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Crossroads of Nature and Culture

By Ted Gostomski, Network Science Writer

The trail was first used in the earliest days of pre-recorded human history, which is to say it was ancient and well-worn when, in 1722, a Frenchman named Pachot reported it to be the best route to the west from Lake Superior. The Ojibwe, who settled there after the Yankton Dakota migrated farther west, already knew it as *Kitchi Onigaming* – "Great Carrying Place" – when the French first began to use the portage approximately 50 years before the North West Company established its base of operations there in the early 1780s. This British company, run by Scots and carried by the hard-working French-Canadian voyageurs, relied upon native technology (such as the birchbark canoe) to reach the shores of the Pacific and Arctic oceans years before Lewis and Clark headed west. With the arrival of Euro-Americans, Grand Portage became a crossroads of transportation, culture, and technology.

Jump ahead more than 200 years to 1951. The United States Congress, recognizing the significance of the area, designates Grand Portage a National Historic Site. After further review, the fort, the 8½-mile portage trail, and the site of old Fort Charlotte at the top of the trail were raised to the status of a National Monument in 1958.

Grand Portage is absolutely a historic site, but it is more than that. It is home for centuries of Ojibwe people, and it is a sliver (710 acres, but less than a half-mile wide) of the boreal-hardwood transition forest with significant natural resources. Those "significant natural resources" are why Grand Portage was included in the Great Lakes Inventory and Monitoring Network, and why visitors today see a crossroads of nature and culture.

"Natural resource management at Grand Portage is a balancing act," says Resource

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Management Chief Bill Clayton. "It is interdisciplinary by necessity."

Biological Science Technician Brandon Seitz agrees. "People come to Grand Portage for the historic experience, but when they set out on the portage trail, it's a big difference from what they might expect based on other [Lake Superior] north shore trail experiences. Around the stockade, the interpreters talk about resource values that are extrinsic—beaver as a commodity that provides fur, wood for practical purposes such as fire and shelter. But people on the trail see resources for their intrinsic values. On the trail, a beaver is a beaver, not a commodity."

Paper birch is a natural and cultural resource at Grand Portage where the tree (*wiigwaasaatig* in Ojibwe) is a pioneer species in the boreal forest ecosystem, and its bark was traditionally used for making shelters and canoes as well as baskets and other art works that are still produced today.

Managing resources that are simultaneously natural and cultural sometimes means working against modern ideas. Restoring Jerusalem artichoke and sweet-grass, for example—two plants important to the Ojibwe for food and for ceremonial purposes, respectively—may require management actions that favor these two species over other plants that may not be exotic or invasive but compete with the culturally important plants.

A bigger challenge at Grand Portage is the issue of scale. "Some of the people we partner with are used to working at larger scales than what we have here," says Seitz. This can be difficult for some, but when it works out, the park benefits greatly. When the Network office, the U.S. Geological Survey, and NatureServe collaborated to produce a vegetation map for Grand Portage (as part of the NPS Vegetation Inventory Project), what came out of it "may be one of the most accurate vegetation maps in the National Park System." Grand Portage's small size contributed to the mapping team achieving greater than 90% accuracy.

In this way, and in others, Seitz feels that smaller parks may benefit from the I&M Network's contributions more than some larger parks. Many park projects have been supported by the Network's contributions of aerial photography, soils map, and vegetation inventory and monitoring. Additionally, Network scientists are a source of subject matter expertise that managers can turn to.

"We use I&M products all the time," says Seitz. "I&M partnerships with small parks is a real credit to the General Authorities and Redwood Acts that provide for small parks with significant natural resources. Because we're beholden to the Organic Act like larger parks we have many of the same resource management problems in common—just at a different scale"

Jerusalem artichoke (*Helianthus tuberosus* in Latin, *ashkibwan* in Ojibwe). The roots of this member of the sunflower family are a traditional food for the North Shore Ojibwe.

