



THREATENED & ENDANGERED SPECIES SURVEY REPORT

for

STONY & CELERON ISLANDS
Stony Island – T4S, R11E, S21-22, 27-28;
Celeron Island – T5S, R11E, S6-7,
Grosse Ile Township, Wayne County, Michigan

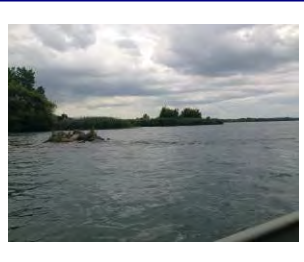
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Field Dates: April 23-26, May 20, July 16 & 28, August 25, &
September 4, 2014

Report Date: September 5, 2014



**2014 STONY & CELERON ISLANDS
THREATENED & ENDANGERED SPECIES SURVEY REPORT**
Grosse Ile Township, Wayne County

September 5, 2014

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
1.0 INTRODUCTION.....	2
2.0 MNFI NATURAL HERITAGE DATABASE AND USFWS COUNTY LIST REVIEW.....	2
3.0 STUDY AREA DESCRIPTIONS.....	5
4.0 SURVEY METHODOLOGY.....	6
5.0 SURVEY RESULTS.....	7
6.0 CONCLUSIONS AND RECOMMENDATIONS.....	16

APPENDICES

- APPENDIX A. PROJECT LOCATION MAP
- APPENDIX B. PROJECT AREA HABITAT MAPS
- APPENDIX C. COMPREHENSIVE T&E DATABASE RESULTS
- APPENDIX D. SITE PHOTOGRAPHS
- APPENDIX E. VEGETATION SPECIES LISTS

EXECUTIVE SUMMARY

This executive summary should not be used as an isolated document. It must be understood in the context of the entire report and serves only as a summary of the survey findings.

Environmental Consulting & Technology, Inc. (ECT) completed species-specific threatened and endangered species surveys within the proposed work areas for the Stony and Celeron Islands Habitat Restoration Projects on April 23-26, May 20, and July 16-17 and 23-24, 2014 (fish), July 28 and September 4, 2014 (plants and terrestrial wildlife), and August 25, 2014 (mussels). Stony and Celeron Islands occur within the Detroit River in Grosse Ile Township, Wayne County, Michigan (Stony Island – T4S, R11E, S21-22, 27-28; Celeron Island – T5S, R11E, S6-7). Target species were derived from a review of the project locations and adjacent Sections within a 1.5-mile radius against known element occurrences recorded in the Michigan Natural Features Inventory (MNFI) natural heritage database, accessed on April 3, 2014, and the U.S. Fish and Wildlife Service (USFWS) Wayne County species list, revised December 2013. Target species included a total of seven plant species, four for Stony Island and seven for Celeron Island, and a total of 27 wildlife species, 19 for Stony Island and 24 for Celeron Island. This report documents ECT's findings for all 34 target species.

Considering the plant target species, no individuals of and little to no suitable habitat for arrowhead, goldenseal, prairie white-fringed orchid, sedge, and wild hyacinth were observed within the proposed project areas on Stony and Celeron Islands. Although American lotus was not observed on Stony Island, this species was observed in a backwater marsh associated with the northern islet of Celeron Island, north of the proposed project area. Several clusters of trailing wild bean were observed along the old railroad grade on Stony Island. No individuals and very low quality habitat for this target species was observed on Celeron Island. For wildlife target species, no individuals of and little to no suitable habitat for common tern, least bittern, russet-tipped clubtail, and smallmouth salamander were observed within the proposed project areas on Stony and Celeron Islands. Additionally, no target fish or mussel species were found during sampling surveys for either island. ECT did not observe any bald eagles or their nests within or adjacent to the proposed project work areas on either island. However, numerous nests of great blue herons were observed on Stony Island in an active rookery within the proposed project area. Eastern fox snake is generally known to occur on both islands and assumed to be present within the proposed project areas. ECT did not observe eastern massasauga on either island, although both islands provide suitable habitat in general. However, since this species is not a strong swimmer, it is very unlikely that a viable population of this species occurs on either island. ECT found that suitable summer habitat of moderate quality for both bat species is present within the proposed project areas on Stony and Celeron Islands. Since protective measures are feasible to avoid adverse impacts to the snake and bat target species, extensive species-specific surveys were unnecessary.

Based on negative species-specific and/or suitable habitat survey results, ECT concludes that the proposed project will have no effect on the vast majority of plant and wildlife target species. For the remaining target species, ECT has recommended protective measures in order to conclude that the proposed projects may affect but are not likely to adversely affect American lotus, the heron rookery, eastern fox snake, eastern massasauga, Indiana bat, and northern long-eared bat. Since no adverse impacts to state listed species are anticipated with the implementation of recommended protective measures, correspondence with the Michigan Department of Natural Resources (MDNR) Wildlife Division and T&E permitting for state listed species are not recommended. No adverse impacts to federally listed species are anticipated with the implementation of recommended protective measures outlined in this report. However, since these projects are federally funded, ECT recommends that informal consultation with the USFWS be initiated per Section 7 of the Endangered Species Act to confirm their concurrence with 1) proposed protective measures for the heron rookery on Stony Island under the jurisdiction of the Migratory Bird Treaty Act and 2) ECT's conclusions that the proposed project activities will have no effect on federally listed species on either island.

1.0 INTRODUCTION

The Friends of the Detroit River requested Environmental Consulting & Technology (ECT) to review the Stony and Celeron Islands project areas for potential impacts to threatened and endangered (T&E) species as part of the Detroit River Area of Concern - Stony and Celeron Islands Habitat Restoration Projects. Stony and Celeron Islands occur within the Detroit River in Grosse Ile Township, Wayne County, Michigan (Stony Island – T4S, R11E, S21-22, 27-28; Celeron Island – T5S, R11E, S6-7). Refer to Appendix A for a site location map. The proposed project involves shoal construction and depressional habitat creation within the Detroit River 1) northwest and southwest of Stony Island and 2) south and southeast of Celeron Island. The islands are currently not developed or managed for human use or recreation. Terrestrial project activities may include temporary stockpiling/storage of construction materials and equipment, existing vegetation management, and placement of habitat structures to improve herpetofauna habitat. This report documents the results of ECT's T&E database review and suitable habitat and species-specific surveys conducted on April 23-26, May 20, and July 16-17 and 23-24, 2014 (fish), July 28 and September 4, 2014 (plants and terrestrial wildlife), and August 25, 2014 (mussels) within the location of proposed construction and restoration activities. Refer to Appendix B for maps of proposed project activities and observed habitat types for each island.

2.0 MNFI NATURAL HERITAGE DATABASE AND USFWS COUNTY LIST REVIEW

Michigan Natural Features Inventory's (MNFI) continuously updated natural heritage database is a comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features, referred to as "element occurrences." Records in the database indicate that a qualified observer has documented the presence of T&E species or special natural features. The absence of records in the database for a particular site does not preclude the potential presence of T&E species or special natural features; it may mean that the site has not yet been surveyed or that element occurrence observations have not yet been reported to MNFI. Furthermore, the U.S. Fish and Wildlife Service (USFWS) publishes a county distribution list of federally-listed threatened, endangered, proposed, and candidate species. This list indicates the potential for T&E species to be present within the county; however, unlike the MNFI database, this list does not necessarily indicate documented presence of T&E species. Other species and unique natural features may be present that have not been recorded in the MNFI database or listed by the USFWS. The only way to obtain a definitive statement on the status of T&E species or special natural features is to have a competent biologist perform a complete field survey.

Under Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection, "a person shall not take, possess, transport, ...fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from the Michigan Department of Natural Resources (MDNR) Wildlife Division. Under the Endangered Species Act of 1973, "the term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." A person shall not take a federal endangered or threatened species without first receiving an Incidental Take Permit from the USFWS. The responsibility to protect endangered and threatened species is not limited to those species listed in this report.

ECT reviewed the location of the project areas and adjacent Sections within a 1.5-mile radius of the proposed project activities against known element occurrences recorded in the MNFI database, accessed on April 3, 2014, and the USFWS Wayne County species list, revised December 2013. ECT reviewed the list of all potential element occurrences and compiled the following Tables 1-3 of only those T&E species that have the potential to be impacted by the proposed project, based on physical site characteristics observable during desktop analysis. A comprehensive listing of all element occurrences has been provided in Appendix C. As a specific example, Rufa red knot (*Calidris canutus rufa*) is primarily an ocean coastal migrant, and ECT did not consider it as a potential target species, despite its presence on the USFWS Wayne County list. The proposed project areas do not involve beaches and on-island construction and restoration activities involving heavy equipment will not occur during the bird's migratory window from May 1st through September 30th due to protective measure time restrictions for listed snake and bat species described below.

Table 1. Stony Island MNFI Potential T&E Species

Common Name	Scientific Name	Status	Recommended Survey Period
Bald eagle	<i>Haliaeetus leucocephalus</i>	State Special Concern; Federal Protected	1 st week of April to 4 th week of June
Channel darter	<i>Percina copelandi</i>	State Endangered	1 st week of April to 4 th week of September
Common tern	<i>Sterna hirundo</i>	State Threatened	1 st week of May to 4 th week of July
Deertoe	<i>Truncilla truncata</i>	State Special Concern	1 st week of April to 1 st week of October
Eastern fox snake	<i>Pantherophis gloydi</i>	State Threatened	1 st week of May to 4 th week of June
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>	State Special Concern, Federal Candidate	1 st week April to 2 nd week September
Goldenseal	<i>Hydrastis canadensis</i>	State Threatened	3 rd week of April to 2 nd week of September
Hickorynut	<i>Obovaria olivaria</i>	State Endangered	1 st week of April to 1 st week of October
Indiana bat	<i>Myotis sodalis</i>	State Endangered; Federal Listed Endangered	May 15 th through August 15 th
Kidney shell	<i>Ptychobranthus fasciolaris</i>	State Special Concern	1 st week of April to 1 st week of October
Lake sturgeon	<i>Acipenser fulvescens</i>	State Threatened	3 rd week of April to 4 th week of August
Northern riffleshell	<i>Epioblasma torulosa rangiana</i>	State Endangered; Federal Listed Endangered	1 st week of April to 1 st week of July
Purple wartyback	<i>Cyclonaias tuberculata</i>	State Threatened	1 st week of April to 1 st week of October
Rainbow	<i>Villosa iris</i>	State Special Concern	1 st week of April to 1 st week of October
Round hickorynut	<i>Obovaria subrotunda</i>	State Endangered	1 st week of April to 1 st week of October
Sedge	<i>Carex squarrosa</i>	State Special Concern	4 th week of May to 4 th week of June
Silver chub	<i>Macrhybopsis storeriana</i>	State Special Concern	1 st week of April to 4 th week of September
Snuffbox	<i>Epioblasma triquetra</i>	State Endangered; Federal Listed Endangered	1 st week of April to 4 th week of October
Trailing wild bean	<i>Strophostyles helvula</i>	State Special Concern	4 th week of July to 4 th week of September
Wavyrayed lampmussel	<i>Lampsilis fasciola</i>	State Threatened	1 st week of April to 1 st week of October

