



Wisconsin Lakesider

Great Lakes Area of Concern Newsletter

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Full Steam Ahead for Lower Menominee South Channel Habitat Restoration Project

The South Channel Habitat Restoration Project is going full steam ahead! Just upstream of Menekaunee Harbor, the project is being implemented by the City of Marinette and DNR with funding from a USEPA Great Lakes Restoration Initiative (GLRI) grant.

This project will improve fish and wildlife habitat along this side channel of the Menominee River. The City has hired Robert E. Lee & Associates, Inc. (REL) to oversee the project, and Applied Ecological Services, Inc. (AES) to implement it.

Initial bids for the project came in too high, primarily due to a 2 ½-foot rise in water levels

since the project was designed. REL revised the plans to make the project more affordable, while still meeting the fish and wildlife goals of the [Lower Menominee River AOC Fish and Wildlife Population and Habitat Restoration Plan](#).

The new plan omits the placement of sand and soil bars. Instead, it improves wetland habitat by expanding the area treated for invasive plant species and planted with native species. The project improves northern pike habitat by providing a channel to improve access



Laurel Last

South Channel project area.

to restored wetlands for spawning. As in the original design, woody structures will be installed to improve fish habitat; nesting structures will be installed for waterfowl, wading birds, (continued on Page 3)

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SEARCH "AOC"

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St. Louis River Lake Sturgeon: Tagging for Understanding Habitat Use and Movement

Forty-five sturgeon have been implanted with hydro-acoustic tags, or transmitters that will help fisheries managers better understand habitat use and movements of the fish in the St. Louis River and western Lake Superior.

The acoustic tagging project is a cooperative effort involving the Wisconsin and Minnesota DNRs, the Fond du Lac Band of Lake Superior Chippewa and the UW-Stevens Point.

Fisheries staff with the Wisconsin and Minnesota DNRs launched the project in April, during the spring spawning run on the St. Louis River, near the Fond du Lac Dam. The sturgeon

were captured using electro-fishing methods. In electro-fishing, a generator on the boat sends

electrical current into the water that momentarily stuns nearby (continued on Page 2)



DNR

St. Louis River

St. Louis River Sediment Pollution Sampling: 2015-2016



US Fish and Wildlife contractors collecting core samples from Pickle Pond in June 2016.

What's Happening?

To learn more about St. Louis River AOC projects and events visit <http://dnr.wi.gov> search "[St. Louis AOC](#)"

For more information, contact:
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Lake Sturgeon Monitoring (Cont. from front)

(continued from front) fish. When a sturgeon is stunned, it comes to the surface where the biologists on board can net it.

After the fish is scanned, weighed, measured and recorded, a small 1 1/2 inch long incision is made in the sturgeon's belly and the acoustic tag is inserted. The fish is stitched up and allowed to recover for a few minutes in a tank of river water before being returned to the River. The tag is a small cylinder about the size of a tube of lipstick (see photo on the right). The transmitters issue a signal every 30 to 90 seconds and the signal is recorded each time the fish passes within about 400 meters of a receiver placed in the river. The tags will produce a signal for about 10 years and will provide a longer term look at individual fish behavior.

Minnesota DNR crews placed eight acoustic receivers in the river. So far, they have brought up four of those receivers to see how many signals they have received from passing sturgeon. By July, the four receivers had recorded signals from 43 of the 45 sturgeon tagged this spring. The

The bugs and otters aren't the only ones playing in the mud of the St. Louis River estuary. In 2015 and 2016 the State of Wisconsin and federal partners were busy beavers collecting samples of the mud that lies at the bottom of the estuary.

Geeky scientists call the mud on the bottom of the water "sediment." Scientists are interested in sediment because the type and quality of sediment is important for providing healthy

initial tag returns indicate that adult size sturgeon are spending time in the river through mid-summer.

The four receivers checked had all been placed in narrow areas of the river upstream of the Bong Bridge. Four other receivers are in place near the Duluth ship canal and Superior entry to detect sturgeon movements into or out of Lake Superior. Those receivers will be checked at a later date.

Paul Piszczek, fisheries biologist for the WDNR in Superior, said that sturgeon tagged in the St. Louis River can also be recorded by other transmitters placed around Lake Superior. "The acoustic technology provides a more quantifiable view of lake sturgeons' seasonal habitat use," Piszczek said, "which can guide habitat management projects throughout the river."

