

CURRICULUM VITAE

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Michael Brent Wunder

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Education

2007 Ph.D., Colorado State University, Ecology
Dissertation title: "Geographic Structure and Dynamics in Mountain Plover"
1994 B.A., University of Colorado Boulder, Environmental and Population Biology

Professional Experience

2008-present	Assistant Professor, University of Colorado Denver
2007-2008	Post-doctoral Associate, Colorado State University
2003-2007	Graduate Research Associate, Colorado State University
1996-2003	Research Associate, Colorado State University
1995-1996	Wildlife Biologist, Colorado Division of Wildlife
1994-1995	Biological Technician, Bureau of Land Management

Refereed Publications (* student author)

1. Doll, A.D.*, R.B. Lanctot, C.A. Stricker, S. Yezerinac, and M.B. Wunder (2014) Isotopic turnover rates estimated from feeding experiments do not translate to free-living animals: estimating arrival dates in arctic-breeding Dunlin (*Calidris alpina arctica*). *Methods in Ecology and Evolution* In Review
2. Cryan, P.M., C.A. Stricker, and M.B. Wunder (2014) Continental-scale, cross-seasonal movements of a heterothermic migratory tree bat. *Ecological Applications* In Press
3. Bryan, R.D.* and M.B. Wunder (2014) Western burrowing owls (*Athene cunicularia hypugaea*) eavesdrop on alarm calls of black-tailed prairie dogs (*Cynomys ludovicianus*). *Ethology* 120:180-188
4. Flockhart, D.T.T., L.I. Wassenaar, T.G. Martin, K.A. Hobson, M.B. Wunder, and D.R. Norris (2013) Tracking multi-generational migratory connectivity: colonization of the breeding grounds by monarch butterflies in eastern North America. *Proceedings of the Royal Society B* 280 (1768):20131087
5. Rundel, C.W., M.B. Wunder, A.H. Alvarado, K.C. Ruegg, R. Harrigan, A. Schuh, J.F. Kelly, R. Siegel, T.B. Smith, and J. Novembre (2013) Novel statistical methods for integrating genetic and stable isotopic data to infer individual-level migratory connectivity. *Molecular Ecology* 22:4163-4176
6. Wunder, M.B., J.R. Jehl, and C. Stricker (2012) The early bird gets the shrimp: confronting assumptions of isotopic equilibrium and homogeneity in a wild bird population. *Journal of Animal Ecology* 81:1223-1232
7. Oyler-McCance, S.J., 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* 5:303-305
8. Barringer, L.E.*, D.F. Tomback, M.B. Wunder, and S. McKinney (2012) Whitebark pine stand condition, tree abundance, and cone production as predictors of visitation by Clark's nutcracker. *PLoS ONE* 7(5):e37663
9. Wunder, M.B. (2012) Determining geographic patterns of migration and dispersal by analysis of stable isotopes in keratins. *Journal of Mammalogy* 93:360-367
10. Cryan, P.M., C.A. Stricker, and M.B. Wunder (2012) Biologically structured isotopic variation in a sedentary population of bats. *Journal of Mammalogy* 93:381-389
11. Smith*, S.M., M.B. Wunder, D.A. Norris, and Y.G. Shellman (2011) A simple protocol for using a LDH-based cytotoxicity assay to assess the effects of death and growth inhibition at the same time. *PLoS ONE* 6(11):e26908

12. Dinsmore, S. J., M. B. Wunder, V. J. Dreitz, and F. L. Knopf (2010) An assessment of factors affecting population growth of the Mountain Plover. *Avian Conservation and Ecology* 5(1): 5
13. Hobson, K.A., M.B. Wunder, S. VanWilgenburg, R. Clark, and L.I. Wassenaar (2009) A method for investigating population declines of migratory birds using stable isotopes: origins of harvested lesser scaup in North America. *PLoS ONE* 4(11): e7915
14. Gutowsky, S., Janssen, M.H., Arcese, P., Kyser, T.K., Ethier, D., Wunder, M.B., Bertram, D.F., Tranquilla, L.M., Lougheed, C., and D.R. Norris. (2009) Concurrent declines in nestling diet quality and reproductive success of a threatened seabird over 150 years. *Endangered Species Research* 9:247-254
15. Wunder, M.B., K.A. Hobson, J.F. Kelly, P.P. Marra, L.I. Wassenaar, C.A. Stricker, and R.R. Doucett (2009) Does a lack of design and repeatability compromise scientific criticism? A response to Smith et al. *Auk* 126:922-926
16. Sellick, M.J., T.K. Kyser, M.B. Wunder, D. Chipley, and D.R. Norris (2009) Geographic variation of strontium and hydrogen isotopes in avian tissue: implications for tracking migration. *PLoS ONE* 4(3): e4735.
17. Augustine, D.J., S.J. Dinsmore, M.B. Wunder, V.J. Dreitz, and F.L. Knopf (2008) Mountain plover response to plague-driven dynamics in black-tailed prairie dog landscapes. *Landscape Ecology* 23:689-697
18. Wunder, M.B. and D.R. Norris (2008) Improved estimates of certainty in stable isotope-based methods for tracking migratory animals. *Ecological Applications* 18:549-559
19. Schorr, R.A., J.L. Siemers, P.M. Lukacs, J.P. Gionfriddo, J.R. Sovell, R.J. Rondeau, and M.B. Wunder (2007) Using prairie rodent survival to evaluate habitats. *Southwestern Naturalist* 52:552-563
20. Norris, D.R., M.B. Wunder, and M. Boulet (2006) Perspectives in Migratory Connectivity. *Ornithological Monographs* 61:79-88.
21. Knopf, F.L. and M.B. Wunder (2006) Mountain Plover (*Charadrius montanus*). In *The Birds of North America Online* (A. Poole Ed.). Ithaca: Cornell Laboratory of Ornithology; Retrieved from *The Birds of North America Online* http://bna.birds.cornell.edu/BNA/account/Mountain_Plover doi:10.2173/bna.211
22. Schneider, S.C., M.B. Wunder, and F.L. Knopf (2006) Relationship between shrubs and foods in Mountain Plover habitat in Park County Colorado, USA. *Southwestern Naturalist* 51:197-202

