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MEMO

To: Kim Walz, WDNR Office of the Great Lakes
From: Christine Ostern, Douglas County Conservationist
Re: Hog Island Project – scope of work document
Date: 27 April 2011

Hello Kim,

Attached, please find the scope of work document you requested regarding Douglas County's Hog Island restoration project for Great Lakes Protection Funding.

Please see the changes you requested at the end of the document.

We still anticipate field work to start at the beginning of May.

Please let me know if you need anything else.

I'll keep you posted as to when the Hog Island celebratory event and tour will happen – right now, we're hoping for a date in June.

Thanks!
Christine

Great Lakes Protection Fund Grant
Douglas County Project: Hog Island Habitat Restoration Project

Douglas County has been working with the Great Lakes Commission through a 3-year National Oceanic and Atmospheric Administration Great Lakes Habitat Restoration Program grant to restore habitat after remediation at the Hog Island site and other lower St. Louis River estuary sites.

Importance and Applicability of Proposal
Hog Island is a place of scenic beauty and high ecological value. Located at the "headwaters of Lake Superior," at the far western end of the lake within the city of Superior, Wisconsin, the area is regionally important both as an ecological resource and a recreational and scenic amenity. For many years the area has served as a disposal site for dredge spoils, a railway yard, and a repository for industrial byproducts. Remediation work at Hog Island/Newton Creek was completed in 2005 after a 10-year, phased, cleanup process. During the final phase involving the lower portions of Newton Creek and the Hog Island Inlet, 60,000 tons of contaminated sediment was removed. This was the first federal Great Lakes Legacy Act project in the Lower St. Louis River AOC and one of the first in the whole Great Lakes system. With remediation complete, the restoration of habitat and ecological functions at Hog Island is the next step within a broader effort to restore and improve the ecology of the Great Lakes system. The process of remediation to restoration demonstrated at Hog Island serves as a model for other AOCs in the Great Lakes.

The long term goals for Hog Island are to restore ecological processes and biodiversity; reduce threats to the long term sustainability of natural communities; and implement a compatible recreational plan for the area. The *Hog Island & Newton Creek Ecological Restoration Master Plan* (Restoration Master Plan) completed in 2007 following a multi-agency, stakeholder-driven, collaborative effort, provides a blueprint for the restoration of natural communities and ecosystem processes within these areas of the AOC (www.biohabitats.com/hogisland/index.php). Funding from the NOAA GLHRP will be used to implement priority habitat restoration actions identified in the Restoration Master Plan at Hog Island, Hog Island Inlet, Allouez Bay, and other adjoining sites in the St. Louis River AOC. See the attachments for the plan's executive summary.

During the development of the Restoration Master Plan, the 2002 *Lower St. Louis River Habitat Plan* (Habitat Plan, www.stlouisriver.org/IAhabitatplan/ habitatplan.html) was used extensively to define ecological systems relating to Hog Island, Hog Island Inlet and the Newton Creek tributary. Known or potential biological communities and targeted species of concern were also highlighted within the Restoration Master Plan. In addition, conservation, management and restoration goals and actions developed by the St. Louis River Habitat Committee were incorporated into the Restoration Master Plan to maintain consistency with existing restoration planning efforts. Other regional plans will continue to be incorporated into Hog Island restoration efforts.

The larger Hog Island/Newton Creek Restoration Master Plan is grounded in the principles of stakeholder collaboration and participation. The vision and goals of the project were defined by an array of federal and state agency representatives, in partnership with Douglas County, the City of Superior, the St. Louis River Citizen Action Committee, and local citizens and interest groups. As a result, the plan defines a cohesive collection of recommended restoration projects at the Hog Island site. Each project includes projected costs and expected restoration outcomes, and identifies agencies and organizations to lead implementation. The Restoration Master Plan also outlines a phasing plan and timeline and a process to measure success, including benchmarks. The complete Restoration Master Plan is ambitious and will be a long-term endeavor that should be revised and updated as restoration activities progress. For this funding opportunity, we have concentrated on the habitat-related restoration activities that are located either on Hog Island and adjoining shoreline, in the Hog Island Inlet, at Allouez Bay, and nearby adjoining sites located within the St. Louis River AOC.

