Existing Conditions Report

OHIO STREET BOAT LAUNCH AND OLD BAILEY WOODS

Buffalo, NY

JULY 2016

Prepared for:

BUFFALO NIAGARA RIVERKEEPER®

721 Main Street
Buffalo, NY 14203

Prepared by:

GOMEZ AND SULLIVAN ENGINEERS

1961 Wehrle Drive
Suite 12
Buffalo, NY 14221

TABLE OF CONTENTS

List of Tables

List of Figures

1 INTRODUCTION

1.1 Background

These projects are designed to restore and improve habitat at the New York State Department of Environmental Conservation (NYSDEC) Ohio Street Boat Launch and Old Bailey Woods sites. Ecological restoration at these two sites will contribute to the Buffalo Area of Concern (AOC) objective to improve approximately 0.2 miles (1,151 feet) of Buffalo River shoreline habitat.

1.1.1 The Project Area and Site Descriptions

Both proposed project areas, Ohio Street Boat Launch and Old Bailey Woods, are located on the Buffalo River in the City of Buffalo, Erie County, New York. These sites have been chosen due to their potential for habitat restoration.

1.1.1.1 NYSDEC Ohio Street Boat Launch

The Ohio Street Boat Launch site is located on Ohio Street and the right descending side of the Buffalo River, 1.5 miles upstream of the river's mouth and between Michigan Street and South Street in Buffalo, NY. The site is bound to the north and south by old industrial properties, to the east by Ohio Street, and to the west by the river. The City of Buffalo maintains this site for hand launching of canoes and kayaks along the Buffalo Urban Canoe Trail. It is also an important component of the Ohio Street revival, and is the site of a recent Complete Streets project carried out by the City of Buffalo.

This project expands on the upland restoration efforts made recently as part of the Ohio Street Complete Streets project to create upland habitat with ecological function for native pollinators, birds, and small mammals, and to provide restoration of 343 linear feet of shoreline habitat and 1.62 acres of riparian buffer and upland habitat restoration and enhancements, roughly 1.7% of the shoreline restoration goal for the AOC. The target area consists of mowed lawn, mature cottonwood trees, and paved walking paths. Restoration efforts will allow for the creation of valuable habitat without compromising the public use of the site and without significantly changing the site's view shed. The shoreline at the site is vegetated with native and non-native species; invasive species may be targeted for removal.

1.1.1.2 Old Bailey Woods

The Old Bailey Woods site is located on the left descending bank of the Buffalo River, downstream of the confluence of the Buffalo River and Cazenovia Creek, and is accessible from land via Bailey Avenue. The project area is composed of two parcels, one owned by the City of Buffalo and one owned by the Buffalo Urban Renewal Agency. Iron Mountain, a storage and information management company, operates a large facility in the adjacent parcel, and holds an easement to the City of Buffalo parcel for access and maintenance purposes. The Old Bailey Woods site is not actively maintained, and public access is not encouraged.

Restoration at Old Bailey Woods is intended to provide 807 linear feet of shoreline habitat and 3.25 acres of upland and riparian buffer habitat restoration and enhancements, representing approximately 4% of the shoreline restoration goal for the AOC. Information provided by Buffalo Niagara Riverkeeper (RIVERKEEPER) indicates that the understory of the forest is dominated by non-native Japanese knotweed (*Reynoutria japonica,* also called *Fallopia japonica*). Other invasive species such as tree of heaven (*Ailanthus altissima*) are also present. Cottonwood (*Populus deltoides*) is the dominant canopy tree. Witch-hazel (*Hamamelis virginiana*), dogwoods (*Cornus spp*.), and box elder (*Acer negundo*) are common understory trees. Other species noted include snake root (*Eupatorium rugosum*), stinging nettle (*Urtica*

dioica), asters (*Symphotrichum* spp.), waterleaf (*Hydrophyllum virginianum*), iris (*Iris* spp.), goldenrods (*Solidago* spp.), and jewelweed (*Impatiens* sp.).

2 DATA GENERATION AND ACQUISITION

2.1 Ecological and General Site Condition Data Collection Methods

A complete description of the ecological sampling methods is given in the Quality Assurance Project Plan for the project (Gomez and Sullivan 2016). Gomez and Sullivan staff performed a qualitative assessment of riparian and emergent plant communities at the Ohio Street Boat Launch and Old Bailey Woods sites. Ecologists used a field computer with a built-in GPS unit to draw the location and boundaries of land cover types over orthoimages using Collector for GIS and then corrected these areas based on a real property survey conducted in June 2016 by a licensed surveyor from Foit Albert Associates. Cover at both sites was initially classified into two broad cover types, anthropogenic and natural. Field ecologists then further defined cover into categories, which are shown below in Tables 2.1-1 and 2.1-2.

Table 2.1-1. Anthropogenic Cover Categories

Categories	Description
Roads and Parking	Paved and gravel covered access roads and parking area.
Trails and Paths	Paved, gravel or woodchip covered trails, or mowed trails through grassy areas.
Shoreline Armoring and Boat Launch	Shoreline areas protected by rip-rap, sheet pile, concrete bulkheads or other hard cover, and areas created to launch canoes, kayaks, and small boats.
Structures	Buildings, kiosks, and other structures.

