 4-9, 2002.
- 2002 McKinney, S., D. F. Tomback, and R.J Hoff. Testing the natural selection stand model in whitebark pine. Invited paper for symposium: The rapid decline of white pine ecosystems of the West: Causes, consequences, and restoration strategies. Annual meeting, Ecological Society of America, Tucson, Arizona, Aug. 4-9, 2002.
- 2002 Tomback, D. F. Whitebark pine ecology and Clark's nutcracker. Invited speaker for Whitebark Pine Subcommittee of the Greater Yellowstone Coordinating Committee, West Yellowstone, Montana, June 24 and 25.
- 2002 Tomback, D. F. Delayed seed germination and regeneration patterns following the 1988 Yellowstone fires. Subcommittee of the Greater Yellowstone Coordinating Committee, West Yellowstone, Montana, June 24 and 25.
- 2001 Tomback, D. F. The rapid decline of whitebark pine ecosystems: biodiversity consequences for the subalpine zone. Invited speaker for Symposium: *Research and management concerns for alpine ecosystems: conflicts, connectivity, and climate change*. The Wildlife Society, Reno, Nevada, Sept. 25-29.
- 2001 Tomback, D. F. Blister rust in white pine ecosystems: the imminent decline of western montane biodiversity. Invited speaker for Symposium: *Towards understanding ecological interactions of forest dwelling microbes at the landscape level*. American Phytopathological Society, Salt Lake City, Aug. 25-29.
- 2000 Tomback, D. F. Invited participation in one-day workshop, White Pine Forest Health, Colorado State University. 15 min presentation and discussion on information from whitebark pine and the blister rust epidemic. March 22.
- 1999 Tomback, D. F. The ecology of limber pine and the white pine blister rust epidemic. Invited presentation to the Forest Pest working group, Colorado State University, November 19.
- 1999 Tomback, D. F. and L. P. Bruederle. The evolution and ecology of bird-dispersed pines with reference to recent systematic developments. Invited speakers for *Symposium: Pine Phylogeny and Coevolution*. International Botanical Congress, St. Louis, Missouri, Aug. 1-7. Abstract: 3.7.7.
- 1999 Keynote address. Tomback, D. F. Ecology and evolution of bird-dispersed pines: the nutcracker suite. Annual meeting, Guild of Rocky Mountain Population Biologists, CU Mountain Research Station, Sept. 17-19.
- 1998 (1) Tomback, D. F., S. F. Arno, and R. E. Keane. The compelling case for management

- intervention. (Introductory presentation). (2) Tomback, D. F. Clark's Nutcracker: agent of regeneration. (3) Tomback, D. F., and K. C. Kendall. Biodiversity losses: the downward spiral. Invited contributions for Symposium: *Restoring Whitebark Pine Ecosystems*. Missoula, Montana, Sept. 9-12.
- 1997 Keane, R.E. and D.F. Tomback. Restoration of whitebark pine ecosystems in western Montana. Symposium: *Fire for Restoration of Communities and Ecosystems*. Annual meeting, Ecological Society of America, Albuquerque, August 10-14.
- 1997 Tomback, D.F. Invited participant, Workshop: *Human-induced Change to the Rocky Mountains*. University of Montana Biological Station, Flathead Lake, September 17-21.
- 1994 Tomback, D.F., J.K. Kees, J. Koehler, R.J. Hoff, and S.F. Arno. Whitebark pine regeneration processes in the Sundance Burn of Idaho. *Workshop in Research and Management in Whitebark Pine Ecosystems*, Glacier National Park, May 3, 1994.
- 1994 Tomback, D.F. Panel organizer: Career and parenting. Panel member: Fieldwork. In: *Workshop on Women in Ornithology*. North American Ornithological Conference, University of Montana, Missoula, June 21-26.
- 1992 Tomback, D.F. (1) Population structure in bird-dispersed pines and evolutionary implications (with W. S. Schuster), (2) The effects of seed dispersal by Clark's Nutcracker on early post-fire regeneration of *Pinus albicaulis*. (3) the ecological relationship between Clark's Nutcracker and four wingless-seed *Strobus* pines of western North America. *International Workshop: Subalpine stone pines and their environment*, St. Moritz, Switzerland, September 5-11, 1992.
- 1990 Tomback, D.F. Update: Post-fire whitebark pine regeneration in the Greater Yellowstone Area. Symposium: Informal review of whitebark pine research. USDA Forest Service Intermountain Research Station, Missoula, Montana.
- 1989 Tomback, D.F., L.A. Hoffmann, and S.K. Sund. Coevolution of nutcrackers and pines: implications for forest regeneration. Symposium: *Whitebark pine ecosystems - Ecology and management of a high mountain resource*, U.S.F.S. and Montana State University.
- 1988 Tomback, D.F. Post-fire regeneration of whitebark pine in the Sleeping Child burn. Symposium: Informal review of research on whitebark pine ecosystems. USDA Forest Service Intermountain Research Station, Missoula, Montana.
- 1986 Tomback, D.F. Nutcracker-pine mutualisms: multi-trunk trees and seed size. Symposium: *Plant-bird mutualisms*, XIX International Ornithological Congress, Ottawa, Canada.
- 1984 Bunch, K.G. and D.F. Tomback. Bolus recovery by Gray Jays: a hard act to swallow. Symposium: Cache site memory in birds. *International Foraging Behavior Conference*, Brown University.
- 1983 Tomback, D.F. Nutcracker-pine mutualism: an experimental approach. Symposium: *Behavior and ecology of food specialization in corvids*. Centennial meetings of the American Ornithologists' Union, American Museum of Natural History.

INVITED SEMINARS/WEBINARS/LECTURES

- 2020 The whitebark pine story: from thriving high-mountain keystone to endangered species. Invited lecture, Buffalo Bill Center of the West, Cody, Wyoming, September 3, 2020.
- 2019 The whitebark pine story: from thriving high-mountain keystone to ESA candidate species. Invited seminar, Department of Natural Resource Ecology and Management, Iowa State University, Ames, Iowa, November 8, 2019.
- 2019 Biodiversity catastrophe in real time: loss of five-needle white pine communities and cascading consequences. Global Change and Sustainability Center Seminar Series, University of Utah, Salt Lake City, UT, April 2, 2019.
- 2018 A call to restore the gray wolf to Colorado. First lecture of 2018-19 lecture series at History Colorado. Denver, Colorado, September 17, 2018.
- 2018 The whitebark pine story: ecology and decline. One in a series of four invited short presentations on the National Whitebark Pine Restoration Plan. Presented for the Department of Interior webinar series, videoed at the Department of Interior, Washington, D.C., May 14, 2018.
- 2018 Whitebark pine status and the potential role of biotechnology for restoration. Webinar sponsored by the National Academy of Sciences, Engineering, and Medicine (NAEM), Committee on Forest Health and Biotechnology, April 2, 2018.
- 2018 Whitebark pine facilitation at treeline: Potential disruption by exotic disease. University of Northern Colorado, School of Biological Sciences, February 9, 2018.
- 2017 Rocky Mountain High Elevation Five-needle White Pine Communities: Biodiversity and Ecosystem Services under Threat. Denver Botanic Gardens, February 22, 2017.
- 2016 Whitebark pine facilitation at treeline: Potential disruption by exotic disease with implications for climate change. Regis University, Department of Biology, October 17, 2016.
- 2015 Connecting science and advocacy: Using whitebark pine as a case history. Invited presentation to Harvard Forest summer REU students. June 17, 2015.
- 2015 Facilitation at treeline in the Rocky Mountains: Disruption by exotic disease and implications for climate change. Invited Harvard Forest seminar. April 3, 2015.
- 2015 Trouble at treeline: Loss of a Rocky Mountain foundation species. Harvard University Herbaria, Department of Organismic and Evolutionary Biology. March 10, 2015.
- 2014 Trouble at treeline: Loss of a Rocky Mountain keystone species. Annual Faculty Achievement Award Lecture, University of Colorado Denver, College of Liberal Arts and Sciences. October 31,

- 2014.
- 2012 Exploring Western Forests and Climate Change. American Forests/Natural Resources Defense Council, Washington, D.C. Public Presentation, Tuesday, June 26, the National Geographic Society, Washington, D.C. Presentations by Diana Tomback (Whitebark Pine Ecosystem Foundation) and James Baalog (Extreme Ice Survey).
- 2011 The magnificent high-elevation white pines: ecological roles and future outlook. February 24, 2011, USDA Forest Service, Washington D. C. Invited by Robert Mangold, Director, Forest Health Protection, U.S. Forest Service.
- 2008 Seed dispersal in limber and southwestern white pine: Comparing core vs. peripheral populations. USDA Forest Service, Fire Sciences Laboratory, Rocky Mountain Research Station, Missoula, MT, April 3.
- 2006 The impact of seed dispersal by Clark's nutcracker on whitebark pine: Multi-scale perspective on a high mountain mutualism. Department of Biological Sciences, University of Calgary, October 20.
- 2005 Vanishing forests: blister rust and the decline of whitebark pine. Department of Biology, Southern Oregon University, October 7.
- 2004 The rapid decline of whitebark pine ecosystems: trends, consequences, and restoration strategies. Department of Biology, Colorado College, February 5.
- 2003 The rapid decline of whitebark pine ecosystems: trends, consequences, and restoration strategies. Yellowstone National Park, administration headquarters, Mammoth Hot Springs, WY, June 23.
- 2002 The nutcracker-whitebark pine interaction and outlook for whitebark pine in the northern Rocky Mountains. Glacier National Park Headquarters, West Glacier, MT, Nov. 19.
- 2001 The nutcracker-pine interaction: ecology and evolution. Division of Biological Sciences, University of Montana.
- 2001 Issues in white pine restoration: seed production "threshold" effect, extinction vortices, and linkages among white pine populations. USDA Forest Service, Fire Sciences Laboratory, Rocky Mountain Research Station, Missoula, Montana.
- 1994 Whitebark pine in the northern Rocky Mountains: elucidating the ecology of a bird-dispersed pine. Department of Botany, University of Wyoming.
- 1991 Seed dispersal by Clark's Nutcracker: costs and benefits to pines. Department of Zoology, University of British Columbia.
- 1990 Seed dispersal by Clark's Nutcracker: costs and benefits to pines. Colloquium of the Biological Sciences, Colorado State University.
- 1990 Seed dispersal by Clark's Nutcracker: costs and benefits to pines. Colloquium of the Biological

Sciences, University of California at Santa Barbara.

