RIVER RAISIN WETLAND ENHANCEMENT AND HABITAT EVALUATION:

SPRING 2011 SHOREBIRD AND HABITAT MONITORING

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INTRODUCTION

The River Raisin Area of Concern (AOC) on the west shore of Lake Erie in Monroe County was designated in 1987 due to several Beneficial Use Impairments (BUIs; Figure 1). The River Raisin Wetland Enhancement and Habitat Evaluation project was initiated in 2010 to address the "Loss of Fish and Wildlife Habitat" and "Degradation of Fish and Wildlife Populations" BUIs. Michigan Department of Natural Resources (DNR) received financial support for this project in the amount of $1.35 million from the U.S. Environmental Protection Agency through the Great Lakes Restoration Initiative. This project has three major components designed to address these BUIs: (1) improving water level control capability in 310 acres of marsh at Sterling State Park by repairing dikes and installing water control structures to provide stopover habitat for shorebirds and allow invasive plant control; (2) controlling common reed (*Phragmites australis*) on approximately 1,100 acres of public and private land in north River Raisin delta wetlands; and (3) collecting baseline data on wetland community conditions and key species in the project area and monitoring changes in those components over time.

Dike repair and water control structure installation activities will occur at Hunt Club Marsh and Union Camp Marsh at Sterling State Park (Figure 1). The monitoring plan calls for shorebird use and habitat conditions to be monitored at both marshes for one year prior to and four years after construction to evaluate the success of the project in improving conditions for migrant shorebirds. The Michigan Natural Features Inventory (MNFI) was contracted to develop a monitoring protocol for shorebirds and shorebird habitat (see Monfils 2011) and conduct spring 2011 baseline shorebird surveys. This report summarizes the results of the spring 2011 surveys.

METHODS

Shorebird Surveys

We conducted eight spring and two fall season shorebird and habitat surveys according to the approved protocol, which is consistent with the guidelines of the Program for Regional and International Shorebird Monitoring (PRISM; Bart et al. 2002) and International Shorebird Surveys (ISS; Manomet Center for Conservation Sciences [MCCS] 2011). We conducted surveys at approximately 10-day intervals according to Option 1 of the ISS protocol (MCCS 2011). The time span between surveys was sometimes more or less than 10 days due to unsuitable weather conditions.

We rotated the order in which the units were surveyed every visit to avoid having the same unit surveyed at the same approximate time of day. The marsh units were surveyed at the designated observation points in order of identification number (Figure 2). We conducted surveys in the morning (between sunrise and 12:00 hr) and avoided doing surveys during high winds (>25 km/hr) or heavy precipitation. Shorebirds were surveyed for at least 10 min at each observation point, but total survey time spent at each point varied depending on the number of birds present. At each observation point, we picked an obvious starting point to survey the marsh unit (or portion visible) and gradually scanned across the area with binoculars/spotting scope. Shorebirds groups were recorded by species and group, with groups of shorebirds or individuals separated by >25 m considered separate groups.

Figure 1. Project area for the River Raisin Wetland Enhancement and Habitat Evaluation project in Monroe County, Michigan.

Figure 2. Locations of observation points and GPS control points used during shorebird surveys conducted at the Hunt Club (HC) and Union Camp (UC) marshes of Sterling State Park, Michigan in 2011.

We recorded the following information for each group observed: (1) species or lowest field-identifiable taxonomic unit; (2) number of individuals; (3) level of accuracy in group count; (4) distance from the observer; (5) dominant wetland type being used; and (6) location on an aerial photograph. If we were unable to identify a group to a lower taxonomic unit, we recorded unidentified shorebirds by the following size classes (Skagen et al. 2011): (1) peep (e.g., Least and Semipalmated Sandpipers); (2) small (i.e., smaller than Killdeer); (3) medium (i.e., larger than Killdeer and smaller than Black-necked Stilt); and (4) large (i.e., larger than Black-necked Stilt). Flying shorebirds were only counted if they originated from or landed in the marsh being surveyed. The dominant wetland type being used by the majority of individuals in each bird group was classified when first observed. We assigned codes for wetland class, water depth, vegetation height, and vegetation density according to the protocol. To minimize the chance of double-counting bird groups, we mapped the approximate location of each group on aerial photographs provided on the data forms. We also recorded new bird observations while moving between observation points and noted in the comments section of the data form that the birds were seen while moving between survey points.

Other Bird Species

Given low numbers of shorebirds on the marsh units, we also recorded observations of waterfowl (i.e., ducks, geese, and swans) and waterbirds (i.e., cranes, coots, moorhens, grebes, gulls, and terns), which will provide additional information on bird response to future management. Waterfowl and waterbird observations were recorded in the same manner described above for shorebirds, including group definition, distance estimation, wetland type classification, and location. Flying birds (e.g., terns) were only counted if they were actively foraging over the area being surveyed. We also noted observations during the breeding season of bird species listed as federally endangered or threatened or State endangered, threatened, or special concern using a MNFI Special Animal Survey Form (see Appendix A).

Wetland Characterization

Wetlands conditions within each subunit were characterized immediately after surveys were completed on the same day using combinations of wetland class, water depth, vegetation height, and vegetation density identified in the protocol. After each survey, we sketched the approximate boundaries of each wetland type (i.e., combination of wetland class, water depth, vegetation height, and vegetation density) occurring within each subunit (Figure 3) on aerial photographs provided on the data forms. Once the approximate boundaries of the wetland types present in the subunit were mapped, we estimated the percent of the total area of the subunit made up by each wetland type. We also took photographs at each observation point to document the conditions when the surveys were conducted and wetlands were characterized. We used the recommended azimuths provided in the protocol for each observation point. Files for digital photographs were named according to the observation point identifier, azimuth, and survey date (i.e., identifier_azimuth_date).

