



## The Edge of Existence: Shrews in the Huron Mountains

By Tom Dibblee

Twice a week, Alexa Unruh makes her rounds. While this Michigan biologist is on duty, she'll drive laps around the Huron Mountain Club property for twenty-four hours straight, checking nine different stations at three-hour intervals. Her stations are spots in the woods where she's buried jars deep in the ground.

What is Unruh hoping might fall into one of these jars? What could be worth this grueling schedule, one might wonder? Unruh is hoping for shrews.

Shrews are among the smallest mammals alive, and it's their tiny body mass that forces Unruh to maintain such a militaristic regimen.

Unlike her colleagues in the chipmunk realm, Unruh has to be on-call all night because if she doesn't reach a trapped shrew within three hours, it will die. A shrew has no fat reserves and no extra space in its stomach. The shrew is a constant forager, eating sixteen to seventeen times a day, taking in its entire body weight, but never storing a milligram. It can't survive long in a trap, or anywhere else, without food.

Maybe it's the feverishness of the shrew's appetite that made its name a synonym for a mean and churlish person; we all tend to get crabby when hungry. But Unruh says shrews are animals whose reputation is sullied by misinformation, and that when she

approaches a trap to extract her catch, she doesn't find them acting particularly shrewish in the human sense. "It's just trying to escape the same way any animal would," she says.

What's different about the shrew, then, isn't the attitude. But it does have something distinct from other small mammals, and that's its body odor. This minuscule animal sports a mammoth scent gland on its belly that emits a strong, musky smell. "By the time I'm a few yards away I know whether I've caught one," Unruh says.

*Far fewer scientists have studied shrews than other small forest mammals, and the data set is new and evolving.*

Among other false rumors about Unruh's chosen species is the perception that shrews are like mice. In reality, the shrew isn't even a rodent, but rather, is more

like a bat without wings. From a distance, to an untrained eye, it might seem mouse-like, but one look at the shrew's long, slender snout sets it apart. By comparison, a mouse's nose is merely a squashed nub. Plus, saying a shrew is smaller than a mouse is an understatement. The smallest shrews can get down to one and a half grams, the weight of a couple of paper clips. By comparison, a large dragonfly might weigh three grams. Unruh says, "Shrews are so diminutive, they occupy the very edge of mammalian existence."

And it's for this quality that the shrew is relevant, in two separate ways. The first is that, because shrews are so difficult to trap, far fewer scientists have studied them than other small forest mammals, and the data set is new and evolving. It's an opportunity for Unruh, a Master's student at the University of Michigan who's handled a few hundred shrews over the past four years, to research an uncharted frontier in science.

The second is that because shrews are so small and dependent on a constant supply of food, they're extremely sensitive to changes in their environment. And this is the goal of Unruh's research: to establish connections between shrew populations and environmental features such as fallen leaf coverage of soil, vegetation, and soil temperature. In time, the potential vulnerability of the shrew could have implications for research in climate change. But for now, the questions Unruh is concerned with come well before that. Providing a foundational data set is Unruh's objective.

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When I visited Unruh in September, she wasn't on her twenty-four hour watch. I caught her on an in-between day during which she surveys the environment around the traps. There was pink tape on the trees and a few orange flags stuck in the ground. I remembered having passed sites exactly like this when I was out hiking, but I'd never stopped to inspect them. But now, the white lids of jars stuck in the ground were obvious. They were placed beside a log, with the very simple notion being that shrews tend to run along logs, and if a jar's nearby, they're liable to fall in.

I positioned myself against a tree, at the ready for salience into the world of shrew science, and I watched and listened to Unruh and her assistant get down to work, tape measures in hand. They crouched on the forest floor, extended the tapes, called out numbers, and silently recorded findings in a notebook. They were measuring the stems growing up in the area around the traps, and they would do this over the course of about a hundred yards of pink flagging. They would carry on with this type of work for four more hours, and at the end of the day, return the milk crate of gear to the Stone House.

There, the gear, tinged with shrew musk, fills the Stone House basement with its fragrance. It is as if the shrew, self-conscious of its size but determined not to be overlooked, has found a way to follow Unruh home, hide out, and nag her nostrils until it gets its due.



