

Todd D. Crail

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PROFESSIONAL PREPARATION

Ph.D. University of Toledo, Biology (Ecology track); 2007-present
M.S. University of Toledo, Biology (Ecology track); 2007
B.A. Bluffton University, Biology; 1995

GRADUATE ADVISORS

Dr. Jonathan Bossenbroek, Dr. Johan Gottgens

APPOINTMENTS

2010 – present Teaching assistant, University of Toledo
2008 – 2010 National Science Foundation GK-12 Graduate Fellow, University of Toledo
2007 - 2008 Research assistant, Lake Erie Center, University of Toledo
2005 - 2007 Teaching assistant, University of Toledo

AWARDS

2010 – Dr. Robert Brundage Scholarship

TEACHING EXPERIENCE

Lab Teaching Assistant for Environmental Problems (EEES-1140 Univ. of Toledo) Spring 2011.
Lab Teaching Assistant for General Ecology Laboratory (EEES-3060 Univ. of Toledo) Fall 2010.
National Science Foundation GK-12 Fellow – High School Environmental Science, Biology. Scott High School,
Toledo, OH, Aug 2008 – May 2010. Teaching and science mentorship ten hours weekly at an urban high school.
Lab Teaching Assistant for Aquatic Ecology Laboratory (EEES-4740, EEES-5740 Univ. of Toledo) Fall 2007.
Lab Teaching Assistant for Biodiversity Laboratory (EEES-2160 Univ. of Toledo) Fall 2005, Spring & Fall 2006.

MENTORING EXPERIENCE

K. M. Navarre 2010 – present. Mapping the habitat characteristics of a population of yellow fringed orchid
(*Plantanthera ciliaris*) in the Oak Openings Region. Honors Thesis, Univ. of Toledo.
K.A. Zmijewski 2010 – present. The distributional characteristics of glossy buckthorn (*Frangula alnus*) thicket in the
Oak Openings Region.
L.T. Olsen 2009 – present. Niche dimensions of *Etheostoma* darters in the Great Lakes drainages. National Science
Foundation Undergraduate Research Mentorship Program.
K.M. Keeler & M.J. Morandi 2009 – Undergraduate Research Technicians
P. T. Mathias 2009. Distribution of Unionid Mussels in the Ottawa River from University of Toledo Main Campus to the
Stranahan Arboretum. Honors Thesis in the Univ. of Toledo Undergrad Summer Research Program.
E. Heppner 2009 – Undergraduate Research Technician
P.T. Mathias & E. Heppner 2008 – Undergraduate Research Technicians
P.T. Mathias 2007 – Undergraduate Research Technician
B.K. Brown 2006 – Undergraduate Research Technician

PUBLICATIONS

Peer Reviewed:

Crail, T.D. R.A. Krebs & D.T. Zanatta 2011. Unionid mussels from the nearshore zones in Lake Erie. *Journal of Great Lakes Research* xxx (2011) xxx-xxx
Crail, T.D., J.F. Gottgens & A.E. Krause 2011. Fish community response to evolving channel complexity in an agricultural system. *Journal of Soil and Water Conservation* xxx (2011) xxx-xxx.

In Preparation:

Crail, T.D., J.M. Bossenbroek & J.F. Gottgens (*in prep* to *Ecology Letters*). Interspecific induced shifts of habitat usage among a benthic community of fishes.
Crail, T.D., J.M. Bossenbroek & J.F. Gottgens (*in prep* to *Copeia*). Habitat dimensions at multiple scales across the range of the imperiled spotted darter, *Etheostoma maculatum*.
Crail, T.D. & D.L. Moorhead (*in prep* to the *Journal of Great Lakes Research*). The presence of a native unionid mussel fauna in an exotic bivalve substrate.

Crail, T.D. & J.F. Gottgens (*in prep* to the Ohio Journal of Science). Status and distribution of native unionid mussels (Unionidae) in the coastal wetlands of the Winous Point Marsh Conservancy.

Other Publications:

Grabarkiewicz J.D. & **T.D. Crail**, 2008. Three Years of Unionid Surveys in Swan Creek, Lower Maumee River Watershed, Lucas Co., OH. Final Report to the Ohio Division of Wildlife, Toledo Naturalists Association, and Metroparks of the Toledo Area: 41pp.

Grabarkiewicz J.D. & **T.D. Crail**. 2007. A new population of rayed bean (*Villosa fabalis*) in a small tributary of the Maumee River, Lucas County, OH. *Ellipsaria* 11(1):7.