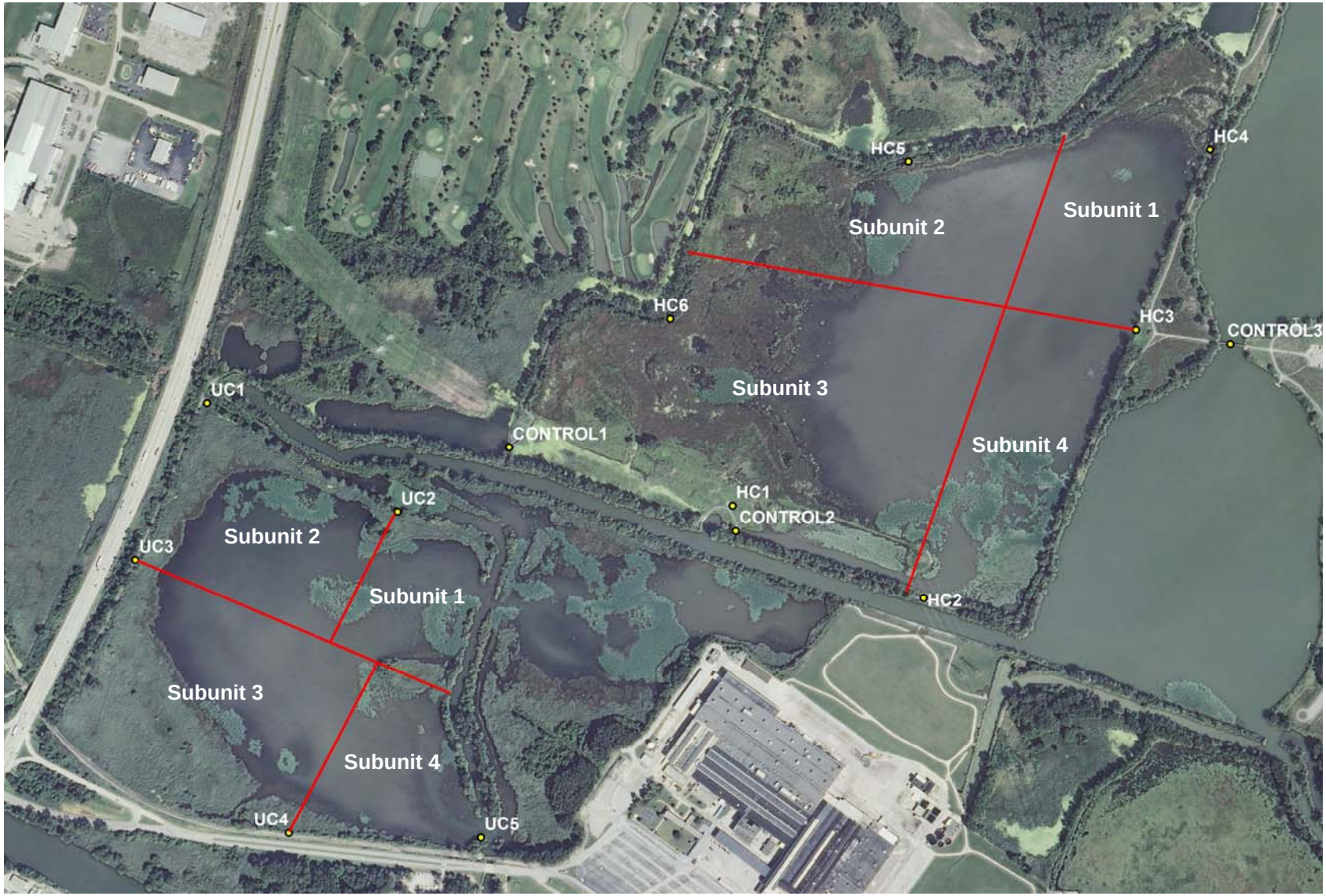

Figure 3. Locations of subunits used during wetland characterizations conducted at the Hunt Club (HC) and Union Camp (UC) marshes of Sterling State Park, Michigan in 2011.

RESULTS AND DISCUSSION

Bird Surveys

Thirty species of waterfowl, waterbirds, and shorebirds were observed overall at the two marsh units during spring and summer 2011. Twenty four species were documented in Hunt Club Marsh (Table 1) and 22 species were recorded in Union Camp Marsh (Table 2). Common and scientific names for the species observed are provided in Appendix B according to the American Ornithologists' Union (AOU) checklist of North American birds (AOU 1998).

Few shorebirds were observed during surveys relative to numbers of waterfowl and waterbird recorded (Tables 1 and 2). We only observed three shorebirds during surveys at Hunt Club and 69 shorebirds at Union Camp Marsh, which made up <1% and 7% of the total birds observed in each unit, respectively. More shorebird species were documented at Union Camp compared to Hunt Club Marsh. Killdeer and Spotted Sandpiper were the only species observed at Hunt Club, whereas those species, Greater Yellowlegs, Least Sandpiper, and Wilson's Snipe were recorded at Union Camp Marsh. Killdeer was the most common shorebird species observed overall.

At Hunt Club Marsh, waterfowl and waterbirds each made up approximately half of the total birds observed during surveys. Canada Goose was the most abundant species, followed by Ruddy Duck, Mallard, Mute Swan, and Wood Duck. We observed Canada Goose, Mute Swan, Wood Duck, and Mallard regularly during surveys and documented evidence of breeding (i.e., incubating birds or flightless young). Other waterfowl species were recorded during spring migration. Double-crested Cormorant was the most abundant waterbird species recorded. Great Blue Heron, Great Egret, Ring-billed Gull, and Herring Gull were also commonly observed.