Table 2. Celeron Island MNFI Potential T&E Species

Common Name	Scientific Name	Status	Recommended Survey Period
American lotus	<i>Nelumbo lutea</i>	State Threatened	1 st week of June to 4 th week of October
Arrowhead	<i>Sagittaria montevidensis</i>	State Threatened	1 st week of August to 1 st week of September
Bald eagle	<i>Haliaeetus leucocephalus</i>	State Special Concern, Federal Protected	1 st week of April to 4 th week of June
Black sandshell	<i>Ligumia recta</i>	State Endangered	1 st week of April to 1 st week of October
Channel darter	<i>Percina copelandi</i>	State Endangered	1 st week of April to 4 th week of September
Deertoe	<i>Truncilla truncata</i>	State Special Concern	1 st week of April to 1 st week of October
Eastern fox snake	<i>Pantherophis gloydi</i>	State Threatened	1 st week of May to 4 th week of June
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>	State Special Concern, Federal Candidate	1 st week April to 2 nd week September
Eastern pondmussel	<i>Ligumia nasuta</i>	State Endangered	1 st week of April to 1 st week of October
Elktoe	<i>Alasmidonta marginata</i>	State Special Concern	1 st week of April to 1 st week of October
Goldenseal	<i>Hydrastis canadensis</i>	State Threatened	3 rd week of April to 2 nd week of September
Hickorynut	<i>Obovaria olivaria</i>	State Endangered	1 st week of April to 1 st week of October
Indiana bat	<i>Myotis sodalis</i>	State Endangered; Federal Listed Endangered	May 15 th through August 15 th
Kidney shell	<i>Ptychobranthus fasciolaris</i>	State Special Concern	1 st week of April to 1 st week of October
Lake sturgeon	<i>Acipenser fulvescens</i>	State Threatened	3 rd week of April to 4 th week of August
Least bittern	<i>Ixobrychus exilis</i>	State threatened	3 rd week of May to 4 th week of June
Northern riffleshell	<i>Epioblasma torulosa rangiana</i>	State Endangered; Federal Listed Endangered	1 st week of April to 1 st week of July
Prairie white fringed orchid	<i>Plantanthera leucophaea</i>	State Endangered; Federal Listed Threatened	3 rd week of June to 3 rd week of July
Pugnose minnow	<i>Opsopoeodus emiliae</i>	State Endangered	1 st week of April to 4 th week of September
Purple wartyback	<i>Cyclonaias tuberculata</i>	State Threatened	1 st week of April to 1 st week of October
Rainbow	<i>Villosa iris</i>	State Special Concern	1 st week of April to 1 st week of October
Round hickorynut	<i>Obovaria subrotunda</i>	State Endangered	1 st week of April to 1 st week of October
Russet-tipped clubtail	<i>Stylurus plagiatas</i>	State Special Concern	1 st week of June to 4 th week of September
Sedge	<i>Carex squarrosa</i>	State Special Concern	4 th week of May to 4 th week of June
Slippershell	<i>Alasmidonta viridis</i>	State Threatened	1 st week of April to 1 st week of October
Smallmouth salamander	<i>Ambystoma texanum</i>	State Endangered	3 rd week of February to 4 th week of March
Trailing wild bean	<i>Strophostyles helvula</i>	State Special Concern	4 th week of July to 4 th week of September
Wavyrayed lampmussel	<i>Lampsilis fasciola</i>	State Threatened	1 st week of April to 1 st week of October
Wild hyacinth	<i>Camassia scilloides</i>	State Threatened	1 st week of May to 4 th week of June

Table 3. Wayne County USFWS Potential T&E Species

Common Name	Scientific Name	Status	Recommended Survey Period
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>	State Special Concern, Federal Candidate	1 st week April to 2 nd week September
Indiana bat	<i>Myotis sodalis</i>	State Endangered; Federal Listed Endangered	May 15 th through August 15 th
Northern long-eared bat	<i>Myotis septentrionalis</i>	Federal Proposed Endangered	May 15 th through August 15 th
Northern riffleshell	<i>Epioblasma torulosa rangiana</i>	State Endangered; Federal Listed Endangered	1 st week of April to 1 st week of July
Prairie white-fringed orchid	<i>Platanthera leucophaea</i>	State Endangered; Federal Listed Threatened	3 rd week of June to 3 rd week of July
Rayed Bean	<i>Villosa fabalis</i>	State Endangered, Federal Listed Endangered	1 st week of April to 1 st week of October

Plant Species

The potential exists for four and seven plant species to occur within the area of proposed project impacts for Stony and Celeron Islands, respectively: a sedge species and trailing wild bean (State Special Concern); American lotus, arrowhead, goldenseal, and wild hyacinth (State Threatened); and prairie white-fringed orchid (State Endangered; Federal Listed Threatened).

Animal Species

The potential exists for 27 animal species to occur within the areas of proposed project impacts, 19 for Stony Island and 24 for Celeron Island, respectively: bald eagle, deertoe, eastern massasauga, elktoe, kidney shell, rainbow, russet-tipped clubtail, and silver chub (State Special Concern); common tern, eastern fox snake, lake sturgeon, least bittern, purple wartyback, slippershell, and wavyrayed lampmussel (State Threatened); black sandshell, channel darter, eastern pondmussel, hickorynut, Indiana bat, northern riffleshell, pugnose minnow, rayed bean, round hickorynut, smallmouth salamander, and snuffbox (State Endangered); and northern long-eared bat (Federal Proposed Endangered). Four of these species (Indiana bat, northern riffleshell, rayed bean, and snuffbox) are also Federal Listed Endangered. Eastern massasauga is a Federal Candidate species.

State special concern, federal candidate and proposed listed species, and rare natural communities are not protected under state or federal endangered species legislation, but recommendations regarding their protection have been provided where appropriate. Protection of these species and unique habitats now may prevent species from declining to the point of being listed as threatened or endangered in the future.

3.0 STUDY AREA DESCRIPTIONS

Stony and Celeron Islands are located within the Detroit River, north of its confluence with Lake Erie. The physiography of both islands is derived from lacustrine sand and gravel as identified from the Quaternary Geology of Michigan. Only the portions of the islands within the proposed projects' footprints were intensively surveyed. See Appendix B Project Area Habitat Maps and study area descriptions below:

Stony Island

The Stony Island project area consists of scrub-shrub and forested communities along an abandoned railroad grade, lowland floodplain forest, and emergent wetland. All plant communities have been disturbed by past land use on the island, including railroad, overhead electric utility line, and quarry activities, and have been degraded by invasion of non-native species. The abandoned railroad grade is dominated by an overstory of northern hackberry (*Celtis occidentalis*), an understory of Amur honeysuckle (*Lonicera maackii*), and a groundcover of garlic mustard (*Alliaria petiolata*). The scrub-shrub community lacks an overstory, contains an understory dominated by red-osier and gray dogwoods (*Cornus sericea* & *C. foemina*), and has a mixed groundcover community with large amounts of garlic mustard. The floodplain forest community is dominated by eastern cottonwood (*Populus deltoides*) in the overstory;

an understory of northern hackberry, box elder (*Acer negundo*), and gray dogwood; and a groundcover of garlic mustard. The emergent wetland south of the abandoned railroad grade and floodplain forest is primarily vegetated by common reed (*Phragmites australis*), but more diversity was observed on the drier edge, including common species like gray dogwood, swamp rose (*Rosa palustris*), and riverbank grape (*Vitis riparia*). A great blue heron rookery was observed in the center of Stony Island, although no element occurrence has been recorded in MNFI's natural heritage database. While this rookery was believed to occupy only areas north of the railroad grade, ECT observed active nests to the south of the railroad grade in the north central portion of the project area. The land cover types adjacent to the project area are floodplain forest, wet meadow, scrub-shrub, and emergent wetland to the north, and the Detroit River to the south, east, and west. See Appendix B Stony Island Habitat Map, Appendix D for site photographs, and Appendix E Tables 1-5 for species lists of the documented plant communities.

Celeron Island

The Celeron Island project area consists of lowland floodplain forest and emergent wetland. Both plant communities have been degraded by invasion of non-native species. The floodplain forest community is dominated by eastern cottonwood in the overstory, an understory of Amur honeysuckle and riverbank grape, and a groundcover of Amur honeysuckle and garlic mustard. The emergent wetland areas are primarily vegetated by common reed, but more diversity was observed on the drier edge along the northern portion of the project area, including common species like common arrowhead (*Sagittaria latifolia*), river bulrush (*Bolboschoenus fluviatilis*), and narrow-leaved and hybrid cattails (*Typha angustifolia* and *T. x glauca*). Areas of threesquare bulrush (*Schoenoplectus pungens*) and cattail were also observed in deeper water areas adjacent to the southern portion of the common reed-dominated emergent wetland. The land cover types adjacent to the project area are floodplain forest and emergent wetland to the north, floodplain and mesic forest to the west, and the Detroit River to the south and east. See Appendix B Celeron Island Habitat Map, Appendix D for site photographs, and Appendix E Tables 6-7 for species lists of the documented plant communities.

4.0 SURVEY METHODOLOGY

ECT reviewed available site data, including site descriptions, aerial photographs, and project drawings. On April 23-26, May 20, and July 16-17 and 23-24, 2014 (fish), July 28, 2014 (plants and terrestrial wildlife), and August 25, 2014 (mussels), ECT staff ecologists/biologists with the appropriate Michigan Endangered Species qualifications and experience, namely Martha Holzheuer, Greg Gaulke, Marty Boote, and Patrick Williams, conducted T&E surveys within the project areas of both islands as shown in Appendix B. Species-specific survey methodology for target plant species included meander surveys on foot and by boat to assess groundcover and/or emergent species composition, soil conditions, hydrology, and presence of known associated species. When potential habitat and/or plant associates were encountered (as indicated by the presence of common plant associates singly or in combination), the perimeter of the area encompassing the species or habitat was determined, then an intensive examination of that entire target area was undertaken searching for evidence of the target plant species. Sets of diagnostic vegetative and floristic characters were developed based on MNFI and USFWS plant recognition descriptions and dichotomous keys in the University of Michigan Herbarium's Michigan Flora Online database to assist in identifying the plants if encountered at the site. For those plant species whose optimal survey period occurred earlier in the year, namely prairie-white fringed orchid, the sedge, and wild hyacinth, ECT carefully assessed areas of suitable habitat and reviewed vegetative and fruit characteristics of plant material observed to determine presence or absence of these species. ECT took photographs to document site conditions (Appendix D) and recorded the predominant plant species observed within each ecosystem type within the proposed project areas (Appendix E).

Survey methodology for wildlife species involved searching for areas of suitable feeding, breeding, and nesting/cover habitat on foot or by boat for aquatic species. Visual meander surveys through suitable habitat were utilized for terrestrial species and life stages. Survey methodology for the fish species included electrofishing and the setting of fyke nets. Survey methodology for the mussel species included snorkeling and searching for individuals within suitable substrate. For wildlife species whose optimal survey periods had already passed this growing season, namely bald eagle, eastern fox snake, least bittern, and smallmouth salamander, surveys for suitable habitat and/or visual meander surveys within potential habitat areas were conducted. Habitat assessments were also conducted for Indiana and northern long-eared bats, since species-specific surveys for federal bat species require specialized equipment for

acoustic surveys and/or a permit issued by the USFWS for mist-netting. As large-scale tree clearing is not part of the proposed projects, this level of survey effort was not necessary. Bat habitat assessment methodology utilized the 2014 Revised Range-Wide Indiana Bat Summer Survey Guidelines issued by the USFWS, specifically the section pertaining to Phase 1 Summer Habitat Assessments. Per this guidance, suitable summer habitat for Indiana bat includes roosting, foraging, and commuting areas. Suitable summer roosting habitat is characterized by the presence of trees (alive or dying) or snags that are >5 inches diameter-at-breast height (DBH) and have exfoliating bark, cracks, crevices, and/or hollows.

5.0 SURVEY RESULTS

Preferred habitat descriptions were derived from the MNFI Rare Species Explorer, and last observed sightings were referenced from the MNFI natural heritage database search conducted on April 3, 2014. Heading text in parentheses denotes for which islands the target species required evaluation.

Target Plant Species

American lotus (*Nelumbo lutea*, Celeron only)

The preferred habitat of American lotus includes marshes, quiet backwaters and near shore areas, and large rivers near the Great Lakes. Associate plants include water-plantain, sedges, spike-rush, northern manna grass, cut grass, smartweed, arrowhead, bur-reed, cattail, wild rice, water-milfoil, watercress, great duckweed, water-lily, bulrush, pickerel weed, arrow-arum, and pondweed. The last observed sighting of this plant was at Lake Erie Metropark in 2010.

ECT did not observe this species or adequate potential habitat for this species within the project area footprint on Celeron Island. ECT did observe some of the associated species on the property (sedges, arrowhead, bur-reed, cattail, and bulrush), but the species observed are relatively common and widespread and alone do not indicate high quality habitat for the target species. However, American lotus was observed from the boat in a backwater marsh associated with the northern islet of Celeron Island, north of the project area as mapped in Appendix B. Additionally, a remnant seed head of American lotus was found washed up on shore, indicating that the species was in some proximity to the project area. The project areas where construction activities are proposed on and around Celeron Island are much too exposed to wind and wave action to support the quiet backwater conditions that American lotus requires. Shoal construction and restoration around the island should serve to further protect the existing population from erosion and promote the establishment of this plant in newly created backwater habitats.

Arrowhead (*Sagittaria montevidensis*, Celeron only)

The preferred habitat of arrowhead includes wet to shallowly inundated mudflats and banks, lagoons, and estuaries. Associate plants include common arrowhead, wild celery, pickerel weed, softstem bulrush, hibiscus, pondweed, and nodding smartweed. The last observed sighting of this plant was at Lake Erie Metropark in 1988.