Sturgeon were essentially extirpated by overfishing and by pollution in the river. Cleanup efforts in the late 1970s and stocking by MDNR and WDNR in 1983 initiated Sturgeon recovery. Sturgeon

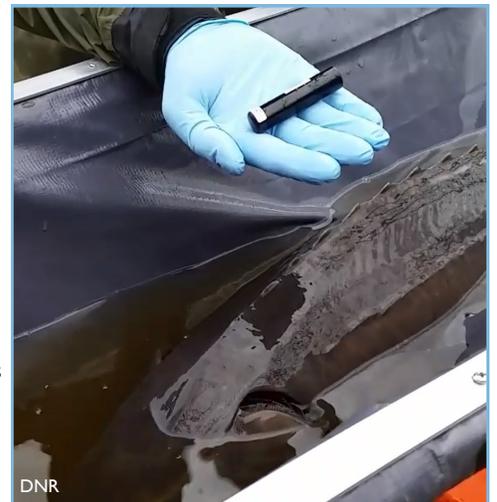
habitats and protecting water quality. When pollution gets in the water it settles to the bottom and levels can build up in sediment to a point where it contributes to beneficial use impairments. In order to address these impairments scientists are particularly interested in "hot spots" or areas with elevated levels of pollution. "Hot spots" are generally located in areas where historic discharges and industrial activities took place as well as in areas where pollution from elsewhere might settle, such as from activities upstream or from air emissions. Knowing the levels of pollution in sediment can help scientists determine locations where cleanup actions are necessary as well as guide habitat restoration efforts. To determine pollution

levels scientists use special equipment to collect samples of the sediment and then analyze it for many different chemicals.

In order to fill gaps in areas where sediment data was lacking, DNR partnered with several federal agencies to sample a whole bunch of locations across the estuary. During the 2015 and 2016 field seasons, these busy beavers conducted nine studies and collected sediment samples from 234 locations! (See map on page 7.)

The list of chemicals analyzed varied for each study, but generally included metals (e.g. mercury, lead, arsenic, zinc, cadmium), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides (continued on Page 7)

Sturgeon are tracked by a lipstick sized tag. The tag will produce a signal for 10 years.



are beginning to re-establish themselves and tribal biologists found evidence that the fish are spawning in the river.

Sturgeon fry and other juvenile sturgeon have been discovered in the river in recent years. Sturgeon stocking ended on the river in 2000.

Sturgeon are a target species for the Fish and Wildlife Populations Beneficial Use Impair-

ment in the St. Louis River.

Fisheries programs will continue to monitor sturgeon each spring in the St. Louis River and plan to add a few receiver locations and implant up to 60 more tags in 2017. —By Matt Steiger.

Lower Menominee River



Mike Donofrio

Crews modify turbine intake at Menominee Dam for safe downstream fish passage

Lower Menominee River Lake Sturgeon Passage

The final phase of a project to pass lake sturgeon safely around the first two dams on the Menominee River is now in full swing. Five hydroelectric dams on the Menominee River prevent lake sturgeon from migrating up the river from Lake Michigan to reach their prime spawning and rearing habitat. The Menominee River Fish Passage Partnership, comprised of state and federal

agencies, nonprofit conservation organizations, and a private energy company, is engineering and implementing safe and effective ways for lake sturgeon to move around the Park Mill and Menominee Dams. Fish passage structures at these two lower dams are being constructed with \$6 million in funding from the Great Lakes Restoration Initiative and over \$3 million from the

dams' owner, Eagle Creek Renewable Energy. Safe downstream passage at the second dam—Park Mill—has been constructed and is now operational. Upstream passage at the first dam—Menominee—is being accomplished with a custom-designed and built fish lift (elevator) and sorting facility, allowing biologists to remove invasive species, return non-target fish downstream, and select lake sturgeon for (continued on Page 7)

What's Happening?

To learn more about the Lower Menominee River AOC projects and events visit <http://dnr.wi.gov> search "[Menominee River AOC](#)"

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NOW AVAILABLE

2015 Remedial Action Plan Status Report

South Channel (continued from front)

(continued from front) raptors, songbirds, and bats; and rocky material will be removed from under the Ogden Street Bridge to improve flows, fish passage, and overall stream connectivity between

South Channel and Menekaunee Harbor.

