Appendix 9.12: Peters Marsh

Written by Erin Giese and Dr. James Horn

<table>
<tr><td>Location (centroid)</td><td>Lat. 44.584690°, Lon. -88.019994°[1] (NAD 1983, UTM Zone 16N)</td></tr>
<tr><td>Total Area (ha)</td><td>106.63 ha</td></tr>
<tr><td>Area Public Land (ha)</td><td>94.37 ha</td></tr>
<tr><td>Area of Habitat Types Present (ha) and Percent of Each Habitat Type</td><td>Dominant Habitat Types: These habitat types were documented during a July 2015 habitat mapping effort led by the University of Wisconsin-Green Bay Cofrin Center for Biodiversity (CCB) across the Lower Green Bay and Fox River Area of Concern (LGB&FR AOC)[3]. Habitat types within Peters Marsh are displayed as a static map at the bottom of this document. Note that the extent of submergent marsh was refined by the CCB's 2017 submerged aquatic vegetation field surveys. There is a total of 104.25 ha of natural habitat within Peters Marsh.

<table>
<tr><th>Habitat Type</th><th>Area (ha)</th><th>Percent</th></tr>
<tr><td>Emergent Marsh (High Energy Coastal)</td><td>50.76</td><td>48.69</td></tr>
<tr><td>Hardwood Swamp</td><td>0.84</td><td>0.81</td></tr>
<tr><td>Other Forest</td><td>0.48</td><td>0.46</td></tr>
<tr><td>Shrub Carr</td><td>11.31</td><td>10.85</td></tr>
<tr><td>Submergent Marsh</td><td>39.4</td><td>37.79</td></tr>
<tr><td>Surrogate Grassland (Old Field)</td><td>0.46</td><td>0.44</td></tr>
<tr><td>Tributary Open Water</td><td>1</td><td>0.96</td></tr>
</table>

Disclaimer! Because this priority area is located within the Great Lakes coastal zone, the amount of habitat types can vary drastically across years and even within years (or months) due to changing Great Lakes water levels, precipitation, and seiche. Within this priority area specifically, the amounts of emergent and submergent marsh are known to fluctuate significantly from year to year and within years. The habitat types listed above and mapped below are based on a field effort conducted in July 2015. Plants recorded in the "Natural Habitat Communities and Significant Plants" section were primarily documented in July 2015 and late summer/fall of 2016 and 2017. Great Lakes water levels were much higher in 2016 and 2017 than in July 2015.</td></tr>
<tr><td>General Description</td><td>Peters Marsh is a relatively large priority area located along the west shore of the bay of Green Bay just south of Lineville Road that is almost entirely publicly owned by Brown County and the Wisconsin Department of Natural Resources. Its eastern border is protected from wave action by Bayshore Drive and the Cat Island Wave Barrier (fully constructed in 2013), though the southern part of the marsh is open and exposed to the bay, seiche, and wave action. Like much of the west shore, it primarily consists of Roscommon muck and Tedrow loamy fine sand soils[2]. Depending on lake levels, it is primarily dominated by emergent and submergent marsh that naturally grades into shrub carr[3,4,5]. Unfortunately, most of the emergent marsh is dominated by a monoculture of the invasive hybrid cattail (Typha × glauca), common reed (Phragmites australis; hereafter referred to as "Phragmites"), and reed canary grass (Phalaris arundinacea), quite unlike the historical assemblage of native plants that formerly were dominants, which includes sedges, wild rice (Zizania aquatica), wild celery (Vallisneria</td></tr>
</table>

[1] File "AOC_PriorityAreas.v09_20171212.shp"
[2] Soil Survey Geographic (SSURGO) by the United States Department of Agriculture's Natural Resources Conservation Service. Published Dec 2010. Available: http://uwgb.maps.arcgis.com/home/item.html?id=204d94c9b1374de9a21574c9efa31164; accessed 1 Nov 2016.
[3] LGB&FR AOC 2015 habitat field mapping effort
[4] LGB&FR AOC 2017 submerged aquatic vegetation (SAV) field surveys
[5] Kupsky and Dornbush 2017 report: file "Final Report.pdf" for Kupsky's UW-Green Bay thesis

