

Curriculum Vitae

## Clifton Keith Ray

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### Education:

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|--|---|
| Auburn University<br>Auburn, AL 36849  | 08/09- present<br>Ph.D. (Biology- Ichthyology)  |
| Auburn University<br>Auburn, AL 36849  | 08/06- 12/10<br>M.S. (Biology-Ichthyology)<br>Thesis Title: Redescription and Morphometric Analysis of <i>Isorineloricaria</i><br>(Siluriformes: Loricariidae)- advised by Dr. Jonathan W. Armbruster |
| Reinhardt College<br>Waleska, GA 30183 | 08/02- 05/06<br>B.S. (Biology)  |

### Current Research:

Taxonomy, Systematics, and Biogeography of *Rhinichthys* (Cypriniformes: Leuciscinae)- PhD Dissertation

Biogeography and Timing of Wide Ranging North American Cyprinids- PhD Dissertation

Ecology and Evolution within Cypriniformes

Revision of transandean species of *Ancistrus* (Siluriformes: Loricariidae)

Redescription and Morphometric Analysis of *Isorineloricaria* (Siluriformes: Loricariidae)- M.S. Thesis

Fishes of the Upper Congo River Basin

Phylogeography of Two Minnow Species (Actinopterygii: Cyprinidae) *Luxilus zonistius* and *Notropis lutipinnis*, in North Georgia

Hybridization between *Percina kathae* and *Percina palmaris* (Percidae) in the Etowah River

Fish monitoring of the Upper Coosa River Basin

### **Teaching Experience and Associated Responsibilities:**

Graduate Teaching Assistant 01/10- 04/10, 05/10- 08/10, 01/11- 8/11  
Auburn University, Auburn, AL  
Teach Comparative Anatomy Labs. Teach dissection methods, terminology, and other advanced anatomy techniques using various vertebrate species as representative examples of major vertebrate lineages.

Graduate Teaching Assistant 08/09- 12/09  
Auburn University, Auburn, AL  
Teach Anatomy and Physiology labs. Teach dissection methods, terminology, and other general anatomy techniques.

Graduate Teaching Assistant 05/09- 08/09  
Auburn University, Auburn, AL  
Teach general ecology labs. Introduce students to field techniques and analysis of data. Lead field trips to local field sites.

Graduate Teaching Assistant 01/09-05/09  
Auburn University Montgomery, Auburn, AL  
Teach organismal biology labs and lab preparation as part of a seamless integration program through Auburn University.

Graduate Teaching Assistant 08/06-05/07, 08/08-12/08, 08/11-12/11  
Auburn University, Auburn, AL  
Teach non-majors general biology labs, lab preparation, and tutoring.

Graduate Teaching Assistant 01/08- 05/08, 01/09-05/09  
Auburn University, Auburn, AL  
Teach organismal biology labs for biology majors, lab preparation, and tutoring.

### **Research Experience and Associated Responsibilities:**

Research Consultant 08/11- 10/11  
Environmental Resource Management (ERM)  
Conduct literature surveys pertaining to sediment and turbidity tolerances of headwater stream fishes in eastern North America as they relate to mining operations in Suriname, South America.

Researcher- Volunteer 05/11- present  
Auburn University, Auburn, AL  
Researcher for the Eco – Geo Morphology Survey of Piedmont Streams in Alabama. Perform fish and crayfish surveys. Generate and analyze GIS data as an aid to site selection based on reference conditions.

Graduate Research Assistant 08/10- present  
Auburn University, Auburn, AL  
Part of the All Cypriniformes Species Inventory. Assist in collection of museum specimens. Curate and maintain collection, including wet and skeletal collections. Identify and curate backlog specimens. Maintain beetle colony for skeletal preps. Direct undergraduate research assistants.

Researcher- Volunteer 07/10  
 Mountain Conservation Society, Jasper, GA  
 Lead survey of Long Swamp Creek (Pickens Co., GA) for the Etowah Darter (*Etheostoma etowahae*) and other fish species. Teach volunteers aquatic organism collecting techniques and demonstrate key ideas about stream biodiversity and stream ecology/ health.

