Biohabitats
GREAT LAKES BIOREGION
2026 Murray Hill Road, Room 102
Cleveland, OH 44106
216.921.4430
www.biohabitats.com

MEMORANDUM

Date: 8/18/23

To: Paloma Garcia, Michael Van Valkenburgh Associates, Inc.

From: Kevin Grieser, Biohabitats, Inc.
Erin Mundorf, Biohabitats, Inc.

RE: Ralph C. Wilson Jr. Centennial Park
Subject: Preconstruction Baseline Aquatic Vegetation Assessment

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This technical memo details the results of the preconstruction baseline aquatic vegetation assessment completed at Ralph C. Wilson Jr. Centennial Park on July 12th, 2023. The formal baseline and Year 1 monitoring report will be completed following initial planting and submitted by December 31st, 2023 per the monitoring requirements of New York State Division of Environmental Conservation (NYSDEC) Permit No. 9-1402-01099.

1.0 INTRODUCTION

This project will continue work on the R.C. Wilson, Jr. Centennial Park Habitat Restoration Project in the Niagara River Area of Concern (AOC) shown in Figure 1 below by creating nearshore shallow water habitat with the goal of addressing the loss of fish and wildlife habitat beneficial use impairment, as described in the AOC management action list. Anticipated outcomes of the proposed project include the creation or restoration of up to 6.5 acres of total habitat including open water, marsh, submerged aquatic vegetation (SAV), shallow water, and shoreline rock shoal. The new aquatic habitat is possible thanks to the conversion of roughly 2 acres of parkland (currently historic fill behind the existing seawall) to water area. The overall inlet design includes about 2,500 linear feet of softened shoreline and fish enhancement structures. Current design plans include a total of 56 habitat enhancement features (27 boulder clusters, 22 aquatic rootwads, and 7 standing snags.) Project success will be tracked through Tier 1 monitoring following NOAA guidance for hydrologic reconnection projects. However, as this project does not fit precisely within the NOAA hydrologic reconnection strategy, the monitoring detailed in this plan deviates slightly from that described in the standard Tier 1 guidance.

