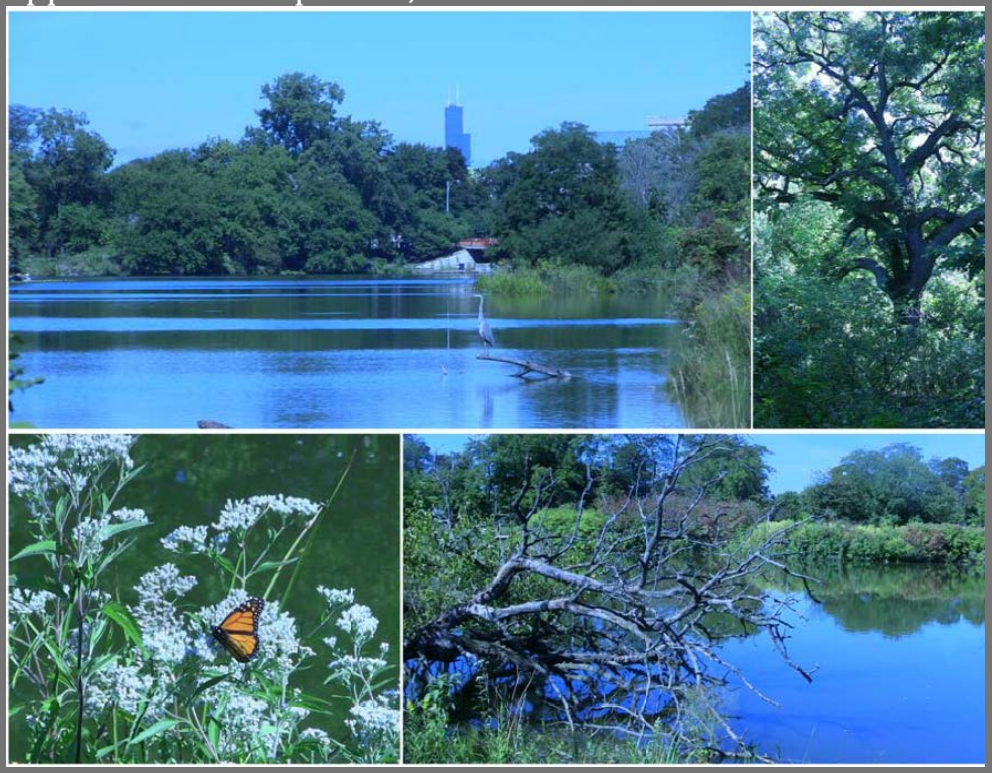
2013

Jackson Park Section 506 Great Lakes Fishery & Ecosystem Restoration Study

Appendix A – Compliance, Coordination & Information



Chicago District
US Army Corps of Engineers
20 December 2013

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A1 – SECTION 404(B)(1) EVALUATION

I. Project Description

a. Location

Jackson Park is located in Chicago, Illinois along the western coast of Lake Michigan. The park resides between 56th Street to the north and 67th Street to the south. The eastern boundary is Lake Shore Drive and Lake Michigan and to the west Stony Island Avenue. The study parcels consists of various natural area parcels of land that total about 162-acres, all of which are owned by the Chicago Park District within Jackson Park. The natural area parcels have the potential to provide pond, hemi-marsh, savanna and woodland habitat

b. General Description

Before the 1830's, the Jackson Park area was a sandy ecosystem of primarily of dune, wetland and savanna ecotypes. Over a period of several decades, this ecosystem was severely altered by human activities. Currently, Jackson Park no longer provides a diversity of habitats, nor is the existing habitat quality sufficient to maintain structure and support healthy plant and animal communities. Based on site inventory and characterization by the USACE, a set of Problems and Opportunities were developed by the study team, non-Federal Sponsors and supporting stakeholders. These drive the need for action, which is summarized as the historic loss of significant migratory bird, fish and wildlife habitats. The purpose of this feasibility study and integrated environmental assessment is to identify the most environmentally beneficial, cost effective and publicly supported habitat restoration project to restore resources lost by the alteration of coastal habitat via the creation of Jackson Park.

c. Authority and Purpose

This study is authorized under Section 506 of the Water Resources Development Act (WRDA) of 2000, Great Lakes Fishery and Ecosystem Restoration. Authority is given to plan, design, and construct projects to restore the fishery, ecosystem, and beneficial uses of the Great Lakes. Projects are justified by ecosystem benefits alone, while considering affects to the human environment including public health, safety, economic benefits, recreational or any combination of these.

Historically, Chicago's shoreline was lush with vast expanses of wetlands. While restoring wetlands in Chicago to their historical conditions is unlikely, converting small expanses of land into structurally diverse wetlands will provide critical habitat for a number of organisms. These patches of wetland and buffering plant communities would serve as an important refuge for migrant and resident bird species, as well as a variety of aquatic organisms (fish, amphibians, aquatic insects, etc.).

Objective 1 – Reestablish Hydrogeomorphology to Support Natural Communities

Currently, Jackson Park is a result of filling in coastal wetlands and sand dunes, thusly there is no recovery mechanism aside from a glacial event. This included altering the site's hydrology via soil and clay fill materials and grading-out micro-topography. Thusly, changes to the current hydrologic regime desired are those that will rehydrate certain patches. These affects would be sustained over the life of the project and optimistically in perpetuity. This objective seeks to reestablish natural hydrologic and geomorphic parameters to support critical wetland and riparian habitats within the Jackson Park natural area. Improvement is predicted via the increase in quantity (acres) and increase in quality (Mean C Value of the FQA) of native plant communities.

Objective 2 – Eradicate Invasive Species from Pond, Wetland, & Riparian Communities

Currently, Jackson Park's pond, wetland, and riparian habitats are dominated by non-native and invasive plant species. This condition resulted from alteration to the natural hydrogeomorphic regime, disturbance to native soils, prevention of natural processes, and the planting of non-native and native weedy (ruderal) plants. The domination of plant communities by certain species such as buckthorn, honeysuckle and Eurasian grasses have also caused pond banks to unravel, further exacerbating adverse affects to the pond and fringing emergent zone. Thusly, the changes to the native plant community desired are those that will reestablish a base native plant community that will diversify overtime. These affects would be sustained and increased over the life of the project and optimistically in perpetuity. This objective seeks to reestablish native plant community richness and structure to support critical wetland and riparian habitats within the Jackson Park's natural areas. Improvement is predicted via the increase in quantity (acres) and increase in quality (Mean C Value of the FQA) of native plant communities.

d. Proposed Fill Material

1) General Characteristics

Soil removed from bank grading and scraping activities onsite at Jackson Park and placement of large limestone slabs for the creation of mudpuppy habitat.

2) Quantity

- Estimated 1.6 acres of soils
- Estimated 54 cubic feet of limestone slab

3) Source

Soils will be from onsite grading and scraping activities. No soil will be transported for use on the project from an offsite source. Limestone slabs for the proposed construction will be clean, inert materials obtained from a commercial supplier.

e. Proposed Discharge Site

1) Location

Soil will be discharged within eastern portions of Jackson Park lagoon to create and expand fringe wetlands. Limestone slabs will be placed within the South Harbor within Jackson Park. See **Figure 1** within the study for more detail.

2) Size, Type, and Habitat

1.6 acres of sandy loam soils will be placed in various locations within Jackson Park lagoon to provide fringe wetland habitat for a variety of fish and bird species. Soils will be sourced from onsite with no materials being brought from offsite locations.

Limestone slabs measuring 3'x 3' x 3' will be placed in two locations wit in the South Harbor at Jackson Park. These slabs will provide much needed mudpuppy habitat along the banks of the harbor. This measure will mimic naturally occurring limestone outcroppings which occur within the Chicagoland area.

3) Timing and Duration of Discharge

The creation of the fringe marsh and placement of the limestone slabs would take no longer than three months to complete.

f. Placement Method

Small bobcat like vehicles and handwork would be the primary means of placing and contouring materials. Coconut coir logs will be used to contain fine sandy material placed within the lagoon.

II. Factual Determinations

a. Physical Substrate Determinations

1) Substrate Elevation and Slope

Elevation of the lagoon substrates is between 580 and 572 NVGD. There is no meaningful slope to this system since it is a lentic body of water.

2) Sediment Type

Soils removed from the bank of the lagoon will be placed within the eastern portions of the lagoon to create small islands. The soil consists of a layer of topsoil with sand beneath.

3) Material Movement

There would be no significant movement of fill material after construction of the fringe marsh. Placement of soil within Jackson Park lagoon would be contained by coconut coir logs which will form the outer ring of the fringe marsh. The fringe marsh would be stabilized after completion to prevent soil erosion from occurring after construction is complete via plantings.

Limestone slabs placed in the South Harbor for mudpuppy habitat are resistant to movement because of their size and weight.

4) Physical Effects on Benthos

Existing benthos directly beneath where the soil for the fringe marsh and limestone slabs would be placed would be covered; however, the effects to the aquatic assemblage would be positive through the enhancement of improved hydraulics and native riparian plant communities, which would greatly increase species richness. There are no significant adverse effects expected.

5) Other Effects

There would be no other significant substrate impacts.

6) Actions Taken to Minimize Impacts

Special measures would be taken to minimize the temporary impacts on physical substrates associated with the proposed activity since this project is both beneficial to ecology and water quality. These include

soil erosion and sediment control measures including, but not limited to placement of coconut coir logs, silt fencing and biodegradable erosion control fabric.

b. Water Circulation, Fluctuation, and Salinity Determinations

1) Water

The proposed fill activity would have no significant negative impacts to water chemistry, water clarity, color, odor, taste, dissolved gas levels, nutrients, or increased eutrophication as a result. Improvements in water clarity, color, dissolved oxygen levels, and levels of eutrophication will be noted in the long-term after introducing native aquatic plant and fish species to the lagoon.

2) Current Patterns and Circulation

NA

3) Normal Water Level Fluctuations

The proposed fill activity would have no significant impact on normal water level fluctuations of Jackson Park lagoon.

4) Salinity Gradients

Not applicable to freshwater environments.

5) Actions Taken to Minimize Impacts

No special measures would be taken to minimize the temporary impacts on water circulation and fluctuation associated with the proposed activity.

c. Suspended Particulate/Turbidity Determinations

1) Expected Changes in Suspended Particulates and Turbidity in Vicinity of Fill

There would be minor increases in suspended particulates and turbidity levels in the immediate area of the proposed fill activity during construction.

2) Effects on Chemical and Physical Properties of Water Column

There would be negligible effects to light penetration or dissolved oxygen levels during construction. The placement of clean fill will not introduce metal, organic, or pathogens to the project area. Aesthetics will be improved in the long-term after habitat heterogeneity is established in the lagoon.

3) Effects on Biota

Only beneficial effects on aquatic biota are expected to result from the restoration activities and minor increase in turbidity or suspended particulates associated with the proposed fill and sediment movement activity is most likely less than that of summer thunderstorm event.

4) Actions Taken to Minimize Impacts

Erosion control fabric, silt fencing and native plantings as appropriate would be implemented to minimize the temporary turbidity impacts associated with the proposed activity.

d. Contaminant Determination

The proposed fill material would not introduce any new contaminants into Jackson Park lagoon, or release any significant amounts of existing contaminants (if any are present) through bottom disturbance in the construction zone.

e. Aquatic Ecosystem and Organism Determinations

1) Effects on Plankton

No affects to planktonic organisms.

2) Effects on Benthos

Existing benthos directly beneath where materials would be placed would temporarily be covered, but the area is so small it would have insignificant effects on the macroinvertebrate and invertebrate population. These minor impacts are necessary to create improved conditions for benthic invertebrates. There are no significant adverse effects expected.

3) Effects on Nekton

Fish eggs and larvae would not be smothered by the proposed fill activity since the anticipated construction activities will occur during non-reproductive or rearing seasons. Additionally, existing fish species will be eradicated and native fish introduced after proposed fill is to be placed within the lagoon. Fish and other free-swimming organisms will tend to avoid the construction area; the construction area will be used again by those organisms soon after construction ends and overall species richness is expected to increase.

4) Effects on Aquatic Food Web

Beneficial improvements to the food web are expected due to the beneficial effects the overall project will have on the macroinvertebrate richness and abundance.

5) Effects on Aquatic Sites

a) Sanctuaries and Refuges – none present; no significant impact
b) Wetlands – increase in hydrophytic vegetation
c) Mud Flats – none present; no significant impact
d) Vegetated Shallows – increase in submergent aquatic macrophytes
e) Coral Reefs – not applicable to freshwater environments
f) Riffle and Pool Complexes – none present; no significant impact

6) Threatened and Endangered Species

Coordination with the Illinois Department of Natural Resources (IDNR) was initiated with a project Scoping Letter dated 24 October 2013. The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location: Peregrine Falcon (*Falco peregrinus*). The USACE has concluded in this report that the project is not likely to adversely affect state listed species. It is expected that the Illinois DNR will provide clearance in response to the public/agency release of the NEPA document.

Coordination with the USFWS was initiated with a project Scoping Letter dated 24 October 2013. The USACE has concluded in this report that the project is "not likely to adversely affect federal species", which precludes the need for further consultation for this project. It is expected that the USFWS will provide a letter of "No Objection" in response to the public/agency release of the NEPA document.

7) Other Wildlife

No other wildlife would be significantly impacted by the proposed activity.

8) Actions Taken to Minimize Impacts

General construction scheduling and sequencing would minimize impacts to reproducing macroinvertebrates and fishes. Erosion control fabric, silt fencing and native plantings would be implemented to minimize the temporary turbidity impacts associated with the proposed activity.

f. Proposed Discharge Site Determinations

1) Mixing Zone Determination

A mixing zone is not applicable to this project as no violation of applicable water quality standards is expected during construction.

2) Determination of Compliance with Applicable Water Quality Standards

The proposed activity would not cause significant or long-term degradation of water quality within Jackson Park lagoon or any associated waterways within or adjacent to Jackson Park and would comply with all applicable water quality standards. Water quality would ultimately improve via the removal of bioturbation caused by common carp and bullheads and the reestablishment of aquatic macrophytes where there currently are none.

3) Potential Effects on Human use Characteristics

No significant impacts to municipal and private water supplies, water-related recreation, aesthetics, recreational, or commercial fisheries are expected.

A detailed history of Jackson Park is provided as attachment in Appendix A of the stud. It is important to note that that the historic designs and designer's intents are in harmony with restoring natural geomorphic and native plant communities within the park's natural areas. Preliminary coordination with the State Historic Preservation Office and the CPD's historical experts are in concurrence with these concepts and fully support the restoration of ecosystem features that would incidentally restore and polish the historical magnificence of this beautiful park.

g. Cumulative Effects on the Aquatic Ecosystem

The proposed project would restore aquatic habitat structure and function. There are no significant adverse effects expected.

h. Secondary Effects on the Aquatic Ecosystem

No significant impacts on the Jackson Park ecosystem are expected as a result of the proposed activity.

III. Findings of Compliance with Restrictions on Discharge

a. No adaptation of the Section 404(b)(1) guidelines was made for this evaluation.

b. No practical alternatives are available that produce fewer adverse aquatic impacts than the proposed plan.

c. The proposed project would comply with applicable water quality standards.

d. The project is in compliance with applicable Toxic Effluent Standards under Section 307 of the Clean Water Act; with the Endangered Species Act of 1973; with the National Historic Preservation Act of 1966; and with the Marine Protection, Research, and Sanctuaries Act of 1972.

e. The proposed fill activity would have no significant adverse impact on human health or welfare, including municipal and private water supplies, recreational and commercial fisheries, plankton, fish, shellfish, or wildlife communities (including community diversity, productivity, and stability), special aquatic sites, or recreational, aesthetic, and economic values.

f. Typical erosion control measures would be taken to minimize construction impacts other than selection of the least environmentally damaging construction alternative.

g. On the basis of the Guidelines, the proposed site for the discharge of fill material is specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse impacts to the aquatic ecosystem.

A2 – 404 / 401 Regional Permit 5 Requirements

The following is a checklist of items to be provided to the Illinois EPA for notice of intent of Regional Permit 5 use:

A. Cover Letter

The cover letter for this notification is provided in Section A5.

B. Joint Application Form

The joint application for this notification is provided in Section A5

C. Special Measures

See Section II e) 8) of 404b1 Analysis for special measures.

D. Project Purpose & Need

See Section I c) of 404b1 Analysis for Purpose & Need.

E. Regional Permit Used

The U.S. Army Corps of Engineers, Chicago District Regional Permit (RP)5 Wetland & Stream Restoration and Enhancement permits the restoration, creation and enhancement of wetlands and riparian areas, and the restoration and enhancement of rivers, creeks and streams, and open water areas on any public or private land. Wetland and stream restoration and enhancement activities include the removal of accumulated sediments; installation, removal and maintenance of small water control structures, dikes and berms; installation of current deflectors; enhancement, restoration, or creation of riffle and pool structures; placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or create stream meanders; backfilling of artificial channels and drainage ditches; removal of existing drainage structures; construction of open water areas; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation; mechanized land-clearing to remove undesirable vegetation; and other related activities. This RP may be used to relocate aquatic habitat types on the project site, provided there are net gains in aquatic resource functions and values.

F. Area of Impact

The area of impacted is 1.75 acres of open water and lagoon banks. The impact is beneficial since the project provides newly created structural habitat. The restoration project is planned and designed based on a 50-year period of analysis, however, it is the intention that the restoration features last perpetually.

G. Fill Type & Quantity

See Section I d) for types and quantity of fill material.

H. Project Area Map

See **Figures 01** and **02** in the Feasibility Report and **Plates 6 & 7,** for project mapping.

I. Site Coordinates

Decimal Degrees - Longitude (-87.581) Latitude (41.785)

J. Site Documentation

See **Chapeter2 Inventory & Forecasting** of the Feasibility Report for a complete description of current physical, ecological and cultural resources, which includes photos of the site.

K. Wetland Delineation

See **Chapter 2 Inventory & Forecasting** of the Feasibility Report for a complete description of current physical and ecological resources, which describes the plant communities to be restored. The wetlands within the project area meet the criteria for soils, hydrology and hydrophytic plants required. See **Section A6** for Florist Quality Assessment.

L. Farmed Wetlands

There are no farmed wetlands within the project area.

M. Plat of Survey

Property boundaries and real estate are presented in **Appendix E**. All project real estate is owned by the CPD.

N. Engineering Drawings

Engineering design drawings are presented in **Appendix B** – Civil Design.

O. Schedule

φ 30 Day Public Review Start	Winter 2014
φ 30 Day Public Review Ends	Winter 2014
φ Final FS Report for Approval	December 2013
φ Division Approval of FS Report	January 2014
φ Design Complete	Spring 2014
φ Open Bids	Summer 2014
φ Contract Award	September 2014
φ Notice to Proceed	Fall 2014
φ Construction Complete	Fall 2019

P. Soil Erosion Sediment Control Plan

Although the affected area of disturbance is more than 1-acre, significant erosion and sediment release is not expected. The SESC plan is part of the plans and specifications, and consists of BMP measures such as silt fencing, and biodegradable erosion control fabric and permanent project features such as native vegetation.

Q. Federally Threatened & Endangered Species

See Section II e) 6) of 404b1 Analysis.

R. State Threatened & Endangered Species

See Section II e) 6) of 404b1 Analysis.

S. Illinois Historic Preservation Agency

Correspondence and clearance with the ILSHPO is provided in Section A4 in a letter dated _____.

T. Applicable Watershed Plans

There is no applicable watershed plan associated with Jackson Park.

U. After the Fact Permit

NA

V. Mitigation Plan

This is a restoration plan that requires no mitigation since lost resources are being recovered.

W. Project Funding Source

This project is federally funded 65% by the USEPA managed GLRI appropriations and 35% by the Chicago Park District

X. Regional Permit 5 Guidelines

Authorization under RP5 is subject to the following requirements which shall be addressed in writing and submitted with the notification:

a. All projects will be processed under Category I.

This project would be processed under Category I.

b. This permit does not authorize activities to relocate or channelize a linear waterway such as a river, stream, creek, etc.

There are no intentions of relocating or channelizing any streams within the project area. See Section I b).

c. This permit cannot be used for the conversion of a stream or creek to another aquatic use, such as the creation of an impoundment for waterfowl habitat.

The agricultural and Spring Creek would not be converted to another aquatic use. The manipulation of Spring Creek's hydraulics or hydrology to create an impoundment for anthropogenic uses is not indented out come. See Section I b).

d. This permit cannot be used to authorize the conversion of natural wetlands to another aquatic use, such as creation of waterfowl impoundments where a forested wetland previously existed, or the conversion of waterfowl impoundments and wildlife habitat areas.

No part of the project area of the project would be converted to another aquatic use. The project is solely intended for ecological restoration. See Section I b).

e. A management and monitoring plan shall be required for the restoration, creation or enhancement of aquatic resources. Upon the District's approval, the management and monitoring plan may be designed to be site specific, with the duration of the plan determined on a case-by-case basis.

Monitoring is required under the GLFER Authority. The monitoring plan is presented in **Appendix F**.

f. For a project site adjacent to a conservation area, forest preserve holdings, or village, city, municipal or county owned lands, the permittee shall request a letter from the organization responsible for management of the area. The response letter should identify recommended measures to protect the area from impacts that may occur as a result of the development. A copy of the request and any response received from the organization shall be submitted to the District with the notification.

The non-Federal sponsor will be responsible for the maintenance and protection of the restoration project per the legally binding Project Partnership Agreement to be signed after this Feasibility Study is approved and before construction commences. This intent is confirmed by the **Letter of Intent** provided by the Chicago Park District.

g. For projects receiving State or Federal grants or funding sources, the permittee shall submit a copy of the document disclosing the expiration date for use of the funds and the expected calendar date for commencement of the project in order to meet funding deadlines.

The expiration date for USEPA managed GLRI funds to be used for this project is September 2014.

A3 – 401 Joint Application Form

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO IL 60606-7206

REPLY TO
ATTENTION OF

Planning Branch
Environmental Formulation Section

Mr. Al Keller
Illinois Environmental Protection Agency
Division of Water Pollution Control
Facility Evaluation Unit
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

RE: Section 404/401 Water Quality Certification Regional Permit – Jackson Park Ecosystem Restoration

Dear Mr. Keller,

Enclosed is documentation for work associated with the USACE Chicago District's Jackson Park Ecosystem Restoration project. The documentation details the requirements set forth by Regional Permit 5 Category I for Wetland & Stream Restoration and Enhancement, under which this project qualifies. This application is being submitted solely to the ILEPA since there are no project features that require permits from Illinois Department of Natural Resources, Office of Water Resources.

The proposed project involves bank grading; creation of vernal pools; new islands within Jackson Park lagoon, and new mudpuppy habitat; and establishment of native plant and fish species. Measures to be covered by Regional Permit 5 Category II include the work restore the native plant communities within Jackson Park. Complete details are included in the enclosed application and supporting documents.

If you have any questions regarding the permit application or the project, please contact Frank Veraldi at 312-846-5589 or Monica Ott, Project Manager, at 312-846-5591.

Sincerely,

DRAFT

Susanne J. Davis
Chief of Planning
District Commander

PM-PL-E
PM-PL-E
PM-PM
OC
DE

Enclosures

JOINT APPLICATION FORM FOR ILLINOIS

ITEMS 1 AND 2 FOR AGENCY USE

1. Application Number	2. Date Received

3. and 4. (SEE SPECIAL INSTRUCTIONS) NAME, MAILING ADDRESS AND TELEPHONE NUMBERS

3a. Applicant's Name	3b. Co-Applicant/Property Owner Name (if needed or if different from applicant)	4. Authorized Agent (an agent is not required)
Monica Ott Company Name (if any) US Army Corps of Engineers, Chicago District; POC: Kirston Buczak Address 231 S. LaSalle St., Ste 1500 Email Address nicole.l.roach@usace.army.mil	Company Name (if any) Address Email Address	Company Name (if any) Address Email Address
Applicant's Phone Nos. w/area code Business: 312-846-5591 Residence: Cell: Fax: 312-353-4256	Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: Residence: Cell: Fax:

STATEMENT OF AUTHORIZATION

I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ Applicant's Signature

_____ Date

5. ADJOINING PROPERTY OWNERS (Upstream and Downstream of the water body and within Visual Reach of Project)

Name	Mailing Address	Phone No. w/area code
a.		
b.		
c.		
d.		