- 1990 Patterns of post-fire regeneration of a bird-dispersed pine. Department of Geography, University of Colorado at Boulder.
- 1987 The evolution of bird-dispersed pines. Department of Biological Sciences, University of California at Santa Barbara.
- 1985 Nutcracker-pine mutualism: experimental approaches. Department of Biology, University of Denver.
- 1984 Foraging ecology of Clark's Nutcracker: seed preferences, cache retrieval, and coevolution. Department of Zoology and Entomology, Colorado State University.
- 1983 Nutcracker-pine mutualism: an experimental approach. Department of Environmental and Forest Biology, State University of New York at Syracuse.
- 1983 Nutcracker-pine mutualism: an experimental approach. Department of Psychology, University of Toronto.
- 1982 Dispersal of whitebark pine seeds by Clark's Nutcracker: a mutualism hypothesis (subtitle: coevolution or coadaptation and coercion). Department of EPO Biology, University of Colorado at Boulder.
- 1979 Dispersal of whitebark pine seeds by Clark's Nutcracker: ecological and evolutionary consequences. Department of Zoology and Entomology, Colorado State University.
- 1976 The ecological relationship between the Clark's Nutcracker and the whitebark pine: predator-prey or mutualism? Department of Zoology, Brigham Young University.

CONTRIBUTED PRESENTATIONS AT PROFESSIONAL MEETINGS

- 2022 Durboraw, T.
- 2022 McLaren, T.
- 2021 Andrade, A.J., D.F. Tomback, M. Kain, and A.C. Mosier. Post-fire tree canopy development influences microclimate but not soil nutrient concentrations nearly 30 years after stand-replacing fire. Annual meeting of the Ecological Society of America, August 2-6, 2021. Virtual.
- 2021 Wheeler, B.E., A.J. Andrade, and D.F. Tomback. Subcanopy conifer regeneration hinders digital estimation of understory plant cover in post-fire whitebark pine communities. Annual meeting of the Ecological Society of America, August 2-6, 2021. Virtual.
- 2021 McLaren, T., D. Tomback, N. Grevstad, W. Wehtje, D. Smith, and L. Walker Clark's nutcracker (*Nucifraga columbiana*) forest habitat use In Yellowstone National Park: An approach to

addressing latent impacts of detectability. Annual meeting of the Ecological Society of America, August 2-6, 2021. Virtual.

- 2019 Andrade, A. J. and D. F. Tomback. Trends in microclimatic and floristic variability 30 years after the 1988 Yellowstone fires. Poster Session, Communities: Spatial patterns and environmental gradients. Ecological Society of America, Louisville, KY, August 11-16, 2019.

- 2018 14th Biennial Scientific Conference on the Greater Yellowstone Ecosystem, Big Sky, MT, September 11-14, 2018:

Oral presentations

Tomback, D. F., E. R. Pansing, and T. Chang. Climate trends in real time? Whitebark pine post-fire regeneration since the 1988 Yellowstone Fires

Tomback, D. F., E. Sprague. R. E. Keane, D. Gwaze, and L. Weldon. The National Whitebark Pine Restoration Plan: A multi-agency collaborative effort to rescue a high elevation foundation and keystone species.

Andrade, A. J., D. F. Tomback, S. Mellmann-Brown, and T. R. Seastedt. Successional trajectories of the understory plant communities following the 1988 Yellowstone Fires: Assessing patterns of recovery.

Poster presentation

Pansing, E. R., D. F. Tomback, and M. B. Wunder. Assessing the impacts of climate-altered fire regimes on projected extinction risk of whitebark pine in the Greater Yellowstone Ecosystem

- 2018 Ecological Society of America, Ernest N. Morial Convention Center, New Orleans, LA, August 5-10, 2018:

Contributed oral presentations

Tomback, D. F., E. Sprague. R. E. Keane, D. Gwaze, and L. Weldon. The National Whitebark Pine Restoration Plan: A multi-agency collaborative effort to rescue a high elevation foundation and keystone species.

Pansing, E. R., D. F. Tomback, and M. B. Wunder. Assessing the impacts of climate-altered fire regimes on projected extinction risk of whitebark pine in the Greater Yellowstone Ecosystem.

Andrade, A. J., D. F. Tomback, S. Mellmann-Brown, and T. R. Seastedt. Successional trajectories of the understory plant communities following the 1988 Yellowstone Fires: Assessing patterns of recovery.

Contributed poster

Malanson, G. P., D. F. Tomback, and L. M. Resler. Concept for range limits with *P. albicaulis*.

- 2018 International Association for Vegetation Science, 61st Annual Symposium: Natural ecosystems as benchmarks for vegetation science. Montana State University, Bozeman, MT, July 22-27, 2018:

Poster session

Andrade, A. J., D. F. Tomback, S. Mellmann-Brown, and T. R. Seastedt. Successional trajectories

of the understory plant communities following the 1988 Yellowstone Fires.

Pansing, E. R., D. F. Tomback, and M. B. Wunder. Assessing the impacts of climate-altered fire regimes on projected extinction risk of whitebark pine in the Greater Yellowstone Ecosystem.

Field trip leaders

Tomback, D. F., E. R. Pansing, and A. J. Andrade. Helped lead the post-conference field trip to the Beartooth Plateau and to Yellowstone National Park, providing information from Tomback Lab long-term studies, July 29 and 30, 2018.

2018 Tomback, D. F., E. R. Pansing, and A. J. Andrade. Field trip presentation to North American Dendroecological Fieldweek, Beartooth Plateau, July 22, 2018.

2016 The 13th Biennial Scientific Conference on the Greater Yellowstone Ecosystem: Building on the past, leading into the future: Sustaining the Greater Yellowstone Ecosystem in the coming century. Jackson Lake Lodge, Grand Teton National Park, WY, October 4 – 6, 2016:

Session 2c. Whitebark Research and Management Guidance for the Future.

Pansing, E. R., D. F. Tomback, M. B. Wunder, and A. C. Wagner. Use of direct seeding to restore subalpine and treeline whitebark pine in the Greater Yellowstone Ecosystem: planting site influences germination and survival.

Wagner, A. C., D. F. Tomback, L. M. Resler, and E. R. Pansing. The ecosystem function of whitebark pine and pathogen disturbance in the Greater Yellowstone Ecosystem.

Tomback, D. F., G. P. Malanson, L. M. Resler, and E. R. Pansing. Forest health threats cascade upwards: Modelling whitebark pine treeline community response to exotic disease and diminished seed production in the Greater Yellowstone Ecosystem.

Session 5b: Fire ecology: Past, present, and future.

Andrade, A. J., D. F. Tomback, S. Mellmann-Brown. Understory recovery following the 1988 Yellowstone Fires: nearly three decades of succession.

Poster session

Lea, M., D. F. Tomback, J. Syring, and R. Cronn. Developing microstaellites for whitebark pine and application to measuring recovery of genetic diversity following the 1988 Yellowstone Fires.

2016 Williams, T., and D. F. Tomback. 2016. Clark's Nutcracker seed use and limber pine metapopulation structure in Rocky Mountain National Park: Predicting future trends. 6th North American Ornithological Conference, Washington Hilton, Washington D.C., August 16-20, 2016.

2015 Resler, L. M., D. F. Tomback, G. Malanson, Y. Shao, E. Smith-McKenna, J. Pyatt, and S. Blakeslee. 2015. Geographic variation in functional role and occurrence of whitebark pine at alpine treeline. In: Mountain treeline ecotones: threshold dynamics and climatic relationships, organized by Connie Millar and David Cairns. Perth III: Mountains of our Future Earth. University of the Highlands and Islands and Perth College, Perth, Scotland, 4 – 8 October, 2015.