Waterfowl represented approximately 39% and waterbirds 54% of the total birds recorded at Union Camp Marsh. Species composition was similar that of Hunt Club Marsh. Canada Goose was the most common waterfowl species observed, followed by Mallard and Wood Duck. We observed Canada Goose nesting in the marsh unit and recorded flightless broods for Canada Goose, Wood Duck, Mallard, and Blue-winged Teal (outside of surveys). Other waterfowl species were observed during spring migration. Double-crested Cormorant was the most abundant waterbird, with Great Egret and Ring-billed Gull second and third most common, respectively. Herring Gull and Great Blue Heron were also regularly recorded.

Four rare bird species, Least Bittern (state threatened), Osprey (state special concern), Bald Eagle (state special concern), and Marsh Wren (state special concern), were documented during surveys. One Least Bittern was seen in suitable nesting habitat at Hunt Club Marsh on April 29. A Least Bittern was heard calling on July 19 after the survey was completed near the location where the first observation was made. Least Bittern has not been previously documented at this site, so these observations will be entered as a new element occurrence in the MNFI database (see Appendix A for special animal form). We regularly observed one or two Ospreys, often perched on nesting platforms, on both marsh units beginning in late May. Two immature Bald Eagles were observed on April 15 and one adult on April 29 at Union Camp Marsh.

Table 1. Number of birds observed by species and date during shorebird surveys conducted at Hunt Club Marsh of Sterling State Park, Michigan in 2011.

Bird Group and Species	5-Apr	15-Apr	29-Apr	5-May	19-May	25-May	6-Jun	17-Jun	19-Jul	27-Jul	Total
Waterfowl											
Canada Goose	11	12	17	19	21	3	4	1	0	7	95
Mute Swan	5	2	5	5	4	2	4	4	6	4	41
Wood Duck	0	0	3	0	0	0	2	5	23	4	37
American Black Duck	6	0	0	0	0	0	0	0	0	0	6
Mallard	7	9	5	3	3	11	0	9	3	0	50
Blue-winged Teal	5	0	2	0	0	0	0	0	0	0	7
Northern Shoveler	4	2	0	0	0	0	0	0	0	0	6
Green-winged Teal	19	0	1	0	0	0	0	0	0	0	20
Bufflehead	0	7	0	0	0	0	0	0	0	0	7
Hooded Merganser	0	2	2	0	0	0	0	0	0	0	4
Red-breasted Merganser	0	0	24	0	0	0	0	0	0	0	24
Ruddy Duck	0	51	0	0	0	0	0	0	0	0	51
Subtotal	57	85	59	27	28	16	10	19	32	15	348
Waterbirds											
Double-crested Cormorant	0	0	159	0	2	1	2	2	0	0	166
Least Bittern	0	0	1	0	0	0	0	0	0	0	1
Great Blue Heron	0	3	6	10	2	3	4	7	4	2	41
Great Egret	0	4	12	18	5	3	1	2	1	2	48
Sora	0	0	0	1	0	0	0	0	0	0	1
American Coot	0	0	0	0	1	0	1	0	0	0	2
Bonaparte's Gull	8	0	1	0	0	0	0	0	0	0	9
Ring-billed Gull	19	12	6	0	0	0	2	0	0	0	39
Herring Gull	20	6	2	6	0	4	1	0	0	0	39
Caspian Tern	0	0	0	0	0	0	0	0	1	0	1
Subtotal	47	25	187	35	10	11	11	11	6	4	347
Shorebirds											
Killdeer	0	0	0	0	0	0	0	0	1	0	1
Spotted Sandpiper	0	0	0	0	0	1	0	1	0	0	2
Subtotal	0	0	0	0	0	1	0	1	1	0	3

Table 2. Number of birds observed by species and date during shorebird surveys conducted at Union Camp Marsh of Sterling State Park, Michigan in 2011.

Bird Group and Species	5-Apr	15-Apr	29-Apr	5-May	19-May	25-May	6-Jun	17-Jun	19-Jul	27-Jul	TOTAL
Waterfowl											
Canada Goose	28	56	19	25	22	22	13	10	29	11	235
Mute Swan	0	2	0	0	0	0	0	0	0	0	2
Wood Duck	0	0	0	0	2	1	2	7	1	5	18
Mallard	5	6	4	0	7	8	7	3	8	18	66
Blue-winged Teal	5	10	0	0	0	0	0	0	0	0	15
Northern Shoveler	0	7	0	1	0	0	0	0	0	0	8
Bufflehead	0	10	0	0	0	0	0	0	0	0	10
Hooded Merganser	0	0	0	4	0	0	0	0	0	0	4
Ruddy Duck	0	10	0	0	0	0	0	0	0	0	10
Subtotal	38	101	23	30	31	31	22	20	38	34	368
Waterbirds											
Pied-billed Grebe	0	0	0	0	0	0	0	0	1	0	1
Double-crested Cormorant	0	0	17	189	29	25	8	3	1	1	273
Great Blue Heron	0	0	0	1	5	4	5	3	4	3	25
Great Egret	0	13	2	11	4	6	5	14	20	15	90
Black-cr. Night-Heron	0	1	0	0	0	0	0	0	0	0	1
Ring-billed Gull	11	2	40	17	6	3	0	0	0	1	80
Herring Gull	8	3	7	9	1	4	1	1	0	0	34
Belted Kingfisher	0	0	0	0	0	0	0	0	0	1	1
Subtotal	19	19	66	227	45	42	19	21	26	21	505
Shorebirds											
Killdeer	5	2	5	5	4	1	1	3	7	11	44
Spotted Sandpiper	0	0	0	1	5	0	0	0	2	3	11
Greater Yellowlegs	0	2	0	0	0	0	0	0	0	0	2
Least Sandpiper	0	0	0	0	7	0	0	0	0	0	7
Wilson's Snipe	0	0	4	0	0	0	0	0	0	0	4
UK Medium Shorebird	0	0	0	0	0	0	0	0	0	1	1
Subtotal	5	4	9	6	16	1	1	3	9	15	69

Given the lack of nesting evidence, the Osprey and Bald Eagle observations will not be entered as element occurrence records in MNFI's Biotics database. Beginning in late May, we regularly observed singing Marsh Wrens in both marsh units. Up to eight singing males were observed in a given survey across both marsh units. Marsh Wrens were consistently observed at several locations in suitable nesting habitat, indicating that breeding likely occurred. The MNFI database does not contain previous records for Marsh Wren, so these observations will be entered as a new element occurrence in the Biotics database.

