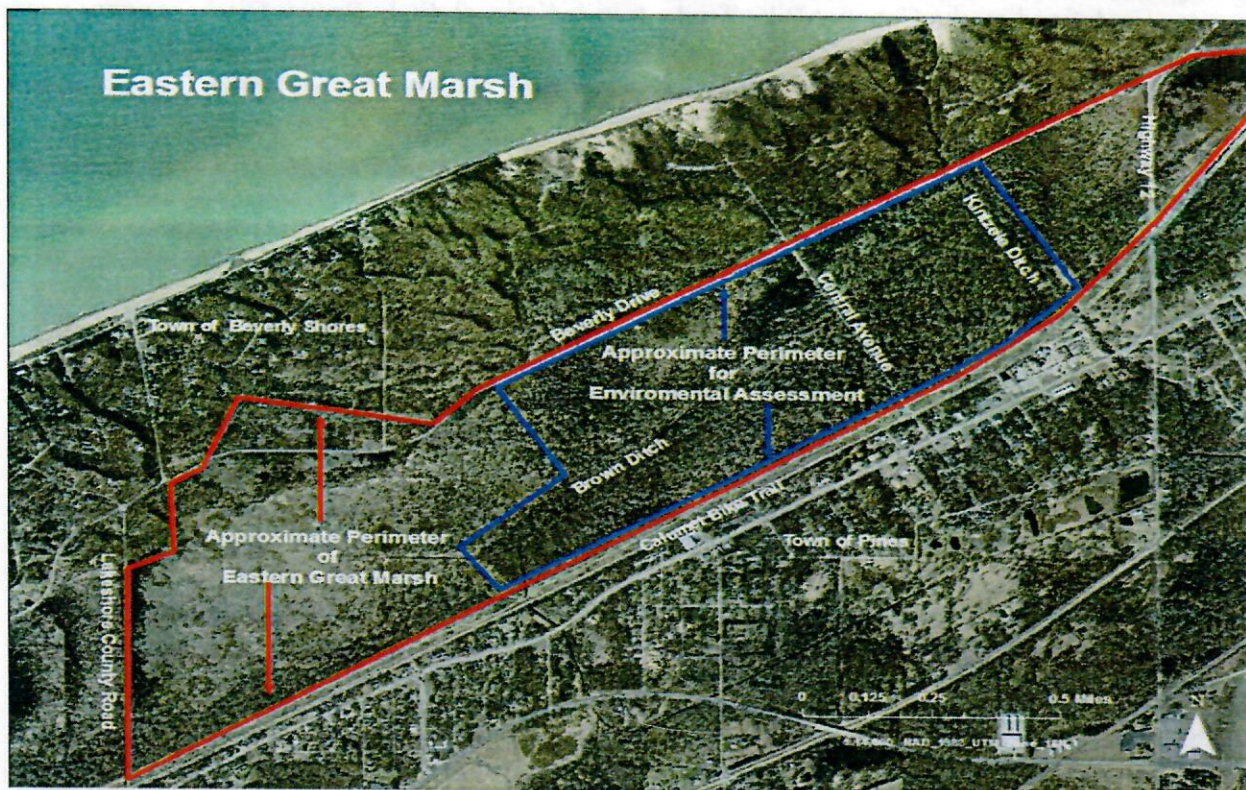


RESTORATION OF EASTERN GREAT MARSH



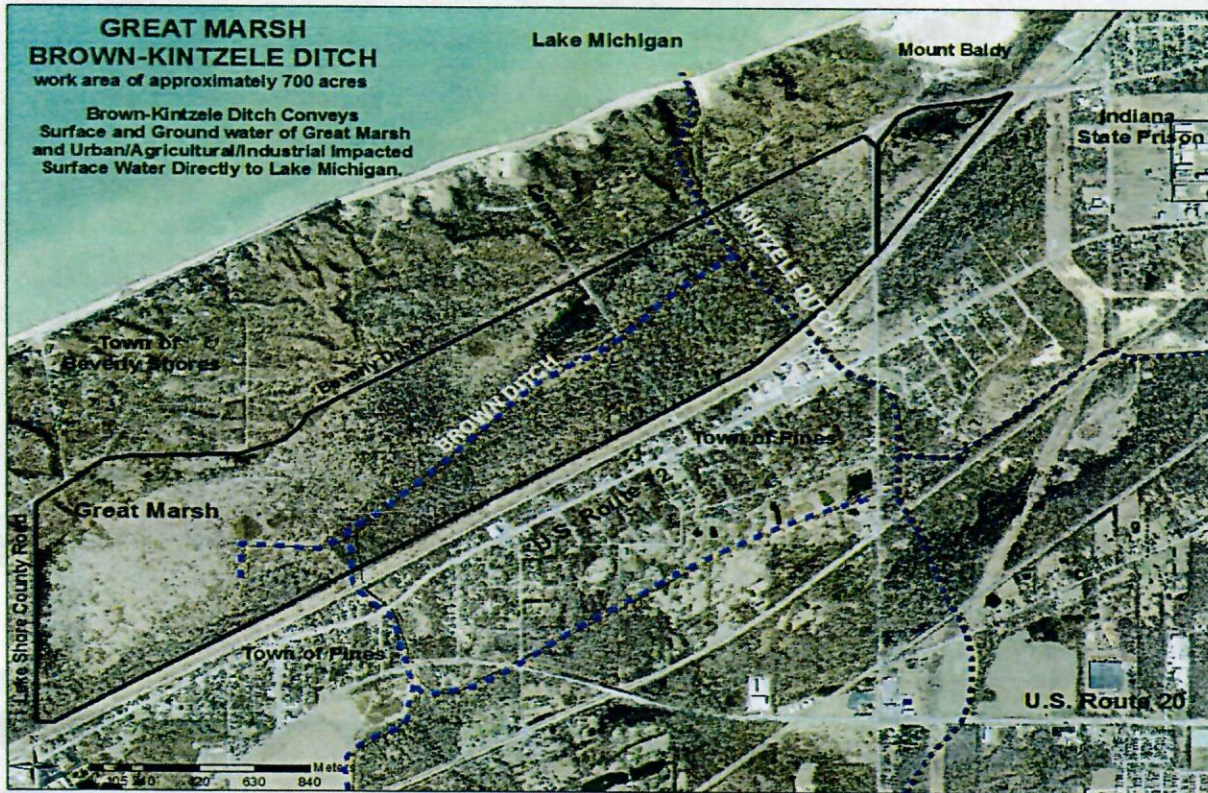
Eastern Great Marsh



Environmental Assessment Work Units

OVERVIEW

Eastern Great Marsh extends east from Lake Shore County Road to approximately 2,120 feet east of US Highway 12. The northern boundary is slightly north of Beverly Shore Drive and the southern boundary is defined by the Calumet Bike Trail. A jurisdictional ditch, Brown Ditch, conveys water from interdunal wetlands south of Great Marsh. Brown Ditch extends through a portion of Eastern Great Marsh terminating at the jurisdictional Kintzele Ditch. Smaller ditches within Great Marsh south of Brown Ditch convey water to Brown Ditch. The construction of Brown Ditch, Kintzele Ditch, and tributary ditches within Great Marsh has removed historic wetland hydrology from this portion of eastern Great Marsh.



Numerous secondary ditches in the town of Pines and Michigan City flow into the main ditch system of Brown and Kintzele Ditch

OBJECTIVES

For the purpose of identifying the preferred methods to restore approximately 300 acres of Great Marsh negatively impacted by Brown Ditch, an Environmental Assessment will be conducted. Three hundred acres of Great Marsh negatively impacted by Brown Ditch have been divided into four work units. The preferred restoration accomplishments are as follows:

- Redirect water flowing through Brown Ditch into Units 1 and 2. The redirected water will have a broad flow pattern and provide water depths in Units 1 and 2 ranging from saturated soil to three feet.
- Prevent surface water from the tributary ditches in Units 3 and 4 from entering Brown Ditch