Those who visit Grand Portage today enter a world vastly different from when it was a hub of the fur trade. Though the natural resources are probably not the reason people visit the monument, the health and condition of the forests, water, and climate all influence the visitor experience. The monument's resource managers, their co-managers with the Grand Portage Band of Lake Superior Chippewa, and the staff of the Great Lakes Inventory and Monitoring Network are working together to ensure the visitor experience continues to include both nature and culture. ●

2012 Field Schedule

Our eagle sampling at MISS, SACN, and APIS takes a well-deserved hiatus this year, but sampling at the three parks continues through a partnership with Northland College. Teams will collect, among other things, dragonfly larvae, fish, and plankton at all three parks to estimate stable isotope ratios in different levels of the food web. These ratios help to interpret contaminant burdens in bald eagles. Routine fish and aquatic insect sampling at the other six parks continues. Vegetation sampling returns to INDU where it began in 2007, and trail monitoring at GRPO begins. River water quality sampling rotates from SACN to MISS this year, though only six of the 13 sites at SACN will also be visited. ●

	BC	LB	LCLU	VEG	WQ
Apostle Islands (APIS)	June-Aug	June			June-Sept
Grand Portage (GRPO)	mid-May	June	April/May		
Indiana Dunes (INDU)	early May	early June		May-Aug	May, Jul, Sept
Isle Royale (ISRO)	late May-June	June			May-Sept
Mississippi River (MISS)	June-Aug	mid-April-early July	Aug/Sept		Apr-Nov
Pictured Rocks (PIRO)	late May-June	June			June-Sept
St. Croix (SACN)	May-Aug	June	Aug/Sept		Apr, Jul, Oct
Sleeping Bear Dunes (SLBE)	mid-May	June			June-Sept
Voyageurs (VOYA)	early May	June			June-Sept

BC - *Bioaccumulative Contaminants.* Fish teams from the University of Wisconsin-La Crosse led by Jim Wiener and Kris Rolfhus at INDU, PIRO, and SLBE, and Mark Sandheinrich and Roger Haro with Ted Gostomski at GRPO, VOYA, and ISRO. Dragonfly team from Northland College at SACN (May). Fish team from the St. Croix Watershed Research Station and Northland College at APIS, MISS, and SACN.

LB - *Landbirds.* Conducted by park staff and volunteers.

LCLU - *Land Cover/Land Use.* Ulf Gafvert and Al Kirschbaum.

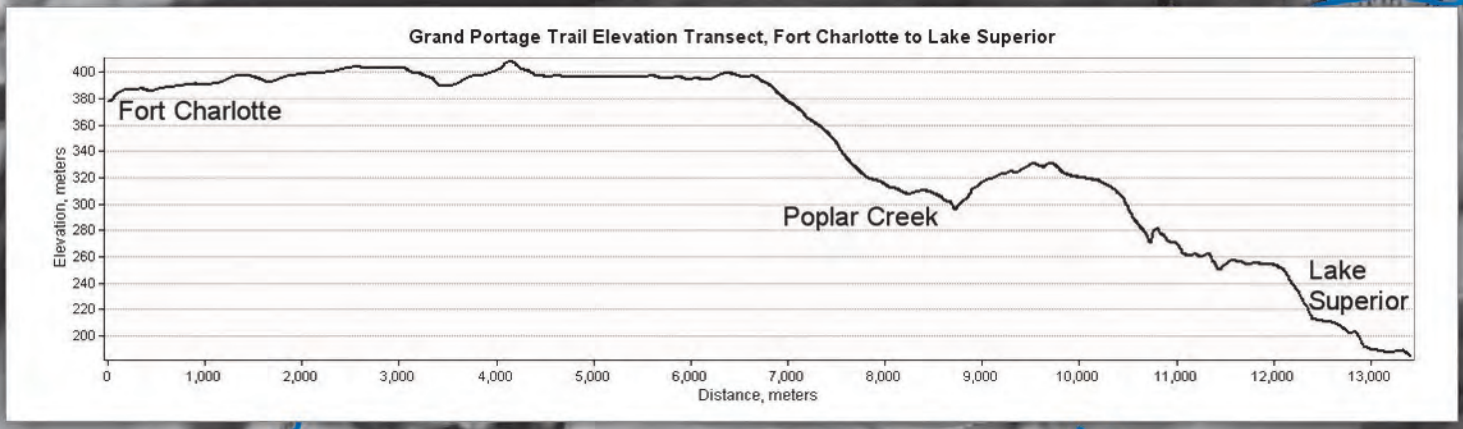
VEG - *Vegetation.* Team of three biological technicians led by Suzy Sanders and Jessica Grochowski.