6. PROJECT TITLE:
Jackson Park 506 Great Lakes Fishery & Ecosystem Restoration Project

7. PROJECT LOCATION

LATITUDE: 41.785 LONGITUDE: -87.581	UTMs Northing: Easting:

STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION	LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO.	RANGE
The park resides between 56th Street to the north and 67th Street to the south. The eastern boundary is Lake Shore Drive and Lake Michigan and to the west Stony Island Avenue.		SW 1/4	13	38N	14E

☒ IN OR ☐ NEAR CITY OF TOWN (check appropriate box) Municipality Name	WATERWAY	RIVER MILE (if applicable)
Chicago, IL	Jackson Park Lagoon	

COUNTY	STATE	ZIP CODE		
Cook	IL	60637		n/a

Revised 2011

☐ Corps of Engineers ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

8. PROJECT DESCRIPTION (Include all features): The project involves the permanently disabling the drain tile system, removal of invasive plant species and reestablishment of native plants throughout the project area, restoring surface hydrology near the western portion of the Spring Creek Preserve, removing Dondlea Road bridge, and the installation of rock riffle structures within Spring Creek

9. PURPOSE AND NEED OF PROJECT: ecological restoration of various areas within Jackson Park. By restoring aquatic and buffering habitats and addressing invasive species issues, this project would provide scarce and essential habitat for fish, migratory birds, reptiles and amphibians within a highly urbanized area.

COMPLETE THE FOLLOWING FOUR BLOCKS IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

10. REASON(S) FOR DISCHARGE: Construction of new islands within Jackson Park lagoon and installation of limestone slabs along banks for mud puppy habitat

11. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS FOR WATERWAYS:

TYPE: See Section G1, I, d of Appendix G for materials and quantities.

AMOUNT IN CUBIC YARDS: Amount in acres: 1.6 acres of soil for island creation. 54 cyds of limestones slabs

12. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (See Instructions)

1.75 acres.

13. DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION (See instructions)

All impacts to WOUS are planned to provide the greatest net benefit to the surrounding aquatic resources on the project site.

14. Date activity is proposed to commence: Spring 2014

Date activity is expected to be completed: Winter 2015

15. Is any portion of the activity for which authorization is sought now complete? Yes ☐ No ☒

NOTE: If answer is "YES" give reasons in the Project Description and Remarks section. Indicate the existing work on drawings.

Month and Year the activity was completed: n/a

16. List all approvals or certification and denials received from other Federal, interstate, state, or local agencies for structures, construction, discharges or other activities described in this application.

Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial

17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED. Yes X No

18. APPLICATION VERIFICATION (SEE SPECIAL INSTRUCTIONS)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant or Authorized Agent — Date

Signature of Applicant or Authorized Agent — Date

Signature of Applicant or Authorized Agent	Date

☐ Corps of Engineers Revised 2011 ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

SEE INSTRUCTIONS FOR ADDRESS

LOCATION MAP

Revised 2011

☐ Corps of Engineers ☐ IL Dept of Natural Resources

☐ IL Environmental Protection Agency

☐ Applicant's Copy

PLAN VIEW

FOR AGENCY USE ONLY

Revised 2011

☐ Corps of Engineers ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

A4 – Agency Coordination

Illinois Historic
Preservation Agency

FAX (217) 782-8161

1 Old State Capitol Plaza • Springfield, Illinois 62701-1512 • www.illinois-history.gov

Cook County
Chicago
Ecosystem Restoration at Jackson Park
6401 S. Stony Island Ave.

COEC
IHPA Log #017102912

December 10, 2012

Peter Bullock
Department of The Army
U.S. Army Corps of Engineers
Chicago District
111 North Canal Street, Suite 600
Chicago, IL 60606

Dear Mr. Bullock:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966 (16 USC 470), as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties". Jackson Park Historic Landscape and Midway Plaisance were entered into the National Register of Historic Places on December 15, 1972.

We have reviewed the preliminary concept plans for the ecosystem restoration project and have the following comments:

1. As currently designed, the park retains a great deal of its integrity. While some of the original features have been modified, or removed, the remaining defining characteristics such as the overall plan developed by Olmstead, Olmstead, and Elliot as depicted on the 1905 map must be respected. These include, but are not limited to, the Golden Lady statue, the Osaka Garden, the current roadway configuration, the beach house, and the configuration of the lagoons.

2. We support the rehabilitation of some of the plantings located within the golf course, but would find the introduction of new water features and/or wetlands to be an adverse effect.

3. We support the effort to retain and enhance the lagoon shorelines and the addition, or re-establishment, of islands within the lagoons so long as they reflect the configuration of islands in the 1905 plan. We also support the re-establishment of communication between the various lagoons and Lake Michigan.

4. We also support the re-introduction and/or enhancement of plantings using Olmsted's 1896 plant list.

We look forward to working with the Chicago Corps of Engineers, the Chicago Park District, and our preservation partners on this complex and worthy project and will review items as quickly as possible as specific aspects of the project are proposed.

If you have questions please contact David J. Halpin, Cultural Resources Manager, at 217-785-4998.

Sincerely,

Anne E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH

Illinois Historic Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701-1512 • www.illinois-history.gov

Cook County
Chicago
6401 S. Stony Island Ave.

PLEASE REFER TO: IHPA LOG #017102912

COEC
Ecosystem Restoration at Jackson Park

March 1, 2013

Peter Bullock
Department of The Army
U.S. Army Corps of Engineers
Chicago District
111 North Canal Street, Suite 600
Chicago, IL 60606

Dear Mr. Bullock:

We are in receipt of the North Lagoon Potential Habitat Layout, the Potential Habitat Layout w/ Olmsted Plan, and the Potential Habitat Layout. It is clear that an extensive amount of planning has taken place and we appreciate the respect paid to Olmsted's vision.

We would like to meet on site so that the biologists may explain the planting schemes to us and to clarify definitions such as the difference between wetlands and the sedge meadows proposed in the golf course. Please propose a date on which we might meet at the park.

Any other aspects of this worthy undertaking that are ready for our review should be submitted in advance of the meeting so that we may incorporate as many elements of the design into our conversation at the park as possible.

If you have questions, please contact David J. Halpin, Cultural Resources Manager, at 217-785-4998.

Sincerely,

Anne E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer
AEH

Illinois Historic Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701-1512 • www.illinois-history.gov

Cook County
Chicago
6401 S. Stony Island Ave.

PLEASE REFER TO: IHPA LOG #017102912

COEC
Ecosystem Restoration at Jackson Park

April 26, 2013

Peter Bullock
Department of The Army
U.S. Army Corps of Engineers
Chicago District
111 North Canal Street, Suite 600
Chicago, IL 60606

Dear Mr. Bullock:

Thank you for hosting our meeting at Jackson Park on April 16, 2013. The tour helped us understand the planting scheme that is being developed for the park. We support the Ecosystem Restoration and appreciate the attention paid to Olmstead's plan for Jackson Park.

Please forward plans to us for review as they become available so that we can work towards a finding of no adverse effect for this undertaking. If you have questions please contact David J. Halpin, Cultural Resources Manager, at 217-785-4998.

Sincerely,

Anne E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer
AEH

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
231 SOUTH LA SALLE STREET, SUITE 1500
CHICAGO IL 60604

REPLY TO
ATTENTION OF

Planning Branch
Environmental Formulation Section

24 OCT 2013

Kenneth Westlake, Chief
Environmental Review Branch
U.S. EPA ME-19J
77 West Jackson
Chicago, IL 60604

Dear Mr. Westlake:

The Chicago District is preparing a National Environmental Policy Act (NEPA) document on impacts of an ecosystem restoration project in the City of Chicago, Cook County, Illinois. As part of the scoping process the Chicago District would appreciate your comments. A map of the park is included with the project area colored blue.

Jackson Park was designed by Fredrick Olmsted in 1890 and is listed on the National Register of Historic Places. Ongoing consultations with the Illinois Historic Preservation Agency are being conducted as part of the planning process to insure all effort is made to adhere to the intent and visual aesthetics of Olmsted's original plans and designs for the park.

The project will include the restoration of several aspects of Olmsted's original plan, including the reconstruction of several former islands within the lagoons. The project will also focus on the restoration of native fish species within the lagoons, the removal of non-native invasive plants, and the planting of native plant species.

Please comment within 30 days, marking your reply to the attention of Mr. Peter Bullock, U.S. Army Corps of Engineers, 231 South La Salle Street, Suite 1500, Chicago, Illinois 60604. Questions may be directed to Mr. Bullock at 312/846-5587, or at peter.y.bullock@usace.army.mil. Your assistance is appreciated.

Sincerely,

/S/
Susanne J. Davis, P. E.
Chief of Planning Branch

Enclosure

Bullock PM-PL-E 10/17/2013
Veraldi PM-PL-E 10/17/13
Fleming PM-PL-E 10/17/13
Ott PM-PM
Davis PM-PL 10/18/13

Scoping Letter Distribution List

Kenneth Westlake, Chief
Environmental Review Branch
U.S. EPA ME-19J
77 West Jackson
Chicago, IL 60604

US Fish and Wildlife Service
Chicago Illinois Field Office
1250 South Grove, Suite 103
Barrington, Illinois 60010
Attn. Louise Clemency

Todd Rettig
Office of Resource Review
Illinois DNR
One Natural Resource Way
Springfield, IL 62702-1271

IDNR, Office of Realty and Environmental Planning
1 Natural Resource Way
Springfield, IL 62702
ATTN: Stefanie Fitzsimons

Illinois DNR/OWR
160 N. LaSalle St,
Suite S-700
Chicago, Illinois 60601
ATTN: Dan Injerd

Illinois DNR
Illinois Coastal Management Program
160 N. LaSalle St,
Suite S-700
Chicago, Illinois 60601
ATTN: Diane Tecic

Illinois EPA
Water Pollution Division
1001 N. Grand
Springfield, IL 62794
ATTN: Bruce Yurdin

Illinois Hist. Pres. Agency
1 Old State Capitol Plaza
Springfield, IL 62701
ATTN: Anne Haaker

Friends of the Parks
17 N. State Street
Chicago, IL 60602
Attn: Erma Tranter

Jackson Park Advisory Council
c/o Jackson Park Fieldhouse
6401 S. Stony Island
Chicago, IL 60637
ATTN Louise Curry

Hyde Park-Kenwood Community Conference
1525 E 53rd St # 907
Chicago, IL 60615

Hyde Park Historical Society
5529 S Lake Park Ave
Chicago, IL 60637

Judy Pollock
Director of Bird Conservation,
Audubon Chicago Region
1718 Sherman Ave. #210
Evanston, IL 60201

TRIBAL LIST

Kickapoo Tribe of Oklahoma
P.O. Box 70
McCloud, OK 74851

Kickapoo Of Kansas
1107 Goldfinch Rd.
Horton, KS 66434

Kickapoo Tribe of Texas
Box HC 1 9700
Eagle Pass, TX 78853

Miami Nation in Indiana
P.O. Box 41
Peru, IN 46970

Miami Tribe of Oklahoma
P.O. Box 1326
Miami, OK 74355
Attn: Mr. George Strack

Citizen Potawatomi Nation
1901 S. Gordon Cooper Dr.
Shawnee, OK 74801

Forest County Potawatomi Exec. Council
P. O. Box 340
Crandon, WI 54520

Nottawaseppi Huron Potawatomi Tribal Office
2221 One-and-a-half Mile Rd.
Fulton, MI 49052

Hannahville Potawatomi Comm., Council
N 14911 Hannahville Road
Wilson, MI 49896-9728

Prairie Band Potawatomi Tribal Council
16281 Q RD
Mayetta, KS 66509

Pokagon Band of Potawatomi Indians
P.O. Box 180
Dowagiac, MI 49047

Kickapoo Tribe of Oklahoma

P.O.Box 70
407 N. Hwy 102
McLoud, Oklahoma 74851

Administration Department
Phone: 405-964-7053; Fax: 405-964-7065
Email: kwilson@kickapootribeofoklahoma.com

October 30, 2013

U.S. Army Corps of Engineers
Chicago District
ATTN: Peter Bullock
231 South La Salle Street, Suite 1500
Chicago, IL 60604

RE: Ecosystem Restoration Project-Jackson Park
City of Chicago, Cook County, IL

Dear Mr. Bullock:

Thank you for consulting with the Kickapoo Tribe of Oklahoma in regard to the above referenced site(s). At this time, the Kickapoo Tribe of Oklahoma has no objections to the proposed improvement project at the intended site(s). However, in the event burial remains and/or artifacts are discovered during the development or construction process, the Kickapoo Tribe of Oklahoma would ask for immediate notification of such findings.

Should I be of any further assistance, please contact me at (405) 964-4227.

Sincerely,

Kent Collier
NAGPRA Contact
Kickapoo Tribe of Oklahoma

Cc: File

Gilbert Salazar
APETOKA
CHAIRMAN

Boyd Ponkilla
ADAMIDATA
VICE-CHAIRMAN

Patricia Gonzales
MOKITANOCUA
SECRETARY

Jennell Downs
KISAKODICUA
TREASURER

Everett Suke
MOKITANOA
COUNCILMAN

From: Pollock, Judy
To: Veraldi, Frank M LRC
Subject: [EXTERNAL] RE: Jackson Park 506 Restoration Project (UNCLASSIFIED)
Date: Thursday, November 07, 2013 2:11:10 PM

HI Frank,

These are my comments about the plan, which looks very good for birds and habitat.

Ecological aspects related to birds:
It would be a good idea to have trees on a few of the islands to vary the habitat.

Page 2 - Some of the woody invasives you mention such as weeping willow at the water's edge and cultivars of crabapple and hawthorn should be retained for bird habitat. Warblers use all these extensively. It is very good that you are salvaging the larger unwanted trees to provide cover until the other desired ones grow.

Page 3 - you know, I'm sure, that these isolated islands are the biggest contributor to Canada Goose populations. Planting shrubs, as you have planned, seems like it might be a good way to deter them from nesting. You might want to address this.

Again leaving a few trees on the islands might be desirable to vary the habitat. Herons, kingbirds, orioles, etc. will use them to nest.

Shorter stature marsh grasses will be an excellent addition to the site.

Sedge meadow measures should include a very very low threshold for invasives since you can lose this to reed canary grass in a very short time.

Public acceptance measures:
Page 2 - Many of the invasives you mention such as Kentucky bluegrass, plantain, yarrow and white clover are widely recognized not to be very problematic in restoration settings. I think people will know that plants like these are not degrading habitat as you claim and it weakens your case to include them. On the other hand, I love your language about "disturbed prairie community" on that page. I find it confusing that planted nature shrubs are included in the paragraph about opportunistic native trees that you want to remove - it seems as if you are planning to remove them - I hope that's not the case.

Page 4 - this is both a habitat and a public acceptance issue - Dense shrubs near any water provide the best bird-watching and the best habitat. Many of these are invasive. The goal should be to phase in new vegetation while retaining as much of the density as possible - both for the sake of biodiversity and in order to appeal to birders who are one of the key user groups in the park. This was done on the island and a similar phased plan should be done here. The set of bullet points just above Fish Community Restoration should explicitly mention shrubs, probably in the middle bullet.

I would suggest you talk to Steve Thompson at Lincoln Park Zoo if you haven't' already - he might have some lessons learned about public reaction to rotenone treatment. Audubon would be very eager to be involved in the public outreach about this plan.

Have you thought about an osprey pole?

Thanks for sending it - please let me know if I should be providing these comments in some other format than this email

Judy
-----Original Message-----
From: Veraldi, Frank M LRC [mailto:Frank.M.Veraldi@usace.army.mil]
Sent: Tuesday, October 29, 2013 11:18 AM
To: Pollock, Judy

Subject: Jackson Park 506 Restoration Project (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Judy,

I was wondering if you received my message on Jackson Park? I was wondering if the attachment was too big to send through to you.

Cheers

Frank Veraldi, PM-PL-E
Ecosystem Planner
USACE, Chicago District
231 S. LaSalle St, Suite 1500
Chicago, Illinois 60604

Office: 312-846-5589
Work Blackberry: 312-860-5461
CHICAGO USACE WEB SITE: http://www.lrc.usace.army.mil
FACEBOOK: http://www.facebook.com/usacechicago

Classification: UNCLASSIFIED
Caveats: NONE

Illinois Historic
Preservation Agency

1 Old State Capitol Plaza, Springfield, IL 62701-1512

FAX (217) 782-8161
www.illinoishistory.gov

Cook County
Chicago
Ecosystem Restoration at Jackson Park
6401 S. Stony Island Ave.
IHPA Log #017102912

November 14, 2013

Peter Bullock
U.S. Army Corps of Engineers, Chicago District
231 S. LaSalle St., Suite 1500
Chicago, IL 60604

Dear Mr. Bullock:

We have reviewed the documentation provided for the referenced project Jackson Park Historic Landscape and Midway Plaisance were entered into the National Register of Historic Places on December 15, 1972.

In our opinion the project meets the Secretary of the Interior's "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings" and we concur in a finding of no adverse effect pursuant to 36 CFR Part 800 provided that the following condition is met:

1. Plans are developed in consultation with our office.

Notifying our office of agreement with these conditions and their subsequent implementation constitutes compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

If you have any questions, please contact me at 217/785-5027.

Sincerely,

Anne E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

NOV 20 2013

REPLY TO THE ATTENTION OF:
E-19J

Peter Bullock
U.S. Army Corps of Engineers - Chicago District
231 N. LaSalle St., Ste. 1500
Chicago, Illinois 60604

RE: Scoping comments – Jackson Park Ecosystem Restoration; City of Chicago, Cook County, Illinois

Dear Mr. Bullock:

The U.S. Environmental Protection Agency has received U.S. Army Corps of Engineers (USACE) correspondence (hereafter: scoping document) dated October 24, 2013, requesting EPA's review of and comments on a proposed ecosystem restoration project at Jackson Park in Chicago, Illinois. Jackson Park was designed by renowned landscape designer Fredrick Law Olmsted in 1890. Jackson Park was the site of the 1893 World's Fair. Due to its significant historical and cultural history, Jackson Park is listed on the National Register of Historic Places.

EPA has reviewed your correspondence and figure provided for the aforementioned project. This letter provides our comments on the scoping document pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

As proposed in your scoping document, the ecosystem restoration project proposes "restoration of several aspects of Olmsted's original plan, including the reconstruction of several former islands within the lagoons. The project will also focus on the restoration of native fish species within the lagoons, the removal of non-native invasive plants, and the planting of native plant species." Your scoping document did not provide any additional information such as the baseline health or status of the current environments and habitats, coverage and types of invasive species proposed to be removed, restoration activities proposed to be undertaken, or how USACE proposes to restore native plant communities within the project area. These elements, along with information on how USACE will ensure that non-native invasive species do not return to restoration areas, and how restoration areas will be protected from trampling and other disturbances, should all be analyzed and discussed in the upcoming environmental assessment (EA).

Due to the lack of information provided in your scoping document, EPA is unable to provide substantive comments or recommendations on your proposal.

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Due to the sensitive nature of this area and its listing on the National Register of Historic Places, EPA recommends that, before you finalize plans, you coordinate with the State Historic Preservation Office (SHPO) and the Chicago Park District to ensure that the project will not detrimentally affect the original plans and design for Jackson Park or its historic designation. In the Draft EA, in addition to providing updates on the status of National Historic Preservation Act Section 106 consultation with the SHPO, EPA requests that you include copies of correspondence sent to, and received from, the SHPO. The Draft EA should also include figures defining the Area of Potential Effect (APE) for this project.

Coordination with the U.S. Fish and Wildlife Service (USFWS) and the Illinois Department of Natural Resources (IDNR) should also be undertaken to ensure that any proposals will not detrimentally effect any federally-endangered or threatened species or critical habitat or any state-endangered or threatened species or critical habitat that are likely to be present at the project site. The Fish and Wildlife Coordination Act[1] requires that agencies consult with the state wildlife agencies and USFWS concerning the conservation of wildlife resources where the water of any stream or other water body is proposed to be controlled or modified by a Federal agency or any public or private agency operating under a Federal permit. As this project potentially involves modifications to waterbodies, consultation with these agencies appears to be warranted.

The Draft EA should also discuss potential construction timeframes and seasons, and how visitors might be impacted based on typical uses of the area. Due to the likelihood of public involvement and site visitation during project implementation, installation of signage during project implementation (covering the different phases of construction, maintenance activities, and anticipated final results, among others) is strongly encouraged.

Additionally, the Draft EA should identify where the project documents will be available for review (e.g., libraries, community centers, etc.). Because the project has potential to impact residents and visitors, EPA recommends that USACE reach out to both types of users (i.e., post a notice of construction on the City of Chicago tourism website and Park District website, in addition to other forms of notification).

Finally, EPA recommends that a Monitoring and Adaptive Management Plan be developed. The plan should include a description of proposed monitoring activities at the project location, include quantifiable and measureable success criteria for the ecosystem restoration work, and should specify the length of the monitoring period(s). Additional information on the party(ies) who will maintain the site in perpetuity, as well as USACE's point of contact at the Chicago Park District, should also be included in the Draft EA.

Additional recommendations are as follows:

- EPA recommends that the Draft EA list all required permits (and their issuing agencies) that will be required for project implementation.
- EPA recommends that the forthcoming EA recommend specific measures and best management practices (BMPs) that will be undertaken to minimize construction impacts to air quality, water resources, soil, and other regulated resources.

[1] 16 U.S.C. §§661-666c; PL 85-624

- The Draft EA should include narrative information on site access, construction equipment staging, and how the project will be constructed. Measures to be taken to further minimize impacts to onsite lagoons, wetlands and sensitive aquatic habitats should be discussed in the Draft EA.
- The forthcoming EA should identify and discuss existing air quality and air quality impacts at the project location, and those potentially associated with future construction and operations at site of the proposed project. The proposed action's impacts on air quality should be assessed by evaluating the impact of the proposed actions on the National Ambient Air Quality Standards (NAAQS).
- The Draft EA should demonstrate that USACE has determined whether hazardous wastes as defined in 40 CFR part 261 (RCRA) will be generated, disturbed, transported or treated, stored or disposed, by the action(s) under consideration. If so, management of these wastes is regulated by 40 CFR parts 260-280 and transportation is governed by 49 CFR parts 171-199. An appropriate level of review regarding the hazardous nature of any materials or wastes to be used, generated, or disturbed by the proposed action, as well as the control measures to be taken, should be provided in the EA.
- The forthcoming EA should document how proposed future actions to be undertaken are in compliance with existing guidance and procedures, including, but not limited to: Environmental Justice: Guidance Under the National Environmental Policy Act, December 10, 1997; Final Guidance for Consideration of Environmental Justice in Clean Air Act 309 Reviews, July 1999; and Executive Order 12898.
- For all environmental impact categories requiring coordination with other Federal or state agencies, EPA recommends that you provide copies of both your letters to those agencies, as well as the responses from those agencies, as appendices to the EA.

Thank you for the early solicitation of EPA's comments regarding the proposal. We are available to discuss our comments with you in further detail if requested. Please send one paper copy and one CD-ROM copy of the Draft EA to my attention once it becomes available. If you have any questions about this letter, please contact Ms. Liz Pelloso, PWS, of my staff at 312-886-7425 or via email at pelloso.elizabeth@epa.gov.

Sincerely,

Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Enforcement and Compliance Assurance

cc: Anne Haaker, Illinois Historic Preservation Agency (SHPO)
Kathi Davis, IDNR
Shawn Cirton, USFWS
William Tillis, Chicago Park District

From:	Cirton, Shawn
To:	Bullock, Peter Y LRC
Cc:	Veraldi, Frank M LRC
Subject:	[EXTERNAL] Jackson Park Ecosystem Restoration Project
Date:	Wednesday, November 20, 2013 2:23:58 PM

Peter,

We received your letter indicating that the Chicago District is preparing a National Environmental Policy Act (NEPA) document for the Jackson Park ecosystem restoration project. As you know, Jackson Park is an important migratory bird stopover area. At this time, we are not aware of any particular issues that should be addressed during the scoping process regarding this project. We will plan to respond to your request to review the NEPA documents when they are complete.

