Beneficial Use Impairment Removal Project

Niagara River Area of Concern Marsh Anuran and Avian Population Monitoring Year 2 (2015) Survey Report



January 21, 2016

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1.0 INTRODUCTION

1.1 BACKGROUND

In 1987 the governments of the United States and Canada identified several areas within the Great Lakes region where environment degradation had occurred due to historic pollution and habitat destruction. The areas were identified and designated for remediation and restoration and referred to as Areas of Concern (AOC). Remedial Action Plans (RAPs) were developed for each AOC and each RAP identified beneficial use impairments (BUI) (i.e., negatively affected chemical, physical, and/or biological properties associated with the AOC) that required restoration or remediation in order to remove the impairment from the list of BUIs associated with AOCs. The 37-mile long Niagara River waterway, which flows from Lake Erie to Lake Ontario, was identified as one of the forty-three AOCs for the Great Lakes region. The Niagara River AOC (NR AOC) is divided into two portions, the New York portion located on the United States side of the river; and the Ontario portion located on the Canadian side of the river. On the U.S. side, the NR AOC extends from Smokes Creek at Buffalo Harbor north to the Niagara River's mouth at Lake Ontario (Figure 1).

The New York State Department of Environmental Conservation (NYSDEC) is currently funded by the United States Environmental Protection Agency (USEPA) to coordinate the Niagara River RAP. Because the Niagara River AOC is a binational AOC, the NYSDEC is coordinating technical assessments and regulatory efforts with the Canadian Niagara River RAP managers. A RAP was developed for the New York portion of the NR AOC (NYSDEC 1994), which identifies and provides the rationale and subsequent remediation plans for several BUIs. A 2012 addendum to the RAP (NR AOC Stage 2 Addendum) describes updated BUI-specific delisting criteria. Included in the delisting criteria for the "Degradation of Fish and Wildlife Populations" BUI, are assessments of 5-year trends in populations of sentinel native species representing the range of trophic levels within aquatic ecosystems (Filipski 2012). In February, 2012, the U.S. Fish and Wildlife Service (USFWS) New York Field Office (NYFO) was contacted by the U.S. Environmental Protection Agency (USEPA) Great Lakes National Program Office (GLNPO) to conduct population trend assessments for the Northern Leopard Frog (Lithobates pipiens), American Toad (Anaxyrus americanus), Bullfrog (Lithobates catesbeianus), and several species of marsh birds (e.g. rails, bitterns, snipe, and grebes) within the NR AOC to support a determination of the status of the "Degradation of Fish and Wildlife Populations" BUI. The species of interest are sentinel native species that represent the mid-level food chain within the Niagara River aquatic ecosystem.

In February 2014, the NYFO and NYSDEC issued a Scope of Work for performance of NR AOC marsh anuran and avian population monitoring surveys (USFWS 2014). Following the criteria outlined in the Scope of Work, in April 2014 a Work Plan was developed, which identified the survey protocols to be used over a 5-year period (2014-2018) for assessing the "Degradation of Fish and Wildlife Populations" BUI within the NR AOC and is hereafter referred to as the "Work Plan" (NewEarth 2015). The Work Plan specifically identified methods used for conducting surveys to facilitate population trend assessments for sentinel native anuran species and focal marsh bird species known to occur in the NR AOC. Anuran species targeted for population trend

assessments include the northern leopard frog, American toad and the bullfrog. Targeted focal marsh bird species include Least Bittern (*Ixobrychus exilis*), Sora (*Porzana carolina*), Virginia Rail (*Rallus limicola*), King Rail (*Rallus elegans*), American Bittern (*Botarus lentiginosus*), Common Gallinule (*Gallinula galeata*), American Coot (*Fulica americana*), and Pied-billed Grebe (*Podilymbus podiceps*).

A brief summary of the methods used during the marsh anuran and avian monitoring effort are provided in Section 2.0 of this report. Results from the Year 2 monitoring effort are provided in Section 3.0, and a discussion of results is provided in Section 4.0. Appendices include photographs (Appendix A), the coordinate locations for survey points (Appendix B), and completed 2015 survey data forms and raw data for anurans (Appendix C), marsh birds (Appendix D), and marsh habitats (Appendix E).

1.2 STUDY AREA

This study focused on the New York portion of the NR AOC located on the U.S. side of the Niagara River and extending from Tifft Nature Preserve near Buffalo Harbor north to the mouth of the Niagara River at Lake Ontario (Figure 1).



Figure 1. Niagara River Area of Concern (New York Portion)

2.0 METHODS

All anuran and marsh bird surveys were conducted in accordance with the approved Beneficial Use Impairment Removal Project, Niagara River Area of Concern Anuran and Avian Population Monitoring Work Plan (Work Plan), 2014-2018 (NewEarth 2015). The Work Plan was adapted from a number of sources that are intensively involved in marsh monitoring efforts applicable to the Niagara River area, including the North American Amphibian Monitoring Program (NAAMP) - Protocol Description by Weir and Mossman (2005); the Marsh Monitoring Program (MMP) Annual Report, 1995-2003 by Crewe et al. (2005); the MMP Annual Report, 1995-2007 by Archer and Jones (2009), and the New York State Marsh Bird Monitoring Program Pilot Study by Yard et al. (2012).

Survey routes, point locations, field methodologies and field efforts were closely coordinated with, and based upon recommendations from, USFWS representative Amy Roe, and NYSDEC representatives Connie Adams, Jennifer Dunn, and Mark Filipski. The Work Plan should be referenced for additional details regarding the survey methodology used in this study.

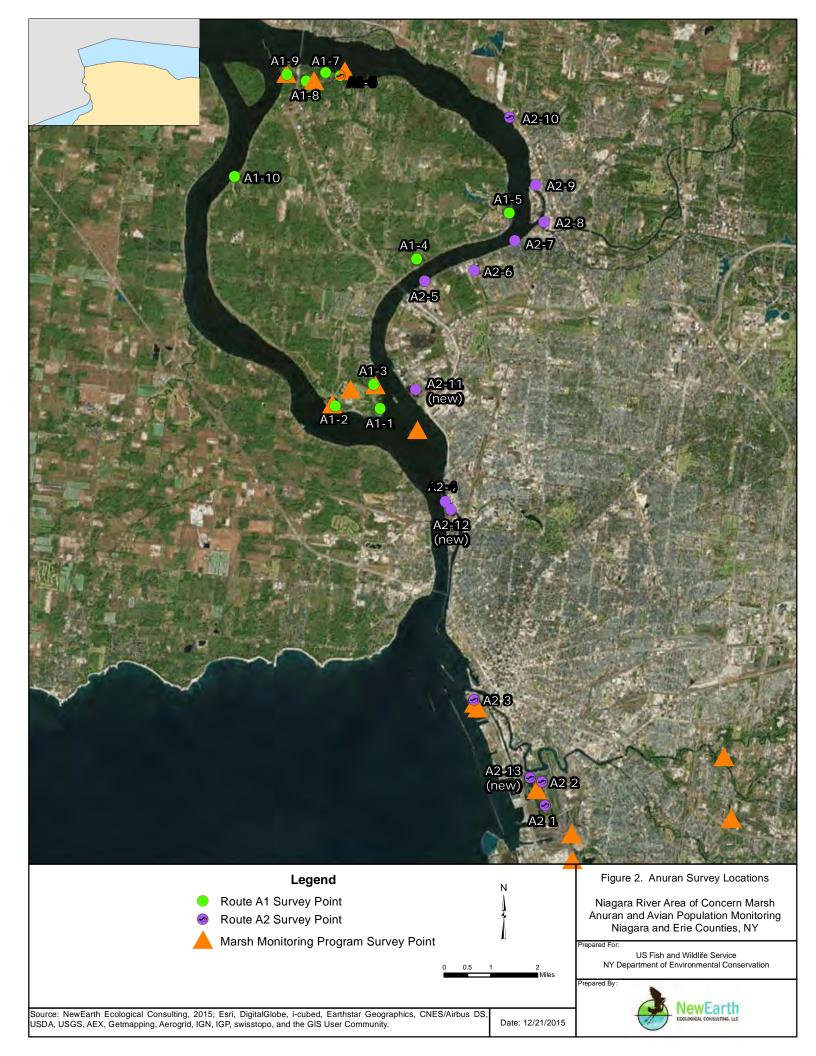
2.1 MARSH ANURAN SURVEYS

2.1.1 Survey Routes and Points

Survey routes and points were originally established using Google EarthTM software and groundtruthed to determine suitability during broad reconnaissance level surveys conducted on March 25-26 and April 17-18, 2014. Two survey routes with ten survey points per route were surveyed in 2014. However, based on the results of 2014 survey effort and additional reconnaissance of the general survey area, three survey points were added for the 2015 survey effort in order to capture potential habitat that had previously not been identified. As shown in Figure 2, the 2015 effort included 10 points on Route A1 and 13 points on Route A2. Points A2-11, A2-12, and A2-13 are new to the 2015 survey effort. The locations of several points surveyed in 2014 were also adjusted slightly for better access, but still target the original designated marsh area. Six of the ten survey points on Route A1, and three of the thirteen survey points on survey Route A2, are located near previously surveyed points established by NYSDEC as part of the Niagara River Marsh Monitoring Program (NR MMP) and included survey points: A1-2; A1-3; A1-6; A1-7; A1-8; A1-9; A2-1; A2-2; and, A2-3 (Figure 2).

Survey points were located based on recommendations from NYSDEC, availability of potentially suitable habitat, and in most cases spaced at least 800 meters (m) apart unless site conditions justified placing them closer; for example, in areas where background noise was impairing detectability. Points were situated along the edges of marsh habitat dominated by emergent vegetation (e.g. *Typha latifolia, Typha angustifolia, Carex lacustris, Hibiscus moscheutos)*, and were located along the Niagara River or abutting tributaries within 800 m of the Niagara River. Latitude and longitude were recorded for each survey point using a handheld GPS receiver and each point was assigned a unique identification number which included the route number followed by the point number (e.g., the first survey point on the first survey route received the unique identifier A1-1).

Figure 2. Marsh Anuran Survey Route and Point Locations



2.1.2 Sampling Periods and Conditions

Previous survey efforts in 2014 included three sampling events that targeted expected peak vocalization periods for breeding amphibians. However, during the 2014 survey event amphibian calls were detected during April pre-survey site reconnaissance efforts prior to the first survey event in May. As a result, a fourth survey event was added to the 2015 survey effort to target these early-spring breeding activities. Additionally, while biologists were performing surveys on site in July 2014 for a separate project, several anuran species were detected at relatively high numbers later in the breeding season than anticipated. Therefore, the fourth survey event in 2015 was shifted from late-June until mid-July to capture this late-season activity. Since peak amphibian calling periods are strongly associated with temperature and precipitation (Archer and Jones 2009), visits were scheduled to occur during four separate events according to minimum night air temperatures above 41 °F for event 1, 50 °F (for event 2), and 63 °F (for events 3 and 4). Survey events were scheduled at least 15 days apart and were completed between mid-April and mid-July as shown in Table 1.

Survey Event	Survey Dates	Temperature Range During Surveys
1	April 17-18	29-61 °F
2	May 14-15	45-71 °F
3	June 12-13	52-76 °F
4	July 11-12	67-84 °F

Table 1. 2015	Anuran	Survey	Dates and	Temperature Rang	es

Surveys were conducted by biologists skilled in the identification of all common anuran vocalizations with the potential to occur within the NR AOC (Table 2). Observers were also trained to estimate distance to, and calling indexes of, calling anurans, and were familiar with wetland plants of Western New York. Surveys were conducted during evenings with little wind and temperatures above the identified thresholds, preferably in moist conditions. Surveys were not conducted in sustained wind speeds above 12 miles per hour (mph) (i.e., level 3 on the Beaufort scale), or during periods of heavy rain. All surveys were conducted between 30 minutes after sunset and 1:00 a.m.

Table 2. List of Target Marsh And	urans in the NR AOC
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Common Name	Scientific Name
American Toad	Anaxyrus americanus
Gray Treefrog	Hyla versicolor
Spring Peeper	Pseudacris crucifer
Boreal/Western Chorus Frog Complex	Pseudacris maculata/triseriata complex
American Bullfrog	Lithobates catesbeianus
Green Frog	Lithobates clamitans
Mink Frog	Lithobates septentrionalis
Wood Frog	Lithobates sylvaticus
Northern Leopard Frog	Lithobates pipiens
Pickerel Frog	Lithobates palustris

2.1.3 Call Surveys

A calling survey technique was used, whereby an observer listened for anuran vocalizations along the previously determined survey route. Each survey route was composed of 10 survey points randomly located within anuran breeding habitat (e.g., wetlands, ponds, shoreline) within the NR AOC. A survey route was completed by one observer (an assistant was used to fill out data forms but did not observe calling anurans) in a single night. At each survey point an observer recorded a two-minute settling period, at which time no observations were recorded and anurans were given time to adjust to any disturbances caused by the arrival of the survey team. Following the settling period, the observer listened for 5 minutes (recording data in two time brackets: the first 3 minutes and the remaining 2 minutes), and then recorded the amphibian calling index for each species heard. Use of recordings of frog calls or other artificial measures to elicit frog responses were not used. When possible, efforts were made to avoid surveying during short-term temporary periods of noise or disturbance near the site.

2.1.4 Anuran Survey Data

Field data for species targeted within the NR AOC (Table 2) during the 2015 survey period were recorded on data forms approved by the USFWS and NYSDEC prior to survey efforts. In addition to documenting occurrences of the target species, key elements of the data collection effort included an amphibian call index, and information on the weather conditions and background noise which are described in more detail below. A blank copy of the anuran data form and observer instructions for completing the form is included in Appendix C.

The amphibian calling index was developed to assist surveyors in identifying relative abundance of calls at any given survey point. The amphibian calling index is provided in the survey instructions portion of the data form (Appendix C). When recording the amphibian calling index, level 1 was assigned when calls did not overlap and calling individuals could be discretely counted; level 2 was assigned if calls of individuals overlapped, but the number of individuals could still be reasonably estimated; and, level 3 was assigned when an estimate of individuals could not be made because of significant overlap in calls making them seem continuous (i.e., a full chorus). Modifiers were used to describe if a calls were occurring within (modifier - a), outside (modifier - b), or both inside and outside (modifier - c) the targeted habitat (within 50-meter radius of survey point). For example, a full chorus of Spring Peepers heard both inside and outside of the targeted habitat was recorded as 3c.

Background Noise

Background noise was documented by recording the number of cars that passed during the listening period and noting any other sources of noise. Car counting was conducted by the observer assistant. The observer indicated whether background noise impaired his/her ability to hear by placing "yes" or "no" in the "*Was Noise a Factor?*" row. Noise levels were identified using the noise index (1-4 scale) provided in the instructions portions of the data form. If a significant noise disturbance lasted for longer than one minute, the observer could discontinue the listening period to avoid sampling during the excessive noise. If such a break was taken it was noted in the "*Did you take a break?*" row on the data form. After the major disturbance ends, the observer resumed

listening for the time remaining. A survey break was only used for significant noise disturbance lasting longer than one minute, and was not be used for background noise.

Weather Conditions

The observer recorded the time, sky code, air temperature and wind code at each point along the survey route to verify that the sampling conditions were met on the evening of the survey (Weir and Mossman 2005). If at least eight of the ten stops did not meet temperature guidelines, surveys would be conducted on another night. Additionally, observed moon or moonlight was noted by placing a "yes" or "no" in the *"Moon or Moonlight Visible?"* row on the data form.

2.1.5 Anuran Habitat Data

Initial data collection of site habitat characteristics was conducted during the 2014 survey effort. This data was then supplemented in 2015 to include the three new point locations (A-11, A-12, A-13), and at one point from 2014 (A2-9) whose location was shifted slightly for better survey coverage of the target marsh. Collected habitat data included percent cover of dominant plant species within a 50 m radius of each survey point, water level, and natural disturbances and management activities near the site. A blank copy of the habitat data form and observer instructions for completing the form are included in Appendix E.

2.1.6 Photographic Documentation of Survey Points

A photographic record of general habitat/site conditions at each survey point was collected in 2014 concurrent to habitat measurement data collection. The photographic record was updated with 2015 photographs as needed to better document conditions at an existing site (A1-2), and to document habitat at the newly established sites. The updated photographic record is presented in Appendix A.

2.2 MARSH BIRD SURVEYS

2.2.1 Survey Routes and Points

Survey routes and points were originally established using Google Earth[™] software and groundtruthed to determine suitability during broad reconnaissance level surveys conducted on March 25-26 and April 17-18, 2014. Survey routes were determined by grouping survey points in a way that all points within a route could be visited during a single morning or evening survey event. Following 2014 efforts, bird points B1-8 and B1-9 were added to capture two additional marsh complexes identified while on site for 2014 efforts, and point B1-1 was eliminated because of unavoidable highway noise so excessive that surveys were not possible. Two survey routes were established as shown on Figures 3A and 3B; Route B1 comprised of eight points and Route B2 comprised of seven. Thirteen of the fifteen survey points are located near previously surveyed areas established by NYSDEC as part of the NR MMP and included all points on routes B1 and B2 except B2-1, B2-2, and B1-9 (Figures 3A and 3B).

Points were located based on recommendations from NYSDEC and availability of potentially suitable habitat. The majority of the emergent marshes located within the NR AOC are relatively

small in size [typically less than 16 hectares (ha)]. For this reason, all potential emergent marshes dominated by vegetation typically associated with wetland habitats and encompassing at least 0.5 ha were considered when establishing point placement. A single survey point was placed in marshes that were determined to have potential marsh bird habitat (emergent vegetation) totaling less than 16 ha in size (Figures 3A and 3B). For larger marshes, points were placed at 400 m spacing, or approximately 1 point per 16 ha when appropriate. Survey areas were photographed and the latitude and longitude were recorded for each survey point using a handheld GPS receiver. A unique identification number was assigned to each survey point and included the route number followed by the point number (e.g., the first survey point on the first survey route received the unique identifier B1-1).