WQ - *Water Quality.* Joan Elias (APIS), Josh Dickey (INDU), Rick Damstra and Jess Ruuti (ISRO), Lora Loope and Leah Kainulainen (PIRO), David VanderMeulen (MISS), Chris Otto (SLBE), Jaime LeDuc (VOYA).

Staff Insider

Ulf Gafvert, GIS Specialist

Ulf graduated from Iowa State University with a degree in Watershed Science, then worked as a soil scientist in Missouri before moving to northern Wisconsin in 1988. Since then, he has conducted soil surveys along the south shore of Lake Superior; worked with 3D visualization and mapping, GIS projects, and orthophoto development; has been involved with local watershed projects; and has provided many training and educational presentations on landforms, geology and wetlands. He assumed the position of GIS Coordinator with the Network office in 2002. Among other hobbies, Ulf is an avid harvester of wild rice, but don't ask where he goes; his rice lakes are closely guarded secrets. ●



Grand

Port

Fort Charlotte

Erosion along steep section of trail

Grand Portage National Monument prese
difficult route between Lake Superior and

The Great Lakes Network is working with
The goal of this program is to provide earl
management, and help direct needed ma
according to modern design concepts, bu
most efficient route. As a result, the trail
in potential for erosion or ponding. Monit
conditions and initiate actions to address

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Park Bo

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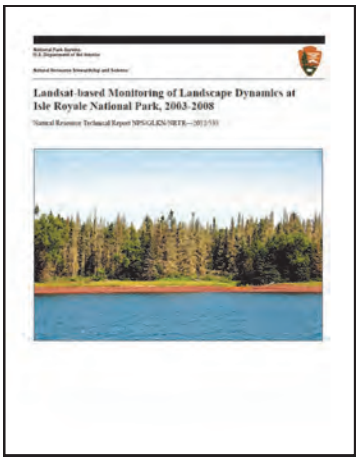
Debris pile beside trail in need of removal

rves the trail traversed by the voyageurs seeking the least
the lake and river systems leading west and north.

the park to develop a trail condition monitoring program.
ly identification of degrading trail conditions, inform
intenance and restoration efforts. The trail was not laid out
t rather has resulted from centuries of travelers seeking the
often traverses steep slopes and crosses wet areas, resulting
coring provides an effective tool to assess these trail
the problems before they become severe.

Things We're Learning

From *Landsat-based monitoring of landscape dynamics at Isle Royale National Park, 2003-2008* by A. A. Kirschbaum and U. B. Gafvert. 2012. Natural Resource Technical Report NPS/GLKN/NRTR—2012/535. National Park Service, Fort Collins, Colorado.