Table 2.1-2. Natural Cover Categories

Categories	Plant Communities	Description
Wooded Areas	Upland Woods	Areas where the dominant cover is comprised of upland tree species, more than 25 feet inland from the top of the stream bank (measured along a horizontal plane).
	Riparian Woods	Areas dominated by trees common to streambank areas, within 25 feet of the top of the bank (measured along a horizontal plane).
Shrub Areas	NA	Areas dominated by shrubs.
Herb Dominated Areas	Grasses and Lawns	Areas dominated by native or cultivated lawn grasses and herbaceous plants, often mowed.
	Upland Herbaceous Areas	Areas dominated by upland herbaceous plants, both native and non-native species.
	Wetland Herbaceous Areas	Areas dominated by wetland herbaceous species, both emergent and submerged listed plants.

Polygons were drawn to delimit the boundaries of each distinct cover category area and the boundaries of each plant community. Each polygon was given a unique number for identification.

Dominant plants were identified to species when possible in each plant community polygon. Some grasses and other species could not be identified due to the time of year and recent mowing. The abundance of each species was described using the following categories:

Dominant: A species that is the most common plant by far (in terms of numbers of individuals), or which occupies by far the most space in the community. A dominant species

would cover roughly three quarters of the community, and be represented by either very many or very large individuals. Dominant plants should be present throughout the community.

Abundant: A species that is very common in the community. An abundant species would occupy roughly half of the community, and be represented by many or moderately large individuals. Abundant plants would generally be present throughout the area (though in fewer numbers or smaller sizes than dominant species), or in large numbers in smaller, discrete patches.

Frequent: A species that is found in several places throughout the community, in fewer numbers than abundant species or at smaller sizes, and generally not distributed throughout the community. A species that would occupy roughly 25% of the space in the community.

Occasional: A species that is found in some places throughout the community, in fewer numbers than abundant or frequent species or at smaller sizes, and generally not distributed throughout the community. An occasional species would occupy roughly 10% of the space in the community.

Rare: A species that represented by very few individuals throughout the community. A rare species would occupy less than 5% of the space in the community.

While on site, the field ecologist evaluated the stability of the shoreline and recorded evidence of any erosion observed. Observations of animal species were recorded. Field notes were assembled to describe particular problems observed or opportunities recognized. All data were recorded in the field computer and on project data sheets. The field ecologist established two photo-monitoring points for each plant community polygon mapped at both sites.

A Coefficient of Conservatism was assigned to each plant species. The coefficient is a weighting factor that expresses the degree of conservatism or fidelity to a particular native plant community evidenced by a particular species in relation to all other species of the region in which the study takes place (Wilhelm & Ladd, 1988; Andreas & Lichvar, 1995). A score of 0 to 10 is assigned to each plant. In general, plants that are not typical or native to a region, or are species with very broad ecological niches (generalist, often early successional species), receive low scores. A score of zero is assigned to any non-native species. The scoring ranges are defined as:

- 0 to 3: Plants with a very broad range of ecological tolerances and are generally found in a variety of plant communities.
- 4 to 6: Plants with an intermediate range of ecological tolerances and are generally associated with a specific plant community.
- 7 to 8: Plants with a relatively narrow range of ecological tolerances and are generally associated with more advanced successional conditions.
- 9 to 10: Plants with very narrow ranges of ecological tolerances and which generally exhibit a high degree of fidelity to specific habitats and communities.

The New England Interstate Water Pollution Control Commission (2013) has published Coefficients of Conservatism for New York. These will be used for this project. Some species we encountered were not listed in the New England Interstate Water Pollution Control Commission (2013) list. We supplemented the New York List with lists from neighboring Ohio (Andreas *et al* 2004) and Pennsylvania (Bowman's Hill 2006). A mean Coefficient of Conservatism was calculated for each plant community polygon, by totaling the

Coefficients of Conservatism and dividing by the number of native and non-native species identified in the area.

2.2 Survey Data

A licensed surveyor from Foit Albert Associates, researched documents from the City of Buffalo, RIVERKEEPER, Erie County and public utility providers in order to locate utilities present on the sites. Topographic mapping was prepared for both sites. Mass points and break lines were collected to create one-foot contour intervals. Spot elevations were recorded at the locations of critical natural and man-made elements. Data collection extended into the Buffalo River up to the 1-foot depth level. Shots were taken at 25-foot intervals in areas of complex features or rapid vertical change.

The survey identified property boundaries, rights-of-way, current easements (both temporary and permanent), the elevation of the river at the time of the survey, the FEMA Special Flood Hazard Area (100-Year Flood Plain) limits, limits of rip rap, all dead and living trees of 9-inches caliper diameter breast height (DBH) or greater (including the caliper and species), dense masses of woody vegetation greater than 300 square feet, limits of existing wetlands, limits of natural depressions greater than 40 square feet, debris piles exceeding 4 feet in height and 64 square feet at the base, areas of exposed rock greater than 16 square feet, adjacent in-water planting beds along the shoreline (showing the line of exposed stakes above water and the ends of the beds) and existing drainage ways (including drainage centerlines).

The survey used North American Datum 83, New York West Zone, for horizontal datum and North American Vertical Datum 88 for vertical datum. Units will be in U.S. Survey Feet. Data precision was plus or minus 0.10 feet on hard or man-made surfaces and plus or minus 0.20 feet on all natural surfaces.

Site utilities, including owner, type, size, material, rim elevation, and invert elevation information, were field-located where present either at the surface or above ground, with estimates of subsurface routing shown on the survey base. Utility easements will also be shown, including width of easement. The sources of all utility information shall be noted on the final survey document.