- Establish native plant assemblages in the four work units reflective of those present prior to anthropogenic induced alterations that removed wetland ecosystem services provided by the four work units.

Unit 1:

Alternative 1: No action – No action will retain the current transport of water directly to Lake Michigan. Ecosystem services will not be restored.

Alternative 2: Construct two water diversion structures at Kansas Ave. and modify the existing road bed of Kansas Ave. to prevent erosive degradation of the road bed due to water flowing over it. This action will restore historic hydrology west of Kansas Ave. and facilitate a broad flow of water between Kansas Ave. and Central Ave.

Alternative 2 will not provide the desired water depths between Kansas Ave. and Central Ave. The neutralization of beaver-induced water impacts to the town of Pines will not be accomplished.

Alternative 3: Construct two water diversion structures at Kansas Ave. and modify the existing road bed to prevent erosive degradation of the road bed due to water flowing over it. A pool riffle will be constructed at the Brown Ditch culvert and at the culverts north of Brown Ditch. The pool riffle at Brown Ditch will be approximately six inches higher than the pool riffle constructed at the north culverts. The pool riffle systems will provide an average water depth at an elevation of 598 MSL, which will retain surface water two to three feet below Central Ave. and Beverly Drive. Alternative 3 will restore historic water depths west of Kansas Ave., facilitate a broad flow of water between Kansas Ave. and Central Ave., and a range of wetland hydrology from saturated soils to a water depth of three feet between Kansas Ave. and Central Ave. However, neutralization of potential beaver induced water impacts to the town of Pines would not be accomplished.