Sincerely,

Shawn Cirton
Fish and Wildlife Biologist
USFWS - Chicago Illinois Field Office
1250 South Grove Avenue, Suite 103
Barrington, IL 60010
(847)381-2253 xt.19
(847)381-2285 Fax
Wednesdays and Fridays - USACOE - (312)846-5545
http://midwest.fws.gov/chicago

Bullock, Peter Y LRC

From: Fitzsimons, Stefanie [Stefanie.Fitzsimons@Illinois.gov]
Sent: Tuesday, November 26, 2013 4:03 PM
To: Bullock, Peter Y LRC
Subject: [EXTERNAL] Jackson Park Ecosystem Restoration

Hi Peter

This is going to be real informal because I see I missed the deadline on the comments on the scoping process for the Jackson Park Ecosystem Restoration project.

In the Environmental Assessment would you be able to provide a survey of fish species that you find in the lagoons whether they are native or non native species. Also a survey of the nonnative invasive plant species you plan on addressing and a list of the native species you plan on planting in their place. This will help IDNR OREP assess the possible impacts that may occur to the listed species in the vicinity of the project. I received the letter from USEPA and I concur with what they asked to be included in the EA as well.

I'm guessing you also contacted the Office of Water Resources in our Chicago building as well. They may have ideas on what needs to be included regarding water resources.

Sorry about the informality of the email.

Thanks for the opportunity to comment.

Stef

Stefanie Fitzsimons

Resource Planner - Impact Assessment

IDNR, Office of Realty and Environmental Planning

1 Natural Resource Way

Springfield, IL 62702

217-524-0501

A5 – DRAFT FONSI

Finding of No Significant Impact
Jackson Park Ecosystem Restoration

Background

The non-Federal sponsor, the Chicago Park District, has requested that the Chicago District, USACE initiate a study under Section 506 Fisheries and Ecosystem Restoration to ascertain the feasibility of restoration features to restore the ecological integrity of the combined Ft. Sheridan natural areas. This study evaluates the feasibility and environmental effects of restoring ravines, bluffs and littoral areas. The scope of this study addresses the issues of altered hydrology and hydraulics, native plant community preservation, invasive species, connectivity, rare wetland communities, native species richness and encourages public education. This Feasibility Report and Integrated Environmental Assessment will assess and identify problems and opportunities, identify and evaluate measures, and recommend and design the most cost effective and feasible solution to the ecological problems currently existing within the area of study

One crucial component that is important to ecosystem integrity and integrates both aquatic and riparian or buffer habitat, is wetlands. Historically, Chicago's shoreline was lush with vast expanses of wetlands. While restoring wetlands in Chicago to their historical conditions is unlikely, converting small expanses of land into structurally diverse wetlands will provide critical habitat for a number of organisms. These patches of wetland and buffering plant communities would serve as an important refuge for migrant and resident bird species, as well as a variety of aquatic organisms (fish, amphibians, aquatic insects, etc.). The main problems at Jackson Park are as follows:

- Absence of submergent aquatic beds (macrophytes/hydrophytes)
- Unnatural geomorphic conditions that promote invasive species success
- Fragmentation of inter and intra site habitat patches
- Absence of species rich coastal plant communities
- Absence of rare and sensitive coastal plant and animal species
- Lack of critical habitat for locally endangered and rare fauna
- Lack of migratory bird resting and forage habitats

Brief Summary of Findings

Fifteen (15) measures, including the No Action measure, were input into the IWR-Planning Suite in terms of costs and benefits. Vernal Pool (VP) restoration was dependent on restoring Sedge Meadow (SM) and Savanna/Woodland (OSW) habitats. Fish Community Separator (FF), Invasive Fish Species Removal (FIR), Mudpuppy Habitat (MH) and Native Species Reintroduction (FNS) were dependent on restoring Pond (P) habitat. All plant community habitat restorations (P), (EI), (NI), (FM), (SM) and (OSW) were dependent on Invasive Species Removal (IPR). Patches of Sedge Meadow (SM), Fringe Marsh (FM) and Savanna/Woodland (OSW) were dependent on Geomorphic Contouring (GC). New Island (NI) plant community was dependent on New Island Creation (NIC). Based on these inputs and criteria, the IWR-Planning software generated 66 alternative combinations for ecosystem restoration. These alternative combinations were analyzed with the IWR Planning Suite Cost Effective & Incremental Cost Analysis, which are presented in the following sections.

The cost effectiveness analysis was used to ensure that certain options would be screened out if they produced the same amount or less output at a greater cost than other options with a lesser cost. Sixty six (66) alternative combinations were analyzed for cost effectiveness. Of these, seventeen (17) cost effective combinations were identified, which is inclusive of the six (6) Best Buy Plans. The No Action plan is always deemed cost effective and a Best Buy Plan. Forty-nine (49) alternative combinations were screened out as non-cost effective.

The following alternative plan(s) that qualified for further consideration were assessed in order to identify whether the benefits are worth Federal investment. The effects include a measure of how well the plan(s) achieve the planning objectives, benefits and costs. Previously in the evaluation process, the positive effects of each plan on Jackson Park's ecosystem were considered individually and compared to the without-project condition. In this step, supportive facts are presented to determine if it is worthwhile to select a plan as the NER Plan for implementation. The supportive facts include the reality of the ecosystem outputs; significance of the ecosystem outputs; completeness, acceptability, effectiveness and efficiency of the potential plan, and any associated risks or uncertainties that may affect or result from the potential plan.

Alternative 1 – No Action Plan

Alternative 2 – (MH) Mudpuppy Habitat, (IPR) Invasive Plant Species Removal, (FF) Fish Community Separator, (FIR) Invasive Fish Species Removal, (FNS) Native Pond Species Introduction, (P) Pond

Alternative 3 – (MH) Mudpuppy Habitat, (IPR) Invasive Plant Species Removal, (FF) Fish Community Separator, (FIR) Invasive Fish Species Removal, (FNS) Native Pond Species Introduction, (P) Pond, (GC) Geomorphic Contouring, (VP) Vernal Pool, (SM) Sedge Meadow, (OSW) Savanna / Open Woodland

Alternative 4 – (MH) Mudpuppy Habitat, (IPR) Invasive Plant Species Removal, (FF) Fish Community Separator, (FIR) Invasive Fish Species Removal, (FNS) Native Pond Species Introduction, (P) Pond, (GC) Geomorphic Contouring, (VP) Vernal Pool, (SM) Sedge Meadow, (OSW) Savanna / Open Woodland, (EI) Existing Islands

Alternative 5 – (MH) Mudpuppy Habitat, (IPR) Invasive Plant Species Removal, (FF) Fish Community Separator, (FIR) Invasive Fish Species Removal, (FNS) Native Pond Species Introduction, (P) Pond, (GC) Geomorphic Contouring, (VP) Vernal Pool, (SM) Sedge Meadow, (OSW) Savanna / Open Woodland, (EI) Existing Islands, (FM) Fringe Marsh

Alternative 6 – (MH) Mudpuppy Habitat, (IPR) Invasive Plant Species Removal, (FF) Fish Community Separator, (FIR) Invasive Fish Species Removal, (FNS) Native Pond Species Introduction, (P) Pond, (GC) Geomorphic Contouring, (VP) Vernal Pool, (SM) Sedge Meadow, (OSW) Savanna / Open Woodland, (EI) Existing Islands, (FM) Fringe Marsh, (NIC) New Island Creation, (NI) New Island

The NER/Preferred Plan

The plan that reasonably maximizes net National Ecosystem Restoration benefits and is consistent with the Federal objective, authorities and policies, is identified as the NER plan. This NER Plan is considered as the Preferred Plan for direct, indirect and cumulative effects assessment under NEPA in the following Chapter. The NER/Preferred Plan was determined to be Alternative 5. Alternative 5 would restore over 155 acres of habitat within Jackson Park which includes hydrogeomorphic and native plant community restoration.

The Preferred Plan presented in this integrated Environmental Assessment are in compliance with appropriate statutes, executive orders and memoranda including the Natural Historic Preservation Act of 1966; the Endangered Species Act of 1973; the Fish and Wildlife Coordination Act; Executive Order 12898 (environmental justice); Executive Order 11990 (protection of wetlands); Executive Order 11988 (floodplain management); and the Rivers and Harbors Act of 1899. The potential project is in compliance with the Clean Air Act; the Clean Water Act, and the National Environmental Policy Act of 1969.

Major Compliance Items

Environmental Justice

Executive Order 12898 (environmental justice) requires that, to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.

A database search of the EPA EJView mapping tool (Accessed 6 November 2013), revealed that within the portion of Chicago containing the Jackson park project site, that majority of the population (30-100%) is considered below the poverty line. Similarly, the majority of the population (30-100%) is considered as a minority. Since the overall project and the preferred plan is considered ecosystem restoration, no adverse human health effects or environmental effects on minority populations and/or low income populations are expected. It is anticipated that this habitat restoration project would have beneficial affects to local communities in terms of aesthetics, wildlife, green open space, recreational opportunity, cleaner surface waters and cleaner air.

Clean Air Act

The local air quality in Chicago and Cook County are considered ‘non-attainment’ under the Clean Air Act for ozone, particulates (PM-10 and PM-2.5), and lead. The project is within the non-attainment zone. Once implemented, the project itself will be neutral in terms of air quality, with no features that either emit or sequester air pollutants to a large degree. During the project construction, heavy equipment would cause minor, temporary air quality impacts, however all equipment will be in compliance with current air quality control requirements for diesel exhaust, fuels, and similar requirements. A general conformity analysis was not conducted due to the short and temporary nature of any air quality impacts.

Section 401 of the Clean Water Act

A Section 404(b)(1) analysis was completed for the preferred plan and is located in Appendix A. Features addressed by the 404 include the fill materials for mudpuppy and wetland restoration. No adverse effects were determined. Since project activities under the jurisdiction of Section 401 are very limited and are all restorative in terms of aquatic ecosystem and water quality, Section 401 Water Certification is already granted via Regional Permit 5 as this project fits all of the requirements. A courtesy copy of the NEPA Document, 401 Certification Application and 404(b)(1) Analysis will be provided to the ILEPA for their records and comment opportunity.

USFWS Coordination

Coordination with the USFWS commenced with a project scoping letter dated 24 October 2014. This environmental assessment identified the NER/Preferred Plan to have "no effects" on federally endangered species or their habitats as determined by following the protocol and guidelines provided by Region 3 Fish & Wildlife Service (http://www.fws.gov/midwest/endangered/section7/index.html); therefore Section 7 is precluded and in compliance. Coordination under the FWCA of the NER/Preferred Plan will continue through the NEPA process and would be precluded before the signing of a FONSI or other determinations made. It is anticipated that the USFWS will have "No Objection" based on informal verbal coordination and study contributions of habitat design recommendations.

State of Illinois Historic Preservation Act

Coordination with the IHPA commenced with a project scoping letter dated 10 December 2012. In a letter dated _____, the Illinois Historic Preservation Agency (IHPA) informed USACE that no historic properties are affected by the NER/Preferred Plan.

Public Interest

An Environmental Assessment (EA) was prepared for the project and sent to Federal, State and local agencies along with the general public for review. A 30-day Public Review period will be held for the Environmental Assessment. Significant comments from the Federal, State or local agencies or the public were addressed and are attached to this FONSI. All comments and correspondence are attached to this FONSI.

Conclusion

In accordance with the National Environmental Policy Act of 1969 and Section 122 of the River and Harbor and Flood Control Act of 1970, the U.S. Army Corps of Engineers has assessed the environmental impacts associated with this project. The purpose of this EA is to evaluate the impacts that would be associated with the restoration of the 155-acres at Jackson Park. The proposed project has been determined to be in full compliance with the appropriate statutes, executive orders and USACE regulations.

The assessment process indicates that this project would not cause significant effects on the quality of the human environment. The assessment process indicates that this project would have only beneficial impacts upon the ecological, biological, social, or physical resources of this area. The findings indicate that that the proposed action is not a major Federal action significantly affecting the quality of the human environment. Therefore, I have determined that an Environmental Impact Statement (EIS) is not required.

Frederic A. Drummond Jr. Date: _____
Colonel, U.S. Army
District Commander

A6 – Planning Information

EcoCAT
Ecological Compliance Assessment Tool

Applicant:	Anastasia Brown	*IDNR Project Number:*	1405209
Contact:	Anastasia Brown	*Date:*	10/09/2013
Address:	231 S. LaSalle Street Chicago, IL 60604		

Project: Jackson Park - 506
Address: 6401 South Stoney Island Ave., Chicago

Description: Restoration and enhancement of Jackson Park in Chicago, IL

Natural Resource Review Results

This project was submitted for information only. It is not a consultation under Part 1075.

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Peregrine Falcon *(Falco peregrinus)*

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Cook

Township, Range, Section:
38N, 14E, 13
38N, 14E, 14
38N, 14E, 24

IL Department of Natural Resources Contact
Impact Assessment Section
217-785-5500
Division of Ecosystems & Environment

Local or State Government Jurisdiction
Other

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

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3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

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Savanna/Woodland ExC/FWOP

Species Name (NWPL/Mohlenbrock)	Species(Synonym)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
Acer negundo	Acer negundo var. violaceum	Ash-Leaf Maple	0	FAC	0	Tree	Perennial	Native
Acer platanoides	ACER PLATANOIDES	Norway Maple	0	UPL	2	Tree	Perennial	Adventive
Acer saccharinum	Acer saccharinum	Silver Maple	0	FACW	-1	Tree	Perennial	Native
Acer saccharum	Acer saccharum	Sugar Maple	3	FACU	1	Tree	Perennial	Native
Achillea millefolium	ACHILLEA MILLEFOLIUM	Common Yarrow	0	FACU	1	Forb	Perennial	Adventive
Aesculus glabra	Aesculus glabra	Ohio Buckeye	3	FAC	0	Tree	Perennial	Native
Aesculus hippocastanum	AESCULUS HIPPOCASTANUM	Horse Chestnut	0	UPL	2	Tree	Perennial	Adventive
Agastache nepetoides	Agastache nepetoides	Yellow Giant-Hyssop	5	FACU	1	Forb	Perennial	Native
Ageratina altissima	Eupatorium rugosum	White Snakeroot	4	FACU	1	Forb	Perennial	Native
Ailanthus altissima	AILANTHUS ALTISSIMA	Tree-of-Heaven	0	FACU	1	Tree	Perennial	Adventive
Alisma subcordatum	Alisma subcordatum	American Water-Plantain	4	OBL	-2	Forb	Perennial	Native
Alliaria petiolata	ALLIARIA PETIOLATA	Garlic-Mustard	0	FAC	0	Forb	Biennial	Adventive
Allium cernuum	Allium cernuum	Nodding Onion	7	FACU	1	Forb	Perennial	Native
Alnus glutinosa	ALNUS GLUTINOSA	European Alder	0	FACW	-1	Tree	Perennial	Adventive
Ambrosia artemisiifolia	Ambrosia artemisiifolia elatior	Annual Ragweed	0	FACU	1	Forb	Annual	Native
Ambrosia trifida	Ambrosia trifida	Great Ragweed	0	FAC	0	Forb	Annual	Native
Andropogon gerardii	Andropogon gerardii	Big Bluestem	5	FAC	0	Grass	Perennial	Native
Aquilegia canadensis	Aquilegia canadensis	Red Columbine	6	FACU	1	Forb	Perennial	Native
Arctium minus	ARCTIUM MINUS	Lesser Burrdock	0	FACU	1	Forb	Biennial	Adventive
Asclepias syriaca	Asclepias syriaca	Common Milkweed	0	FACU	1	Forb	Perennial	Native
Asclepias verticillata	Asclepias verticillata	Whorled Milkweed	1	FACU	1	Forb	Perennial	Native
Astragalus canadensis	Astragalus canadensis	Canadian Milk-Vetch	10	FAC	0	Forb	Perennial	Native
Atriplex patula	ATRIPLEX PATULA	Halberd-Leaf Orache	0	FACW	-1	Forb	Annual	Adventive
Bidens cernua	Bidens cernua	Nodding Burr-Marigold	5	OBL	-2	Forb	Annual	Native
Bidens frondosa	Bidens frondosa	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
Bidens tripartita	Bidens comosa; Bidens connata	Three-Lobe Beggarticks	5	OBL	-2	Forb	Annual	Native
Bouteloua curtipendula	Bouteloua curtipendula	Side-Oats Grama	8	UPL	2	Grass	Perennial	Native
Bromus inermis	BROMUS INERMIS	Smooth Brome	0	FACU	1	Grass	Perennial	Adventive
Bromus pubescens	Bromus pubescens	Hairy Woodland Brome	5	FACU	1	Grass	Perennial	Native
Bromus tectorum	BROMUS TECTORUM	Downy Chess	0	UPL	2	Grass	Annual	Adventive
Carex blanda	Carex blanda	Eastern Woodland Sedge	1	FAC	0	Sedge	Perennial	Native
Carex pensylvanica	Carex pensylvanica	Pennsylvania Sedge	5	UPL	2	Sedge	Perennial	Native
Catalpa speciosa	CATALPA SPECIOSA	Northern Catalpa	0	FACU	1	Tree	Perennial	Adventive
Celtis occidentalis	Celtis occidentalis	Common Hackberry	3	FAC	0	Tree	Perennial	Native
Centaurium pulchellum	CENTAURIUM PULCHELLUM	Branched Centaury	0	FACU	1	Forb	Annual	Adventive
Chenopodium album	CHENOPODIUM ALBUM	Lamb's-Quarters	0	FACU	1	Forb	Annual	Adventive
Cichorium intybus	CICHORIUM INTYBUS	Chicory	0	FACU	1	Forb	Perennial	Adventive
Circaea canadensis	Circaea lutetiana canadensis	Broad-Leaf Enchanter's-Nightshade	1	FACU	1	Forb	Perennial	Native
Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
Cirsium vulgare	CIRSIUM VULGARE	Bull Thistle	0	FACU	1	Forb	Biennial	Adventive
Convolvulus arvensis	CONVOLVULUS ARVENSIS	Field Bindweed	0	UPL	2	Forb	Perennial	Adventive
Cornus obliqua	Cornus obliqua	Pale Dogwood	6	FACW	-1	Shrub	Perennial	Native
Cornus racemosa	Cornus racemosa	Gray Dogwood	1	FAC	0	Shrub	Perennial	Native
Corylus americana	Corylus americana	American Hazelnut	5	FACU	1	Shrub	Perennial	Native
Crataegus mollis	Crataegus mollis	Downy Hawthorn	2	FAC	0	Tree	Perennial	Native
Dactylis glomerata	DACTYLIS GLOMERATA	Orchard Grass	0	FACU	1	Grass	Perennial	Adventive
Daucus carota	DAUCUS CAROTA	Queen Anne's Lace	0	UPL	2	Forb	Biennial	Adventive
Dicentra cucullaria	Dicentra cucullaria	Dutchman's-Breeches	6	UPL	2	Forb	Perennial	Native
Diervilla lonicera	Diervilla lonicera	Dwarf Honeysuckle	9	UPL	2	Shrub	Perennial	Native
Digitaria sanguinalis	DIGITARIA SANGUINALIS	Hairy Crab Grass	0	FACU	1	Grass	Annual	Adventive
Echinacea purpurea	Echinacea purpurea	Purple Coneflower	3	UPL	2	Forb	Perennial	Native
Echinochloa crus-galli	Echinochloa crusgalli	Large Barnyard Grass	0	FACW	-1	Grass	Annual	Native
Eleocharis palustris	Eleocharis erythropoda; Eleocharis palustris major; Eleocharis smallii	Common Spike-Rush	2	OBL	-2	Sedge	Perennial	Native
Elymus canadensis	Elymus canadensis	Nodding Wild Rye	4	FACU	1	Grass	Perennial	Native
Elymus hystrix	Hystrix patula	Eastern Bottle-Brush Grass	5	FACU	1	Grass	Perennial	Native
Elymus virginicus	Elymus virginicus	Virginia Wild Rye	4	FACW	-1	Grass	Perennial	Native
Epilobium coloratum	Epilobium coloratum	Purple-Leaf Willowherb	3	OBL	-2	Forb	Perennial	Native
Erigeron annuus	Erigeron annuus	Eastern Daisy Fleabane	0	FACU	1	Forb	Biennial	Native
Erigeron canadensis	Erigeron canadensis	Canadian Horseweed	0	FACU	1	Forb	Annual	Native
Euonymus alatus	EUONYMUS ALATUS	Winged Euonymus	0	UPL	2	Shrub	Perennial	Adventive
Euonymus atropurpureus	Euonymus atropurpureus	Eastern Wahoo	8	FAC	0	Shrub	Perennial	Native
Eupatorium serotinum	Eupatorium serotinum	Late-Flowering Thoroughwort	0	FAC	0	Forb	Perennial	Native
Euphorbia corollata	Euphorbia corollata	Flowering Spurge	2	UPL	2	Forb	Perennial	Native
Eutrochium purpureum	Eupatorium purpureum	Sweet-Scented Joe-Pye-Weed	7	FAC	0	Forb	Perennial	Native
Frangula alnus	RHAMNUS FRANGULA	Glossy False Buckthorn	0	FACW	-1	Shrub	Perennial	Adventive
Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima	Green Ash	1	FACW	-1	Tree	Perennial	Native
Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima	Green Ash	1	FACW	-1	Tree	Perennial	Native
Gaura biennis	Gaura biennis	Biennial Beeblossom	2	FACU	1	Forb	Biennial	Native
Glechoma hederacea	GLECHOMA HEDERACEA	Groundivy	0	FACU	1	Forb	Perennial	Adventive
Gleditsia triacanthos	Gleditsia triacanthos	Honey-Locust	2	FACU	1	Tree	Perennial	Native
Gymnocladus dioicus	Gymnocladus dioica	Kentucky Coffee Tree	8	UPL	2	Tree	Perennial	Native
Hackelia virginiana	Hackelia virginiana	Beggar's-Lice	0	FACU	1	Forb	Biennial	Native
Humulus lupulus	Humulus lupulus	Common Hop	5	FACU	1	Vine	Perennial	Native
Impatiens capensis	Impatiens capensis	Spotted Touch-Me-Not	3	FACW	-1	Forb	Annual	Native
Juglans nigra	Juglans nigra	Black Walnut	5	FACU	1	Tree	Perennial	Native
Juncus dudleyi	Juncus dudleyi	Dudley's Rush	4	FACW	-1	Forb	Perennial	Native
Lactuca serriola	LACTUCA SERRIOLA	Prickly Lettuce	0	FACU	1	Forb	Biennial	Adventive
Laportea canadensis	Laportea canadensis	Canadian Wood-Nettle	3	FACW	-1	Forb	Perennial	Native
Lemna minor	Lemna minor	Common Duckweed	5	OBL	-2	Forb	Annual	Native
Leonurus cardiaca	LEONURUS CARDIACA	Motherwort	0	UPL	2	Forb	Perennial	Adventive
Lespedeza capitata	Lespedeza capitata	Round-Head Bush-Clover	4	FACU	1	Forb	Perennial	Native
Leucanthemum vulgare	CHRYSANTHEMUM LEUCANTHEMUM PINNATIFIDUM	Ox-Eye Daisy	0	UPL	2	Forb	Perennial	Adventive
Liatris aspera	Liatris aspera	Rough Gayfeather	6	UPL	2	Forb	Perennial	Native
Liatris spicata	Liatris spicata	Dense Gayfeather	6	FAC	0	Forb	Perennial	Native
Lobelia siphilitica	Lobelia siphilitica	Great Blue Lobelia	6	OBL	-2	Forb	Perennial	Native
Lonicera X bella	LONICERA X BELLA	0	0	FACU	1	Shrub	Perennial	Adventive
Lycopus uniflorus	Lycopus uniflorus	Northern Water-Horehound	7	OBL	-2	Forb	Perennial	Native
Maianthemum stellatum	Smilacina stellata	Starry False Solomon's-Seal	5	FAC	0	Forb	Perennial	Native
Matricaria discoidea	MATRICARIA MATRICARIOIDES	Pineapple-Weed	0	FACU	1	Forb	Annual	Adventive
Medicago lupulina	MEDICAGO LUPULINA	Black Medick	0	FACU	1	Forb	Annual	Adventive
Melilotus albus	MELILOTUS ALBA	White Sweet-Clover	0	UPL	2	Forb	Biennial	Adventive
Melilotus officinalis	MELILOTUS ALBA	Yellow Sweet-Clover	0	FACU	1	Forb	Biennial	Adventive
Mentha arvensis	Mentha arvensis villosa	American Wild Mint	5	FACW	-1	Forb	Perennial	Native
Mertensia virginica	Mertensia virginica	Virginia Bluebells	5	FACW	-1	Forb	Perennial	Native
Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	1	Forb	Perennial	Native
Morus alba	MORUS ALBA	White Mulberry	0	FAC	0	Tree	Perennial	Adventive
Muhlenbergia frondosa	Muhlenbergia frondosa	Wire-Stem Muhly	3	FACW	-1	Grass	Perennial	Native
Muhlenbergia schreberi	Muhlenbergia schreberi	Nimblewill	0	FAC	0	Grass	Perennial	Native
Nepeta cataria	NEPETA CATARIA	Catnip	0	FACU	1	Forb	Perennial	Adventive
Oenothera biennis	Oenothera biennis	King's-Cureall	0	FACU	1	Forb	Biennial	Native
Oxalis stricta	Oxalis europaea	Upright Yellow Wood-Sorrel	0	FACU	1	Forb	Perennial	Native
Panicum capillare	Panicum capillare	Common Panic Grass	1	FAC	0	Grass	Annual	Native
Panicum virgatum	Panicum virgatum	Wand Panic Grass	5	FAC	0	Grass	Perennial	Native
Parietaria pensylvanica	Parietaria pensylvanica	Pennsylvania Pellitory	3	FACU	1	Forb	Annual	Native
Parthenocissus inserta	Parthenocissus inserta	Thicket-Creeper	1	FACU	1	Vine	Perennial	Native
Penstemon digitalis	Penstemon digitalis	Foxglove Beardtongue	4	FAC	0	Forb	Perennial	Native
Persicaria hydropiper	Polygonum hydropiper	Mild Water-Pepper	2	OBL	-2	Forb	Annual	Native
Persicaria longiseta	POLYGONUM CESPITOSUM LONGISETUM	Bristly Lady's-Thumb	0	FAC	0	Forb	Annual	Adventive
Persicaria maculosa	POLYGONUM PERSICARIA	Lady's-Thumb	0	FACW	-1	Forb	Annual	Adventive
Persicaria virginiana	Polygonum virginianum	Jumpseed	2	FAC	0	Forb	Perennial	Native
Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
Phellodendron amurense	PHELLODENDRON AMURENSE	Amur Cork Tree	0	UPL	2	Tree	Perennial	Adventive
Phragmites australis ssp. australis	Phragmites australis	Common Reed	0	FACW	-1	Grass	Perennial	Adventive
Physalis subglabrata	Physalis subglabrata	Smooth Ground Cherry	0	UPL	2	Forb	Perennial	Native
Phytolacca americana	Phytolacca americana	American Pokeweed	1	FACU	1	Forb	Perennial	Native
Plantago lanceolata	PLANTAGO LANCEOLATA	English Plantain	0	FACU	1	Forb	Perennial	Adventive
Plantago rugelii	Plantago rugelii	Black-Seed Plantain	0	FAC	0	Forb	Annual	Native
Platanus occidentalis	Platanus occidentalis	American Sycamore	9	FACW	-1	Tree	Perennial	Native
Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
Poinsettia dentata	EUPHORBIA DENTATA	Wild Poinsettia	0	UPL	2	Forb	Annual	Adventive
Polygonatum biflorum var. commutatum	Polygonatum canaliculatum	King Solomon's-Seal	3	FACU	1	Forb	Perennial	Native
Polygonum arenastrum	POLYGONUM ARENASTRUM	Sidewalk Knotweed	0	UPL	2	Forb	Annual	Adventive
Populus alba	POPULUS ALBA	White Poplar	0	UPL	2	Tree	Perennial	Adventive
Portulaca oleracea	PORTULACA OLERACEA	Little-Hogweed	0	FACU	1	Forb	Annual	Adventive
Prunella vulgaris ssp. lanceolata	Prunella vulgaris lanceolata	Common Selfheal	0	FAC	0	Forb	Perennial	Native
Prunus americana	Prunus americana	American Plum	5	UPL	2	Tree	Perennial	Native
Prunus virginiana	Prunus virginiana	Choke Cherry	3	FACU	1	Shrub	Perennial	Native
Ptelea trifoliata	Ptelea trifoliata	Common Hoptree	7	FACU	1	Shrub	Perennial	Native
Quercus alba	Quercus alba	Northern White Oak	5	FACU	1	Tree	Perennial	Native
Quercus macrocarpa	Quercus macrocarpa	Burr Oak	5	FAC	0	Tree	Perennial	Native
Quercus palustris	Quercus palustris	Pin Oak	8	FACW	-1	Tree	Perennial	Native
Quercus rubra	Quercus rubra	Northern Red Oak	7	FACU	1	Tree	Perennial	Native
Ratibida pinnata	Ratibida pinnata	Yellow Coneflower	4	UPL	2	Forb	Perennial	Native
Rhamnus cathartica	RHAMNUS CATHARTICA	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
Rhus hirta	Rhus typhina	Staghorn Sumac	1	UPL	2	Tree	Perennial	Native
Ribes americanum	Ribes americanum	Wild Black Currant	7	FACW	-1	Shrub	Perennial	Native
Rudbeckia hirta	Rudbeckia hirta	Black-Eyed-Susan	1	FACU	1	Forb	Perennial	Native
Rudbeckia laciniata	Rudbeckia laciniata	Green-Head Coneflower	5	FACW	-1	Forb	Perennial	Native
Salix amygdaloides	Salix amygdaloides	Peach-Leaf Willow	5	FACW	-1	Tree	Perennial	Native
Salix babylonica	SALIX BABYLONICA	Chinese Willow	0	FAC	0	Tree	Perennial	Adventive
Sambucus nigra ssp. canadensis	Sambucus canadensis	Black Elder	1	FACW	-1	Shrub	Perennial	Native
Sanicula odorata	Sanicula gregaria	Clustered Black-Snakeroot	2	FAC	0	Forb	Perennial	Native
Saponaria officinalis	SAPONARIA OFFICINALIS	Bouncing-Bett	0	FACU	1	Forb	Perennial	Adventive
Schizachyrium scoparium	Andropogon scoparius	Little False Bluestem	5	FACU	1	Grass	Perennial	Native
Scilla sibirica	SCILLA SIBIRICA	Squill	0	UPL	2	Forb	Perennial	Adventive
Scrophularia lanceolata	Scrophularia lanceolata	Lance-Leaf Figwort	5	FACU	1	Forb	Perennial	Native
Setaria faberi	SETARIA FABERI	Japanese Bristle Grass	0	FACU	1	Grass	Annual	Adventive
Setaria pumila	SETARIA GLAUCA	Yellow Bristle Grass	0	FAC	0	Grass	Annual	Adventive
Silphium laciniatum	Silphium laciniatum	Compass-Plant	5	UPL	2	Forb	Perennial	Native
Silphium perfoliatum	Silphium perfoliatum	Cup-Plant	5	FACW	-1	Forb	Perennial	Native
Solanum americanum	Solanum americanum	American Black Nightshade	0	FACU	1	Forb	Annual	Native
Solanum dulcamara	SOLANUM DULCAMARA	Climbing Nightshade	0	FAC	0	Vine	Perennial	Adventive
Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
Solidago gigantea	Solidago gigantea	Late Goldenrod	4	FACW	-1	Forb	Perennial	Native
Solidago rigida	Solidago rigida	Hard-Leaf Flat-Top-Goldenrod	4	FACU	1	Forb	Perennial	Native
Sonchus arvensis	SONCHUS ARVENSIS	Field Sow-Thistle	0	FACU	1	Forb	Perennial	Adventive
Sorghastrum nutans	Sorghastrum nutans	Yellow Indian Grass	5	FACU	1	Grass	Perennial	Native
Symphoricarpos orbiculatus	SYMPHORICARPOS ORBICULATUS	Coral-Berry	0	FACU	1	Shrub	Perennial	Adventive
Symphyotrichum drummondii	Aster sagittifolius drummondii	Drummond's Aster	2	UPL	2	Forb	Perennial	Native
Symphyotrichum laeve	Aster laevis	Smooth Blue American-Aster	9	FACU	1	Forb	Perennial	Native
Symphyotrichum lanceolatum	Aster simplex	White Panicled American-Aster	3	FAC	0	Forb	Perennial	Native
Symphyotrichum novae-angliae	Aster novae-angliae	New England American-Aster	4	FACW	-1	Forb	Perennial	Native
Symphyotrichum pilosum	Aster pilosus	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
Symphyotrichum shortii	Aster shortii	Short's Aster	8	UPL	2	Forb	Perennial	Native
Taraxacum officinale	TARAXACUM OFFICINALE	Common Dandelion	0	FACU	1	Forb	Perennial	Adventive
Tilia americana	Tilia americana	American Basswood	5	FACU	1	Tree	Perennial	Native
Trifolium pratense	TRIFOLIUM PRATENSE	Red Clover	0	FACU	1	Forb	Perennial	Adventive
Trifolium repens	TRIFOLIUM REPENS	White Clover	0	FACU	1	Forb	Perennial	Adventive
Verbascum thapsus	VERBASCUM THAPSUS	Woolly Mullein	0	UPL	2	Forb	Biennial	Adventive
Verbena hastata	Verbena hastata	Simpler's-Joy	4	FACW	-1	Forb	Perennial	Native
Verbena urticifolia	Verbena urticifolia leiocarpa	White Vervain	5	FAC	0	Forb	Perennial	Native
Verbesina alternifolia	Actinomeris alternifolia	Wingstem	5	FACW	-1	Forb	Perennial	Native
Veronicastrum virginicum	Veronicastrum virginicum	Culver's-Root	7	FAC	0	Forb	Perennial	Native
Viburnum lantana	VIBURNUM LANTANA	Wayfarinig Tree	0	UPL	2	Shrub	Perennial	Adventive
Viburnum lentago	Viburnum lentago	Nanny-Berry	5	FAC	0	Shrub	Perennial	Native
Viburnum opulus var. opulus	VIBURNUM OPULUS	Highbush-Cranberry	0	FAC	0	Shrub	Perennial	Adventive
Viburnum prunifolium	Viburnum prunifolium	Smooth Blackhaw	5	FACU	1	Shrub	Perennial	Native
Viola sororia	Viola sororia	Hooded Blue Violet	3	FAC	0	Forb	Perennial	Native
Vitis riparia	Vitis riparia	River-Bank Grape	2	FACW	-1	Vine	Perennial	Native
Xanthium strumarium	XANTHIUM STRUMARIUM	Rough Cockleburr	0	FAC	0	Forb	Annual	Adventive

