HURON MOUNTAIN WILDLIFE
FOUNDATION

Summer 2014
Newsletter

Huron National Wildlife Refuge Welcomes Research

By Jill Riddell

The Huron Islands became a National Wildlife Refuge in 1905 by executive order of President Theodore Roosevelt. It's the oldest refuge in the Great Lakes and in the Midwest Region, and the only refuge in the region with boreal forests. Here's a view from the islands looking toward the Huron Mountains. *Photo by USFWS.*

The Huron Islands are an archipelago of eight small islands located three miles off the shoreline of the Upper Peninsula of Michigan in Lake Superior. Together, these islands make up the Huron National Wildlife Refuge, the oldest Federal refuge in the Midwest. It was established over a century ago because the islands provide habitat for nesting waterbirds and a spot to rest for migrating birds. At 147 acres, it's a relatively small member of the National Wildlife Refuge System of the U.S. Fish and Wildlife Service.

In the Huron Mountains, you can get a good view of the islands from most of the higher peaks and from the shoreline, particularly from Flat Rock, the point nearest the islands. One of the islands, Lighthouse Island, is open for visitor use during daylight hours, but you're best off traveling to it in a motorboat powerful enough to handle big waves and rapidly changing weather. The other islands are open for use by researchers if they apply for and obtain a Special Use Permit; otherwise, they're off limits to the casual tourist.

The Huron Islands are managed by the staff of Seney National Wildlife Refuge, which is an hour's drive southeast of Pictured Rocks and a full three-hour drive away from Big Bay. Because of the long distance and the islands' remote location, not as many scientific studies have been conducted at the Huron National Wildlife Refuge as have been done at Seney. The Fish and Wildlife staff in Seney would like to encourage Foundation researchers to apply for those Special Use Permits and consider including the islands in future studies, especially the inventory and monitoring of invertebrates, and other lesser known flora and fauna.

The largest and western-most island, West Huron Island, is also called Lighthouse Island because a lighthouse stands at its center. Built in 1868, the lighthouse is listed on the National Register of Historic Places and receives support for upkeep from the Huron Islands Lighthouse Preservation Association. This is the one island open to the public year round, from sunrise to sundown. It has a boat dock and a well-established trail. No camping is allowed.

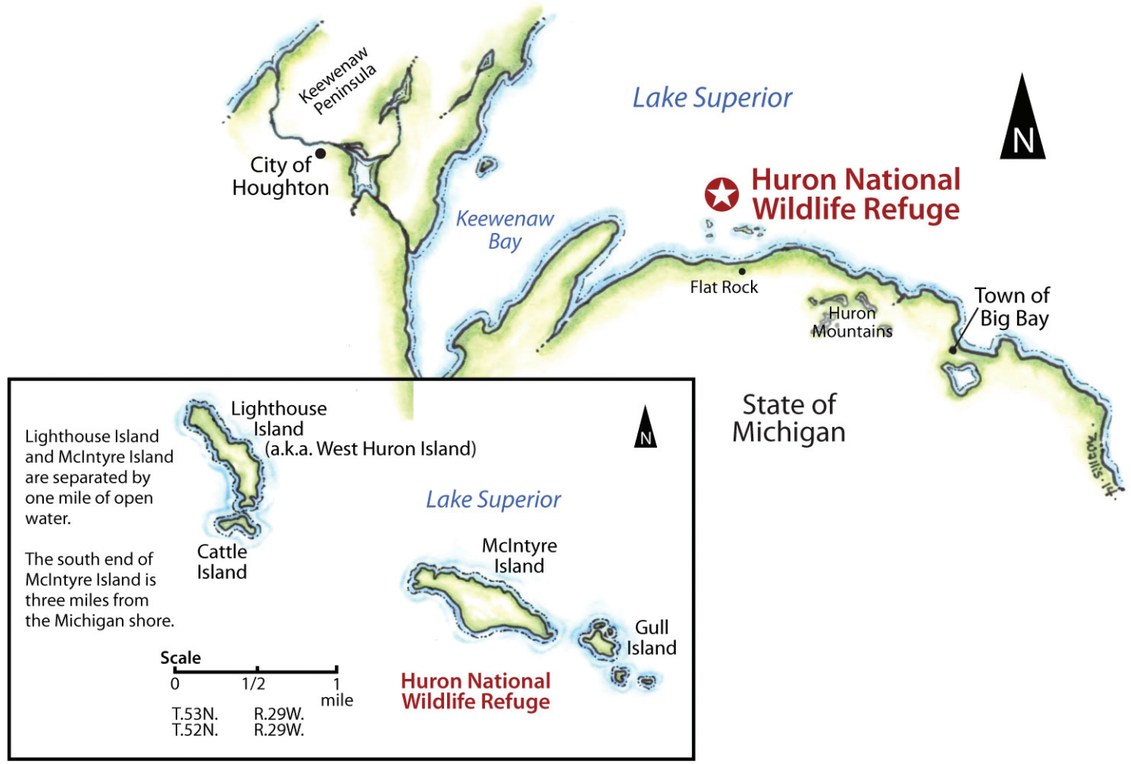
The island just to the southeast of Lighthouse Island is named Cattle Island because of a bad shipwreck that caused passengers and a cargo load of cattle to take shelter on the island in the 1860s. Although both humans and bovines survived, according to