2.2.2 Sampling Periods and Conditions

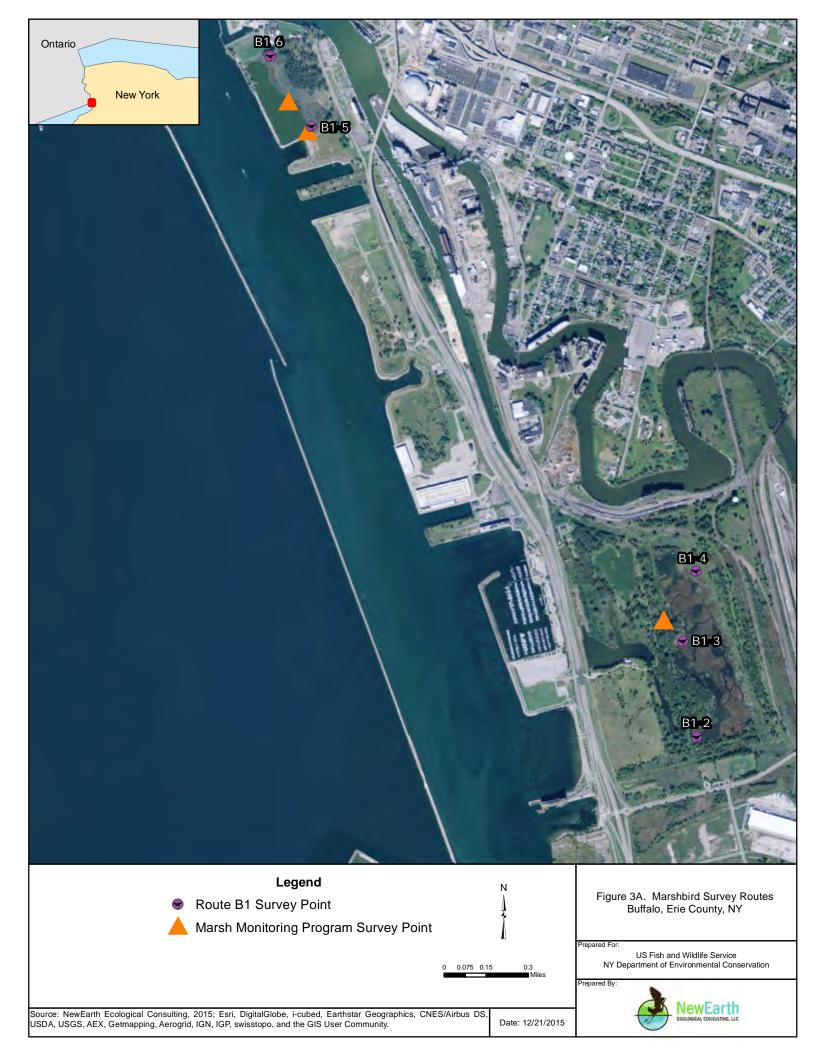
The primary goal of the marsh bird survey effort was to collect information on target primary and secondary marsh bird species to facilitate efforts to establish population estimates and to evaluate trends in the number of breeding adults for each species within the NR AOC. Per approved marsh bird survey guidelines (Conway 2011) and as identified in the approved NR AOC Marsh Anuran and Avian Work Plan, three surveys were completed within the recommended survey windows. Optimal seasonal timing varies from year to year, depending on weather conditions and breeding chronology of focal marsh birds. The timeline presented in Table 3 was followed for the 2015 survey effort and follows the same general schedule as 2014 survey efforts. Survey dates were selected to capture the variation in breeding phenology among coexisting species, with a goal of increasing the probability of conducting at least one of the surveys during the seasonal peak in vocalization among all focal marsh bird species in the area.

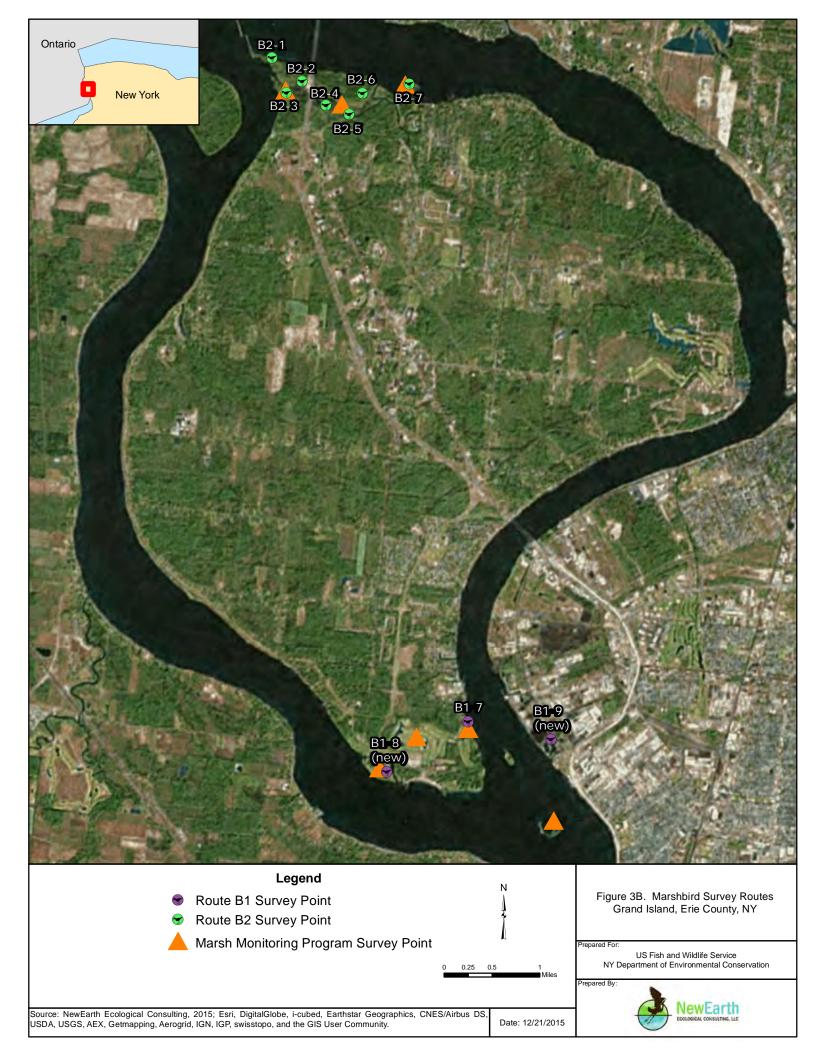
Survey Event	Survey Dates
1	May 15-16
2	June 13-14
3	June 27-28

Table 3. 2015 Survey Dates for Target Marsh Bird Species

Figure 3A. Marsh Bird Survey Route and Point Locations.

Figure 3B. Marsh Bird Survey Route and Point Locations.





Marsh bird surveys were conducted by biologists skilled in the identification of the common calls of primary and secondary focal species (Table 4) with the potential to occur within the NR AOC. Observers were also experienced in the identification of calls of secondary marsh bird species likely to occur in the Project area, estimating the distance to calling marsh birds, and were familiar with wetland plants of Western New York.

Common Name	Scientific Name								
Primary Focal Birds									
American Bittern	Botarus lentiginosus								
American Coot	Fulica americana								
Common Gallinule	Gallinula galeata								
King Rail	Rallus elegans								
Least Bittern	Ixobrychus exilis								
Pied-billed Grebe	Podilymbus podiceps								
Sora	Porzana carolina								
Virginia Rail	Rallus limicola								
Secondary	Focal Birds								
Black Tern	Chlidonias niger								
Common Tern	Sterna hirundo								
Forster's Tern	Sterna forsteri								
Green Heron	Butorides virescens								
Marsh Wren	Cistotoruus palustris								
Sedge Wren	Cistothorus platensis								
Swamp Sparrow	Melospiza georgiana								
Willow Flycatcher	Empidonax traillii								
Wilson's Snipe	Gallinago delicata								

Table 4. List of Primary	and Secondary Ma	rsh Rirds Targeted i	n the NR AOC
Table 4. List of I filliary	and Secondary Ma	I SH DH US I AI geleu I	II IIIC INK AUC

Based on information provided by NYSDEC related to known peak marsh bird vocalization periods in the region, surveys were completed during the morning survey period (i.e., 30 minutes before sunrise to 3 hours after sunrise) for all survey events. In order to reduce time of day bias, points were visited in numerically ascending order during the first set of surveys, descending order during the second set of surveys, and ascending order during the final set of surveys.

Since weather conditions can affect detection probability of marsh birds (Conway 2011), surveys were only conducted during appropriate conditions, when wind speeds were less than 20 km/hr (12 mph), and not during periods of heavy fog or sustained rain. A pocket wind meter (Kestrel 3000) was used to obtain an accurate measure of wind speed in the field. Surveys were postponed if the observer believed winds were affecting calling probability (even if winds were <20 km/hr).

2.2.2 Call Surveys

Due to the secretive nature of marsh birds they are seldom observed and vocalizations are heard infrequently. For these reasons surveyors utilized broadcast calls to elicit vocalizations during surveys. Per recommended marsh bird survey guidelines (Conway 2011) survey efforts at each point included a 2-minute settling period after arrival on site; a 5-minute passive monitoring period

in which surveyors recorded all primary and secondary focal species (see Table 4) detected; then an 8-minute call-broadcast period, in which recorded primary focal marsh bird calls were broadcast into the marsh. The call-broadcast species sequence included only the primary focal species: Least Bittern, Sora, Virginia Rrail, King Rail, American Bittern, Common Gallinule, American Coot, and Pied-billed Grebe, and included 30 seconds of calls for each species, with 30 seconds of silence between calls. The 30 seconds of calls consisted of a mix of the most common calls for the species, separated by 5 to 6 seconds of silence between each call type.

Broadcast equipment included use of an mp3 player with an externally connected speaker with a sound pressure of 80-90 dB at 1m in front of the speaker. The broadcast speaker was placed upright on the ground or on the bow of the boat (when conducting surveys from boat) and was aimed in the direction of the marsh at each survey point (Figures 3A and 3B). Surveyors stood at a minimum 2 m to the side of the speaker while listening for vocal responses.

Because time spent seeking, observing, and recording non-focal species may detract from the quality of observations for primary and secondary focal species, surveyors did not record non-focal species during the survey period (see Johnson *et al.* 2009; Conway 2011 for discussion). When possible, efforts were made to avoid surveying during short-term temporary periods of noise or disturbance near the site.

2.2.3 Marsh Bird Survey Data

Field data for marsh bird species targeted within the NR AOC during the 2015 survey period were recorded on data forms which were approved by the USFWS and NYSDEC prior to survey efforts. In addition to information regarding the survey event and weather conditions, key elements of the data collection included responses from the primary focal broadcast species, and secondary focal species, which are described in more detail below. A blank copy of the marsh bird data form and detailed observer instructions for completing the form are included in Appendix D.

Primary Focal, Broadcast Species

Observers recorded the unique identification number (e.g. B2-1) and time when they first arrived at each survey point. When a focal species was detected, the four letter species code (located in the instructions portion of the marsh bird data form) was entered into the "Species" column on the data form. In addition to the four-letter code, a check box was recorded in each detection column corresponding to the time interval(s) during which that individual was detected. The observer recorded an individual once per minute, regardless of if the individual called once or several times during that minute. If an individual continued to call into a second minute of passive listening an "H" was placed in the second column. If that individual continued to call during the 30-second broadcast for American Bittern or the 30-second silent period following the American Bittern broadcast, an "H" was placed in the column for "AMBI", and so forth. If an individual was heard and seen, both a "H" and "S" were recorded in the appropriate column(s).

When determining if an individual was a new observation or an individual that was already detected, surveyors used their best professional judgment. In general, observers were conservative

and assumed that a call was from the same bird if heard from the same general location (i.e., similar direction and distance from the location of a previously recorded call) as a previously detected individual. If no species were observed during the survey period, the observer recorded "no birds" in the *Species* column of the data form. If the observer heard a marsh bird and was unable to identify the bird to the species level, the surveyor recorded "unknown" in the *Species* column and record all data for the individual as described above.

Secondary Focal, Non-Broadcast Species

Whenever possible, secondary focal species which specifically included Black Tern, Green Heron, Marsh Wren, Sedge Wren, Willow Flycatcher, Wilson's Snipe, Swamp Sparrow and Common Tern were recorded in the same manner as the primary focal species discussed above. Broadcast calls were not used to solicit responses from secondary focal species.

2.2.4 Marsh Bird Habitat Data

As with the anuran marsh habitat survey effort, initial marsh bird habitat data collection was performed during the 2014 survey effort, then supplemented during the 2015 effort with habitat information from the two new point locations (B-8 and B-9) and at three locations where points still target the original marsh area, but were moved slightly to better capture marsh conditions and bird observations (B1-5, B1-6, B2-3) As noted, the same data form template was used to document conditions at both marsh anuran and marsh bird sample points, and in some instances the same survey locations were used for both anurans and birds (Figures 3A and 3B). A copy of the data form and instructions are included in Appendix E.

2.2.5 Photographic Documentation of Survey Points

Photographs were collected at each station in 2014 and were only collected in 2015 at the two new point locations (B-8 and B-9). The photographic record of general habitat/site conditions at each marsh bird survey point is provided in Appendix A.

3.0 **RESULTS**

3.1 ANURANS

General site reconnaissance was conducted on April 16, 2015 to confirm the conditions and accessibility to locations, and anuran call monitoring surveys were performed on April 17-18; May 14-15; and June 12-13; and July 11-12 in 2015. Tables 5 through 9 summarize the survey results, and Figure 2 depicts the locations of each survey route and point. Appendix B provides coordinates for the geographic location of all survey points, Appendices C and E provide the raw survey data and completed data forms from 2015 anuran and habitat surveys.

3.1.1 Anuran Surveys

Survey Route A1 is located on Grand Island and is associated with various habitats along the Niagara River shoreline. Survey Route A2 is located on the east side of the Niagara River, from Tifft Nature Preserve at the southern extent to Gratwick Riverside Park at the northern extent of the survey route. A total of 10 points were surveyed for Route A1 and 13 were surveyed for Route A2 during the four survey periods; resulting in 92 survey events.

Six anuran species were recorded within targeted marsh survey areas across the 92 survey events (Table 5). A seventh species (Pickerel Frog) was documented during survey events, but only observed outside of the target marsh areas. Wood Frog, Mink Frog, and Gray Tree Frog were not detected in the study area.

Species	# and % of Points with Detections Event 1 (April 17-18, 2015) ¹	# and % of Points with Detections Event 2 (May 14-15, 2015) ¹	# and % of Points with Detections Event 3 (June 13-14, 2015) ¹	# and % of Points with Detections Event 4 (July 11-12, 2015) ¹	Total Number of Survey Events With Detections ²
Spring Peeper	13 (57%)	11 (48%)	3 (13%)	0	27 (29%)
Green Frog	0	0	9 (39%)	13 (57%)	22 (24%)
Bull Frog	0	0	5 (22%)	7 (30%)	12 (13%)
Pickerel Frog	0	0	0	0	0
Northern Leopard Frog	6 (26%)	0	0	0	6 (7%)
American Toad	3 (13%)	1 (4%)	1 (4%)	0	5 (5%)
Gray Tree Frog	0	0	0	0	0
Chorus Frog	9 (39%)	0	0	0	9 (10%)
Mink Frog	0	0	0	0	0
Wood Frog	0	0	0	0	0

Table 5. Anuran Species Detections per Survey Event

¹ 23 events total

² 92 events total

The two modifications made to the survey protocol prior to the 2015 effort (a fourth survey event in April and extending the final survey into July), allowed surveyors to capture early season calls

of the chorus frog and high numbers of Green Frogs that were most active in July. Northern Leopard Frog and Chorus Frog were only recorded during the first survey event. Of the 92 total survey events, Spring Peepers were heard during the highest number of events (27), followed by Green Frog at 22 and Bull Frog at 12 (Table 5).

Of the 23 points surveyed, four had no anuran species detections: A1-5, A2-7, A2-8, and A2-10 (Table 6). Spring Peepers were heard at the highest number of survey stations on both routes (at nine points on A1 and six on A2), followed by Green Frogs (at six points on A1 and seven on A2).

Route A1																
Species				1	2	3		4	5	6	7	8	8	9	10	# Unique Points Species was Detected at
Spring Peeper				Х	Х	X		х		х	Х	Х	x	Х	Х	9
Green Frog					х	Х		х			Х	Х	x	х		6
Bull Frog						Х						Х	x	х		3
Pickerel Frog																0
Northern Leopar	d Fr	og						х				Х	X			2
American Toad					х											1
Gray Tree Frog																0
Chorus Frog				Х	х			Х			Х					4
Mink Frog																0
Wood Frog															0	
								F	Rou	te A2	2					
Spring Peeper	X	х	Х		х						x			х		6
Green Frog	X	х	Х	х							x		Х	х		7
Bull Frog	х	х	х						X					х		5
Pickerel Frog																0
Northern	x	x									х			x		4
Leopard FrogAAmerican ToadX					v			v							3	
					X			X		+	_		+		0	
Gray Tree Frog Chorus Frog	x	x				x			+		x			x		5
Mink Frog	Λ	Λ				Λ		<u> </u>	-		Λ			Λ		0
Wood Frog																0

Calls noted inside, outside, and both inside and outside of the targeted habitat at each survey point were recorded using calling code modifiers to evaluate locations of calling amphibians (as described in the Amphibian Calling Index portion of section 2.1.4). Nearly all of the recorded frog calls were detected from within the targeted habitat (89% or 72 of 81 recorded calls in the 5-minute survey period for both Survey Route A1 and A2). Several calls at points A1-6 and A2-5 were only of species located outside of the target survey marsh area (11% or 10 of 81 recorded calls).

Dit	Total Species	Cumulative Species Detections (within target	Cumulative Species Detections (within and	Cumulative Species Detections (outside target
Point	Detections	habitat only)	outside of target habitat) Route A1	habitat only)
A1-1	3	0	1	2
A1-2	5	1	4	0
A1-3	5	3	2	0
A1-4	5	0	5	0
A1-5	0	0	0	0
A1-6	1	0	0	1
A1-7	4	1	2	1
A1-8	6	2	4	0
A1-9	5	2	3	0
A1-10	2	1	0	1
TOTAL	36	10	21	5
			Route A2	
A2-1	7	4	3	0
A2-2	9	3	3	3
A2-3	6	6	0	0
A2-4	2	2	0	0
A2-5	1	0	0	1
A2-6	2	0	2	0
A2-7	0	0	0	0
A2-8	0	0	0	0
A2-9	2	2	0	0
A2-10	0	0	0	0
A2-11	5	1	3	1
A2-12	2	1	1	0
A2-13	9	3	6	0
TOTAL	45	22	18	5

Table 7. Location of Anuran Species in Relation to Survey Points

Data were collected in a manner that also allowed for an evaluation of two widely used anuran monitoring protocols (i.e. Environment Canada Marsh Monitoring Program [MMP] three minute intervals vs. the North American Amphibian Monitoring Program [NAAMP] five minute intervals) (Table 8). As expected, extending the survey period an additional two minutes resulted in some additional detections, but no new species were recorded.