Conservatism-Based Metrics

Mean C (native species)	3.64
Mean C (all species)	2.43
Mean C (native trees)	3.90
Mean C (native shrubs)	5.18
Mean C (native herbaceous)	3.42
FQAI (native species)	39.89
FQAI (all species)	32.57
Adjusted FQAI	29.73
% C value 0	43%
% C Value 1-3	21%
% C value 4-6	27%
% C value 7-10	9%

Additional Metrics

Species Richness (all)	180
Species Richness (native)	120
% Non-native	33%
Wet Indicator (all)	0.47
Wet Indicator (native)	0.25
% hydrophyte (Midwest)	43%
% native perennial	57%
% native annual	8%
% annual	16%
% perennial	77%

Savanna/Woodland FWP

Species Name (NWPL/Mohlenbrock)	Species(Synonym)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
Anemone cylindrica	Anemone cylindrica	Thimbleweed	6	UPL	2	Forb	Perennial	Native
Antennaria plantaginifolia	Antennaria plantaginifolia	Pussy-Toes	3	UPL	2	Forb	Perennial	Native
Aquilegia canadensis	Aquilegia canadensis	Red Columbine	6	FACU	1	Forb	Perennial	Native
Asclepias tuberosa ssp. interior	Asclepias tuberosa	Butterfly-Weed	7	UPL	2	Forb	Perennial	Native
Blephilia hirsuta	Blephilia hirsuta	Hairy Pagoda-Plant	8	FACU	1	Forb	Perennial	Native
Bouteloua curtipendula	Bouteloua curtipendula	Side-Oats Grama	8	UPL	2	Grass	Perennial	Native
Bromus kalmii	Bromus kalmii	Kalm's Brome	10	FAC	0	Grass	Perennial	Native
Carex normalis	Carex normalis	Greater Straw Sedge	5	FACW	-1	Sedge	Perennial	Native
Carex hirsutella	Carex hirsutella	Hairy-Leaf Sedge	4	UPL	2	Sedge	Perennial	Native
Carex muehlenbergii	Carex muhlenbergii	Muhlenberg's Sedge	5	UPL	2	Sedge	Perennial	Native
Carex pensylvanica	Carex pensylvanica	Pennsylvania Sedge	5	UPL	2	Sedge	Perennial	Native
Carex swanii	Carex swanii	Swan's Sedge	8	FACU	1	Sedge	Perennial	Native
Coreopsis lanceolata	Coreopsis lanceolata	Lance-Leaf Tickseed	5	FACU	1	Forb	Perennial	Native
Comandra umbellata	Comandra umbellata	Bastard-Toadflax	7	FACU	1	Forb	Perennial	Native
Dalea candida	Petalostemum candidum	White Prairie-Clover	9	UPL	2	Forb	Perennial	Native
Dalea purpurea	Petalostemum purpureum	Purple Prairie-Clover	9	UPL	2	Forb	Perennial	Native
Dodecatheon meadia	Dodecatheon meadia	Pride-of-Ohio	6	FACU	1	Forb	Perennial	Native
Drymocallis arguta	Potentilla arguta	Prairie Cinquefoil	9	FACU	1	Forb	Perennial	Native
Echinacea pallida	Echinacea pallida	Pale Coneflower	8	UPL	2	Forb	Perennial	Native
Elymus hystrix	Hystrix patula	Eastern Bottle-Brush Grass	5	FACU	1	Grass	Perennial	Native
Erigeron pulchellus	Erigeron pulchellus	Robin's-Plantain	10	FACU	1	Forb	Perennial	Native
Euphorbia corollata	Euphorbia corollata	Flowering Spurge	2	UPL	2	Forb	Perennial	Native
Geranium maculatum	Geranium maculatum	Spotted Crane's-Bill	4	FACU	1	Forb	Perennial	Native
Helianthus occidentalis	Helianthus occidentalis	Few-Leaf Sunflower	10	FACU	1	Forb	Perennial	Native
Heuchera richardsonii	Heuchera richardsonii	Richardson's Alumroot	8	FACU	1	Forb	Perennial	Native
Heserostipa spartea	Stipa spartea	Porcupine Grass	7	UPL	2	Grass	Perennial	Native
Liatris aspera	Liatris aspera	Rough Gayfeather	6	UPL	2	Forb	Perennial	Native
Lilium michiganense	Lilium michiganense	Michigan Lily	6	FACW	-1	Forb	Perennial	Native
Ionactis linariifolius	Aster linariifolius	Flax-Leaf Aster	10	UPL	2	Forb	Perennial	Native
Lupinus perennis var. occidentalis	Lupinus perennis occidentalis	Wild Lupine	7	UPL	2	Forb	Perennial	Native
Maianthemum stellatum	Smilacina stellata	Starry False Solomon's-Seal	5	FAC	0	Forb	Perennial	Native
Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	1	Forb	Perennial	Native
Monarda punctata	Monarda punctata	Spotted Beebalm	5	UPL	2	Forb	Perennial	Native
Pedicularis canadensis	Pedicularis canadensis	Canadian Lousewort	9	FACU	1	Forb	Perennial	Native
Penstemon digitalis	Penstemon digitalis	Foxglove Beardtongue	4	FAC	0	Forb	Perennial	Native
Penstemon hirsutus	Penstemon hirsutus	Hairy Beardstongue	9	UPL	2	Forb	Perennial	Native
Phlox pilosa	Phlox pilosa	Downy Phlox	7	FACU	1	Forb	Perennial	Native
Solidago nemoralis	Solidago nemoralis	Gray Goldenrod	4	UPL	2	Forb	Perennial	Native
Solidago speciosa	Solidago speciosa	Showy Goldenrod	7	UPL	2	Forb	Perennial	Native
Tradescantia ohiensis	Tradescantia ohiensis	Bluejacket	2	FACU	1	Forb	Perennial	Native
Schizachyrium scoparium	Andropogon scoparius	Little False Bluestem	5	FACU	1	Grass	Perennial	Native
Viola pedata	Viola pedata lineariloba	Bird-Foot Violet	9	UPL	2	Forb	Perennial	Native
Taenidia integerrima	Taenidia integerrima	Yellow Pimpernel	9	UPL	2	Forb	Perennial	Native
Baptisia bracteata	Baptisia leucophaea	Cream Wild Indigo	10	UPL	2	Forb	Perennial	Native
Baptisia alba var. macrophylla	Baptisia leucantha	White Wild Indigo	8	FACU	1	Forb	Perennial	Native
Symphyotrichum ericoides	Aster ericoides	White Heath American-Aster	5	FACU	1	Forb	Perennial	Native
Coreopsis palmata	Coreopsis palmata	Prairie Tickseed	6	UPL	2	Forb	Perennial	Native
Chamaecrista fasciculata	Cassia fasciculata	Sleepingplant	5	FACU	1	Forb	Annual	Native
Parthenium integrifolium	Parthenium integrifolium	Wild Quinine	8	UPL	2	Forb	Perennial	Native
Asclepias verticillata	Asclepias verticillata	Whorled Milkweed	1	FACU	1	Forb	Perennial	Native
Pycnanthemum tenuifolium	Pycnanthemum tenuifolium	Narrow-Leaf Mountain-Mint	7	FAC	0	Forb	Perennial	Native
Symphyotrichum sericeum	Aster sericeus	Silky Aster	10	UPL	2	Forb	Perennial	Native
Zizia aurea	Zizia aurea	Golden Alexanders	7	FAC	0	Forb	Perennial	Native
Zizia aptera	Zizia aptera	Heart-Leaf Alexanders	10	FACU	1	Forb	Perennial	Native
Dasiphora fruticosa	Potentilla fruticosa	Golden-Hardhack	10	FACW	-1	Shrub	Perennial	Native
Hypericum kalmianum	Hypericum kalmianum	Kalm's St. John's-Wort	10	FACW	-1	Shrub	Perennial	Native
Diervilla lonicera	Diervilla lonicera	Dwarf Honeysuckle	9	UPL	2	Shrub	Perennial	Native
Rosa carolina	Rosa carolina	Carolina Rose	5	FACU	1	Shrub	Perennial	Native
Amelanchier arborea	Amelanchier arborea	Downy Service-Berry	8	FACU	1	Tree	Perennial	Native
Amelanchier interior	Amelanchier interior	Inland Service-Berry	8	UPL	2	Tree	Perennial	Native
Vaccinium angustifolium	Vaccinium angustifolium	Late Lowbush Blueberry	5	FACU	1	Shrub	Perennial	Native
Quercus velutina	Quercus velutina	Black Oak	6	UPL	2	Tree	Perennial	Native
Quercus ellipsoidalis	0	Hill's Oak	4	UPL	2	Tree	Perennial	Native
Gaylussacia baccata	Gaylussacia baccata	Black Huckleberry	9	FACU	1	Shrub	Perennial	Native
Viburnum prunifolium	Viburnum prunifolium	Smooth Blackhaw	5	FACU	1	Shrub	Perennial	Native
Corylus americana	Corylus americana	American Hazelnut	5	FACU	1	Shrub	Perennial	Native
Hamamelis virginiana	Hamamelis virginiana	American Witch-Hazel	8	FACU	1	Shrub	Perennial	Native
Amorpha canescens	Amorpha canescens	Leadplant	9	UPL	2	Shrub	Perennial	Native
Viburnum acerifolium	Viburnum acerifolium	Maple-Leaf Arrow-Wood	9	UPL	2	Shrub	Perennial	Native
Comptonia peregrina	Comptonia peregrina	Sweet-Fern	9	UPL	2	Shrub	Perennial	Native
Ceanothus herbaceus	Ceanothus herbaceus	Inland New Jersey Tea	10	UPL	2	Shrub	Perennial	Native

Conservatism-Based

Mean C (native species)	6.87
Mean C (all species)	6.87
Mean C (native trees)	6.50
Mean C (native shrubs)	7.92
Mean C (native herbaceous)	6.65
FQAI (native species)	57.91
FQAI (all species)	57.91
Adjusted FQAI	68.73
% C value 0	0%
% C Value 1-3	6%
% C value 4-6	38%
% C value 7-10	56%

Additional Metrics

Species Richness (all)	71
Species Richness (native)	71
% Non-native	0%
Wet Indicator (all)	1.28
Wet Indicator (native)	1.28
% hydrophyte (Midwest)	13%
% native perennial	99%
% native annual	1%
% annual	1%
% perennial	99%

Sedge Meadow ExC/FWOP

Species Name (NWPL/Mohlenbrock)	Species(Synonym)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
Acer saccharinum	Acer saccharinum	Silver Maple	0	FACW	-1	Tree	Perennial	Native
Alliaria petiolata	ALLIARIA PETIOLATA	Garlic-Mustard	0	FAC	0	Forb	Biennial	Adventive
Ambrosia trifida	Ambrosia trifida	Great Ragweed	0	FAC	0	Forb	Annual	Native
Arctium minus	ARCTIUM MINUS	Lesser Burrdock	0	FACU	1	Forb	Biennial	Adventive
Bidens frondosa	Bidens frondosa	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
Bromus inermis	BROMUS INERMIS	Smooth Brome	0	FACU	1	Grass	Perennial	Adventive
Celtis occidentalis	Celtis occidentalis	Common Hackberry	3	FAC	0	Tree	Perennial	Native
Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
Convolvulus arvensis	CONVOLVULUS ARVENSIS	Field Bindweed	0	UPL	2	Forb	Perennial	Adventive
Crataegus mollis	Crataegus mollis	Downy Hawthorn	2	FAC	0	Tree	Perennial	Native
Daucus carota	DAUCUS CAROTA	Queen Anne's Lace	0	UPL	2	Forb	Biennial	Adventive
Echinacea purpurea	Echinacea purpurea	Purple Coneflower	3	UPL	2	Forb	Perennial	Native
Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima	Green Ash	1	FACW	-1	Tree	Perennial	Native
Glechoma hederacea	GLECHOMA HEDERACEA	Groundivy	0	FACU	1	Forb	Perennial	Adventive
Helianthus grosseserratus	Helianthus grosseserratus	Saw-Tooth Sunflower	2	FACW	-1	Forb	Perennial	Native
Leonurus cardiaca	LEONURUS CARDIACA	Motherwort	0	UPL	2	Forb	Perennial	Adventive
Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	1	Forb	Perennial	Native
Morus alba	MORUS ALBA	White Mulberry	0	FAC	0	Tree	Perennial	Adventive
Nepeta cataria	NEPETA CATARIA	Catnip	0	FACU	1	Forb	Perennial	Adventive
Oenothera biennis	Oenothera biennis	King's-Cureall	0	FACU	1	Forb	Biennial	Native
Osmunda claytoniana	Osmunda claytoniana	Interrupted Fern	9	FAC	0	Fern	Perennial	Native
Physostegia virginiana	Physostegia virginiana	Obedient-Plant	6	FACW	-1	Forb	Perennial	Native
Phytolacca americana	Phytolacca americana	American Pokeweed	1	FACU	1	Forb	Perennial	Native
Plantago lanceolata	PLANTAGO LANCEOLATA	English Plantain	0	FACU	1	Forb	Perennial	Adventive
Plantago rugelii	Plantago rugelii	Black-Seed Plantain	0	FAC	0	Forb	Annual	Native
Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
Populus deltoides	Populus deltoides	Eastern Cottonwood	2	FAC	0	Tree	Perennial	Native
Ratibida pinnata	Ratibida pinnata	Yellow Coneflower	4	UPL	2	Forb	Perennial	Native
Rhamnus cathartica	RHAMNUS CATHARTICA	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
Rhus hirta	Rhus typhina	Staghorn Sumac	1	UPL	2	Tree	Perennial	Native
Salix interior	Salix interior	Sandbar Willow	1	FACW	-1	Shrub	Perennial	Native
Setaria pumila	SETARIA GLAUCA	Yellow Bristle Grass	0	FAC	0	Grass	Annual	Adventive
Solanum dulcamara	SOLANUM DULCAMARA	Climbing Nightshade	0	FAC	0	Vine	Perennial	Adventive
Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
Solidago gigantea	Solidago gigantea	Late Goldenrod	4	FACW	-1	Forb	Perennial	Native
Sorghastrum nutans	Sorghastrum nutans	Yellow Indian Grass	5	FACU	1	Grass	Perennial	Native
Symphyotrichum novae-angliae	Aster novae-angliae	New England American-Aster	4	FACW	-1	Forb	Perennial	Native
Symphyotrichum pilosum	Aster pilosus	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
Taraxacum officinale	TARAXACUM OFFICINALE	Common Dandelion	0	FACU	1	Forb	Perennial	Adventive
Viola sororia	Viola sororia	Hooded Blue Violet	3	FAC	0	Forb	Perennial	Native
Vitis riparia	Vitis riparia	River-Bank Grape	2	FACW	-1	Vine	Perennial	Native
Zizia aurea	Zizia aurea	Golden Alexanders	7	FAC	0	Forb	Perennial	Native