	americana), and cattails (*Typha latifolia*)[6,7]. Despite its current extremely low native plant diversity, it provides critical habitat for muskrats, anurans (frogs + toads), breeding and migratory marshbirds, waterfowl, fish, and insects[7,8].
Special Features	• Important habitat for muskrats in the emergent marsh[8]. • Significant breeding habitat for many marsh-nesting bird species[8] and migratory habitat for waterfowl and songbirds[8,9]. • Important habitat for many fish species in the submergent and emergent marshes[8].
Natural Habitat Communities and Significant Plants[3,4,5] (ordered in terms of ecological importance and size/amount)	Nearly half of Peters Marsh consists of **emergent marsh (high energy coastal)**, which is found across much of this priority area's boundary, including the center. A small **tributary** traverses through this marsh and runs north/south. Other small patches of emergent marsh (high energy coastal) are found along the eastern edge of this priority area amongst houses facing the bay of Green Bay. The main section of this marsh in the middle of the priority area is largely dominated by hybrid cattail, *Phragmites*, and reed canary grass. Vervain (*Verbena hastata*), spotted joe-pye-weed (*Eutrochium maculatum*), goldenrod (*Solidago* spp.), and European marsh thistle (*Cirsium palustre*) have also been reported here. During higher lake levels, there are usually large pockets of open water in between the plants. Native plants include: • Blue-joint grass (*Calamagrostis canadensis*), rare • Bulbet water-hemlock (*Cicuta bulbifera*), rare • Swamp milkweed (*Asclepias incarnata*), rare • River bulrush (*Bolboschoenus fluviatilis*), rare • Common lake sedge (*Carex lacustris*), rare • Narrow-leaved hedge-nettle (*Stachys tenuifolia*), rare • Softstem bulrush (*Schoenoplectus tabernaemontani*), common locally • Giant burr-reed (*Sparganium eurycarpum*), common locally Along the southern edge of Peters Marsh is **submergent marsh**, the second most common habitat type that makes up almost 38% of the total area. Natives include: • Coon's-tail (*Ceratophyllum demersum*), common • Perennial duckweed (*Lemna turionifera*) • Giant duckweed (*Spirodela polyrrhiza*) • Leafy pondweed (*Potamogeton foliosus*), moderately common • Canada waterweed (*Elodea canadensis*), common locally • Sago pondweed (*Stuckenia pectinata*), common locally • Common bladderwort (*Utricularia vulgaris*), moderately common • Arum-leaved arrowhead (*Sagittaria cuneata*), moderately common Pockets of **shrub carr** are located in the northwestern corner of Peters Marsh with a few small patches in the southwestern section, making up nearly 11% of total habitat area. The shrub carr largely consists of willow (*Salix* spp.), though dogwood (*Cornus* sp.) and buckthorn (family Rhamnaceae) have also been recently reported. Along the eastern edge of Bayshore Drive are private homes with pockets of **hardwood swamp**, **surrogate grassland (old field)**, and **other forest**, which constitute <2% of Peters Marsh's natural habitats.
Significant Animals	**Birds**: • Over 200 bird species have been recorded along parts of the west shore, including[8]:

[6] Matthes 1976: A recreation plan for the west shore wildlands
[7] McLaughlin & Harris 1990: Aquatic insect emergence in two Great Lakes marshes
[8] LGB&FR AOC comprehensive biota database: file "AOCBiota_DB_ShareableVersion_20171210.accdb"
[9] LGB&FR AOC 2016-17 Waterfowl Surveys by Tom Prestby