Wetland Characterization

We characterized potential shorebird habitat within each marsh unit according to observed wetland class, water depth, vegetation height, and vegetation density. Open water was the dominant wetland class and persistent emergent the second most common wetland class observed in both units overall (Figure 4). Except for one early spring survey conducted during strong offshore winds, estimated proportions of mudflat were low compared to open water and persistent emergents. Union Camp Marsh tended to have a greater proportion of mudflat compared to Hunt Club Marsh, although the amount was still small compared to other wetland classes. Small amounts of non-persistent emergents (i.e., American Lotus [*Nelumbo lutea*]) were observed in the early spring at the Hunt Club marsh and in both units during the late summer.

ACKNOWLEDGEMENTS

Funding for this project was provided by the Michigan DNR via a grant provided by the U.S. Environmental Protection Agency through the Great Lakes Restoration Initiative. Glenn Palmgren (DNR) provided substantial advice in the development of the shorebird and habitat sampling protocol.

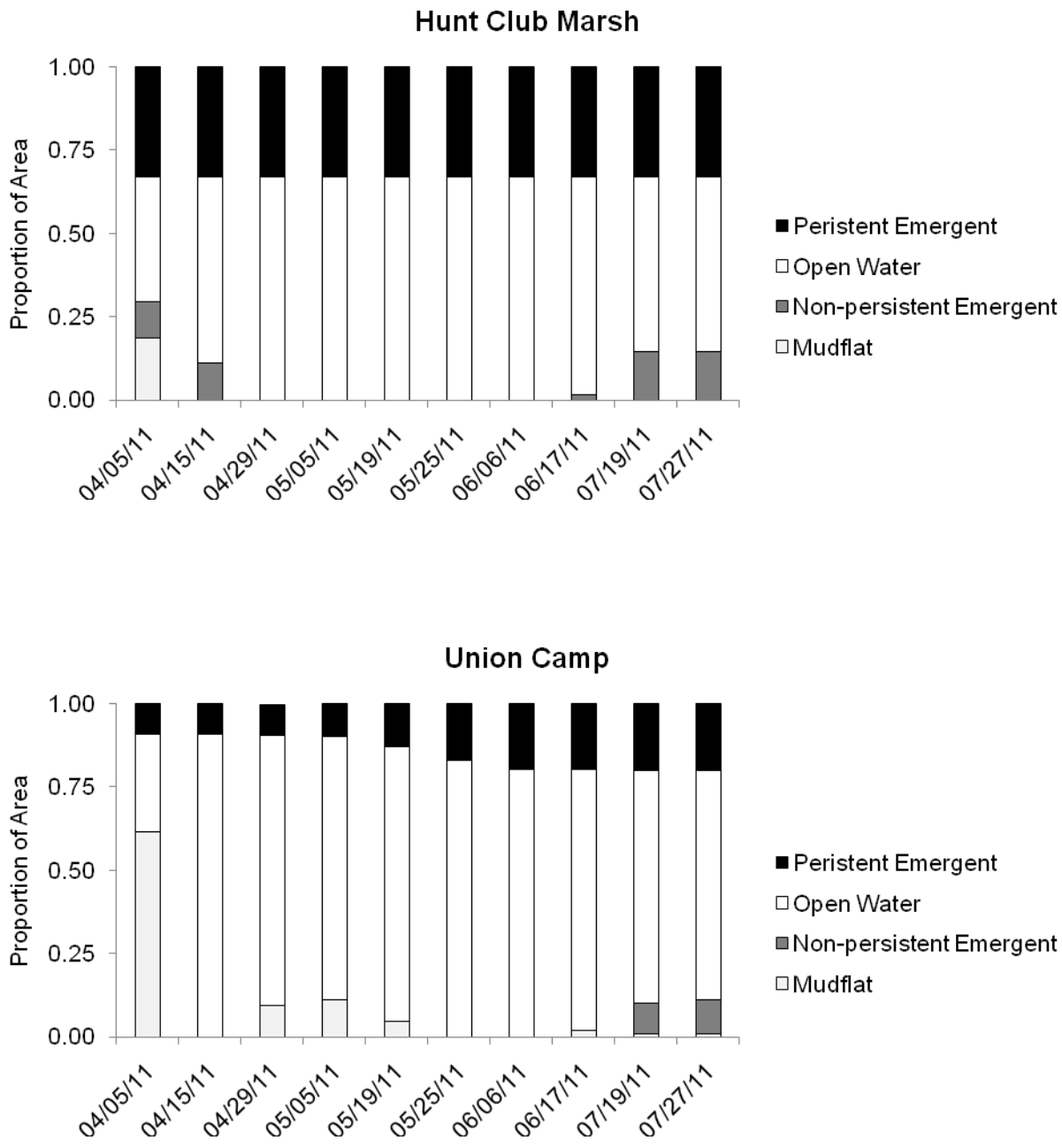

Figure 4. Estimated proportions of the Hunt Club and Union Camp marshes (Sterling State Park, Michigan) consisting of the four major wetland types observed by survey date.