Habitat restoration is expected to be completed in 2016, with follow-up invasive plant monitoring and control through 2019 to ensure that native vegetation is established and project and AOC goals are met. Besides the environmental benefits, these restoration projects are revitalizing the area by cleaning them up and providing economic and recreational opportunities along the river. —By Laurel Last.

Top: Bird Boxes for South Channel Restoration. Below: Goose fencing to protect native species planted in Fall 2016.



Cheryl Bougie



Cheryl Bougie

AOC Open House

The Lower Menominee River AOC Citizens Advisory Committee (CAC) hosted an open house on Thursday, September 15, at UW-Marquette. The event celebrated and showcased the great work completed and in progress to restore the AOC. Steve Galarneau, WDNR Office of the Great Lakes Director, provided a brief welcome and overview of the AOC's history, recent progress, and two beneficial use impairments (BUIs) that are proposed for removal. The remainder of the time, attendees were invited to visit and ask questions at booths set up around the room highlighting sixteen different projects and organizations.

Topics at the event included contaminated sediment remediation projects, habitat restoration projects, the Restrictions on Dredging and Degradation of Benthos BUI draft removal packages, and more. It was a great oppor-

tunity for CAC members and others to share information about all the progress being made in the AOC. Total attendance (including presenters) was estimated at 45 people. In addition, about 20 people attended a tour of the Menekaunee Harbor restoration project before the open house. —By Laurel Last.



Ecology and Environment, Inc



Ecology and Environment, Inc

Lower Green Bay & Fox River



Todd Miller, UW-Milwaukee

Continuous monitoring buoy.

Monitoring Expands Understanding of Harmful Algal Toxins in Green Bay

A new AOC monitoring project will help to assess the status of the *Beach Closings Beneficial Use Impairment*. The use is considered impaired due to historical bacterial contamination as well as excess sediment and algae.

The project will build on a recent study completed by Bay Lake Regional Planning Commission that evaluated conditions around Bay Beach, a historically popular beach that closed in 1938 and that the community wants to restore.

The study found bacteria levels that were comparable to other Lake Michigan beaches. This was a promising finding for the BUI and for future beach restoration efforts; however, the study also acknowledged the need for an algae monitoring strategy to further characterize problems related to

harmful algal blooms.

The new monitoring project, in addition to characterizing the BUI status, will provide insight into the recreational risk associated with expanded use of the lower bay. It will also help with developing tools the community can use to manage that risk, provide supporting data for adapting predictive tools developed for Lake Erie to Lower Green Bay, and contribute to current research on algae bloom dynamics.

Algal blooms occur in the summer and early fall, when elevated nutrient levels, warm temperatures, and lots of sunlight fuel algae growth. Some are generated in the same spot where they appear, and some are moved in by wind and waves. Some contain photosynthetic bacteria (known as blue-green algae) which can produce

toxic chemicals.

Blooms that contain these toxic chemicals are known as “harmful algal blooms” (HABs). Cyanobacteria may float on the surface, forming a scum or be distributed throughout the water. (There are many types of algae and not every algal bloom is a HAB.) Because of these variables, any monitoring strategy must be carefully designed.

The expertise of many project partners, including DNR, NOAA, USGS, UW-Milwaukee, and NEW Water, contributed to the development of the monitoring strategy. Implementation is a team effort as well, with weekly sampling occurring at sites already monitored by NEW Water and more intense monitoring led by UW-Milwaukee occurring at two nearshore sites paired with continuous monitoring buoys.

What's Happening?

To learn more about Lower Green Bay & Fox River AOC projects and events visit <http://dnr.wi.gov> search “[Green Bay AOC](#)”

For more information, contact:
Megan O'Shea, Lower Fox River & Green Bay AOC Coordinator, Wisconsin DNR, Green Bay, WI Phone: 920-662-5465 e-mail: Megan.Oshea@Wisconsin.gov

The algae monitoring project is a 3-year project funded by USEPA's Great Lakes National Program Office with Great Lakes Restoration Initiative funds. The results are expected to be useful not only for the Beach Closings BUI but also for the *Eutrophication or Undesirable Algae* and *Restrictions on Drinking Water* BUIs. For more information about the project, contact Donalea Dinsmore, Great Lakes Quality Assurance and Beach Program Coordinator, at Donalea.Dinsmore@Wisconsin.gov

Lower Fox River Tributary Gets Closer Look as Part of USGS Study

Excessive algae, a condition known as eutrophication, has been a problem that has plagued the Lower Fox River and Lower Green Bay for decades. Algal blooms are fueled by high concentrations of sediment and nutrients running off the land and into the water.

