memo

Project Name |	Library Lake Southeast Stormwater Park	Date |	9/15/20
To / Contact info |	Tom Shroeder, President, Beaver Dam Lake Management District		
Cc / Contact info |	Wisconsin Department of Natural Resources		
From / Contact info |	Jimmy Marty and Britta Hansen, Emmons and Olivier Resources, Inc.		
Regarding |	Library Lake Habitat and Wildlife Assessment		

Library Lake Habitat and Wildlife Assessment

EOR completed a habitat and wildlife assessment along the Library Lake shoreline and site of proposed stormwater BMPs on July 28, 2020. The purpose of the assessment was to evaluate existing shoreline habitat and the fish/wildlife population to inform a landscape restoration plan that supports wildlife in and around Library Lake as part of the proposed Library Lake Southeast Stormwater Park.

The assessment focused on an approximately 6.7-acre Study Area that encompasses the proposed grading limits of the project along with a buffer to account for contingencies and characterize the project vicinity (Figure 1). Methods consisted of a meander survey through upland and wetland areas on foot and open water areas via kayak. An Endangered Resources Review was also completed through Wisconsin Department of Natural Resources (WI DNR) to account for rare species/features and evaluate permitting needs.

Results

Study Area Description

The site borders urban areas adjacent to Wisconsin Highway 48 and 2nd Avenue within the City of Cumberland, Barron County. Most of the Study Area consists of wetland around and within Library Lake and includes wet meadow, shallow marsh, shrub-carr, and open water wetland types (Figure 2). Adjacent upland areas include vacant residential lots, unmanaged grassland, disturbed woodland, and manicured lawn/boulevard.

Vegetation

Nearly the entire Study Area is dominated by non-native or invasive species. Exceptions include the open water of Library Lake and a small area of shoreline in the southwest of the Study Area.

Uplands:

Floristic quality of upland areas is poor due to dominance of non-native or invasive species.

Open upland areas were dominated by non-native or invasive species such as smooth brome, reed canary grass, tansy, Canada thistle, Kentucky bluegrass, hoary alyssum, quackgrass, spotted knapweed, crown vetch, and bird's foot trefoil. Native species were a minor component but included Canada goldenrod, common milkweed, field horsetail, common evening primrose, red raspberry, and yarrow.

Disturbed woodland areas were dominated by a dense shrub layer of invasive species common buckthorn and exotic honeysuckle, with a patchy canopy of native trees including box elder and green ash.

Vacant lots and lawn/boulevard areas were dominated by turfgrass and common lawn weeds with some cultural trees such as white spruce, Norway spruce, sugar maple, and black walnut in the canopy.

Wetlands:

Floristic quality of wet meadow, shallow marsh, and shrub-carr communities is poor due to dominance of non-native or invasive species. Floristic quality of the open water community is good to excellent.

The wet meadow was dominated by invasive reed canary grass. Although native species cover was sparse to patchy, diversity was fair and included dark green bulrush, lake sedge, bluejoint, rice cut grass, American manna grass, marsh bellflower, tall goldenrod, marsh milkweed, water smartweed, tearthumb, and field mint. Other non-native species included redtop.

The shallow marsh was dominated by invasive hybrid cattail extending onto Library Lake via floating mat. Native species cover was sparse and included jewelweed, marsh bellflower, bluejoint, broad-leaved arrowhead, lake sedge, fen wiregrass sedge, northern blue flag, bulbet-bearing water hemlock, great water dock, stiff marsh bedstraw, and northern bugleweed. Other invasive species included purple loosestrife.

The shrub-carr was dominated by invasive common buckthorn and native shrub sandbar willow. A sparse canopy of native trees green ash and box elder was present. Ground cover consisted of similar species to the wet meadow, primarily dominated by reed canary grass.

The open water community was dominated by dense cover of native submerged and floating-leaved species, with excellent diversity. Floating-leaved species white water lily, spatterdock, and watershield formed a dense mat on the surface. Submerged species were abundant below and included coontail, Illinois pondweed, variable pondweed, flat-stem pondweed, sago pondweed, fern-leaf pondweed, ribbon-leaf pondweed, floating pondweed, large-leaf pondweed, small pondweed, water stargrass, Canada waterweed, slender naiad, muskgrass, common bladderwort, and small bladderwort. Emergent species included pickerelweed and swaying bulrush. One invasive species, Eurasian watermilfoil, was observed.

One area of good quality shoreline vegetation was located in the southwestern portion of the Study Area along a transition from wet meadow to shallow open water (Figure 2). This area was dominated by an even mix of native species including broad-leaf cattail, three-way sedge, broad-leaved arrowhead, pickerelweed, white water lily, common spikerush, hardstem bulrush, northern blue flag, dark green bulrush, marsh milkweed, marsh cinquefoil, water smartweed, and bristly sedge. Woody plants along the lakeshore consisted of speckled alder and silver maple.