Conservatism-Based Metrics	
Mean C (native species)	2.48
Mean C (all species)	1.56
Mean C (native trees)	1.50
Mean C (native shrubs)	1.00
Mean C (native herbaceous)	2.89
FQAI (native species)	12.89
FQAI (all species)	10.22
Adjusted FQAI	19.66
% C value 0	49%
% C Value 1-3	33%
% C value 4-6	14%
% C value 7-10	5%

Additional Metrics	
Species Richness (all)	43
Species Richness (native)	27
% Non-native	37%
Wet Indicator (all)	0.40
Wet Indicator (native)	0.15
% hydrophyte (Midwest)	53%
% native perennial	53%
% native annual	7%
% annual	9%
% perennial	81%

Sedge Meadow FWP

Species Name (NWPL/Mohlenbrock)	Species(Synonym)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
Carex haydenii	Carex haydenii	Cloud Sedge	6	OBL	-2	Sedge	Perennial	Native
Arnoglossum plantagineum	Cacalia plantaginea	Groove-Stem Indian-Plantain	10	FAC	0	Forb	Perennial	Native
Thalictrum dasycarpum	Thalictrum dasycarpum hypoglaucum	Purple Meadow-Rue	5	FACW	-1	Forb	Perennial	Native
Onoclea sensibilis	Onoclea sensibilis	Sensitive Fern	8	FACW	-1	Fern	Perennial	Native
Carex pellita	Carex pellita	Woolly Sedge	4	OBL	-2	Sedge	Perennial	Native
Lysimachia quadriflora	Lysimachia quadriflora	Four-Flower Yellow-	9	OBL	-2	Forb	Perennial	Native
Iris virginica var. shrevei	Iris virginica shrevei	Virginia Blueflag	5	OBL	-2	Forb	Perennial	Native
Anemone canadensis	Anemone canadensis	Round-Leaf Thimbleweed	4	FACW	-1	Forb	Perennial	Native
Cicuta maculata	Cicuta maculata	Spotted Water-Hemlock	6	OBL	-2	Forb	Perennial	Native
Doellingeria umbellata	Aster umbellatus	Parasol White-Top	9	FACW	-1	Forb	Perennial	Native
Lythrum alatum	Lythrum alatum	Wing-Angle Loosestrife	7	OBL	-2	Forb	Perennial	Native
Eleocharis palustris	Eleocharis erythropoda; Eleocharis palustris major; Eleocharis smallii	Common Spike-Rush	2	OBL	-2	Sedge	Perennial	Native
Galium obtusum	Galium obtusum	Blunt-Leaf Bedstraw	5	FACW	-1	Forb	Perennial	Native
Caltha palustris	Caltha palustris	Yellow Marsh-Marigold	5	OBL	-2	Forb	Perennial	Native

Conservatism-Based Metrics

Mean C (native species)	6.07
Mean C (all species)	6.07
Mean C (native trees)	n/a
Mean C (native shrubs)	n/a
Mean C (native herbaceous)	6.07
FQAI (native species)	22.72
FQAI (all species)	22.72
Adjusted FQAI	60.71
% C value 0	0%
% C Value 1-3	7%
% C value 4-6	57%
% C value 7-10	36%

Additional Metrics

Species Richness (all)	14
Species Richness (native)	14
% Non-native	0%
Wet Indicator (all)	-1.50
Wet Indicator (native)	-1.50
% hydrophyte (Midwest)	100%
% native perennial	100%
% native annual	0%
% annual	0%
% perennial	100%

Fringe Marsh/Pond ExC/FWOP

Species Name (NWPL/Mohlenbrock)	Species(Synonym)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
Acer negundo	Acer negundo var. violaceum	Ash-Leaf Maple	0	FAC	0	Tree	Perennial	Native
Acer platanoides	ACER PLATANOIDES	Norway Maple	0	UPL	2	Tree	Perennial	Adventive
Acer saccharinum	Acer saccharinum	Silver Maple	0	FACW	-1	Tree	Perennial	Native
Ailanthus altissima	AILANTHUS ALTISSIMA	Tree-of-Heaven	0	FACU	1	Tree	Perennial	Adventive
Alisma subcordatum	Alisma subcordatum	American Water-Plantain	4	OBL	-2	Forb	Perennial	Native
Alnus glutinosa	ALNUS GLUTINOSA	European Alder	0	FACW	-1	Tree	Perennial	Adventive
Ambrosia artemisiifolia	Ambrosia artemisiifolia elatior	Annual Ragweed	0	FACU	1	Forb	Annual	Native
Arctium minus	ARCTIUM MINUS	Lesser Burrdock	0	FACU	1	Forb	Biennial	Adventive
Asclepias syriaca	Asclepias syriaca	Common Milkweed	0	FACU	1	Forb	Perennial	Native
Atriplex patula	ATRIPLEX PATULA	Halberd-Leaf Orache	0	FACW	-1	Forb	Annual	Adventive
Bidens cernua	Bidens cernua	Nodding Burr-Marigold	5	OBL	-2	Forb	Annual	Native
Bidens frondosa	Bidens frondosa	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
Bidens tripartita	Bidens comosa; Bidens connata	Three-Lobe Beggarticks	5	OBL	-2	Forb	Annual	Native
Celtis occidentalis	Celtis occidentalis	Common Hackberry	3	FAC	0	Tree	Perennial	Native
Centaurium pulchellum	CENTAURIUM PULCHELLUM	Branched Centaury	0	FACU	1	Forb	Annual	Adventive
Chenopodium album	CHENOPODIUM ALBUM	Lamb's-Quarters	0	FACU	1	Forb	Annual	Adventive
Cichorium intybus	CICHORIUM INTYBUS	Chicory	0	FACU	1	Forb	Perennial	Adventive
Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
Cirsium vulgare	CIRSIUM VULGARE	Bull Thistle	0	FACU	1	Forb	Biennial	Adventive
Convolvulus arvensis	CONVOLVULUS ARVENSIS	Field Bindweed	0	UPL	2	Forb	Perennial	Adventive
Cornus obliqua	Cornus obliqua	Pale Dogwood	6	FACW	-1	Shrub	Perennial	Native
Dactylis glomerata	DACTYLIS GLOMERATA	Orchard Grass	0	FACU	1	Grass	Perennial	Adventive
Daucus carota	DAUCUS CAROTA	Queen Anne's Lace	0	UPL	2	Forb	Biennial	Adventive
Digitaria sanguinalis	DIGITARIA SANGUINALIS	Hairy Crab Grass	0	FACU	1	Grass	Annual	Adventive
Eleocharis palustris	Eleocharis erythropoda; Eleocharis palustris major; Eleocharis smallii	Common Spike-Rush	2	OBL	-2	Sedge	Perennial	Native
Elodea canadensis	Elodea canadensis	Canadian Waterweed	5	OBL	-2	Forb	Perennial	Native
Elymus canadensis	Elymus canadensis	Nodding Wild Rye	4	FACU	1	Grass	Perennial	Native
Epilobium coloratum	Epilobium coloratum	Purple-Leaf Willowherb	3	OBL	-2	Forb	Perennial	Native
Erigeron canadensis	Erigeron canadensis	Canadian Horseweed	0	FACU	1	Forb	Annual	Native
Euonymus alatus	EUONYMUS ALATUS	Winged Euonymus	0	UPL	2	Shrub	Perennial	Adventive
Euonymus atropurpureus	Euonymus atropurpureus	Eastern Wahoo	8	FAC	0	Shrub	Perennial	Native
Eupatorium serotinum	Eupatorium serotinum	Late-Flowering Thoroughwort	0	FAC	0	Forb	Perennial	Native
Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima	Green Ash	1	FACW	-1	Tree	Perennial	Native
Glechoma hederacea	GLECHOMA HEDERACEA	Groundivy	0	FACU	1	Forb	Perennial	Adventive
Gleditsia triacanthos	Gleditsia triacanthos	Honey-Locust	2	FACU	1	Tree	Perennial	Native
Hackelia virginiana	Hackelia virginiana	Beggar's-Lice	0	FACU	1	Forb	Biennial	Native
Hibiscus moscheutos	Hibiscus palustris	Crimson-Eyed Rose-Mallow	9	OBL	-2	Forb	Perennial	Native
Impatiens capensis	Impatiens capensis	Spotted Touch-Me-Not	3	FACW	-1	Forb	Annual	Native
Iris pseudacorus	IRIS PSEUDACORUS	Pale-Yellow Iris	0	OBL	-2	Forb	Perennial	Adventive
Iris virginica var. shrevei	Iris virginica shrevei	Virginia Blueflag	5	OBL	-2	Forb	Perennial	Native
Juncus dudleyi	Juncus dudleyi	Dudley's Rush	4	FACW	-1	Forb	Perennial	Native
Lactuca serriola	LACTUCA SERRIOLA	Prickly Lettuce	0	FACU	1	Forb	Biennial	Adventive
Lemna minor	Lemna minor	Common Duckweed	5	OBL	-2	Forb	Annual	Native
Lonicera X bella	LONICERA X BELLA	0	0	FACU	1	Shrub	Perennial	Adventive
Lycopus uniflorus	Lycopus uniflorus	Northern Water-Horehound	7	OBL	-2	Forb	Perennial	Native
Matricaria discoidea	MATRICARIA MATRICARIOIDES	Pineapple-Weed	0	FACU	1	Forb	Annual	Adventive
Melilotus albus	MELILOTUS ALBA	White Sweet-Clover	0	UPL	2	Forb	Biennial	Adventive
Melilotus officinalis	MELILOTUS ALBA	Yellow Sweet-Clover	0	FACU	1	Forb	Biennial	Adventive
Mentha arvensis	Mentha arvensis villosa	American Wild Mint	5	FACW	-1	Forb	Perennial	Native
Mentha spicata	MENTHA LONGIFOLIA	Spearmint	0	FACW	-1	Forb	Perennial	Adventive
Morus alba	MORUS ALBA	White Mulberry	0	FAC	0	Tree	Perennial	Adventive
Muhlenbergia schreberi	Muhlenbergia schreberi	Nimblewill	0	FAC	0	Grass	Perennial	Native
Myriophyllum sibiricum	Myriophyllum exalbescens	Siberian Water-Milfoil	7	OBL	-2	Forb	Perennial	Native
Myriophyllum spicatum	MYRIOPHYLLUM SPICATUM	Eurasian Water-Milfoil	0	OBL	-2	Forb	Perennial	Adventive
Nepeta cataria	NEPETA CATARIA	Catnip	0	FACU	1	Forb	Perennial	Adventive
Nuphar advena	Nuphar advena	Yellow Pond-Lily	7	OBL	-2	Forb	Perennial	Native
Oenothera biennis	Oenothera biennis	King's-Cureall	0	FACU	1	Forb	Biennial	Native
Oxalis stricta	Oxalis europaea	Upright Yellow Wood-Sorrel	0	FACU	1	Forb	Perennial	Native
Parietaria pensylvanica	Parietaria pensylvanica	Pennsylvania Pellitory	3	FACU	1	Forb	Annual	Native
Parthenocissus inserta	Parthenocissus inserta	Thicket-Creeper	1	FACU	1	Vine	Perennial	Native
Persicaria hydropiper	Polygonum hydropiper	Mild Water-Pepper	2	OBL	-2	Forb	Annual	Native
Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
Phragmites australis ssp. australis	Phragmites australis	Common Reed	0	FACW	-1	Grass	Perennial	Adventive
Physalis subglabrata	Physalis subglabrata	Smooth Ground Cherry	0	UPL	2	Forb	Perennial	Native
Plantago lanceolata	PLANTAGO LANCEOLATA	English Plantain	0	FACU	1	Forb	Perennial	Adventive
Platanus occidentalis	Platanus occidentalis	American Sycamore	9	FACW	-1	Tree	Perennial	Native
Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
Poinsettia dentata	EUPHORBIA DENTATA	Wild Poinsettia	0	UPL	2	Forb	Annual	Adventive
Polygonum arenastrum	POLYGONUM ARENASTRUM	Sidewalk Knotweed	0	UPL	2	Forb	Annual	Adventive
Prunella vulgaris ssp. lanceolata	Prunella vulgaris lanceolata	Common Selfheal	0	FAC	0	Forb	Perennial	Native
Ptelea trifoliata	Ptelea trifoliata	Common Hoptree	7	FACU	1	Shrub	Perennial	Native
Rhus hirta	Rhus typhina	Staghorn Sumac	1	UPL	2	Tree	Perennial	Native
Salix amygdaloides	Salix amygdaloides	Peach-Leaf Willow	5	FACW	-1	Tree	Perennial	Native
Salix babylonica	SALIX BABYLONICA	Chinese Willow	0	FAC	0	Tree	Perennial	Adventive
Sambucus nigra ssp. canadensis	Sambucus canadensis	Black Elder	1	FACW	-1	Shrub	Perennial	Native
Sanicula odorata	Sanicula gregaria	Clustered Black-Snakeroot	2	FAC	0	Forb	Perennial	Native
Saponaria officinalis	SAPONARIA OFFICINALIS	Bouncing-Bett	0	FACU	1	Forb	Perennial	Adventive
Schoenoplectus pungens	Scirpus pungens	Three-Square	5	OBL	-2	Sedge	Perennial	Native
Setaria faberi	SETARIA FABERI	Japanese Bristle Grass	0	FACU	1	Grass	Annual	Adventive
Setaria pumila	SETARIA GLAUCA	Yellow Bristle Grass	0	FAC	0	Grass	Annual	Adventive
Solanum americanum	Solanum americanum	American Black Nightshade	0	FACU	1	Forb	Annual	Native
Solanum dulcamara	SOLANUM DULCAMARA	Climbing Nightshade	0	FAC	0	Vine	Perennial	Adventive
Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
Solidago gigantea	Solidago gigantea	Late Goldenrod	4	FACW	-1	Forb	Perennial	Native
Sonchus arvensis	SONCHUS ARVENSIS	Field Sow-Thistle	0	FACU	1	Forb	Perennial	Adventive
Spartina pectinata	Spartina pectinata	Freshwater Cord Grass	4	FACW	-1	Grass	Perennial	Native
Stuckenia pectinata	Potamogeton pectinatus	Sago False Pondweed	5	OBL	-2	Forb	Perennial	Native
Symphyotrichum lanceolatum	Aster simplex	White Panicled American-Aster	3	FAC	0	Forb	Perennial	Native
Symphyotrichum novae-angliae	Aster novae-angliae	New England American-Aster	4	FACW	-1	Forb	Perennial	Native
Symphyotrichum pilosum	Aster pilosus	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
Taraxacum officinale	TARAXACUM OFFICINALE	Common Dandelion	0	FACU	1	Forb	Perennial	Adventive
Trifolium pratense	TRIFOLIUM PRATENSE	Red Clover	0	FACU	1	Forb	Perennial	Adventive
Trifolium repens	TRIFOLIUM REPENS	White Clover	0	FACU	1	Forb	Perennial	Adventive
Vallisneria americana	Vallisneria americana	American Eel-Grass	7	OBL	-2	Forb	Perennial	Native
Verbascum thapsus	VERBASCUM THAPSUS	Woolly Mullein	0	UPL	2	Forb	Biennial	Adventive
Verbena hastata	Verbena hastata	Simpler's-Joy	4	FACW	-1	Forb	Perennial	Native
Verbena urticifolia	Verbena urticifolia leiocarpa	White Vervain	5	FAC	0	Forb	Perennial	Native
Viburnum opulus var. opulus	VIBURNUM OPULUS	Highbush-Cranberry	0	FAC	0	Shrub	Perennial	Adventive
Vitis riparia	Vitis riparia	River-Bank Grape	2	FACW	-1	Vine	Perennial	Native

Conservatism-Based Metrics

Mean C (native species)	3.14
Mean C (all species)	1.78
Mean C (native trees)	2.63
Mean C (native shrubs)	5.50
Mean C (native herbaceous)	3.10
FQAI (native species)	23.52
FQAI (all species)	17.69
Adjusted FQAI	23.64
% C value 0	58%
% C Value 1-3	16%
% C value 4-6	18%
% C value 7-10	8%

Additional Metrics

Species Richness (all)	99
Species Richness (native)	56
% Non-native	43%
Wet Indicator (all)	0.00
Wet Indicator (native)	-0.52
% hydrophyte (Midwest)	54%
% native perennial	44%
% native annual	10%
% annual	19%
% perennial	72%

Fringe Marsh/Pond FWP

Species Name (NWPL/Mohlenbrock)	Species(Synonym)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
Acorus americanus	0	Several-Vein Sweetflag	7	OBL	-2	Forb	Perennial	Native
Agalinis tenuifolia	Agalinis tenuifolia	Slender-Leaf False Foxglove	7	FACW	-1	Forb	Annual	Native
Alisma subcordatum	Alisma subcordatum	American Water-Plantain	4	OBL	-2	Forb	Perennial	Native
Angelica atropurpurea	Angelica atropurpurea	Purple-Stem Angelica	7	OBL	-2	Forb	Perennial	Native
Bidens cernua	Bidens cernua	Nodding Burr-Marigold	5	OBL	-2	Forb	Annual	Native
Brasenia schreberi	Brasenia schreberi	Water Shield	10	OBL	-2	Forb	Perennial	Native
Carex comosa	Carex comosa	Bearded Sedge	5	OBL	-2	Sedge	Perennial	Native
Carex lacustris	Carex lacustris	Lakebank Sedge	6	OBL	-2	Sedge	Perennial	Native
Carex stricta	Carex stricta	Uptight Sedge	5	OBL	-2	Sedge	Perennial	Native
Celtis occidentalis	Celtis occidentalis	Common Hackberry	3	FAC	0	Tree	Perennial	Native
Decodon verticillatus	Decodon verticillatus	Swamp-Loosestrife	8	OBL	-2	Shrub	Perennial	Native
Eleocharis acicularis	Eleocharis acicularis	Needle Spike-Rush	2	OBL	-2	Sedge	Perennial	Native
Eleocharis obtusa	Eleocharis ovata	Blunt Spike-Rush	3	OBL	-2	Sedge	Annual	Native
Eleocharis palustris	Eleocharis erythropoda; Eleocharis palustris major; Eleocharis smallii	Common Spike-Rush	2	OBL	-2	Sedge	Perennial	Native
Elodea canadensis	Elodea canadensis	Canadian Waterweed	5	OBL	-2	Forb	Perennial	Native
Eupatorium perfoliatum	Eupatorium perfoliatum	Common Boneset	4	OBL	-2	Forb	Perennial	Native
Hibiscus laevis	Hibiscus laevis	Halberd-Leaf Rose-Mallow	6	OBL	-2	Forb	Perennial	Native
Hibiscus moscheutos	Hibiscus palustris	Crimson-Eyed Rose-Mallow	9	OBL	-2	Forb	Perennial	Native
Impatiens capensis	Impatiens capensis	Spotted Touch-Me-Not	3	FACW	-1	Forb	Annual	Native
Iris virginica var. shrevei	Iris virginica shrevei	Virginia Blueflag	5	OBL	-2	Forb	Perennial	Native
Juncus dudleyi	Juncus dudleyi	Dudley's Rush	4	FACW	-1	Forb	Perennial	Native
Juncus effusus ssp. solutus	Juncus effusus	Lamp Rush	7	OBL	-2	Forb	Perennial	Native
Lemna minor	Lemna minor	Common Duckweed	5	OBL	-2	Forb	Annual	Native
Lobelia siphilitica	Lobelia siphilitica	Great Blue Lobelia	6	OBL	-2	Forb	Perennial	Native
Lycopus americanus	Lycopus americanus	Cut-Leaf Water-Horehound	5	OBL	-2	Forb	Perennial	Native
Lycopus uniflorus	Lycopus uniflorus	Northern Water-Horehound	7	OBL	-2	Forb	Perennial	Native
Lysimachia thyrsiflora	Lysimachia thyrsiflora	Tufted Yellow-Loosestrife	9	OBL	-2	Forb	Perennial	Native
Mentha arvensis	Mentha arvensis villosa	American Wild Mint	5	FACW	-1	Forb	Perennial	Native
Mimulus ringens	Mimulus ringens	Allegheny Monkey-Flower	6	OBL	-2	Forb	Perennial	Native
Myriophyllum sibiricum	Myriophyllum exalbescens	Siberian Water-Milfoil	7	OBL	-2	Forb	Perennial	Native
Nuphar advena	Nuphar advena	Yellow Pond-Lily	7	OBL	-2	Forb	Perennial	Native
Nymphaea odorata	Nymphaea tuberosa	American White Water-Lily	7	OBL	-2	Forb	Perennial	Native
Peltandra virginica	Peltandra virginica	Green Arrow-Arum	10	OBL	-2	Forb	Perennial	Native
Penthorum sedoides	Penthorum sedoides	Ditch-Stonecrop	5	OBL	-2	Forb	Perennial	Native
Persicaria hydropiper	Polygonum hydropiper	Mild Water-Pepper	2	OBL	-2	Forb	Annual	Native
Pontederia cordata	Pontederia cordata	Pickerelweed	10	OBL	-2	Forb	Perennial	Native
Potamogeton natans	Potamogeton natans	Floating Pondweed	7	OBL	-2	Forb	Perennial	Native
Rhynchospora macrostachya	Rhynchospora macrostachya	Tall Horned Beak Sedge	10	OBL	-2	Sedge	Perennial	Native
Rumex britannica	Rumex orbiculatus	Greater Water Dock	8	OBL	-2	Forb	Perennial	Native
Sagittaria latifolia	Sagittaria latifolia	Duck-Potato	4	OBL	-2	Forb	Perennial	Native
Salix amygdaloides	Salix amygdaloides	Peach-Leaf Willow	5	FACW	-1	Tree	Perennial	Native
Schoenoplectus acutus	Scirpus acutus	Hard-Stem Club-Rush	6	OBL	-2	Sedge	Perennial	Native
Schoenoplectus tabernaemontani	Scirpus validus creber	Soft-Stem Club-Rush	5	OBL	-2	Sedge	Perennial	Native
Sium suave	Sium suave	Hemlock Water-Parsnip	7	OBL	-2	Forb	Perennial	Native
Sparganium americanum	Sparganium americanum	American Burr-Reed	10	OBL	-2	Forb	Perennial	Native
Sparganium eurycarpum	Sparganium eurycarpum	Broad-Fruit Burr-Reed	6	OBL	-2	Forb	Perennial	Native
Spiraea alba	Spiraea alba	White Meadowsweet	7	FACW	-1	Shrub	Perennial	Native
Spiraea tomentosa	Spiraea tomentosa rosea	Steeplebush	9	FACW	-1	Shrub	Perennial	Native
Stuckenia pectinata	Potamogeton pectinatus	Sago False Pondweed	5	OBL	-2	Forb	Perennial	Native
Vallisneria americana	Vallisneria americana	American Eel-Grass	7	OBL	-2	Forb	Perennial	Native
Viola lanceolata	Viola lanceolata	Bog White Violet	7	OBL	-2	Forb	Perennial	Native
Vitis riparia	Vitis riparia	River-Bank Grape	2	FACW	-1	Vine	Perennial	Native