One approach to managing nutrient and sediment pollution is to determine the Total Maximum Daily Load (TMDL). The TMDL allocates the maximum amount of a pollutant that a

body of water can receive without disrupting designated uses, like fishing and swimming. In the entire area that drains into the Lower Fox River, two tributaries—Plum Creek and nearby Kankapot Creek—contribute the highest amount of sediment and nutrients per acre to the Lower Fox River/Green Bay Area of Concern. In order to meet the goals of the Lower Fox River TMDL, phosphorus and sediment will have to be reduced by 59% and 55%, respectively. Estimates

from modeling attribute nearly 87% of the annual loading of phosphorus and sediment to agricultural land in Plum Creek, whereas natural areas contribute 1%. Phosphorus and sediment from streambank erosion were not directly accounted for in the modeling; however, Outagamie County's recent stream inventories of Plum Creek indicate that 24 of the 43 miles inventoried had actively eroding streambanks. Preliminary estimates are that these streambanks could be con-

tributing 45% of the sediment annual loading measured at the USGS gage. If stream processes are producing almost half of the annual loading of TSS, the proposed TMDL goal to reduce TSS by 55 percent will not be achievable through agricultural soil conservation practices alone. In order to better assess this potentially unaccounted for source, researchers from the U.S. Geological Survey will be collecting soil samples throughout the (continued on Page 7)

Sheboygan River



Sheboygan river after remediation and restoration.

Vic Pappas

2016. 7. 20

What's Happening?

To learn more about Sheboygan River AOC projects and events visit <http://dnr.wi.gov>

search "[Sheboygan River AOC](#)"

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City of Sheboygan Hosts Annual Great Lakes Advisory Board (GLAB) Conference

On July 20-21, the City of Sheboygan, Sheboygan County and DNR hosted the Great Lakes Advisory Board (GLAB) for a tour of the successful restoration projects completed in Sheboygan over the past six years. The restoration projects, which were funded in part by

the Great Lakes Restoration Initiative (GLRI), have been part of collective efforts by local, state and federal partners to address the Beneficial Use Impairments (BUIs) that affect each of our Great Lakes AOCs. The GLAB provides advice and recommendations to the EPA Administrator, who serves as chair of the federal Interagency Task Force.

The agenda began with a driving tour of the Sheboygan River AOC. The tour allowed attendees to view the remediation and restoration work completed at 7 different areas in the AOC, including the harbor, boat launch, Camp Marina, Taylor Pond, Kiwanis Park, and Esslingen Park. After the land-based tour, attendees launched canoes for a water bound tour of the Sheboygan River that allowed folks to enjoy the improved recreational opportunities of the river while viewing the project improvements from an aquatic perspective! The canoe tour paddled to Esslingen Park, Roy Sebald Natural Area, Wildwood Island, and Kiwanis Park.

The two-day meeting was hosted by Sheboygan Mayor Michael Vandersteen and Sheboygan County Administrator Adam Payne. Additionally, the meeting was facilitated by state, city, and county officials who led the restoration projects. GLAB members asked a number of good questions and gathered some information about projects, BUIs, and the AOC in

general.

The DNR's Office of the Great Lakes was a crucial partner in obtaining the GLRI funding from the U.S. Environmental Protection Agency (USEPA), managing the projects that needed to be completed to address the BUIs affecting the Sheboygan River AOC, and coordinating work completed by the City of Sheboygan and the various groups that planned and implemented restoration efforts throughout the Sheboygan AOC.

During the two-day meeting, GLRI's Science and Information Subcommittee (SIS) provided a preliminary report on SIS' efforts to develop recommendations for incorporating duration and longevity considerations into decision-making under the GLRI. The meeting also resulted in the establishment of two primary work priorities for 2016 and 2017 for the GLAB. The first priority established is advising the Interagency Task Force (IATF) on ways to ensure outcomes and benefits of GLRI projects and activities have long-term durability and sustainability. The second priority is to provide info to EPA for the upcoming development of the next GLRI action plan. The upcoming action plan strategy will guide GLRI investments for the years 2020-2024. -By Sam Wettach.