Fisheries and Wildlife

No fishery survey was conducted but inferences can be made based on the quality of the aquatic plant community, water quality conditions, and WI DNR fishery assessment results. Fishery surveys

conducted in 2013 indicate that Beaver Dam Lake supports a diverse fish community (Cole 2014). Library Lake supports this diverse fishery by providing excellent spawning habitat in its open water areas. Shallow, clear water combined with a healthy aquatic plant community make good spawning habitat suitable for northern pike, perch, smallmouth bass, crappie, and sunfish.

The meander survey conducted by EOR detected several bird, insect, and amphibian species. The species observed represent a snapshot of wildlife present within the Study Area and should not be considered comprehensive. Many other species could be expected to and likely use habitat within the Study Area. Observed species are listed below:

- Birds:
  - American Robin
  - Canada Goose
  - Common Yellowthroat
  - Downy Woodpecker
  - Mourning Dove
  - Northern Flicker
  - Red-winged Blackbird
  - Song Sparrow
  - Tree Swallow
- Butterflies
  - Cabbage White
  - Eyed Brown
  - Monarch
  - White Admiral
- Amphibians
  - American Toad
  - Green Frog

Wildlife habitat within the Study Area is generally poor to fair, although the green space provides valuable refuge near the urban environment of Cumberland. Habitat is poor primarily due to lack of diversity and complexity from dominance by invasive species or maintenance as turfgrass lawn. Much of the upland areas are dominated by invasive grasses, shrubs, or turfgrass. Shallow marsh is dominated by a dense stand of invasive cattail. These dense stands of invasive plants provide some cover for wildlife, but generally provide poor food sources and limit mobility.

Endangered Resources Review

The WI DNR reported one aquatic plant species designated as special concern recorded in the project vicinity. Although the species was not identified during EOR's meander survey, suitable habitat was identified in the shallow open water community of Library Lake and the species should be assumed present. No permit is required due to the species' special concern status, which are not protected by law.

Recommendations

Landscape restoration for the Library Lake Southeast Stormwater Park should focus on restoration of wet meadow, shallow marsh, shrub-carr, and upland communities near the proposed project site and preservation of the high quality shallow open water community.

Restoration of Wet Meadow, Shrub-Carr, and Upland Communities:

Restoration should first focus on control of invasive and non-native species. In wet meadow, shrub-carr, and upland areas, combinations of chemical and mechanical treatment should be effective to remove or reduce cover of invasive herbaceous and woody vegetation. Planting plans following invasive species control should include species described in Eggers and Reed and WI DNR

descriptions of Northern Sedge Meadow and Shrub-Carr for respective wetland community types. Upland areas are suitable for restoration to a variety of communities, but Mesic and Wet-Mesic Prairie may afford both good wildlife habitat and allow for scenic views from the City of Cumberland.

Restoration of Shallow Marsh Community:

The shallow marsh community is dominated by invasive cattail and occupies nearly the entire lakeshore within the Study Area. Control of dense cattail stands is challenging and requires a careful assessment of risks and benefits. Management would require long-term commitment to chemical and mechanical treatments before the site is suitable for revegetation. Dredging/scraping of the cattail may also be an option for quicker results but would require permits from WI DNR and may significantly disturb the site. If dredging is considered a viable option, management should occur from the shore toward the open water as to minimize disturbance to the adjacent high quality shallow open water community. Finally, although the cattail stand is generally poor habitat, it may be providing some water quality benefit as a buffer to stormwater runoff from the City of Cumberland. Restoration to a native plant community would also provide a buffer to stormwater, but perhaps not as effectively as the dense stand of cattail. That said, the proposed stormwater BMPs will improve pre-treatment of runoff and lessen the impact of removing the cattail.

Benefits of cattail removal include improved wildlife and fish habitat, increased plant diversity, limit of spread to other areas of Library Lake, and enhancement of aesthetics. A strong commitment to cattail control and native plant community restoration would undoubtedly benefit the ecology of Library Lake. A high-quality reference site for shallow marsh lakeshore is located in the southwestern portion of the Study Area, and could be used as an example for native plant community restoration following cattail control (Figure 2). The Eggers and Reed community and WI DNR description of Emergent Marsh are also suitable references for restoration of shallow marsh communities.

Preservation of Shallow Open Water Community:

The shallow open water community within the Study Area is high quality and preservation should be high priority. Additionally, this community may harbor an aquatic plant species of special concern as designated by the WI DNR. Recommendations to avoid impact to the rare species were provided in the WI DNR Endangered Resources Review Letter and should be adhered to during proposed work. These species-specific guidelines are also suitable for avoiding impact to the entire community. Appropriate erosion control methods should be employed and disturbance to the shallow open water community should be avoided.

References

Cole, A.J. 2014. Beaver Dam Lake Fisheries Assessment, 2013. Wisconsin Department of Natural Resources, Northern Region – Barron.

Eggers, S.D. and D.M. Reed. 2014. Wetland Plants and Plant Communities of Minnesota and Wisconsin, Version 3.1. U.S. Army Corps of Engineers, St. Paul District.