On Route A1, a total of two additional species were documented that were not captured during the 3-minute survey window, whereas extending an additional two minutes on Route A2 resulted in five additional detections. Of the 81 call detections, 50 were of call index #1 (individual calls could be distinguished), 23 were of call index #2 (some individuals could be distinguished, but some overlapping calls), and eight were of call index # 3 (large choruses, calls continuous and/or overlapping). This suggests that although some species may be detected relatively frequently, survey wide 62% of the detections were of a small number of individuals at any given station.

Table 6. Anuran Specie	Survey R		Survey Route A2			
Species	3-Minute Period # of Points Recorded	5-Minute Period # of Points Recorded	3-Minute Period # of Points Recorded	5-Minute Period # of Points Recorded		
	Survey Event	t 1 (April 17-18, 20				
Spring Peeper	9	9	3	4		
Green Frog	0	0	0	0		
Bull Frog	0	0	0	0		
Pickerel Frog	0	0	0	0		
Northern Leopard Frog	2	2	3	4		
American Toad	0	0	3	3		
Gray Tree Frog	0	0	0	0		
Chorus Frog	4	4	5	5		
	Survey Even	t 2 (May 14-15, 20	15)			
Spring Peeper	5	5	6	6		
Green Frog	0	0	0	0		
Bull Frog	0	0	0	0		
Pickerel Frog	0	0	0	0		
Northern Leopard Frog	0	0	0	0		
American Toad	1	1	0	0		
Gray Tree Frog	0	0	0	0		
Chorus Frog	0	0	0	0		
	Survey Even	nt 3 (June 12-13, 202	15)			
Spring Peeper	2	2	1	1		
Green Frog	3	3	5	6		
Bull Frog	1	1	3	4		
Pickerel Frog	0	0	0	0		
Northern Leopard Frog	0	0	0	0		
American Toad	0	0	0	1		
Gray Tree Frog	0	0	0	0		
Chorus Frog	0	0	0	0		

 Table 8. Anuran Species Detected Using 3 Minute and 5 Minute Call Intervals

	Survey R	Route A1	Survey Route A2			
			3-Minute	5-Minute		
	3-Minute Period	5-Minute Period	Period	Period		
	# of Points	# of Points	# of Points	# of Points		
Species	Recorded	Recorded	Recorded	Recorded		
	Survey Ever	nt 4 (July 11-12, 201	.5)			
Spring Peeper	0	0	0	0		
Green Frog	5	6	7	7		
Bull Frog	2	3	4	4		
Pickerel Frog	0	0	0	0		
Northern Leopard Frog	0	0	0	0		
American Toad	0	0	0	0		
Gray Tree Frog	0	0	0	0		
Chorus Frog	0	0	0	0		

 Table 8. Anuran Species Detected Using 3 Minute and 5 Minute Call Intervals (continued)

3.1.2 Incidental Observations

Six Northern Leopard Frogs and four American Toads were observed incidentally while traversing the Project Area; breeding calls of both were also documented during survey events. Only the Pickerel Frog, heard calling on 4/18 while walking within Tifft Nature Preserve, was not documented during any survey events. Numerous feral/outdoor cats as well as an occasional Red Fox, Whitetail deer, Muskrat, and Beaver were also noted.

3.1.3 Disturbances Noted During Survey Efforts

In highly developed areas, such as the Niagara River AOC, noise can be a significant factor in surveyor ability to detect calling amphibians. Despite surveyor efforts to avoid periods of high noise levels and activity at points, noise had a moderate (score = 2) to serious (score \geq 3) effect on two or more survey events at 16 (70%) of the point locations (Table 9). The primary source of noise on anuran surveys was associated with vehicle traffic and boats. Other factors included sirens, airplanes, construction equipment, and noise from people recreating in the area. Additionally, ongoing restoration and monitoring efforts in Tifft and Times Beach nature preserves have affected vegetation and in some cases has resulted in fluctuating water levels within the marsh system. Disturbance from these activities may have a short-term direct negative affect on amphibian breeding activities in the marsh, but efforts are likely to improve marsh conditions and suitability for breeding amphibians over time. Survey points within that are most likely to be affected by these activities include A2-1, A2-2, and A2-3.

Point	Noise Event 1 ¹	Noise Event 2 ¹	Noise Event 3 ¹	Noise Event 4 ¹				
Route A1								
A1-1	1	0	0	0				
A1-2	1	0	1	0				
A1-3	1	0	1	0				
A1-4	4	3	0	1				
A1-5	0	2	3	0				
A1-6	2	0	0	0				
A1-7	4	2	0	0				
A1-8	4	3	3	0				
A1-9	2	2	3	0				
A1-10	3	1	2	0				
		Route A2						
A2-1	0	1	1	0				
A2-2	0	1	1	1				
A2-3	0	1	3	3				
A2-4	2	3	1	2				
A2-5	1	3	2	2				
A2-6	0	2	3	1				
A2-7	3	2	2	1				
A2-8	1	1	2	2				
A2-9	1	1	0	1				
A2-10	2	1	2	1				
A2-11	3	1	0	2				
A2-12	0	2	2	2				
A2-13	0	0	1	2				

Table 9. Noise Levels During Anuran Survey Events

¹ Effect on Sampling: 0 = none; 1 = slight; 2 = moderate; 3 = serious; 4 = profound

3.1.4 Habitat

Of the 23 marshes surveyed, five are considered open water habitat (i.e., site dominated by open water and wetland/aquatic vegetation cover is less than 25%), twelve are open water/marsh habitats (i.e., site with at least 25% cover of wetland vegetation, and open water present within 50 m of the marsh sample point), and the remaining six sites are considered marsh habitats (i.e., site with at least 25% cover of wetland vegetation, surface water may/may not have be present in the marsh, but any open water is 50 m or more away) (Table 10, and see photographs in Appendix A).

Table 10.	Anuran	Marsh	Habitat	Conditions
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Point	General Type	Detection s ¹	% Veg Cover ²	Water Depth (m)	te % Typha (N) ³	% Lythrum (I) ³	% Phragmites (I) ³	% Lonicera (I) ³	Open Water/Veg Interspersion	Distance to Open Water (m) ⁴
A1-1	Open	3	110	0	10	10	0	0	20/80	3
	Water/Marsh									
A1-2	Open Water	5	30	0.75	10	10	0	0	80/20	1
A1-3	Open Water/Marsh	5	130	0	60	40	0	0	30/70	5
A1-4	Marsh	5	100	0.15	35	14	0	0	0/100	None
A1-5	Open Water/Marsh	0	45	0.12	30	5	0	0	70/30	3
A1-6	Open Water	1	0	0.1	0	0	0	0	100/0	0
A1-7	Marsh	4	110	0	30	0	0	0	0/100	80
A1-8	Open Water/Marsh	6	60	0.25	40	0	0	0	50/50	1
A1-9	Marsh	5	100	0	70	0	0	0	0/100	None
A1-10	Open Water	2	0	0.6	0	0	0	0	100/0	2
	- 1			Rou	te A2	T		1		
A2-1	Open Water/Marsh	7	67	0	60	0	0	5	30/70	1
A2-2	Open Water/Marsh	9	100	0	100	0	0	0	25/75	1
A2-3	Marsh	6	80	0	70	0	10	0	0/100	70
A2-4	Open Water/Marsh	2	37	0.8	20	0	0	0	75/25	2
A2-5	Marsh	1	100	0		0	100	0	0/100	None
A2-6	Marsh	2	110	0	30	0	70	0	0/100	None
A2-7	Open Water	0	0	0.17		0	0	0	100/0	0
A2-8	Open Water	0	0	1.0		0	0	0	100/0	0
A2-9	Open Water/Marsh	2	45	0	20	5	20	0	40/60	10
A2-10	Open Water/Marsh	0	28	0.5	10	0	0	0	80/20	5
A2-11	Open Water/Marsh	5	90	1.5	0	10	75	5	75/25	3
A2-12	Open Water/Marsh	2	95	0.8	60	15	0	0	65/35	3
A2-13	Open Water/Marsh	9	85	1.2	30	15	0	0	75/25	2

Water/Marsh
 ¹ Cumulative number of species detections for all survey events
 ² Cover may exceed 100% due to overlap of vegetation at varying heights within a strata
 ³ (I) = New York State recognized non-native invasive species; (N) native species, but potentially noxious
 ⁴ 0 = open water present at point location; none = no open water within 100 m

Four marshes had no marsh vegetation (primarily because they were open water habitats). Of the 19 remaining areas, one or more invasive species (*Phragmites australis, Lythrum salicaria,* and *Lonicera tatarica*), or potentially noxious species (*Typha angustifolia,* and *Typha latifolia*), were present in each. The invasive species *Phragmites australis* was the dominant vegetation (i.e., had higher coverage than any other species) at three of the sites; A2-5, A2-6 and A2-11 (Table 10), and cattails (i.e., genus *Typha*) were the dominant species at twelve (A1-2, A1-3, A1-4, A1-5, A1-8, A1-9, A2-1, A2-2, A2-3, A2-4, A2-12, and A2-13). *Phragmites* and *Typha* were equally dominant at site A2-9. Native species were more common than these invasive/noxious species at remaining vegetated sites. Other common wetland plants included species in the following genus: *Carex, Cornus, Sparganium, Eupatorium, Bolboschoenus, Schoenoplectus, Dispaucus, Nuphar, Decodan, and Persicaria* (Appendix E). Of these, only *Carex, Cornus, Sparganium,* and *Eupatorium* were found as common species in more than one marsh area surveyed.

Ten sites had no measurable surface water present on the marsh surface at the time of survey (Table 10). Of the remaining 14 areas, water levels were greater than 0.30 m (> ~12 inches) at nine sites, between greater than 0.15 and less than 0.30 m (> ~6 and ~12 inches) at two sites, and between 0.1 and 0.15 m (~ 4 to < ~6 inches) at three sites (Table 10). Although surface water was not present within the marsh habitat at 10 survey locations, open water was present within 50 meters of five of the sites (A1-1, A1-3, A2-1, A2-2, and A2-9), and within 100 m of two sites (A1-7 and A2-3). No open water was reported within 100 m of sites A1-9, A2-5, and A2-6. However, surface water levels are presented herein to give the reader a sense of overall habitat condition near the survey point. It should be noted that water levels can fluctuate dramatically, and the conditions at the location of the measurements are not necessarily representative of the overall marsh system and specific locations that an individual may be breeding in.

3.2 MARSH BIRDS

General site reconnaissance was conducted to evaluate site conditions and accessibility on May 14, 2015, and marsh bird monitoring surveys were conducted on May 15th and 16th, June 13th and 14th, and June 27th and 28th, 20152015. Tables 111 through 414 summarize the survey results, and Figures 3A and 3B show the locations of each survey route and point. Appendix B provides coordinates for the geographic location of all survey points, Appendices D and E provide the raw survey data and completed data forms from 2015 marsh bird and habitat surveys.

3.2.1 Marsh Bird Surveys

Eight survey points for Route B1 were established within Tifft Nature Preserve, Times Beach Nature Preserve, and Beaver Island State Park and generally are associated with various open water habitats along the Niagara River shoreline and adjacent near shore areas. Points for survey Route B2 were established on Grand Island and Sunken Island (also referred to as Grass Island by various sources), with six of the seven survey points located within Buckhorn Island State Park. A total of fifteen points were surveyed for each survey route during the three survey periods, resulting in 45 survey events.

Primary Focal Species

Six of the eight target primary focal marsh bird species were recorded across 45 survey events (Table 11). Surveys along Route B1 resulted in the recording of four species (i.e. least bittern, common gallinule, Virginia rail, and pied-billed grebe), whereas surveys along Route B2 recorded five species (i.e. Virginia Rail, American Coot, Pied-billed Grebe, Common Gallinule, and Sora). Virginia Rail was the most commonly observed species, and was detected during 20% of the survey events (9 of 45). Virginia Rail and Pied-billed Grebe had the highest numbers of individuals recorded at a given point (three individual rails at B1-4 and three grebes at B2-7). King Rail, a target species, was never heard in the project area.

Virginia Rail and Common Gallinule were the species most commonly detected on Environment Canada's MMP routes (on at least 10% of station-years) for this region. All additional target species for this survey were detected on MMP routes, but in much lower numbers (between 4 and 9% of station-years) (Archer and Jones 2009). King Rail were not detected on any MMP routes in any region surveyed.

Species	# and % of Points with Detections Event 1 (May 15-16, 2015) ¹	# and % of Points with Detections Event 2 (June 13- 14, 2015) ¹	# and % of Points with Detections Event 3 (June 27- 28, 2015) ¹	Total Number of Survey Events with Detections ²
Least Bittern	1 (7%)	0	0	1 (2%)
Sora	1 (7%)	1 (7%)	0	2 (4%)
Virginia Rail	3 (20%)	3 (20%)	3 (20%)	9 (20%)
American Bittern	0	0	0	0
Common Gallinule	1 (7%)	1 (7%)	1 (7%)	3 (7%)
American Coot	1 (7%)	0	0	1 (2%)
Pied-Billed Grebe	1 (7%)	1 (7%)	1 (7%)	3 (7%)

Table 11	Marsh	Bird	Snecies	Detections	ner Surve	v Event
Table 11.	Ivial SII	DILU	species	Detections	per Surve	y L'vent

1 15 events total

2 45 events total

Of the 15 points surveyed, nine had no marsh bird species detections: B1-5; B1-6; B1-7; B1-8; B2-1; B2-2; B2-4; B2-5; and B2-6 (Table 12). Point B2-7 had the highest number of different species detected (Common Gallinule, Sora, American Coot, and Pied-billed Grebe). Least Bittern was only observed at point B1-2 and American Coot was only documented within the target marsh at B2-7 (Table 12).

	Number of Individuals Detected ¹									
Point	Least Bittern	Sora	Virginia Rail	American Bittern	Common Gallinule	American Coot	Pied- Billed Grebe	Total Detections		
1 01110	Dittern	5014		y Event 1 (M			Grese			
B1-2	1(1)	-	1 (0)	-	-	-	-	2 (1)		
B1-3	0(1)	-	1 (1)	-	0(1)	-	-	1 (3)		
B1-4	-	-	1 (1)	-	0(1)	-	-	1 (2)		
B1-5	-	-	-	-	-	-	-	0		
B1-6	-	-	-	-	-	-	-	0		
B1-7	-	-	-	-	-	-	-	0		
B1-8	-	-	-	-	-	-	-	0		
B1-9	-	-	-	-	-	-	-	0		
B2-1	-	-	0(1)	-	-	-	-	0(1)		
B2-2	-	-	-	0(1)	-	-	-	0(1)		
B2-3	-	-	0 (1)	-	-	-	-	0(1)		
B2-4	-	-	-	-	-	-	-	0		
B2-5	-	-	-	-	-	-	-	0		
B2-6	-	-	0(1)	-	-	-	-	0(1)		
B2-7	-	1 (0)	-	-	1 (2)	1 (0)	2 (6)	5 (8)		
			Surve	y Event 2 (Ju	ne 13-14, 20	15)		1		
B1-2	0(1)	-	-	-	-	-	0(1)	0 (2)		
B1-3	0 (1)	1 (0)	1(1)	-	1 (1)	-	-	3 (3)		
B1-4	-	-	3 (1)	-	0(1)	-	-	3 (2))		
B1-5	-	-	-	-	0(1)	-	-	0(1)		
B1-6	-	-	-	-	-	-	-	0		
B1-7	-	-	0 (1)	-	-	-	-	0(1)		
B1-8	-	-	-	-	-	-	-	0		
B1-9	-	-	1 (NA)	-	-	-	-	1 (0)		
B2-1	-	-	-	-	-	-	-	0		
B2-2	-	-	-	-	-	-	-	0		
B2-3	-	-	0 (1)	-	-	-	-	0(1)		
B2-4	-	-	-	-	-	-	-	0		
B2-5	-	-	-	-	-	-	-	0		
B2-6	-	-	-	-	-	-	-	0		
B2-7	-	0(1)	-	-	-	-	2 (1)	2 (2)		

¹ Results from 2014 are indicated in parenthesis

	Survey Event 3 (June 27-28, 2015) ¹										
Point	Least Bittern	Sora	Virginia Rail	American Bittern	Common Gallinule	American Coot	Pied- Billed Grebe	Total Detections			
B1-2	0(1)	-	2 (0)	-	-	-	-	2 (1)			
B1-3	0(1)	-	0(1)	-	0(1)	-	0(1)	0 (4)			
B1-4	0(1)	-	1 (0)	-	1 (1)	-	-	2 (2)			
B1-5	-	-	-	-	-	-	-	0			
B1-6	-	-	-	-	-	-	-	0			
B1-7	-	-	-	-	-	-	-	0			
B1-8	-	-	-	-	-	-	-	0			
B1-9	-	-	-	-	-	-	-	0			
B2-1	-	-	-	-	-	-	-	0			
B2-2	-	0(1)	-	-	-	-	-	0(1)			
B2-3	-	-	2 (0)	-	-	-	-	2 (0)			
B2-4	-	-	_	-	-	-	-	0			
B2-5	-	-	-	-	-	-	-	0			
B2-6	-	-	-	-	-	-	-	0			
B2-7	-	-	-	-	-	-	3 (1)	3 (1)			

 Table 12. Marsh Bird Species Detected per Survey Point (continued)

¹ Results from 2014 are indicated in parenthesis

Secondary Focal Species

Secondary focal species were also documented during each of the three survey events and five of the nine targeted secondary focal species were detected. Species detected on Survey Route B1 included Swamp Sparrow, Willow Flycatcher, Marsh Wren, Common Tern, and Green Heron; while Survey Route B2 secondary focal species included Swamp Sparrow, Marsh Wren, Willow Flycatcher, and Common Tern. The most commonly observed secondary focal species were the Swamp Sparrow, recorded during 21 of 45 (47%) survey events, followed by Willow Flycatcher, detected during 13 of 45 (29%) survey events. Black Tern, Forster's Tern, Sedge Wren and Wilson's Snipe were not detected in the survey area.

3.2.2 Incidental Observations

On May 15th, two Northern Harriers were observed flying over the marsh surface near point B1-3.

