



Fish Crossings: A Story of Migration

By Jill Riddell

Birds do it. Butterflies do it. Even mammals, reptiles, amphibians, and fish do it. What they do is migrate, and the “where and why” of animal migration has fascinated humans for centuries and inspired many inquiries. Over the years, the Huron Mountain Wildlife Foundation has supported various studies having to do with animal migration.

Currently, a research biologist at the Shedd Aquarium in Chicago, Karen Murchie, is researching the seasonal migration of *Catostomidae*, a type of fish known in English by the woefully unflattering name of “sucker.” Murchie’s study of suckers in rivers of the Huron Mountains is part of a much larger effort to document fish migrations across the Great Lakes tributaries. Suckers were chosen by Murchie as the main species of interest because they are abundant and easy to spot.

“And besides,” says Murchie, “suckers are awesome.”

The Value of Suckers

Suckers are an important part of freshwater aquatic systems in the Great Lakes and connected streams and rivers. “Each time they spawn, they deposit nutrients for the food web. Algae suck up those nutrients, and that feeds the invertebrates, and then when the invertebrates are in their larval state, they feed trout and pike, and when the invertebrates hatch out and become flying insects, they feed birds and bats,” says Murchie. “Without suckers, you’d be missing the forage fish for a lot of the commercial and recreational fish. Each spring, the spawning of suckers is a really important kickstart to the food web.”

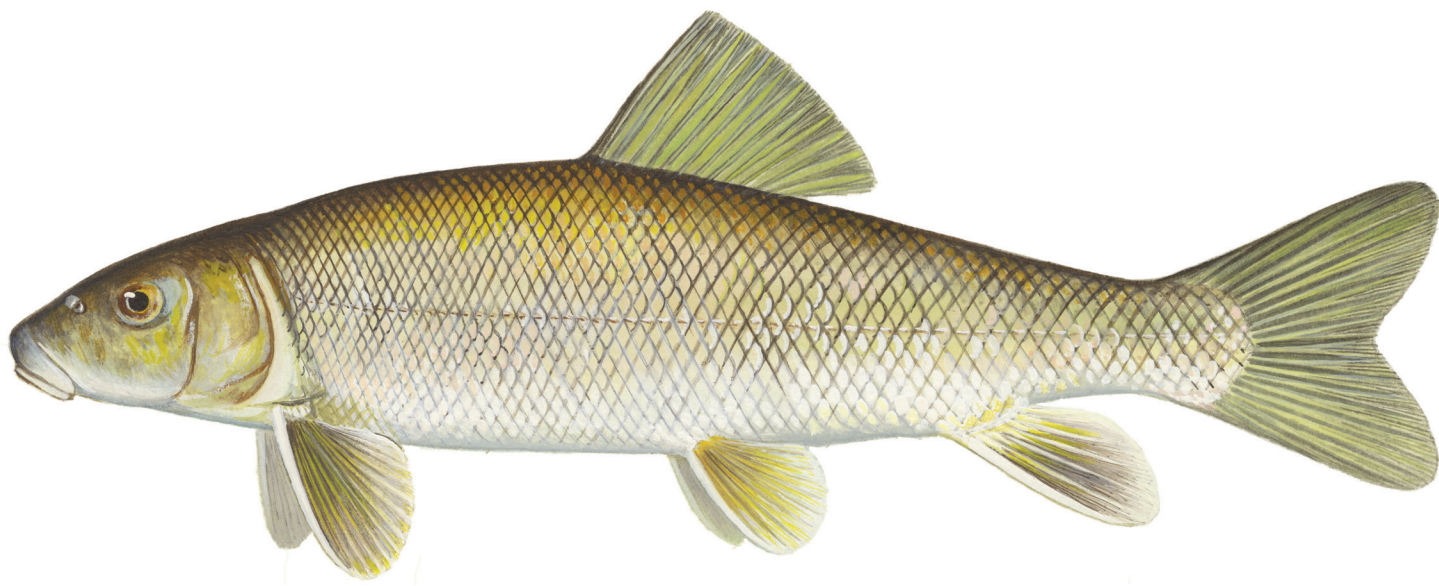
The pattern for suckers throughout the Great Lakes is that once a year, typically between April and May when they’re ready to spawn, they migrate away out of Lake Superior and swim upstream. In the Huron Mountain area, the suckers make their way

A research biologist at the Shedd Aquarium, Karen Murchie’s work takes her from the Shedd’s lively halls to rivers in remote, boreal forests. A native of Ontario, Murchie studied fish and lived in the Arctic and in the Bahamas before her interests landed her in the Great Lakes.