## 2011 ANNUAL MEETING: A NEW ERA FOR THE FOUNDATION

By Kerry Woods, Director of Research

The Foundation's 2011 meeting was particularly notable this year, as it was the first annual meeting ever held on the grounds of the Ives Lake Research Station. This provided an excellent opportunity to celebrate the opening of the Red House, which debuted this research season as a residence and work space.

Foundation supporters used the Red House launch as an occasion to throw a lively party with barbecue, music, and fund-raising auction of art created and donated by Foundation friends. The evening turned out to be a beautiful summer night, with clear skies and pleasant breezes.

The annual meeting keynote was given by Dr. Robert Fahey, whose research concerns the ecology of white pine in old-growth forests. Despite the species' prominence in Great Lakes forests (and in the mythos of the North Woods generally), it has not been all that well understood. Fahey presented his new theories on how white pine – a species that requires very open conditions for regeneration – can persist in old-growth forests. Fahey, a recent Ph.D. graduate of the University of Wisconsin, is a research scientist at the Morton Arboretum, where he is the colleague of another former Foundation researcher and Manierre Award-winner, Bryant Scharenbroch.



**Supporters had a lovely evening at Ives Lake to celebrate completion of the Red House with music, an art auction, and a pig roast.**

*Photos by Taddy Opat*

### NEW INITIATIVES FOR 2012

The 2011 field season was a great success, and we have begun to receive inquiries and pre-proposals concerning projects for 2012. But beyond the "regular" research program, as always, new ideas are brewing and new initiatives are afoot.

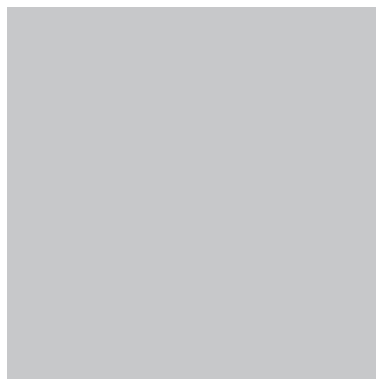
We are working on a number of ideas for developing the full potential of the new facilities, and exploring ways of outfitting the workspaces and information resources in both the Stone House and the Red House to better support researchers working on-site. I expect you'll be hearing about some of these in more detail next year.

At the annual meeting, the Board approved the creation of a scientific advisory group consisting of a small group of established researchers. This panel will both be a vehicle for broadening awareness of the Foundation within the scientific community and for providing a breadth of expertise and experience to be drawn upon in soliciting and reviewing research proposals.

Aside from these tangible benefits, the creation of an advisory group represents another important step in the Foundation's growth as a player in the regional and national research community. The organization has earned and deserves this sort of professionalism. The group is still in the planning stage, but I anticipate that the role and nature of this body, once it is in place, will evolve in interesting ways.

# Ashley Burton Wins 2011 Manierre Award

By Kerry Woods



The winner of this year's Manierre Award was Ashley Burtner, who won for a collaborative paper published in the *Journal of Great Lakes Research*. Her research presented a comparative assessment of factors that influence the productivity of a number of streams in the Huron Mountain region.

The work was part of Ashley's research for her Masters degree at the University of Michigan; currently, she is a researcher at the Cooperative Institute for Limnology and Ecosystem Researcher at Ann Arbor.

The project is notable for a couple of reasons. First, it takes a landscape-scale approach in comparing hypotheses relating stream ecosystem function to management history. The power of this approach is greatly enhanced by the "reference ecosystem" quality of Huron Mountain Club streams. These streams anchored

Burton's comparisons by providing an experimental control that could not have been easily found anywhere else.

Second, the study folded together several parallel strands of research, including work Burtner did while working in Donna Kashian's research group, and work conducted collaboratively with Peter McIntyre that explored the effects on nutrient cycling of in-stream migrations of suckers. Such synergistic work illustrates and emphasizes one of the most valuable potentials afforded by the Foundation's program and by the Ives Lake Field Station. By fostering diverse and sustained landscape-based research in a region of particularly high research value, the Foundation can enhance the potential for groundbreaking integration and collaboration.

