Hog Island / Newton Creek Ecological Restoration

Ecological Restoration Plan Process:

- ☑ Kick-off meeting (Sept 12th, 2006)
- ☑ Data collection
  - ☑ Review of existing datasets (LSLRHP, WDNR data, GIS data, SEH remediation data, USACE restoration analyses, etc.)
  - ☑ Field reconnaissance in October, 2006
    - 1 day spent on Hog Island
    - 1 day spent in Newton Creek
  - Data analysis (ongoing…)
  - HOG ISLAND PUBLIC WORKSHOP (today!!!)
  - Draft Hog Island and Newton Creek Ecological Restoration Plan
  - 2nd public workshop (present and receive comments on Draft Report).
  - Final Hog Island and Newton Creek Ecological Restoration Plan

Biohabitats

Hog Island / Newton Creek Ecological Restoration

Existing Conditions Data – History

- Fond Du Lac band of Chippewa Indians had a village near present-day Superior City.
- 1854 – LaPointe treaty signed between US government and Chippewa tribes, opening are to settlement.
- 1854 – First road in area built.
- By 1857, Superior has a population of 2,000 people, then declines to 500 people that year.
- 1855 – Commercial shipping begins, Superior established as a harbor.
- 1870 – First Railroad completed.
- 1887 – City of Superior recognized as a city – period of rapid growth. By 1893, population is 35,000 people.

Biohabitats

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Existing Conditions Data – History

- Major dredging and shoreline reconstruction activities took place between 1870 and 1920. By 1902, the harbor had 17 miles of shipping channels excavated to a standard depth of 20 feet, and by 1960, most channels had been dredged to a depth of 27 feet.
- 1919 – 1935 – Hog Island created from dredge spoils.
- Murphy Oil facility constructed in 1950.
- 1997 – After a thorough study by WDNR, remediation efforts in Hog Island and Newton Creek begin with the clean-up of contaminated sediments in the impoundment off of Stinson Ave and a 780-foot stretch of Newton Creek near the headwaters (Segment A).
- 2003 – Contaminated sediments in Newton Creek Segments B through K are removed.
- 2005 – Contaminated sediments in the last stretch of Newton Creek (Segment K) and Hog Island inlet are removed, completing the remediation effort.

Biohabitats

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Existing Conditions Data – Biological Communities

- WDNR and Lower St Louis River Habitat Plan have well-defined habitat types and biological community assemblages in this area.

  Habitat types in Hog Island project area:

  a) Estuarine aquatic habitats

  - Industrially-influenced bays
  - Clay-influenced tributaries
  - Lower estuarine dredged channel (adjacent)
  - Lower estuary industrial harbor flats (adjacent)

  b) Vegetative communities

  - Great Lakes coastal wetlands complex emergent marsh
  - Aspen-balsam-poplar lowland & Boreal-spruce-aspen forest
  - Shrub swamp – alder thickets
  - Beach / Great Lakes dune
  - Disturbed sandy dry meadow

Biohabitats

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Existing Conditions Data – Biological Communities

- Each of these habitat types supports native and exotic fish, breeding and migratory bird, and other wildlife communities.
- WDNR and the Lower St Louis River Habitat Plan have documented this inter-relationship between habitat type and wildlife community in the estuarine reaches.
- During the field reconnaissance effort, habitat types and vegetation communities previously mapped by WDNR and LSLRHP were verified.
- Newton Creek is largely devoid of aquatic organisms, although selected tolerant macroinvertebrate taxa were recorded by WDNR during bioassays pre-remediation effort.

Biohabitats

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Existing Conditions Data – Ecological Landscape

- Hog Island is situated along the Mississippi flyway and proximate to the Atlantic flyway, making it valuable for migratory as well as breeding bird habitat.
- Nearby Wisconsin Point is currently defined as an Important Bird Area by Bird Life International and Audubon Society.
- Unlike the Nemadji River, which has a nearly continuous riparian forest running along the river channel, Newton Creek has patches of forested lands and shrublands, but is generally ecologically disconnected from larger landscape elements from the surrounding urban and industrial developments.
- Numerous culverts and barriers restrict fish passage in the Newton Creek channel.
- Fish have access to the Hog Island embayment from Superior Bay and Allouez Bay.

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Existing Conditions Data – Geophysical Elements

HYDROLOGY

- Hydrology in Newton Creek controlled by Murphy Oil outfall. Very little variation in annual flow, due to the small contribution from stormwater runoff (watershed size only 1.3 square miles).
- Newton Creek channel shows little geomorphic complexity. Sediments are rarely, if ever, mobilized. This diminishes the biodiversity of aquatic and riparian organisms.
- The Newton Creek channel is constricted by railroad berms and urban development in the lower reaches.
- Seiches, which can influence water surface elevation in the Hog Island embayment by as much as 2 feet, have a profound effect upon the distribution of wetland vegetation and the biological communities that utilize wetlands.

