

## James H. Roberts

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### EDUCATION

- 2012      **Ph.D., Fish and Wildlife Conservation**  
Virginia Tech, Department of Fish and Wildlife Conservation  
Dissertation: *Using genetic markers to understand the population ecology of stream fishes*  
Advisors: Dr. Paul Angermeier and Dr. Eric Hallerman
- 2003      **M.S., Fisheries Science**  
Virginia Tech, Department of Fisheries and Wildlife Sciences  
Thesis: *Factors influencing darter dispersal patterns in the upper Roanoke River drainage*  
Advisor: Dr. Paul Angermeier
- 2000      **B.S. cum laude, Fisheries and Aquaculture**  
University of Georgia, Warnell School of Forest Resources  
Thesis: *Reproduction of longnose dace (Rhinichthys cataractae) in Coweeta Creek*  
Advisor: Dr. Gary Grossman

### AWARDS

- 2011      **A.B. Massey Award** for outstanding graduate student in the College of Natural Resources and the Environment, Virginia Tech
- 2011      **Best Student Paper**, Southern Division American Fisheries Society Annual Meeting
- 2010      **Best Student Paper**, Southeastern Fishes Council Annual Meeting
- 2009      **James Wright Travel Award**, Genetics Section of the American Fisheries Society
- 2008      **John Skinner Memorial Award**, Education Section of the American Fisheries Society
- 2008      **Robert Ross Graduate Scholarship**, Virginia Chapter of the American Fisheries Society
- 2004      **A.B. Massey Award** for outstanding graduate student in the College of Natural Resources, Virginia Tech
- 2002      **Burd McGinnes Graduate Fellowship**, Department of Fisheries and Wildlife Sciences, Virginia Tech
- 1996-2000      **Hope Scholarship**, University of Georgia

### TEACHING EXPERIENCE

- 2008-2012      **Instructor:** *Applied Conservation Genetics* (Graduate) Virginia Tech
- 2010      **Instructor:** *Fish Ecology* (Undergraduate) University of Virginia, Mountain Lake Biological Station
- 2011      **Instructor:** *Ichthyology*, Virginia Master Naturalist Program, Roanoke Valley Chapter
- 2006      **Instructor:** *Fish Ecology* (Undergraduate) Virginia Tech
- 2005-2011      **Guest Lecturer:** *Wildlife Field Biology* (Undergraduate) Virginia Tech

- 2004, 2008 **Guest Lecturer:** *Conservation Biology*, Virginia Tech  
 2006-2011 **Guest Lecturer:** *Research Planning Graduate Seminar*, Virginia Tech  
 2008 **Guest Lecturer:** *Vertebrate Dispersal Graduate Seminar*, Virginia Tech  
 2007 **Guest Lecturer:** *Fish Ecology*, Virginia Tech  
 2002 **Teaching Assistant:** *Ichthyology*, Virginia Tech

### **RESEARCH EXPERIENCE**

- 2002-Present **Research Specialist II**, Virginia Tech
- Design and implement field research on stream fishes, habitat, and water quality in rivers of Virginia
  - Hire and supervise field and laboratory technicians
  - Analyze ecological and genetic data
  - Communicate findings in peer-reviewed and popular papers and seminars
  - Prepare technical reports and grant proposals
  - Develop and oversee project budgets
  - Collaborate with various agencies (e.g., Virginia Dept. of Game and Inland Fisheries, Virginia Department of Transportation, U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Army Corps of Engineers) to procure research funding, establish research objectives, and provide management guidance based on findings
- 2000-2002 **Graduate Research Assistant**, Virginia Tech  
 Advised by Dr. Paul Angermeier
- Designed and implemented thesis field research on stream fish movement and laboratory research on efficacy of fish tagging methods
  - Hired and supervised field technicians
  - Analyzed ecological data
  - Communicated findings in peer-reviewed and popular papers and seminars
- 1999-2000 **Biological Technician**, University of Georgia  
 Supervised by Dr. Gary Grossman and Bob Ratajczak
- Assisted supervisors with fish and habitat sampling as part of Coweeta Long-Term Ecological Research project
  - Identified benthic macroinvertebrate samples in laboratory
  - Designed and implemented independent research project on reproductive biology of longnose dace

