

CURRICULUM VITAE

Robert Howard Hilderbrand

University of Maryland Center for Environmental Science Appalachian Laboratory
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Professional Positions and Responsibilities:

- 2008 - Associate Professor, University of Maryland Center for Environmental Science Appalachian Laboratory
- 2002-2008 Assistant Professor, University of Maryland Center for Environmental Science Appalachian Laboratory
- 2000-2002 Research Assistant Professor, University of Maryland Center for Environmental Science Appalachian Laboratory
- 1999-2001 David H. Smith Conservation Research Fellow, The Nature Conservancy, Utah State University
- 1998-1999 Postdoctoral Fellow, Ecology Center and Department of Fisheries and Wildlife, Utah State University

Areas of Professional Interest and Expertise:

Ecology, management, conservation, and restoration of freshwater ecosystems
Determining alternate states and resilience in freshwater ecosystems
Linking theory and application for better science, management, and conservation
Population simulation modeling
GIS and spatial analysis

Education:

- Ph.D. 1998 Utah State University: (Ecology)
- M.S. 1994 Virginia Tech (Fisheries Science)
- B.S. 1992 Frostburg State University (Wildlife and Fisheries Management with concentrations in both wildlife management and in fisheries management; Minors – Chemistry, Biology)

Teaching Experience:

- Analysis of Messy Data (1 Cr. Graduate seminar, MEES)
- Mixed Effects Models in R (1 Cr. Graduate seminar, MEES)
- Readings in Conservation and Restoration Ecology (1 Cr. Graduate seminar, MEES)
- Biometry (3 Cr. Graduate, MEES)
- Ecological Foundations (4 Cr. Graduate, MEES)
- Spatial Ecology (2 Cr. Graduate, Utah State University)

Quantitative Methods in Natural Resources (3 Cr. Undergraduate, Utah State University)
Review of Endangered Species Recovery Plans (1 Cr. Graduate seminar, Utah State University)

Publications:

Journal Articles:

1. **Hilderbrand**, R. H., A. D. Lemly, C. A. Dolloff, and K. L. Harpster. 1997. Effects of large woody debris placement on stream channels and benthic macroinvertebrates. *Canadian Journal of Fisheries and Aquatic Sciences* 54:931-939.
2. **Hilderbrand**, R. H., A. D. Lemly, C. A. Dolloff, and K. L. Harpster. 1998. Design considerations for large woody placement in stream enhancement projects. *North American Journal of Fisheries Management* 18:161-167.
3. **Hilderbrand**, R. H., A. D. Lemly, and C. A. Dolloff. 1999. Habitat sequencing and the importance of discharge in inferences. *North American Journal of Fisheries Management* 19:198-202.
4. **Hilderbrand**, R. H., and J. L. Kershner. 2000. Conserving inland cutthroat trout in small streams: how much stream is enough? *North American Journal of Fisheries Management* 20:513-520.
5. **Hilderbrand**, R. H., and J. L. Kershner. 2000. Movement patterns of stream-resident cutthroat trout in Beaver Creek, Idaho-Utah. *Transactions of the American Fisheries Society* 129:1160-1170.
6. Lemly, A. D., and R. H. **Hilderbrand**. 2000. Influence of large woody debris on stream insect communities and benthic detritus. *Hydrobiologia* 421:179-185.
7. **Hilderbrand**, R. H. 2002. Simulating supplementation strategies for restoring and maintaining stream resident cutthroat trout populations. *North American Journal of Fisheries Management* 22:879-887.
8. **Hilderbrand**, R. H. 2003. The roles of carrying capacity, immigration, and population synchrony on persistence of stream-resident cutthroat trout. *Biological Conservation* 110:257-266.
9. **Hilderbrand**, R. H., and J. L. Kershner. 2004. Influence of habitat type on food supply, selectivity, and diet overlap of Bonneville cutthroat trout and nonnative brook trout in Beaver Creek, Idaho. *North American Journal of Fisheries Management* 24:33-40.
10. **Hilderbrand**, R. H., and J. L. Kershner. 2004. Are there differences in growth and condition between mobile and resident cutthroat trout? *Transactions of the American Fisheries Society* 133:1042-1046.
11. Wiley, D. J., R. P. Morgan, II, R. H. **Hilderbrand**, R. L. Raesly, and D. L. Shumway. 2004. Relations of physical habitat and abundance of American eels in five river basins in Maryland. *Transactions of the American Fisheries Society* 133:515-526.
12. Barker, J. M., K. R. McKaye, and R. H. **Hilderbrand**. 2004. The role of dilution and differential predation in brood adoptions of the Midas cichlid (*Amphilophus citrinellus*). *Acta Ethologica* 7:81-87.
13. **Hilderbrand**, R. H., A. C. Watts, and A. M. Randle. 2005. The myths of restoration ecology. *Ecology and Society*10(1): 19. [online] URL: <http://www.ecologyandsociety.org/vol10/iss1/art19/>