ECT did not observe this species or adequate potential habitat within the project area on Celeron Island. ECT did observe one of the associated species on the property, common arrowhead (*S. latifolia*), but this species is common and widespread and alone does not indicate high quality habitat for the target species. While common arrowhead is a closely related species, it can be distinguished from the target species arrowhead by having a longer than wide leaf blade. The emergent wetlands within the project areas on Celeron Island are heavily dominated by invasive common reed (*Phragmites australis*) and are not suitable habitat for the target species.

Goldenseal (*Hydrastis canadensis*, both islands)

The preferred habitat of goldenseal includes mesic southern hardwood forests, usually under a canopy of beech-sugar maple or red oak-sugar maple, as well as moist ravines, near vernal pools, forested streams, and portions of southern floodplain forests. Associate plants include sugar maple, American beech, red oak, yellow birch, silver maple,

American Basswood, black walnut, butternut, hackberry, red/green ash, black ash, blue-beech, leatherwood, spicebush, Jack-in-the-pulpit, wild ginger, sedge (*Carex hirtifolia*), plantain-leaved sedge, spring beauty, trout-lily, blue cohosh, wild geranium, wildoats, common trillium, hepatica, ginseng, and sweet cicely. The last observed sighting of this plant was in Lake Erie Metropark in 2004.

ECT did not observe this species and only low quality potential habitat for this species within the project areas on Stony Island. ECT observed only a couple of the associated species on Stony Island, northern hackberry and red ash. The forest within the project areas were disturbed with notable amounts of invasive and non-native species, nor was the overstory predominantly beech-sugar maple or red oak-maple. In general, the floodplain forest on Stony Island appeared too wet and disturbed to support the target species.

ECT did not observe this species and only low quality potential habitat for this species within the project areas on Celeron Island. ECT did observe some of the associated species, namely silver maple, black walnut, red ash, and northern hackberry, but these species are relatively common and widespread and alone do not indicate high quality habitat for the target species. The forest within the project areas were disturbed with notable amounts of invasive and non-native species, nor was the overstory predominantly beech-sugar maple or red oak-maple. In general, the floodplain forest on Celeron Island appeared too wet and disturbed to support the target species.

Prairie white-fringed orchid (*Platanthera leucophaea*, both islands)

The preferred habitat of the prairie white-fringed orchid includes moist prairie remnants, particularly those associated with lakeplains, although it can also occur in bogs and peaty lakeshores. Associate plants include bluejoint grass, cordgrass, rush, sedges, twig-rush, shrubby cinquefoil, swamp milkweed, big bluestem, Indian grass, Sullivant's milkweed, purple milkweed, swamp thistle, marsh blazing star, whorled loosestrife, grass-of-Parnassus, smooth hedge nettle, swamp rose, Missouri ironweed, joe-pye-weed, common boneset, spike-rush, little bluestem, prairie slough grass, flax, dogwoods, and hardstem bulrush. The last observed sighting of this species was at the Pointe Mouillee State Game Area and Lake Erie Metropark in 2006.

ECT did not observe this species or adequate potential habitat for this species within the project area on Stony Island. ECT did observe some of the associated species, namely various sedges, dogwoods, and swamp rose, but these species were located within the emergent wetland and scrub-shrub ecosystems, are relatively common and widespread, and alone do not indicate high quality habitat for the target species. No prairie remnants were observed, and the sedge meadow north of the old railroad grade, which appeared to provide potential habitat for the target species, is well outside the boundaries of proposed project activities on Stony Island.

ECT did not observe this species or adequate potential habitat for this species within the project area on Celeron Island. ECT did observe some of the associated species on Celeron Island, namely various sedges, but these species were located within the floodplain forest, are relatively common and widespread, and alone do not indicate high quality habitat for the target species. No prairie remnants were observed within the project area on Celeron Island. Furthermore, the open areas where this species could potentially grow were disturbed with notable amounts of invasive and non-native species, primarily common reed.

Sedge (*Carex squarrosa*, both islands)

The preferred habitat of this sedge species includes floodplain forests, typically lower bottoms, as well as seasonally wet vernal pools. Associated species include silver maple, red ash, eastern cottonwood, sycamore, spicebush, southern blue flag, bladdernut, wood nettle, false nettle, creamy white violet, James' sedge, American beak grass, wahoo, paw paw, blue-beech, green dragon, poison ivy, bushy aster, and creeping strawberry bush. This species was last observed on Grosse Ile in 1911.

ECT did not observe this species; however, marginal potential habitat for this species was present within the project areas on Stony and Celeron Island. ECT observed some of the associated species on Stony Island (eastern cottonwood, false nettle, and sedge species) and Celeron Island (eastern cottonwood, false nettle, poison ivy, red ash,

sedge species, silver maple, and wood nettle), but these species are common and widespread in floodplain habitats and alone do not indicate high quality habitat for the target species. The majority of the marginal habitat was too disturbed with non-native and invasive vegetation to support this species.

Trailing wild bean (*Strophostyles helvula*, both islands)

The preferred habitat of trailing wild bean includes sandy soil and disturbed areas including thickets, roadsides, ditch banks, beaches, and dunes. Associate plants include water-plantain, sedges, spike-rush, northern manna grass, cut grass, smartweed, arrowhead, bur-reed, cattail, wild rice, water-milfoil, watercress, great duckweed, water-lily, pickerel weed, arrow-arum, pondweed, little bluestem, big bluestem, colic root, wild indigo, common horsetail, path rush, hairy pinweed, pale spiked lobelia, mountain mint, meadowsweet, tall goldenrod, and bulrush. The last observed sighting of this species was on Grosse Ile in 1916.

Since trailing wild bean is adapted to disturbed sandy soils and several associated species were observed on Stony Island, namely sedges, cattails, tall goldenrod, and mountain mint, potential suitable habitat certainly exists in the non-forested portions of the project area. On July 28, 2014, ECT observed one individual trifoliate trailing plant belonging to the *Fabaceae* family along the old railroad grade approximately 450 feet west of the boat launch location. As only one individual could be located, ECT took photographs of the specimen in lieu of collecting it. Flowers were just beginning to form and no fruit was present at the time of inspection to aid with identification. Considering vegetative characteristics photographed, the individual preliminarily keyed to one of three species, namely hog-peanut (*Amphicarpa bracteata*), trailing wild bean (*Strophostyles helvula*), or wild bean (*Phaseolus polystachios*). The latter is an extirpated species that would be considered state threatened if found again in Michigan and is last known from Wayne County in 1896. Per the recommendation of Dr. Anton Reznicek, Assistant Director of the University of Michigan Herbarium, ECT returned to Stony Island on September 4, 2014 to collect a partial specimen with flowers/fruit. Multiple individuals were observed in both flower and fruit within the vicinity of the original plant found during the initial survey. The specimen was taken to Dr. Reznicek at the UM Herbarium and identification was confirmed as trailing wild bean.

ECT did not observe this species on Celeron Island. Very low quality suitable habitat for this species was present on Celeron Island within the emergent wetland portion of the project area. This emergent wetland has been degraded by non-native, invasive common reed. ECT observed some of the associated species on Celeron Island, namely river bulrush, narrow-leaved and hybrid cattails, sedges, and common bur-reed, but these species are relatively common and widespread and alone do not indicate high quality habitat for the target species.

Wild hyacinth (*Camassia scilloides*, Celeron only)

The preferred habitat for wild hyacinth includes floodplain forests with a fairly open canopy, as well as on river bottom flats and banks. Associate plants include silver maple, green ash, red maple, black walnut, hackberry, black maple, Ohio buckeye, box elder, black ash, black willow, eastern cottonwood, swamp white oak, sycamore, spice bush, paw paw, Kentucky coffee tree, red mulberry, Virginia blue-bells, common trillium, red trillium, stinging nettle, poison ivy, moneywort, Canada moonseed, wild ginger, skunk cabbage, honewort, kidney-leaved buttercup, false mermaid, rough bedstraw, mayapple, blue eyed Mary, and Canada goldenrod. The last observed sighting of this species was at the Huron River mouth at Pointe Mouillee State Game Area in 1916.

ECT did not observe this species on Celeron Island within the project area. Marginal habitat for this species was present within the floodplain forest on Celeron Island, with observed associated species including box elder, eastern cottonwood, northern hackberry, poison ivy, red (akagreen) ash, and silver maple. These species are common and widespread in floodplain habitats and alone do not indicate high quality habitat for the target species. The majority of the marginal habitat was too densely shaded and disturbed with non-native and invasive vegetation to support this species.

Target Animal Species

Bald eagle (*Haliaeetus leucocephalus*, both islands)

Preferred habitat for bald eagle includes a wide variety of habitats that provide nest sites near open water. Nests are typically placed in large snags or live trees close to open water. The last observed sighting of this species was on Celeron Island in 2005 and within 1.5 miles of the island as recently as 2012.

ECT did not observe this species or any nests on Stony Island within or adjacent to the proposed project work area. Potential habitat is present in the form of large live and dead trees, predominantly eastern cottonwoods, near the open water of the Detroit River. No recent sightings of nesting eagles at Stony Island have been reported per Bob Burns, River Keeper for the Friends of the Detroit River.

ECT did observe an active great blue heron rookery in the center of Stony Island, although no element occurrence has been recorded in MNFI's natural heritage database. While this rookery was believed to occupy only areas north of the railroad grade, ECT observed active nests to the south of the railroad grade in the north central portion of the project area as mapped in Appendix B. While not state threatened or endangered, this heron rookery is protected from disturbance by the Migratory Bird Treaty Act.

ECT did not observe this species or any nests on Celeron Island within or adjacent to the proposed project work area. Potential habitat is present in the form of large live and dead trees, predominantly eastern cottonwoods, near the open water of the Detroit River. Despite nesting activity documented in 2005, no recent sightings of nesting eagles at Celeron Island have been reported, per Bob Burns, River Keeper for the Friends of the Detroit River.

Black sandshell (*Ligumia recta*, Celeron only)

The preferred habitat of this mussel includes rivers with strong currents and lakes with a firm substrate of gravel or sand. The last observed sighting of this mussel was in the Detroit River at an undisclosed date.

This species was not observed during mussel surveys within the project area around Celeron Island. Substrates within the project area were mostly bedrock or soft silt and sand.

Channel darter (*Percina copelandi*, both islands)

The preferred habitat of channel darter includes rivers and large creeks in areas of moderate current over sand and gravel substrates. It also occurs in wave swept nearshore areas of lakes Huron and Erie in coarse-sand, fine-gravel beach and sandbar habitats. The last observed sighting of this fish was at Sugar Island and in the Detroit River in 1952.

The channel darter was not observed during ECT fish sampling surveys within the project areas on Stony or Celeron Islands.

Common tern (*Sterna hirundo*, Stony only)

The preferred habitat of common tern includes sand and gravel beaches on islands, thus, avoiding many terrestrial predators. The last observed sighting of this species was at Powder House Island in 1985.

ECT did not observe this species or adequate nesting habitat within the project area on Stony Island. The project area did not contain any sand or gravel beaches upon which this species could nest. Proposed construction of shoals may provide new nesting habitat for this species.

Deertoe (*Truncila truncate*, both islands)

The preferred habitat of deertoe includes firm sand or gravel substrates in rivers and lakes with moderately swift current, although it has been observed in smaller streams as well. The last observed sighting of this species was in the Detroit River in 2007.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. Stony Island substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel habitat. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand.

Eastern fox snake (*Patherophys gloydi*, both islands)

Preferred habitat for the eastern fox snake includes emergent wetlands along Great Lakes shorelines and associated large rivers and impoundments with herbaceous emergent vegetation like cattails. This species may also inhabit drier and disturbed areas and is known to be capable of swimming long distances over open waters and in between islands. Per the MNFI database last observed sighting of this species was on Stony Island in 1994. This species is generally and more recently known to occupy both islands per Bob Burns, River Keeper for the Friends of the Detroit River, and David Mifsud, owner of Herpetological Resource and Management, LLC.

ECT did not observe this species on either island, although an unidentifiable snake skin was observed on Celeron Island. Considering that both Stony and Celeron Islands provide suitable habitat, the snake's ability to swim long distances over offshore waters, and recent anecdotal sighting reports, this species is assumed to occupy both Stony and Celeron Islands for the purposes of the proposed projects. Protective measures are outlined below, and the proposed project activities include the creation of additional herpetofauna hibernacula that will improve habitat for this species on both islands.

Eastern massasauga (*Sistrurus catenatus catenatus*, both islands)

In southern Michigan, preferred habitat for this rattlesnake includes open wetlands, particularly prairie fens, but it may also inhabit open uplands and forest openings for foraging, basking, gestation and parturition. This species is not as strong of a swimmer as eastern fox snake. The last observed sighting of this species was on Grosse Ile in 1858.