“Suckers definitely don’t get the love they should,” says Murchie. “A lot of people don’t appreciate their ecological value and worry that suckers are eating juvenile fish of game species. In fact, when we examine the contents of suckers’ stomachs, we find very few eggs of other species of fish. Mostly it’s insects.” *Photo: Shedd Aquarium/Brenna Hernandez*





"They're beautiful fish. It's not clear who coined the term "suckers" for them," says Karen Muchie. "They have a subterminal mouth position, and like little hoovers, they can use their mouths to suck up food or use it to hold on to a rock so they can remain in one place on the bottom of the stream." Image courtesy of the State Historical Society of Iowa and the Iowa Department of Natural Resources. Artist: Maynard Reece

into Pine River and into the Salmon Trout. These rivers provide the right habitat for spawning, both for hatching the fertilized eggs and for minimizing predation on their young.

Unlike Pacific salmon that famously spawn once and then die, adult suckers are able to spawn year after year, adding nutrients into the stream each time. Murchie explains, "They come in runs of fish in the tens of thousands in some locations. We call them the wildebeests of the Great Lakes, because that's what they're like: they teem upstream in great pulses, many individuals at one time."

Citizen Science

Harnessing the power of citizen scientists, Murchie has recruited volunteers to monitor sucker migrations in seventeen different sites that range from the southern end of Lake Michigan (in Highland Park, Illinois) to northern tributaries in Lake Superior. In addition to checking streamwater level by reading off a giant stream gauge deployed at ice-off, the main objective of volunteers is check each day to see if any suckers have shown up. "Daily observations allow us to determine the date the suckers show up in preparation to spawn, when the peak of the migration occurs, and when the spawning run ends."

It's a volunteer duty of short duration—a few weeks in early spring, and the set of tasks takes only ten minutes—but when the season is on, the volunteer commitment must be executed every day. Though the sucker run lasts from seven to ten days, the volunteers' duties start early to make sure they don't miss the run.

Murchie's objective with the research project is to monitor

long-term to detect any shifts in the timing of sucker migration as the climate warms. Because suckers play such an important role in the ecosystem and the timing of the sucker run is relevant to life cycles of other animals and plants, it's important to know if the fish begin to move into the rivers one or two weeks earlier. If there is a mismatch in the timing of the sucker arrival with the life cycle of the other organisms that rely on the nutrients, they provide, it could cause some issues in the food web.

"It's a great two-way connection, where the volunteers are out there on a daily basis appreciating nature and witnessing a fantastic migration—and they also observe other species, and document that information," says Murchie. "When you're in the habit of looking at a stream every day, you observe what others miss."



A gauge installed in Pine River by the sucker research team is used to monitor water temperature and water level. Volunteers use them to record data before, during and at the completion of the sucker run. Photo by Karen Murchie



Caption here if you want to add one. *Photo by Kerry Woods*

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The Huron Mountain Wildlife Foundation gratefully acknowledges its many donors and devoted supporters.

Without your generosity, there would be no Foundation, and no new discoveries. Thank you!

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You can make a donation by mailing a check made out to "Huron Mountain Wildlife Foundation" to:
Treasurer, Huron Mt. Wildlife Foundation,
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HMWF is a 501(C)(3) organization and donations are fully deductible.