3.2.3 Disturbances Noted During Survey Efforts

Similar to anuran survey efforts, noise (primarily from vehicle and boat traffic), had some effect on surveyor ability to detect calls. Noise was at moderate (score = 2) to serious (score = 3) levels during two or more survey events at seven (47%) of the 15 point locations (Table 13). Although not necessarily documented during actual survey event windows, boats including excessively loud high-speed jet boats, were repeatedly observed in close proximity to known nesting areas for marsh birds and herons such as point B2-7 as well as the Motor Island heron rookery and adjacent restoration site. Additionally, ongoing restoration efforts in Tifft and Times Beach nature preserves has affected vegetation and in some cases resulted in fluctuating water levels within the marsh system. Disturbance from these activities may have a short-term direct negative affect on marsh bird breeding activities in the marsh, but efforts are likely to improve conditions for marsh species over time. Survey points that are most likely to be affected by these activities include B1-2, B1-3, B1-5 and B1-6.

In addition, ongoing restoration and research activities at Times Beach have resulted in some impacts to the marsh vegetation and ongoing disturbance (i.e., noise, human activity) which may have affected breeding activities of marsh dependent species. Marsh species are expected to colonize the site once disturbance activities on the marsh cease.

Point	Noise Level Event 1 ¹	Noise Level Event 2 ¹	Noise Level Event 3 ¹					
Route B1								
B1-2	2	3	0					
B1-3	2	2	1					
B1-4	1	0	1					
B1-5	0	0	0					
B1-6	0	0	0					
B1-7	1	0	1					
B1-8	0	0	1					
B1-9	1	0	0					
Route B2								
B2-1	1	3	2					
B2-2	3	1	3					
B2-3	2	2	1					
B2-4	3	0	2					
B2-5	1	0	1					
B2-6	1	0	1					
B2-7	1	3	2					

Table 13	Noise Levels Durin	a March Rird	Survey Events
Table 15.	Noise Levels Duri	ig Marsh Dhu	Survey Events.

¹ Effect on Sampling: 0 = none; 1 = slight; 2 = moderate; 3 = serious; 4 = profound

3.2.4 Habitat

Twelve of the 15 marsh bird survey points are positioned to assess the same marsh complexes as anuran survey points. Of the marshes surveyed, eight are considered open water/marsh habitats (i.e., site with at least 25% cover of wetland vegetation, and open water present within 50 m of the marsh sample point), and six were considered marsh habitats (i.e., site with at least 25% cover of wetland vegetation, surface water may/may not have been present in the marsh, but any open water is 50 m or more away) (Table 14).

Point	General Type	Detections ¹	% Veg Cover ²	Water Depth (m)	% Typha (N) ³	% Lythrum (I) ³	% Phragmites (I) ³	% Lonicera (I) ³	Open Water/Veg Interspersion	Distance to Open Water (m) ⁴
B1-2	Open Water/Marsh	4	67	0	60	0	0	5	30/70	1
B1-3	Open Water/Marsh	4	100	0.67	30	0	0	0	70/30	0
B1-4	Open Water/Marsh	6	100	0.9	100	0	0	0	25/75	1
B1-5	Marsh	0	80	0	70	0	10	0	0/100	70
B1-6	Marsh	0	100	0	80	0	0	0	25/75	50
B1-7	Open Water/Marsh	0	125	0.1	50	30	0	0	30/70	3
B1-8	Open Water	0	30	0.75	10	10	0	0	80/20	1
B1-9	Open Water/Marsh	1	90	1.5	0	10	75	5	75/25	3
B2-1	Marsh	0	80	0	30	0	0	0	0/100	none
B2-2	Marsh	0	105	0	55	0	0	0	0/100	none
B2-3	Marsh	2	100	0	70	0	0	0	0/100	none
B2-4	Open Water/Marsh	0	60	0.25	40	0	0	0	50/50	1
B2-5	Marsh	0	130	0	80	0	0	0	0/100	none
B2-6	Open Water/Marsh	0	90	0.23	0	0	0	0	25/75	1
B2-7	Open Water/Marsh	10	70	0.58	70	0	0	0	40/60	0

Table 14. Marsh Bird Habitat Conditions

¹ Cumulative number of species detections for all survey events

² Cover may exceed 100% due to overlap of vegetation at varying heights within a strata

 3 (I) = New York State recognized non-native invasive species; (N) = native species, but potentially noxious

 4 0 = open water present at point location; none = no open water within 100 m

Fourteen of the 15 marshes were comprised of one or more invasive species (*Phragmites australis, Lythrum salicaria,* and *Lonicera tatarica*), or potentially noxious species (*Typha angustifolia,* and *Typha latifolia*). The invasive species *Phragmites australis* was the most common species at one site; B1-9 (Table 14), and cattails (i.e., genus *Typha*) were the most common at 9 sites. Native species were more common than these invasive/noxious species at remaining vegetated sites. Other relatively common native wetland plants included species in the following genus: *Carex, Hibiscus, Lemna, Persicaria, Impatiens, Eupatorium, Urtica, Solidago Coronilla, Saggitaria, Nymphea, Nuphar, Decadon,* and an unknown species of grass (Appendix E). Of these, only Carex, Hibiscus, Persicaria and Saggitaria were found as common species in more than one marsh area surveyed.

Eight (53%) of the sites had measurable surface water present at the time of survey (Table 14). Water levels were greater than 0.30 m (> ~12 inches) at five sites, between greater than 0.15 and less than 0.30 m (> ~6 and ~12 inches) at two sites, and between 0.1 and 0.15 m (~ 4 to < ~6 inches) at one location. Although no surface water was present within the marsh habitat at seven of the survey locations, open water was within 50 m of sites B1-2 and B1-6 and within 100 m of site B1-5. No open water was reported within 100 m of sites B2-1, B2-2, B2-3, and B2-5. As with the anuran habitat, it should be noted that water levels can fluctuate dramatically, and the water levels at the location of the measurements are not necessarily representative of the overall marsh system and specific locations that an individual bird may be breeding in.

4.0 **DISCUSSION**

Summaries and data presented herein were collected during the second annual survey effort for the Project. Three additional years of data collection are planned and will help to improve efforts to evaluate and assess marsh anuran and marsh bird populations and habitats within the NR AOC, and will provide a basis for future year-year comparisons.

Routes and Points

Two survey routes with 23 points total were sampled for anurans and two routes with 15 points were sampled for marsh birds during the 2015 effort. Numerous potential locations were visited at the onset of the 2015 survey in an effort to identify any additional suitable areas to include in the survey effort. However, only three new survey locations were identified for anurans (Figure 2) and two were added for marsh birds (Figures 3A, 3B). One marsh bird point (B1-1) was eliminated due to repeated unsuccessful attempts to conduct surveys at the location because of extreme noise levels from highway traffic.

This study represents nearly a full census of every location of potentially suitable habitat within the NR AOC that met the sample selection criteria (i.e., minimum size, location adjacent to the Niagara River, and direct hydrologic connection to the river) for the target guilds. As discussed throughout NR AOC planning documents, nearly all of the former marshes in the region no longer exist, or are degraded to the extent that the vegetation, hydrologic regimes, food sources, and lack of adjacent undeveloped/undisturbed upland areas may make them unsuitable as habitat for breeding anurans and marsh birds. Wetland creation and restoration efforts such as those proposed in the NR AOC action plan (Filipski 2012) are the only foreseeable measures that would provide opportunities for significant expansion of anuran and marsh bird survey routes and points.

Anurans

Six of the 10 target anuran species were documented during the 2015 anuran survey effort and each of the species was also documented during 2014 surveys and during MMP data collection efforts in the NR AOC study area between 1995 and 2011 (Archer and Jones 2009). A seventh species (a lone Pickerel Frog) was documented while on site for survey events, but outside of the target marsh areas. The Pickerel Frog was not documented in 2014, nor was it reported on any previous MMP surveys in the general study area. Three species were not detected during this survey or during 2014 surveys; Mink Frog, Wood Frog, and Gray Tree Frog. The Gray Tree Frog comprised 14% of the species detections on MMP surveys in the region, Wood Frog comprised 1% of the detections. Gray Tree Frogs typically call later in the breeding season and would likely be detected in a later-times survey event. The vernal pool habitat that Wood Frogs depend on for successful breeding may occur in the general MMP survey area (which includes locations greater than 800 ft from the Niagara River), but are not found in the NR AOC study area. Mink Frogs typically occur in areas to the north of the NR AOC and extending into Canada and have never been documented in the general study area on MMP routes.

In an effort to better target species that may have been missed or underrepresented in 2014, the Work Plan for this study was revised post-2014 efforts to include an additional survey event, and to schedule the first and last events earlier (mid-April) and later (mid-July) in the breeding season. These adjustments to the survey approach resulted in documentation of relatively high numbers of chorus frogs in the Project Area; which had previously only been documented incidentally and in low numbers in 2014, as well as higher numbers of Green Frogs, bumping this species from one of the least documented calls heard in 2014 to the second most common species. Consistent with these results, MMP also reported the highest number of detections for Spring Peepers followed by Green Frog (Archer and Jones 2009).

A total of 81 detections of frogs were made during the 92 survey events and included all of the common anuran species known to occur in the region. In 2014, five point locations had no species detections. In 2015 four (17%) of the 23 points had no species detections and of these two are the same points with no detections in 2014 (A1-5 and A2-8). However, although available marsh habitat is being utilized by anurans, consistent with 2014 results over 90% of the detections were of only a small number of chorusing individuals at any given station (call index #2 or less). This reinforces the hypothesis that overall anuran population numbers throughout the NR AOC are quite low.

Collectively 81 documented call events (i.e., call of a single species at a single point) were recorded over the 92 survey events that took place within the four survey periods of 2015; of these, Northern Leopard Frog comprised 7% of the calls detected, American Toad comprised 6%, and Bullfrog comprised 15%. Results from 2014 found that Northern Leopard Frog comprised 4% of all documented calls, American Toad comprised 19%, and Bullfrog comprised 26%. Similarly, MMP data from 1995 through 2011 found that Northern Leopard Frog comprised 2% of the 487 calls detected, American Toad comprised 7%, and Bullfrog comprised 14%.

Wildlife populations are by nature extremely variable year-to-year, long-term large multi-replicate data sets are typically needed to capture true trends. Cause and effect determinations in population trends are further complicated due to effects on species from a host of site variables that may/may not be measurable, variations in weather conditions, previous or on-going activities in the area, logistical problems, overall small population numbers of the target species throughout the region, and the often secretive and allusive nature of the species. The relatively small sample size of this study may not be adequate to detect population trends with meaningful significance. However, future survey efforts, and combining data from this study with other ongoing anuran data collection efforts in the region, will facilitate efforts to assess trends in anuran populations in the NR AOC. Additionally, proposed NR AOC marsh creation and restoration measures (Filipski 2012), if implemented, will eventually yield additional marsh locations and opportunities to increase the survey effort and sample sizes.

Marsh Birds

The 2015 survey effort included two new survey locations. Site B-9 yielded an additional location of Virginia rail, whereas surveys at site B-8 resulted in no marsh bird detections. As with the 2014 survey, this effort detected six of the eight target marsh bird species. American Bittern and King Rail were not observed in 2015, American Coot and King Rail were not detected in 2014. King Rail are also notably absent from other survey efforts in the region (Archer and Jones 2009, Yard et. al. 2012). Although nearly all of the marsh bird species known to occur in the region were

detected during this study, over 95% of the detections were of only a single individual. Despite the fact that marsh birds are secretive and often non-responsive to broadcast calls, this suggests that population numbers throughout the NR AOC are quite low. Additional survey efforts and longer time spent meandering through available habitat may yield higher numbers.

Sunken Island (also referred to as Grass Island by various sources) (point B2-7) and portions of Tifft Preserve (points B1-2 through B1-4) offer the largest relatively high quality marshes in the NR AOC study area, and both the 2015 and 2014 study results found the highest diversity of species in these areas. The Sunken Island area was previously the only known breeding location on the Niagara River for Pied-billed Grebes and American Coots and each of these species were observed in the vicinity of Sunken Island during 2015 and 2014 survey efforts. However, a grebe documented in Tifft Preserve on 2 out of 3 survey events in 2014, was not observed in 2015.

Collectively a total of 27 documented marsh bird call events (i.e., call of a single species at a single point) were recorded over the 45 survey events that took place within the three survey periods; compared to 32 call events detected in 2014. Similar to the marsh anuran effort, marsh bird breeding activities and detectability are highly variable and best captured through extensive survey efforts. The small sample size in the NR AOC may not be sufficient to evaluate marsh bird population trends with any meaningful significance, and there are currently no obvious opportunities to expand the survey effort into additional marshes; this survey was essentially a full census of all accessible available habitat. By comparison, marsh bird population trend analysis conducted by NYSDEC in 2012 included data from nearly 1,500 call-broadcast surveys at 417 survey points (Yard et. al. 2012). However, future annual survey efforts and combining data from this study with other ongoing anuran data collection efforts in the region, will facilitate efforts to assess trends in anuran populations in the NR AOC. Additionally, proposed NR AOC marsh creation and restoration measures (Filipski 2012), if implemented, will eventually yield additional marsh locations and opportunity to increase the survey effort and sample sizes.

5.0 CONCLUSIONS

This study is the second of five annual survey events that will be conducted at an intensive level within the NR AOC and represents nearly a full census of every location of habitat within the AOC that met the sample selection criteria (i.e., minimum size, location adjacent to the Niagara River, and direct hydrologic connection to the river) for the target anuran and marsh bird species. The study provides the baseline on which future survey events will be evaluated and offers a foundation for future comparisons with other studies locally and in the region.

It is well-known that nearly all of the former marshes in the region no longer exist, have been significantly reduced in size, and/or have had at least some of their primary wetland functions degraded. Despite this, seven of the ten targeted anuran species and six of the eight targeted marsh bird species were confirmed in the NR AOC during this study area. Future survey efforts will help to assess population sizes and species use of the marshes found in the NR AOC.

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APPENDIX A

PHOTOGRAPHIC DOCUMENTATION



Anuran Survey Point A1-1 Facing Northeast



Anuran Survey Point A1-2 Facing Southwest



Anuran Survey Point A1-3 Facing North



Anuran Survey Point A1-4 Facing North



Anuran Survey Point A1-5 Facing North



Anuran Survey Point A1-6 Facing Northeast



Anuran Survey Point A1-7 Facing East



Anuran Survey Point A1-8 Facing North



Anuran Survey Point A1-9 Facing West



Anuran Survey Point A1-10 Facing Southeast



Anuran Survey Point A2-1 Facing Southeast



Anuran Survey Point A2-2 Facing Southeast



Anuran Survey Point A2-3 Facing Northwest



Anuran Survey Point A2-4 Facing Northeast



Anuran Survey Point A2-5 Facing West



Anuran Survey Point A2-6 Facing North



Anuran Survey Point A2-7 Facing Northeast



Anuran Survey Point A2-8 Facing Southwest



Anuran Survey Point A2-9 Facing Southwest



Anuran Survey Point A2-10 Facing Northwest



Anuran Survey Point A2-11 Facing West



Anuran Survey Point A2-12 Facing Southeast



Avian Survey Point B1-1 - Deleted due to excessive noise



Avian Survey Point B1-2 Facing East



Avian Survey Point B1-3 Facing Northeast



Avian Survey Point B1-4 Facing Southwest



Avian Survey Point B1-5 Facing Northwest



Avian Survey Point B1-6 Facing South



Avian Survey Point B1-7 Facing Southeast



Avian Survey Point B1-8 Facing West



Avian Survey Point B1-9 Facing West



Avian Survey Point B2-1 Facing South



Avian Survey Point B2-2 Facing West



Avian Survey Point B2-3 Facing West



Avian Survey Point B2-4 Facing North



Avian Survey Point B2-5 Facing North



Avian Survey Point B2-6 Facing South



Avian Survey Point B2-7 Facing Northeast

APPENDIX B

COORDINATES FOR ANURAN AND MARSH BIRD SURVEY LOCATIONS

2015 Anuran and Marsh Bird Survey Point Locations	
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Route	Point ID	Latitude	Longitude
		Anuran Surveys	
A1	A1-1	42.960503	-78.939217
A1	A1-2	42.959568	-78.957962
A1	A1-3	42.967510	-78.942993
A1	A1-4	43.007469	-78.931328
A1	A1-5	43.025017	-78.894989
A1	A1-6	43.060871	-78.972527
A1	A1-7	43.061314	-78.978668
A1	A1-8	43.057976	-78.986420
A1	A1-9	43.059189	-78.994759
A1	A1-10	43.026093	-79.011536
A2	A2-1	42.844940	-78.850868
A2	A2-2	42.852051	-78.853264
A2	A2-3	42.874725	-78.885559
A2	A2-4	42.934406	-78.907394
A2	A2-8	43.023518	-78.880058
A2	A2-5	43.000961	-78.926895
A2	A2-6	43.006184	-78.906746
A2	A2-9	43.034512	-78.885399
A2	A2-7	43.016853	-78.891350
A2	A2-10	43.054249	-78.899612
A2	A2-11 (new)	42.967445	-78.925240
A2	A2-12 (new)	42.931976	-78.904709
A2	A2-13 (new)	42.852886	-78.858452
	N	larsh Bird Surveys	
B1	B1-1 (deleted)	42.843636	-78.851906
B1	B1-2	42.845013	-78.850868
B1	B1-3	42.848431	-78.853615
B1	B1-4	42.852074	-78.853279
B1	B1-5	42.872456	-78.883560
B1	B1-6	42.875782	-78.887016
B1	B1-7	42.968556	-78.942459
B1	B1-8 (new)	42.959610	-78.957802
B1	B1-9 (New)	42.967400	-78.925217
B2	B2-1	43.064117	-78.998535
B2	B2-3	43.059143	-78.994789
B2	B2-2	43.061146	-78.991837
B2	B2-4	43.057987	-78.986374
B2	B2-5	43.057045	-78.981514
B2	B2-6	43.060448	-78.979279
B2	B2-7	43.062645	-78.969978

APPENDIX C

2015 ANURAN SURVEY DATA AND FORMS

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Moon or Moonlight			N	N		N			1	-	1	-	1		,	-	5	1	,	-	1	
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Gray tree frog												0	0							B	B	
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11 - LANDFILL -DELETE ROINT

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Route Number:	AZ								_							
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Northern leopar	d frog					_									-	
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Pickerel frog																