ECT did not observe this species on either island, although an unidentifiable snake skin was observed on Celeron Island. Both islands provide suitable habitat in general; however, since eastern massasauga is not a strong swimmer, it is very unlikely that a viable population of this species occurs on either island. Protective measures described below for eastern fox snake will also serve to protect eastern massasauga. The creation of additional herpetofauna hibernacula will improve habitat for this species, if present, on both islands.

Eastern pondmussel (*Ligumia nasuta*, Celeron only)

This mussel prefers fine sand and mud substrates of lakes and ponds as well as slackwater areas of canals, rivers, and streams. The last known observation of this species was at Lake Erie - Maple Beach in 1931.

ECT did not observe this species in the project area around Celeron Island. There were no areas of still water despite softer substrates present.

Elktoe (*Alasmidonta marginata*, Celeron only)

The preferred habitat of elktoe includes clean, clear water of small to large-sized streams, particularly in riffles featuring swifter currents over packed sand and gravel substrates. The last observed sighting of this species was in the Detroit River at an undisclosed date.

Elktoe was not observed during mussel surveys around Celeron Island. Riffle habitat is absent from the island and little to no areas contained packed sand or gravel substrates. Areas that did contain these substrates were overtop large sheets of bedrock.

Hickorynut (*Obovaria olivaria*, both islands)

The preferred habitat of hickorynut includes large rivers and lakes in sand or sand and gravel substrates. The last observed sighting of this species was in the Detroit River-Livingston Channel prior to 1936 and in the Detroit River at Stony Island in 1933.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. Stony Island substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel habitat. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand.

Indiana bat (*Myotis sodalists*, both islands)

According to the MNFI Rare Species Explorer and the USFWS Indiana bat website, the preferred breeding habitat of this migratory mammal in Michigan includes floodplain forest, southern hardwood swamp, oak openings, bur oak plains, and other upland forest types. This species migrates from its winter habitat primarily in caves in Kentucky, Indiana, and Missouri from the end of April to the end of May. It forms maternity colonies that roost in large live, dead, or dying trees characterized by peeling or exfoliating bark, cracks, crevices, or hollows, preferably with good sun exposure and clear flight paths. They migrate back to their southern winter habitat from late August through October. The most recent observation of this species was on Grosse Ile in 1865.

ECT observed moderate quality potential suitable habitat for Indiana bat within the project areas on both Stony and Celeron Islands. Large snags and live or dying trees with loosening/exfoliating bark, cavities, cracks, crevices, or hollows with the potential to support maternal bat colonies or individual male bats were observed within the project areas. ECT examined these potential roost trees, but did not observe any individuals or evidence of nesting by bats. Some portions of the floodplain forest on both islands have an open understory and canopy, but many areas are also dense with invasive understory shrubs, which block clear flight paths and sunlight. Many of the snags and potential roost trees have cracks/crevices/hollows/cavities with at least partially obstructed flight paths, making them less desirable for bats. Both islands are considered potential habitat due to the presence of potential roost trees, clear flight paths along the shorelines, proximity to the Detroit River, and proximity to other forested areas along the Detroit River. Therefore, this species is assumed to occupy both Stony and Celeron Islands for the purposes of the proposed projects. Protective measures are recommended below. Proposed project activities, such as vegetation thinning for herpetofauna habitat and equipment access along the old railroad grade on Stony Island will likely improve habitat for bats, if present, by opening up flight paths and increasing solar irradiation of existing snags.

Kidney shell (*Ptychobranchnus fasciolaris*, both islands)

The preferred habitat of kidney shell includes rivers and lakes with moderate to swift currents and a sand or gravel substrate. The last observed sighting of this species was in the Detroit River in 1933.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. Stony Island substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel habitat. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand.

Lake sturgeon (*Acipenser fuvescens*, both islands)

The preferred habitat of lake sturgeon includes large rivers and shallow areas of large lakes, most often associated with unvegetated deep run and pool habitats. The last observed sighting of this species was at Elba, Sugar, and Stony Islands in 1970.

Lake sturgeon were not observed during fish sampling conducted by ECT at either island. The shallow habitat around the islands are not favorable habitat for lake sturgeon, as they will typically remain in the deepest sections of the rivers they inhabit. They will move towards shallow, rocky areas to spawn, but no lake sturgeon were observed during spring sampling. The shoal creation activities put forth as part of the proposed projects may improve spawning habitat for this species.

Least bittern (*Ixobrychus exilis*, Celeron only)

The preferred habitat of least bittern includes inland, coastal plain, and Great Lakes emergent marshes with tall, dense stands of emergent vegetation in water 4-30 inches deep. Nests are typically only a few yards from an opening, with large, shallow marshes with a 50:50 ratio of open water to emergent vegetation providing ideal nesting habitat. The last sighting of this species was at the Lake Erie Metropark in 1997.

ECT did not observe this species nor adequate potential habitat within the project area on Celeron Island. Some small areas of cattail- and bulrush-dominated emergent wetland were observed within and adjacent to the project area on the outer edge of dense common reed stands; however, they were not large enough and were exposed to too much current and wave action to support suitable nesting habitat for this species.

Northern long-eared bat (*Myotis septentrionalis*, both islands)

Preferred habitat of this species is similar to that of Indiana bat described above, e.g. roosting and forming maternity colonies under loose bark or in hollows and cavities of mature live, dead, or dying trees. It has been identified by the USFWS as potentially occurring in Wayne County but is not currently documented in MNFI's natural heritage database, as it lacks any sort of state status at this time.

ECT observed moderate quality potential suitable habitat for northern long-eared bat within the project areas on both Stony and Celeron Islands. Large snags and live or dying trees with loosening/exfoliating bark, cavities, cracks, crevices, or hollows with the potential to support maternal bat colonies or individual male bats were observed within the project areas. ECT examined these potential roost trees, but did not observe any individuals or evidence of nesting by bats. Some portions of the floodplain forest on both islands have an open understory and canopy, but many areas are also dense with invasive understory shrubs, which block clear flight paths and sunlight. Many of the snags and potential roost trees have cracks/crevices/hollows/cavities with at least partially obstructed flight paths, making them less desirable for bats. Both islands are considered potential habitat due to the presence of potential roost trees, clear flight paths along the shorelines, proximity to the Detroit River, and proximity to other forested areas along the Detroit River. Therefore, this species is assumed to occupy both Stony and Celeron Islands for the purposes of the proposed projects. Protective measures are recommended below. Proposed project activities, such as vegetation thinning for herpetofauna habitat and equipment access along the old railroad grade on Stony Island will likely improve habitat for bats, if present, by opening up flight paths and increasing solar irradiation of existing snags.

Northern riffleshell (*Epioblasma torulosa fasciolaris*, both islands)

The preferred habitat of northern riffleshell mussel includes fine to coarse gravel in swift flowing riffles and runs. The last observed sighting of this species was in the Detroit River at Stony Island in 1930.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. Stony Island substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel

habitat. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand. Neither island contains sufficient riffle habitat.

Pugnose minnow (*Opsopoeodus emiliae*, Celeron only)

The preferred habitat of the pugnose minnow includes slow, clear, vegetated waters of rivers and shallow areas of lakes, often occurring over sand and organic substrates. The last observed sighting of this species was in the Detroit River at Gibraltar Bay in 1986.

ECT did not observe the pugnose minnow during sampling within the project areas near Celeron Island.

Purple wartyback (*Cyclonaias tuberculata*, both islands)

The preferred habitat of the purple wartyback mussel includes medium to large rivers with gravel or mixed sand and gravel substrates. The last observed sighting of this species was in the Detroit River—Livingstone Channel in 1983. It was also observed at Stony Island in 1933.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. Stony Island substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel habitat. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand.

Rainbow (*Villosa iris*, both islands)

The preferred habitat of the rainbow mussel includes coarse sand or gravel in small to medium streams. The last observed sighting of this species was in the Detroit River in 1933.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. Stony Island substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel habitat. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand.

Rayed bean (*Villosa fabalis*, both islands)

The preferred habitat of the rayed bean mussel includes small, shallow rivers, in and near riffles and often near aquatic vegetation, also occurring along shallow, wave-swept shores of lakes. There has been no observed sighting of this species within the vicinity of the project areas according to the MNFI; this species has been identified by the USFWS as having the potential to occur within Wayne County.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. Stony Island substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel habitat. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand.

Round hickorynut (*Obovaria subrotunda*, both islands)

The preferred habitat of the round hickorynut mussel includes medium to large rivers and along the shores of Lake Erie and Lake St. Clair, near river mouths, typically found in sand and gravel substrates in areas with moderate flow. The last observed sighting of this species was in Lake Erie in 1977. It was also observed at Stony Island in 1930.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. Stony Island substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of

substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel habitat. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand.

Russet-tipped clubtail (*Stylurus plagiatus*, Celeron only)

The preferred habitat of russet-tipped clubtail adults includes riparian corridors or over lakes. Larvae occur in shallow, clear, sandy-bottomed coastal plain rivers and lakes. The last observed sighting of this species was in the Detroit River-Humbug Marsh Unit in 2009.

ECT did not observe adults of this species at Celeron Island. The project area is extremely disturbed with non-native and invasive vegetation, primarily common reed, resulting in a degraded habitat. The proposed shoals will help reduce erosion and siltation, improving water quality and wetland vegetation and increasing available habitat for this water quality-sensitive species.

Silver chub (*Macrhybopsis storeriana*, Stony only)

The preferred habitat of silver chub includes deep waters of low gradient streams and rivers as well as lakes, preferring pools with clean sand and fine gravel substrates. The last observed sighting of this species was in the Detroit River at Stony Island in 1985.

ECT did not observe the silver chub during sampling within the project areas near Stony Island.

Slippershell (*Alasmidonta viridis*, Celeron only)

The preferred habitat of slippershell mussel includes creeks and headwaters of rivers in sand or gravel substrates, occasionally occurring in larger rivers and lakes in mud substrates. The last observed sighting of this species was in the Detroit River at an undisclosed date.

This species was not observed during mussel surveys within the project area around Celeron Island. Substrates within the project area near Celeron Island were mostly bedrock or soft silt and sand.

Smallmouth salamander (*Ambystoma texanum*, Celeron only)

The preferred habitat of smallmouth salamander includes forested bottomlands and associated wetlands in or adjacent to floodplains, although they have been known to occur in hardwood and shrub swamps, mesic southern forest, and more open habitats such as wet meadow, wet prairie, and farm fields. This species requires temporary, fish-free, shallow bodies of water for breeding, then remain hidden under woody debris and litter in more upland areas outside of the spring breeding season. The last observed sighting of this species was in woodlands along Gibraltar Rd. in 2001.

ECT did not observe this species on Celeron Island nor any vernal pool habitats within the proposed project area sufficiently deep enough to sustain the aquatic stage of this species' life cycle. The emergent wetlands along the island's shore are not fish-free and sustain too much current and wave action to be considered suitable habitat for this target species.

Snuffbox (*Epioblasma triquetra*, Stony only)

The preferred habitat of snuffbox mussel includes sand, gravel, or cobble substrates in fast-moving small and medium-sized rivers. The last observed sighting of this species was at Stony Island in 1930.

This species was not observed during mussel surveys within the project area around Stony Island. Substrates varied substantially; however, almost all survey areas had bedrock under less than one inch of substrates. Areas without bedrock contained softer substrates and 100% vegetation cover not suitable for mussel habitat.

Wavyrayed lampmussel (*Lampsilis fasciola*, both islands)

The preferred habitat for wavyrayed lampmussel includes small-medium shallow streams in and near riffles with good current in sand and/or gravel substrates; it rarely occurs in medium rivers. The last observed sighting of this species was on Stony Island in 1908.

This species was not observed during mussel surveys within the project area around Stony or Celeron Islands. It is not expected that this species would be found in the Detroit River.

6.0 CONCLUSIONS AND RECOMMENDATIONS

For target plant species, no individuals of and little to no suitable habitat for arrowhead, goldenseal, prairie white-fringed orchid, sedge, and wild hyacinth were observed within the proposed project areas on Stony and Celeron Islands. Therefore, ECT concludes that the proposed projects will have no effect on these target plant species and recommends that no endangered species permit correspondence with the MDNR or USFWS is necessary regarding these target species for either island.