continued on page 2

BEST PLACE ON THE HURON ISLANDS

U.S. Fish and Wildlife biologist Greg Corace caught his first glimpse of the Huron Islands in the early 1990s. "I was sailing in a boat out of Big Bay, and we ended up at Lighthouse Island. We docked at the old dock – which was treacherous to say the least. As a kid I grew up by Lake St. Clair in the Detroit area, and as I hiked around, I was struck by the fresh air here, the blue skies, and the sense of solitude. The hand of man was visible around me but in a very light fashion."

Today, this same spot remains Corace's favorite. "The architecture of the lighthouse and the other buildings is interesting, and there are grapevines growing that the lighthouse keepers must have used for food and maybe for making wine," he says. "You can take a foot trail around the island, and it passes right by a bald eagle's nest."



Terry Pepper's "Seeing the Light" website, "their vessel [the Arctic] was pounded by storm-driven waves, and crushed to kindling over the following days." Given the rough conditions, it took some time before the people were rescued and the cattle were able to leave the island.

The rest of the archipelago consists of Gull Island, McIntyre Island, and four bare rock islands that remain nameless. The remoteness and the natural quality of the Huron Mountain National Wildlife Refuge have earned it a Wilderness Area designation. This designation is applied to certain Federal lands, and provides an additional overlay of protection that ensures the natural communities will be protected permanently. (It applies to everything on the Hurons except the area immediately around the lighthouse and the outbuildings.)

Boreal forests dominate on the islands, a habitat type that's found nowhere else in the National Wildlife System of the Midwest. Balsam fir, paper birch, white spruce, and the occasional black spruce manage to sink their roots into the shallow soils of Lighthouse Island, Gull Island, Cattle Island and MacIntyre Island. "Because of the harsh conditions, trees are scrubbier and shorter than you'd expect on the mainland," says Greg Corace, the wildlife biologist at Seney. "We don't know how old they are without coring, but a hundred years old wouldn't surprise me. There's no recorded history of anything being logged on any of the islands."

"Our management is very much a hands-off strategy right now," says Corace. "There aren't a lot of pressures on the islands, other than some invasive species. Our biggest management priority is to learn what we have out there."

Baseline studies for butterflies, dragonflies, beetles, spiders, fungi and other taxa would be helpful, Corace says, as little has been done on the islands in terms of inventories. There's some data on plants, birds, and mammals, but most of these surveys are from forty years ago.

"We'd love for someone to take a look at bat use of the islands," says Corace. "Some species of bats migrate, like red bats. Any place where they can take a break from flying over Lake Superior is a good thing. They're passing through in both spring and fall, and could be using the buildings on Lighthouse Island. Bats might be breeding on the islands—we don't know."