### **PUBLICATIONS**

#### **Peer-reviewed:**

12. Hitt N.P. and **J.H. Roberts**. 2012. Hierarchical spatial structure of stream fish colonization and extinction. *Oikos* 121:127-137.
11. **Roberts J.H.** 2011. First observation of a natural hybrid between endangered Roanoke Logperch (*Percina rex*) and Chainback Darter (*Percina nevisense*). *Southeastern Fishes Council Proceedings* 53:21-28.
10. Duncan M.B., S.E. DuRant, B.J.K. Ostby, **J.H. Roberts**, and J.D. Willson. 2011. A multi-taxa

biological survey of Passage Creek, Virginia. The Northeastern Naturalist 18:357-369.

9. **Roberts J.H.** and N.P. Hitt. 2010. Longitudinal structure in temperate stream fish communities: testing conceptual models with temporal data. Pages 281-299 in K. Gido and D. Jackson, eds. Community Ecology of North American Stream Fishes: Concepts, Approaches, and Techniques. American Fisheries Society, Bethesda, MD.
8. **Roberts J.H.** and A.E. Rosenberger. 2008. Threatened fishes of the world: *Percina rex* (Jordan and Evermann 1889) (Percidae). Environmental Biology of Fishes 83:439-440.
7. **Roberts J.H.**, A.E. Rosenberger, B. Albanese, and P. L. Angermeier. 2008. Movement patterns of endangered Roanoke logperch (*Percina rex*). Ecology of Freshwater Fish 17:374-381.
6. Dutton D.J.\*, **J.H. Roberts**, P.L. Angermeier, and E.M. Hallerman. 2008. Microsatellite markers for endangered Roanoke logperch (*Percina rex*) and their potential utility for other species. Molecular Ecology Resources 8:831-834. \*undergraduate mentee
5. **Roberts J.H.** and P.L. Angermeier. 2007. Movement responses of stream fishes to introduced corridors of complex cover. Transactions of the American Fisheries Society 136:971-978.
4. **Roberts J.H.** and P.L. Angermeier. 2007. Spatiotemporal variability of stream habitat and movement of three species of fish. Oecologia 151:417-430.
3. **Roberts J.H.** and J.M. Kilpatrick. 2004. An experimental test of selectivity for benthic prey fishes given injected fluorescent marks. Journal of Freshwater Ecology 19:531-538.
2. **Roberts J.H.** and P.L. Angermeier. 2004. A comparison of injectable fluorescent marks in two genera of darters: effects on survival and retention rates. North American Journal of Fisheries Management 24:1017-1024.
1. **Roberts J.H.** and G.D. Grossman. 2001. Reproductive characteristics of female longnose dace in the Coweeta Creek drainage, North Carolina, USA. Ecology of Freshwater Fish 10:184-190.

**Non-peer-reviewed:**

3. Duong Y. and **J.H. Roberts**. 2010. Reflections on student involvement in the Genetics Section, the Parent Society, and beyond. Fisheries 35(4):188-189.
2. **Roberts J.H.** and E.A. Frimpong. 2009. The extensive and complex landscape of fish-related journals (Response to Mather et al. 2008). Fisheries 34:143-144.
1. **Roberts J.H.** 2004. Marvelous, misunderstood minnows. Virginia Wildlife 65:27-28.

**In preparation:**

**Roberts, J.H.**, P.L. Angermeier, and E.M. Hallerman. Isolation by dams, not distance, creates discrete population structure in a riverine fish. For Conservation Genetics.

**Roberts, J.H.**, P.L. Angermeier, and E.M. Hallerman. Extensive dispersal of endangered Roanoke

logperch inferred using genetic marker data. For Transactions of the American Fisheries Society.