23. Wunder, M.B., C.L. Kester, F.L. Knopf, and R.O. Rye (2005) A test of geographic assignment using isotope tracers in feathers of known origin. *Oecologia* 144:607-615
24. Dretiz, V.J., M.B. Wunder, and F.L. Knopf (2005) Movements and home ranges of Mountain Plovers raising broods in three Colorado landscapes. *Wilson Bulletin* 117:128-132
25. Wunder, M.B., F.L. Knopf and C.A. Pague (2003) The high elevation population of Mountain Plovers in Colorado. *Condor* 105:654-662
26. Wunder, M.B. and F.L. Knopf (2003) Imperial Valley of California is critical to wintering Mountain Plovers. *Journal of Field Ornithology* 74(1):74-80
27. Wunder, M.B., J.L. Siemers, and A.E. Ochs (1998) Geographic distribution: *Spea bombifrons*. *Herpetological Review* 29(1): 50

Refereed Books and Book Chapters

1. Wunder, M.B. (2010) Using isoscapes to model probability surfaces for determining geographic origins. In: *Isoscapes: Understanding movement, pattern, and process on Earth through isotope mapping* (Bowen, G., West, J., Tu, K, and Dawson, T. eds.) Springer-Verlag, New York.
2. Wunder, M.B. and D.R. Norris (2008) Analysis and design for isotope-based studies of migratory animals. In: *Tracking animal migration using stable isotopes* (Hobson, K.A. and L.I. Wassenaar, Eds.). Elsevier, Inc. San Diego, CA
3. Kelly, J.F., S. Bearhop, G.J. Bowen, K.A. Hobson, D.R. Norris, L.I. Wassenaar, J.B. West, and M.B. Wunder (2008) Future directions and challenges for using stable isotopes in advancing terrestrial animal migration research. In: *Tracking animal migration using stable isotopes* (Hobson, K.A. and L.I. Wassenaar, Eds.). Elsevier, Inc. San Diego, CA

Non-refereed Publications

1. Barringer, L.E.*, D.F. Tomback, and M.B. Wunder (2011) The relationship between whitebark pine health, cone production, and nutcracker occurrence across four National Parks. In: Keane, Robert E.; Tomback, Diana F.; Murray, Michael P.; and Smith, Cyndi M., eds. 2011. *The future of high-elevation, five-needle white pines in Western North America: Proceedings of the High Five Symposium. 28-30 June 2010; Missoula, MT. Proceedings RMRS-P-63. Fort Collins, CO. 376 p. Online at http://www.fs.fed.us/rm/pubs/rmrs_p063.html*

2. Scott, J.D.*, D.F. Tomback, and M.B. Wunder (2011) Determining Clark's nutcracker use of whitebark pine communities in regard to stand health in Waterton-Glacier International Peace Park. *In*: Keane, Robert E.; Tomback, Diana F.; Murray, Michael P.; and Smith, Cyndi M., eds. 2011. The future of high-elevation, five-needle white pines in Western North America: Proceedings of the High Five Symposium. 28-30 June 2010; Missoula, MT. Proceedings RMRS-P-63. Fort Collins, CO. 376 p. Online at http://www.fs.fed.us/rm/pubs/rmrs_p063.html
3. Lanctot, R.B., M. Barter, C. Chiang, R. Gill, M. Johnson, S. Haig, Z. Ma, P. Tomkovich, and M. B. Wunder (2009) Use of band resightings, molecular markers and stable isotopes to understand the migratory connectivity of Dunlin breeding in Beringia and wintering in the East Asian-Australasian Flyway. Proceedings from the 2009 International Symposium on Coastal Wetlands and Water Birds Conservation, Chiku Research Center, Tainan, Republic of China (Taiwan), 1-3 December 2009
4. Wunder, M.B. and F.L. Knopf (2006) Monitoring mountain plovers in Colorado, 1990-2006. Report prepared for the Colorado Division of Wildlife, Fort Collins, CO
5. Knopf, F.L. and M.B. Wunder (2005) Toward a survey design to monitor wintering mountain plovers. Report prepared for U.S. Fish and Wildlife Service, Denver, CO
6. Margulies, M.D., M.B. Wunder, and F.L. Knopf (2004) Breeding season investigations of mountain plover in northern New Mexico. Report prepared for the U.S. Geological Survey – Biological Resources Division, Fort Collins, CO
7. Wunder, M.B. (2004) Some analytical options for the use of intrinsic markers in studies of avian migration. In Migration stopover ecology in western avian populations: A southwestern migration workshop (Skagen, S.K., Melcher, C.P., and R. Hazelwood Eds). U.S. Geological Survey, Biological Resources Discipline, Open-File Report 2004-1452, 28 p.
8. Ellison, L.E., M.B. Wunder, C.A. Jones, C. Mosch, K.W. Navo, K. Peckham, J.E. Burghardt, J. Annear, R. West, J. Siemers, R.A. Adams, and E. Brekke (2004) Colorado Bat Conservation Plan. Fort Collins, CO: Colorado Committee of the Western Bat Working Group 107 pp.
9. Mettenbrink, C.W., M.B. Wunder and F.L. Knopf (2003) Imperial Valley winter mountain plover survey. Report prepared for the U.S. Fish and Wildlife Service, Denver, CO
10. Wunder, M.B. (2001) Landform-based spatial probability model for mountain plovers. Report prepared for Bureau of Land Management, Canyon City, CO