14. Colyer, W. T., J. L. Kershner, and R. H. **Hilderbrand**. 2005. Movements of fluvial Bonneville cutthroat trout in the Thomas Fork of the Bear River, Idaho-Wyoming. *North American Journal of Fisheries Management* 25:954-963.
15. **Hilderbrand**, R.H., R. H. Gardner, M. J. Ratnaswamy, and C. E. Keller. 2007. Evaluating population persistence of Delmarva fox squirrels and potential impacts of climate change. *Biological Conservation* 137:70-77.
16. Castro, M. S., R. H. **Hilderbrand**, J. Thompson, A. Heft, and S. E. Rivers. 2007. Relationship between wetlands and mercury in brook trout. *Archives of Environmental Contamination and Toxicology* 52:97-103.
17. Stranko, S. A., R.H. **Hilderbrand**, R.P. Morgan, II, M.W. Staley, A.J. Becker, A. Roseberry-Lincoln, E.S. Perry, and P.T. Jacobson. 2008. Brook trout declines with changes to land cover and temperature in Maryland. *North American Journal of Fisheries Management* 28:1223-1232.
18. Utz, R.M., R.H. **Hilderbrand**, and D.M. Boward. 2009. Identifying regional differences in threshold responses of aquatic invertebrates to land cover gradients. *Ecological Indicators* 9:556-567.
19. Nelson, K.C., M.A. Palmer, J.E. Pizzuto, G.E. Moglen, P.L. Angermeier, R.H. **Hilderbrand**, M. Dettinger, and K. Hayhoe. 2009. Forecasting the combined effects of urbanization and climate change on stream ecosystems: from impacts to management options. *Journal of Applied Ecology* 46:154-163.
20. Strain, G.F., R.L. Raesly, and R.H. **Hilderbrand**. 2009. A comparison of techniques to sample salamander assemblages along highland streams of Maryland. *Environmental Monitoring and Assessment* 156:1-16.
21. Lookingbill, T.R., S.S. Kaushal, R.H. Gardner, A.J. Elmore, R.P. Morgan, R.H. **Hilderbrand**, W.R. Boynton, M.A. Palmer, and W.C. Dennison. 2009. Altered ecological flows blur boundaries in post-industrial, urban watersheds. *Ecology and Society* 14(2): 10.[online] URL: <http://www.ecologyandsociety.org/vol14/iss2/art10/>.
22. Buys, D.J., R.H. **Hilderbrand**, and J.L. Kershner. 2009. Growth and emigration of cutthroat trout and brook trout in fenced stream-enclosures: effects of density on competition. *Western North American Naturalist* 69:371-381.
23. Utz, R.M., R.H. **Hilderbrand**, and R.L. Raesly. 2010. Regional differences in patterns of fish species loss with changing land use. *Biological Conservation* 143:688-699.
24. **Hilderbrand**, R.H., R.M. Utz, S.A. Stranko, and R.L. Raesly. 2010. Applying thresholds to forecast potential biodiversity loss from human development. *Journal of the North American Benthological Society* 29:1009-1016.
25. Dodds, W.K., W.H. Clements, K. Gido, R.H. **Hilderbrand**, and R.S. King. 2010. Thresholds, breakpoints, and non-linearity in freshwater systems as related to management. *Journal of the North American Benthological Society* 29:988-997.
26. Utz, R.M., K.N. Eshleman, and R.H. **Hilderbrand**. 2011. Variation in hydrological, chemical and thermal responses to urbanization in streams between two physiographic regions of the Mid-Atlantic United States. *Ecological Applications* 402-415.
27. Utz, R.M. and R.H. **Hilderbrand**. 2011. Interregional variation in urbanization-induced geomorphic change and macroinvertebrate habitat colonization in headwater streams. *Journal of the North American Benthological Society* 31:25-37.

28. Stranko, S.A., R.H. **Hilderbrand**, and M.A. Palmer. 2012. Comparing the Fish and Benthic Macroinvertebrate Diversity of Restored Urban Streams to Reference Streams. *Restoration Ecology* 20:747-755.
29. Kazyak, D.C., R.H. **Hilderbrand**, and A.E. Holloway. 2013. Rapid visual assessment to determine sex in brook trout. *North American Journal of Fisheries Management* 33:665-668.
30. Cessna, J.F., R.L. Raesly, J.V. Kilian, D.A. Cincotta, and R.H. **Hilderbrand**. 2014. Rainbow darter, *Etheostoma caeruleum*, in the Potomac River drainage; rapid colonization and range expansion following inter-basin transfer. *Northeast Naturalist* 21:1-11.
31. Lookingbill, T.R., J.P. Schmit, S.M. Tessel, M. Suarez-Rubio, and R.H. **Hilderbrand**. 2014. Assessing national park resource condition along an urban-rural gradient in and around Washington, D.C., USA. *Ecological Indicators* 42:147-159
32. Stranko, S., M. Ashton, R.H. **Hilderbrand**, S. Weglein, D. Kazyak, and J. Kilian. 2014. An unintended ecological consequence of dam construction: the cascading top-down effect of top predator exclusion. *Transactions of the American Fisheries Society* 143:700-708.
33. Sjollema, A.L., J.E. Gates, R.H. **Hilderbrand**, and J. Sherwell. 2014. Migratory bats moving off the Mid-Atlantic coast. *Northeast Naturalist* 21:154-163.
34. **Hilderbrand**, R.H., M.T. Kashiwagi, and A.P. Prochaska. 2014. Regional and local scale modeling of stream temperatures and spatio-temporal variation in thermal sensitivities. *Environmental Management* 54:14-22.
35. Kazyak, D.C., R.H. **Hilderbrand**, S.R. Keller, M.C. Colaw, A.E. Holloway, R.P. Morgan, II, and T.L. King. 2015. Spatial structure of morphological and neutral genetic variation in brook trout *Salvelinus fontinalis*. *Transactions of the American Fisheries Society* 144:480-490.
36. Rizzo, A.A., R.L. Raesly, and R.H. **Hilderbrand**. 2016. Stream salamander responses to varying degrees of urbanization within Maryland's Piedmont physiographic province. *Urban Ecosystems* 19:397-413.
37. Sell, M.T., D.C. Kazyak, R.H. **Hilderbrand**, A.A. Heft, and R.M. Cooper. 2016. A comparison of circle hook size on hooking success, deep holing rate, and post-release mortality of hatchery-reared Rainbow Trout, *Oncorhynchus mykiss*. *North American Journal of Fisheries Management* 36:254-258.
38. Kazyak, D.C., M.T. Sell, R.H. **Hilderbrand**, A.A. Heft, and R.M. Cooper. 2016. A comparison of catchability and mortality with circle and J hooks for stream-dwelling Brook Trout *Salvelinus fontinalis*. *North American Journal of Fisheries Management* 36:259-266.
39. Kazyak, D.C., R.H. **Hilderbrand**, T.L. King, S.R. Keller, and V.E. Chhatre. 2016. Hiding in plain sight: A case for cryptic metapopulations in brook trout (*Salvelinus fontinalis*). *PLoS ONE* 11(1): e0146295. doi:10.1371/journal.pone.0146295
40. Campbell, C.A., and R.H. **Hilderbrand**. 2016. Using maximum entropy to predict suitable habitat for the endangered dwarf wedgemussel in the Maryland coastal plain. *Aquatic Conservation: Marine and Freshwater Ecosystems*.
41. **Hilderbrand**, R.H., and D.C. Kazyak. In Press. Spatiotemporal stability patterns of Brook Trout abundance and implications for stream research and monitoring. *North American Journal of Fisheries Management*.