LITERATURE CITED

American Ornithologists' Union. 1998. Check-list of North American Birds. Seventh edition. American Ornithologists' Union, Washington, D.C., USA.

Bart, J., B. Andres, S. Brown, G. Donaldson, B. Harrington, H. Johnson, V. Johnston, S. Jones, R. I. G. Morrison, M. Sallaberry, S. K. Skagen, and N. Warnock. 2002. Program for Regional and International Shorebird Monitoring (PRISM), Version 0.7. Unpublished document.

Manomet Center for Conservation Sciences [MCCS]. 2011. International Shorebird Surveys: guidelines and request for help. < http://www.shorebirdworld.org/template.php?g=13&c=34>. Accessed 1 March 2011.

Monfils, M. J. 2011. River Raisin Wetland Enhancement and Habitat Evaluation shorebird and habitat monitoring protocol. Michigan Natural Features Inventory, Report Number 2011-04. Submitted to the Michigan Department of Natural Resources, Parks and Recreation Division, Lansing, Michigan.

Skagen, S. K., C. P. Melcher, and J. Bart. 2011. Managers' monitoring manual: ground counts of shorebirds at non-breeding sites. U.S. Geological Survey, Patuxent Wildlife Research Center. <http://www.pwrc.usgs.gov/monmanual/techniques/shorebirdsnonbreedingsites.htm>. Accessed 1 March 2011.

APPENDIX A:

MNFI SPECIAL ANIMAL FORMS FOR RARE SPECIES

Michigan Natural Features Inventory

Special Animal Survey Form

MICHIGAN STATE UNIVERSITY EXTENSION

ELEMENT IDENTIFICATION

Data sensitive? ☒ Yes ☐ No

Name (scientific and/or common): Ixobrychus exilis (Least Bitern) EO Rank: E EOID: _____ EO #: _____

SURVEY INFORMATION

Survey date: 4/29/2011-7/19/2011 Time: from _____ ☐AM ☐PM to _____ ☐AM ☐PM Sourcecode: _____

Surveyors (principal surveyor first, include first & last name):

Michael Monfils

Weather conditions: _____

Revisit needed? ☒ Yes ☐ No Why? Periodic surveys to determine if site remains occupied.

LOCATIONAL INFORMATION

Survey site: Sterling State Park Site name: Hunt Club and Union Camp Marshes

Quadcode: _____ Quad name: _____

Township/Range/Section: T07S R09E Section 3 County: Monroe Managed area: yes

DIRECTIONS: Provide detailed directions to the observation (rather than the survey site). Include landmarks, roads, towns, distances, compass directions.

From the North, take I-75 S to exit 15 for Dixie Highway toward downtown Monroe. Turn left onto N Dixie Hwy and take the second right onto State Park Rd. From the South, take I-75 N to exit 15 for Dixie Hwy. Turn right onto N Dixie Hwy and take the second right onto State Park Rd.

Landowner type: ☐ Public ☐ Private ☐ Other: _____

Landowner Name - Contact Information: State of Michigan

Notes: _____

Was a GPS used? ☒ Yes ☐ No Type of unit: Garmin Unit number: GPSMAP 76S

Waypoint name/#: _____ File name and location : Mapped location on aerial photo using known survey point locations.

Latitude: _____ Longitude: _____

Feature Information: (mandatory) Conceptual feature type: ☒ Point: <12.5 m in both dimensions ☐ Line: >12.5 m in one dimension ☐ Polygon: >12.5 m in both dimensions

Source feature: ☐ Single Source EO ☒ Multiple Source EO

MAP (mandatory)

1. Attach appropriate part of a USGS topographic map or map showing exact locations of species. Image can be uploaded into the Map Insert field located at the end of this form or clearly associated with this form once completed.
2. Indicate on the map the exact location of the observation(s):
   a. When the observation area is ***no larger then a pen point*** on the map (i.e., only a small number of individuals or extremely small patches), place small points on the map indicating the location(s) of the individuals or patches, and label each point with an arrow so they are more easily seen.
   b. When the observed area is ***larger then a pen point*** on the map. (e.g., a population of plants, foraging birds):
      (1) Draw a thin solid boundary line showing the extent of the observed area occupied by the individuals.
      (2) Indicate disjunct patches (polygons) by drawing the boundary for each patch separately.
      (3) If the boundary follows the edge of a lake, stream, road, marsh or other feature, draw the boundary precisely on the edge of the feature.
      (4) When needed, add notes to the map with instruction on where the boundary line is located or if the boundary is shared with other observations.
3. A hand drawn sketch may be included for finer details.

LOCATIONAL CERTAINTY

Is your depiction of the observed area on the map within 6.25 m (approx. 20ft) of its actual location on the ground? ☐ Yes ☒ No

If No, complete the following:

a. Estimate of uncertainty distance: based on landmarks, elevation, etc., the location of the observed area on the map is accurate to within

25 ☒ meters ☐ kilometers ☐ feet ☐ miles of its actual location on the ground.

b. Is the observed area known to be located within some feature(s) on the map (e.g., wetland boundary, lake, road, trail, highway, contour lines)? ☐ Yes ☒ No
If Yes, indicate the boundary within which the observed area is known to be located on the map line, and if applicable, identify the feature (e.g., marsh).

IDENTIFICATION

Photo/slide taken? ☒ Yes ☐ No Name and location of photo? Photos only taken of wetland where observations occurred.