Crail, T.D., J.F. Gottgens & P.T. Mathias. 2007. Status and distribution of native unionid mussels (Unionidae) in the coastal wetlands of the Winous Point Marsh Conservancy. Final Report to the Winous Point Marsh Conservancy: 21 pp.

Crail, T.D. & J.F. Gottgens. 2007. Testing the impact of plant colonization on the fish community in headwaters of the Ottawa River, northwest Ohio. Final report to Ohio Lake Erie Commission: 41 pp.

Crail T.D. 2006. System design for the ultimate native fish aquarium. *American Currents*, Vol. 32, No. 2.

FUNDED PROPOSALS

Conservation of native freshwater mussel refuges in Great Lakes coastal zones. Great Lakes Fish and Wildlife Restoration Act Pre-Proposal FY 2010. Multiple University & Agency Proposal, \$348,181.

- D. Zanatta, Central Michigan U, L. Burlakova, Buffalo State College, A. Karatayev, Buffalo State College, R. Krebs, Cleveland State U, M. Hoggarth, Otterbein College, F. A. de Szalay, Kent State U., J. Bossenbroek, E. Meyer, PA Nat. Heritage Prog., M. Walsh, PA Nat. Heritage Prog., M. Schlesinger, NY Nat. Heritage Prog., R. Haas, MI DNR, **T. Crail, U. of Toledo**, P. Badra, MI Nat. Features Inventory, N. Welte, PA Fish and Boat Comm., L. Holst, NY Dept. of Env. C.

T.D. Crail 2010. A new population of the Indiana logperch, *Percina caprodes manitou* (Percidae: Percina) in the headwaters of Maumee River, Michigan, USA & filming a documentary called *The Darters: Warblers of the Water World*. Toledo Naturalists Association, \$700.

Gottgens J.F. & **T.D. Crail**, 2008. The Honey Creek Targeted Watershed Program Proposal. U.S Environmental Protection Agency (\$60,000 – UT share)

Gottgens J.F. & **T.D. Crail** 2007. Mussel Survey of Winous Point Marshes. Winous Point Marsh Conservancy, \$5,000.

Grabarkiewicz, J.D. & **T.D. Crail**, 2007. *The travellin' fish show*. The North American Native Fishes Association, \$1000.

Gottgens J.F. & **T.D. Crail**, 2006. Survey Fish Diversity: Testing the Impact of Vegetative Encroachment. Lake Erie Protection Fund, Lake Erie Commission, \$9,576.

INVITED PRESENTATIONS

2010

- From nowhere to naturalist – The interpretation of Mr. Todd Crail. Bluffton University, Bluffton, OH.
- A tale of two streams. Invited lab activity with the Aquatic Ecology course. University of Toledo, Toledo, OH.
- Ecological dimension and adaptation of fish community in Ten Mile Creek. Invited field trip and lab activity with the Fall Field Ecology course. Lourdes College, Sylvania, OH
- Aquatic Diversity of the Toledo Area. GK-12 Summer Course for Fellows and Teachers, University of Toledo, Toledo, OH.
- Ecological dimension and adaptation of fish community in Ten Mile Creek. Invited field trip and lab activity with the Spring Field Ecology course. Lourdes College, Sylvania, OH.

2009

- Aquatic Diversity of the Toledo Area. GK-12 Summer Course for Fellows and Teachers, University of Toledo, Toledo, OH.

2006

- Ecology of the Unionidae of Southeast Michigan. Invited seminar and field trip, Washtenaw Community College, Ann Arbor, MI.
- Ecology of the Oak Openings Region. Invited seminar and field trip, Owens Community College, Toledo, OH.

CONTRIBUTED PRESENTATIONS

Navarre, K, **T.D. Crail** & J.M. Bossenbroek, 2011. Mapping the habitat characteristics of a population of orange fringed orchid (*Plantanthera ciliaris*) in the Oak Openings Region. Oak Openings Research Forum, Toledo, OH.

Zmijewski, K.A., **T.D.Crail** & R.H. Becker 2011. The distributional characteristics of glossy buckthorn (*Frangula alnus*) thicket in the Oak Openings Region. Oak Openings Research Forum, Toledo, OH.