	○ Four state endangered species (Caspian Tern [*Hydroprogne caspia*], Common Tern [*Sterna hirundo*], Forster's Tern [*Sterna forsteri*], and Peregrine Falcon [*Falco peregrinus*]) ○ Four state threatened species (Great Egret [*Ardea alba*], Acadian Flycatcher [*Empidonax virescens*], Yellow-crowned Night-Heron (*Nyctanassa violacea*), and Cerulean Warbler [*Setophaga cerulea*]) ○ Forty-one Wisconsin Wildlife Action Plan Species of Greatest Concern (e.g., Brown Thrasher [*Toxostoma rufum*], Canada Warbler [*Cardellina canadensis*]) ○ Forty-two state special concern species (e.g., Yellow-billed Cuckoo [*Coccyzus americanus*], Bald Eagle [*Haliaeetus leucocephalus*], Black-throated Blue Warbler [*Setophaga caerulescens*], Purple Martin [*Progne subis*]) ○ Seven International Union for Conservation of Nature-listed species as "vulnerable" (e.g., Rusty Blackbird [*Euphagus carolinus*]) or "near threatened" (e.g., Golden-winged Warbler [*Vermivora chrysoptera*], Red-headed Woodpecker [*Melanerpes erythrocephalus*]) ○ Migratory waterfowl and gulls, including scaup, mergansers, Redhead (*Aythya americana*), teal, Ring-necked Duck (*Aythya collaris*), Ruddy Duck (*Oxyura jamaicensis*), grebes, and others • Despite the emergent marsh's lack of native plant diversity, it provides critical nesting habitat for many marsh- (and sometimes secretive) breeding birds, although the presence of some of these species depends on lake levels[10]: ○ Common Gallinule (*Gallinula galeata*) ○ American Coot (*Fulica americana*) ○ Least Bittern (*Ixobrychus exilis*) ○ American Bittern (*Botaurus lentiginosus*) ○ Pied-billed Grebe (*Podilymbus podiceps*) ○ Marsh Wren (*Cistothorus palustris*) ○ Virginia Rail (*Rallus limicola*) ○ Sora (*Porzana carolina*) ○ Swamp Sparrow (*Melospiza georgiana*) ○ Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) ○ Red-winged Blackbird (*Agelaius phoeniceus*) ○ Green Heron (*Butorides virescens*) ○ Common Yellowthroat (*Geothlypis trichas*) ○ Yellow Warbler (*Setophaga petechia*) **Fish**: • Although >80 fish species have been recorded in the pelagic zone of the lower bay, some of which may use Peters Marsh, only one official record is available at this time, namely the invasive common carp (*Cyprinus carpio*), which has also been recorded spawning in Peters Marsh[5]. Other species that use the bay, include: ○ One federally endangered species: chinook salmon (*Oncorhynchus tshawytscha*) ○ Three state special concern species, including: American eel (*Anguilla rostrata*), banded killifish (*Fundulus diaphanus*), and lake sturgeon (*Acipenser fulvescens*) ○ One International Union for Conservation of Nature-listed species as vulnerable (bloater [*Coregonus hoyi*]) and one as endangered (American eel) ○ Two globally list species (G3 = vulnerable): redside dace (*Clinostomus elongatus*) and lake sturgeon (*Acipenser fulvescens*)

[10] WI Breeding Bird Atlas II Project – data available here: http://ebird.org/ebird/atlaswi/explore

	Mammals: • Although ~50 mammal species are known or are expected to occur along the west shore (e.g., American mink [*Neovison vison*], red fox [*Vulpes vulpes*], North American river otter [*Lontra canadensis*]; as noted in Roznik 1979)[11], only muskrat (*Ondatra zibethicus*), coyote (*Canis latrans*), and eastern chipmunk (*Tamias striatus*) have been officially recorded along the west shore in the southwestern corner. **Anurans**: • Six anuran (frog/toad) species[8,12]: o American toad (*Bufo americanus*), eastern gray treefrog (*Hyla versicolor*), green frog (*Lithobates clamitans*), northern leopard frog (*Lithobates pipiens*), spring peeper (*Pseudacris crucifer*), and wood frog (*Lithobates sylvaticus*) o Northern leopard frog is both a federal and state species of special concern **Arthropods**: • Many different spider species have also been recorded along the southwestern corner of Green Bay's wests shore, including *Tmeticus ornatus*, *Tetragnatha caudate*, and *Larinioides cornutus*[8].
Habitat Quality	Unfortunately, most of the emergent marsh is dominated by a monoculture of the invasive, hybrid cattail (*Typha* × *glauca*), common reed (*Phragmites australis*), and reed canary grass (*Phalaris arundinacea*), quite unlike the historical assemblage of native plants it once included.
Significant Invasive Species Issues	**Invasive Plant Species**: Each of the following species outcompetes and crowds out native plants. Recent herbicide sprayings primarily targeting common reed have been conducted by the WDNR in 2011-2012 throughout the emergent high energy marsh.[13] Then, in 2015-2016, Bay-Lake Regional Planning Commission did some follow up herbicide application in Peters Marsh in 2015 along the southwestern edge of the emergent high energy marsh close to shrub carr.[14] • Hybrid cattail (*Typha* × *glauca*) o Extremely common and widespread in high energy emergent marsh. Outcompetes native species and has developed into a monoculture. • Common reed (*Phragmites australis*) o *Phragmites* is still an ongoing problem in the high energy emergent marsh, though not nearly as difficult as the hybrid cattail. Recent herbicide sprayings have helped to cut back the amount significantly. • Reed canary grass (*Phalaris arundinacea*) o Common in the more upland, northern parts of the emergent high energy marsh. • Eurasian water-milfoil (*Myriophyllum spicatum*) o Relatively uncommon to rare in submergent marsh along the easternmost border of Peters Marsh near houses. **Invasive Animal Species**: • *Birds* o European Starling (*Sturnus vulgaris*)[8] ▪ Poses some threat to native species, particularly cavity nesters (e.g., Tree Swallow), by outcompeting them and occupying