Specimen collected? ☐ Yes ☒ No Collection # and repository:

Identification problems? ☐ Yes ☒ No

If necessary, describe the important animal characteristics **you** used for identification:

SIZE OF ELEMENT OCCURRENCE

Size is a quantitative measure of the area and/or abundance of an occurrence. Components of this factor are 1) area of occupancy, 2) population abundance, 3) population density and 4) population fluctuation.

Type of observation: ☐ sight ☒ song/vocalization ☐ road kill ☐ trapped ☐ other (explain):

Abundance (number of pairs, chicks, nests, adults, juveniles, hatchlings, behavior, sex, size of each individual, etc):

Actual number observed:

4/29/2011: 1 seen in suitable nesting habitat, 7/19/2011: 1 heard calling in suitable nesting habitat

Number estimated and basis for estimate:

Assumed one breeding pair was present based on calling male and two observations occurring in the same area over long period of time.

Population density (if practical): number: _____ per area unit: ☐ meters² ☐ kilometers² ☐ feet² ☐ miles²

Does population fluctuate? (May be particularly relevant to invertebrates):

○ Yes ○ No ◉ unknown Explain:

Area of occupancy (fill in one): _____ meters _____ acres _____ miles Type of measurement (check one): ☐ precise ☐ estimate

ASSOCIATED SPECIES

List other species observed at this site. Note especially listed species and potential competitors, predators, and prey. Mark appropriate columns.

Species	ID +	ID ?	Number Observed	Notes, observations, etc.
See River Raisin Shorebird Survey data forms.	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		

CONDITION:

Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health. 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.

EVIDENCE OF REPRODUCTION:

Singing male indicates likely breeding/nesting activity.

EVIDENCE OF DISEASE/PREDATION:

None.

CONDITION (continued):

HABITAT DESCRIPTION: Describe the specific habitat or micro habitat where this animal occurs. Convey a mental image of the habitat and its features including: land forms, aquatic features, vegetation, slope, aspect, soils, natural disturbances.

The sites consist of diked coastal emergent marshes dominated by Typha angustifolia (narrow-leaf cattail) and open water.

LANDSCAPE CONDITION: Describe the condition of the landscape surrounding the elements habitat (i.e., farmland, residential area, pristine forest)

Lake Erie surrounds portions of the Park, while the remainder of the surrounding landscape is predominantly urban with residential areas and an adjacent golf course.

CURRENT THREATS to this occurrence: (i.e., grazing, logging, mining, plantation, ATVs, dumping, etc.) Discuss exotics in the next section.

None observed.

POTENTIAL THREATS to this occurrence:

Water level and invasive species management could potentially cause short-term impacts, but improve habitat conditions over the long term.

EXOTICS PRESENT? : ☒ yes ☐ no If yes, describe their impacts to the occurrence.

Phragmites australis (Phragmites) and Typha angustifolia (narrow-leaf cattail) are present. Impacts to the occurrence are unknown.

PAST IMPACTS to this occurrence: (i.e., logging, etc.)

Unknown.

TOPOGRAPHY

Elevation: _____ ft.

If elevation is a range:

Minimum: _____ ft.

Maximum: _____ ft.

Aspect (down slope):

Measured Aspect: _____ ° (N = 0°)

☐	Flat	
☐	Variable	
☐	N	338 - 22°
☐	NE	23 - 67°
☐	E	68 - 112°
☐	SE	113 - 157°
☐	S	158 - 202°
☐	SW	203 - 247°
☐	W	248 - 292°
☐	NW	293 - 337°

Slope:

Measured Slope: _____ ° _____ %

☒	Flat	0°	0%
☐	Gentle	0 - 5°	0 - 9%
☐	Moderate	6 - 14°	10 - 25%
☐	Somewhat steep	15 - 25°	26 - 49%
☐	Steep	26 - 45°	50 - 100%
☐	Very Steep	45 - 69°	101 - 275%
☐	Abrupt	70 - 100°	276 - 300%
☐	Overhanging/sheltered	> 100°	> 300%

Light:

☒ Open
☐ Partial
☐ Filtered
☐ Shade

Topographic position:

☐ Ridge, summit, or crest
☐ High slope (upper slope, convex slope)
☐ Midslope (middle slope)
☐ Lowslope (lower slope, footslope)
☐ Toeslope (alluvial toeslope)
☒ Low level (terrace lakeplain, outwash plain, lake bed, etc)
☐ Channel
☐ Other: _____

Hydrologic Regime:

Wetlands:

☐ Intermittently flooded
☐ Permanently flooded
☒ Semipermanently flooded
☐ Temporarily flooded (e.g., floodplains)
☐ Seasonally flooded (e.g., seasonal ponds)
☐ Saturated (e.g., bogs, perennial seeps)
☐ Unknown

Non-Wetlands:

☐ Wet Mesic
☐ Mesic (moist)
☐ Dry-Mesic
☐ Xeric (dry)

MANAGEMENT AND PROTECTION

Management (stewardship and restoration), **Monitoring and Research Needs** for the Element at this location (e.g., burn periodically, open the canopy, control invasives, ban ORV's, remove drainage ditches, clear blocked culvert, break drain tile, reduce deer densities, study effects of herbivore impacts)

Periodic surveys are recommended to determine if the site remains occupied over time and to evaluate the effects of planned wetland restoration activities.

Protection Needs for the Element at this location (e.g., protect the entire marsh, the slope and crest of slope)

IMAGE INSERT: **click** on space below and navigate to saved photo, supported formats include BMP, JPG, GIF, PNG, TIF

MAP INSERT: **click** on space below and navigate to saved map file, supported formats include BMP, JPG, GIF, PNG, TIF

Michigan Natural Features Inventory

Special Animal Survey Form

MICHIGAN STATE UNIVERSITY EXTENSION

ELEMENT IDENTIFICATION

Data sensitive? ☐ Yes ☒ No

Name (scientific and/or common): Cistothorus palustris (Marsh Wren) EO Rank: E EOID: _____ EO #: _____

SURVEY INFORMATION

Survey date: 5/19/2011-7/27/2011 Time: from _____ ☐AM ☐PM to _____ ☐AM ☐PM Sourcecode: _____

Surveyors (principal surveyor first, include first & last name):

Michael Monfils

Weather conditions: _____

Revisit needed? ☒ Yes ☐ No Why? Periodic surveys to determine if site remains occupied.