Alternative 4: All actions proposed in Alternatives 2 and 3 will be conducted. In addition, a water diversion structure will be constructed at an elevation of 603 to 604 MSL east and adjacent to the western spur of Brown Ditch. A structure that will thwart beaver modification to water flow at the west end of the spur will also be constructed.

Alternative 4 will restore historic hydrology west of Kansas Ave, facilitate a broad flow of water and a range of wetland hydrology from saturated soils to a water depth of three feet between Kansas Ave. and Central Ave. Neutralization of beaver induced water impacts to the town of Pines will be accomplished.

Unit 2:

Carolina Ave. divides Unit 2 into a west and east subunit. Carolina Ave. was constructed in part with steel mill slag.

Alternative 1: No Action – No action will not provide the desired water depths and a broad flow of water from Central Ave. to Kintzele Ditch. Ecosystem services will not be restored.

Alternative 2: Due to concerns pertaining to steel mill slag present on Carolina Ave., a berm will be constructed at Carolina Ave. extending from Brown Ditch north to Beverly Drive. Areas of degradation in ditch overcast north of Brown Ditch will be corrected with a water flow feature constructed to facilitate flow of water into Brown Ditch immediately west of Carolina Ave. Alternative 2 will provide desired wetland hydrology in Unit 2 west of Carolina Ave. but not east of Carolina Ave.

Alternative 3: Breaches in ditch overcast north of Brown Ditch will be removed preventing water flow from Unit 2 into Brown Ditch. Twenty-five to thirty feet of Carolina Ave. adjacent to Beverly Drive will be modified to facilitate west to east water flow over Carolina Ave. Breaches in ditch

overcast west of Kintzele Ditch will be removed followed by construction of spillway features that will facilitate a flow of water into Kintzele Ditch.

The water flow structures at Carolina Ave. and Kintzele Ditch will be at an elevation of 596MSL. The water flow structures will provide restoration of targeted wetland hydrology. Maximum water depths will be retained at one to two feet below Beverly Drive.

Unit 3:

Unit 3 extends east from Brown Ditch to Central Ave. Its northern boundary is Brown Ditch and the southern perimeter is the Calumet Trail. Based on soil analyses the majority of the area west of Kansas Ave. was historically not wetland and was vegetated by trees and areas of prairie forbs/grasses. Approximately 60 percent of the area east of Kansas Ave. to Central Ave. was wetland. Soil analysis documented that prior to drainage of the Unit, the wetland of Unit 3 was wet-mesic prairie, a wetland type vegetated by forbs, grasses, and sedges.

Alternative 1: No Action – No action will retain the historic wetland as upland due to drainage of water into Brown Ditch. Invasive shrubs and forbs will continue to expand removing desired habitat and recreational opportunities.

Alternative 2: Breaches in ditch overcast and movement of water to Brown Ditch through ditches will be prevented. Wetland hydrology will be restored to lands with hydric soils. However, high quality vegetation associated with wet-mesic prairie will not establish without a positive anthropogenic based driver.

Alternative 3: Breaches in ditch overcast and movement of water to Brown Ditch through ditches will be prevented. Native plant assemblages will be established through removal of invasive shrubs/forbs and installation of plants and seed. The tree canopy east of Kansas Ave. will be reduced by 30 to 40 percent.

Unit 4:

Vegetation and hydrology present in Unit 4 reflects extreme negative anthropogenic drivers comprised of removal of high quality historic vegetation through drainage of wetland hydrology for farming and implementation of urban infrastructure. Based on soil analysis, approximately 90 percent of Unit 4 was wetland comprised of wet-mesic prairie, wet meadow, and shallow marsh.

Alternative 1: No Action – No action will preserve an anthropogenic derive landscape that provides a negative viewshed and minimal ecosystem services.

Alternative 2: Wetland hydrology will be restored through three actions: 1. Movement of water through ditches will be prevented; 2. Breaches in ditch overcast that facilitates flow of water into Brown Ditch will be removed; 3. A trench of approximately three feet in width and four feet in depth will be constructed in portions of Unit 4 south of Brown Ditch. The trench will be filled with clay. The above actions will restore wetland hydrology to Unit 4. However, the vegetation will continue to reflect negative human influence.

Alternative 3: Wetland hydrology will be restored as given in Alternative 2. In addition, high quality native plant assemblages present prior to human removal of them will be established. The following actions will be taken to establish the historic high quality native plant assemblages: 1. The extensive presence of non-native shrubs will be eradicated; 2. Approximately 80 percent of woody vegetation that colonized following land disturbance will be removed; 3. Native plants will be installed and seeded.