- Crail, T.D. & J.M. Bossenbroek**, 2010. Interspecific induced shifts of habitat usage among a benthic community of fishes. Southeastern Fishes Council. Athens, GA.
- Crail, T.D., J.M. Bossenbroek & J.F. Gottgens**, 2010. Wind-derived seiches as a means for detecting and monitoring the unionid community in the western basin of Lake Erie. Millennium Conference. Windsor, ON.
- Crail, T.D., J.M. Bossenbroek & J.F. Gottgens**, 2009. Niche dimension of *Etheostoma* darters in the Ohio River Basin at multiple scales. American Fisheries Society, Nashville, TN.
- Crail, T.D., J.M. Bossenbroek & J.F. Gottgens**, 2009. A multiscale analysis of *Etheostoma* darter habitat in the Ohio River Basin. Southeastern Fishes Council, Lake Guntersville, AL.
- Crail, T.D., J.M. Bossenbroek & J.F. Gottgens**, 2009. Wind-derived seiches as a means for detecting and monitoring the unionid community in the western basin of Lake Erie. International Association for Great Lakes Research, University of Toledo, Toledo, OH.
- Tessler, N.R., J.D. Selden, **T.D. Crail & J.F. Gottgens**, 2009. Use of Agricultural Streams in Northwestern Ohio as Spawning Habitat by Native Fishes: Impact of Habitat Heterogeneity. 2009 Annual NANFA Convention, Tampa, Florida.
- Blosser J., B. Bodamer, **T. Crail**, C. Kolinski, G. Mentzer, W. Penamon & C. Stepien 2009. River of Shame Lesson Plan. Lesson Plan Session, National Science Foundation Annual GK-12 Conference, Washington D.C.
- Crail, T.D. & J.F. Gottgens**, 2009 Testing the impact of vegetative colonization on fish community in the headwaters of the Ottawa River, northwest Ohio. STEM Science Poster Session, National Science Foundation Annual GK-12 Conference, Washington, D.C.
- Crail, T.D. & J.F. Gottgens**, 2008. Testing the impact of vegetative colonization on fish community in the headwaters of the Ottawa River, northwest Ohio. Annual Meeting of the Ohio Academy of Science, Toledo, OH.
- Gottgens J.F., **T.D. Crail & A.I. Arceo**, 2008. Contrasting fish communities upstream and downstream of a dam in the Ottawa River, Northwest Ohio. Phase I of a dam removal study. Annual Meeting of the Ohio Academy of Science, Toledo, OH.
- Crail, T.D. & J.F. Gottgens**, 2008. Testing the impact of vegetative colonization on fish community in the headwaters of the Ottawa River, northwest Ohio. Ecological Society of America, Milwaukee, WI.
- Gottgens J.F., **T.D. Crail & A.I. Arceo**, 2008. Contrasting fish communities upstream and downstream of a dam in the Ottawa River, Northwest Ohio. Phase I of a dam removal study. Annual Meeting of the Ohio Academy of Science, Toledo, OH.
- Crail T.D. & J.F. Gottgens**, 2007. Testing the impact of plant colonization on fish communities in agricultural ditches of the Ottawa River, Northwest Ohio. Joint Meeting of Ichthyologists and Herpetologists, St. Louis, MO.
- Crail T.D. & J.F. Gottgens**, 2007. Testing the impact of plant colonization on fish communities in agricultural ditches of the Ottawa River, Northwest Ohio. Conference of the International Association of Great Lakes Researchers, College Station, PA.
- Crail T.D. & J.F. Gottgens**, 2006. Testing the impact of vegetative colonization on the fish community in the headwaters of the Ottawa River, northwest Ohio. Lake Erie Conference, Lorain, OH.
- Crail T.D. & J.F. Gottgens**, 2006. Testing the impact of vegetative colonization on the fish community in the headwaters of the Ottawa River, northwest Ohio. Conference of the International Association of Great Lakes Researchers, Windsor, ON.
- Crail T.D. & J.D. Grabarkiewicz**, 2005. Aquatic Fauna of the Oak Openings Region. Metroparks of the Toledo Area Oak Openings Research Forum, Toledo, OH.
- Gottgens J.F., **T.D. Crail & A.I. Arceo**, 2005. Quantifying the fish community response to dam removal: The case of the Ottawa River, northwest Ohio. Geology Society of America Abstracts with Programs Vol. 38, No. 4., Akron, OH.

PROGRAM DEVELOPMENT

Enhancing Environmental Education and Careers: Restoration Project for the Ottawa River at the University of Toledo. Toledo Early College High School (TECHS), Toledo, OH (January 2010 – May 2010) Working with a cohort of TECHS students on a three year river restoration project on the campus of the University of Toledo to promote careers and environmental engagement among the students.