POOR HABITAT 4.5,8 NO 11 7,10

Please complete information below Data collected at start of each survey point S, GROVE Observer Additional notes: Name(s): M. GROVE Route A2 Number: Survey Date 05/14/2015 (mm/dd/yyyy): Window Days since last rainfall: SON S/11 Number: **Survey Point Number** Data collected at each point 11 12 13 4 5 6 7 8 9 10 Start Time (military): 2345 2325 2210 Air Temperature: 52 52 52 Select Scale: °C (F) Was noise a factor? (use index) 2 0 1 Did you take a break? (check if yes) -----Wind (Use Wind Scale) 2 2 Sky (Use Sky Codes) 2 1 1 Moon or Moonlight Visible (Y or N) N N N Number of cars that passed (within 50 m) \mathcal{A} 00 00 Snow cover (Y or N) N N N **Species List** 1 2 3 4 5 6 7 8 9 10 American toad Gray tree frog 3 0 Spring peeper ŀ. 1 Western/Boreal chorus frog Mink frog Wood frog American bull frog Green frog Northern leopard frog **Pickerel frog** Comments: 13- I LOWE PEEPER

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Please comple	ete information be	elow	w		Da	ta d	coll	ecte	ed a	at star	t of ea	ch sur	vey po	int	
Observer Name(s):	S. GROVE M. GROVE				Ad	ditior	nal n	otes							
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Survey Date (mm/dd/yyyy):	6/13/2015	_													
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Mink frog			-	-								++
Wood frog			+	-								++
American bull	frog		-	-	1						-	++
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Northern leopa	ard frog		-	-								-
Pickerel frog			-	-						-		
Comments:	VIRA CALLI	NG	Q	2	# []			24 				

A-1 1/12/2015				Additi	onal	note	s:										
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Please compl	ete information b	pele	w		C	ata	col	lec	ted	at st	art o	fea	ach sur	vey p	oir	nt	
Observer Name(s):	S.GROVE M.GROVE				A	dditi	onal	note	s:							-	
Route Number:	A-2																
Survey Date (mm/dd/yyyy):	7/11/2015				1												
Window Number:	4				D	ays s	ince	last	rainf	all:	1.5		.26'	' on	7	19	
Data collecte	d at each point			_		-			Sur	vey	Point	Nu	mber				
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Moon or Moonlight	Visible (Y or N)	1	V	1	J	1	Y	T	1	N	1	V	N	N	-	N	N
Number of cars that	at passed (within 50 m)	_	2	0	0	+ /		0	0	a	30	12	00	00	5	0 0	OP
Snow cover (Y or N	1)	1	4	1	N		N		Ŭ	N	1	192	N	A	1	N	N
Species List			1		2		3	4	1	5		6	7	8		9	10
American toad						2	2									5	
Gray tree frog											-						
Spring peeper			-								_						
Western/Boreal	chorus frog					-											
Mink frog		-															
Wood frog						-					-						
American bull fi	rog			1	1	2	2						_			11	
Green frog		2	2	9	2		1	2	2								
Northern leopar	d frog							_									
Pickerel frog																	
	A REAL PROPERTY AND A REAL	_	-														
Comments:	- CONCERT NOIS	RE	e e	AP	*	A PON	A	A /	AST	FRI	06	172	ARDA	tERE		+ A HIS	SEA
0,7- 10 6- POLI	HABITAT CE		C	1=	BRG	AIC	- PI	OR	Exi	2855	WSC-	1	rord	BOAT	t		
	AT @ 8																

SPP: DEER, OPPOSUM, MUSKRAT, FOX, RABBIT HOUSE (FERAL CATS

Please comple	ete information b	elow	1	D	ata	coll	ected	at sta	rt of ea	hch sur	vey poi	int	
Observer	S-GROVE			A	dditid	onal n	notes:						
Name(s):	M-GROVE				auren	indi i	iotes.						
Route Number:	A.Z												
Survey Date (mm/dd/yyyy):	7/11/2015	-											
Window Number:	Ч			D	ays s	ince la	ast rainf	all:					
Data collected	at each point		-		1.				oint Nu		-		
	Start Time (military):	115		12	1	_	4	5	6	7	8	9	10
	Air Temperature:	115	81	101	10	15			-				-
Select Scale:		66		67	6	8							
Was noise a factor?	(use index)	2		2		2							-
Did you take a brea	k? (check if yes)	N		N		N						-	-
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Sky (Use Sky Code		14		1	1							-	-
Moon or Moonlight		N		N	1	1					-		
	t passed (within 50 m)	01	16	20	0	0							
Snow cover (Y or N		N	4	N	1	1							
Species List		1		2	11 :	3	4	5	6	7	8	9	10
American toad			-	-	1	L							
Gray tree frog			-	-	-		-		-				
Spring peeper			-	-	-		_			_			
Western/Boreal	chorus frog		-	-							-		
Mink frog													
Wood frog												15	
American bull fr	og				1	1		_					
Green frog		1	1	11	1	1							
Northern leopard	l frog												
Pickerel frog													
Comments: GRN FROGS	INDEX 2 IN	DIT		A TO			DF P	T Aa	- 18				

APPENDIX D

2015 MARSH BIRD SURVEY DATA AND FORMS

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DATE (e.g. 15 May 2015): 5/15/2015 MILLER AREA OF CONCERN MARSH BIRD SURVEY DATA FORM

MULTIPLE OBSERVER SURVEY: YES / NO

BOAT TYPE:

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DATE (e.g. 15 May 2015): 5/16/20/5 MINITIM FORM BUCKHORN

MULTIPLE OBSERVER SURVEY: YES / NO

BOAT TYPE CANOF

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NOITAT2 A38MUN	ЭМІТ ТЯАТ (ҮЯАТІЛІМ	(F) .TEMP. (F)	SKY	ND (Beaufort))	NOISE CKEBONND	SPECIES		1-0 22A	PASS 2-3	FE SSA9	2-4-22A9	IEBI	AAOS	VIRA	KIKA	IBMA	COGA	AMCO	PBGR	OUTSIDE	CALL TYPE(S)	DIRECTION	таряат иі (И\Y) Азяа	DISTANCE (METERS)	ISTANCE AIDE		
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81-3	0450	64	2	-	e	SORA	A		-		<			0							CALLKeet	0.19	X	50	5	2	MAWR
						ANIA	P	-						n							GRUNT	0	2	10	-	2	
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- 4	51,90	65	2	0	0	VIRA	A	-	<					C							GRUNT	6	X	ee!	2	23	MAWR
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							_	-	-	-		-)					

NIAGARA RIVER AREA OF CONCERN MARSH BIRD SURVEY DATA FORM

MARSH	MARSH NAME:	Thu e	tation	ŧ,	2	20" "	e.	2.0	1	OBSE	SER	OBSERVER NAMES (LIST ALL):	N	SM	S (L	IST	AL	Ľ.	is	GR	EONE,	M. GROVE	Nos	m			1
ADDITI	ADDITIONAL NOTES:	IOTE	S:	lli	2.	Ben 6-	locim	MC	1-	22	em	12		~	1		\$	(*		1 (
				IIM	Aa							OBS	OBSERVED DURING	DDU	RINO	67					5	1			DI		
NOITAT2 A38MUN	דאמד דואב (אונודאמץ)	TEMP. (F)	SKY	ND (Beaufort))	иоізе Скевопир	SPECIES	1-0 SSA9	2-1 SSA9	PASS 2-3	PASS 3-4	2-4 SZA9	FEBI	AAOS	AAIV	KIRA	IBMA	COGA	AMCO	рвая	OUTSIDE	(S) APLE (S)	рікестіои	IN TARGET (N/Y) ABAA	DISTANCE (METERS)	STANCE AIDE		соммеитя
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記す	16.57	2		01	-	PBGR	,												T	-	11	Q	~	00	2	2	
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62-2	0713	60	9	2	w	1																0					Swsp
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1326	0630	60	9	3	C .	۱																0					
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ADDITIONAL NOTES:	SONALN	OTE	ŝ		A8							OBS	ERVE	DDD	OBSERVED DURING	5)					>				D	D	
NOITAT2 A38MUN	ТАВТ ТІМЕ (ҮЯАТІЛІМ	(F) (F)	SKY	ND (Beaufort))	NOISE CKEBONND	SPECIES	1-0 SSA9	2-1 22A9	PASS 2-3	PASS 3-4	2-4 22A9	LEBI	AAOS	VIRA	KIKA	IBMA	COGA	AMCO	рвая	BOUTSIDE	SALL TYPE(S)	DIRECTION	IN TARGET AREA (Y/N)	DISTANCE (METERS)	STANCE AIDE	PREVIOUSLY	
B1-11	0503	45	ce	6	-	VIRA							<				T				GRUNTS	9	4	7	2	2	MAWR, SWSD
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B1-3 (1250	R	e	3	1	1						A									1	0					T
31-20	5530	S	9	3	0	VIRA	3						<	T	V	1	1	15			GRUNTS	Q	1	10	5	2	SWSP, M
		-		-		VIRA								4	-			3	<	F,	CLAP ARUNS	9	<-	20	2	5	
31-50	L19(57	2	2	0	1																0					WARD ON SWICP
B1-6 0	0750	57	5	2	0	1																0					STARTED DRIZZING
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APPENDIX E

2105 HABITAT MONITORING DATA AND FORMS

General Information
Survey Date (DD/MM/YYYY): 25/06/2019
Observer(s) Name(s): J. Sweitzer, B. GRIFFITH
Survey Point (complete for each point):Al-1
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other (describe)

Classification & Disturbance

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S.N.K.33

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Balbaschaenus fluxiatilio	60
Lythrom subscore in most subs	10
Typha latifulia	10
Euphonium maculation	10
Criex Junitic	70

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:___

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:_

Photo 4483-4484

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

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Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	T
Shrubs			X			in the
Trees			X			CONTRACTOR OF THE OWNER
Bare soil				······		
Water	10000 41	AAN PANA	X	and a provide	and the start of the	d) and a
Upland				Same and St	1	
Mudflat	AL DE MO	BELLEVE TO R	Will frement	ST SOLOT T	anns a oneo	all Sugar
Floating veg.					(Constant and a constant
Wetland Interspersion (%open water Density of marsh vegetation ² (Circle	one): No	one, sparse	, moderate,	dense	nule un	
Estimated average marsh vegetation				-		
Method used for measuring water d					_	
Distanc					minatro	nilit Lengt
Water edge (m):	berts m	Upla	nd area (m):/	5	
Ditch (m):		Larg	e open-wat	er area (m):3	the culture
Mudflat (m):		Smal	l open-wat	er area (m)		- College
Road or dike (m):50	alaav					

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
Survey Date (DD/MM/YYYY): 7/11/2015	
Observer(s) Name(s): S. GROVE	
Survey Point (complete for each point):) B1-8
How was the point accessed? (Circle one): canoe, motor boat,	
Edge Type (Circle one): roadside/marsh, parking lot/marsh, ditc	h or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or Pl	
Classification & Disturba	nce
NWI code (Record an NWI Code for the target wetland):	PUBH/PEM
NVCS Alliance (Record an NVCS Alliance code or codes for th	
Most dominant plant species (Record % Cover for 3-5 dominar	nt species):
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
TYPHA	10
LYTHRUM SALICARIA	5
CAREX SPP	5

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, other:_____

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:_____

Month/year (if known) of last management action:

Page 1 of 2

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Peri	meter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	7
Shru	ibs			1			
Tree	S		, in the second s	1			1
	e soil						1
Wat	er				X		
Upla					X		
Mud							-
Floa	ting veg.						-
Wetland Inters Density of mars Estimated aver Litter depth (cr	Circle one): none, tree persion (%open wate sh vegetation ² (Circle age marsh vegetation n): or measuring water d	r and %v one): No height Wate	regetation of one, sparse (m): 0-1, 1 r depth (n	cover): e, moderate, -3, 3-6,>6. n):	dense	, other:	* Perimeter around Ponp MARGINAC VALUE
				aracteris			
Water edge (m)	:)		Upla	nd area (m):S	-	-
Ditch (m):	-		Larg	e open-wat	er area (m)	:)
Mudflat (m):	-		Smal	l open-wate	er area (m)		
Road or dike (n	n): <u>30</u>	-					
					1		

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 25	06/2014	
Observer(s) Name(s): 3. SwEITZS		aliaening characteribled
Survey Point (complete for each po	int):A1-3	Emont Directores
How was the point accessed? (Circle	e one): canoe, motor boat, (walk) wade?
Edge Type (Circle one): roadside/man	rsh, ditch or berm/marsh, up	pland/marsh/open water/marsh,
interior/marsh, other (describe)		Star Meller

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): _____ PEMIE

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: VAS. M. M. 19

Most dominant plant species (Record % Cover for 3 dominant species):

% Cover (Absolute cover)
40
60
30

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:___

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:____

412°58'2"N 70°56' 33"W

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	7
Shrubs		0.011	X	lan sale of	Normal 1	dari y
Trees	X					and the second
Bare soil	territ er		and the second second	Di Phane	an tailara	ti sore
Water	an new sea	X	Martin State	- A A B A A A A A A A A A A A A A A A A	bu mond	
Upland			×	Sec. and	in the second	
Mudflat		DID THE REAL PROPERTY			SHER CROTCH	0.0465
Floating veg.						
Wetland Interspersion (%open water	and %v	regetation c	over): 3	0-70)	
Density of marsh vegetation ² (Circle						
Density of marsh vegetation ² (Circle Estimated average marsh vegetation	one): No	one, sparse (m): 0-1,1	, moderate,	dense		
	one): No	one, sparse (m): 0-1,1	, moderate,	dense		
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm):	one): No height _ Wate	one, sparse (m): 0-1	, moderate, -3,)3-6,>6.	dense	Inuto I an andi ² mal	
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm): Method used for measuring water de	one): No height _ Wate epth (Ci	one, sparse (m): 0-1 r depth (m rcle one): s	, moderate, -3,)3-6,>6.	dense meter stick		nimek A
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm): Method used for measuring water de	one): No height _ Wate epth (Ci e to Phy	one, sparse (m): 0-1 1 r depth (m rcle one): s ysical Ch	, moderate, -3, 3-6,>6. a): staff gauge, maracteris	dense meter stick tics		nimob A A
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm): Method used for measuring water do Distance	one): No height _ Wate epth (Ci e to Phy	one, sparse (m): 0-1 1 r depth (m rcle one): s ysical Ch Uplan	, moderate, -3, 3-6,>6. a): staff gauge, maracteris	dense meter stick tics		nimob A A
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm): Method used for measuring water do Distance	one): No height _ Wate epth (Ci e to Ph	one, sparse (m): 0-1 r depth (m rcle one): s ysical Ch Uplan Large	, moderate, -3, 3-6,>6. a): staff gauge, maracteris and area (m) e open-wate	dense meter stick tics):(er area (m)		
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm): Method used for measuring water do Distance Water edge (m):	one): No height _ Wate epth (Ci e to Phy	one, sparse (m): 0-1 1 r depth (m rcle one): s ysical Ch Uplan Large Small	, moderate, -3, 3-6, >6. a): staff gauge, maracteris and area (m) e open-wate	dense meter stick tics):(er area (m)		

 $^{^{2}}$ Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
---------------------	--

Survey Date (DD/MM/YYYY): 25/06/2014	and the second second second
Observer(s) Name(s): J. SUFITZER, B. GRIFFITH	
Survey Point (complete for each point): <u>AI-4</u>	Parospier Churadan Inder Interes
How was the point accessed? (Circle one): canoe, motor boat, walk,	wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland	/marsh, open water/marsh,
nterior/marsh, other (describe)	

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): ______ PFOIC______

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S. N.K.33

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha annustifolia	20
Typha labifolia	15 10 1000
Spannanium	30
Lythrum salura	15
Course Careton	76

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:____

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:) dilch-

Month/year (if known) of last management action: 2014

Page 1 of 2

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

	Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1
	Shrubs		12	V.	has and as	data and t	1
	Trees						
	Bare soil	- Andrews			Care Million and	- tainai	
	Water	1000 01	AUTO CONTRACTO		in the series	the Direction	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Upland						
	Mudflat	n anevan	UNITED BOL	The second second	and a not start	And STORES	attra
	Floating veg.						
Wetland	oatch (Circle one): none, tree Interspersion (%open wate of marsh vegetation ² (Circle	r and %v	regetation of	cover): () - 100	nor (B ₁₀₀	
Density o	i marsh vegetation (Chele	one): No	one, sparse	, moderate,	dense		
Estimate	d average marsh vegetation	n height	(m): 0-1,(1	-3, 3-6,>6.			
Estimate		n height	(m): 0-1,(1				
Estimate Litter dej	d average marsh vegetation	n height Wate	(m): 0-1,(1 er depth (n	-3, 3-6,>6. n):	5	enta ² Irol	
Estimate Litter de Method u	d average marsh vegetation pth (cm):	n height Wate lepth (Ci	(m): 0-1,(1 e r depth (n ircle one): :	-3, 3-6,>6. n):	meter stick	enta ² Irol	
Estimate Litter de Method u	d average marsh vegetation pth (cm):	n height Wate lepth (Ci	(m): 0-1,(1 er depth (n ircle one): ysical Cl	-3, 3-6,>6. n): <u>O, 1</u> staff gauge,	meter stick	, other: _	y ai
Estimate Litter dej Method u Water ed	d average marsh vegetation pth (cm):	n height Wate lepth (Ci	(m): 0-1,(1 er depth (n ircle one): : ysical Cl Upla	-3, 3-6,>6. n): <u>O, 1</u> staff gauge, naracteris	meter stick	- ; other: _	y di autom
Estimate Litter de Method u	d average marsh vegetation pth (cm):	n height Wate lepth (Ci	(m): 0-1,(1 er depth (n ircle one): : ysical Cl Upla Larg	-3, 3-6,>6. h): <u>O, 1</u> staff gauge, haracteris nd area (m	meter stick stics): er area (m)	c, other:	Y di anita an matima matima

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
Survey Date (DD/MM/YYYY): 2506/2014	P magnitude and the
Observer(s) Name(s): J. SwEITZER, B. GRIPPITM	entwise Internal in proceedian
Survey Point (complete for each point): <u>A1-5</u>	de a
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh,	open water/marsh,
interior/marsh, other (describe)	

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): R2UBH

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: 1/ A. 5, N. H. 33

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover			
Typha angustifolia	_ / 0			
Typha labbolin	Zo and and			
Lythron salimin	5			
Persicanta Maculosa	10			

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:

Page 1 of 2

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Charles	<5%	6-25%	26-50%	51-75%	>75%	
Shrubs		1.2613	X	down well at	demonts.	and wrone
Trees			×			and States
Bare soil				CAL PL	and the state of t	diams wel
Water		and the second	X		Contract of	TTT TTTT ALOI
Upland	5.000	X				
Mudflat	(Weineren	1011 100 TO 1	providence in the land	Current of St	200 3121	office Territory
Floating veg.	X					
Wetland Interspersion (%open water	r and %v	vegetation of	cover): 7	0-30		WILL SOV
Density of marsh vegetation ² (Circle			_			
Estimated average marsh vegetation	n height	(m): 0-1,(1	-3,)3-6,>6.			
Estimated average marsh vegetation	n height	(m): 0-1,(1	_			
Estimated average marsh vegetation	n height Wate	(m): 0-1.(1 er depth (n	-3,3-6,>6. n):0,1	Z	nia tari temi	
Estimated average marsh vegetation Litter depth (cm): Method used for measuring water d	n height Wate lepth (Ci	(m): 0-1(1 er depth (n ircle one):	-3,)3-6,>6. n):	Z meter sticl	- c, other: _	
Estimated average marsh vegetation Litter depth (cm): Method used for measuring water d Distanc	n height Wate lepth (Ci e to Ph	(m): 0-1(1 er depth (n ircle one): ysical Cl	-3,)3-6,>6. n): <u>0,1</u> staff gauge,	Z meter stick	c, other: _	ia.
Estimated average marsh vegetation Litter depth (cm): Method used for measuring water d Distanc Water edge (m):	n height Wate lepth (Ci e to Ph	(m): 0-1,1 er depth (n ircle one): ysical Cl Upla	-3,3-6,>6. n): <u>0,1</u> staff gauge, haracteris nd area (m	Z meter stick stics	c, other: _	noinntae
Estimated average marsh vegetation Litter depth (cm): Method used for measuring water d Distanc	n height Wate lepth (Ci e to Ph	(m): 0-1.(1 er depth (n ircle one): ysical Cl Upla Larg	-3,3-6,>6. n): <u>0,1</u> staff gauge, haracteris nd area (m e open-wat	Z meter stick stics .): ter area (m	<., other:	naiomna a

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information
Survey Date (DD/MM/YYYY): 26 06 2614
Observer(s) Name(s): J. SwEIFZER, B. GRIFFITH
Survey Point (complete for each point):
How was the point accessed? (Circle one): canoe, motor boat, walk) wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other (describe)

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): R2US2C / R2UBH

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹:_____

Most dominant plant species (Record % Cover for 3 dominant species):

% Cover (Absolute cover)
the sector of the base be

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:____

Noto 4505

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1 CLASSER
Shrubs		X	and the second	And an address		Sec. Post
Trees		240	X			-
Bare soil				Con eren and	- Anti-	di esere
Water	Second Str	surface and a second	×	-) abreats	du strand	
Upland				×		
Mudflat	P A PARTIN	and this also h	Conta submitta	CI O'OLECTIVA	and most -	19962.00
Floating veg.						Canto Interes
Wetland Interspersion (%open water Density of marsh vegetation ² (Circle						
Estimated average marsh vegetation						
Method used for measuring water d						
Distanc	e to Ph	ysical Cl	haracteris	stics		
Water edge (m):	brib , drad	Upla	nd area (m):;	1	.naimures
Ditch (m):		Larg	e open-wat	er area (m)):	0
Mudflat (m):		Smal	l open-wat	er area (m)	:	13965
Road or dike (m):	Slady					

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 26/06/2014	
Observer(s) Name(s): 5. SwEITZER, B, GRIFFITH	di
Survey Point (complete for each point): <u>A1 - 7</u>	
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,	
interior/marsh, other (describe)	

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIEd

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V. A.S. N. K. 6

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cove			
Cares lacustris	70			
Typha lapifolia	30			
Cornus AMOMUM	10			

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:

Photo 4506

Page 1 of 2

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs		15	ut-los	X	house
Trees	1		X		
Bare soil	X			F- 05	
Water					and the second
Upland	-		X		
Mudflat	e alle and		Same Street and	State Uptor 1	2.14 S.15-
Floating veg.					
Wetland Interspersion (%open water Density of marsh vegetation ² (Circle Estimated average marsh vegetation	one): No	one, sparse	e, moderate,	dense	
Litter depth (cm):			n):(
			haracteris		
Distanc	e to i h	ysical Cl	uai acteri.	Sucs	
Water edge (m): 80 - 60	berla, mo	Upla	nd area (m):	
Ditch (m):		Larg	e open-wat	er area (m):2
Mudflat (m):		Smal	l open-wat	er area (m)	:
Road or dike (m): 150	al (think				

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
Survey Date (DD/MM/YYYY): 24/06/2014	والمربط والمراز
Observer(s) Name(s): J. Sweitzer, B. GRIFFITH	nino Tanabo
Survey Point (complete for each point): <u>A1-10</u>	112
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	
Edge Type (Circle one), roadside/marsh, ditch or berm/marsh, upland/marsh, open wa	iter/marsh,
interior/marsh, other (describe)	10172

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): R20BH

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹:______

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
NONE	
The state of the state of the state of the	Turst bridge 2

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:____

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Photo 4512

Page 1 of 2

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	La ragina si
Shrubs	×	X	stanion	dawn wet at	James	vice Point
Trees			- 11- 14			1
Bare soil	1			In Provide	- Inton	de same
Water	140000	Salar - Salar	X	131 1 LANDO 31	hourse a	Car Ob Char
Upland			×	1		
Mudflat	11 SICIM	AUTORI JOLI	CALOD CONCERNING	Career Deal	SHELL STORE	a segret a
Floating veg.						
Vetland Interspersion (%open water Density of marsh vegetation ² (Circle		-				
stimated average marsh vegetation						
itter depth (cm):	Wate	er depth (n	n): 0.6	0	-	
Aethod used for measuring water d	epth (Ci	ircle one):	staff gauge,	meter sticl	, other: _	_
Distanc	e to Ph	ysical Cl	naracteris	stics		
Vater edge (m):	on, dent	Upla	nd area (m):C)	Le lans
Ditch (m):		Larg	e open-wat	er area (m):	2
fudflat (m):		Smal	l open-wat	er area (m)):	ashedra
Road or dike (m):	http://					

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
Survey Date (DD/MM/YYYY): 24/06/2014	10h
Observer(s) Name(s): J. Sweitzer B. GRIFFITH	
Survey Point (complete for each point): <u>A2-4</u>	
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,)
nterior/marsh, other (describe)	

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PVBHx

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A. J.N.m. 19

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typh- unaustitalia	20
Schoenaplectus sp.	10
Carex - vulpinoiden	5
Butomus umbellatus	A AVE & DE LE THE ON TO DE

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

Month/year (if known) of natural disturbance event:____

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other: _//A

Month/year (if known) of last management action:

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs		X	Afrelas	Sec. 2. 1	ALLER DON'T BY
Trees		X			
Bare soil			X	the statement	a tates a
Water	and the second		×	1	our reacting of
Upland				X	a tai
Mudflat	in man	Neuradi Kuy	Destri Trestinos	COURSESS OF	pro clori 7
Floating veg.					
Wetland Interspersion (%open water	r and %v	regetation of	cover):	80/2	0
Density of marsh vegetation ² (Circle	one): No	one, sparse	, moderate,	dense	melymesi
Density of marsh vegetation ² (Circle Estimated average marsh vegetation	one): No	one, sparse (m): 0-1,1	, moderate,	dense	melymesi
Density of marsh vegetation ² (Circle Estimated average marsh vegetation	one): No n height Wate	one, sparse (m): 0-1,1 er depth (n	-3, 3-6,>6. n):	glense 3	nudq men mesk n. 19
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm):	one): No n height Wate lepth (Ci	one, sparse (m): 0-1, <u>(1</u> er depth (n ircle one):	, moderate, -3, 8-6,>6. n): 0, (staff gauge,	dense 3 meter stick	nudq men mesk n. 19
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm):	one): No n height Wate lepth (Ci se to Ph	one, sparse (m): 0-1,1 er depth (n ircle one): ysical Cl	, moderate, -3, 8-6, > 6. a): $0, 6$ staff gauge, maracteris	dense 3 meter stick stics	- c, other:
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm):	one): No n height Wate lepth (Ci se to Ph	one, sparse (m): 0-1, <u>(</u> 1 er depth (n ircle one): ysical Cl Upla	, moderate, -3, B-6, > 6. a): O, G staff gauge, naracteris nd area (m	dense dense meter stick stics):	- c, other:
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm):	one): No h height Wate lepth (Ci te to Ph	one, sparse (m): 0-1,1 er depth (n trcle one): ysical Cl Upla Larg	, moderate, -3, 3-6,>6. n):	dense 3 meter stick stics): ter area (m	x, other:

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems Page 2 of 2

General Information
Survey Date (DD/MM/YYYY): 24/06/2014
Observer(s) Name(s): J. SWEITZER, B. GRIFFITH
Survey Point (complete for each point): <u>A2-5</u>
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other (describe) trail parking lot/ trail

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIFX**NVCS Alliance** (Record an NVCS Alliance code or codes for the target wetland)¹: V_1A , 5_1N , q, b

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Phragmites dustralis	100
and the second staff particular many second staff in the	a state of the second second second second

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event: ________/A

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:_

Photo 4436

Page 1 of 2

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs			- I keelinger	dame and al	
Trees					
Bare soil				my it	
Water	ansino an	COLIC SPOKIES	a contraction	and a surger of	are series
Upland					X
Mudflat	na denario	00150 NO 1	ALL HEREIN	CIDING HORIZA	SHO SHOT
Floating veg.					

Distance to vegetation patch edge (m): 2
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 0/100
Density of marsh vegetation ² (Circle one): None, sparse, moderate, dense
Estimated average marsh vegetation height (m): 0-1, 1-3, 3-6,>6.
Litter depth (cm): Water depth (m):
Method used for measuring water depth (Circle one): staff gauge, meter stick, other:
Distance to Physical Characteristics
Water edge (m): Upland area (m):
Ditch (m): Large open-water area (m):
Mudflat (m): Small open-water area (m):
Road or dike (m): 3

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY):	24/06/2014
Observer(s) Name(s):	Sweitzer, B- Griffith
Survey Point (complete for each	
How was the point accessed? (Ci	rcle one): canoe, motor boat, walk, wade?
	marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other (describe)	

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland):_____PEMIA

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V,A,S,N, 9, 6

Most dominant plant species (Record % Cover for 3 dominant species):

% Cover (Absolute cover)
70
30
10

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs	×				1010
Trees					Name and and
Bare soil					
Water			10110 01 01	3) 11-1-1	THE PROPERTY
Upland					V
Mudflat	il de la	is not the	olds die thin	abieber i	10
Floating veg.					

Distance to vegetation patch edge (m):_____3

Type of patch (Circle one): none, tree, shrub, herbaceous

Wetland Interspersion (%open water and %vegetation cover): 100% Vegetation

Density of marsh vegetation² (Circle one): None, sparse, moderate, dense

Estimated average marsh vegetation height (m): 0-1, 1-3, 3-6,>6.

Litter depth (cm): _____ Water depth (m): _____

Method used for measuring water depth (Circle one): staff gauge, meter stiek, other:

Distance to Physical Characteristics

Water edge (m):	Upland area (m): 5
Ditch (m):	Large open-water area (m):
Mudflat (m):	Small open-water area (m):
Road or dike (m): 50	vincent boolest, destroits have being daten (hoores

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYY)	T): 24/06	2014	tur dur t	sheet (h), placing as "X" and
Observer(s) Name(s):	oth Sweiter	Ben	Frithith	The second s
Survey Point (complete for e	each point):	A2-7		stude
How was the point accessed?	(Circle one):	canoe, mo	tor boat, walk,	wade?
Edge Type (Circle one): roads	side/marsh, ditc	h or berm	/marsh, upland	/marsh, open water/marsh,
interior/marsh, other (describe) upland	1 open	water - no	marsh present

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): R2VBH

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹:_____

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Ala IF	
110A/F	title select
10000	-
and rate with the true and spirit abo	C THE R STREET OF CALL ON

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road construction, invasive species control, wetlands restoration, dredging, other: NAMonth/year (if known) of natural disturbance event: NAManagement Actions (circle all that apply): Trail/road construction, dredging, invasive species control (mechanical and chemical), wetland restoration, wildlife management, other: NAMonth/year (if known) of last management action: NA

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	
Shrubs		X	Santan	dama hall at	Long and	in real
Trees	X					and Dece
Bare soil	1	X				di samon
Water	analoga an	THE PROPERTY	×	and freezeway	an service a	
Upland			×			
Mudflat	ni danni	191120 20 1	onto Lucitore	MARDEN/	9991 Same 3	115 121
Floating veg.						
	r and 0/1	regetation (over).	12 witte	d	
		-				
Density of marsh vegetation ² (Circle	one):N	one, sparse	, moderate,	dense		
Density of marsh vegetation ² (Circle Estimated average marsh vegetation	e one): N n height	one, sparse (m): 0-1, 1	-3, 3-6,>6.	dense		
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm):/A	e one): N n height Wate	one, sparse (m): 0-1, 1 er depth (n	e, moderate, -3, 3-6,>6. n):	dense Ica	nadi popu lecso? tent	
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm): <u>M/A</u> Method used for measuring water o	e one): N n height Wate lepth (C	one, sparse (m): 0-1, 1 er depth (n ircle one):	e, moderate, -3, 3-6,>6. n):	dense Ican meter stiel	- k, other: _	alitarità suo 9
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm): <u>M/A</u> Method used for measuring water o Distanc	e one): N n height Wate lepth (C ce to Ph	one, sparse (m): 0-1, 1 er depth (n ircle one): nysical Cl	e, moderate, -3, 3-6,>6. n): staff gauge, haracteris	dense 7cm meter stiel stics	k, other: _	alitada sua 9 9 9
Water edge (m): Organization	e one): N n height Wate lepth (Ci ce to Ph	one, sparse (m): 0-1, 1 er depth (n ircle one): hysical Cl Upla	e, moderate, -3, 3-6,>6. n): staff gauge, haracteris	dense	k, other: _	
Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm):/A Method used for measuring water o Distance Water edge (m):	e one): N n height Wate lepth (C ce to Ph	one, sparse (m): 0-1, 1 er depth (n ircle one): hysical Cl Upla Larg	e, moderate, -3, 3-6,>6. n): <u>17</u> staff gauge, haracteris nd area (m e open-wat	dense 7cm meter stiel stics):(ter area (m	k, other:	

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYY)	Y): 24/06/2014
Observer(s) Name(s):	tin Sucitor, Ber Griffith
Survey Point (complete for e	each point):A2-8
How was the point accessed?	? (Circle one): canoe, motor boat, walk, wade?
Edge Type (Circle one): roads	side/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other describe) gravel driveway / marsh
0	Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): R2VBH

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹:_____

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
ALANE	- A
NVIVE	
and the second party, they will also a state	a state of the second second second

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:_____/A

Month/year (if known) of natural disturbance event: _____//A

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other: _//A

Month/year (if known) of last management action: M/A

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	
Shrubs	X	2000	. Continue	day to a start	deres a b	aloft yourn
Trees						1
Bare soil	and and		and the second	the office	and and and	dres in al
Water	and the	Uar, some	×		one surrouts	
Upland				X		
Mudflat	the second sec	140350	SALE ASING	CONSTRUCT C	and another	1000
Floating veg.						
Fype of patch (Circle one) (none), tree Wetland Interspersion (%open wate Density of marsh vegetation ² (Circle	er and %v		cover): <u>/</u>	lo wetlan	d	
Estimated average marsh vegetation	n height	(m): 0-1, 1	-3, 3-6,>6.			
Litter depth (cm): N/A	Wate	er depth (n	n):/_	1	- 11	
Method used for measuring water of	lepth (C	ircle one):	staff gauge,	meter stic	k, other: _	
Distanc	e to Ph	ysical C	haracteris	stics	sunsta	
Water edge (m):	deals an	Upla	nd area (m): <u> </u>) av lesvau	A COLUMN THE
Ditch (m):		Larg	e open-wat	ter area (m):0	an data
Mudflat (m):		Smal	ll open-wat	er area (m):0	tears) to

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 24 /o	6/2014
Observer(s) Name(s): Justin Sure	itzer Ben Griffith
Survey Point (complete for each point):	A2-9
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?
Edge Type (Circle one): roadside/marsh, o	litch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other (describe)	g lot / marsh

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland):_____PEMIF

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V,A, 5, N 1, 4/9

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Phraymites australis	20
Typha latitolia	10
Lythrom Salilana	5

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:_____/A

Month/year (if known) of natural disturbance event: N/A

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other Mowing

Month/year (if known) of last management action: 06/2014

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1
Shrubs		- No Ill	10minut	duran mail an	desmost	start germanis
Trees						
Bare soil			alman area	Charles and	and all and	Mare want the
Water	Colored Tes	a the produces of	X		AS REFUG	are transcended
Upland				X		
Mudflat	In Wellow	THE REAL	ono neccin	(a) fixibility (and orall of	1-10-12-12
Floating veg.						South and the state of the stat
Type of patch (Circle one): none, tree Wetland Interspersion (%open wate Density of marsh vegetation ² (Circle Estimated average marsh vegetation	er and %v e one): No	vegetation o	cover): <u>40</u> e, moderate,	dense	nas (<mark>lizan</mark> tanl plant	
Litter depth (cm): 3-5	Wate	er depth (n	n):(0	_	
Method used for measuring water of	lepth (Ci	ircle one):	staff gauge,	meter stick	k, other: _	
Distanc	e to Ph	ysical C	haracteri	stics		Normal Bin
Water edge (m): //		Upla	nd area (m	ı): <u>5</u>	ta konti	o canip
Ditch (m):		Larg	e open-wa	ter area (m):/	<u>o</u> <u>C</u> n.
Mudflat (m):		Smal	ll open-wat	er area (m)):/(Damegaar M
Road or dike (m):	to all the					

Page 2 of 2

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
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				e dievaile	10010010	teda jan enda
Observer(s) Name(s):	JUSTIN !	SWEITLER	BEN (RIFFIH		
		1.40 m		22 12 12	and the second	111
Survey Point (comple	te for each p	oint): A2 -	10		anha	20 3
				0		
How was the point ac	cessed? (Circ	le one): cano	e, motor b	oat, walk, wa	ide?	
How was the point ac Edge Type (Circle one					E	W

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): R2UBH

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: $V_1C, 2N.g$ (V.A.S.N.1, 9)

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Sparganium anurocladum	10
Typha angustifolia	10
Nuphar Variegatum	7
Caret scoparia	

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other: _____/A_____

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

NIA

control (mechanical and chemical), wetland restoration, wildlife management, other:_____//A

Month/year (if known) of last management action: Unknown date for introllation of

boat dour, boat ramp, walking trail.