11. Grunau, L. and M. Wunder (2001) Conservation assessment for mountain plover (*Charadrius montanus*) in South Park, Colorado. Report prepared for Bureau of Land Management, Canyon City, CO
12. Wunder, M.B. and F.L. Knopf (2000) Summary report on the status and conservation of Mountain Plover in South Park. Report prepared for Bureau of Land Management, Canyon City, CO
13. Schrupp, D.L., W.A. Reiners, T.G. Thompson, L.E. Obrien, J.A. Kindler, M.B. Wunder, J.F. Lowsky, J.C. Buoy, L. Satcowitz, A.L. Cade, J.D. Stark, K.L. Driese, T.W. Owens, S.J. Russo, and F. D'Erchia (2000) Colorado gap analysis program: a geographic approach to planning for biological diversity. Report prepared for U.S. Geological Survey, Denver, CO
14. Fayette, K, M.B. Wunder, and S.A. Schneider (2000) Biological Survey of Eagle County, Colorado. Report prepared for Eagle Valley Land Trust
15. Pineda, P.M., S. Kettler, and M.B. Wunder (1999) Significant natural resources of the Caribou Ranch open space and their conservation. Report prepared for Boulder County, CO
16. Wunder, M.B., J.E. Gross, and R.A. Schorr (1998) Suggested interpretation of mammalian taxonomy in Colorado for use in ranking and tracking. Report prepared for the Colorado Natural Heritage Program, Colorado State University, CO
17. Sovell, J., and M.B. Wunder (1998) Zoological Inventory of Nine State Parks. Report prepared for Colorado State Parks
18. Rondeau, R.J., M.B. Wunder, A. Meredith, C.A. Pague, and S. Spackman (1997) Biological Survey of Naval Oil Shale Reserve No. 1 (NOSR-1) Final Report. Report prepared for U.S. Department of Energy, Casper, WY
19. Wunder, M.B. (1996) Summary Report of Goshawk Inventories on Bureau of Land Management Lands in the Glenwood Springs Resource Area. Report prepared for Bureau of Land Management, Glenwood Springs, CO
20. Coleman, L. and Wunder, M.B. (1995) Raptor Management Policy. Internal Policy Document prepared for Bureau of Land Management, Glenwood Springs, CO
21. Wunder, M.B. (1994) Sage Grouse Reconnaissance at King Mountain. Report prepared for Bureau of Land Management, Glenwood Springs, CO
22. Wunder, M.B. (1993) Results Summary for Mexican Spotted Owl Surveys + supplement. Report prepared for Bureau of Land Management, Durango, CO

Publications in Preparation (* student author)

Doll, A.C.*, R.B. Lanctot, C.A. Stricker, and M.B. Wunder (2014) Dunlin tissue chemistry sheds light on behavior and distribution. *In preparation for* Journal of Ornithology

Wunder, M.B., R. Lanctot, C. Stricker, L. Wassenaar, B. Casler, A. Dey, P. Doherty, S. Drovetski, D. Edwards, R. Gates, B. Hill, O. Lane, J. Liebezeit, D. Poppe, B. Schwartz, P. Tomkovitch, D. Tracy, O.P. Valchuk, and S. Zack (2014) Using stable isotopes in primary feathers to classify dunlin subspecies. *In preparation for* Condor

Wunder, M.B., Skrade, P., F.L. Knopf, S.J. Dinsmore, and V.J. Dreitz (2014) Sex ratios in mountain plover. *In preparation for* Journal of Ornithology

Stricker, C.A., A.M. Christ, L.D. Rea, D.A.S. Rosen, D.J. Tollit, S.D. Farley, R. Scherer, and M.B. Wunder (2014) Carbon and nitrogen isotope discrimination for Stellar's sea lion (*Eumetopias jubatus*) vibrissae relative to milk and fish/squid diets. *In preparation for* Canadian Journal of Zoology