LOCATIONAL INFORMATION

Survey site: Sterling State Park Site name: Hunt Club and Union Camp

Quadcode: _____ Quad name: _____

Township/Range/Section: T07S R09E Sections 3 and 4 County: Monroe Managed area: yes

DIRECTIONS: Provide detailed directions to the observation (rather than the survey site). Include landmarks, roads, towns, distances, compass directions.

From the North, take I-75 S to exit 15 for Dixie Highway toward downtown Monroe. Turn left onto N Dixie Hwy and take the second right onto State Park Rd. From the South, take I-75 N to exit 15 for Dixie Hwy. Turn right onto N Dixie Hwy and take the second right onto State Park Rd.

Landowner type: ☐ Public ☐ Private ☐ Other: _____

Landowner Name - Contact Information: State of Michigan

Notes: _____

Was a GPS used? ☒ Yes ☐ No Type of unit: Garmin Unit number: GPSMAP 76S

Waypoint name/#: _____ File name and location : Mapped location on aerial photo using known survey point locations.

Latitude: _____ Longitude: _____

Feature Information: (mandatory)

Conceptual feature type: ☐ Point: <12.5 m in both dimensions ☐ Line: >12.5 m in one dimension ☐ Polygon: >12.5 m in both dimensions

Source feature: ☐ Single Source EO ☒ Multiple Source EO

MAP (mandatory)

1. Attach appropriate part of a USGS topographic map or map showing exact locations of species. Image can be uploaded into the Map Insert field located at the end of this form or clearly associated with this form once completed.
2. Indicate on the map the exact location of the observation(s):
   a. When the observation area is ***no larger then a pen point*** on the map (i.e., only a small number of individuals or extremely small patches), place small points on the map indicating the location(s) of the individuals or patches, and label each point with an arrow so they are more easily seen.
   b. When the observed area is ***larger then a pen point*** on the map. (e.g., a population of plants, foraging birds):
      (1) Draw a thin solid boundary line showing the extent of the observed area occupied by the individuals.
      (2) Indicate disjunct patches (polygons) by drawing the boundary for each patch separately.
      (3) If the boundary follows the edge of a lake, stream, road, marsh or other feature, draw the boundary precisely on the edge of the feature.
      (4) When needed, add notes to the map with instruction on where the boundary line is located or if the boundary is shared with other observations.
3. A hand drawn sketch may be included for finer details.

LOCATIONAL CERTAINTY

Is your depiction of the observed area on the map within 6.25 m (approx. 20ft) of its actual location on the ground? ☐ Yes ☒ No

If No, complete the following:

a. Estimate of uncertainty distance: based on landmarks, elevation, etc., the location of the observed area on the map is accurate to within

25 ☒ meters ☐ kilometers ☐ feet ☐ miles of its actual location on the ground.

b. Is the observed area known to be located within some feature(s) on the map (e.g., wetland boundary, lake, road, trail, highway, contour lines)? ☐ Yes ☒ No
If Yes, indicate the boundary within which the observed area is known to be located on the map line, and if applicable, identify the feature (e.g., marsh).

IDENTIFICATION

Photo/slide taken? ☒ Yes ☐ No Name and location of photo? Photos only taken of wetland where observations occurred.

Specimen collected? ☐ Yes ☒ No Collection # and repository:

Identification problems? ☐ Yes ☒ No

If necessary, describe the important animal characteristics **you** used for identification:

SIZE OF ELEMENT OCCURRENCE

Size is a quantitative measure of the area and/or abundance of an occurrence. Components of this factor are 1) area of occupancy, 2) population abundance, 3) population density and 4) population fluctuation.

Type of observation: ☐ sight ☒ song/vocalization ☐ road kill ☐ trapped ☐ other (explain):

Abundance (number of pairs, chicks, nests, adults, juveniles, hatchlings, behavior, sex, size of each individual, etc):

Actual number observed:

5/19/2011: 7 observed, 5/25/2011: 7 observed, 6/6/2011: 8 observed, 6/17/2011: 7 observed, 7/19/2011: 2 observed, 7/27/2011: 4 observed

Number estimated and basis for estimate:

Up to 8 breeding pairs based on the observation of singing males in suitable nesting habitat.

Population density (if practical): number: _____ per area unit: ☐ meters² ☐ kilometers² ☐ feet² ☐ miles²

Does population fluctuate? (May be particularly relevant to invertebrates):

○ Yes ○ No ◉ unknown Explain:

Area of occupancy (fill in one): _____ meters _____ acres _____ miles Type of measurement (check one): ☐ precise ☐ estimate

ASSOCIATED SPECIES

List other species observed at this site. Note especially listed species and potential competitors, predators, and prey. Mark appropriate columns.

Species	ID +	ID ?	Number Observed	Notes, observations, etc.
See River Raisin Shorebird Survey data forms.	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		

CONDITION:

Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health. 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.

EVIDENCE OF REPRODUCTION:

Singing male indicates likely breeding/nesting activity.

EVIDENCE OF DISEASE/PREDATION:

None.

CONDITION (continued):

HABITAT DESCRIPTION: Describe the specific habitat or micro habitat where this animal occurs. Convey a mental image of the habitat and its features including: land forms, aquatic features, vegetation, slope, aspect, soils, natural disturbances.