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	and the other street of the
Shrubs	X	01-13	dialac	Auge and at		Survey Patr
Trees						and the course
Bare soil	handred		- and the street			
Water	10000	and a resulting	X	11-01-11	X	it as a work is
Upland			X			
Mudflat	C. D. D. D. D.	ARTES TO B	one please	CONCERNS OF	080 - 20 3	addy young
Floating veg.		X				1
Distance to vegetation patch edge (n Type of patch (Circle one): none, tree Wetland Interspersion (%open water Density of marsh vegetation ² (Circle Estimated average marsh vegetation	e, shrub, r and %v one): No	herbaceous regetation of one, sparse	cover): <u>80</u> , moderate,	/ ZO dense	inene (<u>Seren</u> Kanteg teme	
Litter depth (cm):						
Method used for measuring water d	epth (Ci	rcle one):		meter stick	, other: _	and income
Water edge (m):						-
Ditch (m):/A		Larg	e open-wat	er area (m):	tics (wrmit/
Mudflat (m):/A		Smal	l open-wat	er area (m)):A	1/9
Road or dike (m): 30	200 mg					

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	on
Survey Date (DD/MM/YYYY): 7/12 201	15
Observer(s) Name(s): <u>S. GROVE</u>	
Survey Point (complete for each point): A 2 - 11	B1-9
How was the point accessed? (Circle one): canoe, motor bo	at, walk, wade?
Edge Type (Circle one): roadside/marsh, parking lot/marsh, c	litch or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or	PFO wetland/Marsh, other (describe)
Classification & Distur	bance
NWI code (Record an NWI Code for the target wetland):	PUBHX IPSM
it wir code (Record an Nwir Code for the target wetland):	1. Ship I Chi
NVCS Alliance (Record an NVCS Alliance code or codes for	the target wetland) ¹ :
Most dominant plant species (Record % Cover for 3-5 domi	nant species):
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
PHRAGMITES AUSTRALIS	. 80
LYTHRUM SALICARIA	10
UNABLE TO ACCESS BEYOND	MARSH EDGE
BERMS/FENCE/CH	ANNEL
Natural Disturbance (circle all that apply): Fire, ice damage	animal/insect demoses other
INDUSTRIAL SITE PONDS/PO	ous
Month/year (if known) of natural disturbance event:	NGOING
Management Actions (circle all that apply): Trail/road cons	struction, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildli	fe management, other:
Month/year (if known) of last management action:	S A RESTORATION
SITE IN SOME AREAS	
For NVCS Alliance codes, see http://www.natureserve.org/explorer/servl	at Allation Prove Pinite Fact
	Dece 1 of 1
PERIMETER MARSH AROUND	POND - Ingerorz

BERMIUPLAND ON PERIMETER OF SYSTEM

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Perimeter Characteristic	: <5%	6-25%	26-50%	51-75%	>75%	7	
Shrubs		X				-	
Trees		X					
Bare soil							
Water					1	1	
Upland			1	X		1	
Mudflat						1	
Floating veg.						1	
Distance to vegetation patch edge Type of patch (Circle one): none, tr Wetland Interspersion (%open wa Density of marsh vegetation ² (Circ Estimated average marsh vegetati Litter depth (cm): 32.0	tee, shrub, ter and %v le one): N on height	vegetation of one, sparse (m): 0-1, 1	cover): e, moderate, -3, 3-6>6.		~	ARSH ON SES OF POND	N
Method used for measuring water						estimat	TEL
Distan	ce to Ph	ysical Cl	naracteris	tics			
Water edge (m):	-	Upla	nd area (m):5		5	
Ditch (m):		Larg	e open-wat	er area (m)):	S	
Mudflat (m):		Smal	l open-wate	er area (m)	:^	VA	
Road or dike (m): 60							

UNABLE TO ENTER & DUE TO FENCE, CHANNEL, BERMS-SURVEYED FROM MARSH SDGE

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

Page 2 of 2

General Information		
Survey Date (DD/MM/YYYY): 7/12/2015		
Observer(s) Name(s): 5. GROVE		
Survey Point (complete for each point): A2-12	SHAW ISLAND	PARK
How was the point accessed? (Circle one): canoe, motor boat, w	alk, wade?	
Edge Type (Circle one): roadside/marsh, parking lot/marsh, ditch	or berm/marsh, upland/marsh,	
open water/marsh, interior/marsh, open water/upland, PSS or PFC) wetland/Marsh, other (describe)	
Classification & Disturban	ce	
NWI code (Record an NWI Code for the target wetland):	PUB/PEM	
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland) ¹ :	
Most dominant plant species (Record % Cover for 3-5 dominant	species):	
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)	
TYPHA LATIFOLIA ANGUST	60	
LYTHRUM SAULCARIA	15	
CARSX VULPENDIDEA CORNUS RACEMOSA	10	
Natural Disturbance (circle all that apply): Fire, ice damage, an	imal/insect damage, other:	
Month/year (if known) of natural disturbance event:		
Management Actions (circle all that apply): Trail/road construct	tion, dredging, invasive species	
control (mechanical and chemical), wetland restoration, wildlife m	anagement, other:	
Month/year (if known) of last management action:/ N	PARIC -	
MOWING ALONG I	DOND EUGE B	UT

PERIMETER MARSH AROUND POND Page - RUPLAND COSURROUNDS SYSTEM ALSO ASSOC. W SMALL DITCH &'S

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Shrubs	 ×			
Trees	Y			
Bare soil				
Water		1		1
Upland			X	1
Mudflat			/	
Floating veg.				

Type of patch (Circle one): none, tree, shrub, herbaceous

		/
Wetland Interspersion (%open water and %vegetation cover):	65	135

Density of marsh vegetation² (Circle one): None, sparse, moderate, dense

Estimated average marsh vegetation height (m): 0-1, 1-2, 3-6,>6.

Litter depth (cm): 6.0 Water depth (m): 8

Method used for measuring water depth (Circle one): staff gauge, meter stick, other: ____

Distance to Physical Characteristics

Water edge (m): 3	Upland area (m):
Ditch (m):	Large open-water area (m):
Mudflat (m):	Small open-water area (m):
Road or dike (m): <u>15</u>	

Page 2 of 2

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
Survey Date (DD/MM/YYYY): 7/12/2015	
Observer(s) Name(s): S. 6ROV 8	
Survey Point (complete for each point): A213	POND IN TIFFT
How was the point accessed? (Circle one): canoe, motor boat,	walk, wade?
Edge Type (Circle one): roadside/marsh, parking lot/marsh, ditc	h or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or PI	FO wetland/Marsh, other (describe)
Classification & Disturba	nce
NWI code (Record an NWI Code for the target wetland):	PUBHy / PEM
NVCS Alliance (Record an NVCS Alliance code or codes for the	e target wetland) ¹ :
Most dominant plant species (Record % Cover for 3-5 dominar	nt species):
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)

Cover (Absolute cover)
30
15
20
10
10

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, other:______

Month/year (if known) of natural disturbance event:____

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:_____

Month/year (if known) of last management action:

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1
Shrubs			1			
Trees		1	-			1
Bare soil						-
Water						1
Upland		1	1			
Mudflat		-				-
Floating veg.						1
Type of patch (Circle one): none, tree Wetland Interspersion (%open water Density of marsh vegetation ² (Circle Estimated average marsh vegetation	r and %v one): No height	egetation of one, sparse (m):0-1.1	cover): , moderate, -3, 3-6,>6.	dense	5	Perimeter marsh
Litter depth (cm): 3 Method used for measuring water d				-	- x, other:	
Distance	e to Ph	ysical Ch	aracteris	tics		
0				0	-	
Water edge (m):		Uplan	nd area (m): 0	×	
Ditch (m):		Larg	e open-wat	er area (m)):	2
Mudflat (m):		Smal	l open-wate	er årea (m)		
Road or dike (m): 75 (1 RAILROAD GROAD FRINGE MARSH	PIRTI	30.				

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

Page 2 of 2

General Information	
Survey Date (DD/MM/YYYY): 24/06/2014	stiet (by placing an
Observer(s) Name(s): J. Sweitzer, B. GRIFFITH	aministra jarnona
Survey Point (complete for each point):	adonila
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, o	pen water/marsh,
interior/marsh, other (describe)	an particular

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIEX

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S.N.a

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover		
Phragmites australis	100		
Lolonilla Jai-	10		
Solidano Sp	5		

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:____

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:_

Photo 4449

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1
Shrubs	×		and the local		diama as a	1
Trees		X				
Bare soil	and a state		datus etc.	The Party of the P		
Water		Purd provides	1.1.2110.0103		and a second	sta sour inco
Upland			X			
Mudflat	Harsh, D	amino an a	THE TREAM	CALIFORNIA ()	and states	1997 28
Floating veg.] Demotional and
Wetland Interspersion (%open water Density of marsh vegetation ² (Circle	one): N	one, sparse	, moderate,	dense		
Estimated average marsh vegetation	n height	(m): 0-1(1	-3,)3-6,>6.			
Litter depth (cm): >	Wate	er depth (n	n):(0	_	
Method used for measuring water d	lepth (Ci	ircle one):	staff gauge,	meter stic	, other: _	_
Distanc	e to Ph	ysical Cl	haracteris	stics		
Water edge (m):	boih.m	Upla	nd area (m	ı): <u>5</u>	-	Properties.
Ditch (m):		Larg	e open-wa	ter area (m):	- og dino
Mudflat (m):		Smal	l open-wat	er area (m):	The Agen
Road or dike (m):/ Ø	soften					

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY):	24/06/2014
Observer(s) Name(s): Justin	Sweifzer, Ben Griffith
Survey Point (complete for each	point): 81.2 / A2-1
	cle one): canoe, motor boat, walk, wade?
Edge Type (Circle one): roadside/n	narsh, ditch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other (describe)	

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIE /PVBH

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S.N.1.⁹

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha angustitolia	60
Loniera tatarica	5
Sambreus canadensis	2

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:_____//A

Month/year (if known) of natural disturbance event: N/A

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other: ____//A

Month/year (if known) of last management action: M/A

11 1

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

	Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1
	Shrubs	E-SIC.	E CAN	X			
	Trees		X			- and the second second	dell gr
	Bare soil	and all		Same and		and and the	
	Water		Car Lander	X		an mund	the second
	Upland			×			
	Mudflat	and the second	vanoo lo n	ante susception	PULSE STREET	Sim dealle	29210
	Floating veg.	-					1
	Interspersion (%open water f marsh vegetation ² (Circle			_			
Estimated	d average marsh vegetation	height	(m): 0-1, (anul4 sici		
Estimated Litter dej	d average marsh vegetation	height	(m): 0-1, (r depth (m	-3, 3-6,>6. n):1	2	un kener	
Estimated Litter dej	d average marsh vegetation oth (cm):	n height (Wate epth (Cir	(m): 0-1, (r depth (m rcle one): s	-3, 3-6,>6. n):1	meter stick	e, other:	1 (14) (14)
Estimated Litter dej Method v	d average marsh vegetation oth (cm):	n height (Wate epth (Ci e to Phy	(m): 0-1, (r depth (m rcle one): s ysical Ch	-3, 3-6,>6. a): staff gauge, aracteris	meter stick	e, other: _	4 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
Estimated Litter dej Method u Water ed	d average marsh vegetation oth (cm):	n height (Wate epth (Ci e to Phy	(m): 0-1, (r depth (m rcle one): s ysical Ch Uplan	-3, 3-6,>6. a): staff gauge, aracteris	meter stick tics	e, other:	and term
Estimated Litter dej Method u Water ed	d average marsh vegetation oth (cm):	height (Wate epth (Ci e to Ph	(m): 0-1, (r depth (m rcle one): s ysical Ch Uplan Large	-3, 3-6,>6. a): staff gauge, aracteris aracteris and area (m e open-wat	meter stick tics): er area (m)	e, other:	and term

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 24/06/2014	nhan "7" megetaalig opti trake
Observer(s) Name(s): Justin Sweitzer, Ben Griffith	and a company of works
Survey Point (complete for each point):	- Grad
How was the point accessed? (Circle one): canoe, motor boat, walk	wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland	d/marsh, open water/marsh,
interior/marsh, other (describe)	and young

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEM IF / PUBH

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S.N.1.9

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha angustifolig	30
Lemna Sp.	70
spin to the pass to the series and the series and	titen cannerse (6) berg

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other: ____//A

Month/year (if known) of natural disturbance event: N/A

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species control (mechanical and chemical), wetland restoration, wildlife management, other: N/AMonth/year (if known) of last management action: N/A

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1
Shrubs			Talar	Can the st	dimment 1	Marries Tour
Trees		X				and concrete
Bare soil	the stand		and the second s	150 P.S.		di sur mal
Water	and the second second	1111	Carles Glos		AR SHOOL	and the state of the state of
Upland						1
Mudflat	di the di t	FILTERS HOLD	CHER MAL		2011 9 1 1	Stor Lade
Floating veg.						-
Type of patch (Circle one): none, tree Wetland Interspersion (%open water Density of marsh vegetation ² (Circle	r and %v one): No	vegetation o	cover): 70	/30 dense	neig tu	
Estimated average marsh vegetation					unaioli mui	
Method used for measuring water d			-		k, other: _	
Distanc	e to Ph	ysical Cl	haracteris	stics		
Water edge (m): 50	book and	Upla	nd area (m):	a leave	and farmers
Ditch (m):		Larg	e open-wat	er area (m):(2
Mudflat (m):		Smal	l open-wat	er area (m): <u></u> ;	incoort
Road or dike (m): /00						

Page 2 of 2

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 24/06/2014	elers (hy plasma an "X" uni
Observer(s) Name(s): J. SWEITZER, B. GRICFITH	The second second
Survey Point (complete for each point): <u>A2-2</u> / B1-4	sdanle
How was the point accessed? (Circle one): canoe, motor boat, walk w	vade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/m	narsh, open water/marsh,
interior/marsh, other (describe)	Sou mainter a

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIF / PVBHx **NVCS Alliance** (Record an NVCS Alliance code or codes for the target wetland)¹: $V_*A_*S_*N_*/.1_9$ **Most dominant plant species** (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha angustisolia	100
Weither deputy corre-	a mol dopen a
and the second	
	THE PERSONNEL FOR LONG CAR

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:

Photo 4448

For NVCS Alliance codes, see http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1
Shrubs	X	7-21	1 Marline	design and and	alexander and a second second	alon ve
Trees	-					and a second
Bare soil				The Photo in		
Water	Jur 1 1	acan Sever	a storage stars	Col Lucion	are autorit.	di so e
Upland	-		×			
Mudflat	n non	outper to a	00310 201/0620	Carlstoon 1	price anno	A HOLE T
Floating veg.						
Wetland Interspersion (%open water Density of marsh vegetation ² (Circle			~			
Estimated average marsh vegetation		C	/			
Litter depth (cm):	_ Wate	er depth (n	n):	9		
Method used for measuring water d	epth (C	ircle one):	staff gauge.	meter sticl	k) other: _	
Distanc	e to Ph	ysical Cl	haracteri	stics		
Water edge (m):	tenh ini	Upla	nd area (m	ı):)	<u>e</u> nder
Ditch (m):		Larg	e open-wa	ter area (m	ı):	Tal
Mudflat (m):		Smal	ll open-wat	er area (m):	/
Road or dike (m): 20	stillin					

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information
Survey Date (DD/MM/YYYY): 24/06/2614
Observer(s) Name(s): J SWEITZER
Survey Point (complete for each point): <u>A2-3 / B1-5</u>
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other (describe)

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIES

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S.N.I.A

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typhe angustifolia	70
Phragmles australis	10
	Contraction and the second

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:_

Management Actions (circle all that apply): Trail/road construction, dredging invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action: 2014

For NVCS Alliance codes, see http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol

Photo 4446

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	1 Starting
Shrubs	XB	1.1.1.2	and all and	And Server and		and the second
Trees		X				and a second
Bare soil			and the second s	Carlo Brit		dt an ar any H
Water	Las us	Contraction of the			Star Trade 1	OT ALL MOTOR
Upland			and the second s	×	1	1
Mudflat	an annan	011295201	and canor	Sarrisopon (2011 / 01-015-2	and a state
Floating veg.						
Type of patch (Circle one): none, tree Wetland Interspersion (%open water Density of marsh vegetation ² (Circle Estimated average marsh vegetation	r and %v one): No	vegetation of one, sparse (m): 0-1, 1	cover): (, moderate, -3, 3-6,>6.) - 16 () dense	nan (<u>Kasa</u> taaliy taa haliy taa	
Litter depth (cm): 10	Wate	er depth (n	n):C)		
Method used for measuring water d	lepth (Ci	ircle one):	staff gauge,	meter sticl	, other: _	
Distanc	e to Ph	ysical Cl	naracteris	stics		Nimes De
Water edge (m): 70	imb m	Upla	nd area (m):2	in the state	olonie-o
Ditch (m):		Larg	e open-wat	er area (m):_70	in Also-M
Mudflat (m):		Smal	l open-wat	er area (m)		(harrante)
Road or dike (m): / 00	-Million		A.S.Sheve S			

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information
urvey Date (DD/MM/YYYY): 24/06/2014
bserver(s) Name(s): J. SwEITZER B GRIFFIFFI
urvey Point (complete for each point):
ow was the point accessed? (Circle one): canoe, motor boat, walk, wade?
dge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
terior/marsh, other (describe) board will (Marsh

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMES

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S. N.L.9

Most dominant plant species (Record % Cover for 3 dominant species):

80
20
CAPACITY OF LOAD

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:_____

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species)

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action: 2014

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	Contraction of the
Shrubs		0	- Alexander	(and a start of		Survey Fall
Trees		X				and the two
Bare soil	and the second second			in an		di anti ta li
Water		X		and a subserver an		AT ANY AND AND AND
Upland			X	-		
Mudflat	U JECOS	THE REAL	Died. Oscient	Service of 13		This Cold
Floating veg.	_				7	
Distance to vegetation patch edge (m Type of patch (Circle one): none, tree Wetland Interspersion (%open water Density of marsh vegetation ² (Circle Estimated average marsh vegetation Litter depth (cm):/ 6	e, shrub,(r and %v one): No height	herbaceous vegetation o one, sparse (m): 0-1.(1	s) cover): <u>/(</u> e, moderate) -3) 3-6,>6.	dense	an O <u>rian</u> antipina antipina	
Method used for measuring water d	epth (Ci	ircle one):	staff gauge,	meter sticl	, other: _	
Distanc	e to Ph	ysical Cl	haracteris	stics		
Water edge (m):	Lorib ,mi	Upla	nd area (m):	Swanne	<u>a</u> riitan ann
Ditch (m):		Larg	e open-wat	er area (m):5	0
Mudflat (m):		Smal	l open-wat	er area (m)	:	Temperade
Road or dike (m):	<u>s</u> talland					

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 25/06/2014	scheel (by physiog an "
Observer(s) Name(s): J. SHEITZER B. GRIFKITH	anasonana fisi naga
Survey Point (complete for each point):	1.1
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	Ten wind wite W
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, o	pen water/marsh,
interior/marsh, other (describe)	

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEM IF

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S. N.m.