American lotus

Since this species was not observed within or near the Stony Island project areas, ECT concludes that proposed project activities will have no effect on American lotus. This species was observed in a backwater marsh associated with the northern islet of Celeron Island, north of the project area as mapped in Appendix B. ECT recommends that construction crews are instructed not to enter this backwater marsh area, so as not to disturb the population. Shoal construction and restoration around the island should serve to further protect the existing population from erosion and promote the establishment of this plant in newly created backwater habitats. Contingent upon project activities and related transportation remaining outside of the backwater marsh, ECT concludes that the proposed project for Celeron Island may affect but is not likely to adversely affect American lotus. ECT recommends that no additional correspondence or permitting with MDNR is necessary regarding this target species.

Trailing wild bean

Since this species was not observed within or near the Celeron Island project areas, ECT concludes that proposed project activities will have no effect on trailing wild bean. This species was observed in multiple clusters on Stony Island on the eastern side of the old railroad grade. Although Special Concern species do not have statutory legal protection, ECT recommends that on-island construction activities that involve heavy equipment traversing the old railroad grade be either limited to occur from November 1st through May 1st to avoid direct adverse impact to the plants or that the plants be fenced off with four-foot high protective fencing and equipment routed around the clusters. Construction crews should be instructed about the listed status of the plant and the importance of not driving over or storing construction materials on top of the target species. Contingent upon implementation of these protective measures, ECT concludes that the proposed project activities on Stony Island may affect but are not likely to adversely affect trailing wild bean. ECT recommends that no additional correspondence or permitting with MDNR is necessary regarding this target species.

For wildlife target species, no individuals of and little to no suitable habitat for common tern, least bittern, russet-tipped clubtail, and smallmouth salamander were observed within the proposed project areas on Stony and Celeron Islands. Therefore, ECT concludes that the proposed projects will have no effect on these target wildlife species and recommends that no endangered species permit correspondence with the MDNR is necessary regarding these target

species for either island. Aside from abundant *Dreissena spp.*, no live native mussels were found during the mussel surveys around Stony and Celeron Islands. Additionally, no target fish species were found during sampling surveys. Therefore, ECT concludes that the proposed projects will have no effect on mussel or fish target species and recommends that no endangered species permit correspondence with the MDNR or USFWS is necessary regarding these above-listed aquatic target species for either island.

Bald eagle and Great Blue Heron Rookery

Bald eagles are no longer federally listed as an endangered species, and the State of Michigan recognizes them only as a species of special concern; however, the bald eagle and its active and alternate nests are still federally protected under the Bald and Gold Eagle Protection Act of 1940. ECT did not observe this species or any nests within or adjacent to the proposed project work areas on either island. Therefore, ECT concludes that the proposed projects will have no effect on this target species.

Numerous nests of great blue herons were observed on Stony Island in an active rookery within the proposed project area as mapped in Appendix B. This rookery is protected under the Migratory Bird Treaty Act. ECT recommends that no on-island project activities involving heavy equipment occur within 660' of the rookery during the active breeding and nesting season, e.g. March 15th through September 1st. Construction crews should be made aware of the protected status of the rookery and instructed not to disturb the nests within or outside of the breeding season. Contingent on the implementation of these protective measures, ECT concludes that the proposed project for Stony Island may affect but is not likely to adversely affect the rookery. Considering federal funding for the projects, informal consultation with the USFWS is recommended to secure their concurrence with ECT's conclusions.

Eastern fox snake and Eastern massasauga

Eastern fox snake is a state threatened species generally known to occur on both islands and assumed to be present within the proposed project areas. To protect the species from adverse impacts, ECT recommends that no on-island project activities involving heavy equipment be conducted during the snake's active period, from April 1st through November 1st. Construction materials should also not be stored on-island during the snake's active period, so as not to create temporary hibernacula that may result in species disturbance at a later date. Restoration crews working on-island on foot during the snake's active season should be educated about the natural history and identifying characteristics of this species, carefully scanning work areas for this species prior to commencing restoration/habitat creation tasks. Only individuals with the proper T&E permit may handle any individuals found and relocate them carefully outside of the work area. The proposed project activities include the creation of additional herpetofauna hibernacula that will improve habitat for this species on both islands. Therefore, contingent upon the implementation of the above protective measures, ECT concludes that the proposed projects for Stony and Celeron Islands may affect but are not likely to adversely affect eastern fox snake and that proposed habitat creation efforts will benefit this species in the long-term. Since no adverse effects are anticipated to this target species due to protective measures, ECT recommends that consultation with the MDNR Wildlife Division and T&E permitting are not necessary.

Although eastern massasauga is not known from either island and is not likely to be present so far from the mainland, the protective measures recommendations outlined above for eastern fox snake will also serve to protect eastern massasauga, if present. Since no adverse effects are anticipated to this target species due to protective measures for eastern fox snake, ECT concludes that the proposed projects for Stony and Celeron Islands may affect but are not likely to adversely affect eastern massasauga, if present.

Indiana bat and Northern long-eared bat

Indiana bat is a federal and state listed endangered species, and northern long-eared bat is a federal proposed endangered species. ECT believes that suitable summer habitat of moderate quality for both bat species is present within the proposed project areas on Stony and Celeron Islands. Per past project correspondence with Chris Mensing, Fish and Wildlife Biologist from the USFWS East Lansing Field Office, informal consultation with the East Lansing Field

Office should be initiated for projects characterized by 1) a federal nexus, e.g. involving federal land, federal funding, or federal action, and/or 2) the need to remove or trim trees that may provide roost habitat for the Indiana bat during the time period when bats are likely to be occupying their summer habitat in Michigan, i.e. April 1st through October 15th. Considering the federal funding associated with these projects, informal consultation with the USFWS will be necessary. ECT recommends that trees and logs to be used for proposed habitat structures be sourced from off-island or be cut on-island from October 16th through March 31st to avoid potential impacts to roosting bats. Snags and live or dead trees with peeling or loose bark, cracks, hollows, and crevices should not be utilized but left standing for roost habitat. Any tree clearing conducted for on-island equipment access and construction material storage should also be conducted from October 16th through March 31st. Proposed project activities, such as vegetation thinning for herpetofauna habitat and equipment access along the old railroad grade on Stony Island will likely improve habitat for bats, if present, by opening up flight paths and increasing solar irradiation of existing snags. Contingent upon the above protective measures being implemented, ECT concludes that the proposed projects may affect but are not likely to adversely affect Indiana or northern long-eared bats.

Rufa red knot

Rufa red knot (*Calidris canutus rufa*) is primarily an ocean coastal migrant, and ECT did not consider this species as a potential target species, despite its presence on the USFWS Wayne County list. The proposed project areas do not involve beaches and on-island construction and restoration activities involving heavy equipment will not occur during the bird's migratory window from May 1st through September 30th due to protective measure time restrictions for listed snake and bat species. Therefore, ECT concludes that the projects will have no effect on this species.

To summarize, no adverse impacts to state listed target species are anticipated with the implementation of the recommended protective measures outlined above. Therefore, correspondence with MDNR Wildlife Division and T&E permitting for state listed species are not recommended. No adverse impacts to federally listed target species are anticipated with the implementation of the recommended protective measures outlined above. Since these projects are federally funded, ECT recommends that informal consultation with the USFWS be initiated per Section 7 of the Endangered Species Act to confirm their concurrence with 1) proposed protective measures for the heron rookery on Stony Island under the jurisdiction of the Migratory Bird Treaty Act and 2) ECT's conclusions that the proposed project activities will have no effect on federally listed species on either island.

Respectfully submitted,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

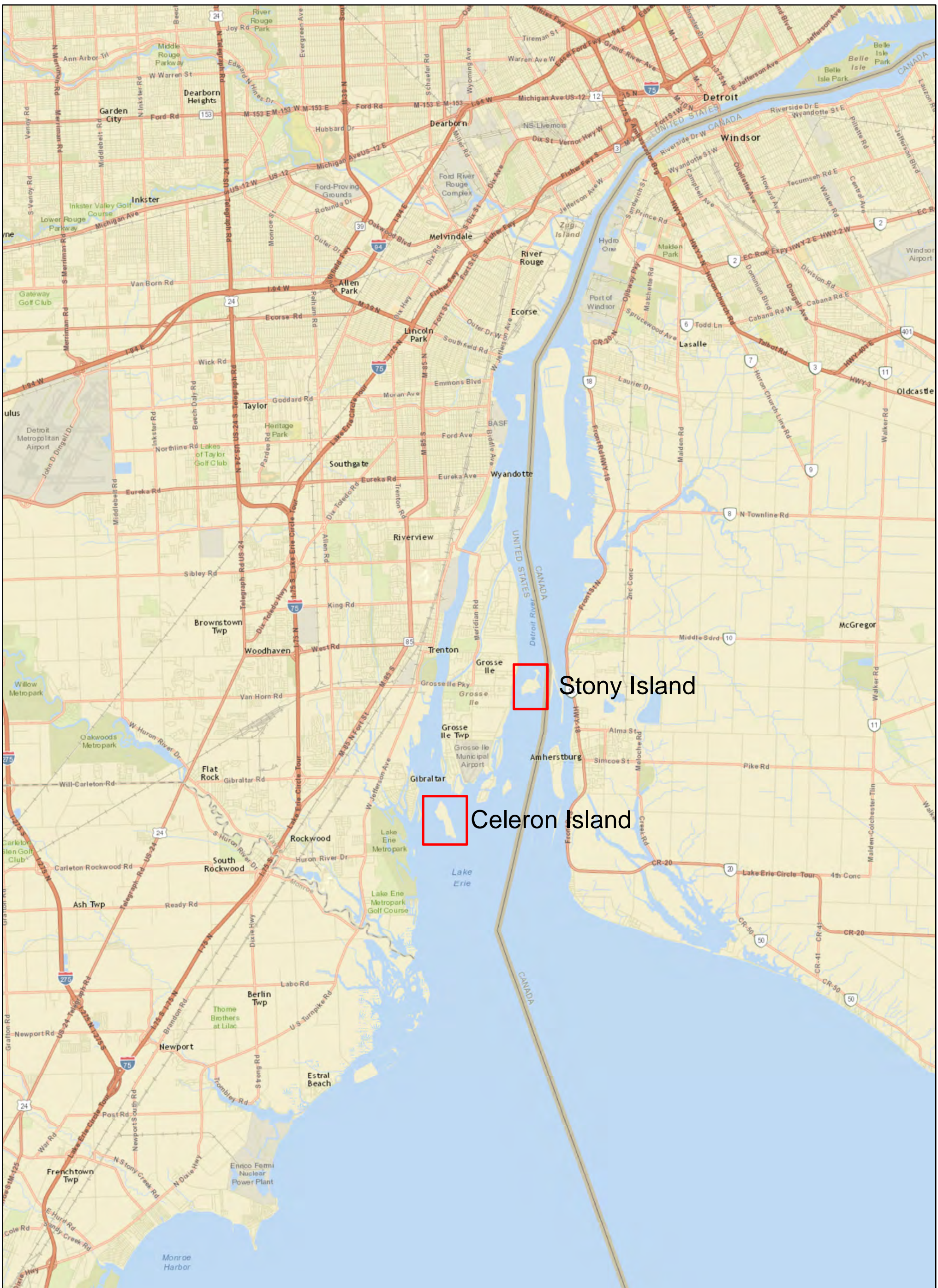


Martha Holzheuer, LLA, CE, CA
Landscape Ecologist
MDNR Threatened/Endangered Species Permit # 1719



Greg Gaulke, M.Sc.
Fisheries/Aquatic Scientist
MDNR Threatened/Endangered Species Permit #2083