Scherer, R.D., A.D. Doll*, L.D. Rea, C.A. Stricker, A.M. Christ, and M.B. Wunder (2014) Spatial variation in the diets of female Stellar sea lions inferred from stable isotope values of vibrissae from pups. *In preparation for* Marine Ecology

Refereed Presentations at Meetings (* student author)

1. VnaderZanden, H.B., K.A. Hobson, L.I. Wassenaar, M.B. Wunder, J.M. Welker, and G.J. Bowen (2013) Incorporating climate variability into precipitation isoscapes for interpreting animal migration. *Contributed poster* presented at the 46th annual fall meeting of the American Geophysical Union. San Francisco, CA (12/13)
2. Cryan, P., E. Valdez, C.A. Stricker, M.B. Wunder, R. Barclay, E. Baerwald, C. Willis, J. Jameson, E.A. Snider, and E. Crichton (2012) Carcass ecology: forensic techniques shed light on the possible causes of bat susceptibility to turbines. *Contributed paper* presented at the 19th annual meeting of the Wildlife Society, Portland, OR (10/12)
3. Doll, A.C.*, M.B. Wunder, R.B. Lanctot, and C.A. Stricker (2012) Estimating temporal movements of a migratory species using stable carbon isotopes. *Contributed paper* presented at the 8th International Conference on Applications of Stable Isotope Techniques to Ecological Studies. Brest, France (8/12)
4. Stricker, C.A., A.M. Christ, L.D. Rea, D.A.S. Rosen, D.J. Tollit, S.D. Farley, M.B. Wunder, and R.D. Scherer (2012) Carbon and nitrogen isotope

- discrimination factors for Stellar sea lions (*Eumetopias jubatus*) vibrissae relative to milk and fish/squid diets. *Contributed poster* presented at the 8th International Conference on Applications of Stable Isotope Techniques to Ecological Studies. Brest, France (8/12)
5. Christ A.M., L.D. Rea, J.N. Waite, C.A. Stricker, M.B. Wunder, and R.D. Scherer (2012) Discrimination factors for $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ profiles of vibrissae from adult Steller sea lion females and their pups in utero and post parturition. *Contributed poster* presented at the 8th International Conference on Applications of Stable Isotope Techniques to Ecological Studies. Brest, France (8/12)
 6. Scherer, R.D., L.D. Rea, C.A. Stricker, A.M. Christ, and M.B. Wunder (2012) Spatial variation in the diets of female Steller sea lions inferred from ^{13}C and ^{15}N values of vibrissae from pups. *Contributed poster* presented at the 8th International Conference on Applications of Stable Isotope Techniques to Ecological Studies. Brest, France (8/12)
 7. Christ, A.M., L.D. Rea, C.A. Stricker, J.N. Waite, M.B. Wunder, and R.D. Scherer (2012) Estimating locations for local extrema of stable isotope signatures in Stellar sea lion vibrissae. *Contributed paper* presented at International Statistical Ecology Conference, Oslo, Norway (7/12)
 8. Doll, A.*, M.B. Wunder, R. Lanctot, and C.A. Stricker (2012) Determining individual arrival times of migratory birds using stable carbon isotopes. *Contributed poster* presented at Research and Creative Activities Symposium, Denver, Colorado (4/12)
 9. Beebe, C.K.*, and M.B. Wunder (2012) An ecological study of *Perognathus fasciatus*: examining population parameters using mark-recapture and radio telemetry. *Contributed poster* presented at Research and Creative Activities Symposium, Denver, Colorado (4/12)
 10. Doll, A.*, M.B. Wunder, R. Lanctot, and C. Stricker (2012) Estimating migration times using stable carbon isotopes. *Contributed paper* presented at 18th annual Front Range Ecology Symposium, Colorado State University, Fort Collins, Colorado (2/12)
 11. Beebe, C.K.*, and M.B. Wunder (2012) Estimating population abundance, density, seasonal survival and home range size of *Perognathus fasciatus*. *Contributed Poster* presented at the 18th annual Front Range Ecology Symposium, Colorado State University, Fort Collins, Colorado (2/12)
 12. Bryan, R.D.* and M.B. Wunder. (2012) Burrowing owl responses to black-tailed prairie dog alarm calls. *Contributed paper* presented at 18th annual Front Range Ecology Symposium, Colorado State University, Fort Collins, Colorado (2/12)