42. Keller, S.R., R.H. **Hilderbrand**, M.K. Shank, and M. Potapova. In Press. Environmental DNA genetic monitoring of the nuisance freshwater diatom, *Didymosphenia geminata*, in eastern North American streams. *Diversity and Distributions*.

Book Chapters

1. **Hilderbrand**, R.H. and R.M. Utz. 2015. Ecological thresholds and resilience in streams. Pages 461-478 in P.M. Rowinski and A. Radecki-Pawlik, eds. *Rivers – physical, fluvial, and environmental processes*. Springer.

Symposium Proceedings

1. Rowinski, P. M., J. J. Napiorkowski, and R. H. **Hilderbrand**. 2001. Measures of assessing the behavior of natural systems. *Proceedings of the Polish Geophysical Society (In Polish)* 76-81.
2. Kazyak, D.C., and R.H. **Hilderbrand**. 2014. Growth variation in a Mid-Atlantic brook trout population. *Proceedings of Wild Trout XI. Supplement:350-356*.
3. Sell, M.T., A.A. Heft, D.C. Kazyak, R.H. **Hilderbrand**, and R.P. Morgan, II. 2014. Short term and seasonal movements of eastern brook trout, *Salvelinus fontinalis*, in the upper Savage River watershed, Garrett County, Maryland. *Proceedings of Wild Trout XI. Supplement:357-362*.

Technical Reports:

- Kershner, J. L., and seven co-authors. 1998. Sierra Nevada Province effectiveness monitoring protocols for aquatic and riparian habitats. USDA Forest Service. Fish and Aquatic Ecology Unit Technical Report. 67 p.
- Wiens, J. A., T. Comendant, R. H. Hilderbrand, C. Jordan, N. Sferra, and D. Zollner. 2004. Science capacity assessment, Central US Region. The Nature Conservancy. The Nature Conservancy, Arlington, VA.
- Raesly, R. L., R. H. Hilderbrand, and P. F. Kazyak. 2004. Inventory and biological monitoring of fishes in national parks of the National Capital Region. Final Report to the National Park Service.
- Hilderbrand, R. H., R. L. Raesly, and P. F. Kazyak. 2005. Baseline water resource inventory to support aquatic and watershed management activities in National Capital Region parks. Final Report to the National Park Service.
- Hilderbrand, R.H., R. L. Raesly, and D. M. Boward. 2005. Water resources protocols for streams in the National Capital Region of the National Park Service. Final Report to the National Park Service.
- Hilderbrand, R. H., R. L. Raesly, and D. M. Boward. 2005. Sampling results for inventory and monitoring protocols for water resources of National Capital Region parks. Final Report to the National Park Service.
- Kline, M., R. Hilderbrand, and A. Hairston-Strang. 2005. Maryland Biological Stream Survey 2000-2004 Volume 10:Riparian zone conditions. Maryland Department of

- Natural Resources Monitoring and Non-tidal Assessment. CBWP-MANTA-EA-05-7. Annapolis, Maryland.
- Heft, A. A., and twenty coauthors. 2006. Maryland brook trout fisheries management plan. Maryland Department of Natural Resources, Fisheries Service, Inland Fisheries Management Division, Annapolis, MD. 130pp.
- Boicourt, K. and Z.P. Johnson (eds.). 2011. Comprehensive strategy for reducing Maryland's vulnerability to climate change, Phase II: Building societal, economic, and ecological resilience. Report of the Human Health, Agriculture, Forests, and Terrestrial Ecosystems, Bay and Aquatic Resources, and Growth and Infrastructure subgroups. University of Maryland Center for Environmental Science, Cambridge, Maryland, and Maryland Department of Natural Resources, Annapolis Maryland.
- Patten, D., et al. 2011. Review of field-based aquatic life benchmark for conductivity in central Appalachian Streams. U.S. Environmental Protection Agency Science Advisory Board Panel on Ecological Impacts of Mountaintop Mining and Valley Fills. EPA-SAB-11-006.
- Patten, D., et al. 2011. Advisory on EPA's draft report on aquatic ecosystem effects of mountaintop mining and valley fills. U.S. Environmental Protection Agency Science Advisory Board Panel on Ecological Impacts of Mountaintop Mining and Valley Fills. EPA-SAB-11-005.