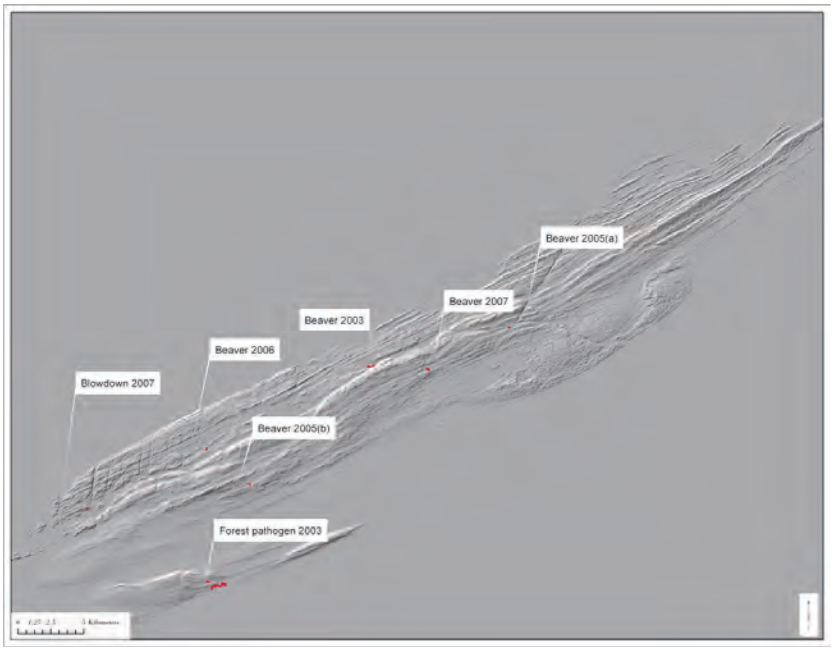


Previous landscape change studies conducted in the Great Lakes region have focused on large-scale changes in land cover / land use using moderate resolution imagery. Many studies also focused on individual agents of vegetation change rather than incorporating multiple disturbance agents. Despite all this work, we are unaware of any studies performed specifically on Isle Royale (ISRO) that have systematically delineated changes in a spatial context relative to disturbance agents. The Great Lakes Network's Landsat-based monitoring of landscape dynamics works synergistically with the long-term vegetation monitoring plots to provide a spatial context to the subtle shifts detected in vegetation composition on the ground. Together, the two programs provide ISRO managers with both fine-scale and large-scale monitoring of forest change.

Disturbances on ISRO and in portions of adjacent Canada and Minnesota were delineated for six years (2003-2008) using a combination of Landsat satellite imagery and high resolution aerial photos. A set of computer algorithms collectively known as LandTrendr was used in conjunction with a dense time series of Landsat imagery to track vegetation changes in and around the park. Change agents such as fire, forest harvest, development, flooding due to beaver activity, and blowdowns were identified for each disturbance, in addition to the year of occurrence, and starting and ending vegetation classes. High resolution imagery (e.g., airphotos, Quickbird) was used to substantiate evidence of disturbances detected by LandTrendr, and to identify the cause of each disturbance.

A **total of 0.03% of park land was disturbed** during the six-year analysis period. By comparison, 2.66% of the land in the Canada analysis area was disturbed during the six-year period.

Primary disturbance agents were beaver, forest pathogens, and blowdown. The largest amount of disturbance occurred in 2003, resulting from beaver activity and forest pathogens (see map). Beaver disturbances tended to be small in size and scattered throughout the park, while the forest pathogen disturbance was larger but isolated to one area of the park. Beaver activity was detected in four out of the six years. Forest pathogens and blowdown occurred one year each, the latter in the Washington Harbor area in 2007. Disturbances outside the park were dominated by forest harvest and development.



Distribution, type, and year of occurrence for disturbances detected by LandTrendr on Isle Royale, 2003-2008.

The **mean disturbance patch size inside the park was <1 hectare** (range=0.25 ha to 2 ha). The areas adjacent to ISRO, in Canada and Minnesota, experienced 88 times more disturbance than inside the park.

See the **full report** and more on our website: http://science.nature.nps.gov/im/units/GLKN/monitor/landuse/landuse.cfm.

New Publications

Gostomski, T., S. Melena, C. Nash, M. Nortrup, M. O'Herron, P. Tobar-Starkey, and J. Waller. 2012. Effective science communication. Pages 119-124 in S. Weber, ed., Rethinking Protected Areas in a Changing World: Proceedings of the 2011 George Wright Society Biennial Conference on Parks, Protected Areas, and Cultural Sites. The George Wright Society, Hancock, Michigan. Online at www.georgewright.org/proceedings2011.

Kirschbaum, A.A. and **U.B. Gafvert**. 2012. Landsat-based monitoring of landscape dynamics at Isle Royale National Park, 2003-2008. Natural Resource Technical Report NPS/GLKN/NRTR—2012/535. National Park Service, Fort Collins, Colorado.

Lafrancois, B. M., S. Magdalene, D. K. Johnson, **D. VanderMeulen**, and D. Engstrom. 2012. Water quality conditions and trends in the Mississippi National River and Recreational Area, 1976-2005. Natural Resource Technical Report NPS/GLKN/NRTR—2012/XXX. National Park Service, Fort Collins, Colorado.

Sanders, S. and **J. Grochowski**. In Prep. The forests of Isle Royale National Park: Can we preserve this pristine wilderness in the face of climate change? Natural Areas Journal.