3 DATA ANALYSIS, IDENTIFICATION OF PROBLEMS AND OPPORTUNITIES

3.1 Ohio Street Boat Launch

3.1.1 Summary of Field Findings

The land area within the surveyed property boundary encompasses 1.62 acres. Eleven cover type polygons were mapped at the Ohio Street Boat Launch site (Figure 3.1.1-1). These polygons are summarized in Table 3.1.1-1.

Table 3.1.1.-1 Cover Types and Cover Categories at Ohio Street Boat Launch

Cover Category	Acreage	Area(s)
Natural Cover Types		
Wooded Areas		
Upland Woods	0.22	3
Riparian Wooded Areas	0.26	8
Herb Dominated Areas		
Grasses or Lawns	0.84	1, 4, 5, 7, 9
Anthropogenic Cover Types		
Trails and Paths	0.14	6
Roads or Parking	0.16	2
TOTAL	**1.62**	

Table 3.1.1-2 lists the species found in each mapped cover type area. Taxonomy and nativity determinations follow the New York Flora Atlas (Weldy *et al* 2016). Status designation follow the New York Rare Plant Law (New York State Environmental Conservation, Title 15, § 9-1503). Taxa that could not be identified to species were assigned "not available" for nativity, coefficient of conservatism and status.

Area 1 is a natural herb dominated cover type and category, Grasses and Lawns, which covers 0.45 acres. There were 14 plant taxa identified in this area, with unidentified lawn grasses being the dominant taxa. Note that the grassy areas are mowed regularly and had been mowed prior to the field crew's visit. This prevented identification even to genus. Lawns are typical dominated by cultivated members of the genera *Poa* (bluegrass), *Festuc*a (fescue) and *Agrostis* (bent grass). Five of the taxa in area 1 were native species, and five were non-native. One invasive species, *Artemisia vulgaris* (mugwort) was listed as an occasional plant in Area 1. This invasive plant was only growing near the landscape boulders.

Note that Kentucky coffee tree (*Gymnocladus dioica*), which is growing in Area 1, is listed as endangered in New York State. Kentucky coffee tree is native to the United States, though it is unknown if the tree is native to New York. The trees at the Ohio Street Boat Launch were planted.

Area 2 is a parking lot with no vegetation. This area covers 0.16 acres. No changes will be made to this area.

Area 3 is a natural wooded cover type in the category Upland Wooded, encompassing 0.22 acres. The upland wooded area at the site is an area of mowed lawn with an overlapping canopy of cottonwood (*Populus deltoides*) trees. The dominant herbaceous species were unidentified lawn grasses, the understory was generally populated by species commonly found in lawns and abandoned areas. Seven taxa were identified. Two are native species; four are not native. Nativity of the lawn grass was not available. No listed species were found.

Area 4 is a natural herbaceous cover type in the category Grasses and Lawns, which covers 0.07 acres. This area covers where the Ohio Street Boat Launch parking area used to be before the most recent landscape improvements. The grass here was planted and is the only plant taxa in the area.

Area 5 is a natural herbaceous cover type in the category Grasses and Lawns, occupying 0.15 acres. Grasses were the dominant taxa, with common lawn weeds narrow leaved plantain (*Plantago lanceolata*) and common dandelion (*Taraxacum officinale*) occurring abundantly. Both of the taxa identified to species are non-native. No listed species were found.

Area 6 is the paved area comprised of paved paths, a sitting area and the boat launching ramp. The total area was 0.14 acres. Visitors to the site walk on these paths; however, they also walk along the lawns. The boat launching ramp is used frequently by kayakers, picnickers, and dog walkers, and also provides easy access to the upland for wading birds and animals.

Area 7 is also a natural herbaceous cover type in the category Grasses and Lawns. The dominant plants in this 0.15-acre area are lawn grasses and lawn weeds. There is also a line of mature cottonwood trees along the northern boundary of the property. These trees show signs of herbivory by beaver, but otherwise appear healthy. There is a single linden tree (*Tilia americana*) species that was planted.

The only riparian wooded area on the site is Area 8, an area of 0.26 acres which borders the Buffalo River on the west side of the site. The riparian area includes cottonwood and willow trees, as well as shrubs and herbaceous plants. It is dominated by invasive European buckthorn (*Rhamnus cathartica*).

Area 9 is a small area of 0.02 acres that borders the parking lot. Most of this area is taken up by landscape boulders that prevent cars from driving on the lawns or walking paths. There is sparse grass growing around the boulders.

The grass and lawn areas were dominated by planted lawn grasses mixed with familiar lawn weeds, such as gill over the ground (*Glechoma hederacea*), red clover (*Trifolium repens*), and lance-leaf plantain (*Plantago lanceolata*). Ornamental tree species are also growing in the lawns, but they do not form a closed canopy. Most of these trees were planted within the last two years. Human uses include walking, picnicking and fishing. The only animals observed in this cover category during the site visit were Canada geese; however, there were signs that mammals such as beaver are also using these areas to access the trees growing at the site. There are burrows or tunnels in the grass near the north side of the site. RIVERKEEPER staff reported that deer are regularly seen in the area.