Vic Pappas

2016. 7. 20



Vic Pappas

Attendees enjoyed a canoe tour of the improved river which included several wildlife sightings.

Milwaukee Estuary

What's Happening?

To learn more about Milwaukee Estuary AOC projects and events visit <http://dnr.wi.gov> search "[Milwaukee AOC](#)"

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Menominee River Concrete Removal Complete!

The Menomonee River Stream Management project, a major habitat rehabilitation project in the Milwaukee Estuary Area of Concern (AOC), was completed this summer.

The project was completed in several phases by Milwaukee Metropolitan Sewerage District (MMSD) and the U.S. Army Corps of Engineers, with help from their partners. With GLRI funding, concrete lining was removed and over 3,800 feet of the river was restored over the past two years.

The river was first deepened and lined in 1965 to improve flood carrying capacity. However, these changes created a hazard to navigation and recreational uses of the river and a barrier to fish and wildlife movement. It cut off fish from access to their historical spawning and rearing habitat, including over 1,000 acres of riparian wetlands. The rehabilitation enables fish to access habitat and creates new fishing opportunities along 37 additional miles of river and tributaries.



Stacy Hron

The project will benefit fish such as lake sturgeon, red horse sucker, walleye, lake run trout, salmon, northern pike, and smallmouth bass.

The rehabilitation included removing the 58 foot wide by 8 inch thick concrete channel bottom and replacing it with cobble and boulder rock substrate, constructing alternating riffles and pools and replacing concrete with predominantly rock lined side slopes.

There will now be a three year vegetation establishment monitoring period. The total construction cost is \$10 million, with funding from the GLRI (\$4.8 million), MMSD (\$5 million), and National Fish and Wildlife Foundation (\$200,000). In-kind contributions were additionally provided by the DNR, Southeastern Wisconsin Regional Planning Commission, Milwaukee Riverkeeper and Trout Unlimited Southeastern Wisconsin Chapter. —By Stacy Hron.

Walleye are one of the many fish that will benefit from the improved waterway.



New GLRI Funding Accelerates Habitat and Beach Restoration Progress

With USEPA's Great Lakes National Program Office promising \$2.5 million of Great Lakes Restoration Initiative funds to support several habitat restorations and a beach project, the Milwaukee Estuary AOC is on the cusp of an exciting acceleration of project implementation.

The Milwaukee Estuary AOC is geographically large compared to other AOCs, encompassing three tributaries – the Menomonee, Milwaukee, and Kinnickinnic Rivers – as well as Milwaukee harbor. The level of effort required to meet AOC restoration goals is correspondingly large.

Multiple partners have been working together over many years to restore and protect the health of AOC waters, and a great deal of progress has been made already.

\$2.5 million in Great Lakes Restoration Initiative funds

Building on existing efforts, area partners collaborated with DNR's AOC Coordinator to develop prioritized AOC actions ("management actions") for the "Loss of Fish and Wildlife Habitat" and "Beach Closings" beneficial use impairments.

This new funding enhances the capacity of several area partners, who already had the energy, commitment, and know-how but lacked adequate implementation resources, to undertake these management actions on an accelerated schedule. The AOC Coordinator provided support for developing proposals and is assisting partners through the project implementation.

The projects that will be supported with this latest round of GLRI AOC funds are as follows: Bay View Wetland/Grand Trunk Wetland Restoration in partnership with the City of Milwaukee Department of City Development & Port Authority; Kinnickinnic River Habitat Rehabilitation in partnership with Milwaukee Metropolitan Sewerage District (MMSD); Little Menomonee River Corridor Habitat Restoration in partnership with Milwaukee County Department of Parks, Recreation and Culture (DPRC); South Shore Park Beach and Water Quality Improvements in partnership with Milwaukee County DPRC and Kletzsch Park Dam Fish Passage in partnership with Milwaukee County DPRC and the Fund for Lake Michigan. —By Stacy Hron.

Lower Menominee River Lake Sturgeon Passage (continued from Page 3)



Sturgeon are sorted in holding tanks and carefully examined before passing upriver.