2015 Tomback, D. F. 2015. Whitebark pine ecosystems in western North America: bird-pine

- mutualism, ecological function, and widespread decline. In: Mountain forests: stresses, disturbances, and ecosystem services, organized by Georg Gratzer and William Keeton. Perth III: Mountains of our Future Earth. University of the Highlands and Islands and Perth College, Perth, Scotland, 4 – 8 October, 2015.
- 2014 Tomback, D. F. J. D. Scott, M. B. Wunder, and S. T. McKinney. Whitebark pine cone production and the probability of stand visitation by Clark's Nutcracker: Assessments from Glacier and Waterton Lakes National Parks. American Ornithologists' Union/Cooper Ornithological Society/Society of Canadian Ornithologists joint annual meeting, Estes Park, CO, 23-28 September 2014.
- 2014 Pansing, E. R., D. F. Tomback, M. B. Wunder, A. C. Wagner, and J. P. French. Germination and seedling survival of common Clark's Nutcracker cache locations and consequences of cache pilferage. American Ornithologists' Union/Cooper Ornithological Society/Society of Canadian Ornithologists joint annual meeting, Estes Park, CO, 23-28 September 2014.
- 2014 Fike, J. A., D. F. Tomback, M. B. Wunder, A. M. Siepielski, T. D. Schaming, and S. J. Oyler-McCance. Examining genetic structure across the range of Clark's Nutcracker. Poster. American Ornithologists' Union/Cooper Ornithological Society/Society of Canadian Ornithologists joint annual meeting, Estes Park, CO, 23-28 September 2014.
- 2014 McKinney, S.T., and D.F. Tomback. The viability of evolutionary rescue in natural populations. Society for Conservation Biology North America Congress for Conservation Biology, Missoula, MT, 13-16 July 2014 .
- 2014 Tomback, D. F., L. M. Resler, G. P. Malanson, E. K. Smith-McKenna, S. C. Blakeslee, and J. C. Pyatt. White pine blister rust alters facilitation interactions at treeline: implications for treeline communities and response to climate change. IUFRO joint conference: *Genetics of Five-needle Pines, Rusts of Forest Trees, and Strobosphere*. June 15-20, 2014, Ft. Collins, CO.
- 2014 Pansing, E. R., A. C. Wagner, and D. F. Tomback. Whitebark pine direct seeding trials in the northern Rocky Mountains: The role of planting sites and cache pilferage by rodents. Poster presentation. IUFRO joint conference: *Genetics of Five-needle Pines, Rusts of Forest Trees, and Strobosphere*. June 15-20, 2014, Ft. Collins, CO.
- 2013 McKinney, S. T., and D. F. Tomback. Invasive pathogen trumps natural selection thwarting evolutionary rescue. 98th Annual Meeting, Ecological Society of America, Minneapolis, MN, August 4-9, 2013.
- 2012 Pyatt, J. C., D. F. Tomback, S. C. Blakeslee, R. R. Pansing, L. M. Resler. The role of *Pinus albicaulis* as a tree island initiator in the alpine-treeline ecotone: Comparing microclimates among microsites. Poster presentation. 97th Annual Meeting, Ecological Society of America, Portland, OR, August 5-10, 2012.
- 2012 Blakeslee, S. C., D. F. Tomback, J. C. Pyatt, E. R. Pansing, L. M. Resler. Whitebark pine (*Pinus albicaulis*) vigor and functional roles within the alpine treeline ecotone. Poster presentation. 97th Annual Meeting, Ecological Society of America, Portland, OR, August 5-10, 2012.

- 2011 Tomback, D. F., and P. Achuff. The high-elevation five-needle white pines of western North America: ecological roles and future outlook. 4th IUFRO (International Union of Forest Research Organizations) *Conference on the Breeding and Genetic Resources of Five-Needle Pines*, 9-18 August 2011, Tomsk, Russia.
- 2011 Tomback, D. F., L. M. Resler, K. Chipman, and E. Smith. Ecological role of whitebark pine in treeline communities of the northern Rocky Mountains, North America: projected impact of invasive disease on climate change response. 4th IUFRO *Conference on the Breeding and Genetic Resources of Five-Needle Pines*, 9-18 August 2011, Tomsk, Russia.
- 2011 Tomback, D. F., S. T. McKinney, M. B. Wunder, and L. E. Barringer. Invasive pathogen in whitebark pine (*Pinus albicaulis*) ecosystems: cone production decline impacts seed dispersal by nutcrackers. 4th IUFRO *Conference on the Breeding and Genetic Resources of Five-Needle Pines*, 9-18 August 2011, Tomsk, Russia.
- 2010 Turner, T. J., D. F. Tomback, B. Van Anderson, and M. Murray. Sugar pine seed harvest by Clark's nutcracker. Contributed poster paper. *High-Five symposium: The future of high-elevation five-needle white pines in western North America*. University of Montana, June 28 to 30, 2010. Sponsored by the Whitebark Pine Ecosystem Foundation, Missoula, MT.
- 2008 Tomback, D. F., A. W. Schoettle, K. M. Grompone, M. J. Perez, K. K. Hill, S. Mellmann-Brown, and A.D. East. Development of whitebark pine communities following the 1988 Yellowstone fires. *The '88 Fires: Yellowstone and Beyond*. September 22-27, 2008, Jackson Hole, Wyoming. Oral presentation.
- 2008 Tomback, D. F., M. J. Perez, A. W. Schoettle, and K. M. Grompone. Microsites facilitating whitebark pine survival following the 1988 Yellowstone Fires. *The '88 Fires: Yellowstone and Beyond*. (Sponsored by the International Association of Wildland Fire.) September 22-27, 2008, Jackson Hole, Wyoming. Oral presentation.
- 2008 Andrade, A. J., S. M. Marvez, S. Mellmann-Brown, K. S. Carsey, D. F. Tomback, and A. W. Schoettle. Emerging herbaceous community successional pathways following the 1988 Yellowstone fires. *The '88 Fires: Yellowstone and Beyond*. (Sponsored by the International Association of Wildland Fire.) September 22-27, 2008, Jackson Hole, Wyoming. Oral presentation.
- 2008 Mellmann-Brown, S., D. F. Tomback, and A. W. Schoettle. Understory development of subalpine forests after the 1988 Yellowstone fires. *The '88 Fires: Yellowstone and Beyond*. (Sponsored by the International Association of Wildland Fire.) September 22-27, 2008, Jackson Hole, Wyoming. Oral presentation.
- 2007 Tillman-Sutela, E., A. Kauppi, and D.F Tomback. Are unusual seed structures in *Cembrae* pines key to a persistent soil seed bank? *Seed Ecology II. International Conference*, September 9-13, 2007, Perth, Australia. Oral presentation.
- 2007 Resler, L., and D. F. Tomback. Blister rust prevalence in krummholz whitebark pine: implications for treeline dynamics. Workshop: *Whitebark Pine in Western Canada*. August 21-24, 2007,

- Whistler, B.C., Canada. Sponsored by British Columbia Ministry of Forests and Range.
- 2007 Tomback, D. F., K. G. Chipman, S. T. McKinney. Is white pine blister rust influencing Clark's Nutcracker population trends? American Ornithologists' Union, annual meeting, August 8 – 11, 2007, University of Wyoming, Laramie, Wyoming. Oral presentation.
- 2007 McKinney, S. T., C.E. Fiedler, and D. F. Tomback. Is the Clark's Nutcracker – whitebark pine mutualism threatened by white pine blister rust? American Ornithologists' Union, annual meeting, August 8 – 11, 2007, University of Wyoming, Laramie, Wyoming. Oral presentation.
- 2007 Lansing, J. M., and D. F. Tomback. Estimating population sizes of the Gray Jay using geographic information systems (GIS) and habitat preferences. American Ornithologists' Union, annual meeting, August 8 – 11, 2007, University of Wyoming, Laramie, Wyoming. Poster paper.
- 2006 Schwandt, J. W., D. F. Tomback, R. E. Keane, and W. W. McCaughey. First-year results of a whitebark pine seed planting trial near Baker City, OR. *Symposium-- Whitebark Pine: A Pacific Coast Perspective*. August 27 - 31, 2006, Southern Oregon University, Ashland, Oregon.
2006. Tomback, D. F., R. E. Keane, W. W. McCaughey, and C. M. Smith. 2006. Methods for surveying and monitoring whitebark pine for blister rust infection and damage. *Symposium-- Whitebark Pine: A Pacific Coast Perspective*. August 27- 31, 2006, Southern Oregon University, Ashland, Oregon.
- 2006 Tillman-Sutela, E., A. Kauppi, and D. F. Tomback. Structural adaptation in bird-dispersed whitebark pine and Siberian stone pine seeds. *Symposium-- Whitebark Pine: A Pacific Coast Perspective*. August 27- 31, 2006, Southern Oregon University, Ashland, Oregon.
- 2006 Tomback, D.F., A.W. Schoettle, K.M. Grompone, M.J. Perez, and K. Hill. Development of whitebark pine communities following the 1988 Yellowstone fires, and the role of fire in whitebark pine growth. Ecological Society of America, Aug. 6 to 11, 2006, Memphis, Tennessee.
- 2006 Perez, M.J., K.M. Grompone, D.F. Tomback, and A.W. Schoettle. Whitebark pine regeneration following the 1988 Yellowstone fires: microsites favoring survival and seedling demographics. Poster paper. Ecological Society of America, Aug. 6 to 11, 2006, Memphis, Tennessee.
- 2006 Samano, S., D.F. Tomback, E. L. Pruett, D. N. Maddox, K. M. Grompone, and M. J. Perez. Differences in seed size, seed dispersers, and seed predators between a core and peripheral population of southwestern white pine. Ecological Society of America, Aug. 6 to 11, 2006, Memphis, Tennessee.
- 2006 McKinney, S. T., C. E. Fiedler, and D. F. Tomback. Habitat use of whitebark pine (*Pinus albicaulis*) forests by Clark's nutcracker (*Nucifraga columbiana*): implications for restoration. Annual Meeting of the Society for Conservation Biology, June 24-28, San Jose, CA.
- 2004 Tomback, D. F., A.W. Schoettle, K. E. Chevalier, and C.A. Jones. Life on the edge for limber pine: seed dispersal within a peripheral population. Seed Ecology 2004: An international meeting on seeds and the environment. Rodos Palace Hotel-Convention Center, Rhodes Island, Greece, April 29-May 4.