Table 3.1.1-2 Plant Species at Ohio Street Boat Launch

Species	Common name	Nativity	DAFOR Rating	Coefficient of Conservatism	Status
Area 1, Grasses and Lawns, 0.45 acres					
Acer x. freemanii	Freeman maple	Native	Occasional	None given	Not applicable
Achillea millefolium	Yarrow	Native	Occasional	0[2]	Not listed
Amelanchier canadensis	Coastal shadbush	Native	Occasional	7[1]	Not listed
Artemisia vulgaris	Mugwort	Invasive	Occasional	0[2]	Not available
Betula nigra	River birch	Native	Rare	7[1]	Not listed
Cichorium intybus	Chicory	Non-native	Occasional	0[3]	Not applicable
Cirsium vulgare	Bull thistle	Non-native	Rare	0[2]	Not applicable
Daucus carota	Queen Anne's lace	Non-native	Frequent	0[2]	Not applicable
Gymnocladus dioicus	Kentucky coffee tree	Unknown	Occasional	8[1]	Listed, NY Endangered
Leucanthemum vulgare	Ox-eye daisy	Non-native	Occasional	Not available	Not applicable
Lotus corniculatus	Birds-foot-trefoil	Non-native	Frequent	0[3]	Not applicable
Rhamnus cathartica	European buckthorn	Invasive	Rare	Not available	Not applicable
Pinus nigra	Austrian pine	Non-native	Occasional	0[2]	Not applicable
Plantago lanceolata	Narrow-leaved plantain	Non-native	Abundant	0[2]	Not applicable
Poaceae	Grass	Not available	Dominant	Not available	Not available
Quercus rubra	Red oak	Native	Rare	4[1]	Not listed
Taraxacum officianale	Common dandelion	Non-native	Occasional	0[2]	Not applicable
Area 2, Roads or Parking, 0.16 acres					
No vegetation					
Area 3, 0.22 acres					
Achillea millefolium	Yarrow	Native	Occasional	0[2]	Not listed
Cirsium vulgare	Bull thistle	Non-native	Rare	0[2]	Not applicable
Daucus carota	Queen Anne's lace	Non-native	Frequent	0[2]	Not applicable
Plantago lanceolata	Narrow-leaved plantain	Non-native	Abundant	0[2]	Not applicable

Species	Common name	Nativity	DAFOR Rating	Coefficient of Conservatism	Status
Poaceae	Grass	Not available	Dominant	Not available	Not available
Populus deltoides	Cottonwood	Native	Frequent	4[1]	Not listed
Tilia americana	small leaf linden	Non-native	Rare	5[1]	Not applicable
Taraxacum officianale	Common dandelion	Non-native	Occasional	0[2]	Not applicable
Area 4, Grasses or Lawn, 0.07 acres					
Betula nigra	River birch	Native	Rare	7[1]	Not listed
Poaceae	Grass	Not available	Dominant	Not available	Not available
Area 5, Grasses or Lawn, 0.15 acres					
Plantago lanceolata	Narrow-leaved plantain	Non-native	Abundant	0[2]	Not listed
Poaceae	Grass	NA	Dominant	Not available	NA
Taraxacum officianale	Common dandelion	Non-native	Abundant	0[2]	Not listed
Area 6, Trails or Paths, 0.14 acres					
No vegetation					
Area 7, Grasses or Lawns, 0.15 acres					
Crataegus sp.	Crab apple	Native	Rare	Not available	Not listed
Poaceae	Grass	Not available	Dominant	Not available	Not available
Populus deltoides	Cottonwood	Native	Occasional	4[1]	Not listed
Tilia cordata	Small leaf linden	Non-native	Rare	Not Available	Not applicable
Area 8, Riparian Wooded Area, 0.26 acres					
Ailanthus altissima	Tree of heaven	Invasive	Occasional	0[2]	Not applicable
Alnus glutinosa	Black alder	Non-native	Frequent	0[2]	Not applicable
Apocynum cannabinum	Indian hemp	Native	Occasional	2[1]	Not listed
Arctium lappa	Greater burdock	Non-native	Occasional	0[2]	Not applicable
Asclepias syriaca	Common milkweed	Native	Occasional	2[1]	Not listed
Cornus amomum	Silky dogwood	Native	Frequent	4[5]	Not listed
Cornus sericea	Red-osier dogwood	Native	Frequent	3[1]	Not listed
Elaeagnus umbellata	Autumn olive	Invasive	Rare	0[2]	Not available
Frangula alnus	Glossy buckthorn	Invasive	Rare	0[3]	Not available
Fraxinus pennsylvanica	Green ash	Native	Rare	5[1]	Not listed
Geum sp.	Avens	Native	Rare	Not available	Not listed

Species	Common name	Nativity	DAFOR Rating	Coefficient of Conservatism	Status
Iris sp.	Iris	Invasive[4]	Occasional	Not available	Not available
Linaria vulgaris	Butter and eggs	Non-native	Rare	0[2]	Not applicable
Lonicera morrowii	Morrow's honeysuckle	Invasive	Occasional	0[2]	Not available
Oenothera biennis	Evening primrose	Native	Occasional	2[1]	Not listed
Populus deltoides	Cottonwood	Native	Frequent	4[1]	Not listed
Prunus virgniana	Choke cherry	Native	Occasional	3[1]	Not listed
Reynoutria japonica	Japanese knotweed	Invasive	Occasional	0[1]	Not available
Rhamnus cathartica	European buckthorn	Invasive	Dominant	0[2]	Not available
Rhus typhina	Staghorn sumac	Native	Abundant	1[2]	Not listed
Rosa multiflora	Multiflora rose	Invasive	Rare	0[2]	Not available
Salix x. fragilis	Crack willow	Non native	Abundant	0[3]	Not listed.
Salix sp.	Willow	Not available	Occasional	Not available	Not available
Vitis riparia	Riverbank grape	Native	Dominant	3[1]	Not listed
Area 9, Grasses or Lawn, 0.02 acres					
Lotus corniculatus	Birds-foot-trefoil	Non-native	Frequent	0[3]	Not applicable
Plantago lanceolata	Narrow-leaved plantain	Non-native	Abundant	0[2]	Not listed
Poaceae	Grasses	Not available	Dominant	Not available	Not available