APPENDIX A: PROJECT LOCATION MAP



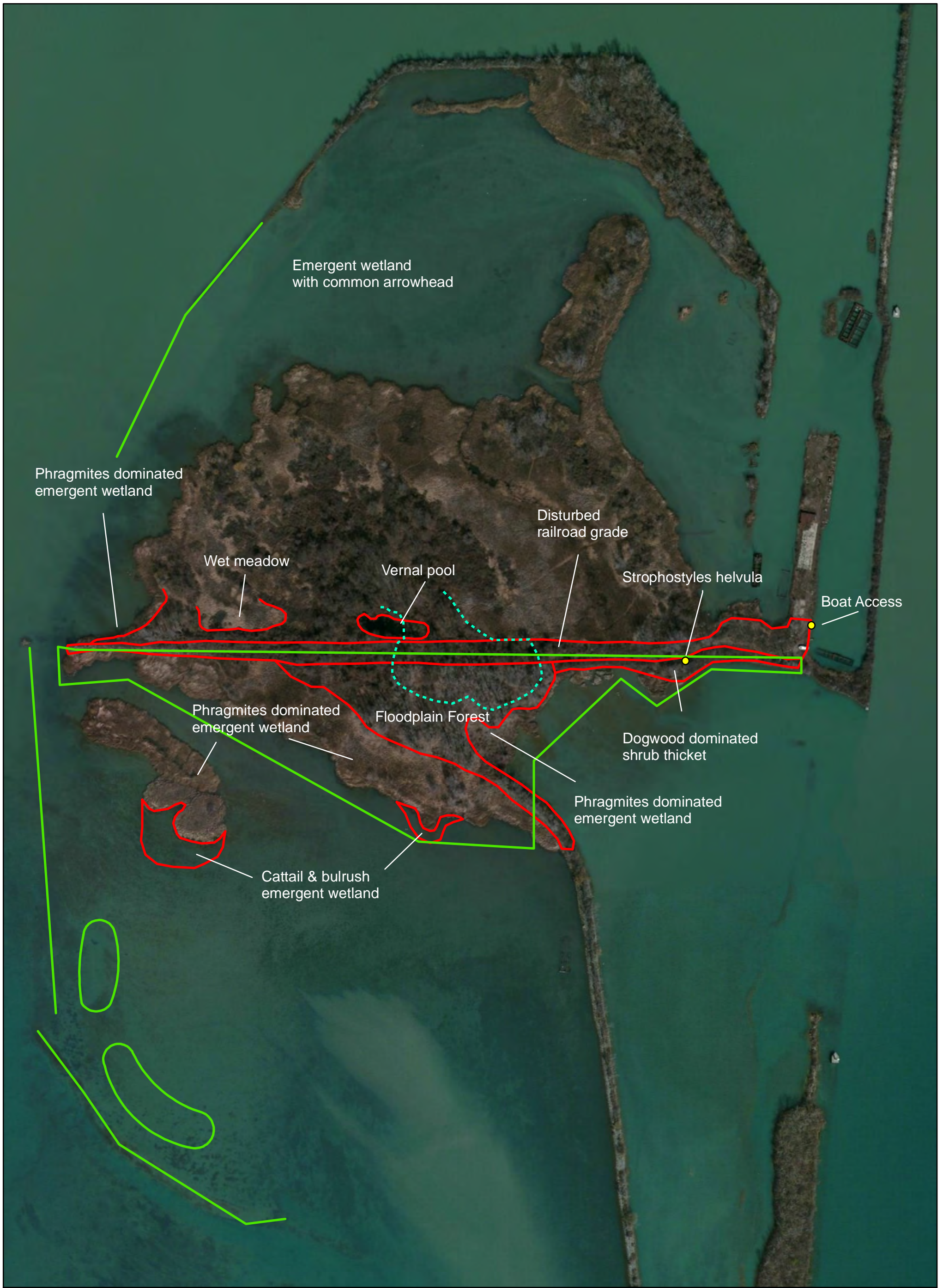
PROJECT LOCATION MAP

Friends of the Detroit River
 Stony & Celeron Islands
 Habitat Restoration Project

 Project Location



APPENDIX B: PROJECT AREA HABITAT MAPS



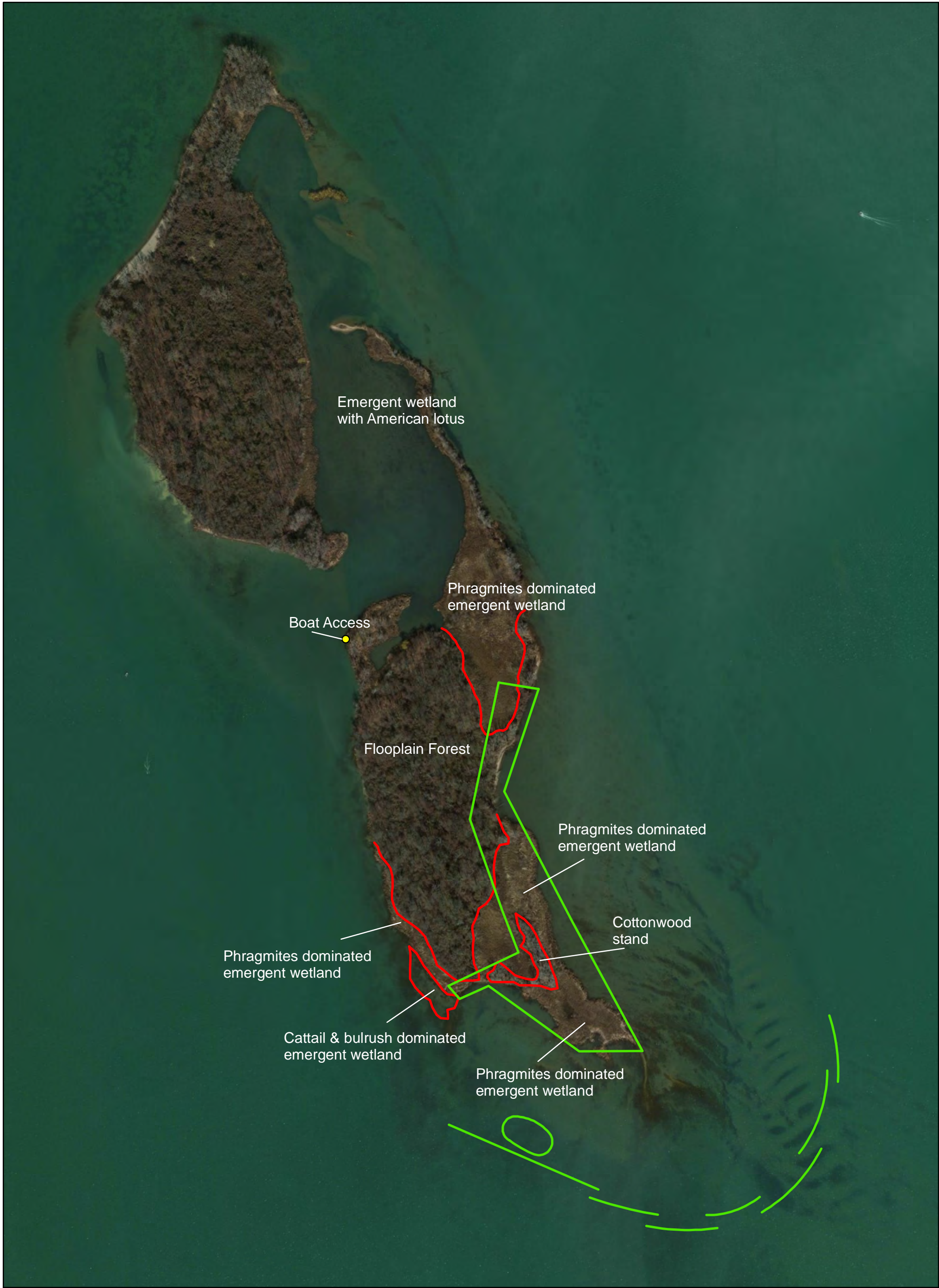
STONY ISLAND HABITAT MAP

Friends of the Detroit River
 Stony & Celeron Islands
 Habitat Restoration Project



— Habitat Restoration Area **N**
— Habitat boundary
⋯ Heron Rookery

0 200 400 600 800 1,000
 Feet



CELERON ISLAND HABITAT MAP

Friends of the Detroit River
 Stony & Celeron Islands
 Habitat Restoration Project



- Habitat Restoration Area
- Habitat boundary



APPENDIX C: COMPREHENSIVE T&E DATABASE RESULTS

Table 1. MNFI Database Results for Stony Island (T4S, R11E, S21-22, 27-28)

Common Name	Scientific Name	State Status*	Federal Status*	First Observed Date	Last Observed Date	Element Category
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2012	2012	Animal
Deertoe	<i>Truncilla truncata</i>	SC		2007	2007	Animal
Eastern fox snake	<i>Pantherophis gloydi</i>	T			1912-06	Animal
Eastern fox snake	<i>Pantherophis gloydi</i>	T		1970	1994	Animal
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>	SC	C	1858	1858	Animal
Field Chickweed	<i>Cerastium velutinum</i>	X		5/18/1913	5/18/1913	Plant
Fire pink	<i>Silene virginica</i>	E		1838	7/1/1917	Plant
Goldenseal	<i>Hydrastis canadensis</i>	T		1914	5/11/1916	Plant
Hickorynut	<i>Obovaria olivaria</i>	E		6/13/1933	6/13/1933	Animal
Hickorynut	<i>Obovaria olivaria</i>	E		1936-pre	1936-pre	Animal
Indiana bat	<i>Myotis sodalis</i>	E	LE	1865	1865	Animal
Kidney shell	<i>Ptychobranthus fasciolaris</i>	SC		6/13/1933	6/13/1933	Animal
Lake sturgeon	<i>Acipenser fulvescens</i>	T			1970	Animal
Northern riffleshell	<i>Epioblasma torulosa rangiana</i>	E	LE		1930	Animal
Purple wartyback	<i>Cyclonaias tuberculata</i>	T			6/13/1933	Animal
Rainbow	<i>Villosa iris</i>	SC		1909	7/13/1933	Animal
Round hickorynut	<i>Obovaria subrotunda</i>	E			1930	Animal
Sedge	<i>Carex squarrosa</i>	SC		1911	7/22/1911	Plant
Silver chub	<i>Macrhybopsis storeriana</i>	SC		1984	1985-03	Animal
Snuffbox	<i>Epioblasma triquetra</i>	E	E		1930	Animal
Trailing wild Bean	<i>Strophostyles helvula</i>	SC		1914	9/4/1916	Plant
Wavyrayed lampmussel	<i>Lampsilis fasciola</i>	T		1908	10/11/1908	Animal

* C = candidate, E = endangered, LE = listed endangered, SC = special concern, T = threatened, X = presumed extirpated but legally threatened if found. Special concern and federal candidate species and natural communities are not protected under state or federal endangered species legislation. However, efforts should be taken to minimize impacts to these element occurrences.

Table 2. MNFI Web Database Results for Stony Island: Sections within 1.5 Miles of Project Area (T4S, R11E, S14-17, 20-23, 26-29, 32-35)

Common Name	Scientific Name	State Status*	Federal Status*	First Observed Date	Last Observed Date	Element Category
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2012	2012	Animal
Channel darter	<i>Percina copelandi</i>	E		1952	9/9/1952	Animal
Common tern	<i>Sterna hirundo</i>	T		1980	1985	Animal
Deertoe	<i>Truncilla truncata</i>	SC		2007	2007	Animal
Eastern fox snake	<i>Pantherophis gloydi</i>	T			1912-06	Animal
Eastern fox snake	<i>Pantherophis gloydi</i>	T		1970	1994	Animal
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>	SC	C	1858	1858	Animal
Field Chickweed	<i>Cerastium velutinum</i>	X		5/18/1913	5/18/1913	Plant
Fire pink	<i>Silene virginica</i>	E		1838	7/1/1917	Plant
Goldenseal	<i>Hydrastis canadensis</i>	T		1914	5/11/1916	Plant
Hickorynut	<i>Obovaria olivaria</i>	E		6/13/1933	6/13/1933	Animal
Hickorynut	<i>Obovaria olivaria</i>	E		1936-pre	1936-pre	Animal
Indiana bat	<i>Myotis sodalis</i>	E	LE	1865	1865	Animal
Kidney shell	<i>Ptychobranthus fasciolaris</i>	SC		6/13/1933	6/13/1933	Animal
Lake sturgeon	<i>Acipenser fulvescens</i>	T			1970	Animal
Lake sturgeon	<i>Acipenser fulvescens</i>	T			1970	Animal
Northern riffleshell	<i>Epioblasma torulosa rangiana</i>	E	LE		1930	Animal
Purple wartyback	<i>Cyclonaias tuberculata</i>	T			6/13/1933	Animal
Rainbow	<i>Villosa iris</i>	SC		1909	7/13/1933	Animal
Round hickorynut	<i>Obovaria subrotunda</i>	E			1930	Animal
Sedge	<i>Carex squarrosa</i>	SC		1911	7/22/1911	Plant
Silver chub	<i>Macrhybopsis storeriana</i>	SC		1984	1985-03	Animal
Snuffbox	<i>Epioblasma triquetra</i>	E	E		1930	Animal
Trailing wild Bean	<i>Strophostyles helvula</i>	SC		1914	9/4/1916	Plant
Wavyrayed lampmussel	<i>Lampsilis fasciola</i>	T		1908	10/11/1908	Animal