Boreal forests can experience a wide range of temperatures between seasons, but one of their consistent characteristics is that

"In addition to being the U.S. Fish and Wildlife biologist overseeing the Huron National Wildlife Refuge, Greg Corace is on a Foundation research team conducting studies of bird communities in pine forests. *Photo by USFWS.*

they tend to experience (and rely on) long and cold winters. Climate change may alter the length of winter seasons in the future, and may make winters warmer. This means that the dominant natural communities on the islands could experience some level of stress from climate change. In order to know in the future what organisms are being affected, it's important to gather data on what's living there now, or at least, within the next few years.

"This year is the 50th anniversary of the Wilderness Act," says Corace. "The Huron National Wildlife Refuge is untrammeled. It's a place to experience solitude. It's as good of a Wilderness Area as any we have in the Midwest."

Dr. Corace can be contacted at Greg_Croace@fws.gov

To apply for a Research Special Use Permit: http://www.fws.gov/refuge/Seney/what_we_do/research.html

To learn more about protection of the lighthouse, contact: Huron Island Lighthouse Preservation Association; P.O. Box 381; L'Anse, MI 49946. Phone (906) 524-6593

MANIERRE AWARD TO BE PRESENTED TO OLIVER GAILING

The Manierre Award is offered annually by the Huron Mountain Wildlife Foundation to honor particularly noteworthy peer-reviewed publications of research sponsored by the Foundation. Since 2010, Dr. Oliver Gailing, an ecological geneticist at the School of Forest Resources and Environmental Science at Michigan Technological University, and his collaborators have been studying oak populations in the Huron Mountains and surrounding areas. Oaks from the region have been assigned to two species – northern red oak *(Quercus rubra)* – and Hill's oak or northern pin oak *(Q. ellipsoidalis)* – but both species show a great deal of morphological variation or "plasticity," and it has been unclear how to assign some populations. There has also been a question of whether there's significant hybridization or gene-flow between the two species.

Gailing, with colleague Erik Lilleskov and grad student Jennifer Lind, set out to assess whether the two groups are strongly genetically separated, and whether morphological and genetic variations are adaptively related to local environmental conditions. Results of this work are reported in two 2013 publications that have been selected for the 2014 Manierre Award:

- Gailing, O. 2013. Differences in growth, survival and phenology in *Quercus rubra* and *Q. ellipsoidalis* seedlings. *Dendrobiology* 70:73–81; and
- Lind, J. F., and O. Gailing. 2013. Genetic structure of *Quercus rubra L.* and *Quercus ellipsoidalis* E. J. Hill populations at gene-based EST-SSR and nuclear SSR markers. *Tree Genetics & Genomes* 9:707–722.

Oak populations within the Huron Mountain Club have, in the past, been assigned to both species based on both morphology and where they were found. Populations on dry rock outcrops and sandy areas were thought to be Hill's oak and those in moister forest habitats were labeled northern red oak. In fact, genetic results from Gailing's research show that although there is some evidence of hybridization in the past, all our oaks are northern red oak.

This demonstrates that northern red oak can display an extremely wide range of morphological plasticity in response to habitat differences. Since 2013, Dr. Gailing has extended his research on oak population genetics to assess whether populations of northern red oak in uncut, old-growth forests show any differences from populations in second-growth forests following logging. We look forward to the results of this research. The Award will be presented at the Foundation's Annual Meeting on July 29.

The Manierre Award honors the many contributions of naturalists William and Anne Manierre to the work of the Foundation and to the pursuit of natural history research in the Huron Mountains. A list of past Manierre Award winners, with links to publications, can be found at http://www.hmwf.org/displayImage.php?id=287

PRODUCTS AND OUTCOMES OF FOUNDATION SUPPORT

By Kerry Woods, Director of Research

The path from the laborious field work done outside in the forests and on the waters of the Huron Mountains to publication in peer-reviewed journals can be long and tortuous. It's not uncommon for several years to elapse between the moment when a scientist leaves the Ives Lake Field Station for the last time to the moment when the work is published in a scientific journal. The occasional emails I receive from scientists from years past providing the Foundation with digital copies of their just-published papers are sometimes unexpected gifts, like finding money in a long-forgotten coat pocket. These emails are also encouraging reminders that our efforts contribute greatly to the larger current of scientific research.