[1] Source: New England Water Pollution Control Commission (2013)

[2]Source: Andreas *et al* (2004)

[3]Bowman's Hill (2006)

[4]Yellow iris is not native. These individuals were not identified to species, but yellow iris is much more common than the native blue iris, so we've assumed the individuals we found were not native. We can confirm the species identification once flowering occurs.

P:\arcgis_online\job1787\offline_desktop\Existing_Conditions_Report\Figure_3_1_1_1.mxd

BUFFALO NIAGARA RIVERKEEPER®

Figure 3.1.1-1. NYSDEC Ohio Street Boat Launch Project Area

0 125 250 Feet

N

GOMEZ AND SULLIVAN ENGINEERS

3.1.2 Problem Identification

General problems at the Ohio Street Boat Launch include a lack of plant species diversity, particularly of native species. There is limited structural diversity in the plant communities. This lack of diversity manifests in both vertical and horizontal dimensions. The grassy areas have a single vertical layer, while deer browse and other sources of herbivory have altered the sub-canopy layers in the wooded areas. The dominant species are plants that deer do not prefer. Horizontal structural diversity is also lacking. The boundaries between the various plant communities are sharp and distinct. Some of this is due to the paved paths, the sidewalk, and the shoreline, but some is due to the sharp transitions from wooded to mowed areas, and the general homogeneity of the non-wooded communities.

There were 36 taxa mapped at the Ohio Street Boat Launch. Ten of these were non-native species, and seven were classified as invasive. Sixteen species were listed as native, and three could not be classified as they could not be identified to species. Thus, almost half of the identified plant taxa are not native species.

There are specific problems in some of the mapped plant communities as well, these are described in the restoration opportunities below.

In Area 4, the soils are thin and rather poor. This area was apparently originally used for parking, there is gravel and other stone close to and on the surface. The dominant species are lawn grasses, with a planted black birch (*Betula nigra*) Topsoil is lacking and therefore some of the plant growth is rather sparse.

3.1.3 Restoration Opportunities

There are specific restoration opportunities in each mapped area. Overall, taking advantage of these opportunities will create a continuous habitat across the Ohio Street Boat Launch site, allowing for greater use by native plants and wildlife, and enhanced recreation opportunities for human visitors. As with most urban areas, the Ohio Street Boat Launch site is subject to herbivory by deer. This can pose a particular problem in maintaining new plantings. As the designs progress, the team will consider the palatability of species for deer, and will develop plans to protect new plantings.

Area 1: There are five non-native species in this area, and one invasive plant. The native trees and shrubs should be retained. The population of mugwort should be treated. Islands of native shrubs could be created in this almost half acre area. Species could include common winterberry (*Ilex verticillata*), red-osier dogwood (*Cornus sericiea*), or New Jersey tea (*Ceanothus americana*). To maximally increase native diversity, the removal of the non-native species should be considered. The grassy areas dominated by non-native lawn species could be removed and replaced with a mix of native grasses and forbs. A mix might include Indian grass (*Sorghastrum nutrans*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), butterfly weed (*Asclepias tuberosa*), bee-balm (*Monarda punctata*), smooth blue aster (*Symphyotrichum leave*), blackeyed Susan (*Rudbeckia hirta*), early goldenrod (*Solidago juncea*) or other meadow species.

Area 2: The parking area is not within the scope of this project and therefore no improvements are planned.

Area 3: The main ecological need for this area is to increase diversity and structural complexity.

Area 4: This area has thin soil over an old parking lot. The main ecological need is to improve conditions for plant growth by bringing in additional topsoil, and planting native grass, meadow and shrub species.

Area 5: A meadow similar to that described for Area 1 could be installed here.

Area 6: The trail system has generally good pavement and any proposed changes to the trail or boat ramp area will be first discussed with RIVERKEEPER.

Area 7: This area is mowed lawn with cottonwoods, a linden, and a hawthorn planted near the south side. The space could offer improved habitat, particularly for birds, by replacing areas of the lawn with native grass and meadow plant species, as well as adding clumps of shrubs to offer food, nesting and shelter habitat for birds. Native virburnums, hollies, and elderberries all attract a variety of passerine birds with their fruits. When planted in clumps separated by meadow species, they also offer shelter and nesting cover. Bird boxes (suitable for bluebirds, swallows, and other species) might be installed. Bat boxes might also be installed. These are best placed on free standing poles, rather than attached to tree trunks.

Area 8: The Buffalo River shoreline in this riparian area shows little evidence of erosion, and appears largely intact. There is a fair amount of driftwood along the shore. This material should be carefully removed to allow planting and other activities. The non-native glossy buckthorn and other non-native and invasive species should be cut and the stems removed. They will be replaced by native riparian trees and shrubs. Along steeper portions of the bank, native thorny shrubs such as Virginia rose (*Rosa virginiana*), devil's walking stick (*Aralia spinosa*), common blackberry (*Rubus allegheniensis*) or purple flowered blackberry (*Rubus odoratus*) might be planted near locations where the bank is steep and potentially unsafe for walking.