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Table 3. MNFI Database Results for Celeron Island (T5S, R11E, S6-7)

Common Name	Scientific Name	State Status*	Federal Status*	First Observed Date	Last Observed Date	Element Category
	Wet-mesic Flatwoods			1983	4/27/1983	Community
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2001	5/10/2005	Animal
Field Chickweed	<i>Cerastium velutinum</i>	X		5/18/1913	5/18/1913	Plant
Pugnose minnow	<i>Opsopoeodus emiliae</i>	E		1986	10/15/1986	Animal
Round hickorynut	<i>Obovaria subrotunda</i>	E		18??	3/1/1977	Animal

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Table 4. MNFI Web Database Results for Celeron Island: Sections within 1.5 Miles of Project Area (T4S, R10E, S36; T4S, R11E, S31-32; T5S, R10E, S1,12-13; T5S, R11E, S4-9,17-18)

Common Name	Scientific Name	State Status*	Federal Status*	First Observed Date	Last Observed Date	Element Category
American lotus	<i>Nelumbo lutea</i>	T		8/5/2004	2010-Fall	Plant
Arrowhead	<i>Sagittaria montevidensis</i>	T		1988	8/9/1988	Plant
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2012	2012	Animal
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2001	5/10/2005	Animal
Black sandshell	<i>Ligumia recta</i>	E				Animal
Channel darter	<i>Percina copelandi</i>	E		1952	9/9/1952	Animal
Channel darter	<i>Percina copelandi</i>	E		9/9/1952	9/9/1952	Animal
Deertoe	<i>Truncilla truncata</i>	SC		6/20/1935		Animal
Eastern fox snake	<i>Pantherophis gloydi</i>	T			1912-06	Animal
Eastern fox snake	<i>Pantherophis gloydi</i>	T		1991	1991	Animal
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>	SC	C	1858	1858	Animal
Eastern pondmussel	<i>Ligumia nasuta</i>	E		1931	1931	Animal
Elktoe	<i>Alasmidonta marginata</i>	SC				Animal
Field Chickweed	<i>Cerastium velutinum</i>	X		5/18/1913	5/18/1913	Plant
Fire pink	<i>Silene virginica</i>	E		1838	7/1/1917	Plant
Goldenseal	<i>Hydrastis canadensis</i>	T		1914	5/11/1916	Plant
Goldenseal	<i>Hydrastis canadensis</i>	T		7/1/2004	7/1/2004	Plant
Hickorynut	<i>Obovaria olivaria</i>	E		1936-pre	1936-pre	Animal

Indiana bat	<i>Myotis sodalis</i>	E	LE	1865	1865	Animal
Kidney shell	<i>Ptychobranchnus fasciolaris</i>	SC				Animal
Lake sturgeon	<i>Acipenser fulvescens</i>	T			1970	Animal
Least bittern	<i>Ixobrychus exilis</i>	T		6/5/1997	6/5/1997	Animal
Northern riffleshell	<i>Epioblasma torulosa rangiana</i>	E	LE			Animal
Prairie white-fringed orchid	<i>Platanthera leucophaea</i>	E	LT	1985	6/23/2006	Plant
Pugnose minnow	<i>Opsopoeodus emiliae</i>	E		1986	10/15/1986	Animal
Purple wartyback	<i>Cyclonaias tuberculata</i>	T		1983	7/23/1983	Animal
Rainbow	<i>Villosa iris</i>	SC		1909	7/13/1933	Animal
Round hickorynut	<i>Obovaria subrotunda</i>	E		18??	3/1/1977	Animal
Russet-tipped clubtail	<i>Stylurus plagiatu</i>	SC		2007-08	8/29/2009	Animal
Sedge	<i>Carex squarrosa</i>	SC		1911	7/22/1911	Plant
Slippershell	<i>Alasmidonta viridis</i>	T				Animal
Smallmouth salamander	<i>Ambystoma texanum</i>	E		1962	3/27/2001	Animal
Trailing wild Bean	<i>Strophostyles helvula</i>	SC		1914	9/4/1916	Plant
Wavyrayed lampmussel	<i>Lampsilis fasciola</i>	T		1908	10/11/1908	Animal
Wild hyacinth	<i>Camassia scilloides</i>	T		1916	11/11/1916	Plant
	Great Lakes Marsh			1998	9/22/1998	Community
	Lakeplain Oak Openings			1998	9/22/1998	Community
	Wet-mesic Flatwoods			1983	4/27/1983	Community

* C = candidate, E = endangered, LE = listed endangered, SC = special concern, LT = listed threatened, T = threatened, X = presumed extirpated but legally threatened if found. Special concern and federal candidate species and natural communities are not protected under state or federal endangered species legislation. However, efforts should be taken to minimize impacts to these element occurrences.

Table 5. Wayne County Federally Listed Species

Common Name	Scientific Name	State Status*	Federal Status*	First Observed Date	Last Observed Date	Element Category
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>	SC	C	1858	1858	Animal
Prairie white-fringed orchid	<i>Platanthera leucophaea</i>	E	LT	1985	6/23/2006	Plant
Indiana bat	<i>Myotis sodalis</i>	E	LE	1865	1865	Animal
Northern Long-eared Bat	<i>Myotis septentrionalis</i>		PE			Animal
Northern riffleshell	<i>Epioblasma torulosa rangiana</i>	E	LE			Animal
Rayed Bean	<i>Villosa fabalis</i>	E	LE		2006	Animal
Rufa Red Knot	<i>Calidris canutus rufa</i>		PT			Animal

* C = candidate, E = endangered, LT = listed threatened, LE = listed endangered, PT = proposed threatened, PE = proposed endangered, SC = special concern, T = threatened, X = presumed extirpated but legally threatened if found. Special concern and federal candidate and proposed species and natural communities are not protected under state or federal endangered species legislation. However, efforts should be taken to minimize impacts to these element occurrences.

APPENDIX D: SITE PHOTOGRAPHS

Stony Island Site Photographs



Above: man-made spit east end of island; proposed equipment staging area looking south

Below: east project area, shrub thicket, looking east



Stony Island Site Photographs



Above: Trailing wild bean along old railroad grade on east side of project area

Below: Trailing wild bean along old railroad grade on east side of project area

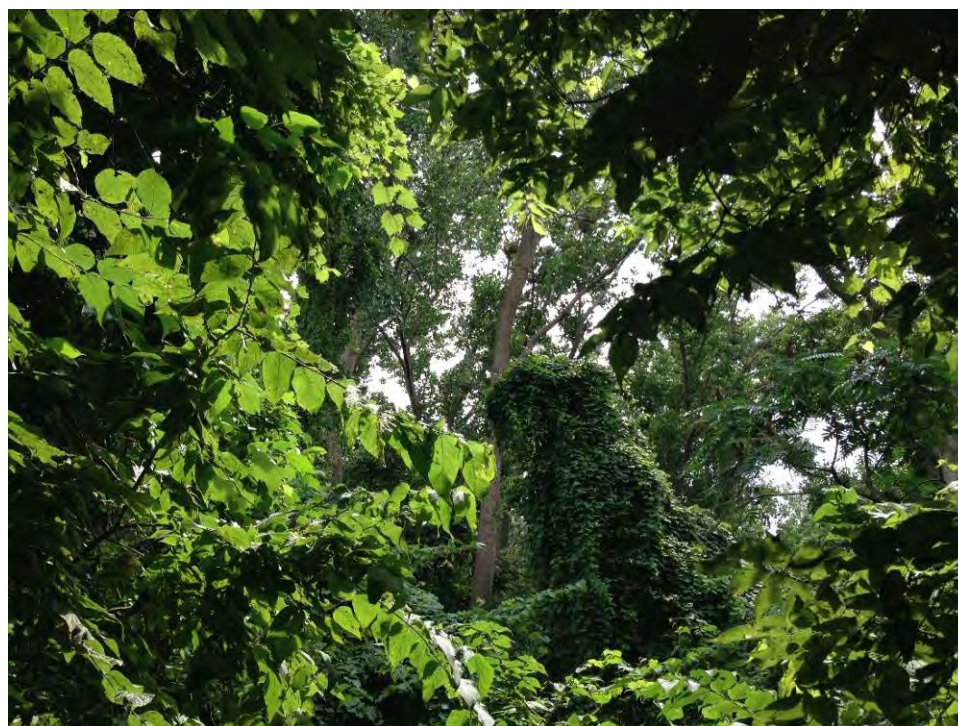


Stony Island Site Photographs



Above: central project area, floodplain forest, looking southeast

Below: central project area, great blue heron rookery, looking south



Stony Island Site Photographs



Above: central project area, great blue heron rookery, looking south

Below: central project area, dead ash potential bat roost tree, looking west



Stony Island Site Photographs



Above: central project area, understory beneath great blue heron rookery, looking south

Below: west project area, narrow railroad grade, looking west



Stony Island Site Photographs



Above: west project area, looking south into *Phragmites* dominated emergent wetland

Below: west project area, narrow railroad grade, looking east



Stony Island Site Photographs



Above: west project area, *Phragmites* dominated emergent wetland south of railroad grade, looking west

Below: northern shoal looking east from boat at common arrowhead and cattail dominated emergent wetland



Stony Island Site Photographs



Above: west end of project area looking south-southeast from boat

Below: north end of middle shoal looking southeast from boat at exposed river bottom dominated by *Phragmites* and willow



Stony Island Site Photographs



Above: southern end of shoal south of island looking north from boat

Celeron Island Site Photographs



Above: *Phragmites* dominated emergent wetland, northwest project area, looking east

Below: *Phragmites* dominated shoreline, east-central side project area, looking south



Celeron Island Site Photographs



Above: east-central side project area, potential bat roost habitat, dead ash and bur oak

Below: east-central side project area, potential bat roost habitat, shagbark hickory



Celeron Island Site Photographs



Above: south end project area, cottonwood stand looking north

Below: *Phragmites* dominated emergent wetland, south end project area, west shoreline looking south



Celeron Island Site Photographs



Above: *Phragmites*, cattail, and bulrush dominated emergent wetland, south end project area, west shoreline looking north

Below: south end project area from boat looking northeast



Celeron Island Site Photographs



Above: south end project area from boat looking north

Below: south end project area from boat looking north-northwest



Celeron Island Site Photographs



Above: central project area from boat looking northwest

Below: north end project area from boat looking northwest



APPENDIX E: VEGETATION SPECIES LISTS

Plant species listed in capital letters are not native in Michigan.

Table 1. Stony Island Staging Area (east side of island near boat landing)

Scientific Name	Common Name	Frequency	Layer
<i>Asclepias incarnata</i>	Swamp milkweed	Sparse	Groundcover
<i>Cornus foemina</i>	Gray dogwood	Common	Understory
<i>Cornus sericea</i>	Red-osier dogwood	Dominant	Understory
<i>DAUCUS CAROTA</i>	Wild carrot	Uncommon	Groundcover
<i>ELAEAGNUS UMBELLATA</i>	Autumn-olive	Uncommon	Understory
<i>Fragaria virginiana</i>	Wild strawberry	Uncommon	Groundcover
<i>FRANGULA ALNUS</i>	Glossy buckthorn	Common	Understory
<i>LONICERA TATARICA</i>	Tartarian honeysuckle	Uncommon	Understory
<i>LYTHRUM SALICARIA</i>	Purple loosestrife	Sparse	Groundcover
<i>MELILOTUS ALBA</i>	White sweet-clover	Uncommon	Groundcover
<i>PHRAGMITES AUSTRALIS</i>	Common reed	Common	Groundcover
<i>Populus deltoides</i>	Eastern cottonwood	Sparse	Understory
<i>Potentilla anserina</i>	Silverweed	Uncommon	Groundcover
<i>Prunella vulgaris</i>	Selfheal	Uncommon	Groundcover
<i>Rhus typhina</i>	Staghorn sumac	Common	Understory
<i>Rubus occidentalis</i>	Black raspberry	Sparse	Groundcover
<i>Scirpus atrovirens</i>	Green bulrush	Sparse	Groundcover
<i>Solidago altissima</i>	Tall goldenrod	Common	Groundcover
<i>Verbena hastata</i>	Blue vervain	Sparse	Groundcover
<i>Vitis riparia</i>	Riverbank grape	Common	Understory