- 2003 Sniezko, R.A, D. F. Tomback, R. M. Rochefort, E. Goheen, R. Hunt, J. S. Beatty, M. Murray, and F. Betlejewski. Exotic pathogens, resistant seed and restoration of forest tree species in western North America. Poster paper presentation, The 4th North American Forest Ecology Workshop: Ecosystems in Transition, Corvallis, Oregon, June 16-20.
- 2000 Breindel, S.M. and D. F. Tomback. Foraging ecology and role of pine seeds in the diet of Steller's Jay. Annual meeting, Cooper Ornithological Society, Riverside, California, April 25-29.
- 2000 Bay, K.M. and D.F. Tomback. Does trophic structure morphology of the Steller's Jay (*Cyanocitta stelleri*) vary in relation to habitat type? Annual meeting, Cooper Ornithological Society, Riverside, California, April 25-29.
- 2000 Samano, S. and D. F. Tomback. Clark's Nutcracker and southwestern white pine: another bird-pine mutualism. Annual meeting, Cooper Ornithological Society, Riverside, California, April 25-29.
- 2000 Tomback, D.F. Delayed seed germination in whitebark pine following the 1988 Yellowstone fires: an ecological strategy. Annual meeting, Guild of Rocky Mountain Population Biologists, Rocky Mountain Biological Station, Crested Butte, Colorado, September 8-10.
- 2000 Breindel, S.M. and D.F. Tomback. Foraging ecology and role of pine seeds in the diet of Steller's Jay. Annual meeting, Guild of Rocky Mountain Population Biologists, Rocky Mountain Biological Station, Crested Butte, Colorado, September 8-10.
- 1999 Keynote address. Tomback, D. F. Ecology and evolution of bird-dispersed pines: the nutcracker suite. Annual meeting, Guild of Rocky Mountain Population Biologists, CU Mountain Research Station, Sept. 17-19.
- 1999 Bay, K. M., D. F. Tomback, and S. M. Breindel. Does trophic structure morphology of the Steller's Jay (*Cyanocitta stelleri*) vary in relation to habitat type? Annual meeting, Guild of Rocky Mountain Population Biologists, CU Mountain Research Station, Sept. 17-19.
- 1999 Bay, Kirstie M., D. F. Tomback, and S. M. Breindel. Does trophic structure morphology of the Steller's Jay (*Cyanocitta stelleri*) vary in relation to habitat type? Poster paper. Annual meeting, Cooper Ornithological Society, Portland, Oregon, March 29 – April 3.
- 1998 Tomback, D. F., L. P. Bruederle, and K. K. Kelly. Clark's Nutcracker on Cerro Potosi: The ecology of a disjunct distribution. Annual meeting, Guild of Rocky Mountain Population Biologists, CU Mountain Research Station, Sept. 18-20.
- 1998 Tomback, D. F., L. P. Bruederle, and K. K. Kelly. Clark's Nutcracker on Cerro Potosi: The ecology of a disjunct distribution. North American Ornithological Conference, St. Louis, Missouri, April 6-12.
- 1997 Forbes, C. D. W., L. L. Torick, S. M. Breindel, and D. F. Tomback. The timing of cone opening and shift from limber to ponderosa pine seeds by Clark's Nutcracker. Annual meeting, Cooper Ornithological Society, Hilo, Hawaii, April 30-May 4.

- 1997 Tomback, D.F., R. Feldman, and J. Koehler. Competition, tree morphology, and pollen cone production in limber pine tree clusters: a cost of mutualism. All-scientists Meeting, Rocky Mountain National Park, CO, June 9-10.
- 1997 Kelly, K.K., L.P. Bruederle, D.F. Tomback, and R.C. Hardwick. Bird-dispersed pines have relatively low levels of genetic diversity. Annual meeting, Guild of Rocky Mountain Population Biologists, Colorado College, Crestone campus, Sept. 19-21.
- 1996 Tomback, D.F., A.J. Anderies, K.S. Carsey, and M.L. Powell. Cone production, moisture, and the evolution of delayed seed germination in a bird-dispersed pine. Annual meeting, Ecological Society of America, Providence, R.I., Aug. 10-14.
- 1996 Anderies, A., D.F. Tomback, K.S. Carsey, and M.L. Powell. Patterns of subalpine forest regeneration following the 1988 fires. (poster paper) Annual meeting Ecological Society of America, Providence, R.I., Aug. 10-14.
- 1996 Kelly, K.K., L.P. Bruederle, D.F. Tomback, and R.C. Hardwick. Bird-dispersed pines have relatively low levels of genetic diversity. Annual meeting AIBS, Seattle, WA, Aug. 4-7.
- 1996 Johnson, S.A., L.P. Bruederle, and D.F. Tomback. Genetic evidence supports a hybrid origin for *Apocynum X floribundum* Greene (Apocynaceae). Annual meeting, AIBS, Seattle, Washington, Aug. 4-7.
- 1996 Tomback, D. F. Are Clark's Nutcrackers better seed dispersers than wind? Comparing patterns of post-fire regeneration in the northern Rocky Mountains. Annual meeting, Cooper Ornithological Society, San Diego, California, March 27-31.
- 1994 Baud, K.S., and D.F. Tomback (presenters). Small mammal predation of simulated Clark's Nutcracker seed caches. North American Ornithological Conference. Annual meeting, American Ornithologists' Union, Cooper Ornithological Society, Wilson Ornithological Society, University of Montana, Missoula, June 21-26.
- 1993 Tomback, D.F., K.S. Carsey, and M.L. Powell. Post-fire patterns of whitebark pine (*Pinus albicaulis*) germination and survivorship in the Greater Yellowstone Area. The Ecological Implications of Fire in Greater Yellowstone, Yellowstone National Park, Wyoming, September 19-21.
- 1993 Tomback, D.F., K.S. Carsey, and M.L. Powell. Patterns of *Pinus albicaulis* regeneration following the 1988 Yellowstone fires. Annual meeting, Ecological Society of America, University of Wisconsin-Madison, July 31 to August 4.
- 1992 Tomback, D.F. and T.T. Veblen (poster paper). Does climate change cause genetic change? University of Colorado Symposium on Global Change and Environmental Quality.
- 1991 Tomback, D.F., S.F. Arno, and R.E. Keane. The status of whitebark pine populations in the northern Rocky Mountains. Symposium on Biodiversity in the Rocky Mountains, Colorado State University.

- 1991 Tomback, D.F. Post-fire whitebark pine seed dispersal by Clark's Nutcrackers in Yellowstone National Park. Annual meeting, Cooper Ornithological Society, University of Oklahoma.
- 1991 Tomback, D.F., K.S. Carsey, and M.L. Powell. Early post-fire *Pinus albicaulis* regeneration in the Greater Yellowstone Area. Annual meeting, Guild of Rocky Mountain Population Biologists, Mountain Research Station, University of Colorado.
- 1990 Tomback, D.F. and J.W. Knowles. Post-fire whitebark pine seed dispersal by Clark's Nutcrackers in Yellowstone National Park. Annual meeting, Guild of Rocky Mountain Population Biologists, Mountain Research Station, University of Colorado.
- 1990 Feldman, R., K.S. Carsey, and D.F. Tomback. Reproductive costs of a nutcracker-pine mutualism: clustered versus solitary growth forms. Annual meeting, Guild of Rocky Mountain Population Biologists, Mountain Research Station, University of Colorado.
- 1990 Tomback, D.F., R. Feldman, and K.S. Carsey. The nutcracker-limber pine interaction: tree growth form and the cost of mutualism. Annual meeting, American Ornithologists' Union, Los Angeles, California.
- 1989 Tomback, D.F., L.A. Hoffmann, and S.K. Sund. Post-fire regeneration of a bird-dispersed pine, *Pinus albicaulis*, in western Montana. Ecological Society of America, Toronto, Canada.
- 1989 Tomback, D.F., L.A. Hoffmann, and S.K. Sund. Coevolution of whitebark pine and nutcrackers: implications for forest regeneration. Symposium: Whitebark pine ecosystems: ecology and management of a high mountain resource Montana State University.
- 1989 Keane, R.E., S.F. Arno, J.K. Brown, and D.F. Tomback. Modelling disturbance and conifer succession in whitebark pine forests. Whitebark pine ecosystems: ecology and management of a high mountain resource, symposium, Montana State University.
- 1988 Keane, R.E., S.F. Arno, J.K. Brown, and D.F. Tomback. Modelling stand dynamics in whitebark pine forests Annual meeting, Ecological Society of America, Davis, California.
- 1988 Langley, R.G. and D.F. Tomback. Foraging by olfaction in Gray Jays. Animal Behavior Society, Missoula, Montana.
- 1987 Tomback, D.F. and Y.B. Linhart. The evolution of bird-dispersed pines. Annual meeting, American Ornithologists' Union, San Francisco, California.
- 1986 Tomback, D.F. Nutcracker-pine mutualisms: multi-trunk trees and seed size. Plant-bird Mutualisms Symposium, XIX International Ornithological Congress, Ottawa, Canada.
- 1986 Langley, R.G. and D.F. Tomback. Specialized olfactory ability in Gray Jays. Annual meeting, Cooper Ornithological Society, Davis, California.
- 1986 Bornstein, M.S. and D.F. Tomback. Are squaw currant seeds bird-dispersed? Cooper Ornithological Society, Davis, California.

- 1985 Tomback, D.F. and K.L. Burnell. Seed size selection by Clark's Nutcrackers: predictions and preliminary data. III International Congress of Systematic and Evolutionary Biology, Brighton, England.
- 1985 Tomback, D.F. and K.L. Burnell. Foraging preferences of Clark's Nutcrackers: predictions and preliminary data. Joint annual meeting of the Cooper and Wilson Ornithological Societies, Boulder, Colorado.
- 1984 Tomback, D.F. Annual meeting, American Ornithologists' Union, Lawrence, Kansas. Observations on the ecology and behavior of the Marianas Crow (Corvus kubaryi).
- 1984 Tomback, D.F. and Y.B. Linhart. Nutcracker-pine mutualism: seed selection and tree growth form. Annual meeting, Guild of Rocky Mountain Population Biologists, CU Mountain Research Station.
- 1984 Burnell, K.L. and D.F. Tomback. Gray Jay foraging behavior: field and lab observations. Annual meeting, Guild of Rocky Mountain Population Biologists, CU Mountain Research Station.
- 1984 Bunch, K.G. and D.F. Tomback. Bolus recovery by Gray Jays: a hard act to swallow. Foraging Behavior Conference (international), invited contribution, Providence, Rhode Island.
- 1984 Linhart, Y.B. and D.F. Tomback. Multi-trunk limber and whitebark pine: a consequence of seed caching by nutcrackers (poster paper). Foraging Behavior Conference (international), Providence, Rhode Island.
- 1983 Tomback, D.F. Nutcracker-pine mutualism: an experimental approach (symposium contribution). Centennial meeting, American Ornithologists' Union, New York.
- 1983 Tomback, D.F. Experimental studies of cone preference in Clark's Nutcracker: avian generation gap? Annual Meeting, Cooper Ornithological Society, Albuquerque, New Mexico.
- 1982 Tomback, D.F. Assortative mating by White-crowned Sparrows at dialect boundaries. Annual meeting, Guild of Rocky Mountain Population Biologists, CU Mountain Research Station.
- 1982 Tomback, D.F., K.G. Bunch, and G.S. Sullivan. Seed caching by Clark's Nutcracker: substrate preference and cache site recall. Annual meeting, American Ornithologists' Union, Chicago, Illinois.
- 1982 Tomback, D.F. and M.C. Baker. Assortative mating by White-crowned Sparrows at dialect boundaries. Annual meeting, American Ornithologists' Union, Chicago, Illinois.
- 1981 Tomback, D.F. Dialect population stability in White-crowned Sparrows: testing the male exclusion hypothesis. Annual meeting, American Ornithologists' Union, Edmonton, Canada.
- 1980 Tomback, D.F. Post-fire subalpine regeneration by Clark's Nutcracker. Annual meeting, American Ornithologists' Union, Ft. Collins, Colorado.