**Roberts, J.H.**, P.L. Angermeier, and E.M. Hallerman. Influences of land-use and fragmentation on genetic diversity of stream fishes in the upper Tennessee River basin. For Ecological Applications.

### **SCIENTIFIC PRESENTATIONS**

#### **Invited oral presentations:**

7. **Roberts J.H.**, P.L. Angermeier, B.W. Albanese, and J. Jiao. Linking individual movement to the demographics and evolution of fish populations. American Fisheries Society Annual Meeting, September 2011, Seattle, WA.
6. Angermeier P.L., **J.H. Roberts**, N.P. Hitt, and B.W. Albanese. Roles of individual mobility and habitat use in shaping spatial structure and vulnerability of stream fish populations. American Fisheries Society Annual Meeting, September 2011, Seattle, WA.
5. **Roberts J.H.**, P.L. Angermeier, and E.M. Hallerman. Using spatial ecological and genetic data to inform conservation of endangered Roanoke logperch. Southern Division American Fisheries Society Spring Meeting, January 2011, Tampa, FL. (**Awarded Best Student Paper**)
4. **Roberts J.H.**, E.M. Hallerman, J. Jones, and P.L. Angermeier. Effects of dams, reservoirs, and tailwaters on functional connectivity in the upper Tennessee River basin. American Fisheries Society Annual Meeting, September 2010, Pittsburgh, Pennsylvania.
3. **Roberts J.H.**, D.J. Dutton, J.E. Davis, P.L. Angermeier, and E.M. Hallerman. Balancing risks to the endangered Roanoke logperch. American Fisheries Society Annual Meeting, August 2009, Nashville, Tennessee.
2. **Roberts J.H.**, and N.P. Hitt. Persistence of longitudinal structure in stream fish communities. American Fisheries Society Annual Meeting, August 2008, Ottawa, Ontario.
1. **Roberts J.H.** Spatial perspectives on the population ecology of benthic stream fishes. North American Benthological Society Annual Meeting, June 2007, Columbia, SC.

#### **Contributed oral presentations:**

11. **Roberts J.H.**, J. Jiao, P.L. Angermeier, and B.W. Albanese. A meta-analysis of North American stream-fish movement studies. Annual meeting of the Virginia Chapter of the American Fisheries Society, February 2012, Blacksburg, VA.
10. **Roberts J.H.**, P.L. Angermeier, and E.M. Hallerman. Extensive dispersal of Roanoke logperch inferred from genetic marker data. Southeastern Fishes Council Annual Meeting, November 2010, Athens, GA. (**Awarded Best Student Paper**)
9. **Roberts J.H.**, and N.P. Hitt. Waterfalls, chubs, and the persistence of longitudinal "succession" in stream fish communities. Southern Division AFS Student Colloquium, October 2009, Blacksburg, VA.
8. **Roberts J.H.**, D.J. Dutton, J.E. Davis, P.L. Angermeier, and E.M. Hallerman. Population genetics and conservation of Roanoke logperch (*Percina rex*), an endangered stream fish. Society for

Conservation Biology Annual Meeting, July 2008, Chattanooga, TN.