The ecological restoration for Hog Island to be conducted through this project define specific measures for restoring ecological processes and key habitats within the Hog Island area and provides a template for the

remediation to restoration process throughout the Great Lakes watershed. In doing so, it addresses habitat BUIs in the Lower St. Louis River AOC, and furthers U.S. EPA's goal of delisting the AOC while meeting the objectives of the Habitat Plan. Hog Island, Hog Island Inlet, Newton Creek and Allouez Bay are extremely important for local and migratory fish and wildlife populations. Ecological restoration within these areas will provide essential habitat for rare, threatened and endangered species; control invasive vegetation and other threats to ecological viability; improve water and sediment quality; and provide recreation and an aesthetic amenity for local residents and visitors.

Despite the success of the remediation at Hog Island, the Legacy Act project did not include funding for the ecological restoration at the site following remediation. With the Restoration Master Plan now complete and a clear blueprint for restoration, securing funding to initiate these efforts is critical to completing the ecological restoration within this important area. Implementation of the Restoration Master Plan and other restoration activities at adjoining sites in the St. Louis River AOC as described provides for the restoration of a suite of ecological functions and biodiversity improvements that will address habitat-related BUIs, and, ultimately, result in the delisting the AOC.

Technical/Scientific Merit

The Restoration Master Plan aims to restore and/or enhance the form and function of ecosystems and habitat complexes within Hog Island and Hog Island Inlet. The St. Louis River Habitat Plan provides restoration plans for ecosystems and habitat complexes contained in the entire Lower St. Louis River project area, defined as an area roughly similar to the St. Louis River AOC encompassing parts of St. Louis and Carlton Counties, Minnesota and Douglas County, Wisconsin. The success of this endeavor is dependent upon an understanding of the current physical and biological conditions that exist on the site, and the primary drivers of ecological change. This includes a wide range of environmental attributes, from the physiographic province of western Lake Superior, northern Wisconsin and east-central Minnesota, to the larger Lower St. Louis River and Nemadji River watershed, to the specific physical conditions and plant and animal communities present on the site.

The Wisconsin Department of Natural Resources (WDNR) has compiled a wide array of information on shoreline and riparian ecosystem composition and conditions for northern Wisconsin, including the study site. At the watershed scale, the Habitat Plan provides specific ecological conditions for a variety of habitat types in the City of Superior harbor and minor tributaries. This includes spatially referenced inventories of bird species; fish; aquatic macro invertebrates; rare, threatened, endangered species; vegetation communities; and individual plant species. It is the primary reference for biological communities within Hog Island and Hog Island Inlet. Finally, an array of information on the project site was collected during the sediment remediation project.

Hog Island and Hog Island Inlet are ecologically connected to their surrounding landscapes through aquatic, terrestrial and bird migration routes. Fish and other aquatic organisms that inhabit the greater Lake Superior and Superior harbor waters have direct access to Superior harbor and Hog Island inlet and shoreline. The only barrier to migration into the inlet is water depth, which will preclude the use of these areas by larger fish species with the exception of Lake Sturgeon. Hog Island lies along the Mississippi and Atlantic flyways and provides important foraging and breeding habitat for many migratory bird species. The Newton Creek channel and riparian corridor provides linkages from the shoreline to upland and wetland areas and to the Nemadji River corridor immediately to the south.

More than 310 bird species have been identified in the Duluth/Superior harbor area, many of which would likely frequent the Hog Island site. Hog Island is one of the most heavily used areas of the harbor for non-colonial nesting birds. While varieties of shore, marsh and water birds reside in or pass through the harbor area, colonial nesting birds (gulls, terns, plovers and herons) comprise the most abundant and sensitive breeding birds in the area. Migratory waterfowl utilize the harbor for breeding, feeding and rest during migration. While few birds over-winter in the harbor, the snowy and great horned owls, as well as a local population of ring-necked pheasant are year-round residents. The adjacent Wisconsin Point area is an exceptional feeding, resting and nesting site for numerous species of migratory birds. Federally listed birds

that have resided in or pass through the area include the bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*).