[11] Green Bay West Shores Master Plan Concept Element 1979 by Roznik et al.
[12] Anuran surveys from 2016-17 Great Lakes Coastal Wetland Monitoring Program, per Erin Giese
[13] WDNR Phragmites treatment shapefile: "Aerial.shp"
[14] Bay-Lake Regional Planning Commission Phragmites treatment shapefile: "GLFWRA_Phrag2015_16_aoc.shp"

	potential nest sites; likely to be found near agricultural fields, housing, and open fields; not currently being managed. ○ Exotic bird species, Ring-necked Pheasant (*Phasianus colchicus*), has been recorded in the southwestern corner of the west shore in lower Green Bay; however, it generally does not significantly affect native birds because they typically inhabit human areas (e.g., developed or agricultural areas)[8]. • *Fish* ○ Common carp (*Cyprinus carpio*)[5] ▪ Destroy vegetation by uprooting plants and increasing cloudiness of water; not currently being managed[15].
Management and Restoration Recommendations	• Control invasive plant species (e.g., *Phragmites*, hybrid cattail) and maintain an appropriate mix of open water native emergent vegetation in west shore marshes. • Create nest structures for Black Tern (*Chlidonias niger*) and Forster's Tern. • Establish safe road crossings at strategic areas for anurans and turtles. • Continue investigating the re-establishment of wild celery and wild rice in the submergent marsh by determining substrate needs for target plant species and then enhance and restore substrate condition. • Improve and maintain a high quality, native mix of submergent and emergent plants. • Maintain sustainable populations of muskrat. • Establish safe road crossings at strategic areas for anurans and turtles. • Conduct aquatic invertebrate baseline study and continue investigating the possibility of reintroducing mayflies (e.g., *Hexagenia* sp.).
Reference Links and Documents	**Links**: • Topographic Map of Peters Marsh: https://www.topozone.com/wisconsin/brown-wi/swamp/peters-marsh/ **Reference Documents**: • Dorney, J.R. 1975 The vegetation pattern around Green Bay in the 1840s as related to geology, soils, and land use by Indians with a detailed look at the Townships of Scott, Green Bay, and Suamico. Book available through the UW-Green Bay Cofrin Library Archives and Area Research Center. • Draney, M. L., and Jaskula, J. M. 2004. Araneae and Opiliones from Typha spp. and *Phragmites australis* stands of Green Bay, Lake Michigan, and an exotic spider species newly reported from the U.S. Great Lakes region. The Great Lakes Entomologist 37(3-4):159-164. • Harris, H. J. and R. S. Cook. 1973. Preimpoundment baseline studies of the Peters Marsh Wildlife Area. Preliminary report. • Herdendorf, C. E., S. M. Hartley, and M. D. Barnes. 1981. Fish and wildlife resources of the Great Lakes coastal wetlands within the United States. FWS/OBS-81/02. U.S. Fish and Wildlife Service Technical Report 5(3), 383 pp. • Kupsky, B. and M. Dornbush. 2017. Cat Island and Duck Creek Delta Restoration: Restoring Green Bay Aquatic Vegetation Final Report. Final report submitted to Ducks Unlimited in January 2017. • Matthes, L. R. 1976. A recreation plan for the west shore wildlands. Report. 84 pp. • McLaughlin, D. B. and H. J. Harris. 1990. Aquatic insect emergence in two Great Lakes marshes. Wetlands Ecology and Management 1(2):111-121. • Roznik, F. D. 1978. Response of the Yellow-headed Blackbird to vegetation and water level changes in coastal marshes of Green Bay. Thesis. University of Wisconsin-Green Bay, Green Bay, Wisconsin.

[15] Nico, L., E. Maynard, P.J. Schofield, M. Cannister, J. Larson, A. Fusaro, and M. Neilson. 2016. *Cyprinus carpio*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=4 Revision Date: 7/15/2015. Accessed 17 Oct 2016.