Scott High School Stream Team. Scott High School, Toledo, OH (January 2010 – April 2010) Worked with a select group of Environmental Science juniors and seniors at an urban high school to apply a model of stream processes to the landscape scale of Toledo, Ohio. The activity helped hone scientific method, environmental appreciation, and produced study skills necessary for survival in college courses.

Michigan Botanical Society Spring Foray. Perrysburg, OH (May 2010) Organized field trips and speakers for a conference held every five years by the Society.

See Real Live Fish Up Close! Steps For Kids, Ann Arbor, MI (February– July 2009) Designed fish, mussel and native plant programming for an after-school program at a low income co-op housing project. The co-op bordered a wetland-turned-detention pond they were ecologically improving. <http://www.stepsforkids.org>

The *Meet Your Stream* Series. (April 2004 – ongoing) Developed interpretative field activities that make stream fauna accessible at any level of engagement with the stream; from bank observation to actually getting into the stream.

Toledo Chapter of Wild Ones. Toledo, OH (September 2005 – December 2008) Founding Member and past President of the Toledo chapter of Wild Ones, a national landscaping group that promotes environmentally sound landscaping practices to preserve biodiversity through the preservation, restoration and establishment of native plant communities. <http://www.for-wild.org>

SYNERGISTIC ACTIVITIES

2010

- The Secret Sex Lives of Unionid Mussels. Toledo Area Student Watershed Watch 2010, Toledo, OH.
- Darters – The Warblers of the Water World. Toledo Naturalists Association, Toledo, OH.
- Macroinvertebrate Casserole! – Lecture and lab activity, Lake Erie Center Summer Camp, Oregon, OH.
- The Maumee River Drainage Network - It Flows Downhill. Friends Earthcare Witness, Bowling Green, OH.
- Lucas County Big Day for Fishes - Field trip sampling four aquatic environments across Lucas County for Fishes, Toledo Naturalists Association, Toledo, OH.
- Geologic and Botanical Context for the Michigan Botanical Society Spring 2010 Foray, Perrysburg, OH.
- Licking the Wounds – An overview of Toledo Area streams: Their Provenance, Perils & Progress, Start High School, Toledo, OH.
- Meet Your Stream – Fishes of the Blanchard River. Field trip with the Toledo Naturalists Association, Findlay, OH.
- The Secret Lives of Unionid Mussels. Washtenaw County Parks, Milan, MI.
- Enhancing Environmental Education and Careers: Restoration Project for the Ottawa River at the University of Toledo. Toledo Early College High School, Toledo, OH.

2009

- The Secret Sex Lives of Unionid Mussels. Royal Oak Nature Society, Royal Oak, MI.
- The Secret Sex Lives of Unionid Mussels. Toledo Area Student Watershed Watch 2009 Keynote Speaker, Toledo, OH.
- Meet Your Stream – Fishes of the Maumee River. Field trip with the Maumee Valley Chapter of the National Wild Turkey Federation Annual Kids Day, Grand Rapids, OH.
- Meet Your Stream – Fishes and Mussels of the River Raisin. Field trip with the Toledo Naturalists Association, Toledo, OH.
- See Real Live Fish Up Close – the Field Trip! Field trip with Steps For Kids, Ann Arbor, MI.
- Farmertodd Institute for Senior Hiatus (FISH). Field trip with area high school Seniors during their Senior Projects to understand local fish ecology. Toledo, OH.
- An Aquatic Primer – Careers in Aquatic Systems, Northview High School, Sylvania, OH.
- Mussel Fauna of the Swan Creek Watershed. Toledo Naturalists Association, Toledo, OH.
- See Real Live Fish Up Close! Steps For Kids, Ann Arbor, MI. <http://www.stepsforkids.org>

2008

- Discovering hidden life in the Maumee River watershed. Annual Banquet Keynote, Lucas County Soil and Water District, Toledo, OH.
- The Oak Openings Region From the Ground Up: Geological Processes Founding Incredible Biodiversity. Ohio Prairie Conference Keynote Speaker, Toledo, OH.
- Meet Your Stream – Fishes and Mussels of the Maumee River. Field trip with the Toledo Naturalists Association, Toledo, OH.
- *A guide to the Common Fishes of the Toledo Area.* <http://www.farmertodd.com/fishguide>
- Snorkelling North America's Waterways. Southwest Michigan Aquarium Society, Kalamazoo, MI.