Table 2. Stony Island Railroad Grade Community

Scientific Name	Common Name	Frequency	Layer
<i>ALLIARIA PETIOLATA</i>	Garlic mustard	Dominant	Groundcover
<i>ARCTIUM MINUS</i>	Common burdock	Uncommon	Groundcover
<i>Celtis occidentalis</i>	Northern hackberry	Dominant	Understory/Overstory
<i>Cornus florida</i>	Flowering dogwood	Common	Understory
<i>Geum laciniatum</i>	Rough avens	Common	Groundcover
<i>Hackelia virginiana</i>	Beggar's lice	Common	Groundcover
<i>LONICERA MAACKII</i>	Amur honeysuckle	Dominant	Understory
<i>LONICERA TATARICA</i>	Tartarian honeysuckle	Uncommon	Understory

<i>MORUS ALBA</i>	White mulberry	Common	Understory/Overstory
<i>Persicaria virginiana</i>	Jumpseed	Uncommon	Groundcover
<i>Vitis riparia</i>	Riverbank grape	Dominant	Understory

Table 3. Stony Island Scrub-Shrub Community

Scientific Name	Common Name	Frequency	Layer
<i>Agrimonia gryposepala</i>	Tall agrimony	Uncommon	Groundcover
<i>ALLIARIA PETIOLATA</i>	Garlic mustard	Common	Groundcover
<i>Anemone canadensis</i>	Canada anemone	Sparse	Groundcover
<i>Apocynum cannabinum</i>	Indian-hemp	Sparse	Groundcover
<i>ARCTIUM MINUS</i>	Common burdock	Sparse	Groundcover
<i>Asclepias syriaca</i>	Common milkweed	Sparse	Groundcover
<i>Carex cristatella</i>	Sedge	Sparse	Groundcover
<i>Carex vulpinoidea</i>	Brown fox sedge	Sparse	Groundcover
<i>Cornus florida</i>	Flowering dogwood	Uncommon	Understory
<i>Cornus foemina</i>	Gray dogwood	Dominant	Understory
<i>Cornus sericea</i>	Red-osier dogwood	Dominant	Understory
<i>ELAEAGNUS ANGUSTIFOLIA</i>	Russian olive	Sparse	Understory
<i>Elymus virginiana</i>	Virginia wild-rye	Sparse	Groundcover
<i>Eutrochium maculatum</i>	Joe-pye-weed	Sparse	Groundcover
<i>FRANGULA ALNUS</i>	Glossy buckthorn	Uncommon	Understory
<i>Geum canadense</i>	White avens	Uncommon	Groundcover
<i>Lycopus americanus</i>	Common water horehound	Sparse	Groundcover
<i>MELILOTUS ALBA</i>	White sweet-clover	Uncommon	Groundcover
<i>Monarda fistulosa</i>	Wild bergamot	Sparse	Groundcover
<i>Parthenocissus quinquefolia</i>	Virginia creeper	Uncommon	Groundcover
<i>Pycnanthemum virginianum</i>	Common mountain mint	Sparse	Groundcover
<i>PHALARIS ARUNDINACEA</i>	Reed canary grass	Uncommon	Groundcover
<i>Populus deltoides</i>	Eastern cottonwood	Sparse	Understory
<i>Prunella vulgaris</i>	Selfheal	Uncommon	Groundcover
<i>Prunus virginiana</i>	Choke cherry	Sparse	Understory
<i>ROSA MULTIFLORA</i>	Multiflora rose	Common	Groundcover/Understory
<i>Rubus strigosus</i>	Wild red raspberry	Uncommon	Groundcover
<i>Salix exigua</i>	Sandbar willow	Common	Understory
<i>Salix nigra</i>	Black willow	Uncommon	Understory

<i>Smilax rotundifolia</i>	Common greenbrier	Sparse	Groundcover
<i>Solidago altissima</i>	Tall goldenrod	Common	Groundcover
<i>Strophostyles helvula</i>	Trailing wildbean	Sparse	Groundcover
<i>Symphotrichum novae-angliae</i>	New England aster	Sparse	Groundcover
<i>Triosteum aurantiacum</i>	Horse-gentian	Sparse	Groundcover
<i>VERBASCUM THAPSUS</i>	Common mullein	Sparse	Groundcover
<i>Verbena stricta</i>	Hoary vervain	Sparse	Groundcover

Table 4. Stony Island Floodplain Forest Community

Scientific Name	Common Name	Frequency	Layer
<i>Acer negundo</i>	Box elder	Common	Understory/Overstory
<i>ALLIARIA PETIOLATA</i>	Garlic mustard	Dominant	Groundcover
<i>ARCTIUM MINUS</i>	Common burdock	Uncommon	Groundcover
<i>Campanulastrum americanum</i>	Tall bellflower	Sparse	Groundcover
<i>CATALPA SPECIOSA</i>	Northern catalpa	Sparse	Understory
<i>Celtis occidentalis</i>	Northern hackberry	Common	Understory/Overstory
<i>CIRSIIUM ARVENSE</i>	Canada thistle	Sparse	Groundcover
<i>Cornus foemina</i>	Gray dogwood	Common	Understory
<i>Corylus americana</i>	American hazelnut	Sparse	Understory
<i>Fraxinus pennsylvanica</i>	Red ash	Uncommon	Overstory/Understory
<i>Geum laciniatum</i>	Rough avens	Common	Groundcover
<i>Impatiens capensis</i>	Orange jewelweed	Uncommon	Groundcover
<i>LAMIACEAE</i> sp.	Unknown mint	Sparse	Groundcover
<i>MORUS ALBA</i>	White mulberry	Uncommon	Understory/Overstory
<i>Pilea pumila</i>	Clearweed	Uncommon	Groundcover
<i>Populus deltoides</i>	Eastern cottonwood	Dominant	Understory/Overstory
<i>Quercus muehlenbergii</i>	Chinquapin oak	Sparse	Overstory
<i>RHAMNUS CATHARTICA</i>	Common buckthorn	Uncommon	Understory
<i>Ribes americanum</i>	Wild black currant	Sparse	Groundcover
<i>Rubus strigosus</i>	Wild red raspberry	Common	Groundcover
<i>Tilia americana</i>	American basswood	Sparse	Overstory
<i>Ulmus rubra</i>	Slippery elm	Sparse	Overstory
<i>Urtica dioica</i>	Stinging nettle	Common	Groundcover
<i>Viburnum lentago</i>	Nannyberry	Sparse	Understory

Table 5. Stony Island Emergent Wetland Community

Scientific Name	Common Name	Frequency	Layer
<i>Boehmeria cylindrica</i>	False nettle	Sparse	Groundcover
<i>Campanula aparinoides</i>	Marsh bellflower	Uncommon	Groundcover
<i>Carex lacustris</i>	Lake sedge	Uncommon	Groundcover
<i>Cornus amomum</i>	Silky dogwood	Uncommon	Understory
<i>Cornus foemina</i>	Gray dogwood	Common	Understory
<i>Cornus sericea</i>	Red-osier dogwood	Uncommon	Understory
<i>Eupatorium perfoliatum</i>	Common boneset	Sparse	Groundcover
<i>Impatiens capensis</i>	Orange jewelweed	Uncommon	Groundcover
<i>LYTHRUM SALICARIA</i>	Purple loosestrife	Sparse	Groundcover
<i>Persicaria amphibia</i>	Water smartweed	Uncommon	Groundcover
<i>PHRAGMITES AUSTRALIS</i>	Common reed	Dominant	Groundcover/Understory
<i>Rosa palustris</i>	Swamp rose	Common	Groundcover/Understory
<i>Sambucus canadensis</i>	Elderberry	Uncommon	Understory
<i>Scutellaria galericulata</i>	Marsh skullcap	Sparse	Groundcover
<i>TYPHA ANGUSTIFOLIA</i>	Narrow-leaved cattail	Uncommon	Groundcover
<i>TYPHA x GLAUCA</i>	Hybrid cattail	Uncommon	Groundcover
<i>Verbena hastata</i>	Blue vervain	Sparse	Groundcover
<i>Verbena urticifolia</i>	White vervain	Sparse	Groundcover
<i>Vitis riparia</i>	Riverbank grape	Common	Understory

Table 6. Celeron Island Emergent Wetland Community

Scientific Name	Common Name	Frequency	Layer
<i>Boehmeria cylindrica</i>	False nettle	Sparse	Groundcover
<i>Bolboschoenus fluviatilis</i>	River bulrush	Common	Groundcover
<i>CIRSIUM ARVENSE</i>	Canada thistle	Sparse	Groundcover
<i>Impatiens capensis</i>	Orange jewelweed	Sparse	Groundcover
<i>Laportea canadense</i>	Wood nettle	Sparse	Groundcover
<i>PHALARIS ARUNDINACEA</i>	Reed canary grass	Uncommon	Groundcover
<i>PHRAGMITES AUSTRALIS</i>	Common reed	Dominant	Groundcover/Understory
<i>Sagittaria latifolia</i>	Common arrowhead	Common	Groundcover
<i>SOLANUM DULCAMARA</i>	Bittersweet nightshade	Sparse	Groundcover
<i>Teucrium canadense</i>	Wood-sage	Sparse	Groundcover
<i>Toxicodendron radicans</i>	Poison ivy	Sparse	Groundcover
<i>TYPHA ANGUSTIFOLIA</i>	Narrow-leaved cattail	Common	Groundcover
<i>TYPHA</i> x <i>GLAUCA</i>	Hybrid cattail	Common	Groundcover

Table 7. Celeron Island Floodplain Forest Community

Scientific Name	Common Name	Frequency	Layer
<i>Acer negundo</i>	Box elder	Common	Overstory/Understory
<i>Acer saccharinum</i>	Silver maple	Uncommon	Understory/Overstory
<i>AILANTHUS ALTISSIMA</i>	Tree-of-heaven	Uncommon	Overstory/Understory
<i>ALLIARIA PETIOLATA</i>	Garlic mustard	Common	Groundcover
<i>ARCTIUM MINUS</i>	Common burdock	Uncommon	Groundcover
<i>Bolboschoenus fluviatilis</i>	River bulrush	Sparse	Groundcover
<i>Carex</i> sp.	Unknown broad-leaved sedge	Common	Groundcover
<i>Carya cordiformis</i>	Bitternut hickory	Sparse	Understory
<i>Carya ovata</i>	Shagbark hickory	Sparse	Overstory
<i>Celtis occidentalis</i>	Northern hackberry	Common	Understory/Overstory
<i>CIRSIUM ARVENSE</i>	Canada thistle	Sparse	Groundcover
<i>Echinocystis lobata</i>	Wild-cucumber	Uncommon	Understory
<i>Elymus virginicus</i>	Virginia wild-rye	Sparse	Groundcover
<i>EUONYMOUS EUROPAEA</i>	Spindletree	Uncommon	Understory
<i>Fraxinus pennsylvanica</i>	Red ash	Sparse	Understory
<i>Geranium maculatum</i>	Wild geranium	Sparse	Groundcover
<i>Geum laciniatum</i>	Rough avens	Common	Groundcover

<i>Heracleum maximum</i>	Cow-parsnip	Uncommon	Groundcover
<i>HESPERA MATRIONALIS</i>	Dame's rocket	Uncommon	Groundcover
<i>Hydrophyllum virginianum</i>	Virginia waterleaf	Sparse	Groundcover
<i>Juglans nigra</i>	Black walnut	Uncommon	Understory/Overstory
<i>LIGUSTRUM VULGARE</i>	Common privet	Sparse	Understory
<i>LONICERA MAACKII</i>	Amur honeysuckle	Dominant	Groundcover/Understory
<i>MORUS ALBA</i>	White mulberry	Common	Overstory/Understory
<i>Parthenocissus quinquefolia</i>	Virginia creeper	Uncommon	Groundcover/Understory
<i>PHRAGMITES AUSTRALIS</i>	Common reed	Dominant	Groundcover/Understory
<i>Pilea pumila</i>	Clearweed	Uncommon	Groundcover
<i>Populus deltoides</i>	Eastern cottonwood	Dominant	Overstory
<i>RHAMNUS CATHARTICA</i>	Common buckthorn	Common	Groundcover/Understory
<i>Rubus occidentalis</i>	Black raspberry	Uncommon	Groundcover
<i>Salix exigua</i>	Sandbar willow	Common	Understory
<i>Schoenoplectus pungens</i>	Threesquare	Common	Groundcover
<i>Sparganium eurycarpum</i>	Common bur-reed	Sparse	Groundcover
<i>Ulmus americana</i>	American elm	Uncommon	Understory/Overstory
<i>Ulmus rubra</i>	Slippery elm	Sparse	Overstory
<i>Urtica dioica</i>	Stinging nettle	Common	Groundcover
<i>Vitis riparia</i>	Riverbank grape	Dominant	Understory