Biohabitats

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Existing Conditions Data – Geophysical Elements

GEOLOGY & SOILS

- Geology of the Newton Creek area is dominated by glacial till, composed of red clay, silt, and sand. Easily erodable. No bedrock outcrops in the watershed.
- Soils on Hog Island consist of sandy dredge materials, with very low to low organic content (<1.5%), low cation exchange capacity (<4 meq/100 g), and pH of 6-6.5.
- Soils along Newton Creek are composed of red clay and clay-loam, with medium to high organic content (2-6%), medium cation exchange capacity (~30 meq/100g), and slightly basic pH of 7.0 – 7.2.

Biohabitats

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Existing Conditions Data – Human Uses

Industrial & Commercial:

- Upper half of Newton Creek watershed dominated by the Murphy Oil operation, active since 1950.
- Railroad berms intersect Newton Creek in many areas, and Burlington Northern Santa Fe railroads run along the shoreline of Superior Bay.
- A commercial district runs along parts of 2nd Ave and between 20th and 24th Streets and 4th and 6th Ave.

Municipal:

- Urban and suburban development in the lower half of the watershed. Mostly low density. Roads, rooftops, pavement, and other impervious surfaces cover approximately 10% of the watershed.

Biohabitats

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Existing Conditions Data – Human Uses

Recreation:

- The Osaugie Trail runs along the shoreline, providing the last human-use feature between Superior City and Hog Island.
- Hog Island is protected as a Special Use District by City of Superior Parks and Rec.
- Hog Island is designated as a City of Superior archery hunting site.
- Loon's Foot Landing boat launch provides boat access adjacent to project area.
- A bird watching platform and foot-trail connector to the Osaugie Trail currently provides visual access to the Island.
- City of Superior is planning a trail along 24th Ave to Bardon, which would allow recreational access into the upper Newton Creek watershed.

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Existing Conditions Data – Threats / Impairments

INVASIVE SPECIES

- Unintentionally introduced through ship ballast waters, or intentionally as ornamental plants.
- Aquatic invaders include the Eurasian ruffe, Zebra mussel, rusty crayfish, three spine stickleback, and the round goby.
- Many of these invasive fish were found in Hog Island inlet during the 2005 remediation effort. Crayfish (not a 100% positive ID on the rusty crayfish species) were seen in Newton Creek during the field reconnaissance in October 2006.
- There is still a limited understanding of the degree of impact many of these species have on native populations.
- Invasive plant species include phragmites (large stands in the Hog Island embayment), reed canary grass, hybrid cattail, and garlic mustard. Purple loosestrife likely to exist but not confirmed.

Biohabitats

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Existing Conditions Data – Threats / Impairments

WATER QUALITY

- Elevated levels of nutrients in Newton Creek, including areas of low dissolved oxygen (DO < 5 mg/l).
- Stormwater runoff from adjacent urban / suburban areas.
- Lack of ecological flows in Newton Creek.
- Surface water quality may exceed standards when contaminated sediments (in the bed or banks) are disturbed.

Biohabitats

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Existing Conditions Data – Threats / Impairments

SEDIMENT CONTAMINATION

- Contaminants include Petroleum byproducts, including polyaromatic hydrocarbons (PAHs), lead, diesel range organics (DROs), ammonia, oil and grease.
- Sampling pre-remediation by WDNR in 1993 and 1994 indicated contaminant levels harmful to aquatic life in Newton Creek and portions of the Hog Island inlet.
- Bioassays (macroinvertebrate sampling) confirmed that Newton Creek and the mouth of the creek at Hog Island inlet demonstrate acute and chronic toxicity to organisms. Central and western portion of the inlet also demonstrated severe ecological impacts.
- Study concluded that the wetland areas in the inlet may be suffering some ill effects from Newton Creek contamination, but not at severe levels.
- Post-remediation sediment quality data not yet available.

Biohabitats

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Existing Conditions Data – Threats / Impairments

HUMAN ACCESS AND RECREATION

- Hog Island currently supports an informal foot trail network in the open meadows. There is evidence of use for hunting; blinds in the wetlands areas and litter and debris in places.
- Newton Creek has informal foot trails and stream crossings in the upper watershed. Level of impact is currently very small.
- Current level of recreation / human access appears to be sustainable. An increase in human uses may become ecologically harmful.

URBAN / SUBURBAN DEVELOPMENT

- Direct displacement of habitat assemblages and natural communities.
- Altered hydrology.
- Pollution from point and non-point sources.

Biohabitats

Hog Island - Congruence with Existing Plans

Lower St Louis River Habitat Plan

- Health and composition of estuarine natural communities in Hog Island and Newton Creek area characterized.
- Threats to those “conservation targets” identified.
- Conservation and restoration goals for identified habitat complexes, species assemblages, and specific species.
- Specific strategies to mitigate threats.
- Indicators of success.

** Most of this is directly applicable to the project site, although the alluvial / colluvial sections of Newton Creek channel and watershed are ***not*** included in habitat characterization.

Biohabitats