Conservatism-Based Metrics	
Mean C (native species)	6.02
Mean C (all species)	6.02
Mean C (native trees)	4.00
Mean C (native shrubs)	8.00
Mean C (native herbaceous)	6.07
FQAI (native species)	43.41
FQAI (all species)	43.41
Adjusted FQAI	60.19
% C value 0	0%
% C Value 1-3	13%
% C value 4-6	42%
% C value 7-10	44%

Additional Metrics	
Species Richness (all)	52
Species Richness (native)	52
% Non-native	0%
Wet Indicator (all)	-1.81
Wet Indicator (native)	-1.81
% hydrophyte (Midwest)	100%
% native perennial	88%
% native annual	12%
% annual	12%
% perennial	88%

Islands ExC/FWOP

Species Name (NWPL/Mohlenbrock)	Species(Synonym)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
Acer saccharinum	Acer saccharinum	Silver Maple	0	FACW	-1	Tree	Perennial	Native
Achillea millefolium	ACHILLEA MILLEFOLIUM	Common Yarrow	0	FACU	1	Forb	Perennial	Adventive
Ageratina altissima	Eupatorium rugosum	White Snakeroot	4	FACU	1	Forb	Perennial	Native
Ailanthus altissima	AILANTHUS ALTISSIMA	Tree-of-Heaven	0	FACU	1	Tree	Perennial	Adventive
Alliaria petiolata	ALLIARIA PETIOLATA	Garlic-Mustard	0	FAC	0	Forb	Biennial	Adventive
Asclepias syriaca	Asclepias syriaca	Common Milkweed	0	FACU	1	Forb	Perennial	Native
Asclepias verticillata	Asclepias verticillata	Whorled Milkweed	1	FACU	1	Forb	Perennial	Native
Bidens cernua	Bidens cernua	Nodding Burr-Marigold	5	OBL	-2	Forb	Annual	Native
Bidens frondosa	Bidens frondosa	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
Bidens tripartita	Bidens comosa; Bidens connata	Three-Lobe Beggarticks	5	OBL	-2	Forb	Annual	Native
Bromus inermis	BROMUS INERMIS	Smooth Brome	0	FACU	1	Grass	Perennial	Adventive
Carex blanda	Carex blanda	Eastern Woodland Sedge	1	FAC	0	Sedge	Perennial	Native
Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
Convolvulus arvensis	CONVOLVULUS ARVENSIS	Field Bindweed	0	UPL	2	Forb	Perennial	Adventive
Cornus racemosa	Cornus racemosa	Gray Dogwood	1	FAC	0	Shrub	Perennial	Native
Daucus carota	DAUCUS CAROTA	Queen Anne's Lace	0	UPL	2	Forb	Biennial	Adventive
Digitaria sanguinalis	DIGITARIA SANGUINALIS	Hairy Crab Grass	0	FACU	1	Grass	Annual	Adventive
Echinochloa crus-galli	Echinochloa crusgalli	Large Barnyard Grass	0	FACW	-1	Grass	Annual	Native
Eleocharis palustris	Eleocharis erythropoda; Eleocharis palustris major; Eleocharis smallii	Common Spike-Rush	2	OBL	-2	Sedge	Perennial	Native
Elymus canadensis	Elymus canadensis	Nodding Wild Rye	4	FACU	1	Grass	Perennial	Native
Epilobium coloratum	Epilobium coloratum	Purple-Leaf Willowherb	3	OBL	-2	Forb	Perennial	Native
Erigeron annuus	Erigeron annuus	Eastern Daisy Fleabane	0	FACU	1	Forb	Biennial	Native
Erigeron canadensis	Erigeron canadensis	Canadian Horseweed	0	FACU	1	Forb	Annual	Native
Eupatorium serotinum	Eupatorium serotinum	Late-Flowering Thoroughwort	0	FAC	0	Forb	Perennial	Native
Euphorbia corollata	Euphorbia corollata	Flowering Spurge	2	UPL	2	Forb	Perennial	Native
Frangula alnus	RHAMNUS FRANGULA	Glossy False Buckthorn	0	FACW	-1	Shrub	Perennial	Adventive
Glechoma hederacea	GLECHOMA HEDERACEA	Groundivy	0	FACU	1	Forb	Perennial	Adventive
Impatiens capensis	Impatiens capensis	Spotted Touch-Me-Not	3	FACW	-1	Forb	Annual	Native
Juncus dudleyi	Juncus dudleyi	Dudley's Rush	4	FACW	-1	Forb	Perennial	Native
Lactuca serriola	LACTUCA SERRIOLA	Prickly Lettuce	0	FACU	1	Forb	Biennial	Adventive
Leucanthemum vulgare	CHRYSANTHEMUM LEUCANTHEMUM PINNATIFIDUM	Ox-Eye Daisy	0	UPL	2	Forb	Perennial	Adventive
Lobelia siphilitica	Lobelia siphilitica	Great Blue Lobelia	6	OBL	-2	Forb	Perennial	Native
Medicago lupulina	MEDICAGO LUPULINA	Black Medick	0	FACU	1	Forb	Annual	Adventive
Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	1	Forb	Perennial	Native
Muhlenbergia frondosa	Muhlenbergia frondosa	Wire-Stem Muhly	3	FACW	-1	Grass	Perennial	Native
Muhlenbergia schreberi	Muhlenbergia schreberi	Nimblewill	0	FAC	0	Grass	Perennial	Native
Oenothera biennis	Oenothera biennis	King's-Cureall	0	FACU	1	Forb	Biennial	Native
Oxalis stricta	Oxalis europaea	Upright Yellow Wood-Sorrel	0	FACU	1	Forb	Perennial	Native
Panicum capillare	Panicum capillare	Common Panic Grass	1	FAC	0	Grass	Annual	Native
Panicum virgatum	Panicum virgatum	Wand Panic Grass	5	FAC	0	Grass	Perennial	Native
Parthenocissus inserta	Parthenocissus inserta	Thicket-Creeper	1	FACU	1	Vine	Perennial	Native
Persicaria hydropiper	Polygonum hydropiper	Mild Water-Pepper	2	OBL	-2	Forb	Annual	Native
Persicaria longiseta	POLYGONUM CESPITOSUM LONGISETUM	Bristly Lady's-Thumb	0	FAC	0	Forb	Annual	Adventive
Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
Phragmites australis ssp. australis	Phragmites australis	Common Reed	0	FACW	-1	Grass	Perennial	Adventive
Phytolacca americana	Phytolacca americana	American Pokeweed	1	FACU	1	Forb	Perennial	Native
Plantago lanceolata	PLANTAGO LANCEOLATA	English Plantain	0	FACU	1	Forb	Perennial	Adventive
Plantago rugelii	Plantago rugelii	Black-Seed Plantain	0	FAC	0	Forb	Annual	Native
Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
Polygonum arenastrum	POLYGONUM ARENASTRUM	Sidewalk Knotweed	0	UPL	2	Forb	Annual	Adventive
Portulaca oleracea	PORTULACA OLERACEA	Little-Hogweed	0	FACU	1	Forb	Annual	Adventive
Rhamnus cathartica	RHAMNUS CATHARTICA	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
Rhus hirta	Rhus typhina	Staghorn Sumac	1	UPL	2	Tree	Perennial	Native
Sanicula odorata	Sanicula gregaria	Clustered Black-Snakeroot	2	FAC	0	Forb	Perennial	Native
Saponaria officinalis	SAPONARIA OFFICINALIS	Bouncing-Bett	0	FACU	1	Forb	Perennial	Adventive
Scilla sibirica	SCILLA SIBIRICA	Squill	0	UPL	2	Forb	Perennial	Adventive
Setaria pumila	SETARIA GLAUCA	Yellow Bristle Grass	0	FAC	0	Grass	Annual	Adventive
Solanum americanum	Solanum americanum	American Black Nightshade	0	FACU	1	Forb	Annual	Native
Solanum dulcamara	SOLANUM DULCAMARA	Climbing Nightshade	0	FAC	0	Vine	Perennial	Adventive
Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
Solidago gigantea	Solidago gigantea	Late Goldenrod	4	FACW	-1	Forb	Perennial	Native
Solidago rigida	Solidago rigida	Hard-Leaf Flat-Top-Goldenrod	4	FACU	1	Forb	Perennial	Native
Sorghastrum nutans	Sorghastrum nutans	Yellow Indian Grass	5	FACU	1	Grass	Perennial	Native
Symphyotrichum lanceolatum	Aster simplex	White Panicled American-Aster	3	FAC	0	Forb	Perennial	Native
Symphyotrichum novae-angliae	Aster novae-angliae	New England American-Aster	4	FACW	-1	Forb	Perennial	Native
Symphyotrichum pilosum	Aster pilosus	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
Trifolium pratense	TRIFOLIUM PRATENSE	Red Clover	0	FACU	1	Forb	Perennial	Adventive
Verbena hastata	Verbena hastata	Simpler's-Joy	4	FACW	-1	Forb	Perennial	Native
Veronicastrum virginicum	Veronicastrum virginicum	Culver's-Root	7	FAC	0	Forb	Perennial	Native
Viburnum lentago	Viburnum lentago	Nanny-Berry	5	FAC	0	Shrub	Perennial	Native
Viburnum opulus var. opulus	VIBURNUM OPULUS	Highbush-Cranberry	0	FAC	0	Shrub	Perennial	Adventive
Viola sororia	Viola sororia	Hooded Blue Violet	3	FAC	0	Forb	Perennial	Native
Vitis riparia	Vitis riparia	River-Bank Grape	2	FACW	-1	Vine	Perennial	Native

Conservatism-Based Metrics	
Mean C (native species)	2.26
Mean C (all species)	1.42
Mean C (native trees)	0.50
Mean C (native shrubs)	3.00
Mean C (native herbaceous)	2.35
FQAI (native species)	15.33
FQAI (all species)	12.17
Adjusted FQAI	17.95
% C value 0	53%
% C Value 1-3	26%
% C value 4-6	19%
% C value 7-10	1%
Additional Metrics	
Species Richness (all)	73
Species Richness (native)	46
% Non-native	37%
Wet Indicator (all)	0.23
Wet Indicator (native)	-0.04
% hydrophyte (Midwest)	52%
% native perennial	47%
% native annual	14%
% annual	22%
% perennial	71%

Islands FWP

Species Name (NWPL/Mohlenbrock)	Species(Synonym)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
Alnus incana	Alnus rugosa	Speckled Alder	8	FACW	-1	Shrub	Perennial	Native
Asclepias longifolia	Asclepias hirtella	Long-Leaf Milkweed	10	UPL	2	Forb	Perennial	Native
Baptisia alba var. macrophylla	Baptisia leucantha	White Wild Indigo	8	FACU	1	Forb	Perennial	Native
Bouteloua curtipendula	Bouteloua curtipendula	Side-Oats Grama	8	UPL	2	Grass	Perennial	Native
Cornus alba	Cornus stolonifera	Red Osier	6	FACW	-1	Shrub	Perennial	Native
Decodon verticillatus	Decodon verticillatus	Swamp-Loosestrife	8	OBL	-2	Shrub	Perennial	Native
Dodecatheon meadia	Dodecatheon meadia	Pride-of-Ohio	6	FACU	1	Forb	Perennial	Native
Eurybia macrophylla	Aster macrophyllus	Large-Leaf Wood-Aster	8	FACU	1	Forb	Perennial	Native
Hypericum kalmianum	Hypericum kalmianum	Kalm's St. John's-Wort	10	FACW	-1	Shrub	Perennial	Native
Koeleria macrantha	Koeleria cristata	June Grass	7	UPL	2	Grass	Perennial	Native
Liatris aspera	Liatris aspera	Rough Gayfeather	6	UPL	2	Forb	Perennial	Native
Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	1	Forb	Perennial	Native
Osmunda spectabilis	Osmunda regalis spectabilis	Royal Fern	8	OBL	-2	Fern	Perennial	Native
Packera aurea	Senecio aureus	Golden Groundsel	7	FACW	-1	Forb	Perennial	Native
Pedicularis canadensis	Pedicularis canadensis	Canadian Lousewort	9	FACU	1	Forb	Perennial	Native
Penstemon hirsutus	Penstemon hirsutus	Hairy Beardstongue	9	UPL	2	Forb	Perennial	Native
Physocarpus opulifolius	Physocarpus opulifolius	Atlantic Ninebark	8	FACW	-1	Shrub	Perennial	Native
Rosa palustris	Rosa palustris	Swamp Rose	7	OBL	-2	Shrub	Perennial	Native
Rudbeckia hirta	Rudbeckia hirta	Black-Eyed-Susan	1	FACU	1	Forb	Perennial	Native
Sabatia angularis	Sabatia angularis	Rose-Pink	10	FAC	0	Forb	Biennial	Native
Salix humilis	Salix humilis	Prairie Willow	6	FACU	1	Shrub	Perennial	Native
Salix myricoides	Salix glaucophylloides	Bayberry Willow	7	FACW	-1	Shrub	Perennial	Native
Silene regia	Silene regia	Royal Catchfly	10	UPL	2	Forb	Perennial	Native
Solidago rugosa	Solidago rugosa	Wrinkle-Leaf Goldenrod	6	FAC	0	Forb	Perennial	Native
Spiraea alba	Spiraea alba	White Meadowsweet	7	FACW	-1	Shrub	Perennial	Native
Spiraea tomentosa	Spiraea tomentosa rosea	Steeplebush	9	FACW	-1	Shrub	Perennial	Native
Symphyotrichum ericoides	Aster ericoides	White Heath American-Aster	5	FACU	1	Forb	Perennial	Native
Symphyotrichum oolentangiense	Aster azureus	Azure Aster	8	UPL	2	Forb	Perennial	Native
Thelypteris palustris var. pubescens	Dryopteris thelypteris pubescens	Eastern Marsh Fern	6	OBL	-2	Fern	Perennial	Native
Verbena stricta	Verbena stricta	Hoary Vervain	4	UPL	2	Forb	Perennial	Native
Viola lanceolata	Viola lanceolata	Bog White Violet	7	OBL	-2	Forb	Perennial	Native
Zizia aurea	Zizia aurea	Golden Alexanders	7	FAC	0	Forb	Perennial	Native

Conservatism-Based Metrics	
Mean C (native species)	7.19
Mean C (all species)	7.19
Mean C (native trees)	n/a
Mean C (native shrubs)	7.60
Mean C (native herbaceous)	7.00
FQAI (native species)	40.66
FQAI (all species)	40.66
Adjusted FQAI	71.88
% C value 0	0%
% C Value 1-3	3%
% C value 4-6	28%
% C value 7-10	69%

Additional Metrics	
Species Richness (all)	32
Species Richness (native)	32
% Non-native	0%
Wet Indicator (all)	0.19
Wet Indicator (native)	0.19
% hydrophyte (Midwest)	50%
% native perennial	97%
% native annual	0%
% annual	0%
% perennial	97%

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Jackson Park
Design Evolution

Creation of South Park Commission

In 1869, after several years of lobbying by prominent south-siders, the Illinois State Legislature approved a bill establishing the South Park Commission. A five member board was given the authority to improve and maintain a 1055 acre parcel, then located in townships just south of Chicago, as a public park. The nationally renowned designers, Frederick Law Olmsted and Calvert Vaux, who had previously designed New York's Central Park, were hired to lay out a comprehensive plan for the new park, then known as South Park.

Original South Park Plan

South Park was envisioned as a landscape with two large sections linked together by a boulevard which Olmsted named the Midway Plaisance (middle garden). The Eastern Division, a 593 acre area adjacent to Lake Michigan, later became known as Jackson Park, and the Western Division was a 372 acre area that was later renamed Washington Park (Olmsted & Vaux, *Chicago South Commissioners Plan of: South Open Ground, Upper Plaisance, Midway Plaisance, Open Ground, Lagoon Plaisance and Parkway Quadrant,* 1871).

Olmsted often incorporated a site's natural attributes into his designs, however, he considered the conditions of Chicago's unimproved park site "extremely bleak." (Olmsted 1893: 22, 19). He asserted that "if a search had been made for the least park-like ground within miles of the city, nothing better meeting the requirement could have been found" (ibid). The most "obvious defect of the site" was viewed as "that of its flatness" (Olmsted & Vaux, *Chicago South Commissioners Plan of: South Open Ground, Upper Plaisance, Midway Plaisance, Open Ground, Lagoon Plaisance and Parkway Quadrant,* 1871).

Olmsted found the Eastern Division area particularly "forbidding," with sand bars that had formed in the lake, boggy swales, and ridges covered with "vegetable mold" (Olmsted 1893, XXII: 2, 19). He did however, interpret Lake Michigan as the site's greatest advantage. He suggested that there was:

> "but one object of scenery near Chicago of special grandeur or sublimity, and that, the lake, can be made by artificial means no more grand or sublime. By no practical elevation of artificial hills, that is

> to say, would the impression of the observer in overlooking it be made greatly more profound. The lake may, indeed, be accepted as fully compensating for the absence of sublime or picturesque elevations of land" (Olmsted 1871).

Olmsted's design compositions generally combined "sublime" and "beautiful" areas (Beveridge 1977). In the original plan for South Park, Olmsted relied upon the "sublime" style in his design for the Eastern Division by linking to Lake Michigan a system of rugged, heavily planted channels and lagoons. Had the plan been implemented, these waters would have flowed into a formal channel extending the length of the Midway Plaisance and then into smaller ponds in the Western Division. In the Western Division, which later became known as Washington Park, Olmsted articulated the "beautiful" style through the use of a large open sheep meadow.

Delays in Implementing the South Park Plan

Olmsted and Vaux submitted the South Park plan and accompanying report to the South Park Commission in 1871. Five months later, much of Chicago was devastated by the Great Fire. While the South Park land was not affected by the fire, the Commission's downtown office was destroyed. Among the documents that burned was a "nearly complete assessment roll, which was to assign holders of property adjacent to the park their share of park costs" (Ranney 1972, 32). Progress to improve the park "was suspended and all employees except a small police force were discharged" (ibid).

As the city began recovering from the destruction of the fire between the early and mid-1870s, the South Park Commission slowly began improving the Western Division of South Park. Problems in acquiring much of the land for the Eastern Division caused additional delays in improving this section. By 1875, when the Eastern Division was renamed Lake Park, it remained unimproved (South Park Commissioners 1874-75, 6).

Eastern Division/ Lake Park's Earliest Improvements

During the late 1870s, work was done to improve the northernmost part of Lake Park including grading, spreading manure, seeding lawns, and planting trees. In addition, two artificial lakes were created. One of the two lakes was located on the northwest corner of the park. Oblong in configuration and crossed by a masonry bridge, this waterway was called the "twin lakes" (Andraes 1889, 169). During the winter, when the lake was frozen it was used for skating.

The second artificial lake is the water body that later became the Columbia Basin. This lake had little relationship to the corresponding water area on Olmsted's 1871 plan. It had a simple, irregularly shaped configuration, with a broad beach at its northern end,

and mowed lawn at the surrounding edges (n.a. *Map Showing Progress Made in the Improvement of the Eastern Division of South Park*, 1880). In the center were two islands with rocky edges (photo, *Jackson Park Pond*, 1888). In 1880, a masonry and iron bridge was constructed across the artificial lake's southern end. Some of the original masonry is believed to be part of the existing Clarence Darrow Bridge (photo, *View of Art Building from World's Fair Bridge*, 1895).

The improvements in Lake Park were immediately popular. The picnic grounds were used by large numbers of people. Boating was offered in both artificial lakes. In 1881, Lake Park was officially renamed Jackson Park, in honor of Andrew Jackson, eleventh president of the United States.

By the early 1880s, lakeshore erosion was already a problem. A breakwater was constructed, and the beach was paved along Lake Michigan from 56th St. to 59th St. between 1882 and 1884 (*South Park Commission Annual Report* 1884, 22). The granite pavers were extended southward to 61st St. between 1888 and 1890 (*South Park Commission Annual Report* 1890, 15). During the late 1880s and early 1890s the long stretch of paved beach became a popular promenade space for strolling and bicycling.

Two buildings were also constructed in the park during this period. One was a large shelter at 56th St. near the lake, which was designed by Daniel H. Burnham. (During the World's Columbian Exposition, this structure was adapted for use as the Iowa Building.) The second structure was a ladies comfort station located to the east of the artificial lake with the two islands (which later became the Columbia Basin). Both structures were constructed of light colored rusticated stone. (The ladies comfort station is the oldest extant building in Jackson Park).

World's Columbian Exposition

When Chicago won the honor of hosting the World's Columbian Exposition in 1890, Frederick Law Olmsted was asked to help select the site for the fairgrounds (South Park Commissioners 1889-90, 14). After much controversy, Jackson Park was selected, and a general outlay for the fair was jointly developed by consulting landscape architects, Olmsted, and his associate Henry Codman, and consulting architects, Daniel Burnham and John Welborn Root (Hines 1974, 77). In a paper read to the World's Congress of Architects, which met in Chicago several months after the official opening of the World's Columbian Exposition, Olmsted explained that:

> "...a crude plot, on a large scale, of the whole scheme was rapidly drawn on brown paper... The plot, formed in the manner described, contemplated the following as leading features of design: That there should be a great architectural court with a body of water therein; that this court should serve as a suitably dignified and impressive entrance-

> hall to the Exposition, and that visitors arriving by train or boat should all pass through it; that there should be a formal canal leading northward from this court to a series of broader waters of a lagoon character, by which nearly the entire site would be penetrated, so that the principal Exposition buildings would each have a water as well as land frontage, and would be approachable by boats..." (*World's Columbian Exposition Report of the Director of Works* 1892, 4-5).

This scheme continued to be followed, even after John Welborn Root's death in 1891, and Burnham's appointment as Chief Consulting Architect for the Fair.

As conceived by the design team, the Court of Honor was a hard-edged basin flanked by monumental Beaux Arts style buildings. The focal point was Daniel Chester French's *Statue of the Republic* at the eastern end. Like the Fair buildings, the monument was made of a type of plaster known as staff. The figure was gilded, except for its arms and face which were exposed white staff.

East and West Lagoons and Wooded Island

The Court of Honor was the most formal area of the Fair's landscape. Contrasting with this formality, the east and west lagoons were rugged and naturalistic. Other than the straight-edged terrace extending from the Horticultural Building on the west side of the West Lagoon, the edges of both lagoons were irregularly shaped and planted with masses of low shrubbery and grasses. In the center, between the two lagoons was the Wooded Island. There were also some very small islands scattered around the large Wooded Island, particularly at its south end.

The Wooded Island was formed by the re-shaping of some of the site's natural ridges. Olmsted wanted the Island to have a "secluded, natural sylvan" character (*World's Columbian Exposition Report of the Director of Works* 1892, 5). He asserted that the intention was:

> "to have what has since been called the Wooded Island, occupying a central position, held free from buildings and all objects that would prevent it from presenting, in connection with the adjoining waters, a broad space, characterized by calmness and naturalness, to serve as a foil to the artificial grandeur and sumptuousness of the other parts of the scenery" (Olmsted 1893, XXII: 2, 20).

While there was only one year's time for plantings to mature, Olmsted achieved a wooded character by incorporating the site's scattered groups of existing native oaks into the design. Olmsted added other fast-growing plantings. The existing oak clusters served:

> "...as centers for such broad and simple larger masses of foliage as it would be practicable to establish in a year's time by plantations of young trees and bushes. Because the water in the lagoons would be subject to considerable fluctuations, it was proposed that its shores should be occupied by a selection of such aquatic plants as would endure occasional submergence and yet survive an occasional withdrawal of water from their roots" (*World's Columbian Exposition Report of the Director of Works* 1892, 5).

The designers' intention was to keep the island free of buildings and retain it as a natural-looking "horticultural preserve," however, many of the exhibitors wanted to construct on the island, and "Burnham received numerous petitions" for building permits there (Hines 1974, 108). Pressure for additional exhibit space became so great that Olmsted and Burnham "became convinced that it would be impossible to successfully resist these demands" (Olmsted 1893: 44, 194). Of all of the proposals for exhibits on the Wooded Island, Olmsted believed that ones that would have the "least obtrusive and disquieting result" were a temple proposed by the Japanese government, and floral display to coincide with Horticultural Hall (Olmsted 1893, XXII: 2, 20).