Site History (e.g., original vegetation, past conservation projects)	In the early 1630s, Frenchman Jean Nicolet first arrived in lower Green Bay when it was primarily inhabited by Native American tribes[16]. Lower Green Bay consisted of large beds of wild rice (*Zizania* sp.) and wild celery (*Vallisneria americana*), extensive emergent marsh (*Schoenoplectus* sp., cattail), sedge meadows (*Calamagrostis canadensis*), shrub carr (e.g., *Cornus* spp., *Salix* spp.), swamps, and wet conifer forest (black spruce [*Picea mariana*], balsam fir [*Abies balsamea*])[17,18,19,20,21,22]. Between the late 1600s and 1800s, European fur trade, duck hunting, fishing, logging, shipping, and agriculture were important early industries in lower Green Bay[23,24,25]. In the early 1800s, there were a few small settlements and farms of Europeans and Native Americans in the lower bay[24]. In late August and September 1840, surveyors of the Wisconsin Public Land Survey System (PLSS) noted that along the coastal area close to Peters Marsh there were natural, wet meadows with neighboring areas of tamarack (*Larix laricina*) and oak (*Quercus* sp.)[26]. Similarly, Dorney (1975) reported that parts of Peters Marsh consisted of tamarack (*Larix laricina*) as well as neighboring grassy marshes[27]. According to other sources, sedges, wild rice, wild celery, and cattails were found in Peters Marsh with the vegetation varying of course due to lake levels[6,7]. By the mid-1970s, the wild rice and wild celery beds were gone[6], largely due to carp, which are known to destroy plants by uprooting them as well as declining water quality in Green Bay[28]. However, sedges, grasses, and shrub carr still remained[6,29]. The bands of shrub carr of Peters Marsh were dominated by willow (*Salix* sp.) along the middle/center and tag alder (*Alnus incana*) along the far western edge[6]. The Arnold Otto Peters family owned most of the present day Peters Marsh with the exception of the land east of Bayshore Drive, which was owned by Elmer Dickinson, Alton Van Gemert, Serena Salscheider, and Peaks Rite Retrievers Club (ownership based on old paper property map with no date). Eventually, the Fort Howard Foundation owned most of the property but ultimately donated the land to Brown County in the early 1970s[31]. A few years later, the state of Wisconsin acquired part of Peters Marsh starting in December 1978[31]. Today, the Otto Peters family still owns a small parcel on the east side of Bayshore Drive, while the bulk of the marsh is owned by Brown County and to a lesser extent by the WDNR. According to a study conducted in the early 1970s, Peters Marsh provided critical breeding habitat for many bird species, some of which are rare or gone today, including