Here is a list of some recent publications of research done under the auspices of the Foundation, along with an accounting of presentations made recently at conferences. (Typically, such presentations are the precursors of manuscripts.)

For most reports, digital copies can be provided on request. We're also keeping a library of hard copies of publications resulting from Foundation-sponsored research in the library at the Stone House at Ives Lake. Feel free to visit to peruse past reports or to look up something specific. In addition to what's listed below, I know of several more manuscripts "in the pipeline," so please check the fall issue of this newsletter for more publications.

PEER-REVIEWED PUBLICATIONS

Adamski, D., J.-F. Landry, V. Nazari, and R.J. Priest. 2014. Three new species of leaf-mining Glechiidae (Lepidoptera) from Canada and northeastern United States. *Journal of the Lepidopterists' Society* 68:101-123.

Liebgold, Eric B. 2014. The influence of social environment: behavior of unrelated adults affects future juvenile behaviors. *Ethology* 120:388–399

Matthew J. Igleski and Kirsten E. Nicholson. 2014. Spatial pattern of *Batrachochytrium dendrobatidis* infection in green grogs *(Lithobates clamitans).* Herpetological Review 45(1):34-40.

CONFERENCE PRESENTATIONS

Arnold, A.E., et al. 2014. What can >50,000 cultures tell us about the specificity of endophytes and related fungi? *International Mycological Congress,* Bangkok, Thailand.

Gora, E.M., S.P. Yanoviak. 2014. Lightning ecology in a northern forest. *Midwest Ecology and Evolution Conference,* University of Dayton, Dayton, Ohio.

Gora, E., S. Yanoviak, and M. Feil. 2013. Resistivity of trees and vines. *Kentucky Academy of Science.* Morehead, Kentucky.

Grecco, A.E., and J.M. LaMontagne. 2014. Spatiotemporal patterns in white spruce cone production in Wisconsin and Michigan. *Midwest Ecology and Evolution Conference,* University of Dayton, Dayton, Ohio.

LaMontagne, J.M. and A.E. Grecco, 2014. Synchrony in white spruce cone production across three spatial scales. *Genomes to Biomes, joint meeting of the Canadian Society for Ecology & Evolution and the Canadian Society of Zoology.* Montreal, Canada.

Banner Year for Research Projects in 2014

By Kerry Woods, Director of Research

I just returned from two weeks pursuing research at the Huron Mountains and enjoying the flow of researchers coming through the Ives Lake Field Station. The Stone House and Red House were both lively with discussion among investigators. One of the great attractions of a well-used field-station is the opportunity to see and hear about diverse projects, to share ideas and information, and to explore possibilities for cross-fertilization among projects. Our Ives Lake facilities offer a superb venue for creating this sort of synergy. Investigators express their excitement at the opportunity to interact with their fellow researchers in a comfortable, welcoming, and well-maintained work environment. Thanks again to all HMWF supporters for making this possible!

Our research program for 2014 continues the trends of recent years, drawing researchers from a wide range of institutions. The scientific scope of the program continues to broaden, and I'm pleased to see projects ranging from the basic, descriptive natural science that is the essential substrate of strong natural science, to studies that are part of larger conceptual advancement and synthesis. We have around 25 active projects this year; because some close collaborations between researchers and projects have emerged, a simple count has become more difficult. Investigators hail from two dozen different institutions and a dozen states and provinces. Here is the overview:

Earth Science

This is a big year for earth sciences at Ives Lake. Researchers are bringing new techniques to bear to build a growing, integrated body of information about the development of the Huron Mountain landscape since the last glacial retreat. **Jim Bockheim** (University of Wisconsin – Madison) is in the final stages of his detailed mapping of glacially related landscape features. Three other projects are attempting to understand the fluctuating lake levels of Lake Superior over the last 6,000 years and how these have shaped the coastal features. **Henry Loope** and colleagues (Indiana Geological Survey and Wilfrid Laurier University) are using cores of sand deposits from ancient beach ridges and dunes to reconstruct former shorelines, while **Andy Breckenridge** (University of Wisconsin – Superior) and **Nigel Wattrus** (University of Minnesota – Duluth) are examining the formation of lakes from former embayments of a higher Lake Superior. (These include Pine Lake and Conway Lake.) **Harry Jol** (University of Wisconsin – Eau Clarie) and **Walter Loope** (U.S. Geological Survey) continue their work with ground-penetrating radar, to image and date sedimentary deposits in some of the same areas.

Fritz Nelson (now at Northern Michigan University) and **Ken Hinkel** (University of Cincinnati) are building upon their long-term microclimate monitoring and modeling, adding temperature profiling of additional lakes and new studies of snow properties.

It's particularly satisfying to see an emerging network of synergistic projects that both build on past work (the mapping of glacial features and ancient lake shores by Richard Rice) and add insight made possible by new tools and techniques.

Biodiversity

As always, a number of researchers are making use of the unusual habitats and "diversity hot-spot" properties of the Huron Mountains in studies of particular groups of organisms. **Patrick Gorring** (Harvard University) is continuing studies of pine-sawyer beetles and other beetles. **David Houghton** (Hillsdale College) will be sampling caddisflies (Order *Trichoptera*) from Huron Mountain streams. **James Bess,** from Houghton, Michigan, will survey macromoths and leafhoppers (both underdocumented groups at Huron Mountain) with a focus on "barrens" habitats. **Thomas Werner** (Michigan Tech) is inventorying additional groups of moths as well as native fruit flies. Prior to this summer, there was no documentation of any species in this group, but certainly many different species will be found to exist in the Huron Mountains. **Mark Wetzel** (Illinois Natural History Survey) will be completing his surveys of earthworm diversity, while **Dana Richter** (Michigan Tech) will continue surveys of fungi. These studies could add well over a hundred species to documented biodiversity of the Huron Mountains. (The All-Taxa Biodiversity Inventory currently stands at 4,477 species.) They will almost certainly document a variety of range extensions and regional records.

Communities and Ecosystems

Several researchers will make use of the pristine ecosystems of HMC holdings to gain insight into the properties and dynamics of ecosystems and ecological communities and the demographic structure and population genetics of a range of native species. Such studies in "reference ecosystems"are essential to understanding the effects of human activities on natural systems, ranging from gene pools to ecosystem function and carbon storage and differentiating these effects from a lively background of natural change.

Long-term studies of forest dynamics remain a core part of our research program. **Dennis Riege** will continue monitoring large study plots in white pine-hemlock stands near Fisher Creek (with the added dimension of monitoring the effects of beaver activity in one area). **Kerry Woods** (Bennington College) will return to re-census permanent plots dating back to as early as 1962. This is one of the longest-term records for old-growth forests in North America. These long-term study plots provide the backdrop for intensive studies of three-dimensional forest canopy "architecture" using new laser ranging technology (ground-based LiDAR) by **Bob Fahey** (Morton Arboretum) and **Alex Fotis** (Ohio State University).

Continued monitoring of the large deer exclosure near Fisher Creek – **Don Waller** (University of Wisconsin – Madison) and **Dennis Riege** (University College – University of Maryland) – will be complemented by a new project in which **Walter Carson** (University of Pittsburgh) and **Rose-Marie Muzika** (University of Missouri) are examining the potential for large boulder-tops to serve as "refugia" from deer browse for particularly sensitive plant species, and possibly a source of recolonization should deer populations decrease in future years.