Grants and Awards:

- 1999 The Nature Conservancy. - \$137,000. Design of freshwater conservation reserves using cutthroat trout as a focal species. D.H. Smith Conservation Research Fellowship.
- 2001 Utah Division of Wildlife Resources. - \$23,283. Implementing a spatial database for aquatic biological information for the State of Utah.
- 2002 National Fish and Wildlife Foundation. - \$24,900. Estimating habitat and landscape determinants of population viability of the Delmarva fox squirrel (Co-PI with R. H. Gardner).
2002. National Park Service. - \$70,457. Inventory and biological monitoring of fishes in national parks. (Co-PI with R.L. Raesly)
- 2003 National Park Service. - \$247,692. Aiding management by assessing condition and identifying stressors of aquatic resources in National Capital Region parks.
- 2003 National Park Service. - \$99,975. Baseline water resource inventory to support aquatic and watershed management activities in National Capital Region parks. (R.L. Raesly Co-PI)
- 2003 Maryland Department of Natural Resources. - \$100,000. Maryland wildlife habitat grant (Co-PI with P.M. Kazyak and R.L. Raesly)
- 2003 National Park Service. - \$61,207. Inventory and monitoring protocols for water resources of National Capital Region Parks. (R.L. Raesly Co-PI).
- 2005 National Park Service. - \$69,000. Discovery of remnant populations of the endangered dwarf wedgemussel using GIS habitat analysis.
- 2005 Maryland Department of Natural Resources. - \$137,908. MBSS 2005: Maryland Biological Stream Survey (Co-PI with R.P. Morgan, II)

- 2005 Maryland Department of Natural Resources . - \$137,908. Round three Maryland Biological Stream Survey (Co-PI with R.P. Morgan, II)
- 2005 Maryland Department of Natural Resources. - \$20,000. Otter Point Creek submerged aquatic vegetation grid study (Co-PI with K.A.M. Engelhardt).
- 2005 Maryland Department of Natural Resources. - \$7,750. Mercury concentrations in water, invertebrates, forage fish, and brook trout populations in Maryland's upper Savage River watershed (upstream of the Savage River dam) (Co-PI with M.S Castro).
- 2005 EPA STAR. - \$295,079. Quantifying ecological thresholds and resilience in stream ecosystems.
- 2006 National Park Service. -\$18,271. Biological monitoring for water resources of National Capital Region Parks.
- 2006 Maryland Department of Natural Resources. -\$59,938. MBSS 2006: Maryland Biological Stream Survey. (Co-PI with R.P. Morgan, II).
- 2007 Maryland Department of Natural Resources. -\$44,999. Estimating space requirements and extinction risk for Maryland brook trout.
- 2007 Maryland Department of Natural Resources. -\$2,959. Influence of stream accessibility on brook trout population characteristics.
- 2007 Maryland Department of Natural Resources. -\$35,000. Re-inventory of targeted brook trout (GCN species) populations in western Maryland. (Co-PI with R.P. Morgan, II).
- 2007 Maryland Department of Natural Resources. -\$9,553. Field sampling of resilient streams.
- 2007 National Park Service. -\$39,762. Integrative scorecards for using NPS monitoring data to report park status and trends. (Co-PI with T.A. Lookingbill).
- 2007 NOAA Sea Grant. -\$155,315. Investigation of stream restoration as a means of reducing nitrogen pollution from rapidly urbanizing coastal watersheds of the Chesapeake Bay. (Co-PI with S.S. Kaushal et al.).
- 2007 Maryland Department of Natural Resources. -\$159,776. MBSS 2008: Maryland Biological Stream Survey. (Co-PI with R.P. Morgan, II).
- 2008 National Park Service. -\$39,964. Integrative report cards for reporting park status and trends. (Co-PI with T.A. Lookingbill).
- 2008 Maryland Department of Natural Resources. -\$18,999. Translating aquatic research into conservation applications for the State of Maryland.
- 2008 Maryland Department of Natural Resources. -\$30,233. Tier 2 sampling support.

- 2008 Maryland Department of Natural Resources. -\$6,033. Assessing effectiveness of the Savage River brook trout regulations.
- 2009 Maryland Department of Natural Resources. -\$159,796. MBSS 2009: Maryland Biological Stream Survey.
- 2009 Maryland Department of Transportation, State Highway Administration. - \$227,891. Chemical and Biological Assessment of Lake Louise (2009-2018).
- 2009 Maryland Department of Natural Resources. -\$35,000. Analysis of non-tidal stream temperature regimes.

- 2009 Maryland Department of Transportation, State Highway Administration. - \$76,665. Stream restoration assessment for SHA: 2009 (Co-PI with R.P. Morgan, II).
- 2009 Maryland Department of Natural Resources. -\$45,000. Brook trout life history, movement, and habitat preference in relationship to water temperature flow, movement, location, and population density (\$75K match by MD DNR for equipment).
- 2010 Maryland Department of Natural Resources. -\$159,794. MBSS 2010: Maryland Biological Stream Survey.
- 2011 Maryland Department of Natural Resources. -\$154,735. MBSS 2011: Maryland Biological Stream Survey.
- 2012 Maryland Department of Natural Resources. -\$160,065. MBSS 2012: Maryland Biological Stream Survey.
- 2012 Maryland Department of Natural Resources. -\$9,704. Assessing effectiveness of the Savage River brook trout regulations. 2012-2014.
- 2013 Maryland Department of Natural Resources - \$149,981. MBSS 2013: Maryland Biological Stream Survey. 2013..
- 2014 Mid-Atlantic Panel on Aquatic Invasive Species (NOAA/USFWS) - \$14,939..Environmental DNA monitoring of the invasive freshwater diatom, *Didymosphenia geminata* in Mid-Atlantic waters. 2014-2015 (with S.R. Keller).
- 2014 MD Sea Grant, NOAA. \$146,560. From genes to ecosystems: Integrating measures of aquatic biodiversity and ecosystem health within urbanizing Bay watersheds. 2014-2015 (with S.R. Keller & A. Santoro).
- 2014 Maryland Department of Natural Resources - \$150,002. MBSS 2014: Maryland Biological Stream Survey. 2014.
- 2015 Chesapeake Bay Trust - \$292,602. Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland.
- 2015 Maryland Department of Natural Resources - \$168,393. MBSS 2015: The Maryland Biological Stream Survey.
- 2015 Frederick County Government - \$11,996. Ecological Monitoring at Little Tuscarora Creek.
- 2015 Maryland Department of Natural Resources - \$5,630. Analysis of the Savage River brook trout monitoring: 2015
- 2016 Maryland Department of Natural Resources - \$14,999. Analysis and design support for MANTA program monitoring 2016.
- 2016 Maryland Department of Natural Resources - \$7,506. Analysis of the Savage River brook trout monitoring: 2016
- 2016 Maryland State Highway Administration - \$66,512. SHA stream restoration assessment projects: FY 2017.