13. Doll, A. *, M.B. Wunder, R. Lanctot, and C.A. Stricker (2011) Estimating arrival times of arctic-breeding dunlin using stable isotopes. *Contributed paper* presented at the 4th meeting of the Western Hemisphere Shorebird Group, Simon Fraser University, Burnaby, British Columbia (8/11)
 14. Wunder, M.B., R. Lanctot, C. Stricker, L. Wassenaar, B. Casler, A. Dey, P. Doherty, S. Drovetski, D. Edwards, R. Gates, B. Hill, O. Lane, J. Liebezeit, D. Poppe, B. Schwartz, P. Tomkovitch, D. Tracy, O.P. Valchuk, and S. Zack (2011) Using stable isotopes in primary feathers to classify dunlin subspecies. *Contributed paper* presented at the 4th meeting of the Western Hemisphere Shorebird Group, Simon Fraser University, Burnaby, British Columbia (8/11)
 15. Doll, A. *, M.B. Wunder, R. Lanctot, and C.A. Stricker (2011) Using tissue isotope values ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) to characterize a population level diet transition and to estimate arrival times of dunlin. *Contributed poster* presented at Research and Creative Activities Symposium, Denver, Colorado (4/11)
 16. Bryan, R.D.*, and M.B. Wunder (2011) Cynomys says: Characteristics of Black-tailed Prairie Dog (*Cynomys ludovicianus*) Alarm Calls in Response to Simulated Predator Stimuli. *Contributed poster* presented at Research and Creative Activities Symposium, Denver, Colorado (4/11)
- ** Won Chancellor's award for Excellence in Graduate Research
17. Bryan, R.D.*, and M.B. Wunder (2011) Rumors on the prairie: Do birds eavesdrop on alarm calls of black-tailed prairie dogs? *Contributed poster* presented at the 17th Annual Front Range Student Ecology Symposium, Colorado State University, Fort Collins, Colorado (2/11)
 18. Cryan, P.M., C.A. Stricker, and M.B. Wunder (2010) Migratory structure and geographic origins of hoary bats (*Lasiurus cinereus*) inferred from stable isotope analysis. *Contributed paper* presented at the 15th International Bat Research Conference, Prague, Czech Republic (8/10)
 19. Wunder, M.B. (2010) Overview of studying migration using stable isotope values in keratin. *Invited paper* presented as part symposium at the 90th Annual Meeting of the American Mammalogists Society. University of Wyoming, Laramie, WY (6/10)
 20. Cryan, P.M., C.A. Stricker, and M.B. Wunder (2010) Migratory structure and geographic origins of hoary bats (*Lasiurus cinereus*) inferred from stable isotope analysis. *Contributed paper* presented at the 90th Annual Meeting of the American Society of Mammalogists, Laramie, Wyoming (6/10)
 21. Barringer, L.*, D. F. Tomback, and M. B. Wunder (2010) The relationship between whitebark pine health, cone production, and nutcracker occurrence across four national parks. *Invited paper* presented at High-Five symposium:

- The future of high-elevation five-needle white pines in western North America. Whitebark Pine Ecosystem Foundation, University of Montana, Missoula (6/10)
22. Scott, J.*, D. F. Tomback, M. B. Wunder, and M. Maier (2010) Determining Clark's nutcracker use of whitebark pine communities in the Waterton-Glacier Peace Park. *Invited paper* presented at High-Five symposium: The future of high-elevation five-needle white pines in western North America. Whitebark Pine Ecosystem Foundation, University of Montana, Missoula (6/10)
 23. Cryan, P.M., C.A. Stricker, and M.B. Wunder (2009) Stable isotope inferred geographic constraints on origins of hoary bats (*Lasiurus cinereus*) killed at wind turbine facilities. *Contributed paper* presented at the 39th Annual Meeting of the North American Society for Bat Research, Portland, Oregon (11/09)
 24. Wunder, M.B., Jehl, J.R., Parnell, A., Jackson, A., Inger, R., and S. Bearhop (2008) Estimating proportional mixtures of hydrogen and oxygen sources in a highly restricted avian system. *Contributed paper* presented at the 6th International Conference on Applications of Stable Isotope Techniques to Ecological Studies, Honolulu, HI (8/08)
 25. Wunder, M.B. (2008) Using isoscapes to model probabilities of origin. *Invited paper* presented at Isoscapes2008, an NSF-sponsored (BASIN RCN) symposium, Santa Barbara, CA (3/08)
 26. Wunder, M.B. and F.L. Knopf (2007) Geographic structure and dynamics in mountain plover. *Contributed paper* presented at 125th meeting of the American Ornithologists' Union. Laramie, WY (8/07)
 27. Wunder, M.B. and J.R. Jehl, Jr. (2007) Stable isotopes in feathers grown under extreme natural constraints. *Contributed paper* presented at 125th meeting of the American Ornithologists' Union. Laramie, WY (8/07)
 28. Wunder, M.B. (2007) Generalized spatial resolution limits for inferring geographic limits from stable hydrogen isotopes. *Contributed paper* presented at 125th meeting of the American Ornithologists' Union. Laramie, WY (8/07)
 29. Wunder, M.B. (2007) Distance sampling to estimate abundance of mountain plovers. *Invited paper* given as part of symposium titled Bird Monitoring and Detectability: Understanding and Applying Appropriate Methods. Fort Collins, CO (2/07)
 30. Wunder, M.B., C.L. Kester, C.T. Webb (2006) Error propagation and resolution limits for inferring geographic origins from stable hydrogen isotopes. *Contributed paper* presented at the 5th International Conference on