Greg Corace (U.S. Fish and Wildlife Service) and colleagues will be pursuing the second year of studies of bird communities in fire-dependent pine forests and will be particularly interested in monitoring effects of management activities near Pine River.

The Huron Mountain landscape offers equally powerful opportunities for research on aquatic systems. **Casey Huckins** and **Amy Marcarelli** (Michigan Tech) are expanding their long-term studies stream fish communities and ecosystem processes in a comparative analysis of several streams in the Huron Mountains. The continuing work of **Scott Tiegs** (Oakland University) and **Donna Kashian** (Wayne State University) focuses on comparisons of macroinvertebrate communities and in-stream litter decomposition across a wider regional scope.

Population Biology and Genetics

Focused studies of particular populations are essential to addressing most ecological questions, and populations in reference systems are particularly important in understanding how individual species might respond to a wide range of environmental influences, including climate change. Increasingly, modern genetic tools are adding power to the kinds of population studies that have long been part of the HMWF research program. **Oliver Gailing** (Michigan Tech.) is applying just such approaches in comparing oak populations in old-growth forests and managed forests to assess whether management history affects genetic properties. **Evelyn Williams** (Chicago Botanic Garden) is adding genetic analyses to her long-term tracking of populations of *Botrychium* ferns.

Other population studies focus on species ranging from white spruce trees – **Jalene LaMontane's** (DePaul University) studies of mast-seeding (episodic production of very large cone and seed crops) – to birds – **Laurel Hill's** (Northern Michigan University) continuing studies of regional populations of spruce grouse, a bird with strong northern affinities – to fish – **Kayla Knoll's** (Northern Michigan University) new study of the potential evolutionary effects of barriers to migration and gene flow in streams. Finally, **John Willis** (Michigan State University) is in the final stages of thesis work assessing the role of nurse-logs in tree regeneration (work that follows up on research done over a decade ago by Laura Marx).

ANNUAL MEETING

HMWF Annual Meeting
Tuesday, July 29 at 4:00 p.m.
The Playhouse at
the Huron Mountain Club

Deer World: The Impact of White-Tailed Deer in the Upper Peninsula
The researchers supported by the Foundation, all donors to the Foundation, and anyone with even the vaguest interest in nature are invited to attend (and participate in) the Foundation's annual meeting. Donald Waller, a Foundation researcher and the John T. Curtis Professor of Botany at the University of Wisconsin in Madison will be the speaker. He is four years into a comprehensive study of the effects deer have on forests in northern Wisconsin and the Upper Peninsula of Michigan, and has many interesting and some surprising observations to offer.

All are welcome! Please come.

Species New to Science Named in Honor of Manierres

Ron Priest, a researcher in the Department of Entomology at Michigan State University, recently published a paper with colleagues from the Smithsonian that describes three new species of leaf-mining insects. In the larval stage, leaf miners live and feed between the epidermal layers of a leaf. They're the ones responsible for the odd designs one sometimes observes on leaves.

The *Gelechiidae* are a large family of small moths, some of which have the leaf mining habit, while others do not. The new species of *Gelechiidae* that Priest named for Will and Anne Manierre, *Scrobipalpula manierreorum,* was found on bigleaf aster in August of 2004. The plants grew along a one-kilometer stretch of the Ives Lake Road. Ron Priest went back for additional observations and collections thirteen more times, from 2004 to 2010. The paper announcing Priest's discovery was published earlier this year in the *Journal of the Lepidopterist's Society.*

Photo by Ron Priest.

Above: This is the pattern the insect *Scrobipapula manierrorum* makes on big leaf aster while in its larval stage.

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**

We welcome comments and suggestions on this newsletter. Please send them to:

Timothy H. Brown
4730 South Kimbark Avenue
Chicago, IL 60615
tbrown@wabashco.com

Editor: Jill Riddell ***Designer:*** Amanda Micek

HURON MOUNTAIN WILDLIFE FOUNDATION
4730 South Kimbark Avenue
Chicago, Illinois 60615