Presentations at Conferences and Workshops:

Hilderbrand, R. H. and R. P. Morgan II. 1995. Environmental disturbance and within basin population dynamics of brook trout under different land use conditions. East

- Coast Trout Management and Culture Workshop II. Penn State University, Pennsylvania.
- Hilderbrand, R. H., A. D. Lemly, and C. A. Dolloff. 1995. Stream channel responses to experimental additions of large woody debris in two Appalachian Mountain streams. East Coast Trout Management and Culture Workshop II. Penn State University, Pennsylvania.
- Hilderbrand, R. H., A. D. Lemly, and C. A. Dolloff. 1995. Stream channel responses to experimental additions of large woody debris in two Appalachian Mountain streams. Western Division, American Fisheries Society, Park City, Utah.
- Hilderbrand, R. H., and J. L. Kershner. 1996. Timing and scale of Bonneville cutthroat trout movements in Beaver Creek, Utah. Western Division, American Fisheries Society, Eugene, Oregon.
- Hilderbrand, R. H., and J. L. Kershner. 1996. Timing and scale of Bonneville cutthroat trout movements in Beaver Creek, Utah. Annual Meeting, American Fisheries Society, Dearborn, Michigan.
- Hilderbrand, R. H., and J. L. Kershner. 1997. Movements and growth of stream resident cutthroat and brook trout in Beaver Creek, Idaho. Wild Trout VI, Bozeman, Montana.
- Hilderbrand, R. H., and J. L. Kershner. 1997. Movements and growth of stream resident cutthroat and brook trout in Beaver Creek, Idaho. Annual Meeting, American Fisheries Society, Monterey, California.
- Hilderbrand, R. H., and J. L. Kershner. 1998. Interactions between non-native brook trout and Bonneville cutthroat trout: evidence for competition? Annual Meeting, Ecological Society of America, Baltimore, Maryland.
- Hilderbrand, R. H., and J. L. Kershner. 1998. Critical needs for cutthroat trout recovery and persistence. Plenary Session, American Fisheries Society Meeting of the Bonneville and Wyoming/Colorado Chapters, Grand Junction, Colorado.
- Hilderbrand, R. H., and J. L. Kershner. 1999. Evaluating spatial requirements for conserving interior populations of cutthroat trout. Annual Meeting of the Society of Conservation Biology, College Park, Maryland.
- Discussion Panelist. 2000. How to become an effective conservation biologist. Annual Meeting of the Society for Conservation Biology, Missoula, Montana.
- Hilderbrand, R. H. 2000. Design of freshwater conservation areas. Invited presentation, The Nature Conservancy, International Science and Stewardship Conference, Orlando, Florida.
- Hilderbrand, R.H. 2001. How much stream is enough: maintaining conservation potential in the Intermountain West. Invited talk for workshop entitled *How to make advances in conservation ecology hit the ground*. Annual meeting Ecological Society of America, Madison, Wisconsin.
- Hilderbrand, R. H., J. L. Kershner, and W. C. Colyer. 2003. Maintaining and restoring conservation potential for interior cutthroat trout: paradigms and possibilities. Symposium, Annual meeting of the Society for Conservation Biology, Duluth, Minnesota.
- Whalen, J. K., M. Hudy, and R. H. Hilderbrand. 2003. Analysis of human population over time (1790-2000) for watersheds in the Eastern U.S. Joint meeting of the

- Virginia and Virginia Tech Chapters of the American Fisheries Society, Blacksburg, Virginia.
- Hilderbrand, R. H., and J. L. Kershner. 2004. Reserve design issues for protecting cutthroat trout and aquatic biodiversity in the Bonneville Basin. Symposium, Annual meeting of the Society for Conservation Biology, New York.
- Hilderbrand, R. H. 2005. Myths and realities: wood in Maryland streams. Maryland streams symposium, Westminster, Maryland.
- Castro, M.S., R. H. Hilderbrand, J. E. Thompson, A. Heft, and S. E. Rivers. 2006. Relationship between wetlands and mercury in brook trout. International Mercury Conference. Madison, WI.
- Schuett, E., and R. H. Hilderbrand. 2006. Confluence effects on benthic macroinvertebrate communities. Annual meeting of the Ecological Society of America. Memphis, TN.
- Hilderbrand, R. H., R. M. Utz, and R. L. Raesly. 2006. Identifying stressor thresholds and alternate states in stream ecosystems of Maryland. Annual meeting of the Ecological Society of America. Memphis, TN.
- Campbell, C.A., W.L. Lellis, R.H. Hilderbrand, and J.E. McKenna, Jr. 2007. Predicting freshwater mussel occurrence in the Delaware River. National Gap Analysis Program Conference, Asheville, NC.
- Cushman, S. F., R. P. Morgan, II, and R. H. Hilderbrand. 2007. Habitat selection by stream cyprinids across the urban-rural gradient: implications for stream restoration. Annual Meeting of the Ecological Society of America, San Jose, CA.
- Dolloff, C.A., C. Roghair, C. Kryger, R.H. Hilderbrand, and A.D. Lemly. 2007. Large wood additions to small Appalachian streams: 1993-2007. Annual meeting of the American Fisheries Society, San Francisco, CA.
- Heft, A.A., R.H. Hilderbrand, R.P. Morgan, II, K. Knotts, and A. Klotz. 2007. Implementation of a catch and release brook trout regulation on a watershed scale. Wild Trout IX, West Yellowstone, MT.
- Hilderbrand, R.H. To be presented November, 2007. The myths of restoration. Mid-Atlantic stream restoration conference, Cumberland, MD
- Hilderbrand, R.H., A. Heft, and R.P. Morgan, II. 2007. Spatially explicit risk assessments of Maryland's brook trout. Annual meeting of the American Fisheries Society, San Francisco, CA.
- Hilderbrand, R.H., R.L. Raesly, E.N. Powers, and R.M. Utz. 2007. Quantifying ecological thresholds and resilience in stream ecosystems. Ecological thresholds in aquatic ecosystems: the role of climate change, anthropogenic disturbance, and invasive species progress review, Washington, DC.
- Powers, E.N., and R.H. Hilderbrand. 2007. Identification of reference fish communities and their stressors in Maryland streams: methods and uses. Annual meeting of the American Fisheries Society, San Francisco, CA.
- Utz, R.M., and R.H. Hilderbrand. 2007. Taxon-specific responses of fish and macroinvertebrates to urbanization in eastern Maryland. Annual meeting of the American Fisheries Society, San Francisco, CA.
- Hilderbrand, R.H., A. Heft, and R. Morgan. 2008. Spatially explicit risk assessments of Maryland's brook trout populations. Annual meeting of the American Fisheries Society, Southern Division. Wheeling, WV.