Area 9: This is a small area of mowed lawn planted around landscape boulders. The non-native flora here should be removed and replaced with native upland grasses, herbs and shrubs. Species could be chosen from the list provided for Area 1.

3.2 Old Bailey Woods

3.2.1 Summary of Field Findings

The land area within the surveyed property boundary encompasses 3.25 acres. Three cover type polygons were mapped at the Old Bailey Woods site (Figure 3.2.1-1). These polygons are summarized in Table 3.2.1-1.

Table 3.2.1-1 Cover Types and Cover Categories at Old Bailey Woods

Cover Category	Acreage	Area(s)
Natural Cover Types		
Wooded Areas		
Upland Woods	2.06	10
Riparian Wooded Areas	0.48	11
Herb Dominated Areas		
Grasses and Lawns	0.52	12
Anthropogenic Cover Types		
Roads or Parking Areas	0.19	13
TOTAL	**3.25**	

Area 10 is categorized as an Upland Wooded Area. This area is a floodplain forest with a canopy of black willow and cottonwood trees. The forest understory is dominated by invasive Japanese knotweed, garlic mustard (*Allaria petiolata*) and dame's rocket (*Hesperis matronalis*). Song birds and one deer were observed in this area during the site visit.

Area 11 is the Riparian Wooded Area at the Old Bailey Woods site. It is located on the slope that descends from the floodplain forest to the shoreline of the Buffalo River. Vegetation in this area is not as thick as in the floodplain forest; however, Japanese knotweed is still present. Dominant species in the canopy include walnut (*Juglans nigra*) and box elder (*Acer negundo*). The dominant shrub, growing close to the shoreline, is European black alder (*Alnus glutinosa*). Iris plants are also present along the shoreline. The plants are likely yellow iris (*Iris pseudoacorus*); however, they could not be identified to species at the time of the data collection.

Area 12 is a Grasses and Lawns area dominated by planted lawn grasses mixed with familiar lawn weeds, such as gill over the ground and red clover. Two stands of black willow (*Salix nigra*) trees and one large tree of heaven (*Ailanthus altissima*) are growing within the lawn, and are mowed around. This area is regularly mowed and was being mowed when Gomez and Sullivan and RIVERKEEPER were on site for the ecological data collection visit. No signs of animal use were observed in the grass and lawn area.

The driveway that is used by Iron Mountain Records Management, Inc. is shown as Area 13. The survey conducted by Foit-Albert Associates shows that Iron Mountain Records Management, Inc. holds an easement to this 25-foot wide area for fire access and maintenance.

Table 3.2.1-2 Plant Species at Old Bailey Woods

Species	Common name	Nativity	DAFOR Rating	Coefficient of Conservatism	Status
Area 10, Upland Woodland, 2.06 acres					
Acer negundo	Box elder	Native	Occasional	2[1]	Not Listed
Acer platanoides	Norway Maple	Non-native	Rare	0[2]	Not listed
Ailanthus altissima	Tree-of-heaven	Non-native	Occasional	0[2]	Not listed
Alliaria petiolata	Garlic mustard	Invasive	Dominant	0[2]	Not listed
Artemisia vulgaris	Mugwort	Invasive	Abundant	0[2]	Not available
Glechoma hederaceae	Ground ivy	Non-native	Occasional	0[2]	Not listed
Hesperis matronalis	Dame's rocket	Non-native	Dominant	0[2]	Not listed
Juglans nigra	Black walnut	Native	Rare	3[1]	Not listed
Ligustrum obtusifolium	Border privet	Unknown	Occasional	0[2]	Listed, NY Endangered
Lonicera morrowii	Morrow honeysuckle	Invasive	Occasional	0[2]	Not available
Morus alba	White mulberry	Non-native	Rare	0[2]	Not listed
Populus deltoides	Cottonwood	Native	Occasional	4[1]	Not listed
Prunus virginiana	Choke cherry	Native	rare	3[1]	Not listed
Reynoutria japonica	Japanese knotweed	Invasive	Dominant	0[1]	Not available
Rhus typhina	Staghorn sumac	Native	Rare	1[1]	Not available
Rubus occidentalis	Black raspberry	Native	Occasional	3[1]	Not listed
Rumex obtusifolius	Broad-leaved dock	Non-native	Occasional	0[2]	Not listed
Salix nigra	Black willow	Native	Frequent	4[1]	Not listed
Urtica dioica	Stinging nettle	Non-native	Frequent	1[1]	Not listed
Viburnum oppulus	Highbush cranberry	Native	Occasional	7[1]	Not listed
Vitis riparia	Riverbank grape	Native	Frequent	3[1]	Not listed
Area 11, Riparian Wooded, 0.48 acres					
Acer negundo	Box elder	Native	Occasional	2[1]	Not Listed
Alnus glutinosa	Black alder	Non-native	Dominant	0[2]	Not listed
Iris sp.	Iris	Invasive	Occasional	Not available	Not available
Juglans nigra	Black walnut	Native	Occasional	3[1]	Not listed