(continued from page 3) transport above the two dams. The third phase of the project—safe downstream passage at the Menominee Dam—is in progress and will be completed this year. Downstream passage of adult fish will be accomplished by a surface bypass constructed at the current location of

an abandoned fish ladder. Safe downstream passage of juvenile fish will entail modifying the turbine intake by reducing the spacing of the trash racks and guiding the fish toward the bypass. Since 2014, 108 adult sturgeon have been transported upstream, some in the spring and some in the fall. The sturgeon are transported with a truck and trailer and released upstream of the Park Mill Dam. Most of the fish passed have been implanted with acoustic transmitters in order to monitor their movements with several stationary receivers distributed over 25 river miles, from Grand Rapid dam to the Menominee River mouth. Biologists have been testing the fish lift and studying the sturgeon in order to maximize the effectiveness of the upstream passage. Stay tuned for updates! —By Laurel Last.

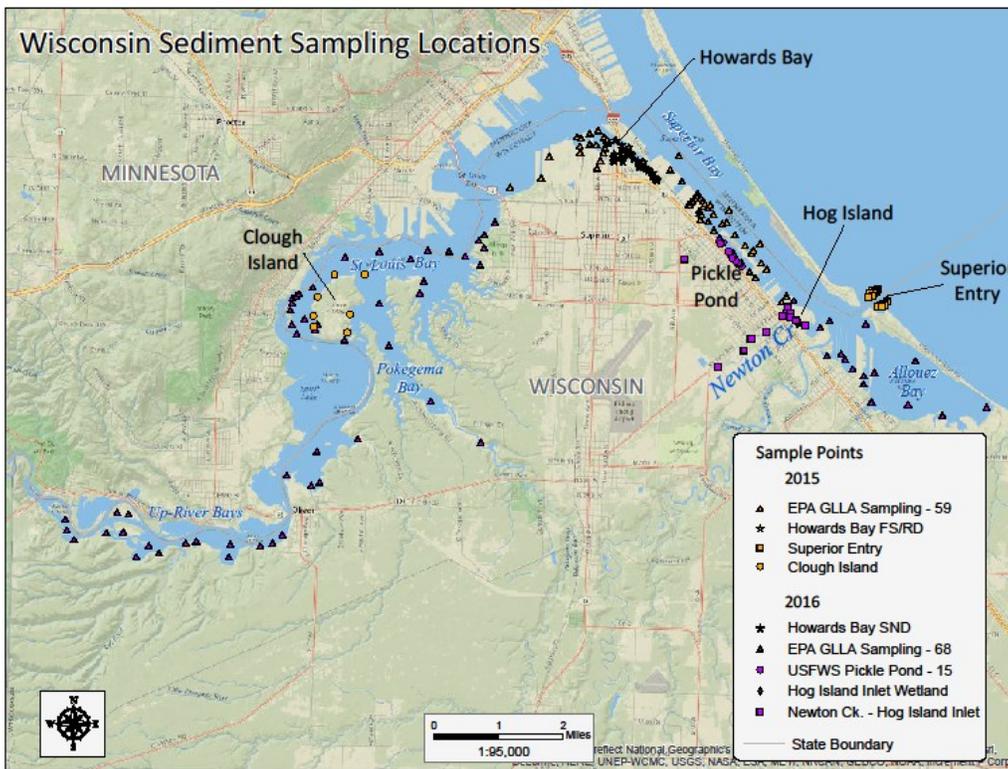
St. Louis River Sediment (continued from Page 2)

(continued from page 2) (e.g. dieldrin, organotin), and dioxin/furan congeners. Physical characteristics were also looked at including the amount of sand, silt, and clay present at a location.

DNR worked with the U.S. EPA Great Lakes National Program (GLNPO) and EPA

contractors to conduct screening level assessments using Great Lakes Legacy Act funds.

These data are now being compiled and will be used to determine if there are additional “hot spots” and to prioritize areas for further assessment or remediation. —By Joe Graham.



Tributary Study

(continued from Page 4)

(continued from page 4) area that drains into Plum Creek. They will collect soil samples from a variety of land uses, including agricultural cropland and eroding streambanks. By using trace element analysis, they will be able to distinguish anthropogenic from natural sediment loading. They will also be able to identify stream reaches with gully, bank, and channel erosion that may need to be addressed through other soil and sediment conservation practices. For more information about the project, please contact Megan O’Shea. —By Megan O’Shea.



Wisconsin DNR Office of the Great Lakes

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