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha latific	50
Lythrum salicaria	30
Sigitaria lation	10
lesserio	a manual state of the contraction
Corres Spricton	30

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:____

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:_

454

Photo

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs		×	ringham		Anna I
Trees		X			
Bare soil	X	0			
Water	California and	*	Water but		di marene
Upland			X		
Mudflat	D. Heatel	Martin 193	200 1150000	CANNEL OF T	MALL SUGAL
Floating veg.					

Distance to vegetation patch edge (m): 3

Type of patch (Circle one): none, tree, shrub; herbaceous)

Wetland Interspersion (%open water and %vegetation cover): 30-70

Density of marsh vegetation² (Circle one): None, sparse, moderate, dense

Estimated average marsh vegetation height (m): 0-1, (1-3, 8-6,>6.

Litter depth (cm): _____ Water depth (m): _____ 0.02

Method used for measuring water depth (Circle one): staff gauge, meter stick, other: _

Distance to Physical Characteristics

Water edge (m):	Upland area (m): 20
Ditch (m):	Large open-water area (m): 3 0
Mudflat (m):	Small open-water area (m):
Road or dike (m): 25	

Page 2 of 2

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
Survey Date (DD/MM/YYYY): 7/11/2015	
Observer(s) Name(s): S. GROVE	
Survey Point (complete for each point):) B1-8
How was the point accessed? (Circle one): canoe, motor boat,	
Edge Type (Circle one): roadside/marsh, parking lot/marsh, ditc	h or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or Pl	
Classification & Disturba	nce
NWI code (Record an NWI Code for the target wetland):	PUBH/PEM
NVCS Alliance (Record an NVCS Alliance code or codes for th	
Most dominant plant species (Record % Cover for 3-5 dominar	nt species):
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
TYPHA	10
LYTHRUM SALICARIA	5
CAREX SPP	5

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, other:_____

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:_____

Month/year (if known) of last management action:

Page 1 of 2

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Peri	meter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	7
Shru	ibs			1			
Tree	S		, in the second s	1			1
	e soil						1
Wat	er				X		
Upla					X		
Mud							
Floa	ting veg.						-
Wetland Inters Density of mars Estimated aver Litter depth (cr	Circle one): none, tree persion (%open wate sh vegetation ² (Circle age marsh vegetation n): or measuring water d	r and %v one): No height Wate	regetation of one, sparse (m): 0-1, 1 r depth (n	cover): e, moderate, -3, 3-6,>6. n):	dense	, other:	* Perimeter around Ponp MARGINAC VALUE
				aracteris			
Water edge (m)	:)		Upla	nd area (m):S	-	-
Ditch (m):	-		Larg	e open-wat	er area (m)	:)
Mudflat (m):	-		Smal	l open-wate	er area (m)		
Road or dike (n	n): <u>30</u>	-					
					1		

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	on
Survey Date (DD/MM/YYYY): 7/12 201	15
Observer(s) Name(s): <u>S. GROVE</u>	
Survey Point (complete for each point): A 2 - 11	B1-9
How was the point accessed? (Circle one): canoe, motor bo	at, walk, wade?
Edge Type (Circle one): roadside/marsh, parking lot/marsh, c	litch or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or	PFO wetland/Marsh, other (describe)
Classification & Distur	bance
NWI code (Record an NWI Code for the target wetland):	PUBHX IPSM
it wir code (Record an Nwir Code for the target wetland):	1. Ship I Chi
NVCS Alliance (Record an NVCS Alliance code or codes for	the target wetland) ¹ :
Most dominant plant species (Record % Cover for 3-5 domi	nant species):
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
PHRAGMITES AUSTRALIS	. 80
LYTHRUM SALICARIA	10
UNABLE TO ACCESS BEYOND	MARSH EDGE
BERMS/FENCE/CH	ANNEL
Natural Disturbance (circle all that apply): Fire, ice damage	animal/insect demoses other
INDUSTRIAL SITE PONDS/PO	ous
Month/year (if known) of natural disturbance event:	NGOING
Management Actions (circle all that apply): Trail/road cons	struction, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildli	fe management, other:
Month/year (if known) of last management action:	S A RESTORATION
SITE IN SOME AREAS	
For NVCS Alliance codes, see http://www.natureserve.org/explorer/servl	at Allation Prove Pinite Fact
	Dece 1 of 1
PERIMETER MARSH AROUND	POND - Ingerorz

BERMIUPLAND ON PERIMETER OF SYSTEM

Habitat characteristics (for 50-m radius area)

Select (by placing an "X" under each % category) the % of wetland perimeter covered by the following characteristics:

Perimeter Characteristic	: <5%	6-25%	26-50%	51-75%	>75%	7	
Shrubs		X				-	
Trees		X					
Bare soil							
Water					1	1	
Upland			1	X		1	
Mudflat						1	
Floating veg.						1	
Distance to vegetation patch edge Type of patch (Circle one): none, tr Wetland Interspersion (%open wa Density of marsh vegetation ² (Circ Estimated average marsh vegetati Litter depth (cm): 32.0	tee, shrub, ter and %v le one): N on height	vegetation of one, sparse (m): 0-1, 1	cover): e, moderate, -3, 3-6>6.		~	ARSH ON SES OF POND	N
Method used for measuring water						estimat	TEL
Distan	ce to Ph	ysical Cl	naracteris	tics			
Water edge (m):	-	Upla	nd area (m):5		5	
Ditch (m):		Larg	e open-wat	er area (m)):	S	
Mudflat (m):		Smal	l open-wate	er area (m)	:^	VA	
Road or dike (m): 60							

UNABLE TO ENTER & DUE TO FENCE, CHANNEL, BERMS-SURVEYED FROM MARSH SDGE

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

Page 2 of 2

General Information	
Survey Date (DD/MM/YYYY): 26/06/2014	na pilada (d) kalar
Observer(s) Name(s): J. SwENTZER, B. GRIEFINH	The Party of the P
Survey Point (complete for each point): $B \ge -1$	adam?
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, op	en water/marsh,
interior/marsh, other (describe) PSS marsh	1 Top 1 2

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEM/Ed

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S. N. m.

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover
Typha lahfolin	30
Corex locustria	20
Hibiscus moutherby	30
Flibiscus Mag(Meulo)	50

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:____

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:____

Phoho 4503

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs		X	marian	And and and	the second of
Trees		X			
Bare soil				DI BE	and the
Water	cution an	trona Passingi	1000 2003	- a narray	dis Plant
Upland					
Mudflat	U Alena	Virgelo to 3	outh testeru	A Inclusion R	Sun ainua
Floating veg.					

Distance to vegetation	n patch edge (m):
Type of patch (Circle	one): none, tree, shrub, herbaceous
Wetland Interspersion	n (%open water and %vegetation cover): 0-150
Density of marsh veg	etation ² (Circle one): None, sparse, moderate, dense
Estimated average m	arsh vegetation height (m): 0-1, 1-3) 3-6,>6.
Litter depth (cm):	3 Water depth (m):
Method used for mea	suring water depth (Circle one): staff gauge. meter stick, other:
	Distance to Physical Characteristics
Water edge (m):	Upland area (m):
Ditch (m):	Large open-water area (m):
Mudflat (m):	Small open-water area (m):
Road or dike (m):	1.5 Service molecular and the set of the set

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 26/06/2014	Minwing characterionics
Observer(s) Name(s): J. Sweitzer B. GRIFFI	TH
Survey Point (complete for each point): <u>B2-2</u>	10m ² 9
How was the point accessed? (Circle one): canoe, motor boat,	walk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	pland/marsh, open water/marsh,
interior/marsh, other (describe)	and Adduct a

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIEd

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S.N.M.

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)			
Hibiscus moscheutous	30			
Typha latifalia	15 100 00000			
Typher anavitifalis	40			
Carex lacustris	20			

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:____

Photo 4510

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	The second secon
Shrubs	×		(Cales		(comp)	ves Popp
Trees	X				a destruction of the	To 1 Con
Bare soil						
Water	- 10 P - 10	Later Contraction	A ways a real	and the second second	ale record	and show it
Upland						
Mudflat	a delet	FUASS(55) 1	CORD TH STEPS	sor s sils	the sould	1 10 13 10
Floating veg.						
Wetland Interspersion (%open wate Density of marsh vegetation ² (Circle			-			
Estimated average marsh vegetation	n height	(m): 0-1 (1	-3, 3-6,>6.			
Litter depth (cm): 5	Wate	er depth (n	n):	0	-	
Method used for measuring water d	lepth (Ci	ircle one):	staff gauge,	meter sticl	k, other: _	_
Distanc	e to Ph	ysical Cl	haracteris	stics		
Water edge (m):	pan an	Upla	nd area (m	ı):	3	
Ditch (m):		Larg	e open-wat	ter area (m):	Ta-çılın
Audflat (m):		Smal	ll open-wat	er area (m)):	- Constant
Road or dike (m): 20	-310.h-					

 $^{^{2}}$ Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 26/06/2014	n, inder
Observer(s) Name(s): 5. SWEITZER B. GRIEFITH	all realized
Survey Point (complete for each point): <u>B2-3</u> , A1-9	
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh) open water/mar	rsh,
interior/marsh, other (describe)	

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): \underline{PEMIEd} **NVCS Alliance** (Record an NVCS Alliance code or codes for the target wetland)¹: $\underline{V}, \underline{A}, \underline{S}, \underline{N}, \underline{M}, \underline{I9}$ **Most dominant plant species** (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Tuch- Frauskhlin	70
Euplorium foundation	20
Carer lacustris	10
	ten uses gar desident with texture

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:___

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:_

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs		X	and share	former and all	Acres and a
Trees		X			
Bare soil				A	e peak se
Water		2.341 (-304 (05)	al state and t	PI ANOLEM	an mostly
Upland		X			
Mudflat	ite inclusion	1011180 1021	THE LEGAL	P P P P P P P P P P P P P P P P P P P	and alone h
Floating veg.					
Wetland Interspersion (%open water Density of marsh vegetation ² (Circle			C		
Estimated average marsh vegetation					naise just
Litter depth (cm):	Wate	er depth (n	n):	>	-
Method used for measuring water d	epth (Ci	ircle one):	staff gauge,	meter sticl	k, other:
Distanc	e to Ph	ysical Cl	haracteris	stics	
Water edge (m): 50	bank and	Upla	nd area (m):	Thursd)
Ditch (m):		Larg	e open-wat	er area (m):
Mudflat (m):		Smal	l open-wat	er area (m)	autor, to
Road or dike (m):	slittin				

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/Y	YYY): 25/06/2014
Observer(s) Name(s):	J. SWEITZER
Survey Point (complete	for each point): <u>B7-4</u> / A1-8
How was the point acces	ssed? (Circle one): canoe, motor boat, walk, wade?
Edge Type (Circle one): 1	roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
interior/marsh, other (desc	cribe)

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIEd

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V. A. S. N. I. 9

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha anoustifalia	46
Decodon Verheilatus	10
Nuphar Variantim	10

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:_____

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs	×	1			
Trees	X				
Bare soil			dame ater	Case P. Barrows	and Lation .
Water	X	Contract of the last	and a second	and the second	NUL SELECTION -
Upland		1- 12 N	X		
Mudflat	21 .m.120	The section of the se	and there is	CA LABOR A	Sad Manna
Floating veg.	X				
Wetland Interspersion (%open wate Density of marsh vegetation ² (Circle	e one): N	one, sparse	e, moderate,	dense	
Estimated average marsh vegetation				-	
Litter depth (cm): 3	Wate	er depth (n	n):	5	_
Method used for measuring water d				-	
Distanc	e to Ph	iysical C	haracteris	stics	
Water edge (m):	porto arrolg	Upla	nd area (m):Z	-
Ditch (m):		Larg	ge open-wat	ter area (m):
Mudflat (m):		Smal	ll open-wat	er area (m)):
Road or dike (m): 30	- Sith by				

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information	
Survey Date (DD/MM/YYYY): 25/06/2014	in presents and finded
Observer(s) Name(s): 5 Sweltzer	and a contract of the second
Survey Point (complete for each point): <u><u>B2-5</u></u>	Shrinkier Shrubi
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, op	en water/marsh,
interior/marsh, other (describe)	of particular

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIEd

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.5, N.I.9

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover			
Typha provinifilla	80			
Susitaria lahfolion	10			
Persilaria	20			
nettle	20			

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:_____///A_____

Month/year (if known) of natural disturbance event:_

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:_

Photo 4478

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%	10/00/71200
Shrubs		12 3 12 1	X	loans have been	1070	10% 70.9%
Trees		X		1 1 1 1 1 1		ante vera
Bare soil	media		-	PA Planer	and and	1
Water	annu te		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		en court	the later of
Upland			X			
Mudflat	n menul	diama to h	and the more	BORGERSON IN	New District	MAL and
Floating veg.]
Type of patch (Circle one): none, tree Wetland Interspersion (%open water Density of marsh vegetation ² (Circle Estimated average marsh vegetation	and %v one): No	egetation cone, sparse (m): 0-1, (cover): ,moderate, -3,3-6,>6.	ට - / ට ථ dense	ine (<u>Pero</u>	
Litter depth (cm):					, other:	
Distance	e to Phy	ysical Ch	aracteris	tics		
Water edge (m): 00		Uplar	nd area (m)	:/	5	Anato
Ditch (m):50		Large	e open-wate	er area (m)	:	the Colomb
Mudflat (m):		Small	open-wate	er area (m)	andak b	owner and
Road or dike (m): 40	stillin.					

 $^{^{2}}$ Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

urvey Date (DD/MM/YYYY): 26 06 2014
Observer(s) Name(s): 5 SWEATZER B. GRIFFITH
urvey Point (complete for each point): <u>B2-6</u>
low was the point accessed? (Circle one): canoe, motor boat, walk, wade?
dge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, open water/marsh,
nterior/marsh, other (describe)

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland): PEMIEd

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S.N.k.b.

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)			
6-1-55	40			
Carer Jacustas	30			
Soliduno SP.	10			
Nymologie odolata	10			

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:____//A_____

Month/year (if known) of natural disturbance event:____

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:____

4507

¹ For NVCS Alliance codes, see http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs			X		1010
Trees			X		
Bare soil			~		
Water		X			
Upland		X			
Mudflat					
Floating veg.		X			
Wetland Interspersion (%open water Density of marsh vegetation ² (Circle Cstimated average marsh vegetation Litter depth (cm): O Method used for measuring water d	one): No height (Water	one, sparse (m): 0-1), 1 r depth (m	, moderate, -3, 3-6,>6. n): 0,23	dense	
Distance	e to Phy	ysical Ch	aracteris	tics	
Water edge (m):		Uplar	nd area (m)	:2	5
Ditch (m):		Large	e open-wat	er area (m)	:
Mudflat (m):		Small	open-wate	er area (m)	
Road or dike (m):					

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems

General Information

Survey Date (DD/MM/YYYY): 25 06 2014	
Observer(s) Name(s): B. GRIFFITH, J. SWEITZER	and an an an and
Survey Point (complete for each point): <u>B2-7</u>	Souther Connected and a second s
How was the point accessed? (Circle one): canoo, motor boat, walk,	wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland	/marsh, open water/marsh,
interior/marsh, other (describe)	विके मेत्रामेन

Classification & Disturbance

NWI code (Record an NWI Code for the target wetland):

NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland)¹: V.A.S.N. 9

Most dominant plant species (Record % Cover for 3 dominant species):

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cove		
Typha angustibalia	70		
a state of the second s			
the of them and a final that the start of the	AND A MAN DESIGNATION OF FLICK		

Natural Disturbance (circle all that apply): Fire, ice damage, animal/insect damage, trail/road

construction, invasive species control, wetlands restoration, dredging, other:

Month/year (if known) of natural disturbance event:

Management Actions (circle all that apply): Trail/road construction, dredging, invasive species

control (mechanical and chemical), wetland restoration, wildlife management, other:

Month/year (if known) of last management action:

¹ For NVCS Alliance codes, see <u>http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</u>

Habitat characteristics (for 50-m radius area)

Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%]
Shrubs		5-1	15 Honin	for each a	a balance a	have grad
Trees						
Bare soil	-		De service and	and the second	- total	firm mus the
Water			2	X		
Upland Mudflat	Cont official	inites series	The states	and the second	time she	Diser Tree C
Floating veg.						
r loating veg.				Laurillan	and an other	derardi netrani
Wetland Interspersion (%open water Density of marsh vegetation ² (Circle Estimated average marsh vegetation	one): No	one, sparse), moderate,	dense	is couple is	
Litter depth (cm):	_ Wate	r depth (n	n): 0.52	3		
Method used for measuring water d	epth (Ci	rcle one):	staff gauge,	meter stick	other: _	
Distanc	e to Ph	ysical Cl	naracteris	tics	stanie (g	Nomen Dista
Water edge (m):						
Ditch (m):		Larg	e open-wat	er area (m):	2 To Complete
Mudflat (m):		Smal	l open-wat	er area (m)	:(Demogram M
Road or dike (m): 200	e sinhu		en basites			

² Estimate density of vegetation within 50 m around survey point using the following categories: 1-Dense = water not visible through base of stems at water level and you cannot easily push hand through the stems; 2-Moderate = anything that falls between dense and sparse; 3-Sparse = water easily visible through base of widely scattered stems