*You can find a list of past Manierre Award winners and links to the publications recognized at our website: <http://www.hmwf.org/displayImage.php?id=284>. The award was named in honor of Dr. William and Anne Manierre, stalwart supporters of the Foundation who continue to share their own extensive knowledge of the Huron Mountain lands with researchers. The award recognizes publication of research conducted under the auspices of the Foundation in peer-reviewed scientific journals.*

## RESULTS OF FOUNDATION GRANTS: PUBLICATIONS AND CONFERENCE PRESENTATIONS

**The Foundation is proud to play a role in advancing scientific knowledge. One important part of any scientific endeavor is sharing findings. Foundation-sponsored research appears in scientific publications and is shared in presentations at national and international scientific conferences. Here is a list of some recent products:**

### PEER-REVIEWED PUBLICATIONS

Burtner, Ashley M., Peter B. McIntyre, J. David Allen, and Donna R. Kashian. 2011. The influence of land use and potamodromous fish on ecosystem function in Lake Superior tributaries. *Journal of Great Lakes Research* 37:521-527, doi:10.1016/j.jglr.2011.05.014.

Riege, Dennis. Demography of old-growth white pine stands at the Huron Mountain Club Reserve and Estivant Pines in Upper Michigan. *Michigan Botanist* in press.

Van Grinsven, Matthew, Alex Mayer, and Casey Huckins. 2011. Estimation of streambed groundwater fluxes associated with coaster brook trout spawning habitat. *Ground Water*, first published online 29 August, 2011.

### CONFERENCE PRESENTATIONS

Fahey, Robert and Craig G. Lorimer. Competitive status of underplanted eastern white pine in mesic hemlock-hardwood forests: Can gap-based restoration succeed? 2011 North American Forest Ecology Workshop, Roanoke, VA, June 2011.

Gailing, Oliver. Oak hybrid studies, Integration with EU projects. Schatz Tree Genetics Colloquium, Chambersburg, PA, July 2011.

Lind, J. and Oliver Gailing. Different local genetic adaptation in oaks: *Quercus rubra* and *Q. ellipsoidalis* as an example. Plant & Animal Genomes XVIII Conference, San Diego, CA, January 2011.

Sessa Emily B., Zimmer E. A. and Givnish. T.J. Phylogeny, Physiology, and Reticulate Evolution: An Integrated Approach to North American *Dryopteris* (Dryopteridaceae). XVIIIth International Botanical Congress (Session, "Exploring the Fern Frontier: Identifying the Next Generation of Challenges in Fern Biology."), Melbourne, Australia. Summer, 2011.

Wetzel, Mark J. and Peggy Morgan. The aquatic oligochaetes (Annelida, Clitellata) of the Huron Mountain Club, Marquette, Michigan, USA: final results from our 2010 study, and status of surveys conducted in July 2011. 25th Annual Meeting, Florida Association of Benthologists, October 2011.

# 2010-2011 Donors

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## 2011 Auction

**Great thanks to the wonderful artists who donated their work to the auction, and to HMWF supporters who donated some historic pieces of artwork. We also wish to acknowledge the patrons who purchased the art, for they made important financial contributions to the Foundation's work.**