- 1979 Tomback, D.F. Vocalizations of Clark's Nutcracker: sound structure, function, and environmental selection (poster paper). Annual meeting, American Ornithologists' Union, College Station, Texas.
- 1978 Tomback, D.F. and R.M. Lanner. Consequences of nutcracker-mediated seed dispersal: growth form and winglessness in whitebark and limber pine. Annual meeting, Cooper Ornithological Society, Tempe, Arizona.
- 1977 Tomback, D.F. and J.R. Murphy. Geographic color phase variation in the Ferruginous Hawk. Annual meeting, Raptor Research Foundation, Tempe, Arizona.
- 1977 Tomback, D.F. and J.R. Murphy. Geographic color phase variation in the Ferruginous Hawk (*Buteo regalis*). Annual meeting, American Ornithologists' Union, Berkeley, California.
- 1977 Tomback, D.F. The ecological relationship between Clark's Nutcracker and the whitebark pine: predator-prey or mutualism? Annual meeting, Cooper Ornithological Society, Pocatello, Idaho.
- 1977 Tomback, D.F. Pre-roosting flights of the Clark's Nutcracker in the eastern Sierra Nevada: phototaxis or thermoregulation? Annual meeting, Cooper Ornithological Society, Bozeman, Montana.
- 1976 Tomback, D.F. Seed storage and recovery strategies of the Clark's Nutcracker in the eastern Sierra Nevada. Annual meeting, American Ornithologists' Union, Haverford, Pennsylvania.
- 1976 Tomback, D.F. Seed storage and recovery strategies of the Clark's Nutcracker in the eastern Sierra Nevada. Annual meeting, Southern California Academy of Sciences, Santa Barbara, California.
- 1974 Tomback, D.F. Summer behavior of the Clark's Nutcracker in the Sierra Nevada. Annual meeting, Cooper Ornithological Society, Flagstaff, Arizona.

COURSES TAUGHT (2005-present)

Advanced Ecology, Biol. 4052/5052 current
 Biology Field Studies: Costa Rica, Biol. 4050/5050
 Conservation Biology, Biol. 4154/5154 current
 Evolution
 Introduction to Research
 Plant-animal Mutualisms
 Principles of Ecology, Biol. 3411, current
 Special topics, Biol. 7050: Vegetation Metrics and Data Analysis current
 Special topics, Biol. 7050: Disturbance Ecology current
 Vertebrate Biology

RECOGNITIONS, HONORS, ETC.

Charles Bullard Fellowship, Harvard Forest, Harvard University, spring and summer 2015
 CLAS Outstanding Faculty Achievement Award, spring 2014.
 Research Award, College of Liberal Arts and Sciences, University of Colorado at Denver, 2001
 Fellow, American Ornithologists' Union, 1994
 USDA Forest Service Centennial (1891-1991) Conservation Award, December, 1991

Elective Member, American Ornithologists' Union, 1983
 University of Colorado Foundation, Faculty Research Award, 1983

PROFESSIONAL ASSOCIATIONS

American Association for the Advancement of Science
 American Ornithological Society (merger of AOU and COS)
 Ecological Society of America
 Sigma Xi

PROFESSIONAL CONSULTING

- 2017 U.S. Forest Service, Western Wildlands Environmental Threat Assessment Center: report for STDP panel: Tomback, D.F. and Sniezko, R.A.
- Tomback D.F., Sniezko R.A. 2017. Five-needle Pine Needs. Internal synthesis for FHP STDP and EM projects, contracted by WWETAC. December 11, 2017. 5pp.
 - Tomback D.F., Sniezko R.A. 2017. Western Five-needle White Pine Knowledge Gaps/Priority Needs. Informational Brief for US Forest Service, Forest Health Protection, Special Technology Development Program (FHP STDP), contracted by US Forest Service, USFS Western Wildlands Environmental Threat Assessment Center (WWETAC). August 19, 2017. 9pp.
- 2006 Review of article for National Wildlife Foundation, *Ranger Rick* magazine.
- 2001 *National Geographic Society* magazine. *The Nature Conservancy* magazine.
- 2000 *Earth and Sky* radio series.
- 1989 Marty Stouffer Productions, LTD. Film: "Whitebark".
- 1987 British Broadcasting Corporation. Film: "Land of the Eagle".
- 1986-1998 Fire Sciences Laboratory, USDA Forest Service, Whitebark Pine Research Team.

BOOKS, ARTICLES, ONLINE STORIES MENTIONING MY RESEARCH OR ADVOCACY (recent examples)

- <https://www.americanforests.org/article/a-true-trailblazer-for-whitebark-pine/>
- <https://www.nwnewsnetwork.org/2021-07-29/pining-for-whitebarks-researchers-work-across-the-northwest-to-save-quintessential-wilderness-trees>
- [Denver looks to tree-planting to help shade city, add greenspace as heat islands grow \(denverpost.com\)](https://www.denverpost.com/2020/12/07/colorado-logging-forests-wildfires/)
- <https://jhnewsandguide-wy-app.newsmemory.com/?publink=07bfcc9de>
- <https://missoulacurrent.com/outdoors/2020/12/whitebark-pine-threatened/>
- <https://www.wired.com/story/a-bold-plan-to-save-the-last-whitebark-pines/>
- <https://www.denverpost.com/2020/12/07/colorado-logging-forests-wildfires/>
- <https://www.ijpr.org/environment-energy-and-transportation/2020-12-01/whitebark-pine-selected-for-endangered-species-protection>
- [The Energy 202: In an unusual move, Trump administration will protect a pine tree due to climate change \(washingtonpost.com\)](https://www.washingtonpost.com/climate-environment/2020/12/07/colorado-logging-forests-wildfires/)
- [Colorado Throws Itself To The Wolves \(huffpost.com\).](https://www.huffpost.com/?url=https%3A%2F%2Fwww.huffpost.com%2Fentry%2Fcolorado-proposition-114-gray-wolf-)
[read://https_www.huffpost.com/?url=https%3A%2F%2Fwww.huffpost.com%2Fentry%2Fcolorado-proposition-114-gray-wolf-](https://www.huffpost.com/?url=https%3A%2F%2Fwww.huffpost.com%2Fentry%2Fcolorado-proposition-114-gray-wolf-)
- <https://clas.ucdenver.edu/integrative-biology/2019/07/09/diana-tomback-speaks-southern-ute->

- [museum-photo-unveiling](#)
- <https://www.americanforests.org/magazine/article/a-precarious-partnership-of-pine-and-bird/> 2014
- <https://archive.sltrib.com/article.php?id=55109891&itype=CMSID> 2012
- <https://www.ksl.com/article/46388494/a-summer-of-fire-and-then--rebirth>
- [hoarding](#) 2016
- <https://www.allaboutbirds.org/news/analysis-the-economic-value-of-birds/> 2017
- <https://phys.org/news/2018-10-genetic-breakthrough-aid-whitebark-efforts.html> 2018
- Gilman, S. 2019. Corvid conservation corps. *Audubon*, Winter 2019.
- Mathews, D. 2020. *Trees in Trouble*. Counterpoint Press.
- Nikiforuk, A. 2011. *Empire of the Beetle*. Greystone Books.
- Lanner, R. M. 1997. *Made for Each Other: A Symbiosis of Birds and Pines*. Oxford

OTHER PROFESSIONAL ACTIVITIES

PROFESSIONAL SOCIETY COMMITTEE WORK

American Ornithologists' Union/Cooper Ornithological Society/Society of Canadian Ornithologists

Chair scientific program committee. Joint Meeting, September 22-28, 2014, Estes Park, CO.

American Ornithologists' Union Committee Work:

President's Council, 1986-1988

Committee for the Nomination of Fellows & Elective Members, 1984-1988

Student Poster Awards, 1984

Special Committee on the Election of Members & Fellows, 1983-1984

Student Awards Committee, 1981-1983

Membership Committee, 1979-1985

Cooper Ornithological Society Committee Work:

Member, Board of Directors 1997-2000

Chair, Finance Committee 1999-2000

Member, Miller Award Committee, 1996-97

Chair, Mewaldt-King Award Fund Committee, 1991-1995

Awards Committee, 1989

Chair, Resolutions and Conservation Committee, 1985

EDITORIAL BOARDS

Editorial board: *Forests* mdpi, 2019-

Invited guest editor: *Forests* mdpi, issue on Biodiversity and Conservation: 2/2015-3/2016

http://www.mdpi.com/journal/forests/special_issues/biodiversity_conservation

American Ornithological Society, Associate Editor, *The Condor: Ornithological Applications*: 2015-2020

PEER OR INVITED REVIEW (multiple papers for some journals and multiple grants for all

funding agencies): 1999-2018

Arctic, Antarctic, and Alpine Research; Canadian Journal of Forest Research; Canadian Journal of Zoology; International Journal of Forestry; Journal of Avian Biology; Journal of Ecology; Journal of Field Ornithology; Ecology; Ecological Monographs; Ecological Applications; Ecosphere; Forests; Forest Ecology and Management; Frontiers in Ecology and the Environment; Functional Ecology; ÉcoScienc; Global Change Biology; Journal of Biogeography; Journal of Mountain Science; Mycorrhiza; The Condor: Ornithological Applications; The Natural Areas Journal; Landscape Online; Perspectives in Plant Ecology, Evolution, and Systematics; Plant Ecology and Diversity; PLOS one; The Auk; Heredity; Environmental Management; Wilson Journal of Ornithology.