7. **Roberts J.H.** What is a population of darters? Southeastern Fishes Council Annual Meeting, November 2007, Chattanooga, TN.
6. **Roberts J.H.**, D.J. Dutton, P.L. Angermeier, and E.M. Hallerman. Incorporating population boundaries into Aquatic GAP assessments: is Gerrymandering in order? National GAP Analysis Conference, 2007, Asheville, NC.
5. **Roberts J.H.**, D.J. Dutton, P.L. Angermeier, and E.M. Hallerman. Using microsatellites to characterize the population structure of redline and greenside darters in the upper Tennessee River basin. Southern Division American Fisheries Society Spring Meeting, February 2007, Memphis, TN.
4. **Roberts J.H.** and P.L. Angermeier. Assumptions, evolution, and application of conceptual models of Roanoke logperch population dynamics. Southern Division American Fisheries Society Spring Meeting, February 2005, Virginia Beach, VA.
3. **Roberts J.H.** and P.L. Angermeier. A comparison of injectable fluorescent marks in two genera of darters: effects on mortality and retention rates. Southern Division American Fisheries Society Midyear Meeting, February 2003, Little Rock, AR.
2. **Roberts J.H.**, T.J. Newcomb, and M.J. Pinder. Assessment of biological integrity in an agriculturally impacted Virginia mountain stream. Virginia Academy of Sciences Annual Meeting, 2002, Virginia Beach, VA.
1. **Roberts J.H.** and P.L. Angermeier. Influences of instream features on the dispersal patterns of darters. Southern Division American Fisheries Society Midyear Meeting, February 2002, Jacksonville, FL.

**Contributed poster:**

Duncan M. and **J.H. Roberts.** A summary of the American Fisheries Society's restoration and monitoring efforts on Stroubles Creek. Dean's Forum on the Environment, 2007, Blacksburg, VA.

**PRESENTATIONS TO NON-SCIENTIFIC GROUPS**

6. **Roberts, J.H.** The rainforest in your backyard: biology and conservation of fish in the Roanoke River. Monthly meeting of the Roanoke Valley Chapter of Trout Unlimited, Roanoke, VA, May 2012.
5. **Roberts, J.H.** The rainforest in your backyard: biology and conservation of fish in the Roanoke River. Monthly meeting of the Roanoke Valley Chapter of the Sierra Club, Roanoke, VA, January 2012.
4. **Roberts, J.H.** The natives are restless: perceptions, misconceptions, and a way forward in the management of introduced aquatic species. Tennessee Aquarium staff, Chattanooga, TN, December 2011.
3. **Roberts, J.H.** Diversity and conservation of Roanoke River fishes. Keynote Address at Roanoke Valley Fall Waterways Cleanup Celebration, Roanoke, VA, October 2011.

2. **Roberts, J.H.** The king and his court: an overview of the ecology of *Percina rex* (and other Roanoke River natives). North American Native Fish Association Annual Meeting, Roanoke, VA, May 2011.
1. **Roberts, J.H.** Fish tales from the upper Roanoke River. Monthly meeting of the Upper Roanoke River Roundtable, Roanoke, VA, February 2005.

### EXTRAMURAL RESEARCH GRANTS

#### **Funded proposals**

- \$608,675 **Roberts J.H.** and P.L. Angermeier. (2005-2012) Assessing impacts of the Roanoke River Flood Reduction Project on the endangered Roanoke logperch. U.S. Army Corps of Engineers, Wilmington, NC.
- \$10,000 **Roberts J.H.** and P.L. Angermeier. (2011-2012) Assessment of the distribution and abundance of Roanoke logperch in tributaries of the Dan River. Virginia Department of Game and Inland Fisheries, Richmond, VA.
- \$28,987 P.L. Angermeier and **J.H. Roberts** (2006-2010) Monitoring and population genetics of endangered Roanoke logperch in the Smith River, Virginia. U.S. Army Corps of Engineers, Wilmington, NC.
- \$4,758 **Roberts J.H.**, P.L. Angermeier, and E.M. Hallerman. (2010) Survey of mitochondrial DNA variation in endangered Roanoke logperch (*Percina rex*). Virginia Department of Game and Inland Fisheries, Richmond, VA.
- \$3,603 **Roberts J.H.** and P.L. Angermeier. (2008) Habitat and fish surveys for Roanoke logperch (*Percina rex*) and orangefin madtom (*Noturus gilberti*) in North Fork Little Chestnut Creek, Franklin County, Virginia. Joyce Engineering Inc., Greensboro, NC.
- \$10,500 **Roberts J.H.**, P.L. Angermeier, and E.M. Hallerman. (2007-2008) Continuing assessment of the population genetics of Roanoke logperch (*Percina rex*). U.S. Fish and Wildlife Service, Gloucester, VA.
- \$2,060 Duncan M.B., **J.H. Roberts**, and D. Weaver. (2007) A survey of the fish fauna of Passage Creek. The Potomac Conservancy, Silver Spring, MD.
- \$4,057 **Roberts J.H.** and P.L. Angermeier. (2007) Surveys for habitat suitable for endangered Roanoke logperch in streams crossed by proposed Transco gas pipeline extensions in Pittsylvania and Campbell counties, Virginia. ENSR, Houston, TX.
- \$32,000 **Roberts J.H.**, P.L. Angermeier, and E.M. Hallerman. (2006-2007) Development of microsatellite markers for study of Roanoke logperch (*Percina rex*) population genetic structure and viability. Virginia Department of Game and Inland Fisheries, Richmond, VA.
- \$48,522 **Roberts J.H.**, P.L. Angermeier, and E.M. Hallerman. (2005-2006) Population genetics of fishes as a tool to assess the conservation value of watersheds in the upper Tennessee River basin. U.S. Geological Survey, Reston, VA. (Sub-proposal within a larger Aquatic GAP contract awarded to J.L. Waldon and P.L. Angermeier).