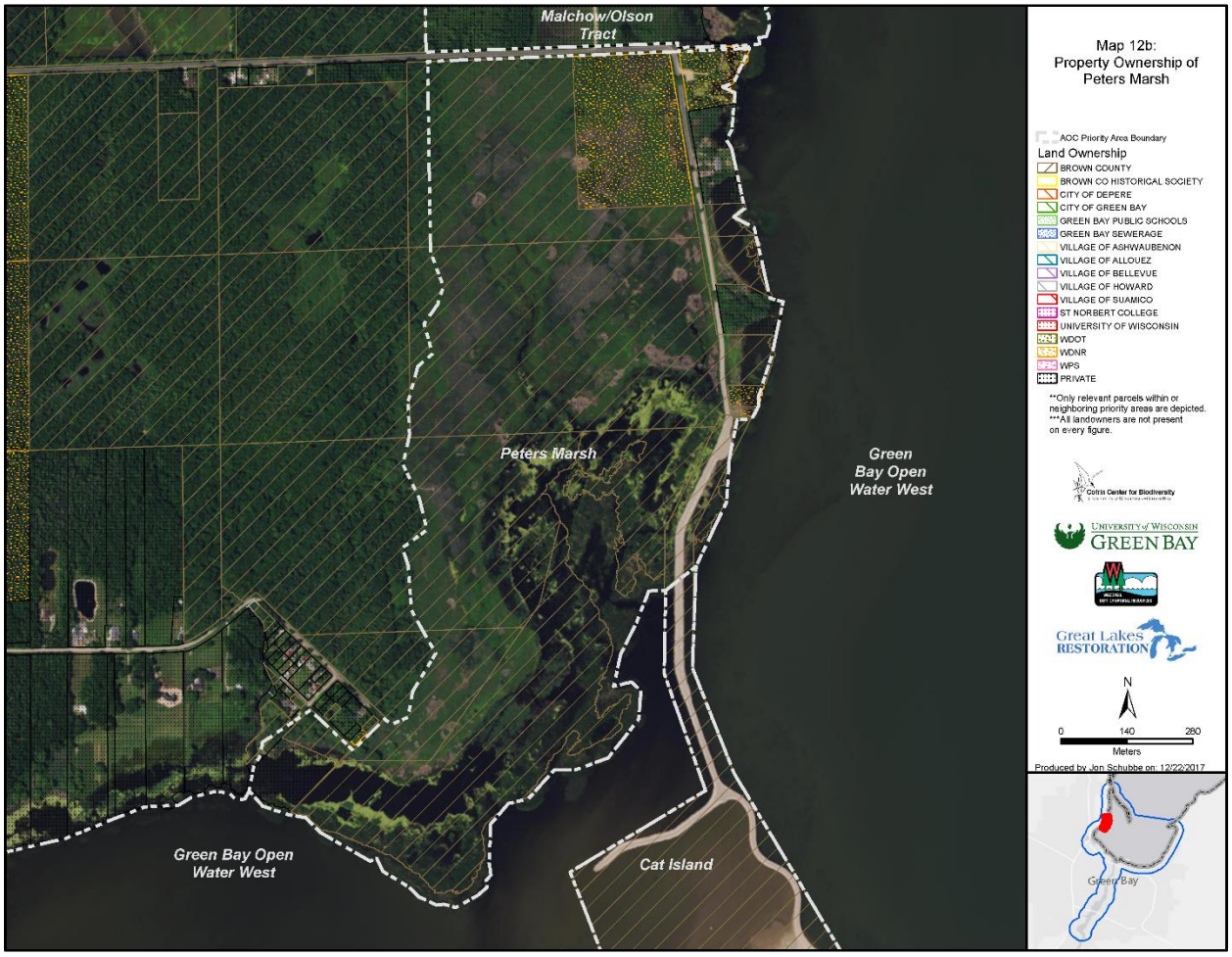
[16] Jean Nicolet: French Explorer. By The Editors of Encyclopaedia Britannica. Available: https://www.britannica.com/biography/Jean-Nicolet (accessed on 24 Oct 2016).
[17] Arthur C. Neville's Map of Historic Sites on Green Bay, Wisconsin 1669-1689. Available: http://s3.amazonaws.com/labaye/data/Bay%20Settle ment%20Map%20WI%20Historical%20Bulletin%201926.pdf (accessed on 24 Oct 2016).
[18] Survey of the N.W. Lakes: East Shore of Green Bay 1843. Available: http://s3.amazonaws.com/labaye/data/1843%20East%20Shore%20of %20Green%20Bay.jpg (accessed on 24 Oct 2016).
[19] 1845 Chart of Green Bay. Available http://s3.amazonaws.com/labaye/data/1845%20Chart%20of%20Green%20Bay.pdf (accessed on 24 Oct 2016).
[20] 1820s Fox River Military Road Map to Ft. Crawford. Available: http://s3.amazonaws.com/labaye/data/1820s%20Fox%20River%20Military%20 Road%20Map%20to%20Ft.%20Crawford.pdf (accessed on 24 Oct 2016).
[21] UW-Green Bay personal communication with Thomas Erdman.
[22] 1845 Map of western lower Green Bay. Available: http://browncounty.maps.arcgis.com/apps/StorytellingSwipe/index.html?appid=72615351 ef33434e9a6a1bb5fffdbe9c&webmap=02074b6abfc44b88bfe9e96afe90a014 (accessed on 28 Oct 2016).
[23] City of Green Bay's History Webpage: http://www.ci.green-bay.wi.us/history/1800s.html (accessed on 20 Oct 2016).
[24] Excerpt from "Recollections of Green Bay in 1816-17" by James W. Biddle. Available: http://s3.amazonaws.com/labaye/data/Recollections %20of%20Green%20Bay%20in%201816-1817.pdf (accessed on 24 Oct 2016).
[25] The Early Outposts of Wisconsin: Green Bay for Two-Hundred Years, 1639-1839. Available: http://labaye.org/item/70/2810 (accessed on 25 Oct 2016).
[26] Wisconsin Public Land Survey System (1834) from file "PLSS_SurveyData.shp"
[27] The vegetation pattern around Green Bay in the 1840s as related to geology, soils, and land use by Indians with a detailed look at the Townships of Scott, Green Bay, and Suamico by John Dorney, 1975.
[28] Howlett, Jr. 1974: The rooted vegetation of west Green Bay with reference to environmental change
[29] Harris and Cook 1973: Preimpoundment baseline studies of the Peters Marsh Wildlife Area.