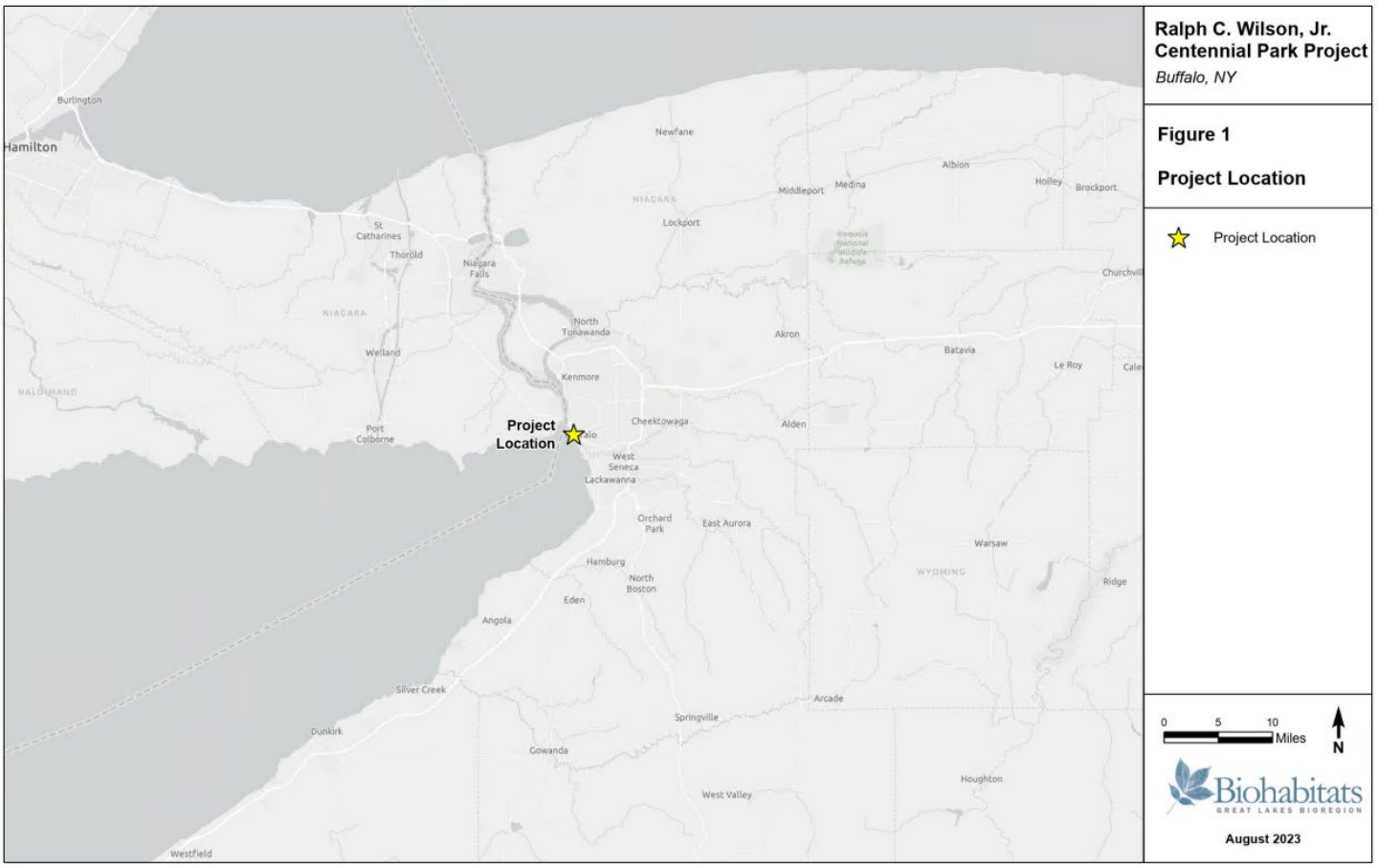

Figure 1. Project Site Location Map

The U.S. Army Corps of Engineers (USACE) and The New York State Department of Environmental Conservation (NYSDEC) have identified a number of monitoring requirements associated with the restoration of submerged aquatic vegetation (SAV) and emergent aquatic vegetation (EAV) as part of the Ralph Wilson, Jr. Centennial Park project as noted below as a part of NYSDEC Permit No. 9-1402-01099.

- A baseline report detailing the extent of planting areas, species planted, the densities of plantings, and the dates of plantings shall be submitted by December 31 of the year in which plantings were made (year 1).

- Monitoring reports submitted by December 31 of the monitoring year detailing the percent vegetative coverage and species composition in all respective planting areas, in years 2, 3 and 4 following initial planting. In addition, the report shall detail any subsequent plantings or other activities to foster establishment of vegetation after the initial planting.
- Successful restoration planting would be considered at least 50% coverage by year 2 and 80% coverage by year 4. Coverage includes SAV and EAV as viewed from above toward the total percent cover.
- The restoration planting areas must be monitored for exotic invasive species and result in no more than 10 percent of aerial cover of exotic species (as listed in 6 NYCRR Part 575 Prohibited and Regulated Species and the New York Flora Atlas) in the restoration area at the end of the four year period. Exotic invasive species do not count towards the 50% coverage by year 2 or 80% coverage by year 4 goals.

In addition to the NYSDEC monitoring requirements, survivorship assessments will also be necessary given the restoration planting approach for this project is a phased approach. For example, 25% of the SAV plants are to be installed in year 1, but they will be evaluated in year 2 to determine what species performed the best to then guide species selection for the remaining 75% of plants for installation in year 2 or 3.

Finally, the Great Lakes Commission has also indicated that monitoring of existing SAV immediately adjacent to the restoration work and outside of the Marine Limit of Work (see the Monitoring Figures in Appendix A for grid and plot distribution) should be included as part of the 4 years of monitoring and includes the following:

- A pre-construction assessment of the SAV, detailing percent coverage, to be included in the baseline report based on 15 permanent monitoring plots (3m diameter each).
- Assessment of the SAV, detailing percent coverage, to be included in the monitoring reports for years 2, 3 and 4 based on 15 permanent monitoring plots (3m diameter each).

The following sections contain the results of the database review and field activities conducted for the pre-construction assessment of the project site. Field data were collected to gain an understanding of the existing conditions of the SAV community present within the Ralph C. Wilson, Jr. Centennial Park prior to construction activities. The following activities were performed and are described in more detail below.