- Lookingbill, T., J. Julian, A. Elmore, S. Kaushal, K. Eshleman, W. Boynton, R. Hilderbrand, and R. Gardner. 2008. Ecosystem consequences of landscape change in the Potomac River watershed. Annual meeting of the American Association of Geographers, Boston, MA.
- Powers, E., R. Hilderbrand. 2008. Resilience of fish assemblages: importance of habitat-specific assessments. Annual meeting of the American Fisheries Society, Southern Division. Wheeling, WV.
- Powers, E.N., and R.H. Hilderbrand. 2008. Resilience of fish assemblages to thermally-altered habitats. Annual meeting of the Society for Conservation Biology, Chattanooga, TN.
- Utz, R., and R. Hilderbrand. 2008. Variation in ecosystem sensitivity to urbanization between physiographic ecoregions in the southeastern, United States. Annual meeting of the American Fisheries Society, Southern Division. Wheeling, WV.
- Utz, R.M., and R.H. Hilderbrand. 2008. Variation in ecosystem sensitivity to urbanization between physiographic ecoregions in the southeastern United States. Annual meeting of the Society for Conservation Biology, Chattanooga, TN.
- Campbell, C.A., R.H. Hilderbrand, and W.A. Lellis. 2009. Mussel and mussel-fish associations in Maryland. International symposium of the freshwater mollusk conservation society. Baltimore, MD.
- Campbell, C.A., R.H. Hilderbrand, and W.A. Lellis. 2009. Using landscape analysis to conserve the endangered dwarf wedgemussel. Annual Meeting of the US-International Association for Landscape Ecology. Salt Lake City, UT.
- Utz, R.M., K.N. Eshelman and R.H. Hilderbrand. 2009. Variation in hydrological, chemical and thermal responses to urbanization between two physiographic regions of the Mid-Atlantic United States. American Fisheries Society annual meeting, Nashville, TN.
- Utz, R.M., K.N. Eshelman and R.H. Hilderbrand. 2009. Variation in hydrological, chemical and thermal responses to urbanization between two physiographic regions of the Mid-Atlantic United States. Gordon Research Conference series- Catchment Science: Interactions of Hydrology, Biology, & Geochemistry, Andover, NH.
- Campbell, C.A., and R.H. Hilderbrand. 2011. Using predictive models to find the dwarf wedgemussel. Maryland Streams Symposium. Westminster, MD.
- Hilderbrand, R.H., R.M. Utz, S.A. Stranko, and R.L. Raesly. 2011. Urbanization and the future of aquatic biodiversity in Maryland. Maryland Streams Symposium. Westminster, MD.
- Hilderbrand, R.H., A.A. Heft, and A. Klotz. 2011. Brook trout population responses to restrictive fishing regulations in the Savage River watershed. Maryland Streams Symposium. Westminster, MD.
- Hilderbrand, R.H. 2011. Thermal regimes of Maryland's non-tidal streams. Maryland Streams Symposium. Westminster, MD.
- Kazyak, D. and R.H. Hilderbrand. 2011. Life history of brook trout in western Maryland. Maryland Streams Symposium. Westminster, MD.
- Stranko, S.A., R.H. Hilderbrand, R.P. Morgan, II, M. Staley, A. Becker, E.S. Perry, P.T. Jacobson, and A. Rosberry-Lincoln. 2011. Brook trout declines with land cover and temperature changes in Maryland. Maryland Streams Symposium. Westminster, MD.