Graduate Research Assistant 05/09- 08/09  
 Auburn University, Auburn, AL  
 Assist in collection of museum specimens. Curate and maintain collection, including wet and skeletal collections. Maintain beetle colony for skeletal preps.

Assistant Researcher- Volunteer 10/08  
 Auburn University, Auburn, AL  
 Survey of streams around Wolf Bay, AL for effects of urbanization. Sample fish and benthic invertebrates.

Assistant Researcher- Volunteer 08/08  
 Auburn University, Auburn, AL  
 Survey headwater streams in Cherokee National Forest, Tennessee for an endangered species, the Tennessee Dace, *Phoxinus tennesseensis*.

Graduate Research Assistant- Volunteer 01/08- present  
 Auburn University, Auburn, AL  
 Guide undergraduates in research opportunities in both Dr. Jonathan Armbruster's lab and in the Auburn University Museum. Develop techniques for skeleton preparation of specimens, perform outreach through research initiative with other departments within the university, and provide support to visiting researchers. Perform analysis of GIS and LandSat data and create maps for expedition and field work logistics.

Research Assistant 08/07-08/09  
 Auburn University, Auburn, AL  
 Fish specialist for Alabama Mill Dam Inventory. Collect and identify fish from Alabama streams. Collect mussels, crayfish, and other invertebrates. Prepare specimens for data analysis and museum preservation. Obtain and maintain collection permits, including listed species.

Endangered Species Survey Consultant 07/07-08/07  
 Reinhardt College, Waleska, GA  
 Survey Conasauga River drainage for populations of Blue Shiners (*Cyprinella caerulea*) and Goldline Darters (*Percina aurolineata*) for US Fish and Wildlife Service.

Research Assistant 05/07-08/07  
 Auburn University, Auburn, AL  
 Population survey of the Crystal Darter (*Crystallaria asprella*) in Uphapee Creek, Tallapoosa River, AL. Consultant on Alabama Mill Dam Project, including mussel, crayfish, and fish surveys. Assist in collection, identification, and curation of specimens in the Auburn University Museum Ichthyology Collection.

Endangered Species Survey- Volunteer 02/06  
Mountain Conservation Society, Jasper, GA  
Survey Long Swamp Creek (Pickens Co., GA) for the Etowah Darter (*Etheostoma etowahae*) and the Cherokee Darter (*Etheostoma scotti*).

Endangered Species Survey- Volunteer 08/05  
Mountain Conservation Society, Jasper, GA  
Survey Long Swamp Creek (Pickens Co., GA) for the Etowah Darter (*Etheostoma etowahae*).

Undergraduate Assistant 05/05-05/06  
Department of Biology  
Reinhardt College, Waleska, GA  
Collection and curation of zoological specimen for teaching and museum collections. Collection of tissues of fish for research. Perform mitochondrial DNA extractions and purification on tissues samples and analyze gene sequences from samples.

**Committees:**

Graduate Committee Memeber 11/11-present  
Auburn University Natural History Learning Center

**International Field Experience:**

Upper Congo Fishes Project/ ACSI II 08/10  
Upper Congo River, Kisangani, Orientale, Demoratic Republic of the Congo

**Technical Skills and Abilities:**

Proficient with Microsoft Office Suite  
Proficient with Microsoft Windows XP/ Vista/ 7, Mac OS X, and Ubuntu (Linux)  
Understanding of Free Open Source Software (FOSS) tools and sources  
GIS/GPS operations: ESRI ARCGIS Desktop Certified, ERDAS Imagine

**Employment Experience:**

Senior Range Assistant 03/02-06/06  
River Bend Gun Club, Dawsonville, GA  
Oversee safety on shooting ranges. Maintenance of ranges and equipment. Supervise other range assistants. Assistant to Shotgun Manager and General Manager. Coach new and intermediate shooters. Shoot coordinator and referee. Assisted in club and shoot marketing.