Technical reports can be downloaded from the Network website—**http://science.nature.nps.gov/im/units/glkn**. ●

Network Award Winners

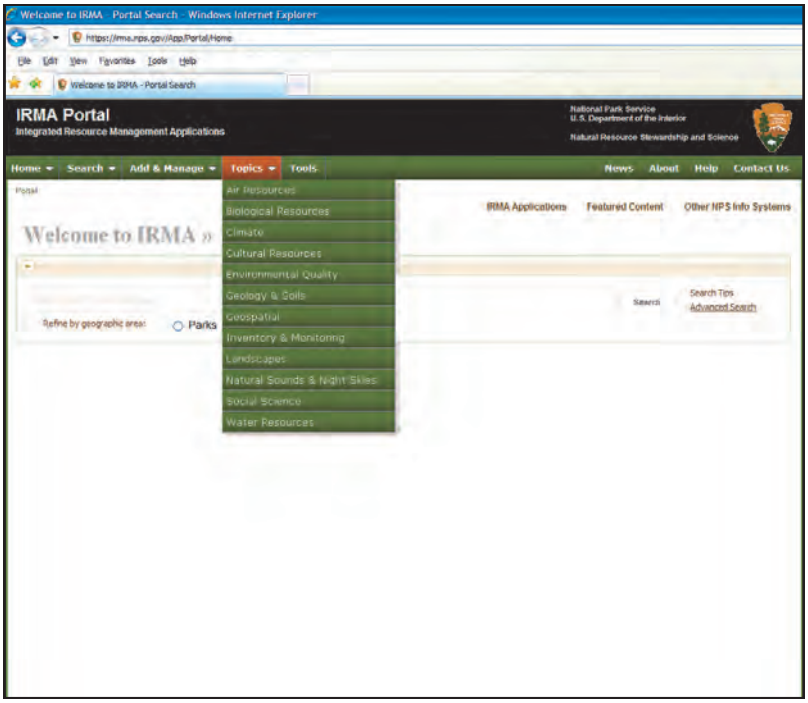
Among those selected for the 2011 Midwest Region Director's Natural Resource Awards were **Dr. Jim Wiener** (for Natural Resource Research) and **John Anfinson** (for Natural Resource Management). Dr. Wiener of the University of Wisconsin–La Crosse oversees the Network's fish and insect contamination monitoring. John Anfinson is Chief of Resource Management at Mississippi National River and Recreation Area. Both are now eligible for awards in their respective categories at the national level. Congratulations and good luck! ●

Have You Met IRMA?

NatureBib, NPSpecies, NRInfo, Data Store — she has been known by many names, but IRMA, the Integrated Resource Management Applications database, seems ready for her close-up.

IRMA is an internet-based tool intended to make the delivery of scientific data and information about NPS natural and cultural resources more efficient and effective. IRMA's development was a "signature initiative" in the Department of Interior's 2011 Customer Service Plan, and the U.S. Fish and Wildlife Service is developing a similar database. When fully implemented, IRMA and a linked FWS counterpart will provide improved customer access to scientific data, reports and other documents, maps, images, links, and other information, and will streamline how resource data are entered, managed, discovered, and shared.

IRMA can be found online at https://irma.nps.gov/App/Portal/Home. ●



Welcome to IRMA. The Integrated Resource Management Applications database contains a wide variety of natural and cultural resource data in the national parks.

National Park Service
Great Lakes Inventory and Monitoring Network
2800 Lakeshore Drive East, Suite D
Ashland, Wisconsin 54806
Phone: (715) 682-0631
http://science.nature.nps.gov/im/units/glkn/

Improving park management through greater reliance on scientific knowledge

Apostle Islands National Lakeshore
Grand Portage National Monument
Indiana Dunes National Lakeshore
Isle Royale National Park
Mississippi National River and Recreation Area
Pictured Rocks National Lakeshore
Sleeping Bear Dunes National Lakeshore
St. Croix National Scenic Riverway
Voyageurs National Park

The Current is published twice a year for Great Lakes Network park staff, our partners, and others interested in resource management at Great Lakes region national parks.

Editor
Ted Gostomski

Network Coordinator
Bill Route

Webmaster
Mark Hart

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Bill Clayton
Tim Cochrane
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Brandon Seitz

You can find resource briefs, reports, and more on our website

http://science.nature.nps.gov/im/units/glkn/