North Pond and Fine Arts Building

The irregularly shaped artificial lake that had been created in the park in the late 1870s was converted into the northernmost section of the lagoon system (Department of Works, *Map of the Buildings & Grounds of the World's Columbian Exposition,* 1893). This was called the North Pond and later known as the Columbia Basin. As part of the Fair plans, this was conceived as the water frontage setting for the Fine Arts Building, a neo-classical style structure designed by Charles Atwood.

In preparation for the Fair, the two islands were removed and the North Pond was dredged. Much of the shape of the pond remained the same. A small section of the southwest side of the pond was filled to create the area for the Illinois Building (Burnham, *Map of the Buildings & Grounds of the World's Columbian Exposition*, 1893). The entire pond had a strongly defined edge, much of which was composed of mowed lawn adjacent to the water (photos, *Fotgrafiske Billeder of Verdensud Stillingen of Midway Plaisance*, 1894). The north side of the pond was reconfigured from beach edge to a formal terrace which extended from the Fine Arts Building into the water. This was the primary facade of the building, and the water became a dramatic reflecting pool, and provided access for boats (Appelbaum 1980).

In contrast to the more naturalistic and rugged east and west lagoons adjacent to the Wooded Island, the North Pond was consciously conceived as a water setting for the monumental Fine Arts Building (Olmsted 1893: 41). Olmsted was disappointed with the construction of the numerous smaller pavilions surrounding the pond. He asserted

that most of these buildings were sited without his consultation, and were placed in a manner that "intercepted vistas and disturbed spaces intended to serve for the relief of the eye" (Olmsted, 1893: 41).

After the Fair

The World's Columbian Exposition closed in October of 1893. The intent had always been for the fair to be temporary, and beginning in January of 1894 a series of fires destroyed many of the buildings (Appelbaum 1980, 107). Later that year, the Chicago Wrecking and Salvage Co. was hired to demolish most of the buildings that were still standing. One of the few exceptions was the Fine Arts Building, which had been built with a more permanent internal structure than many of the other buildings. It had a fire vaulted interior because it housed such an important collection of artworks during the fair. Towards the end of the World's Columbian Exposition, prominent Chicagoans decided to memorialize the event by creating a "Columbian Museum" (Commission on Chicago Landmarks 1994, 18). A one million dollar donation by department store magnate Marshall Field made it possible to purchase anthropological artifacts that had been exhibited at the exposition. The Fine Arts Bldg. became the "Field Columbian Museum" (Commission on Chicago Landmarks 1994, 18).

The other buildings that remained after the Fair were the German Building, the Iowa Building, La Rabida and the *Ho-oh-den* (the Japanese Temple on the Wooded Island).

Redesign of Jackson Park 1894-1906

Early in 1894, Frederick Law Olmsted's landscape design firm, then known as Olmsted, Olmsted, and Eliot, began working on a re-design plan for Jackson Park. The South Park Commissioners did not want the park to be "shorn of all the beauty that the World's Fair bestowed upon it" (n.a. *Park and Cemetery* 1895, 20). In fact, the intent was to create a "beautiful park" that would retain "many of the features characteristic of the landscape design of the World's Fair" and also provide "all of the recreative facilities which the modern park should include for refined and enlightened recreation and exercise" (n.a. *Park and Cemetery* 1895, 20).

In 1895, Olmsted, Olmsted & Eliot's Revised General Plan for Jackson Park was completed. Between that date and 1906, the entire park was improved. The majority of the work followed the plan, however, there were some modifications. The most notable was the addition of the golf course in 1899.

The Olmsted Olmsted & Eliot plan included "three principal elements of the scenery" for Jackson Park, "the Lake," "the Fields," and "the Lagoons" (Olmsted, Olmsted & Eliot, *Revised General Plan for Jackson Park*, 1895). Olmsted sent an eight page report to South

Park Commission Joseph Donnersberger on March 10, 1895, further describing these plans principal elements.

The Lake Shore

Olmsted asserted that the "finest thing about the Park is unquestionably the view of Lake Michigan, which is obtained from the shore" (Olmsted A39: 20, 698). Lake Shore Drive was intended as the major feature allowing broad views of the Lake for people walking, driving and riding. The Drive was conceived in Olmsted's original 1871 plan. A paved beach and promenade were constructed along the edge of the Lake between 1875 and 1890. These elements remained during the World's Columbian Exposition. The initial construction of Lake Shore Drive commenced in 1894, after the Fair, in accordance with the Olmsted, Olmsted and Eliot's redesign plan.

Following the redesign plan, Lake Shore Drive extended from the northern boundary of the park, passing southward between the Museum and the beach, across a bridge over the North Inlet at 59th Street. The Classical style limestone bridge was designed by D. H. Burnham and Co., and structural engineer C.L. Strobel, who was a noted bridge designer and "pioneer in skyscraper construction" (Sarring 1993). Constructed in 1895, the North Inlet bridge was designed in a manner very similar to the World's Fair Bridge that it replaced.

Olmsted intended for Lake Shore Drive to extend to a "terminal circle" just north of the South Inlet (approximately located at 63rd St.) He did not want the Drive to cross over the South Inlet (which was the mouth of the South Haven, now considered the Outer Harbor), because he thought it was more important to keep the Inlet open to boats entering from the lake (Olmsted to Donnersberger March 10, 1895, A39: 698). At the north end of the South Inlet, between the western edge of the South Haven and eastern edge of the South Lagoon, Lake Shore Drive then connected with a road which followed " a gentle curve about three fourths of a mile in length" (Olmsted to Donnersberger March 10, 1895, A39, 698). The curved road was historically considered South Haven Drive or Harbor Drive, and also referred to as Coast Guard Drive after the South Park Commission agreed to allow the U.S. Coast Guard to build a life saving station on the west side of the South Haven in 1904. The South Haven Drive extended over a granite bridge designed by architect Peter J. Weber, who won a competition sponsored by the South Park Commission. The Classical style bridge, with whimsical bas relief ornamentation on both the east and west elevations, was constructed in 1904. Just south of this bridge, the South Haven Drive connected with South Road, which was later renamed Marquette Drive.

System of Lagoons

The Olmsted, Olmsted & Eliot redesign plan included a system of interconnected lagoons, which provided a sequential series of changing landscape scenes, as well as access by boats throughout the entire waterway. An 1895 article describing the plan explained that:

> "The water effects have been amplified and diversified and the system of lagoons, extending as it does in its varied design the entire length of the park, will present waterscapes of infinite variety and beauty as well as afford the most liberal facilities for boating and aquatic pleasures" (n.a. *Park and Cemetery* 1895, 20).

Olmsted emphasized the importance of the lagoon system as a place for boating in a April 10, 1894 letter to Joseph Donnersberger. Olmsted wrote that Lake Michigan could not well accommodate rowing, but that the lagoons within the park were sure to become popular for this activity. He suggested that Jackson Park would become "the finest domestic boating park in the world" (Library of Congress, A33:806).

The ability to create a changing sequence of landscape scenes was one of the most brilliant aspects of the 1895 Olmsted, Olmsted, and Eliot plan. In a letter to the South Park Board President Joseph Donnersberger dated May 7, 1894, Olmsted emphasized the importance of the different treatments within the design composition. He asserted that in order to "devise a comprehensive general design" each part of the "park must be planned subordinately to and dependently upon every other part" (Library of Congress, A:34:79). Olmsted suggested that, "In this interdependence of parts lies the difference between landscape gardening and gardening. It is as designers, not of scenes but of scenery, that you employ us, and we are not to be expected to serve you otherwise than as designers of scenery" (ibid).

The formal Court of Honor and a small adjacent lagoon of the World's Fair grounds were replaced by the South Haven (outer yacht harbor) and South Lagoon. These simple water elements emphasized the visual and physical connection with Lake Michigan while also providing access for boats. The South Lagoon narrowed at the north and flowed under the Center Bridge (later considered the Hayes Drive Bridge). Constructed in 1902, the red granite bridge had a simple elliptical arch with clearance of fourteen feet above the water level, allowing adequate space for the passage of boats.

The water areas north of the South Lagoon and south of the Wooded Island were the most rugged-looking, lush and densely planted portions of the lagoon system. Known as the North and South Bayous, these were intricate areas of water and land. Just north of the North Bayou were the East and West lagoons, which had simpler edges, but also included dense shrub plantings on the waters edge. The West lagoon was widened and

its west bank made more naturalistic than the formal terrace that had extended from Horticultural Hall during the Fair (photo, Appelbaum 1980, 56).

The Olmsted, Olmsted and Eliot also plan included two boat houses on the edge of the West Lagoon. The "principal station for rowboats and canoes" was "designed to be placed in the cove just north" of the Midway Plaisance (Olmsted to Donnersberger A21: 702). Just south of the Midway was the "principal electric launch station" (ibid.). Both of the boating structures were designed by D.H. Burnham & Co. and were Classically inspired. The principal station for rowboats and canoes was constructed in 1896 and the electric launch station was construction in 1906. Composed of two brick pavilions and center launch area, this utilitarian structure was tucked along the western edge of the lagoon. (Today, the launch station is extant, however, the principal boat station no longer remains).

The East and West lagoons had numerous small islands that were also heavily planted. Between the East Lagoon and the North Inlet there was a bridle path bridge called the Music Court Bridge, because it led to the formal music area to the north. Constructed between 1904 and 1906, the granite bridge had three arched openings with moveable gates. The gates were meant to help regulate the fluctuations in water levels of Lake Michigan, and allow the inner waters to be frozen for skating during the winter.

Olmsted, Olmsted and Eliot's treatment of the area north of the East and West Lagoons was the most formal of the entire lagoon system. This was due to the decision to retain the Fine Arts Building as the Field Columbian Museum.

Area Surrounding Field Columbian Museum

The legend of the 1895 Olmsted, Olmsted and Eliot plan states that, "Contrasting with the rest of the park, the neighborhood of the vast building of the Field Columbian Museum is designed upon formal lines for the sake of architectural harmony." Olmsted explained the importance of a landscape treatment that would emphasize the museum building:

> "All other buildings and structures to be within the park boundaries are to be placed and planned exclusively with a view to advancing the ruling purpose of the park. They are to be auxiliary to and subordinate to the scenery of the park. This Art Building is to be on a different footing. Plantations, waters, roads and walks near it are to be arranged with a view to convenience of communication with the Building; with a view to making the Building a dominating object of interest, and with a view to an effective outlook from it, especially over the lagoons to the southward" (Olmsted to Donnersberger, May 7, 1894, Library of Congress, A34:152).

A formal circuit drive encircled this area which included the museum building, symmetrically arranged depressed lawn panels to the north, and the North Pond to the south. The circuit drive had simple formal terminal circle elements on the east and west axis, and crossed the bridge dividing the North Pond from the East and West Lagoons.

In the 1895 Olmsted, Olmsted, and Eliot plan, the North Pond was shown as a formal, hard- edged basin. The Olmsted firm had been conferring with Charles Atwood, the architect of the Fine Arts building, who was advising the South Park Commission on its adaptation for use as the Field Columbian Museum. In a letter to Supt. J. Frank Foster dated September 17, 1894, Olmsted stated that Atwood had "always hoped that this basin might be treated architecturally," but that it was understood at the time that South Park Commission was "not in possession of the funds to be directed to such a purpose" (Olmsted to Foster, Sept. 17, 1894, A36: 19, 124). Thus recommending an informal basin design, the Olmsted firm developed a scheme that left the area largely as it had been during the Fair (Olmsted National Historic Site, Planting Plan #54, Oct. 15, 1894). The overall design philosophy for the area was articulated through the simple, irregular configuration of basin and its surrounding landscape of mowed lawn and scattered trees and shrubs framing views of the monumental building.

Just southeast of the circuit drive was another formal element, the Music Court, which was also conceived as part of the Olmsted, Olmsted and Eliot plan. This "place especially designed for the gathering of crowds about a band stand" was composed of a semi-circular area for a band stand with two outer semi-circular paths pierced by diagonal paths (Olmsted to Donnersberger, March 10, 1895, 704). The surface was meant to "gently descend towards the music stand, as in an amphitheater" (Olmsted to Donnersberger, March 10, 1895, 704). The paths were lined by formal rows of trees to shade the area. The Music Court was "intended to be lighted after dark and kept always open" (Legend accompanying Revised General Plan for Jackson Park, 1895).

The Fields

The fourth major element of the 1895 Olmsted, Olmsted and Eliot plan was the fields. These green lawn areas were meant as a contrast to the lake shore scenery, lagoon scenery, and formality of the museum area (Olmsted to Donnersberger, March 10, 1895, 703). The fields included an outdoor gymnasia area at the park's western perimeter, a tennis lawn meadow just west of Lake Shore Drive, and a large playing field at the southwestern section of the park.

When proposed in 1895, the men and women's outdoor gymnasia were features that were relatively new in the United States. Olmsted reported that "similar gymnasia proved very successful in Europe and in Boston" (Olmsted A39: 20, 704). The plan

included two oval shaped areas, one for men and one for women. Both were encircled by running tracks. Between the two areas was a playground for children.

The outdoor gymnasia area was one of the first sections of in Jackson Park to be improved following the adoption of the Olmsted, Olmsted & Eliot plan. The gravel used for grading and surfacing the outdoor gymnasia were taken from the World's Fair walks (SPC Annual Report 1894-5, 8). Soon after the outdoor gymnasia were opened to the public, the gravel running tracks began to be used as bicycle tracks (Report of SPC 1895, 9).

The lawn tennis area was located between the North and South Inlets, west of Lake Shore Drive. This was an oblong meadow space on which temporary lawn tennis nets were placed. In 1899, the South Park Commissioners decided that Jackson Park would include the first public golf course. According to Tom Govedarica, author of *Chicago Golf: The First 100 Years*, this was the "first golf course west of the Alleghenies opened to the public" (1991, 58). The initial 9 hole course was placed at the southern end of the lawn tennis field.

The Olmsted, Olmsted and Eliot plan for the park was modified to include a second golf course in 1900. (The degree to which the Olmsted firm was involved in this effort is unknown). This second course, which had eighteen holes, was added to the park's southern perimeter and the playing field at the southwestern part of the park. The playing field was conceived as a sixty acre great meadow. The broad green lawn which had "room for ball games of all kinds" was easily adapted for golf (Olmsted to Donnersberger, March 10, 1895, 703). When the playing field was first improved for golf in 1900, the project included the construction of a brick golf shelter building. (At the time, the other 9 hole course also remained).

Popularity of Recreation and Sports 1906-1918

By 1906, Jackson Park's new recreational amenities were intensively used. Though golf was very new to Chicagoans, Jackson Park's courses were already extremely popular. During the golf season of 1906, a total of 87,500 people played on the eighteen hole course and 40,000 played on the nine hole course (SPC 1906 Annual Report, 35). On Fourth of July, the busiest day of the year, 1400 people played on the eighteen hole course, and 900 people played on the nine hole course during that day (ibid).

Due to the large number of people who played golf, the golf course shelter underwent two major additions within the first few years. The first was constructed in 1903 and the second was constructed in 1907. The first project added lockers for the players and a lunch counter. The second project, a large addition to the east, matched the brick and Spanish tile roof of the original building. This addition included 700 new lockers, shower baths for men and women, and an extension of the lunch counter.

There was "no charge for lockers, towels or soap," and the "use of the links" was free (SPC Annual Rept. 1906-8, 44).

The popularity of golf continued to grow. During the 1911 season, a total of 70,000 people played on the nine-hole course and a total of 140,000 players used the eighteen-hole course (SPC Annual Rept. 1912, 25). In 1912, a second golf shelter was constructed in the eighteen hole course. Located by the ninth hole, the new shelter was sited by the Olmsted Brothers (successor firm of Olmsted, Olmsted and Eliot) (B files-Library of Congress, May 23, 1911). Designed by D.H. Burnham and Co., the Classical style building was constructed of exposed aggregate concrete with a Spanish tile hipped roof. Its center open loggia, with men's bathrooms on one side and women's on the other, allowed for beautifully framed views of Lake Michigan.

In addition to wonderful views, Lake Michigan was valued as an important recreational asset to Jackson Park. Swimming became increasingly popular after the 1899 completion of Chicago's innovative Drainage Canal, allowing for the diversion of sewage, which had previously been emptied into Lake Michigan (Mayer and Wade, 1969, 274). By 1908, the South Park Commissioners were discussing plans to extend the beach, and construct a large building to be located near the proposed Casino building of the Olmsted, Olmsted, and Eliot plan. (There was also the earlier Casino building of the World's Columbian Exposition, that had existed in nearly the same location). The South Park Commissioners consulted with the Olmsted Brothers in 1908 on the design and layout of the new beach area. The Olmsted Brothers recommended that two new buildings be constructed; a Casino restaurant as had previously been proposed and a new bathing pavilion structure (Olmsted Bros. to Henry Foreman, Sept.. 6, 1908, B Files). This proposal would allow "that a suitable view may be obtained up and down the shore from the balconies of the building" and would "provide suitable accommodations for refreshment as well as shelter and meet the demands of the public for parties and other free, suitable, entertainment" (SPC 1908, p. 15).

In 1914, a general plan for Jackson Park that was created by South Park Commission in-designers included the bathing beach extension. This plan included only one building for the new beach; the bathing pavilion. Following this general scheme, South Park Commission in-house architects developed plans for a Classical style building with open loggias and center courtyard spaces in 1917. The ten acre beach extension was filled in 1916 and 1917. Restrictions on building materials during World War I delayed completion of the building until 1919.

World's Columbian Exposition Remnants 1918-1933

In honor of the twenty-fifth anniversary of the World's Columbian Exposition and the Centennial of Illinois statehood, a smaller version of the *Republic* sculpture was erected in Jackson Park. The piece was purchased through remaining proceeds from the

World's Fair combined with some funding from the B.F. Furgeson Fund. Daniel Chester French, the artist of the original monument was commissioned to sculpt the commemorative version, and the architect Henry Bacon was selected for the design of the pedestal and platform. The gilded bronze sculpture was 24' tall, while the gilded plaster original was 65' tall.

The triangular traffic island on which the monument was erected had previously been considered as the location of two proposal. During the mid- 1890s, this location was considered as a possible location for the Logan Monument. The Olmsted, Olmsted, and Eliot firm argued against this suggestion, as they did not believe a war monument was appropriate anywhere in Jackson Park (A47 reel, 947-954). Later, in 1910, the Olmsteds consulted the South Park Commission on the placement of a flagpole in Jackson Park, and the triangle island was considered again. The Olmsteds suggested that the "little triangle, considering its informal planting and location and the scale of its immediate surroundings, would seem too trivial to serve as a dignified base for the flagpole" (B files--Olmsted Brothers to Henry G. Foreman, Aug. 18, 1910). It is likely that the Olmsted Brothers were not involved in the placement of the *Statue of Republic*. Apparently, the decision to erect the monument on the triangle island was made because this had also been the location of the monumental Administration Building during the World's Fair (Park and Cemetery 1918, 198).

Although the new *Statue of the Republic* reminded Chicagoans of the significance of the World's Columbian Exposition, two of the remaining original Fair buildings were destroyed during the 1920s. After the World's Fair, the Spanish Building, which was a replica of La Rabida of Palos, Spain was retained as a sanitarium for sick babies. Beginning in 1895, the hospital was opened during the summer season of each year. In 1918, the facility closed down due to a shortage of nurses during wartime (Jackson Park Sanitarium Year Book 1927-28, 31). The building, which had been intended as a temporary structure, had fallen into a terrible state of disrepair, and was destroyed by fire in 1922.

A raised seating area, named Convent Hill, was constructed on the original site of La Rabida in 1924. In the late 1920s, there was a proposal to build a new La Rabida structure to be located south of the original building. Despite some objections from the community, legal permission was granted to the La Rabida Jackson Park Sanitarium to construct the new hospital. Designed by Graham, Anderson, Probst and White, the Mediterranean Revival style building was constructed in 1932.

The second World's Fair Building that was destroyed in the 1920s was the German Building. After the Fair, the German Building had been retained as a restaurant. The Olmsted, Olmsted, and Eliot plan anticipated that eventually it "would become necessary to abandon the temporary restaurant in the German Building," and suggested its replacement with the proposed Casino Building on the beachfront. The German

Building did received some rehabilitation work, including the construction of new toilet rooms in 1911 (SPC Annual Rept 1911-12, 13). The building fell into a terrible state of disrepair and burned down in 1925. A bowling green and club house building were placed on the site of the German Building in 1927. The brick Revival style club house was designed by South Park Commission architects. In 1931, an addition was constructed at the southwest side of the building.

Like the other two World's Fair buildings, by the late 1920s the original Fine Arts Building was in severely deteriorated condition. The collections that were housed in the building after the Fair were moved to the newly constructed Field Museum of Natural History in Grant Park in 1920. Prominent individuals and organizations were discussing proposals to renovate the original Fine Arts Building for a number of years. In 1926, Julius Rosenwald, chairman of Sears, Roebuck and Co. proposed the re-use of the Fine Arts Building as an industrial museum that would highlight new scientific discoveries (Commission on Chicago Landmarks, Jan. 5, 1994, 22). The idea was supported by the Commercial Club of Chicago. In 1927, Rosenwald traveled through Europe with two members of the South Park Board visiting museums of science and technology.

The architectural firm of Graham, Anderson, Probst and White was responsible the exterior restoration of the museum, which was completed in 1930. The interior work, which commenced in 1930 was designed by Shaw, Naess and Murphy, a firm of three architects who had previously worked for Graham, Anderson, Probst, and White. The interior work included notable features executed in the Art Deco style. By the time of Rosenwald's death in 1932, he donated over 7 million dollars to the project (Commission on Chicago Landmarks, Jan. 5, 1994, 22). The opening of the Museum coincided with the 1933 Century of Progress, Chicago's second World's Fair, which was held in Burnham Park.

WPA Improvements 1935-1941

By the mid- 1930s, all twenty-two of Chicago's independent park commissions were in financial turmoil due to the Great Depression. Access to federal funds encouraged the consolidation of the numerous park commissions into the Chicago Park District in 1934. Between 1935 and 1941, more than one hundred million dollars of government funds were devoted to projects within Chicago's parks.

Many of the WPA- funded improvements emphasized modernization, convenience and increased recreational benefits. In addition, a significant amount of work was also done to improve and rehabilitate park landscapes. Jackson Park projects fell within all of these categories, and were all designed by Chicago Park District in-house staff. They included the construction of a passerelle over Lake Shore Drive and inlet bridges in the golf course; five new buildings; and landscape work including the rehabilitation and

minor alterations to the Columbia Basin, a major replanting of the Wooded Island, and the creation of the perennial garden.

Passerelles were constructed at various intervals over Lake Shore Drive to provide pedestrian access across the eight lane roadway. The 62nd St. passerelle, a steel structure with Art Moderne details was completed in 1936. An identical structure built at 67th St. in the early 1940s was later removed. Two small bridges were also constructed in the golf course in 1936. These stone footbridges with wood handrails provided pedestrian access over the inlet streams in the southern part of the golf course.

Jackson Park's five new buildings included two comfort stations, two combination shelter/comfort stations, and a maintenance/service yard building. All were all designed by E.V. Buchsbaum, a Chicago Park District in-house architect who had previously worked for the South Park Commission. Buchsbaum had originally designed Jackson Park's frame Colonial Revival style comfort station for the South Park Commission in 1933, however, it was not built at the time due to the lack of funds. In 1935, the proposed building was constructed at the landscape triangle on the lakefront at 59th St. This comfort station was moved north on the beach near 57th St. in 1949. The other comfort station was constructed in the children's playground at the western perimeter of the park in 1936. This building was identical to the frame structure in terms of plan, massing, and scale, and had similar details. It was executed in lannon stone, however, and was considered the English Stone style version.