### **Pending proposals**

\$86,505 **Roberts, J.H.**, E.M. Hallerman, and P.L. Angermeier. (2013-2014) Assessment of the distribution and degree of introgression of Roanoke bass (*Ambloplites cavifrons*) in Virginia. Virginia Department of Game and Inland Fisheries, Richmond, VA.

\$12,410 **Roberts, J.H.** and P.L. Angermeier. (2012) Surveys for Roanoke logperch (*Percina rex*) in Tinker Creek, Botetourt County, Virginia

\$264,430 **Roberts J.H.**, P.L. Angermeier, and G.B. Anderson. (2013-2015) Assessing impacts of the Roanoke River Flood Reduction Project on the endangered Roanoke logperch. U.S. Army Corps of Engineers, Wilmington, NC.

### **PROFESSIONAL INVOLVEMENT**

#### **Leadership Positions**

- 2010 **Vice President**, Virginia Tech Chapter of the American Fisheries Society
- 2006 **President**, Fisheries and Wildlife Graduate Student Association, Virginia Tech
- 2005 **President**, Virginia Tech Chapter of the American Fisheries Society
- 2004 **Chair**, Stream Concerns Committee, Virginia Tech Chapter of the American Fisheries Society
- 2003 **Communications and Outreach Officer**, Nongame Aquatics Committee, Southern Division American Fisheries Society
- 2003 **Chair**, Natural History and Biodiversity Section, Virginia Academy of Science
- 2002 **Vice President**, Virginia Tech Chapter of the American Fisheries Society
- 2001 **Chair**, Stroubles Creek Restoration Committee, VT Chapter of the American Fisheries Society
- 2000 **Treasurer**, University of Georgia American Fisheries Society Student Subunit

#### **Memberships**

- 1999-Present American Fisheries Society
- 2001-Present Southeastern Fishes Council
- 2003-Present Society for Conservation Biology
- 2008-Present Genetics Section, American Fisheries Society
- 2008-Present Education Section, American Fisheries Society

#### **Other professional service**

- 2010 Member of the search committee for Assistant Professor of Fisheries Ecology in the Department of Fisheries and Wildlife Sciences at Virginia Tech
- 2006-2007 Graduate representative to faculty meetings in the Department of Fisheries and Wildlife Sciences at Virginia Tech
- 2002-2011 Peer reviewer for the journals Canadian Journal of Fisheries and Aquatic Sciences, Conservation Biology, Ecography, Ecology of Freshwater Fish, Global Ecology and Biogeography, Hydrobiologia, Journal of the American Water Resources Association, Journal of Fish and Wildlife Management, Landscape Ecology, North American Journal of Fisheries Management, The Southeastern Naturalist, and Transactions of the American Fisheries Society

### **STUDENT MENTORING**

- 2010 Co-mentored Brian Fulton, a high-school student, through the Upward Bound Internship at

Virginia Tech. Upward Bound is designed to engage students from low-income regions with careers involving a four-year college degree. Brian assisted me with field sampling, data entry and management, and a laboratory study on fish reproduction. He plans to attend Virginia Tech in fall 2012.