Report On 2018 Annual Meeting

By Kerry Woods

Keynote Address by Nyeema Harris

Dr. Nyeema Harris gave the keynote at HMWF's 2018 annual meeting on July 31. Dr. Harris is Assistant Professor of Ecology and Evolutionary Biology at the University of Michigan, and director of the "Applied Wildlife Ecology" lab. Her research – an intensive, state-wide study of "mesocarnivore" communities – was the topic of the cover story for HMWF's summer

newsletter. The charisma of her study group, which includes everything from skunks and raccoons to coyotes and bobcats (any carnivore smaller than a wolf and larger than a weasel!) drew a full-house audience this summer at the HMC Playhouse.

Dr. Harris's research uses extensive networks of stationary trail cameras, maintained at several sites across Michigan through all seasons and for several years, to document populations of animals that generally are very difficult to study in the wild. Many of the research subjects are nocturnal and notoriously shy and cryptic. For more on the background and nature of the research, you can find the Summer 2018 Newsletter at our website (<http://www.hmwf.org/news/newsletters/>).

Harris also talked about her broader mission as a wildlife scientist. The acronym for her lab – "the AWE Lab" – is intentional. Harris seeks to build enthusiasm, interest, and appreciation – awe – for nature and wildlife among human communities. While the first phase of the project is now complete, Harris will pursue further work at the Huron Mountains focusing more closely on particular mammal populations.

Manierre Award for Ashley Coble and Amy Marcarelli

The Manierre Award is presented by HMWF in honor of the Manierre family – particularly, the late Anne and Dr. William Manierre. Each year the Award recognizes a scientist for notable, recent peer-reviewed research publication based on work done, at least in part, under Foundation sponsorship. The award gives us an opportunity to celebrate the research sponsored by HMWF as it becomes part of the permanent story of field science.

As numbers of publications have increased over the last decade, selection of Manierre winners has become quite competitive. This year, the Award went to Drs. Ashley Coble and Amy Marcarelli, the first two authors of two papers springing primarily from the dissertation research of Dr. Coble at Michigan Technological University. Dr. Marcarelli was Coble's advisor and collaborator. Currently, Coble is a research scientist for the National Center for Air and Stream Improvement (NCASI), a non-profit organization in Corvallis, Oregon. Both papers addressed aspects of ecosystem function in regional streams, focusing on the role of dissolved organic matter and its degradation, showing that these processes can be critical in affecting differences among streams in nutrient cycling and productivity.

Links to both papers, along with information on all past Manierre Award winners are available at the Foundation's website (<http://www.hmwf.org/news/manierre-award/>).

Logistics prevented Dr. Coble from attending the meeting, but Dr. Marcarelli was able to be present to receive the award.



Amy Marcarelli, a professor at Michigan Tech, accepts the Manierre Award on behalf of herself and Ashley Coble, a research scientist for the National Center for Air and Stream Improvement. On left, Anne Sherett, a member of the Manierre family; on right, Foundation director Kerry Woods.

Supporters of the Foundation were invited to participate in a field-site visit with Foundation researchers on the morning following the annual meeting. Despite cool, damp weather, a large group showed up at Conway Bay to meet with Dr. Jalene LaMontagne of Chicago's DePaul University. LaMontagne is particularly interested in how warming climates will influence populations of white spruce near the species' southern range limit. (LaMontagne is pictured here, near left, in blue jacket.) Photo by Kerry Woods



FOUNDATION RESEARCH RESULTS IN PAPERS, PRESENTATIONS & PRODUCTS

In addition to sharing their work with Foundation members through outings, talks, and articles in this newsletter, HMWF researchers are contributors to the larger, international community of science. The work scientists do while staying at the Ives Lake Research Station appears in presentations at national and international meetings and, ultimately, in publications in peer-reviewed journals, books, and dissertations. These become part of the constantly expanding core structure of science, which is certainly the Foundation's most lasting product. Here are results from recent months:

Photo by Kerry Woods

THESES, PEER-REVIEWED PAPERS, PUBLICATIONS

Dye, Alex. 2018. *Annual Aboveground Biomass Growth of Temperate Forests in Eastern North America*. Ph.D. Dissertation, West Virginia University.