2007

- The Oak Openings Region From the Ground Up: Geological Processes Founding Incredible Biodiversity. Michigan Botanical Society, Ann Arbor, MI.
- North American Pearly Mussels: Who you callin' Fat Mucket?! Toledo Naturalists Association, Toledo, OH.
- Fear Not the Deep Substrate! Convention of the North American Native Fishes Association, Banquet Speaker, Greensboro, NC.

- *The travellin' fish show*. Interpretive poster printed with a grant from the North American Native Fishes Association.
- *40 feet at the Southview Prairie*. Interpretative sign placed along the University Parks Bike Path at the Sylvania Southview prairie remnant.

2006

- Native Plant Gardens – Tomorrow's Home? Toledo Chapter of Wild Ones, Toledo, OH.
- A Simple Headwater Sample Design for Amateurs (That the Professionals Will Want to Use Too). Convention of the North American Native Fishes Association, Cape Girardeau, MO.
- Meet Your Stream – Fishes and Mussels of the River Raisin. Field trip with the Washtenaw County Park district, Ann Arbor, MI.
- *Freshwater Mussels of the Maumee River*. Interpretative display in the Department of Environmental Sciences, University of Toledo, Toledo, OH.

2005

- The Karner Blue Butterfly Reintroduction to the Oak Openings Region - A Look at a Successful Federally Endangered Animal Reintroduction. Toledo Chapter of Wild Ones, Toledo, OH.
- North American Pearly Mussels: Who you callin' Fat Mucket?! Toledo Chapter of Wild Ones, Toledo, OH.
- Native Plants – A weed by any other name. Toledo Seed Swap, Toledo, OH.

2004

- Meet Your Stream - University of Toledo Honors Service Learning/Community Service After School Enrichment Program
- Native Fish – Jewels in our Streams. Lourdes College, Sylvania, OH.
- Native Fish – Jewels in our Streams. Maumee Valley Country Day School, Toledo, OH.

MEDIA COVERAGE

Quoted and photography appeared in “UT students discover state-listed fish in Ottawa River”, UT News, October 26, 2010.

Quoted and photography appeared in “Bite Sized Fish”, full page color Sunday Feature, The Toledo Blade, May 30, 2010. (<http://www.toledoblade.com/article/20100530/ART16/100539984>)

Interviewed on *Environmentally Sound with Larry Burns*. WJR760 April 27, 2010.

Quoted in “High school students help investigate large fish kill.” Ohio Outdoor News, February 26, 2010.

Quoted in “UT student to receive Brundage Scholarship”, The Toledo Blade, January 18, 2010. (<http://www.toledoblade.com/article/20100118/NEWS04/1180312>)

Quoted in “Scott's watershed team gets immersed in work”. The Toledo Blade, December 13, 2009. (<http://www.toledoblade.com/article/20091213/COLUMNIST22/912130359>)

“Fishing for Knowledge at UT”. The Toledo Blade, September 20, 2007. (<http://www.toledoblade.com/article/20070920/NEWS21/70920020>)

Quoted in “Wild Ones Relocate Native Plants, Soil from Development Sites.” The Maumee Mirror, March 22, 2007.

“Ottawa River at UT Shows Signs of Life”, The Toledo Blade, September 18, 2003. (<http://www.toledoblade.com/article/20070920/NEWS21/70920020>)

PUBLISHED PHOTOGRAPHY

Corkum, L.D. 2010. *Fishes of Essex County and Surrounding Waters*. Essex County Naturalists Association, Windsor, Ontario, Canada.

Smith, G.R. 2010. *Guide to Great Lakes Fishes*. University of Michigan Press, Ann Arbor, MI.

Holm, E., N.E. Mandrak & M.E. Burridge 2009. *The ROM Field Guide to Freshwater Fishes of Ontario*. Royal Ontario Museum, Toronto, Canada.

Grabarkiewicz, J.D. & W.S. Davis, 2008. An introduction to freshwater mussels as biological indicators. EPA-260-R-08-015. U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC.

Grabarkiewicz, J.D. and W.S. Davis. 2008. An introduction to freshwater fishes as biological indicators. EPA-260-R-08-016. U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC.

PROFESSIONAL MEMBERSHIPS

- Southeastern Fishes Council
- Freshwater Mollusk Conservation Society
- International Association for Great Lakes Research
- Ecological Society of America
- American Society of Ichthyologists and Herpetologists