INVITED REVIEWS FOR FEDERAL AGENCIES

U.S. Fish and Wildlife Service Species Status Assessment for whitebark pine, Sept.,2018

Reviews also for conservation plans for whitebark pine or other five-needle white pines: Bureau of Land Management, U.S. Forest Service—Region 6 and Rocky Mountain Research Station

National Science Foundation, USDA NRI, USDA NCRIG.

FEDERAL AGENCY-RELATED SERVICE (also see Whitebark Pine Ecosystem Foundation)

Tomback as a key organizer and science lead: **The National Whitebark Pine Restoration Plan**, a multi-federal agency effort organized by the U.S. Forest Service, American Forests, and the Whitebark Pine Ecosystem Foundation, 2016-2022, <https://whitebarkfound.org/our-work/national-whitebark-pine-restoration-plan/>

- Meeting with U.S. F&WS representatives to discuss Sec. 7 conferencing regarding whitebark pine proposed listing (Dec. 2, 2020), Dec. 8, 2020. Sent revisions and comments to group.
- Meeting with National Park Service and Bureau of Land Management to discuss draft Sec. 7 provisions Dec. 3, 2020 based on proposed whitebark pine listing.
- NWPRP Liaison meeting, Zoom meeting, Washington Office, U.S. Forest Service, Sept. 30, 2020.
- Provided presentation updating leadership of the Washington Office, U.S. Forest Service NWPRP, Aug. 26, 2020 with Eric Sprague, American Forests.
- NWPRP R1/R4 Core Area Nominations Working Group formed June 22,2020, with DFT, Eva Karau (USFS Fire Modeling Institute, Robert Keane (USFS), and Julee Shamhart (WPEF). Multiple meetings through 2021.
- May 16, 2019, seminar update to leadership on the National Whitebark Pine Restoration Plan, Washington Office of the US Forest Service. May 15, 16, meetings with director-level leadership in Washington Office of National Park Service and US Fish & Wildlife Service on the National Whitebark Pine Restoration Plan (see above)
- May 14, 2018, NWPRP webinar presentation to DOI (see INVITED SEMINARS/WEBINARS/LECTURES). Meetings with Associate Directors Bureau of Land

Management, National Park Service. May 15, repeat presentation of DOI webinar material to Forest Service leadership, Washington Office, 5/15/18.

- January 30, and May 6, 2018, led two NWPRP conference calls with federal agency NWPRP Liaison Committee regarding Data Calls.
- Work closely with WPEF staffer on Data Call details.
- Wrote roll-out letters for Data Calls 1 and 2A; drafted or co-drafted associated web page material during 2018 year.
- Co-organizer of National Whitebark Pine Summit connected with National Whitebark Pine Restoration Plan, held November 7-9, 2017, Hilton Garden Inn, Missoula, Mt.
- August 28-September 25, 2017. Organized and led seven teleconferences in the data discovery phase of the National Whitebark Pine Restoration Plan with the following resource management: Region 1, 2, 4, 5, 6 of the US Forest Service, with the National Park Service, and led the effort to compile the Best Management Practices for whitebark pine restoration.
- As director, wrote a proposal to the U.S. Forest Service to develop the National Whitebark Pine Restoration Plan in collaboration with American Forests. Awarded to American Forests with subcontract to the Whitebark Pine Ecosystem Foundation: \$100,000 in 2017 and second round of funding (\$85,000) in 2020.

Other activities involving federal representatives:

- Panel interview for evaluation and review of U.S. Forest Service Region 6, Dorena Genetic Resources Center, March, 2018
- Central Rocky Mountains White Pine Health Working Group, 2003-2014
- USDA Forest Service, Washington, D.C. West Logic Workshop. 2005
- USDA Forest Service, Region I, Whitebark pine restoration planning committee, 2006
- US Fish and Wildlife Service, Whitebark Pine Status Review Advisory Committee, 2017-

DEPARTMENT, COLLEGE, AND UNIVERSITY SERVICE: 1999-

Member (Faculty Assembly representative), campus search committee for Associate Vice Chancellor of Research, spring 2022.

Faculty Mentor for Center for Faculty Development, Promotion from Associate to Full Professor, spring 2022.

Chair, research evaluation, Integrative Biology committee for Annika Mosier and Sara Branco for tenure and comprehensive review, respectively, fall 2021. Provided service letters for both.

Chair, research evaluation, Integrative Biology committee for Greg Ragland and Brian Buma tenure review, fall 2020.

Member, Center for Faculty Development, Committee on Promotion from Associate to Full Professor, spring 2020-

Chair, Integrative Biology Curriculum Committee, fall 2018-2019

Research evaluation, Integrative Biology committee for Brian Buma Comprehensive Review, Fall, 2019

Research evaluation, Integrative Biology committee for Michael Greene Promotion Evaluation, fall 2018

Research evaluation, Integrative Biology committee for Greg Ragland Comprehensive Review, fall 2018

Member, CLAS Council Strategic Priorities Subcommittee on Research and Creative Activities, summer 2018-2019

Member, CU-Denver Faculty Assembly, spring 2018-

Member, CU-Denver, Vice Chancellor of Academic Affairs Advisory Committee (VCAC): spring 2018 and 2019

Judge, RaCAS, spring 2018

Department of Chemistry Promotion Committee, fall 2016

Intercampus Dependent Tuition Benefit Task Force, fall 2016-

Acting member, Campus Budget Priorities Council, and CLAS BPC spring 2016-2017

CLAS Outstanding Faculty Achievement Award Selection Committee, 2016-

Member, Department of Integrative Biology Mentoring Committee, fall 2018-2019

Chair, Department of Integrative Biology, Mentoring Committee, fall 2015-spring, 2018

Chair, Department of Integrative Biology, Mentoring Committee, fall 2019-

Department of Integrative Biology, Co-Chair, Awards, Scholarships, Outreach Committee 2015-2016

Member, Department of Integrative Biology Finance Oversight Committee, fall 2019-

Chancellor's distinguished Lecture Series Committee, 2015-2020

University of Colorado Denver, 1st annual Mini-Stem School Lecture presentation, "Evolution and the Origin of Life," January 30, Mini-Stem School, Jan-March 2013.

Department of Integrative Biology, Chair, Merit Review Committee, Fall 2012-14

Department of Integrative Biology, Graduate Advisory Committee, Fall 2011-19

CLAS Budget Planning Council, Fall 2012

Microbiology Search Committee, Fall 2012-Spring 2013

CLAS Research Advisory Group, 2011

CLAS Learning Enhancement Task Force, 2011-2014

Department of Integrative Biology: rewrite RTP document, 2009, 2010, 2013, 2019

University of Colorado Denver: Distinguished Professor Selection Committee, 2008

Department of Biology: Mentoring Committee for Michael Wunder, 2008

Department of Biology: Mentoring Committee Michelle Engel, 2006-2009

College of Engineering, Department Post-tenure Review Committee, spring 2009

College of Engineering, Department of Mechanical Engineering, Department Post-tenure Review Committee, spring 2012

Department of Integrative Biology: Chair, Evolutionary Genetics Search Committee, 2008-09

Department of Biology: Doctoral Proposal Committee, 2007-present

Department of Biology: Graduate Advisory Committee, 2007-2010

Department of Biology: Chair, Biostatistics/Computational Biology Search Committee, 2007-08

Department of Mathematics: Member, Biostatistics Search Committee, 2007-08

CLAS (College of Arts and Sciences): Budget Planning Council, 2006-2009, fall 2010

CLAS M.S. in Environmental Sciences Faculty Advisory Committee, 2005-06

UCDHSC: Udall Scholarship Committee, 2005-06

School of Business: RTP committee, spring 2006

UCDHSC: Faculty Assembly representative for CLAS, 2001-06

Department of Biology: Mentoring Committee for Timberley Roane (until tenure)

Department of Biology: Mentoring Committee for Greg Cronin (until tenure)

UCDHSC: Chair 2010 Committee, 2002-03

CLAS: Research Award Committee, 2002

University of Idaho: External RTP reviewer, 2001

UCD: Budget Priorities Committee, 1999-2004

UCD: Advisory Committee for Center for Environmental Sciences, 1990-2002
 CLAS: Advisory Committee for M.S. in Environmental Sciences, 1990-2002
 CLAS: Member, Search Committee for Dean, 1999

COMMUNITY SERVICE IN A PROFESSIONAL CAPACITY: Media interviews and presentations

On behalf of Rocky Mountain Wolf Project and Colorado Sierra Club, Wolf Recovery Team, science presentations on wolf recovery in Colorado:

- Sept. 17-Oct. 21, 2020; four webinars on wolf reintroduction, D. F. Tomback, M. Barnes, G. Skiba, three chapters of Sierra Club and Steamboat Creates
- Presentation on Yellowstone trophic cascade at “Blessing of the Wolves,” Colorado Sierra Club, Wolf Team, Colorado Wolf and Wildlife Center, Divide, CO, Oct. 4, 2020.
- Multiple community talks on wolf education: Logan School, Shepherd of the Hills Church, senior community center, 2020.
- November 2, 2019: Wolf education, Aurora Open Space volunteers
- September 18, 2019: Graduate class in Environmental Management, Western Colorado University
- May 25, 2019, presentation on Wolf Day at the Southern Ute Museum in conjunction with Tribal Pow-wow and Bear Dance.
- April 8, 2019, presentation to Senior Community at Gail Bell’s request.
- Various media interviews on first wolf pack in Colorado in Moffat Co., 2019, 2020.