Marcarelli Amy M., Ashley A. Coble, Karl M. Meingast, Evan S. Kane, Colin N. Brooks, Ishi Buffam, Sarah A. Green, Casey J. Huckins, David Toczydlowski, Robert Stottlemeyer. 2018. Of small streams and great lakes. *Journal of the American Water Resources Association*: Paper No. JAWRA-18-0011-P

Murchie Karen J., Knapp CR, McIntyre PB. 2018. Advancing freshwater biodiversity conservation by collaborating with public aquaria – making the most of an engaged audience and trusted arena. *Fisheries* 43:172-178.

Riege, Dennis. 2019. The versatile role of *Pinus strobus* L. within the composition and structure of permanent plots in five mature mixed forests of the Upper Midwest USA, accepted, *Journal of the Torrey Botanical Society*.

Werner, Thomas, T. Steenwinkel, and John Jaenike. 2018. *Drosophilids of the Midwest and Northeast, Version 2*. Michigan Technological University. <https://digitalcommons.mtu.edu/oabooks/1>

Willis, John L. And Michael B. Walters. 2018. Nutrition and *mycorrhizae* affect interspecific patterns of seedling growth on coarse wood and mineral soil substrates. *Ecosphere* 9:e02350.

CONFERENCE PRESENTATIONS

Betras, Tiffany, Thomas Diggins, Walter Carson. 2018. Do windstorms create novel microsites in forest communities? A test using tip-up mounds in northern Michigan. Annual meeting Ecological Society of America.

Dye, Alex. 2018. Huron Mountain hemlocks: growth synchrony, release events, and regional context. Annual Meeting American Association of Geographers.

Kashian, Donna R., C. Krabbenhoft, A. Burtner. 2018. A Decadal Assessment of Anthropogenic Impacts to Streams of Northern Michigan Watersheds. Society of Freshwater Sciences.

Leeper, Abigail C., Beth A. Lawrence, Jalene M. LaMontagne. 2018. How does soil nutrient availability influence mast seeding dynamics of white spruce? US Regional Association of the International Association for Landscape Ecology Conference.

Messick, Emily, Mark Isken, Scott Tiegs. 2018. Quantifying interannual and among—stream variation in organic-matter decomposition rates to evaluate stream “health.” Annual Meeting of the Society for Freshwater Science.

Sterman, Jillian, Abigail C. Leeper, Jalene M. LaMontagne. 2018. Mast Seeding Patterns in a Boreal Mast Seeding Patterns in a Boreal Forest Community. Midwest Ecology & Evolution Conference.

Tiegs, Scott, David Costello, Mark Isken, Guy Woodward, Peter B. McIntyre, Eric Chauvet, Alexander Flecker, Mark Gessner, Natalie Griffiths. 2018. The CELDEX Consortium. Global patterns and controls of organic matter decomposition in streams and riparian zones revealed through crowdsourcing. Annual Meeting of the Society for Freshwater Science.

A CALL TO ALL HMC MEMBERS, GUESTS & EMPLOYEES “HIT US WITH YOUR BEST SHOT!”

Huron Mountain Wildlife Foundation Benefit Juried Photography Exhibit

Submissions accepted in these categories:

(One entry/category/person, please)

- A Moment at HMC – A Celebration of Fleeting Time
- Visions & Perspectives – The Shape of Things
- Off the Beaten Path
- “We Are HMC!” – Faces, Places & Events
- Where the Wild Things Are
- “Now, That’s Funny!”

The juried exhibit will run July 1-August 31, 2018. Entries will be showcased with an ongoing silent auction. Recognition will be given for Best in Each Category, Best in Show and A People’s Choice Award. All images and proceeds will be considered a donation to directly benefit the Huron Mountain Wildlife Foundation. All copyrights remain with the artist.

Please include with each submission:

Title of Entry, Category, Name, Minimum Bid Amount (if desired)

All photography-based media accepted and should be shipped “ready to hang” to:
HMC c/o Gina Adamini, PO Box 70, Big Bay, MI 49808

Exhibit entries will be accepted Sept. 1, 2018-May 31, 2019. Please contact
Taddy Opat (Taddy56@aol.com) or Barb Dykema (hbdykema@gmail.com)
with questions.

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

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