Despite the industrial nature of the Duluth-Superior harbor area, diverse habitat in the vicinity supports abundant wildlife. Hog Island Inlet provides access from Superior Bay to a shallow embayment that receives the flow of Newton Creek and is connected to Superior Harbor and Lake Superior through a narrow, shallow straight on the northern end of Hog Island. The inlet was formed by the creation of Hog Island from dredged materials in the early 1900s. It was not dredged until the recent sediment remediation and retains a shallow depth that supports a large system of emergent wetlands and other habitats. The wetlands, beaches and open waters support a complex ecological system, including diverse populations of fish, shellfish, aquatic insects, and myriad bird and other wildlife.

In comparison to Hog Island, Hog Island Inlet has related but distinct ecological drivers that control the composition and function of natural communities in the embayment. Lake level fluctuations associated with the seiche effect define the distribution of wetland communities and influence fish and wildlife populations. Other hydrologic variables, including discharge and sedimentation from Newton Creek, and the long-term effects of climate change, can also greatly affect ecological conditions in the embayment. The Habitat Plan describes the shallow, sheltered, clay-influenced bay existing at the Hog Island Inlet site as one of the most rare and productive types in the Lower St. Louis River estuary.

The shoreline of Hog Island and the "neck" that connects Hog Island to the Superior shoreline is composed of sandy beaches, beach grasses and large patches of emergent wetland vegetation. The western Superior city shoreline that runs parallel to the Burlington Northern railroad properties is composed of steep riprap and railroad berms with numerous shallow areas of mudflats and wetland extending into the inlet. The Ogdensburg Pier, which extends into Superior harbor along the northwestern end of the inlet, has a steep, narrow shoreline buffer composed of beaches, grasses and shrubs, with a few trees. Riprap and bulkhead banks exist in some areas along the pier.

Key elements of the Restoration Master Plan include the restoration of natural landscapes to attain self-sustaining, reproducing, native populations of species and assemblages; ecosystem resiliency; biodiversity; and the mitigation of threats to the ecosystems. Using a three-part approach, the Restoration Master Plan recommends using 1) ecological targets and references defined in the Habitat Plan; 2) regional ecosystems as references for ecosystem components slated for restoration; and 3) existing literature and tools to determine desired ecosystem attributes for restored habitat complexes. The Restoration Master Plan will guide restoration efforts in accordance with the vision developed in the planning process and an array of guiding principles (see section 2.2 of the Restoration Master Plan for a complete list).

2011 – 2012 Restoration Activities

Action 1: Maintenance of Vegetative Buffers

Conduct maintenance activities for 18 acres of vegetative buffers restored at Hog Island, Loon's Foot Landing, and Allouez Bay during year-two, including monitoring and controlling invasive species using mechanical/organic/biological methods, maintaining population of beetles to control purple loosestrife, weeding, and re-planting native species if necessary.

Action 2: Riparian Restoration - Establish buffers along Newton, Bear, and Bluff Creeks

Plan, conduct site preparation, planting, protection, and maintenance of 2 to 8 acres of riparian buffers along the Newton Creek, Bluff and Bear Creeks. Along the Newton Creek corridor, native conifer species such as white spruce will planted to both restore habitat and help remove and control of invasive species in the riparian buffer area. Along Bluff and Bear Creeks (tributaries to Allouez Bay), riparian habitat will be restored using native shrub and tree species, with an emphasis on conifer species as recommended in regional conservation plans.