- 2007 Co-mentored Jason Emmel, a Virginia Tech undergraduate, through the American Fisheries Society Hutton Scholarship program. The Hutton program is designed to increase involvement of underrepresented groups in the fisheries field. Jason assisted me with field sampling and data entry and management. He plans to attend graduate school to study fisheries and aquatic sciences in fall 2012.
- 2006-2007 Mentored Dan Dutton, a Virginia Tech undergraduate, on an independent research project to develop and evaluate new genetic markers for Roanoke logperch, an endangered fish. This led to a scientific publication authored by Dan. He has since completed a graduate degree in biology and now teaches Environmental Science at the Virginia Governor's School.

### **OUTREACH ACTIVITIES**

- 2011-2012 Taught fish education activities for Junior Master Naturalist Clubs at Montgomery County elementary schools
- 2000-2010 Led numerous K-12 field and in-class aquatic education activities through the Outreach Committee of the Virginia Tech AFS chapter
- 2005-2011 Led annual fish and invertebrate collection field trips for Virginia Tech's undergraduate Wildlife Field Biology class
- 2010 Co-organized "Fishes of the New River" educational booth at the Giles County Riverfest
- 2004 Wrote article about minnow diversity ("Marvelous, misunderstood minnows") for Virginia Wildlife magazine
- 2003 Developed outreach website for the Southern Division AFS Nongame Aquatics Committee
- 2003 Created a fish diversity activity for K-12 instructors that is available online
- 1999 Certified in Project Learning Tree, Project Wild, and Project Aquatic Wild (K-12 environmental outreach programs)

### **MEDIA COVERAGE**

- 2011 Good signs for the endangered Roanoke logperch: Paul Angermeier and I are interviewed by WDBJ7 News of Roanoke/Lynchburg in a video news report about long-term monitoring of Roanoke logperch as part of the Roanoke River Flood Reduction Project. Available online at [www.wdbj7.com](http://www.wdbj7.com).
- 2011 Staying around the mound is sound: Freshwater Research News features recent research by Than Hitt and me regarding the role of *Nocomis* chub nests in facilitating the persistence of nest-associating minnow species. Available online at [freshwaterresearch.wordpress.com](http://freshwaterresearch.wordpress.com).
- 2010 Conservancy calls on student researchers to help preserve the integrity of the Potomac's Passage Creek watershed: Virginia Tech Research Magazine profiles our biodiversity surveys for the Potomac Conservancy in Passage Creek, a high-quality tributary of the Shenandoah River. Available online at [www.research.vt.edu/resmag/2010summer/passagecreek.html](http://www.research.vt.edu/resmag/2010summer/passagecreek.html).

### **OTHER SKILLS, ABILITIES, AND CERTIFICATIONS**

- Familiarity with R, SAS, ArcGIS, MARK, Microsoft Office suite, and a number of specialized statistical and genetics software packages
- Experience using various statistical techniques, including linear and nonlinear regression, information-theoretic model selection, Bayesian inference, nonparametric, multivariate, selectivity and diversity indices, spatial statistics, and resampling methods

- Experience using various techniques in aquatic field biology, including fish, mussel, and macroinvertebrate sampling in streams and lakes, habitat delineation, water quality sampling, snorkeling, and fish telemetry
- Experience with DNA extraction and quantification, PCR, and gel electrophoresis
- SCUBA-PADI certified open water diver
- Red Cross CPR, First-Aid, AED, and Blood-Borne Pathogen certified
- Authorized by U.S. Fish and Wildlife Service as surveyor for Roanoke logperch, Spotfin chub, and Tennessee dace