- Applications of Stable Isotope Techniques to Ecological Studies. Belfast, Northern Ireland (8/06)
31. Wunder, M.B., J.R. Jehl, Jr. (2006) Natural variation in isotope composition veils simplistic migratory system. *Contributed poster* at the 5th International Conference on Applications of Stable Isotope Techniques to Ecological Studies. Belfast, Northern Ireland (8/06)
 32. Wunder, M.B., F.L. Knopf, C.L. Kester, R.O. Rye (2004) Avian migration: Pitfalls and promises of stable isotope tracers. *Contributed poster* at the 4th International Conference on Applications of Stable Isotope Techniques to Ecological Studies. Wellington, New Zealand (4/04)
- ** Won award for Best Student Poster
33. Wunder, M.B. (2004) Analytical options for stable isotope studies of migration patterns. *Invited paper* presented at symposium for Southwestern U.S. and Northern Mexico Landbird Migration, Tucson, AZ (1/04)
 34. Wunder, M.B. and F.L. Knopf (2003) Mountain Plover population mixing during winter in the Imperial Valley of California. *Contributed paper* presented at 73rd Annual Meeting of the Cooper Ornithological Society. Flagstaff, AZ (5/03)
 35. Wunder, M.B. and F.L. Knopf (2002) A population of montane Mountain Plovers. *Invited paper* presented at annual meeting of the Colorado chapter of The Wildlife Society. Colorado Springs, CO (1/02)
 36. Wunder, M.B. and F.L. Knopf (2001) A population of Mountain Plovers breeding at high elevation in Colorado. *Contributed paper* presented at 71st Annual Meeting of the Cooper Ornithological Society. Albuquerque, NM (4/01)

Invited Seminars and Workshops Presented

1. Bowen, G., K. Hobson, and M.B. Wunder (2012) Isotope applications for geospatial assignment. *Workshop* given at the 8th International Conference on Applications of Stable Isotope Techniques to Ecological Studies. Brest, France (8/12)
2. Wunder, M.B. and J. Shamoun-Baranes (2010) Data Fusion. *Workshop* given at Max Planck Institute for Ornithology. Radolfzell, Germany (6/10)
3. Kelly, J., Wikelski, M., Mabee, S., Wunder, M.B., Bridges, E., and F. Moore (2010) Joint North American and European Workshop on Bird Migration. Max Planck Institute for Ornithology, Radolfzell, Germany (6/10)

4. Wunder, M.B. (2009) Isotope forensics in wildlife population studies. *Invited seminar* presented as part of the Natural Resource Ecology Lab seminar series, Colorado State University. Fort Collins, CO (12/09)
5. Wunder, M.B. (2009) Putting Feathers on the Map: A Study in Stable Isotope Forensics. *Invited seminar* presented for Earth and Environmental Sciences Division of Los Alamos National Laboratory. Los Alamos, NM (6/09)
6. Wunder, M.B. (2009) Modeling geographic provenance of migratory birds using stable hydrogen isotopes in feathers. *Invited seminar* presented for Department of Mathematical and Statistical Sciences, University of Colorado Denver. Denver, CO (3/09)
7. Wunder, M.B. (2007) Geographic structure and dynamics in mountain plover. Ph.D. defense seminar given in the department of Fish, Wildlife, and Conservation Biology, Colorado State University. Fort Collins, CO (3/07)
8. Wunder, M.B. (2004) Biogeography of Mountain Plovers. *Invited seminar* presented at Center for Tropical Research, University of California, Los Angeles, CA (5/04)
9. Wunder, M.B. (2001) Preliminary investigations of Mountain Plovers breeding on a montane grassland. *Invited seminar* for Department of Fish, Wildlife and Conservation Biology spring seminar series, Colorado State University. Fort Collins, CO (3/01)
10. Wunder, M.B. (1998) Mapping potential habitat for lynx in Colorado. *Invited seminar* for Department of Fish, Wildlife and Conservation Biology fall seminar series, Colorado State University, Fort Collins, CO (10/98)

Synergistic Activities

National Center for Ecological Analysis and Synthesis (NCEAS) working group. Establishing an open-source animal-tracking analysis platform for archival geolocators. Santa Barbara, CA (2013)

NSF Macrosystems Training Grant. Inter-University Training for Continental-scale Ecology (ITCE) program, based at University of Utah (2012-2017)

NSF Research Coordination Network (RCN). Migration Interest Group: Research Applied Toward Education (MIGRATE) program, based at University of Oklahoma (2007-2010)

NSF Research Coordination Network (RCN). Biogeosphere-Atmosphere Stable Isotope Network (BASIN) program, based at University of California, Berkeley (2008)

Courses Taught

1. Biogeography (UCD)
2. Biostatistics (UCD)
3. Biological Data Analysis (UCD)
4. Design of Wildlife Projects (Colorado State University)
5. Principles of Biological Research (UCD)
6. Research Seminar in Biology (UCD)
7. SPATIAL: Spatial-Temporal Isotope Analytics Lab (University of Utah)
8. Wildlife Data Collection and Analysis (Colorado State University)

Service

Associate Editor, *Journal of Animal Ecology* (2009-present)

Referee (from 2001-present): *Aquatic Biology, Auk, Avian Conservation and Ecology, Journal of Avian Biology, Biology Letters, Canadian Journal of Zoology, Condor, Ecology, Ecological Applications, Ecological Monographs, Ecosphere, Journal of Field Ornithology, Journal of Herpetology, Journal of Mammalogy, Marine Biology, Methods in Ecology and Evolution, National Science Foundation, Oecologia, Ornithological Monographs, Rapid Communications in Mass Spectrometry, Studies in Avian Biology, Trends in Ecology and Evolution, Waterbirds, Wilson Journal of Ornithology*