	Black Tern (nested on muskrat houses through the 1980s[30]), Yellow-headed Blackbird, Mallard (*Anas platyrhynchos*), Northern Pintail (*Anas acuta*), Gadwall (*Anas strepera*), teal, American Coot, Common Gallinule, Least Bittern, Sora, King Rail (*Rallus elegans*), Virginia Rail (*Rallus limicola*), Wilson's Snipe (*Gallinago delicata*), Common Tern, Forster's Tern, Marsh Wren, and many others[29]. The marsh also served as a migratory stopover site for waterfowl, waterbirds, landbirds, songbirds, and shorebirds[29]. Despite providing important bird habitat, many outbreaks of botulism occurred in Peters Marsh and other neighboring west shore marshes, thus negatively affecting many waterbirds[31]. Unfortunately, by the late 1990s and early 2000s, lake levels dropped around the same time that *Phragmites* arrived in lower Green Bay. Like most of Green Bay's marshes and other habitats, Peters Marsh soon became invaded by *Phragmites*, which in turn outcompeted the native sedges and grasses that once dominated this marsh. The hybrid cattail also took over the wetter parts of the marsh, which also outcompeted native plants. Thus, today, Peters Marsh is a rather large monoculture of hybrid cattail and *Phragmites* with reed canary grass in the northern section of the marsh where it is drier, though some natives still persist. In 2011-2012, the WDNR applied herbicide primarily targeting *Phragmites* throughout the emergent high energy marsh.[32] Then, in 2015, the Bay-Lake Regional Planning Commission did some follow up herbicide application in Peters Marsh along the southwestern edge of the emergent high energy marsh close to shrub carr.[33] Despite these invasive treatments, the monoculture of hybrid cattail is still prominent today, though there are some native emergent and submergent plants along the southern end of the marsh. Recent efforts have been made to try to re-establish wild celery and wild rice. In June 2015, under the guidance of UW-Green Bay's Dr. Mathew Dornbush, graduate student Brianna Kupsky investigated establishing wild rice, wild celery, and hard-stem bulrush (*Schoenoplectus acutus*) at multiple locations in the southern portion of Peters Marsh[5]. The success of these plantings was mixed. Hard-stem bulrush plantings did not do well, largely due water depth and possibly herbivory. Wild rice overall did not do very well though Kupsky suspects that it might thrive in more open water along the southern edge of the marsh. Lastly, wild celery was the most tolerant of the three species and survived the best. As a follow-up study, Dr. Amy Carrozzino-Lyon, Dr. Patrick Robinson, and others are leading an effort to reintroduce wild rice along the west shore from the Duck Creek area up to Seagull Bar in Marinette, WI, including Peters Marsh. They seeded rice this fall (2017). More results to come. For the past two years, the WDNR has constructed and placed artificial nesting platforms in Peters Marsh to try and encourage Black Terns to nest there[34]. While Black Terns have been found in the LGB&FR AOC during the breeding season, they have not used these nesting platforms, and no one has confirmed breeding for this species yet in the lower bay[10].

[30] AOC Stakeholder's Meeting on 23 June 2015; noted by Dr. H.J. "Bud" Harris
[31] Roznik 1979 Concept Element of the Green Bay West Shore Wildlife Area Master Plan
[32] WDNR Phragmites treatment shapefile: "Aerial.shp"
[33] Bay-Lake Regional Planning Commission Phragmites treatment shapefile: "GLFWRA_Phrag2015_16_aoc.shp"
[34] Personal communication with Joshua Martinez

Map of Peters Marsh plant communities, which are delineated based on the UW-Green Bay 2015 habitat mapping effort and 2017 submerged aquatic vegetation surveys. Map made by UW-Green Bay's Jon Schubbe.

Land ownership boundaries at Peters Marsh. Map made by UW-Green Bay's Jon Schubbe.



Photograph of Peters Marsh facing west. Photograph taken by Erin Giese on 2 December 2016.