Figure 1. Study Area boundary

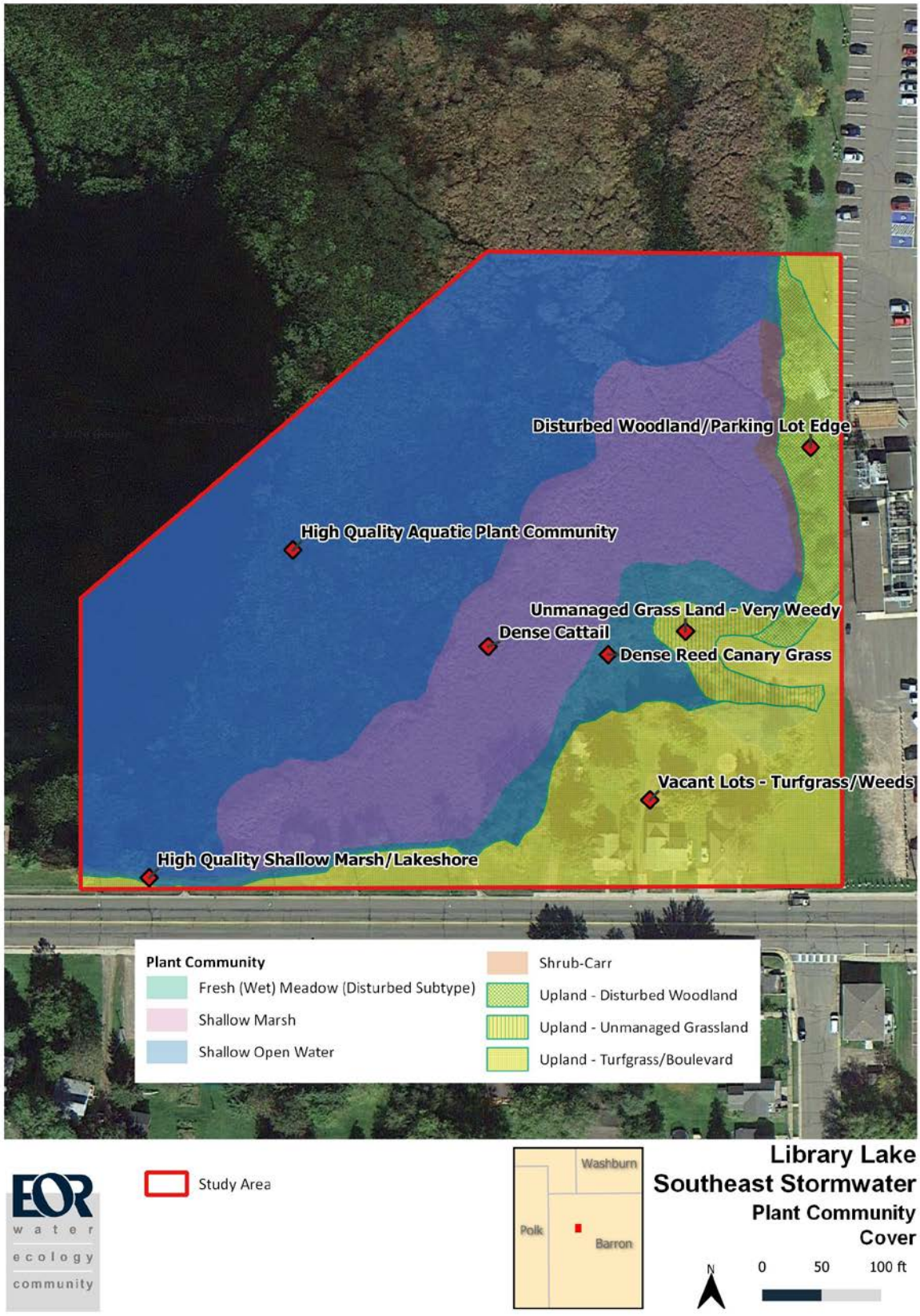

Figure 2. Plant community cover and notes.

Photograph 1. Looking toward reed canary grass-dominated wet meadow and cattail-dominated shallow marsh from the edge of unmanaged, weed-dominated grassland.

Photograph 2. Transition from mowed turfgrass to unmanaged, weed-dominated grassland with wet meadow and cattail marsh in background.

Photograph 3. From northern extent of the Study Area looking at transition between disturbed woodland, shrub-carr dominated by sandbar willow, and shallow marsh dominated by cattail.

Photograph 4. Wet meadow dominated by reed canary grass looking toward shallow marsh dominated by cattail.

Photograph 5. Area of wet meadow with some diversity of native species including bluejoint, dark green bulrush, and marsh milkweed. Reed canary grass is still dominant.

Photograph 6. Good-quality shallow marsh in southwestern portion of Study Area dominated by broad-leaf cattail, pickerelweed, three way sedge, and common spikerush.

Photograph 7. Turfgrass and lawn weeds in vacant residential lots, with ornamental plantings, sugar maple, and spruce.

Photograph 8. High-quality aquatic plant community; floating-leaved plants white water lily and watershield are visible in foreground along with yellow flowers of common bladderwort.

Photograph 9. Eyed brown butterfly observed in the wet meadow.