Action 3: Restore Emergent Vegetation and Wild Rice

Continuing work from Year 2, partners will work cooperatively with the Great Lakes Indian Fish and Wildlife Commission to restore 2 acres of native emergent vegetation and wild rice. Successful restoration of native

species in disturbed areas will also provide and opportunity for long-term control of invasive species. Because Phragmites is of greater local concern than invasive Typha, if Phragmites is discovered through other concurrent local inventories, priority for control through restoration of native emergent vegetation will be granted to Phragmites rather than Typha.

Action 4: Replace/Retrofit Culverts

Design and replace 2 sub-standard culverts coordinating with Town of Parkland Public Roads Department, Douglas County Highway Department, and the U.S. Fish and Wildlife Service, design and replace sub-standard culverts in the Allouez Bay watershed to restore hydrology, improve habitat for fish and wildlife, and "slow-the-flow" in the watershed that is degrading water quality and habitat.

Action 5: Wetland Restoration

Approximately 20 acres of wetlands will be restored in the SLR AOC sub-watersheds to restore natural hydrologic functions on the landscape and mitigate stream channelizing runoff. Priority will be given to projects in the Allouez Bay sub-watershed. The abundance of retired agricultural land and the presence of heavy clay soils on the Lake Superior clay plain facilitate the cost effective restoration of palustrine emergent wetlands. Hydrology is restored by plugging ditches and digging shallow scrapes at old field sites.

Action 6: Restore Submergent Aquatic Vegetation

Approximately 2 acres of native submergent aquatic vegetation will be restored to the remediated portions of the Hog Island inlet (the same areas where aquatic habitat structures are placed in year-two), by placing seed and rootstock in weighted mesh bags to temporarily anchor seed and stock to bottom sediments.

Action 7: Restoration/Enhancement of Piping Plover Nesting Habitat

In collaboration with WDNR, USACE, USFWS, and City of Superior, design, plan, and contract for clearing of trees, construction of rock groins to trap sand moving across the littoral zone, depositing dredged material as beach nourishment and covering with sand to restore and enhance 3 acres of piping plover habitat along Wisconsin Point/Allouez Bay.

Hog Island Habitat Restoration Project: Year 3 (2011) Approved Amended Activities

Activity		Total Acres	Timeline	Est. Total Cost ($)	Grt. Lks. Pro. Fund ($)
1	Maintenance – vegetative buffers	18	2011-2012	37,350	-
2	Riparian restoration (Newton Cr.)	2 - 8	2011-2012	121,000	-
3	Emergent vegetation & wild rice	2	2011-2012	52,000	-
4	Replace/retrofit culverts	2 culverts	2011-2012	53,000	20,000
5	Wetland restoration	20	2011-2012	35,500	10,000
6	Submergent aquatic vegetation	2	2011-2012	51,000	
7	Piping plover habitat restoration	3	2011-2012	30,500	20,000
TOTAL		**47 - 53**		**380,350**	**50,000**

HI - Hog Island AB - Allouez Bay

Specifically, Douglas County will use a total of $50,000 of Great Lakes Protection Funding to accomplish the following activities:

Wetland Restoration

Purchase of materials and restoration of approximately 3 acres of wetlands in the SLR AOC sub-watersheds to restore natural hydrologic functions on the landscape and mitigate stream channelizing runoff. Great Lakes Protection Fund: $10,000

Replace/Retrofit Culverts

Purchase of materials and replacement of 1 sub-standard culvert in the Allouez Bay/Newton Creek watersheds to restore hydrology, improve habitat for fish and wildlife, and "slow-the-flow" in the watershed that is degrading water quality and habitat. Great Lakes Protection Fund: $20,000

Restoration/Enhancement of Piping Plover Nesting Habitat

Purchase of materials and restoration and/or enhancement of piping plover nesting habitat located along Wisconsin Point/Allouez Bay in collaboration with ad-hoc piping plover habitat management team comprised of staff from the following organizations: UWS-LSRI, LS NERR, WDNR, USACE, USFWS, City of Superior, and St. Louis River Alliance. Great Lakes Protection Fund: $20,000