Private Tutor 02/04-01/05  
Waleska, GA  
Privately tutored high school mathematics and science.

Range Assistant 07/98-03/02  
River Bend Gun Club, Dawsonville, GA  
Maintain safety on shooting ranges. Grounds maintenance.

### **Related Educational Experience:**

Spanish Language/ Cultural Studies 05/04-06/04  
Study Abroad  
Cadíz, Spain

### **Outreach:**

AU Explore 04/07, 04/08, 04/09, 05/10, 04/11  
Auburn University, Auburn, AL  
Set-up and run hands on activities and exhibits for middle school aged children as outreach for the science departments at Auburn University. Included displays of live animals and research tools used to study fishes.

See Volunteer positions above.

### **Presentations:**

Clifton Keith Ray and Jonathan W. Armbruster. Redescription and Morphometric Analysis of *Isorineloricaria* (Siluriformes: Loricariidae). American Society of Ichthyologists and Herpetologists, Minneapolis, MN. 2011.

Clifton Keith Ray and Jonathan W. Armbruster. *Isorineloricaria*: Redescription and Morphometric Analysis (Siluriformes: Loricariidae). Southeastern Ecology and Evolution Conference, Auburn, AL. 2011.

Clifton Keith Ray, Tyler L. Mosley, and David C. Werneke, Michael M. Gangloff. Where did it go? A look into practical temperature data logger modifications for the real world. Southeastern Fishes Council, Gunthersville, AL. 2009.

Clifton K. Ray, Kerstin L. Edberg, Lauren M. Hewett, and Steven L. Powers. Genetic structure and biogeography of the Bandfin Shiner, *Luxilus zonistius*, and Yellowfin Shiner, *Notropis lutipinnis* (Cyprinidae) in North Georgia. American Society of Ichthyologists and Herpetologists, St. Louis, MO. 2007.

### **Invited Lectures:**

"Careers in science." 9/2010, 3/2011  
Environmental Science Class, Pickens Co. High School  
Jasper, GA

"Graduate school and life as a vertebrate biologist." 7/2010  
Vertebrate Biodiversity Class, Auburn University  
Auburn, AL

### **Grants and Research Awards:**

Ernst Mayer Travel Grant in Animal Systematics 2008  
Harvard University, Museum of Comparative Zoology  
\$1350 Travel Award for studies in taxonomy and systematics.

### **Scholarships and Awards:**

Academic Scholarship, Reinhardt College 2002-2006  
Four year, full tuition, with a 3.0+ GPA

GA Hope Scholarship 2002-2006  
\$1500 per semester, with 3.0+ GPA

Georgia Tuition Equalization Grant 2002-2006  
\$400 per semester, with 3.0+ GPA

Big Canoe Chapel Scholarship 2002-2003  
\$800 scholarship

Partners Scholarship 2002-2003  
\$500 academic scholarship

### **Extracurricular Positions and Awards:**

Student Representative 02/06-05/06  
Student Government Association  
Reinhardt College, Waleska, GA

Beta Beta Beta Biological Honors Society 2004-2006  
Psi Pi Chapter, Reinhardt College, Waleska, GA

- Vice President 2005-2006
- Secretary 2004-2005
- Founding Member of Chapter 2004

Cross Country 2002-2006  
Reinhardt College

- Thelma Rodgers Silver Eagle Award for School Leadership And Spirit 2006
- Team Leadership Award 2006
- Team Captain 2005-2006
- SSAC All Conference Athlete 2003-2006

Service Award, Two-years Excellent Service 2000  
River Bend Gun Club, Dawsonville, GA

### **Professional Societies and Associations:**

American Society of Ichthyologists and Herpetologists 2006-present

Association of Southeastern Biologists 2007- present

Southeastern Fishes Council 2007- present

Georgia Academy of Science 2008-present

Coosawatee Watershed Alliance 2008-present

\* References and writing samples are available upon request.