The two larger shelter structures were composed of the same kind of lannon stone as the English Stone comfort station. One of them, a structure that was square in plan with a small open courtyard at the center, was located just northeast of the Museum of Science and Industry. This project included the demolition of the 1880s masonry structure that had been used as the Iowa Building during the 1893 World's Columbian Exposition. The Museum of Science and Industry donated $20,000 towards the construction of the new building, which is also considered the Iowa Building (CPD Annual Rept. 1936, 26). A sculpture known as the Garden Figure which was cast in plaster by Frederick Cleveland Hibbard for a 1930 art exhibit at the Merchandise Mart, was modeled in marble in 1940 for placement in the Iowa Building's open courtyard. Construction delays, however, led to its installation in the Lincoln Park Conservatory.

The other combination shelter/ toilet facility was constructed in the area which had included the nine-hole golf course. To provide greater recreational opportunities, the nine-hole course was removed and replaced with a running track and ball fields and a new parking lot in 1936. The combination shelter was identical to a ball field structure constructed in Lincoln Park. Composed of random ashlar masonry and half-timbering, the building is T-shaped in plan, with an enclosed office, bathrooms, and a roofed open shelter area.

The maintenance/service yard building was constructed in 1936, on the park's western perimeter, just south of 64th St. This site had been designated as the service yard on Olmsted, Olmsted and Eliot's 1895 plan, and an L-shaped shed structure had existed at this location since 1900. The WPA project included the demolition of the historic sheds and construction of a one story brick building with a rectangular plan flanking and open service yard area.

The landscape work in Jackson Park that was funded by the WPA was also designed and implemented by Chicago Park District staff members. It included a planting program throughout the park, with a particularly large number of trees and shrubs planted on the Wooded Island. The planting design of this period tended to be characterized by dense massings of understory trees such as hawthorns, crab apples, and dogwoods. The these species were compatible with the Olmsted, Olmsted, and Eliot palette, however, the 1890s design used understory trees more sparingly, as scattered accent points rather than heavy masses.

Additional work on the Wooded Island included the installation of the Torii Gate and Japanese Tea House which had been exhibited in Burnham Park for the 1933-34 Century of Progress. This project included the installation of a new Japanese Garden. The Japanese pavilion known as the Ho-o-den which had existed on the Wooded Island since the 1893 World's Columbian Exposition received some rehabilitation work. In addition, the World's Fair Rose Garden received a major replanting.

A new perennial garden was also created in 1936. Placed in Jackson Park at the junction of the Midway Plaisance between Stony Island Ave. and Cornell Dr., the large circular sunken garden was incorporated into an existing circular recessed lawn panel. That lawn element followed the form that had been shown as a formal water basin in Olmsted's 1871 original plan as well as the Olmsted, Olmsted and Eliot 1895 plan. The sunken lawn panel remained in the center of the garden. Simple retaining walls of stratified limestone were added, as well as limestone steps down to the lawn panel. The perrenial beds were placed at grade surrounding the circular lawn panel. An outer border of shrubs gave the perrenial garden a sense of enclosure.

Jackson Park's WPA landscape projects also included work on the Columbia Basin and surrounding site. Conducted between 1937 and 1940, the project included minor cutting and filling to the basin resulting in some reconfiguration (Chicago Park District, *Jackson Park Rosenwald Museum Lagoon Fill*, March 9, 1937, Revised: March 21,1938). This included filling the northeastern portion, slight filling on the west side of the basin, and some cutting to enlarge the Columbia Basin at the northwestern corner to meet the edge of the building. There were also some plantings added to the landscape surrounding the basin (Chicago Park District, *Jackson Park Landscape Design for Columbian Fine Arts Bldg. occupied by Museum of Science and Industry.* May, 1938, Revised: March, 1940). By

the end of 1940, most of the historic views of the museum were either intact or reinstated.

Alterations and Additions 1946-1986

During the post World War II period, labor and material costs were high and steel allotments continued to be restricted by the government. The few projects that were done in Jackson Park during this period tended to focus on pragmatic ways to increase recreational uses of the park. There was little interest or concern for the park's historic integrity. Between 1946 and 1950, the south lagoon's west shoreline was reconfigured and the remaining islands were removed to provide more access for boaters. As a means of providing better access to the 57th beach, a simple utilitarian passerelle was constructed in 1949 across Lake Shore Drive. In addition, the existing 59th St. comfort station was moved north to the 57th St. beach at that time. In 1953, the first of numerous expansions was added to the LaRabida hospital building. Unfortunately, most of these additions reflected an interest in Modernism rather than relating to the original 1932 building.

As funding became more available in the mid-to-late 1950s, the functional and recreation-oriented approach to projects continued. A fieldhouse had been proposed for Jackson Park since the late 1890s, however, this idea was not realized until 1957. The brick Modern style building was designed by Ralph Burke, a consulting engineer who had previously been a member of the Chicago Park District Engineering Dept. staff. The fieldhouse was sited on the west perimeter of the park at 65th St. south of the maintenance yard and outdoor gymnasium area.

In 1956, when the federal government installed a NIKE missile site in Jackson Park's lawn tennis area, the running track and a number of ball fields became off limits to park users. To make up for the lost recreation space, the Chicago Park District filled in the north and south bayous and created a large ball field meadow. This project destroyed the physical and visual interconnection of the water system. In addition to the project's negative impact on the historic landscape, it included the demolition of the two historic bridges that spanned south over the bayous from the Wooded Island. A non-ornamental bridge was constructed over the remaining water area to the Wooded Island in 1957.

Another important historic structure was demolished in 1962. This was Classical style Burnham-designed boathouse at the north end of the west lagoon which was originally constructed in 1896. In 1964, the historic Japanese bridge that spanned from the north side of the Wooded Island was razed. It was replaced with a utilitarian structure that was identical to the one that was constructed at the south end of the Island. In 1977, the Wooded Island was designated as the Paul Douglas Nature Sanctuary. Landscape maintenance practices were minimized so that volunteer growth would attract

migratory birds. The Wooded Island has become one of Chicago's premier spots for bird-watching, however, the lack of pruning and removal of volunteer plants has had a negative impact on the historic landscape. Efforts are now being manage the area as both a natural habitat and a designed landscape.

In 1978, the Chicago Park District constructed a golf driving range in the area that had historically been the lawn tennis area and then the nine-hole golf course. In the late 1930s, ball fields and a cinder running track were placed in this area, however, they were not accessible during the period in which the NIKE site installation was in the park between 1956 and 1971. By the late 1970s, community members had hoped that this area of the landscape would be restored. Much of the area, however, was converted into a golf driving range that required the installation of nearly a thousand lineal feet of chain-link along its two sides between the east lagoon and Lake Shore Drive. Just north and west of the driving range, an area of prairie plantings known as Bob-o-link meadow was planted.

Some of the most major impacts to the historic integrity of Jackson Park were caused by traffic engineering projects conducted in the late 1970s and early 1980s. The southern end of the circuit road around the Museum and Columbia Basin was closed, and the roadway sections that connected it with Lake Shore Drive at the east and Cornell Drive at the west were removed. Another significant alteration was the removal of some of the curved sections of the southwest corner of the Marquette Drive circuit and construction of new angled sections of road. This included an extension of Marquette Drive straight to the west through the perimeter landscape. The entire length of Cornell Drive was substantially widened. The construction of an exit lane for southbound traffic between Cornell Drive and Stony Island Drive, just to the north of Marquette Drive, also undermined the historic integrity of the western perimeter landscape. In 1978, the roadway that extended from La Rabida to South Shore Drive was closed and converted to parking for La Rabida.

Restoration and Rehabilitation 1980 to present

In 1980, an effort to rehabilitate the Japanese Garden on the Wooded Island represented the beginnings of a new appreciation for Jackson Park's historic features. In the years following the destruction of the Ho-o-den Japanese pavilion in 1946, the Japanese Garden, had fallen into a state of disrepair. In 1980, the Chicago Park District and Chicago Department of Planning jointly applied for funds to reconstruct the Japanese Garden from the Illinois Department of Conservation. Through that agency two federal grants were secured. Mr. Kaneji Domoto of New Rochelle, New York was commissioned to work with the Chicago Park District landscape design staff to develop a plan for a new Japanese Garden. A new waterfall was constructed and the shoreline was reconfigured. The plan included a variety of plantings of Japanese character, a new circular path system, a "Moon Bridge" and a stepping stone bridge. The only remaining

element of the historic WPA garden was the Kasuga lantern (located outside the entrance gate). Several other Japanese style granite lanterns were also included in the new garden.

The Japanese Garden was formally dedicated in 1981. The Japanese Garden was renamed the Osaka Garden in 1992 to commemorate the 20th anniversary of Chicago and Osaka as members in the Partner City program and their new status as Sister Cities. In 1994, a new formal entry gate was designed by Kobayashi & Associates of Seattle and hand-crafted by John Okumura of Chicago. The Chicago Park District replanted the Japanese Garden in 1995.

Several projects that were done to a higher lever of historic authenticity have taken place during the 1990s. The first was the result of a terrible fire in 1988 that destroyed a substantial portion of the US Coast Guard Station. The sections of the building that were destroyed were reconstructed, and entire building was restoration. The project, which was conducted by the Chicago Park District architectural design staff won a 1990 Paul Cornell Award for Historic Preservation.

In honor of the 100th anniversary of the World's Columbian Exposition, the Statue of the Republic was restored and rededicated in 1993. The monument, which had originally been installed in honor of the 25th anniversary of the World's Fair in 1918, had been regilded several times. By the early 1990s, however, it was in dire need of conservation. The Chicago Park District sculpture conservator was responsible for removing the remaining gilding and corrosion products. The monument was then re-gilded by Gold Leaf Studios of Washington DC.

Another recent rehabilitation project that has achieved a high degree of historic authenticity is the 59th Street Bridge, which was originally designed by Burnham and Strobel in 1895. Today, the bridge is within the jurisdiction of the City of Chicago. In 1993, the Chicago Department of Transportation hired the firm of Hasbrouck, Peterson, Zimoch, Sirirattumrong in conjunction with Kevin Lee Sarring, architect to develop a historic structures report for the bridge. In 1994, the bridge was reconstructed. The project included the reconstruction of the historic lighting fixtures, which had originally been designed for the 1893 World's Columbian Exposition.

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JACKSON PARK

General List.

FROM
OLMSTED OLMSTED & ELIOT,
LANDSCAPE ARCHITECTS,
BROOKLINE, MASS.

COMPLETE PLANTING LIST,

JACKSON PARK, CHICAGO, ILL.

Olmsted, Olmsted & Eliot,
Landscape Architects, July, 1896.

1. Ulmus americana
Elm

2. Ulmus campestris
English Elm

3. Fraxinus pubescens
Red Ash

4. Acer negundo
Box Elder

5. 8 feet apart.
Ilex verticillata
Black Alder
Cornus sericea
Silky Cornel
Rosa multiflora
Ligustrum Ibota
Amoor River Privet
Syringa vulgaris
Lilac
Viburnum opulus
High-bush Cranberry
Hibiscus syriacus
Althea
Philadelphus coronarius
Sambucus canadensis.

6. 2 feet apart.
Pyrus arbutifolia
Choke berry
Berberis thunbergii
Hypericum prolificum
Shrubby St. John'swort
Myrica cerifera
Bayberry

7. 3 feet apart.
Spiraea thunbergii

Spiraea reevesii
Hydrangea paniculata
Forsythia viridissima
Deutzia crenata
Lonicera orientalis
Philadelphus coronarius
Rhodotypos kerrioides
Weigelia rosea
Rosa rugosa
Cydonia Japonica
Japan Quince.

8. 3 ft. apart.

Rosa wichuraiana
Lonicera halleana

9. 2 ft. apart.

Potentilla fruticosa
Shrubby cinquefoil
Rhus copallina
Sumac
Rosa nitida
Rosa lucida
Ribes cynosbati
Gooseberry
Spiraea salicifolia
Meadow-sweet
Berberis vulgaris
Barberry
Berberis thunbergii
Symphoricarpos occidentalis
Wolfberry
Spiraea tomentosa
Steeple bush
Cornus sanguinea
Red Dogwood
Viburnum acerifolium
Dockmackie
Myrica cerifera
Bayberry
Rhus aromatica
Sumac
Celastrus scandens
Bitter-sweet
Spiraea opulifolia
Nine-bark
Ilex verticillata
Beach Alder
Staphylea trifoliata
Bladder-nut.

Symphoricarpos vulgaris
Indian Currant
Aralia spinosa
Hercules Club
Rhamnus catharticus
Buckthorn
Pyrus arbutifolia
Chokeberry
Xanthoxylum americanum
Prickly Ash.

10. 5 feet apart.

Sassafras officinale
Sassafras
Cornus florida
Dogwood
Cercis canadensis
Red-bud
Crataegus crus-galli
Cockspur thorn
Acer pennsylvanicum
Moosewood
Pyrus aucuparia
Mountain ash
Ptelea trifoliata
Hop Tree
Acer spicatum
Mountain Maple
Amelxanchier canadensis
Shad-bush
Crataegus coccinea
Viburnum dentatum
Arrowwood
Hamamelis virginica
Witch hazel
Rhus typhina
Staghorn Sumac

11. 4 feet apart.

Betula papyrifera
Paper Birch
Betula lenta
Sweet Birch
Acer dasycarpum
Silver Maple
Acer saccharinum
Sugar Maple
Acer rubrum
Red Maple
Quercus palustris
Pin Oak

Quercus alba
White Oak
13.
Quercus coccinea
14.
Scarlet Oak
Quercus rubra
15.
Red Oak
Acer negundo
16.
Box Elder
17.
Populus balsamea
Balm Gilead
18.
Populus caroliniana
Cotton Wood
19.
Populus fastigiata
Lombardy Poplar.
Salix regalis
20.
Willow
Salix laurifolia
Salix Russian Golden
Catalpa speciosa
21.
Catalpa.

12. 3 feet apart.
22.
Spiraea opulifolia
Nine-bark
Berberis vulgaris
23.
Barberry
Ligustrum vulgare
Privet
24.
Cornus sericea
Silky Cornel
Clethra alnifolia
25.
Sweet pepperbush
Rhus glabra
26.
Sumac
Ligustrum ibota
27.
Amorpha fruticosa
False indigo
Symphoricarpos vulgaris
Indian Currant
Rosa lucida
Wild Rose
Viburnum prunifolium.
Black Haw
Ribes floridum
Wild Black Currant
Viburnum opulus
High-bush cranberry
Cephalanthus occidentalis
Button Bush

13. Acer dasycarpum

14. Acer platanoides
Norway Maple

15. Acer rubrum
Red Maple

16. Alnus americana

17. Catalpa speciosa

18. Salix alba
Willow

19. Tilia americana
Basswood

20. Quercus alba
White Oak

21. Quercus prinus
Chestnut Oak

22. Quercus macrocarpa
Burr Oak

23. Quercus palustris
Pin Oak

24. Quercus rubra
Red Oak

25. Betula papyrifera
Paper Birch

26. Crataegus oxyacantha

27. 3 feet apart.

Ligustrum vulgare
Privet

Clethra alnifolia
Sweet-pepper Bush

Cornus sericea
Silky Cornel

Cornus stolonifera
Red Osier

Ligustrum ibota

Symphoricarpos vulgaris
Indian Currant

Xanthoxylum americanum
Prickly Ash

Carpinus americana
Hornbeam

Viburnum dentatum
Arrow-wood
Spiraea opulifolia
Nine-bark

28. Trees 20' apart.
Shrubs 3' apart.

Betula papyrifera
Paper Birch
Betula lenta
Black Birch
Acer rubrum
Red Maple
Quercus alba
White Oak
Quercus coccinea
Scarlet Oak
Quercus rubra
Red Oak
Ligustrum vulgare
Privet
Clethra alnifolia
Cornus sericea
Silky Dogwood
Cornus stolonifera
Red Osier
Ligustrum ibota
Symphoricarpos vulgaris
Indian Currant
Xanthoxylum americanum
Prickly Ash
Carpinus americanus
Hornbeam
Viburnum dentatum
Arrow-wood
Spiraea opulifolia
Nine-bark

29. Populus monolifera
Cottonwood

30. Platanus orientalis
Oriental Plane

31. Lonicera halleana, 3 feet apart.

32. 3 feet apart.
Rhus glabra
Sumac
Corylus americana
Hazel Nut

Salix in var.
Hamamelis virginiana
Witch Hazel
Sambucus canadensis
Elder
Cephalanthus occidentalis
Button Bush
Tamarix gallica
Symphoricarpos racemosus
Snowberry
Xanthoxylum americanum
Prickly Ash
Carpinus americana
Hornbeam
Populus tremuloides
Aspen

33. 5 feet apart.

Betula papyrifera
Paper Birch
Catalpa speciosa
Populus balsamea
Balsam Poplar
Populus monolifera
Cottonwood
Populus alba
Silver Poplar
Salix laurifolia
Laurel-leaved Willow
Salix vitellina
Salix viminalis
Acer negundo
Box Elder
Pyrus americana
Mountain Ash.

34. Vitis labrusca, 3 feet apart.

35. Ailanthus glandulosa
Tree of Heaven.

36. Betula lenta
Black Birch
37. Betula lutea
Yellow Birch
38. Betula nigra
River Birch
39. Celtis occidentalis
Hackberry
40. Fraxinus americana

41. Fraxinus viridis
Green Ash

42. Liriodendron tulipifera
Tulip Tree

43. Populus alba
White Poplar

44. Populus balsamifera
Balsam Poplar

45. Acer pennsylvanicum
Moosewood

46. Carpinus americana
Hornbeam

47. Cercis canadensis
Red bud

48. Cornus florida
Dogwood

49. Ostrya virginica
Hop Hornbeam

50. Pyrus americana
Mountain Ash

51. Salix caprea
Goat Willow

52. Xanthoxylum americanum

53. Acer saccharinum
Sugar Maple

54. Liquidamber styraciflua
Sweet Gum

55. Quercus coccinea
Scarlet Oak

56. Fagus ferruginea
Beech

57. Gymnocladus canadensis
Kentucky Coffee Tree

58. Nyssa sylvatica
Tupelo

59. Fraxinus sambucifolia
Black Ash

60 Halesia tetraptera

61. Cladrastis lutea
Yellow Wood

62. Chionanthus virginica
White Fringe

63. Salix laurifolia
Laurel-leaved Willow

64. Quercus bicolor
Swamp White Oak

65. Quercus phellos
Willow Oak

66. Tilia heterophylla
Linden

67. Juniperus virginiana
Red Cedar

68. Salix in var. (shrubby form) 3 feet apart.
Willow

69. Arctostaphyles uva-ursi, 2 feet apart.
Bear Berry

70. Hudsonia tomentosa, 1 foot apart.

71 Juniperus sabina

72. Sassafras officinale
Sassafras

73. Quercus nigra
Black Oak

74. Pinus banksiana
Gray Pine

75. Salix nigra
Black Willow

76. Celastrus scandens, 3 feet apart.
Bitter-sweet.

77. 1 foot apart.
Ammophila arundinacea
Sea Sand Reed.
Elymus canadensis
Wild Rye
Elymus mollis
Panicum virgatum
Panic grass
Calamagrostis longifolia
Reed Bent Grass
Agropyrum repens
Couch Grass
Agropyrum dacystackyum
Lathyrus maritimus
Beach Pea
Solidago in var.
Asters in var.
Anemone multifida
Campanula rotundifolia var. arctica
Harebell

Cyperus in var.
Carex in var.
Sedge
Cnicus pitcherii
Thistle
Smilacina stellata
Artemisea canadensis

78. Cornus stolonifera, 3 feet apart.
Red Osier.
79. Cornus sericea, 3 feet apart.
Silky Cornel
80. Prunus pumila, 3 feet apart.
Dwarf cherry
81. Rhus aromatica, 2 feet apart.
Sumac
82. Ptelea trifoliata, 4 feet apart.
Hop Tree

83. Cexphalanthus occidentalis, 4 feet apart.
Button-bush

84. Corylus rostrata, 4 feet apart.
Hazel-nut
85. Hypericum kalmianum, 2 feet apart.

86. Potentilla fruticosa, 2 feet apart.
Shrubby cinquefoil

87. Rosa blanda, 2 feet apart.

88. Rosa humilis, 2 feet apart.
89. 4 feet apart.

Salix in var.
Willow
Cornus stolonifera
Red Osier
Cornus sericea
Silky Cornel
Prunus pumila
Dwarf Cherry
Ptelea trifoliata
Hop Tree
Cephalanthus occidentalis
Button Bush.
Corylus rostrata
Hazel-Nut
Hypericum kalmianum
Potentilla fruticosa

Rosa blanda
Rosa humilis

90. 3 feet apart.

Cytissus purpureus
Cytissus nigricans
Genista tinctoria
Woad Waxen
Hypericum densiflorum
Hypericum prolificum
Desmodium penduliflorum
Desmodium ~~xxxxxxxxxxxx~~ japonicum
Coronilla emerus
Scorpion Senna
Corema couradii
Helianthemum vulgare
Sun Rose.
Empetrum nigrum

91. Iva frutescens
Marsh Elder
Potentilla fruticosa
Shrubby Cinquefoil
Rosa blanda
Hypericum densiflorum

92. 2 feet apart.

Cotoneaster buxifolia
Cotoneaster microphylla
Cotoneaster horizontalis
Potentilla fruticosa
Shrubby Cinquefoil
Philadelphus microphyllus
Coriaria myrtifolia

93. 3 feet apart.
Symphoricarpos vulgaris
Indian Currant
Symphoricarpos racemosus
Snowberry
Salix tristis
Sand Willow
Gaylussacia resinosa
Huckleberry
Diervilla trifida
Bush Honeysuckle
Lycium barbarum
Matrimony Vine
Lycium europeum
Lonicera alberti

94. 5 feet apart.
Hippophae rhamnoides
Sea Buckthorn
Sheperdia canadensis
Buffaloberry
Tamarix gallica
Tamarix tetrandra purpurea

95. Pinus mughos

96. Potentilla tridentata, 1 foot apart.

97. 2 feet apart.
Rhus aromatica,
Sumac
Rosa blanda
Rosa humilis

98. 5 feet apart.
Corylus avellana
Hazel-nut
Cephalanthus occidentalis
Button Bush
Sassafras officinale
Sassafras
Ptelea trifoliata
Hop tree

99. 3 feet apart.
Cornus stolonifera
Red Osier
Cornus sericea
Silky Cornel
Salix in var.
Prunus pumilla
Dwarf Cherry

100. 2 feet apart.
Potentilla fruticosa
Shrubby cinquefoil
Hypericum kalmianum
Artemesia frigida

101 4 feet apart.
Cephalanthus occidentalis
Button Bush
Alnus serrulata
Alder
Viburnum opulus
High-bush Cranberry

102.

102. 3 feet apart.
Clethra alnifolia
Sweet-pepper Bush
Azalea viscosa
Swamp Honeysuckle

103. 3 feet apart.
Cornus stolonifera
Red Osier
Cornus sanguinea
Red Dogwood
Rosa carolina
Wild Rose
Myrica Gale
Sweet Gale.

104. Clethra alnifolia, 3 feet apart.
Sweet-pepper Bush

105. Rosa carolina, 2 feet apart.

106 Myrica gale, 3 feet apart.

107. Water plants.

108. 2 feet apart.

Potentilla fruticosa
Shrubby Cinquefoil
Rosa nitida
Wild Rose
Rosa lucida
~~Dwarf~~ Wild Rose
Ribes cynosbati
Gooseberry
Spiraea salicifolia
Meadow-sweet
Berberis thunbergii
Symphoricarpos occidentalis
Wolf-berry
Myrica cerifera
Bayberry
Rhus aromatica
Fragrant Sumac
Celastrus scandens
Symphoricarpos vulgaris
Indian Currant
Rosa blanda
Early Wild Rose
Rosa humilis
Prunus pumila
Sand Cherry
Hypericum kalmianum
Myrica gale
Sweet Gale
Rosa carolina
Swamp Rose

109. Kalmia angustifolia, 2 feet apart.
Lambkill

110. Ceanothus americanus, 2 feet apart.

111. Myrica cerifera

112. Myrica asplenifolia, 2 feet apart.

113. Gaultheria procumbens, 1 foot apart in clumps
Wintergreen

114. Rubus hispidus, 1 1/2 feet apart.
Swamp Blackberry.

115. 2 feet apart.

Vaccinium pennsylvanicum

Vaccinium vacillans

Kalmia angustifolia
Lambkill
Gaylussacia resinosa
Huckleberry

116. Viburnum acerifolium, 2 feet apart.