Organizing Committee – Joint North American and European Workshop on Bird Migration, Max Planck Institute For Ornithology, Radolfzell, Germany (2010)

Co-Chair – Scientific Program Committee, Joint Conference of the American Ornithologists' Union, Cooper Ornithological Society, and the Society for Canadian Ornithologists, Estes Park, CO (2014)

Session Chair, American Ornithologists' Union Conference, Laramie, WY (2007)

Award Selection Committee – Painton Award, Cooper Ornithological Society (2007)

NSF Research Coordination Network – MIGRATE (2005-2010)

Science and Conservation Committee – Colorado Audubon Society (1999-2010)

Chair – Colorado Committee of The Western Bat Working Group (1999-2000)

Executive Board – Colorado chapter of The Wildlife Society (1998-1999)

Dept of Integrative Biology; PhD Program Steering Committee (2012-present)

Dept of Integrative Biology; Co-Chair Graduate Advisory Committee (2013-present)

Dept of Integrative Biology; Advisor - Academic Probation Students (2011-present)

Dept of Integrative Biology; Graduate Advisory Committee (2012-2013)
Dept of Integrative Biology; Merit Review Committee (2009-2013)
Dept of Integrative Biology; Teaching Effectiveness Committee (2011-2012)
Dept of Integrative Biology; Systems Biology Search Committee (2011-2012)
Dept of Integrative Biology; Graduate Curriculum Committee (2010-2011)
College of Liberal Arts and Sciences CRISP grant proposal review (2011)
College of Liberal Arts and Sciences Scholarship Committee (2009-2011)

Recognition and Honors

2013 College of Liberal Arts and Sciences Excellence in Research Award
2003-2006 NSF IGERT fellow (Program In Mathematics, Ecology, and Statistics)
2004 Best Student Poster, 4th International Conference on Applications of
 Stable Isotope Techniques to Ecological Studies. Wellington, New
 Zealand
1995 Outstanding Contribution Award, Bureau of Land Management
1988 Regents Scholar, University of Colorado

Students Mentored

Thesis advisor for

1. Colin Wooley, MSc Candidate Integrative Biology (Fall 2013 – present)
2. Amber Carver, MSc Candidate Integrative Biology (Fall 2013 – present)
**Co-advised with Dr. Diana Tomback*
3. Jessica Fish, MSc Candidate Integrative Biology (Fall 2012 – present)
4. Chelsea Beebe, MSc Candidate Integrative Biology (Fall 2011 – present)
5. Andrew Doll, MSc Integrative Biology (Fall 2010 – Spring 2013)
**Recognized as the 2013 Outstanding MSc Graduate Student by CLAS*
6. Rebecca Bryan, MSc Integrative Biology (Fall 2010 – Spring 2012)
**Won 2010 UCD Chancellor's Award for Excellence in Graduate Research*

On Thesis committee for

1. Kara Collier, MSc Candidate Environmental Sciences (Fall 2013 – present)
2. Joshua Sackett, MSc Candidate Integrative Biology (Fall 2013 – present)
3. Mark Visel, MSc Candidate Integrative Biology (Spring 2013 – present)
4. Elizabeth Pansing, MSc Candidate Integrative Biology (Spring 2012 – present)

5. Jill Pyatt, MSc Integrative Biology (Fall 2011 – Spring 2013)
6. Jennifer Scott, MSc Integrative Biology (Fall 2010 – Summer 2013)
7. Sarah Blakeslee, MSc Integrative Biology (Fall 2010 – Fall 2012)
*Recognized as the 2012 Outstanding MSc Graduate Student by CLAS
8. Lauren Barringer, MSc Integrative Biology (Spring 2009 – Spring 2010)

Undergraduates

1. Allison Pierce (Spring 2013 – Fall 2013)
2. Katharine Ozenberger (Spring 2013 – Fall 2013)
3. Mallory O'Malley (Spring 2013)
4. Christopher Henderson (Spring 2013)
5. Bincy Varghese (Spring 2013)
6. Logan Thompson (Spring 2012)
7. Artur Ergashev (Fall 2009 - Spring 2010)
8. Matt Ericksen (Spring 2009 - Fall 2009)

Post-Doctoral Fellows

1. Simona Ceriani (Summer 2104)
2. Hannah Vander Zanden (Summer 2013 – present)
*Jointly mentored with Drs. Gabe Bowen (U Utah) and Keith Hobson (EC)
3. Mark Hayes (Fall 2012 – Fall 2013)
*Jointly mentored with Dr. Paul Cryan (USGS)
4. Richard Scherer (Spring 2011 – Fall 2012)
5. Andrew Schuh (Spring 2010)