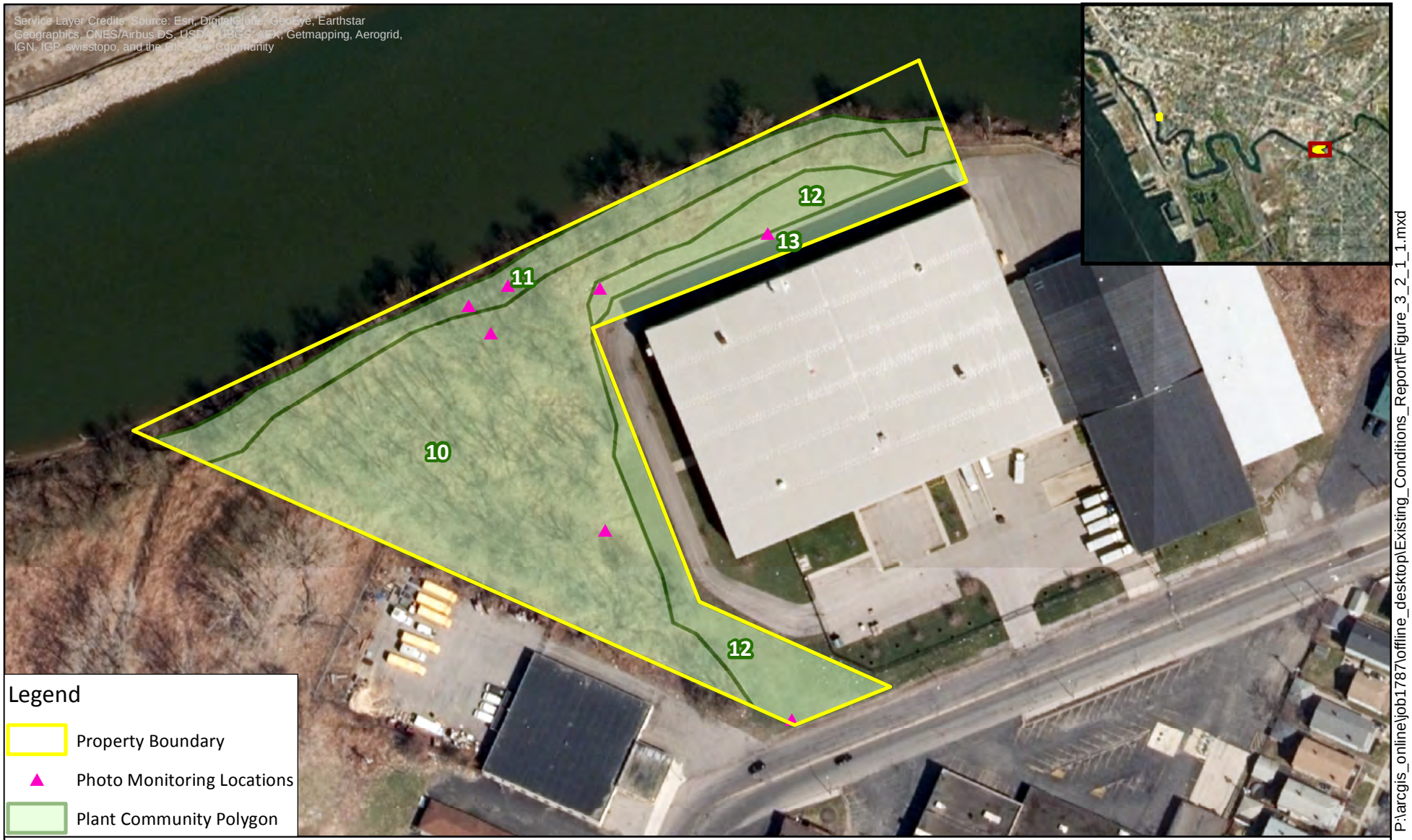
Species	Common name	Nativity	DAFOR Rating	Coefficient of Conservatism	Status
Reynoutria japonica	Japanese knotweed	Invasive	Dominant	0[1]	Not available
Tussilago farfara	Colt's foot	Non-native	Abundant	0[1]	Not listed
Ulmus sp.	Elm	Native	Occasional	Not Available	Not listed
Urtica dioica	Stinging nettle	Non-native	Occasional	1[1]	Not listed
Vitis riparia	Riverbank grape	Native	Occasional	3[1]	Not listed
Area 12, Grasses or Lawn, 0.52 acres					
Glechoma hederaceae	Ground ivy	Non-native	Frequent	0[2]	Not listed
Poaceae	Grasses	Not available	Dominant	Not available	Not available
Salix nigra	Black willow	Native	Null	4[1]	Not listed
Vitis riparia	Riverbank grape	Native	Dominant	3[1]	Not listed
Poaceae	Grasses	Not available	Dominant	Not available	Not available
Taraxacum officianale	Common dandelion	Non-native	Abundant	0[2]	Not listed
Trifolium pratense	Red clover	Non-native	Dominant	0[2]	Not listed
Urtica dioica	Stinging nettle	Non-native	Rare	1[1]	Not listed

[1] Source: New England Water Pollution Control Commission (2013)

[2]Source: Andreas *et al* (2004)

[3]Bowman's Hill (2006)

[4]Yellow iris is not native. These individuals were not identified to species, but yellow iris is much more common than the native blue iris, so we've assumed the individuals we found were not native. We can confirm the species identification once flowering occurs.



BUFFALO NIAGARA RIVERKEEPER®

Figure 3.2.1-1. Old Bailey Woods Project Area

0 125 250 Feet

N

GOMEZ AND SULLIVAN ENGINEERS

P:\arcgis_online\job1787\offline_desktop\Existing_Conditions_Report\Figure_3_2_1_1.mxd

3.2.2 Problem Identification

The Old Bailey Woods site is dominated by invasive, herbaceous plant species. In order to restore the ecological benefits of a native floodplain forest, the invasive Japanese knotweed, garlic mustard, and dame's rocket populations must be reduced and the native plant species' populations increased.