- Stranko, S.A. and R.H. Hilderbrand. 2011. Comparing the fish and benthic macroinvertebrate diversity of restored urban streams to reference streams. Maryland Streams Symposium. Westminster, MD.
- Hilderbrand, R.H., A. Heft, and A. Klotz. 2012. Brook trout populations responses to the Savage River regulations. East Coast Trout Management and Culture Workshop V. Frostburg, MD.
- Kazyak, D.C., and R.H. Hilderbrand. 2012. Life-history studies to inform brook trout management in the Savage River watershed, MD. East Coast Trout Management and Culture Workshop V. Frostburg, MD.
- Kazyak, D.C., A.E. Holloway, and R.H. Hilderbrand. 2012. Sexual dimorphism in brook trout: can it be used to effectively distinguish the sexes? East Coast Trout Management and Culture Workshop V. Frostburg, MD.
- Holloway, A.E., D.C. Kazyak, and R.H. Hilderbrand. 2012. Nonlethal sex determination in brook trout (*Salvelinus fontinalis*). Annual Meeting of the American Fisheries Society. Minneapolis, MN.
- Kazyak, D.C., and R.H. Hilderbrand. 2012. Life-history studies to inform brook trout management in the Savage River watershed, MD. Annual Meeting of the American Fisheries Society. Minneapolis, MN.
- Hilderbrand, R.H., D.C. Kazyak, M. Sell, A. Klotz, and A. Heft. 2013. Advantages and disadvantages of plasticity in Maryland brook trout. Maryland Water Monitoring Council Annual Meeting. Linthicum, MD.
- Kazyak, D.C., and R.H. Hilderbrand. 2013. Growth variation in a Mid-Atlantic brook trout population. Annual meeting of the Tidewater Chapter of the American Fisheries Society. Solomons, MD.
- Kazyak, D.C., and R.H. Hilderbrand. 2013. Growth variation in a Mid-Atlantic brook trout population. 26th International Congress for Conservation Biology. Baltimore, MD.
- Santoro, A., S. Keller, S. Laperriere, R. Trott, J. Cessna, and R. Hilderbrand. 2014. Stream microbes and molecular barcoding: A new frontier for biomonitoring? Maryland Water Monitoring Council Annual Meeting, Linthicum, MD.
- Hilderbrand, R.H. 2014. Recent trends in chloride and conductivity in core-trend streams. Maryland Water Monitoring Council Annual Meeting, Linthicum, MD.
- Santoro, A., S. Laperriere, S. Keller, R. Trott, J. Cessna, and R. Hilderbrand. 2015. Microbial diversity as an index of biological water quality in Maryland headwater streams. Maryland Water Monitoring Council Annual Meeting, Linthicum, MD.
- Hilderbrand, R.H., S. Laperriere, R. Trott, J. Cessna, S. Keller, and A. Santoro. 2015. Citizen science and stream microbial community research. Maryland Water Monitoring Council Annual Meeting, Linthicum, MD.

Invited seminars and lectures:

- Hilderbrand, R. H. 1997. Paradigms born and lost: Is there restricted movement evidence in fish communities. What is the implication for managing small populations? Advanced Concepts in Aquatic Ecosystems short course. USDA Forest Service - Regions 2, 3, 4. Logan UT.

- Hilderbrand, R. H. 1998. Considerations in developing core areas and population reserves for inland salmonids. Advanced Concepts in Aquatic Ecosystems short course. USDA Forest Service - Regions 2, 3, 4. Logan UT.
- Hilderbrand, R. H. 1998. Overview of cutthroat trout research in Utah. Technical session, USDA Forest Service, Region 2 meeting of Biologists and Hydrologists.
- Hilderbrand, R. H. 1999. Considerations in developing conservation strategies to protect aquatic systems. Advanced Concepts in Aquatic Ecosystems short course. USDA Forest Service - Regions 2, 3, 4. Logan UT.
- Hilderbrand, R. H. 1999. Bonneville cutthroat trout life history/habitat relationships. Cutthroat conservation and restoration workshop. USDA Forest Service - Region 4. Salt Lake City, UT.
- Hilderbrand, R. H. 2001. The new Sisyphus: conservation and restorations of streams. Invited seminar, Maryland Department of Natural Resources headquarters, Annapolis, Maryland.
- Hilderbrand, R. H. 2001. Conservation and restoration of populations and physical habitat in coldwater streams. Appalachian Laboratory seminar series, Frostburg, Maryland.
- Hilderbrand, R. H. 2001. Conservation and restoration of populations and physical habitat in coldwater streams. Invited seminar, Horn Point Laboratory, Cambridge, Maryland.
- Hilderbrand, R. H. 2002. The new Sisyphus: conservation and restoration of stream ecosystems. Invited seminar, Clarion University, Clarion, Pennsylvania.
- Hilderbrand, R. H. 2002. Planning for the future: maintaining persistent stream fish populations. Invited half-day lecture. USDA Forest Service Fish Habitat Short Course. Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- Hilderbrand, R. H. 2002. Assembling the puzzle: Maintaining persistent populations of cutthroat trout. Invited seminar, University of Idaho, Moscow, Idaho.
- Hilderbrand, R. H. 2002. Assembling the puzzle: Maintaining persistent populations of cutthroat trout. Invited seminar, Idaho Fish and Game Headquarters, Boise, Idaho.
- Hilderbrand, R. H. 2002. How much stream is enough: maintaining conservation potential in the Intermountain west. Invited talk, cutthroat trout viability workgroup for western states, Salt Lake City, Utah.
- Hilderbrand, R. H. 2002. The new Sisyphus: conservation and restoration of stream ecosystems. Invited seminar, University of Maryland, College Park, Maryland.
- Hilderbrand, R. H. 2002. How much is enough: Using cutthroat trout as models for decision making. Invited talk, Conservation workgroup for Idaho Fish and Game, Lewiston, Idaho.
- Kershner, J. L., Hilderbrand, R. H., and W. C. Colyer. 2002. Needed: a new paradigm for conservation and management of cutthroat trout populations. Invited talk, Conservation workgroup for Idaho Fish and Game, Lewiston, Idaho.
- Hilderbrand, R. H., and R. H. Gardner. 2003. Population viability analysis for the Delmarva fox squirrel. Delmarva fox squirrel recovery meeting. Annapolis, Maryland.
- Hilderbrand, R. H., R. L. Raesly, and P. F. Kazyak. 2004. Water resources monitoring, assessment, and research in National Capital Region Parks. CESU Federal Managers Meeting, Baltimore, MD.