1.1 LITERATURE REVIEW

To support the various field activities, information on the study area was obtained from known available resources. This investigation was performed prior to most field activities to avoid duplication of past efforts and began by collecting GIS data and reviewing other standard agency resources. The investigation began by collecting GIS data and reviewing other standard agency resources. Information was obtained from:

- Aerial photography *circa.* 1958-2019. http://www.historicaerials.com
- Past aquatic vegetation surveys on-site including Submerged Aquatic Vegetation Mapping in the Niagara River (O'Brien & Gere Engineers & Quantum Spatial Inc., 2015) and Bathymetric Surveying Services – Approximate Limit of Underwater Vegetation (ASI Marine, 2019)
- Nearby restoration projects with SAV plantings including Unity Island, Buffalo Motor Generator Corporation and Blue Tower Turning Basin Habitat Restoration, and the Buffalo Outer Harbor Restoration.

2.0 METHODS

The methods for the field assessment for the project area included a remote investigation of aquatic resources and site visits to identify SAV and EAV existing on sites prior to construction. This fieldwork was performed on July 12, 2023.

Fifteen (15) permanent vegetation plots were established along transects shown on Figure 2 below. Each vegetation plot is three meter in diameter and all vegetation, SAV and EAV, were assessed for survivorship, absolute percent coverage in 5% increments, species composition, and exotic/invasive species composition. Open water, Unvegetated Open Water, percent Bare Ground, and percent Litter Cover were also documented for verification purposes. Algae were not included in coverage estimates. Vegetation was assessed through the use of hand-powered watercraft with aquascope viewing devices and aquatic rakes and recorded through the use of GPS tablet collection devices to fill out the Vegetation Monitoring Excel Sheet.

Figure 2. Project Site Map

Coverage densities were evaluated as absent, low, medium, high, and very high according to the following densities for qualitative and quantitative assessment:

- Absent: 0% aerial coverage
- Low: 1-24% aerial coverage
- Medium: 25-49% aerial coverage
- High: 50-79% aerial coverage
- Very High: 80-100% aerial coverage

Each individual species coverage were rated in 5% intervals (0%, 1-5%, 6-10%, etc…). The total absolute coverage per plot is a sum of the coverage of the individual species. The total coverage overall within the plots is a sum of the overall coverage of plots divided by the total number of plots for use in meeting coverage goals as given by Equations 1 and 2 below. The range of coverage densities above will be used for overall estimates of aerial coverage.

$$Total\ coverage\ per\ plot = \sum each\ species\ \%\ coverage \quad (1)$$

$$Total\ overall\ coverage = \frac{\sum absolute\ \%\ cover\ per\ plot}{15\ plots} \quad (2)$$

3.0 RESULTS

The fifteen permanent vegetation plots were assessed for SAV. Data forms are included in Appendix A. Results are shown in Table 1 and Figure 3 below.

Table 1. Preconstruction SAV Survey Results

Plot Number	Qualitative Coverage	Absolute Coverage (%)	Species Observed
1	Very High	100	*Potamogeton perfoliatus* (100%)
2	Very High	100	*Potamogeton perfoliatus* (90%), *Potamogeton pusillus* (10%)
3	Very High	100	*Potamogeton perfoliatus* (100%)
4	Very High	100	*Potamogeton perfoliatus* (95%), *Potamogeton pusillus* (5%)
5	Medium	40	*Potamogeton pusillus* (20%), *Vallisneria americana* (20%)
6	Medium	40	*Potamogeton pusillus* (20%), *Vallisneria americana* (20%)
7	Medium	30	*Potamogeton perfoliatus* (15%), *Vallisneria americana* (15%)
8	Low	10	*Potamogeton perfoliatus* (10%)
9	Low	20	*Potamogeton perfoliatus* (20%)
10	Low	10	*Potamogeton pusillus* (10%)
11	Low	5	*Vallisneria americana* (5%)
12	Low	10	*Potamogeton perfoliatus* (10%)
13	Low	5	*Potamogeton pusillus* (5%)
14	Low	20	*Vallisneria americana* (20%)
15	Low	15	*Potamogeton pusillus* (15%)

Three species were observed on-site – water celery (*Vallisneria americana*), clasping-leaved pondweed (*Potamogeton perfoliatus*), and common narrow-leaved pondweed (*Potamogeton pusillus*). Representative photographs are included in Appendix B. All species observed are native and non-invasive as per 6 NYCRR Part 575 Prohibited and Regulated Species and the New York Flora Atlas. Continuous vegetation was observed throughout the study area and the highest density of SAV was observed in the northern part of the site.