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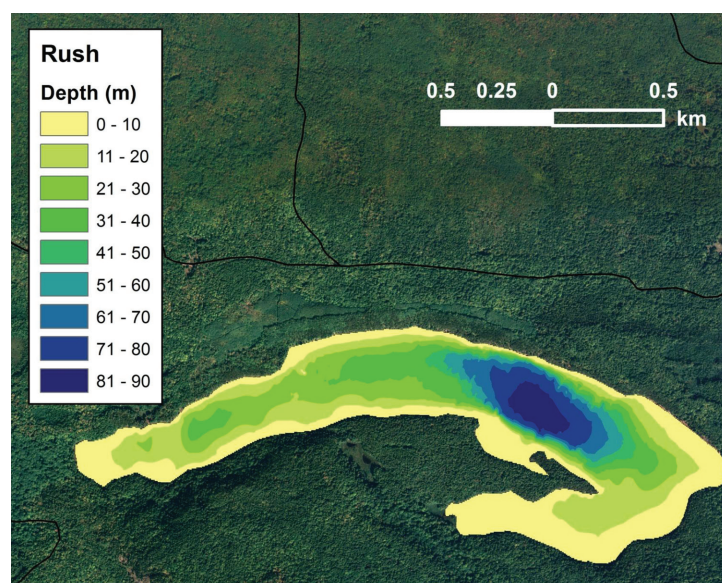
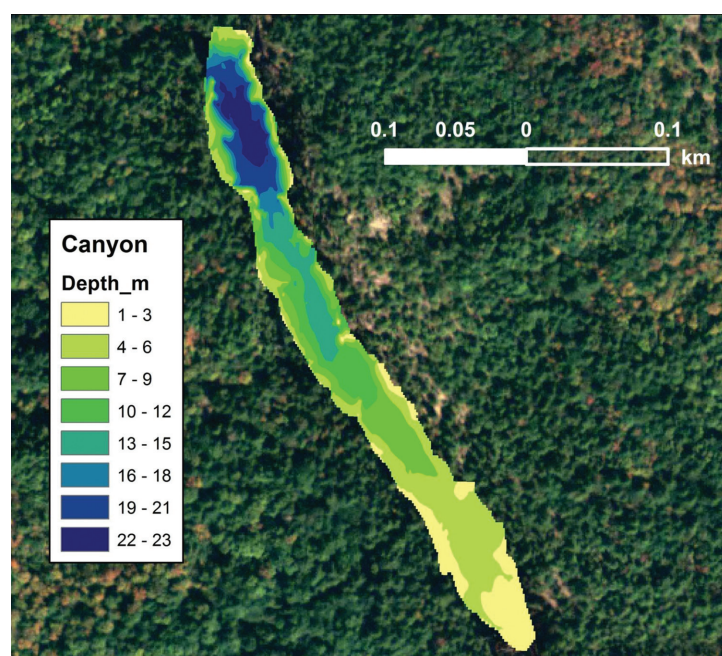
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## Bathymetry Revealed

As part of a comprehensive study of the glacial geology of the Huron Mountains, Ken Hinkel and Jim Bockheim used sonar to map lake depths (bathymetry). The hidden terrain shown in these maps helps reconstruct how drainage from melting ice-sheets shape the landscape, but this data-set will be valuable to other researchers as well. Lake-basin properties influence distributions of aquatic organisms and control function of aquatic ecosystems. For example, some of the lakes at Huron Mountain exhibit unique properties due to their origins as glacial melt-water channels. Both Rush Lake and Canyon Lake are exceptionally deep for their size, and this shapes their biology; Rush Lake is home to a distinctive form of lake trout, while the deep waters of Canyon Lake are permanently and completely oxygen-free, and so devoid of multi-cellular organisms.



# An Impressive Array of Life



Included in the new revision is a thoroughly updated list of fungi supplied by Dana Richter, a long-time Foundation researcher from Michigan Technological University. In addition to bringing taxonomy up to date, Richter added species documented from recent collections and from records he found in herbaria. Other revisions include a thorough updating of botanical nomenclature, and some significant new lists of aquatic annelid worms from Mark Wetzel, and butterflies and moths from surveys by Ron Priest and Eric North. *The latest grand total is 4,386 species documented from the lands of the Huron Mountain Club.* This is certainly only a small fraction of what's really there; look for updates as new projects address poorly documented groups.

*The full inventory, with annotations and references, is published as a Foundation "Occasional Paper" at [http://www.hmwf.org/species\\_list.php](http://www.hmwf.org/species_list.php).*

Want to know if that bird you hope you identified correctly has been recorded at the Huron Mountains? Check out the *All-Taxa Biodiversity Inventory*. It's a list of all species of life so far documented within Club boundaries—fern, fish, fungus, or fowl—and its latest version was published this past summer.

**About the Huron Mountain Wildlife Foundation:**  
Since 1955, the Huron Mountain Wildlife Foundation has supported original research in a wide variety of scientific fields. The research takes place in the Upper Peninsula of Michigan. More information on the Foundation can be found at: [www.hmwf.org](http://www.hmwf.org)

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