- Gardner, R. H., and Hilderbrand. 2004. Demographic analysis and estimates of extinction risk for the Delmarva fox squirrel. Delmarva fox squirrel recovery team meeting. Blackwater Wildlife Refuge, Maryland.
- Hilderbrand, R. H. 2004. Using population matrix models for species conservation, management, and recovery. Invited seminar, West Virginia University, Morgantown, West Virginia.
- Hilderbrand, R. H., R. L. Raesly, and P. F. Kazyak. 2004. Water resources monitoring protocols development for National Capital Region Parks. NPS inventory and monitoring protocol development workshop. Patuxent, Maryland.
- Hilderbrand, R. H. 2005. Plenary Address: The futures of Maryland streams. Maryland Streams Symposium, Westminster, Maryland.
- Hilderbrand, R. H. 2006. Attaining population persistence for the endangered Delmarva fox squirrel. Invited Seminar, Conservation Biology Series, Frostburg State University, Frostburg, Maryland.
- Hilderbrand, R. H. 2006. Altered states: streams in Maryland's rapidly changing landscape. Invited seminar, MANTA (Monitoring and Non-Tidal Assessment) seminar series, Maryland Department of Natural Resources, Annapolis Maryland.
- Hilderbrand, R. H. 2006. The myths of restoration. Invited keynote to kick off special symposium on ecosystem restoration, The Nature Conservancy Conservation Science in Practice Conference, Tucson, Arizona.
- Hilderbrand, R.H. 2007. Measuring risk, resilience, and restoration potential at multiple ecosystems scales. Invited seminar, UMCES Chesapeake Biological Laboratory, Solomons, MD.
- Hilderbrand, R.H. 2013. Global change and headwater streams: from land use to thermal regimes. BayCEER colloquium, University of Bayreuth, Germany.
- Hilderbrand, R.H. 2016. Experimental design and restoration monitoring. Invited talk, Stream restoration forum: Science and regulatory connections. Baltimore, MD
- Hilderbrand, R.H. 2016. Stream restorations and fish. Invited talk, Stream restoration forum: Science and regulatory connections. Baltimore, MD
- Hilderbrand, R.H. 2016. Global change and headwater streams: ecological thresholds, resilience, and conservation. iDiv group. Leipzig, Germany

Graduate Students:

Amanda Hern	MS	Finished 2006, Currently a consultant
Amanda Holloway	MS	Finished 2012, Research mentor for Johns Hopkins
David Kazyak	PhD	Finished 2014, postdoc USGS Leetown Science Center
Elissa Schuett	MS	Finished 2007, Toolik Lake LTER - Woods Hole MBL
Gabriel Strain	MS	Finished 2007, PhD program West Virginia University
Ryan Utz	PhD	Finished 2009, Asst Professor, Chatham University
Robin Graber	MS	Finished 2015, Research mentor for UMCP CONS
Jenny Saville	MS	
Joe Acord	MS	

Service and Science Advisory Activities:

To UMCES:

Faculty Development committee (2001)
Faculty forum Discussion leader (2001)
Computer Committee (2001-2004)
Faculty Forum Discussion Leader (2002)
Graduate Education Committee (2004-2006)
Chair, Landscape and Watershed Ecology graduate program track (2004-present)
Faculty Search Committee: Landscape Ecologist (2005)
Faculty Senate (2006-2010)
Faculty Search Committee: Global Change Scientist (2007-2008)
Faculty Search Co-chair: Forest ecologist (2010)
Graduate education committee (2011-present)
Organizer, MEES graduate program colloquium (2011)
UMCES Presidential Fellowship committee (2014-present)
UMCES Graduate Faculty Council (2014-present)
UMCES GFC Data Policies Committee (2014-2015)
UMCES MEES Graduate Program Committee (2016-present)
Faculty Search Chair: Evolutionary Ecologist (2014-2015)
Faculty Search Committee: Chesapeake Biological Laboratory (2016)
Promotion Committee Chair (2016)

To the Profession:

Ad Hoc Referee for: Archives of Hydrobiology, Canadian Journal of Fisheries and Aquatic Sciences, Conservation Biology, Ecological Applications, Ecological Engineering, Environmental Biology of Fishes, Environmental Management, Fisheries, Great Basin Naturalist, Frontiers in Ecology and the Environment, International Review of Hydrobiology, Journal of Fish Biology, Journal of the North American Benthological Society, Northeastern Naturalist, North American Journal of Fisheries Management, Northwest Science, Restoration Ecology, Transactions of the American Fisheries Society, National Science Foundation (DEB), Smith Fellows program (The Nature Conservancy, Society for Conservation Biology), National Geographic Society

Science Advisory Committee, Smith Fellows Program (2001-2003)
Science Advisory Committee, Maryland Northern Snakehead taskforce (2002)
Reviewer to USFWS for recovery plan for Paiute cutthroat trout, 2002.
Reviewer to State of Maryland for Maryland Physical Habitat Index, 2002.
Team member, science capacity review of Central US region and Canada, The Nature Conservancy 2004.
Peer Reviewer of Hoogland (2005) book – Conservation and Management of Prairie Dogs
Reviewer of Puritan tiger beetle PVA model for Maryland Department of Natural Resources 2005.
Advisor to The Nature Conservancy on freshwater priority watersheds

Advisor to US Fish and Wildlife Service on initial conditions requirements for successful Delmarva fox squirrel translocations
Advisor to the National Park Service National Capital Region on water resources monitoring design and implementation
Technical advisor to Maryland Fisheries Task Force (2008).
External Examiner of Doctoral Dissertations: University of Monash, Australia;
University of Cape Town, South Africa
EPA Science Advisory Board – Mountaintop Mining Valley Fill expert panel (2010)

To the community:

Panel member for Maryland Regional Science and Math Camp, 2004
High School Teacher Internship Program, 2005
Highlands Environmental Leadership Program speaker, 2006, 2007
Advisory Board member, Highlands Action Program (HAP), 2006-present
Board of Directors, Savage River Watershed Association, 2014-present