The sites consist of diked coastal emergent marshes dominated by Typha angustifolia (narrow-leaf cattail) and open water.

LANDSCAPE CONDITION: Describe the condition of the landscape surrounding the elements habitat (i.e., farmland, residential area, pristine forest)

Lake Erie surrounds portions of the Park, while the remainder of the surrounding landscape is predominantly urban with residential areas and an adjacent golf course.

CURRENT THREATS to this occurrence: (i.e., grazing, logging, mining, plantation, ATVs, dumping, etc.) Discuss exotics in the next section.

None observed.

POTENTIAL THREATS to this occurrence:

Water level and invasive species management could potentially cause short-term impacts, but improve habitat conditions over the long term.

EXOTICS PRESENT? : ☒ yes ☐ no If yes, describe their impacts to the occurrence.

Phragmites australis (Phragmites) and Typha angustifolia (narrow-leaf cattail) are present. Impacts to the occurrence are unknown.

PAST IMPACTS to this occurrence: (i.e., logging, etc.)

TOPOGRAPHY

Elevation: _____ ft.

If elevation is a range:

Minimum: _____ ft.

Maximum: _____ ft.

Aspect (down slope):

Measured Aspect: _____ ° (N = 0°)

☐	Flat	
☐	Variable	
☐	N	338 - 22°
☐	NE	23 - 67°
☐	E	68 - 112°
☐	SE	113 - 157°
☐	S	158 - 202°
☐	SW	203 - 247°
☐	W	248 - 292°
☐	NW	293 - 337°

Slope:

Measured Slope: _____ ° _____ %

☒	Flat	0°	0%
☐	Gentle	0 - 5°	0 - 9%
☐	Moderate	6 - 14°	10 - 25%
☐	Somewhat steep	15 - 25°	26 - 49%
☐	Steep	26 - 45°	50 - 100%
☐	Very Steep	45 - 69°	101 - 275%
☐	Abrupt	70 - 100°	276 - 300%
☐	Overhanging/sheltered	> 100°	> 300%

Light:

- ☒ Open
- ☐ Partial
- ☐ Filtered
- ☐ Shade

Topographic position:

- ☐ Ridge, summit, or crest
- ☐ High slope (upper slope, convex slope)
- ☐ Midslope (middle slope)
- ☐ Lowslope (lower slope, footslope)
- ☐ Toeslope (alluvial toeslope)
- ☒ Low level (terrace lakeplain, outwash plain, lake bed, etc)
- ☐ Channel
- ☐ Other: _____

Hydrologic Regime:

Wetlands:

- ☐ Intermittently flooded
- ☐ Permanently flooded
- ☒ Semipermanently flooded
- ☐ Temporarily flooded (e.g., floodplains)
- ☐ Seasonally flooded (e.g., seasonal ponds)
- ☐ Saturated (e.g., bogs, perennial seeps)
- ☐ Unknown

Non-Wetlands:

- ☐ Wet Mesic
- ☐ Mesic (moist)
- ☐ Dry-Mesic
- ☐ Xeric (dry)

MANAGEMENT AND PROTECTION

Management (stewardship and restoration), **Monitoring and Research Needs** for the Element at this location (e.g., burn periodically, open the canopy, control invasives, ban ORV's, remove drainage ditches, clear blocked culvert, break drain tile, reduce deer densities, study effects of herbivore impacts)

Periodic surveys are recommended to determine if the site remains occupied over time and to evaluate the effects of planned wetland restoration activities.

Protection Needs for the Element at this location (e.g., protect the entire marsh, the slope and crest of slope)

IMAGE INSERT: **click** on space below and navigate to saved photo, supported formats include BMP, JPG, GIF, PNG, TIF

MAP INSERT: **click** on space below and navigate to saved map file, supported formats include BMP, JPG, GIF, PNG, TIF

APPENDIX B:

SCIENTIFIC AND COMMON NAMES OF BIRD SPECIES OBSERVED

Table C-1. Common and scientific names of bird species observed during shorebird surveys at the Hunt Club and Union Camp marshes of Sterling State Park, Michigan in 2011.

Common Name	Scientific Name
Canada Goose	*Branta canadensis*
Mute Swan	*Cygnus olor*
Wood Duck	*Aix sponsa*
American Black Duck	*Anas rubripes*
Mallard	*Anas platyrhynchos*
Blue-winged Teal	*Anas discors*
Northern Shoveler	*Anas clypeata*
Green-winged Teal	*Anas crecca*
Bufflehead	*Bucephala albeola*
Hooded Merganser	*Lophodytes cucullatus*
Red-breasted Merganser	*Mergus serrator*
Ruddy Duck	*Oxyura jamaicensis*
Pied-billed Grebe	*Podilymbus podiceps*
Double-crested Cormorant	*Phalacrocorax auritus*
Least Bittern	*Ixobrychus exilis*
Great Blue Heron	*Ardea herodias*
Great Egret	*Ardea alba*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Osprey	*Pandion haliaetus*
Bald Eagle	*Haliaeetus leucocephalus*
Sora	*Porzana carolina*
American Coot	*Fulica americana*
Killdeer	*Charadrius vociferus*
Spotted Sandpiper	*Actitis macularius*
Greater Yellowlegs	*Tringa melanoleuca*
Least Sandpiper	*Calidris minutilla*
Wilson's Snipe	*Gallinago delicata*
Bonaparte's Gull	*Chroicocephalus philadelphia*
Ring-billed Gull	*Larus delawarensis*
Herring Gull	*Larus argentatus*
Caspian Tern	*Hydroprogne caspia*
Belted Kingfisher	*Megaceryle alcyon*
Marsh Wren	*Cistothorus palustris*