Living with Wolves, Aspen Public Radio. January 2, 2017. Broadcast interview by environmental reporter Elizabeth Stewart-Severy about photo exhibit at Aspen Airport that features National Geographic photographers Jim and Jamie Dutcher. Discussion of exhibit by D. Malone and D. Tomback, representing the Rocky Mountain Wolf Project, which sponsored the exhibit.

Living with Wolves, interview by John Fahee, Dec. 5, 2017. News article on photographic exhibit by Jim and Jamie Dutcher, National Geographic photographers, opening at Aspen Airport. Representing Rocky Mountain Wolf Project and the University of Colorado Denver.

“Bird Talk,” KNUS radio, hosted by David and Scott Menough. October 17, 2015. Discussion of the mutualism between Clark’s nutcracker and whitebark pine and the decline of whitebark pine.

Interview by Jefferson Public Radio, Ashland, OR, Southern Oregon University. September 17, 2015. The status of whitebark pine. In conjunction with Whitebark Pine Ecosystem Foundation Science and Management Workshop. With Jen Beck, National Park Service, and Kristen Chadwick, US Forest Service.

Union of Concerned Scientists/The Rocky Mountain Climate Organization. “Rocky Mountain Forests at Risk.” Panel participant for report release/media event. Denver Press Club, Wednesday, September 10, 2014.

American Forests/Natural Resources Defense Council, Washington, D.C. Public Presentation: “Exploring Western Forests and Climate Change.” Tuesday, June 26, 2012, The National Geographic Society: Presentations by Diana Tomback and James Baalog.

Whitebark Pine Ecosystem Foundation (WPEF), Missoula, MT. www.whitebarkfound.org

Outreach and Policy Coordinator: 2017-

Volunteer director: February 2001-November, 2017.

A 501 (c) (3) science-based organization dedicated to bringing attention to declining whitebark pine communities, providing scientific consulting expertise, and educating the community about the importance of whitebark pine. Organizes workshops and major conferences; dissemination of current management and restoration information through *Nutcracker Notes* newsletter.

Activities:

2017- : Policy and Outreach Coordinator (note activities are from most recent to earliest)

2001-2016: Director (volunteer)

- Co-moderator and presenter. Whitebark Experts Strategy Meeting, Inter-agency meeting, February 12 & 13, 2020, US Forest Service, Pacific SW Research Station, Institute of Forest Genetics, Placerville, CA.
- Crown of the Continent Partnership: Crown of the Continent Ecosystem Five-needle Pine Working Group Tech Team: extending the restoration plan to the trans-boundary, multi-agency jurisdictions for whitebark and limber pine, 2019- , <https://www.crownmanagers.org/five-needle-pine-working-group>
- Science leader on **National Whitebark Pine Restoration Plan (NWPRP)**, an effort entailing outreach and communication and working with representatives of federal agencies. Intermittently from 2017 through---
- 2016, three meetings with American Forests leadership in Washington, D.C. in 2016; Two meetings in the Washington office of the U.S. Forest Service to advocate for whitebark pine restoration in 2016.
- Newspaper interview, *The Missoulian*, Missoula, Montana, September 2016.
- Interview on Jefferson Public Radio, Ashland, Oregon, on the decline of whitebark pine, along with scientists from the US Forest Service and National Park Service, September, 17, 2015. This local NPR station services southern Oregon and northern California.
- Supervisor to part-time staff member and to contract webmaster and grant writer.
- Establishment of sister organization, WPEF-Canada. Formalized partnerships with Region I of the U. S. Forest Service, American Forests, and USDA Forest Service, Forest Health Protection.
- Numerous media stories in 2011, including quotes from DFT, with whitebark pine placed on candidate list for Endangered/Threatened species under the Endangered Species Act.
- Two Director's Message columns each year in *Nutcracker Notes* plus occasional articles.
- Annual Whitebark Pine Science and Management Workshop, each September, located in the Western U. S. or Canada each year.
- Invited presentation to U.S. Forest Service leadership, Washington, D.C., February, 2011
- 10th anniversary meeting, Buffalo Bill Historical Center, Cody, WY September 16, 2011
- Representative on organizing committee of IUFRO Five-needle pine breeding and genetics working group, June 2014 meeting, Ft. Collins, Colorado.
- Partnership meeting with American Forests and US Forest Service, December 10-11, 2015, Washington, D.C.
- Worked with U.S. Senator Conrad Burn's Senate Interior Appropriations Committee; wrote a \$3 million funding proposal for whitebark pine restoration for their budget. Negotiated with US Forest Service leadership on final request for \$800,000. Enlisted the bipartisan support of congressional delegation of Montana, Wyoming, and Idaho. Included as a line item in 2007 budget but President Bush ended line items. USFS Forest

Health Protection started the Whitebark Pine Restoration Fund, based on proposal.

- Lead person in development of methods for whitebark pine health survey and monitoring, *Methods for surveying and monitoring whitebark pine for blister rust damage and infection*, published by the WPEF in 2004 and 2005 (www.whitebarkfound.org). Chief organizer for workshop to teach methods: “Monitoring whitebark pine for blister rust: a methods workshop,” West Yellowstone, Montana, June 2004. Attended by >100 federal agency personnel. Sponsored by the Greater Yellowstone Coordinating Committee; NPS Rocky Mountain Cooperative Ecosystems Studies Unit; USDA Forest Service Northern Region, Forest Health Protection; and USDA FS Fire Sciences Laboratory, Rocky Mountain Research Station. Microsoft Access database developed for the methods by National Park Service, Inventory and Monitoring. Adopted or modified for monitoring by Parks Canada, the Greater Yellowstone Whitebark Pine Monitoring Working Group, the Bureau of Land Management, Region 6 of the US Forest Service.

Sierra Club, Colorado. Invited scientist on Wolf Restoration Team 2015 – Multiple outreach meetings and events.

- Organized CU-Denver event with Biology club: showing of film “Medicine of the Wolf” followed by discussion of wolf reintroduction to Colorado, April 27, 2017.
- Work in collaboration with Rocky Mountain Wolf Project (see below)

Rocky Mountain Wolf Project. Organized by Turner Endangered Species Fund. Member (through Sierra Club) beginning 2015.

Member, Science Advisory Committee, 2017-2019

- “A Call to Restore the Gray Wolf to Colorado,” Colorado History Museum. Writer-naturalist Tom Wolf, Ph.D. and Diana Tomback, first of 2018-2019 Lecture Series, Monday, September 17, with programs at both 1 pm and 7 pm.
- Living With Wolves, National Geographic Photo Exhibit (Jim and Jamie Dutcher), Aspen Airport reception, December 9, 2017-2020: PR and outreach.
- Two annual workshops a year and monthly conference calls.
- Additional outreach activities.

American Forests, Washington, D.C. Oldest environmental non-profit organization in the United States.

Member, National Science Advisory Board, 2011-

- Collaboration with the Whitebark Pine Ecosystem Foundation (see above) especially on National Whitebark Pine Restoration Plan
- Invited presentation to Board of Directors, October 17, 2011, as Director of Whitebark Pine Ecosystem Foundation, Jackson Hole, Wyoming. Launching major restoration campaign for the high elevation five-needle white pines.
- Work with staff on fund-raising campaign for high elevation five-needle white pines.
- Collaborative work on whitebark pine restoration.

History Colorado, Consulting on mountain pine beetle exhibit. August, 2011.

Conservation Program Advisory Committee, Denver Zoo, Denver, CO, 2010

Natural Resources Defense Council, Wild Bears Project, Livingston, MT. Invited speaker and field trip leader for media workshops on threats to whitebark pine as a food source for grizzly bears in the Greater Yellowstone Area. April 2005, July 2007, August 2008. Has resulted in numerous media stories.

Natural Resources Defense Council, Washington, D.C. Reviewer and consultant on whitebark pine issues. 2008, 2009.

Denver Museum of Natural History: Outside member, search for Chair of Zoology, 1999.

Thorne Ecological Institute:

Board of Trustees, 1983-1986, Executive Committee, 1984-1986, Secretary, Board of Trustees, 1985-1986

Cloud Ridge Naturalists:

Board of Trustees, 1992-1994

RESEARCH SUPPORT

- 2021-23 P.I. with doctoral student Laurel Sindewald. Estimation of limber pine seed viability across high elevations in Rocky Mountain National Park. \$39,999
- 2021-22 P.I. with CTT Associate Professor Matthew Cross and Associate Professor Peter Anthamatten, CU-Denver Office of Research Services, Large grant program, Application of high-resolution satellite imagery to resolve treeline species composition: Case study using limber pine in Rocky Mountain National Park, \$29,570.
- 2020-21 U.S. Forest Service, Washington Office (through American Forests). National Whitebark Pine Restoration Plan. \$17,459.
- 2019-26 Ricketts Conservation Foundation. Clark's nutcrackers in Yellowstone National Park: Seed resources, habitat preferences, spatial and temporal movements, and population status. \$80,000+ (\$20,000+ per year). Funding varies with annual need. Renewed in 2021 for an anticipated additional \$138,000 over five years.
- 2019 CLAS dissemination grant. \$1,500.
- 2019 CU-Denver Office of Research Services, Small grant program, Limber pine at treeline in Rocky Mountain National Park: distribution and community structure. \$3,500.
- 2017-19 With Assistant Professor Annika Mosier, USDA Forest Service, Forest Health Protection: Whitebark pine forest recovery after the 1988 Yellowstone Fires: regeneration dynamics in a warming climate. \$16,900.
- 2017 CLAS Dissemination Grant for publication costs, spring, \$1,000.
- 2017 With Assistant Professor Annika Mosier, CU-Denver Office of Research Services, Small grant program, Whitebark pine forest recovery after the 1988 Yellowstone Fires: regeneration dynamics in a warming climate. \$3,000.
- 2016 CLAS Dissemination Grant for publication costs, spring, \$1000.
- 2016 With Assistant Professor Annika Mosier, CU-Denver Office of Research Service, Large grant program: Forest community development after the 1988 Yellowstone fires: effects of changing climate and fire frequency and severity. \$22,600.
- 2016-18 With Elizabeth Pansing: Effects of climate change and climate-altered fire regimes in