Grants, Contracts, and Operational Support

Grants and Contracts – University of Colorado Denver

1. Wunder, M.B. Assessing habitat use and seasonal distributions of tree-roosting bats at risk from industrial wind energy development. Sponsor – USGS-BRD; \$101,673 (2012-2014)
2. Wunder, M.B. Estimating seasonal diet composition in Steller sea lions from stable isotopes of carbon and nitrogen. Sponsor – Alaska Department of Game and Fish; \$191,041 (2011-2014)
3. Wunder, M.B. CLAS research dissemination grant. Sponsor – University of Colorado Denver; \$750 (2012)
4. Bryan, R. and M.B. Wunder. Responses of mountain plovers and burrowing owls to black-tailed prairie dog alarm calls. Sponsor – Denver Audubon Society, Lois Webster Memorial Fund; \$1,400 (2011)
5. Wunder, M.B. CLAS research dissemination grant. Sponsor – University of Colorado Denver; \$1,000 (2011)

6. Wunder, M.B. Structured Decision Making in Seasonal Migratory Systems: The Mountain Plover Case Study. Sponsor – USFWS; \$17,697 (2009-2010)
7. Tomback, D.F. and M.B. Wunder. Tracking Clark’s nutcracker movements and population structure using intrinsic markers: combining genetic and stable isotope signatures. Sponsor – University of Colorado Denver; \$9,985 (2009-2010)
8. Wunder, M.B. and D.F. Tomback. Exploring Clark’s nutcracker population patterns using intrinsic markers. Sponsor – Denver Museum of Nature and Science; \$760 (2009)

Grants and Contracts – Colorado State University

1. Wunder, M.B. Monitoring Mountain Plovers in Colorado. Sponsor – CDOW; \$163,684 (2004-2008)
2. Wunder, M.B. Evaluating the population structure of Mountain Plovers. Sponsor – CDOW; \$285,012 (2004-2006)
3. Wunder, M.B., Knopf, F.L. and V.J. Dreitz. Resolving conflicts of *Charadrius montanus* breeding on private lands. Sponsors – USGS-BRD, CDOW; \$603,500 (2001-2004)
4. Wunder, M.B. and F.L. Knopf. Status and conservation of Mountain Plover. Sponsor – USGS-BRD; \$155,600 (2000-2003)
5. Wunder, M.B., Schorr, R.A., Wunder, B.A., and G. Florant. Monitoring small mammals at Pueblo Chemical Depot. Sponsor – USDOD-Army; \$411,000 (1999-2004)
6. Fayette, K., Rondeau, R.J., and M.B. Wunder. Eagle County biological assessment; Sponsors – Eagle Valley Land Trust, Eagle County, GOCO, BLM, USFS; \$81,200 (1999-2000)
7. Spackman, S. and M.B. Wunder. A Natural Heritage inventory of Staunton State Park, Jefferson and Park Counties, CO. Sponsor – CODNR-State Parks; \$20,800 (1999)
8. Wunder, M.B. Mountain Plovers breeding in South Park and Moffat County. Sponsor – BLM; \$42,200 (1998-2002)
9. Wunder, M.B. Development of rank specifications for occurrences of animals of concern. Sponsors – TNC, USFS; \$22,000 (1998-2000)
10. Wunder, M.B. Zoological inventory of nine state parks. Sponsor – CODNR-State Parks; \$25,000 (1998)
11. Wunder, M.B. Development of a potential habitat model for lynx in Colorado. Sponsor – USFS; \$25,000 (1998)

12. Lyons, P. and M.B. Wunder. Uncompahgre Basin biological assessment. Sponsor – The Valley Land Conservancy, GOCO; \$52,500 (1998)
13. Spackman, S. and M.B. Wunder. A Natural Heritage inventory of the Roaring Fork watershed. Sponsors – Pitkin County, GOCO; \$45,000 (1998)
14. Rondeau, R.J. and M.B. Wunder. Biological Inventory of Mineral County and the Zapata Ranch. Sponsors – TNC, GOCO, Mineral County; \$45,000 (1998)
15. Kittel, G. and M.B. Wunder. A Natural Heritage inventory of the Caribou Ranch. Sponsor – Boulder County Parks and Open Space; \$16,500 (1998)
16. Pineda, P.M. and M.B. Wunder. Lepidoptera survey of Jefferson County lands. Sponsor – Jefferson County Open Space; \$8,800 (1998)

Operational Support from collaborative grants – University of Colorado Denver

1. Dwyer, A.M. et al. Conservation of species of greatest conservation need in the short grass prairie of Nebraska and Colorado. Field support for two graduate student thesis projects (Woolley and Carver), including summer stipends, field housing and travel, radio telemetry supplies, and costs for experimental field manipulations. Sponsors – USFWS through Nebraska Department of Game and Parks; \$132,074 (2013-2015)
2. Wunder and Beebe. Population ecology of olive-backed pocket mouse. Field support for MS student Chelsea Beebe, including summer stipends, housing and travel, radio telemetry equipment and field supplies. Sponsor – Colorado Parks and Wildlife; \$10,000 (2011-2012)
3. Wunder and Doll. Migration ecology of dunlin. Field support for MS student Andrew Doll, including summer stipends, room and board, and airfare to Barrow Alaska, and laboratory support for stable isotope analysis of bird tissues. Sponsors – U.S. Fish and Wildlife Service and Manomet Center for Conservation Sciences; \$154,560 (2011)