On average, the shoreline has a generally steep slope with an average ratio of approximately 1:2. At its steepest point near the northern extent of the site, there is approximately 100 feet of shoreline where the slope ratio is approximately 1:1. Remedial efforts to reduce erosion along the steep slope in this area will be assessed. There is evidence of ice scraping on a few of the shoreline trees. Woody debris in the form of large driftwood and other woody debris is trapped along the shore in most places. Emergent species are sparse along the shore; none were seen during our field visit.

3.2.3 Restoration Opportunities

Area 10: In the upland areas the greatest need is to reduce the dominance of invasive and non-native species. While there are approaches that do not involve herbicides that might be tried, including hand removal of select species like garlic mustard, or covering select areas with dark tarps and mulch, the size of the area and the widespread occurrence of these undesirable species argues for a careful herbicide treatment. A low volume foliar application of an appropriate herbicide could be carefully applied to specific invasive and non-native target species. Given the seedbank that is most likely extant at the site, more than one application would likely be required to control these undesirable plants. A late summer application could be made in 2016, followed by a spring application in 2017. Planting could follow in 2017.

After control is achieved, the principal goals would be to:

1) Plant additional younger individuals of the desirable canopy species on the site. Tulip tree, black walnut and choke cherry could be planted in canopy gaps and more open areas. Oak species, including red oak and white oak, could also be planted in more open areas. Red and sugar maple could be planted under the canopy, these species typically reach the canopy as a result of nearby gaps, taking several gap events to eventually grow tall.

2) Plant suitable understory trees and shrubs, to begin to restore a multi-layered aspect to the woods. Species could include spicebush (*Lindera benzoin*), deerberry (*Vaccinium stamineum*), arrowwood (Viburnum dentatum), maple leaf viburnum (*Viburnum acerifolium*), ironwood (*Carpinus caroliniana*) and flowering dogwood (*Cornus florida*).

3) Plant native understory species, such as mayapple (*Podophyllum peltatum*), phlox (*Phlox divaricata*), plantain-leaved sedge (*Carex plantaginea*), eastern woodland sedge (*Carex blanda*), bottle-brush grass (*Elymus hystrix* L. *var hystrix*), foam flower (*Tiarella cordifolia*), jewel weed (*Impatiens capensis*) and others.

4) Control herbivory through species selection and installation of a wildlife deterrent system.

Area 11: The small eroded area of the shoreline at the northern end of the property should be addressed to restore natural shoreline characteristics and mitigate against further erosive damage. Repairs may include re-grading to a stable configuration and providing protection against future erosion with an emphasis on the use of "soft" shoreline protection techniques with native species plantings. Driftwood and other debris should be removed from the shoreline to allow for subsequent planting. Plantings will need to be protected with a wildlife deterrence system. Some consideration should be given to providing protection against ice scour along the shore. This could take the form of anchored logs, rock vanes, large boulders or other structures. Emergent species could be planted in shallow areas close to the shore.

Area 12: This is an area of mowed grasses and lawn species, with a few black willow trees. The soils are thin in spots, and many of the species are not native. Non-native grasses and herbs should be replaced with upland grasses, herbs and shrubs. A suitable mix might include Indian grass (*Sorghastrum nutrans*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), butterfly weed (*Asclepias tuberosa*), bee-balm (*Monarda punctata*), smooth blue aster (*Symphyotrichum leave*), blackeyed Susan (*Rudbeckia hirta*), early goldenrod (*Solidago juncea*) or other meadow species. Appropriate shrubs for this area include common winterberry (*Ilex verticillata*), red-osier dogwood (*Cornus sericiea*), New Jersey tea (*Ceanothus americana*) or inkberry (*Ilex glabra*).

Area 13: This paved area is unvegetated. No changes are proposed here.

4 REFERENCES

Andreas, Barbara K., John J. Mack, and James S. McCormac. (2004). Floristic Quality Assessment Index (FQAI) for vascular plants and mosses for the State of Ohio. Ohio Environmental Protection Agency, Division of Surface Water, Wetland Ecology Group, Columbus, Ohio. 219 p.

Andreas, B. K. & Lichvar, R.W. (1995). Floristic Index for Establishing Assessment Standards: A Case Study for Northern Ohio. Technical Report WRP-DE-8, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS: US Army Corps of Engineers.

Bowman's Hill Wildlife Preserve. (2006). Plant Stewardship Index. Bowman's Hill Wildflower Preserve, New Hope, PA. Retrieved February 2016 from http://www.bhwp.org/psi/pdf/BHWP_Full_List.pdf.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. (2014). The National Wetland Plant List: 2014 update of wetland ratings. Phytoneuron 2014-41: 1–42. Published 2 April 2014. Retrieved from http://rsgisias.crrel.usace.army.mil/nwpl_static/data/DOC/lists_2014/National/National_2014v1.pdf

New England Interstate Water Pollution Control Commission. (2013). Retrieved February 2016 from http://www.neiwpcc.org/nebawwg/fqaresources.asp.

Wilhelm, G. & Ladd, D. (1988). Natural areas assessment in the Chicago region. Trans. 53rd N.A. Wildl. and Nat. Res. Conf.