- whitebark pine populations. Joint Fire Sciences Program, GRIN. \$21,028.
- 2015 CLAS Dissemination Grant for travel to Perth III, "Mountains of our Future Earth." March 15, 2015, \$1900.
- 2014-19 USDA Forest Service, Forest Health Protection; and Shoshone National Forest. A. Direct seeding in two subalpine and treeline locations: examining the role of microsite type and rodent seed theft. B. Functional role of whitebark pine in the Wind River Range. \$21,338.
- 2013-14 Whitebark Pine Ecosystem Foundation website project. Funding from Forest Health Protection, USDA Forest Service, \$15,000, subcontract. Oversight Committee to advise project.
- 2012 Faculty Development Award, CU-Denver. Tomback, P.I., The impact of rodents and microsite type on the regeneration of whitebark pine, \$4,978.
- 2011-12 Graduate Student Internship Grant from Whitebark Pine Ecosystem Foundation. Grant provides 10 hr/week funding to support Foundation-related activities, \$5,000.
- 2011 UCD, CLAS Dissemination Grant for travel to the IUFRO 4th Conference on the Breeding and Genetic Resources of Five-Needle Pines in Tomsk, Siberia, \$2,000.
- 2009-13 National Science Foundation, Geography and Regional Science Program, Implications of an invasive forest pathogen for alpine treeline dynamics. BCS-0850548. P.I.s, Lynn Resler (Virginia Tech), Diana Tomback, George Malanson (Univ. of Iowa). \$439,006; UCD subcontract: \$221,687.
- 2009-10 Global Forest Science. "Natural history of Clark's Nutcracker." Tuition grant to D. F. Tomback for M.S. students. \$3000.
- 2009-12 National Park Service-Rocky Mountains Cooperative Ecosystem Studies Unit. "Clark's nutcracker summer use of whitebark pine communities." \$30,000.
- 2009-10 CRISP, College of Liberal Arts and Sciences, UCD. "Tracking Clark's Nutcracker movements and population structure using intrinsic markers: combining genetic and stable isotope signatures." With co-P.I. Michael Wunder. \$9,985.
- 2009-10 P.I. Michael Wunder, Co-P.I. Tomback. Lloyd David and Carlye Cannon Wattis Foundation Internship, Denver Museum of Nature and Science. \$760.
- 2008-10 USDA Forest Service, Forest Health Protection, 2008 Whitebark Pine Restoration Project Funds. Establishing permanent transects for monitoring seed dispersal by Clark's nutcrackers (*Nucifraga columbiana*) in relation to whitebark pine (*Pinus albicaulis*) health in Yellowstone, Grant Teton, Glacier, and Waterton Lakes National Parks. \$18,296 (includes 2009 supplement)
- 2008-10 National Park Service-Rocky Mountains Cooperative Ecosystems Studies Unit (RM-CESU) Award, Technical Support, sponsored by Yellowstone National Park. "Establishing permanent transects for monitoring seed dispersal by Clark's nutcrackers in relation to whitebark pine health in Yellowstone, Grant Teton, and Glacier National Parks. \$5,000.
- 2008-10 Global Forest Science. Tuition grant to D. F. Tomback for M.S. student Lauren Barringer. \$5,498.
- 2007 Faculty Development Award. "The impact of exotic disease on treeline communities." \$2,000.
- 2006 Course release funded by Global Forest Science.
- 2005-06 SUMPS, Center for Faculty Development, UCDHSC, DDC. "The role of climate and microsite factors in whitebark pine regeneration." \$2,600.
- 2003-07 USDA Forest Service, Rocky Mountain Research Station, Missoula, and Fire Sciences Laboratory, Missoula. "Preliminary investigation of the magnitude and time-frame of post-fire whitebark pine regeneration within selected areas in the Bob Marshall Wilderness Complex and adjacent lands." Co-P.I.s, Steve Wirt, Flathead National Forest, and Ward

- McCaughey and Robert Keane (Rocky Mountain Research Station). \$37,000.
- 2004-09 Crater Lake Natural History Association. "First-ever documentation of sugar pine as a nutcracker foodsource: a study." With Dr. Michael Murray (Park Terrestrial Ecologist), Crater Lake National Park. \$2,882.
- 2002 National Park Service, Rocky Mountain Cooperative Ecosystem Studies Unit, Glacier National Park Learning Center. CA-1200-99-007. A study of whitebark pine regeneration after fire in Glacier National Park. \$2,709.
- 2001-06 USDA Forest Service, Rocky Mountain Research Station, Ft. Collins, Colorado. The status of whitebark pine regeneration in the Greater Yellowstone Area following the 1988 fires. Co-P.I., Dr. Anna Schoettle (Rocky Mountain Research Station) \$36,980.86
- 2001-04 USDA Forest Service, Fire Sciences Laboratory. Whitebark pine regeneration after the fires of summer 2000: The effect of stand mortality and canopy damage from white pine blister rust on seed dispersal services by Clark's Nutcracker. \$ 20,779.00
- 2000-03 With Dr. Anna Schoettle, USDA Forest Service, Rocky Mountain Research Station, Ft. Collins, Colorado. Seed dispersal mechanisms in limber pine. \$5,000.
- 1998-99 University of Colorado at Denver, Global Change and Environmental Quality Program (L. P. Bruederle and D. F. Tomback) Vulnerability of marginal populations to environmental perturbations. \$7,779.
- 1997-98 University of Colorado at Denver, Faculty Grant Award. The evolution of bird-dispersed pines in the limber pine- southwestern white pine - Mexican pine complex (with Prof. Bruederle, Co-P.I.). \$4,600.
- 1996-97 Colorado Natural History Small Grants Program. Southwestern white pine communities: studies of pine seed foraging by birds and small mammals. \$1,500.
- 1995-96 USDA Forest Service Intermountain Research Station. Patterns of post-fire regeneration in the Greater Yellowstone Area. \$14,000.
- 1995-96 University of Colorado at Denver, Faculty Grant Award. Genetic diversity in Whitebark pine: implications for conservation of a rapidly declining subalpine species (D. F. Tomback and L.P. Bruederle). \$4,982.
- 1995-96 Michaux Fund, American Philosophical Society. Population genetic structure in whitebark pine: a rapidly declining subalpine species (L. P. Bruederle and D. F. Tomback). \$3,600.
- 1993-95 USDA Forest Service Intermountain Research Station. Supplement: Patterns of post-fire regeneration of whitebark pine in the Greater Yellowstone Area. \$10,000.
- 1991-93 USDA Forest Service Intermountain Research Station. Patterns of whitebark pine regeneration in a large northern Idaho burn: effects of blister rust and distance along an elevational isocline. \$11,970.
- 1991-92 University of Colorado Program on Global Change and Environmental Quality. Does climate change cause genetic change in limber pine? (D. F. Tomback and T. T. Veblen) \$12,200.
- 1990-93 USDA Forest Service Intermountain Research Station (RFP). Patterns of post-fire regeneration of whitebark pine in the Greater Yellowstone Area. \$32,970.
- 1989 University of Colorado at Denver Faculty Development Award. \$5,000.
- 1987-89 USDA Forest Service Intermountain Research Station. Post-fire regeneration of whitebark pine: patterns of seedling establishment and nutcracker seed dispersal activity. \$21,419.
- 1985-87 National Park Service - Colorado State University Cooperative Studies Unit. Effect of artificial feeding on behavior and ecology of Clark's Nutcrackers. \$10,865.
- 1984 University of Colorado at Denver Faculty Development Award. \$7,000.
- 1982 University of Colorado Junior Faculty Development Award. \$7,000.
- 1981 Chapman Fund of the American Museum of Natural History. \$228.
- 1980 American Philosophical Society. Behavior and ecology of the Marianas Crow. \$888.

- 1979 USDA Forest Service Pacific Southwest Station Cooperative Aid Agreement. Post-fire regeneration of krummholz whitebark pine. \$4,000.
- 1978 University of California at Riverside, Intramural Research Grant. \$700.
- 1977 Pomona College Faculty Research Committee Award. \$365.
- 1977 Chapman Fund of the American Museum of Natural History. \$272.
- 1977 University of California Patent Fund Grant. \$322.
- 1976 Chapman Fund of the American Museum of Natural History. \$454.
- 1974 Sigma Xi Grant-in-Aid of Research. \$100.
- 1973 Sigma Xi Grant-in-Aid of Research. \$150.

GRADUATE STUDENT RESEARCH SUPPORT 2015-

Laurel Sindewald: Colorado Native Plant Society, John W. Marr grant. 6/2017, \$1,000

Brandi Wheeler: CU Denver, Determining quantitative value of vegetation cover and deadfall using photography. Undergraduate Research Opportunity Fund(UROP). 9/2017. \$210.

Elizabeth Pansing (and DFT): Joint Fire Sciences GRIN: With Elizabeth Pansing: Effects of climate change and climate-altered fire regimes in whitebark pine populations. GRIN, Joint Fire Sciences Program. \$21,028, 2016.

Marian Lea: Wyoming Native Plant Society, 2016. \$500.

Tyler Williams: Denver Field Ornithologists, 2016. \$750.

Tyler Williams: Rocky Mountain Conservancy, 2015. \$11,000