Figure 3. Preconstruction Monitoring Results

Appendix A
Data Forms

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	1
Notes:	Qualitative Cover Rating Very High

% Open Water	100
% Unvegetated Open Water	0
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	100

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton perfoliatus	100						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	2
Notes:	Qualitative Cover Rating Very High

% Open Water	100
% Unvegetated Open Water	0
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	100

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton perfoliatus	90						
Potamogeton pusillus	10						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	3
Notes:	Qualitative Cover Rating Very High

% Open Water	100
% Unvegetated Open Water	0
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	100

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton perfoliatus	100						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	4
Notes:	Qualitative Cover Rating Very High

% Open Water	100
% Unvegetated Open Water	0
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	100
Absent = 0%, Low = 1-24%,	
Medium = 25-49%, High = 50-79%	
Very High = 80-100%	

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton perfoliatus	95						
Potamogeton pusillus	5						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	5
Notes:	Qualitative Cover Rating Medium

% Open Water	40
% Unvegetated Open Water	60
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	40
Absent = 0%, Low = 1-24%,	
Medium = 25-49%, High = 50-79%	
Very High = 80-100%	

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton pusillus	20						
Vallisneria americana	20						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	6
Notes:	Qualitative Cover Rating Medium

% Open Water	40
% Unvegetated Open Water	60
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	40

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton pusillus	20						
Vallisneria americana	20						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	7
Notes:	Qualitative Cover Rating Medium

% Open Water	30
% Unvegetated Open Water	70
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	30
Absent = 0%, Low = 1-24%, Medium = 25-49%, High = 50-79% Very High = 80-100%	

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton perfoliatus	15						
Vallisneria americana	15						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
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Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	8
Notes:	Qualitative Cover Rating Low

% Open Water	10
% Unvegetated Open Water	90
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	10

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	**% Cover**	**Exotic?**	**Invasive?**	**Species**	**% Cover**	**Exotic?**	**Invasive?**
Potamogeton perfoliatus	10						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
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Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	9
Notes:	Qualitative Cover Rating Low

% Open Water	20
% Unvegetated Open Water	80
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	20

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton perfoliatus	20						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
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Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	10
Notes:	Qualitative Cover Rating Low

% Open Water	10
% Unvegetated Open Water	90
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	10

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton pusillus	10						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
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Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	11
Notes:	Qualitative Cover Rating Low

% Open Water	5
% Unvegetated Open Water	95
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	5

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Vallisneria americana	5						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	12
Notes:	Qualitative Cover Rating Low

% Open Water	10
% Unvegetated Open Water	90
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	10

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	**% Cover**	**Exotic?**	**Invasive?**	**Species**	**% Cover**	**Exotic?**	**Invasive?**
Potamogeton perfoliatus	10						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	13
Notes:	Qualitative Cover Rating Low

% Open Water	5
% Unvegetated Open Water	95
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	5

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Potamogeton pusillus	5						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	14
Notes:	Qualitative Cover Rating Low

% Open Water	20
% Unvegetated Open Water	80
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	20

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	% Cover	Exotic?	Invasive?	Species	% Cover	Exotic?	Invasive?
Vallisneria americana	20						

Site Information

Site Name:	Ralph Wilson Centennial Park	**County:**	Erie
Sampling Date:	7/12/2023	**Collectors:**	Kevin Grieser, Erin Mundorf
Affiliation:	Biohabitats	**Contact Info:**	emundorf@biohabitats.com

Plot #:	15
Notes:	Qualitative Cover Rating Low

% Open Water	15
% Unvegetated Open Water	85
% Bare Ground	0
% Litter Cover	0

Absolute % Cover:	15

Absent = 0%, Low = 1-24%,
Medium = 25-49%, High = 50-79%
Very High = 80-100%

Species	**% Cover**	**Exotic?**	**Invasive?**	**Species**	**% Cover**	**Exotic?**	**Invasive?**
Potamogeton pusillus	15						

Appendix B
Photo Log

Photo 1: Representative water celery (*Vallisneria americana*) photo.

Photo 2: Representative clasping-leaved pondweed (*Potamogeton perfoliatus*) photo.

Photo 3: Representative common narrow-leaved pondweed (*Potamogeton pusillus*) photo.