# Beneficial Use Impairment Removal Project

Niagara River Area of Concern Marsh Anuran and Avian Population Monitoring Year 1 (2014) Survey Report



**Final: January 19, 2015** 

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**Final – January 19, 2015** 

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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.

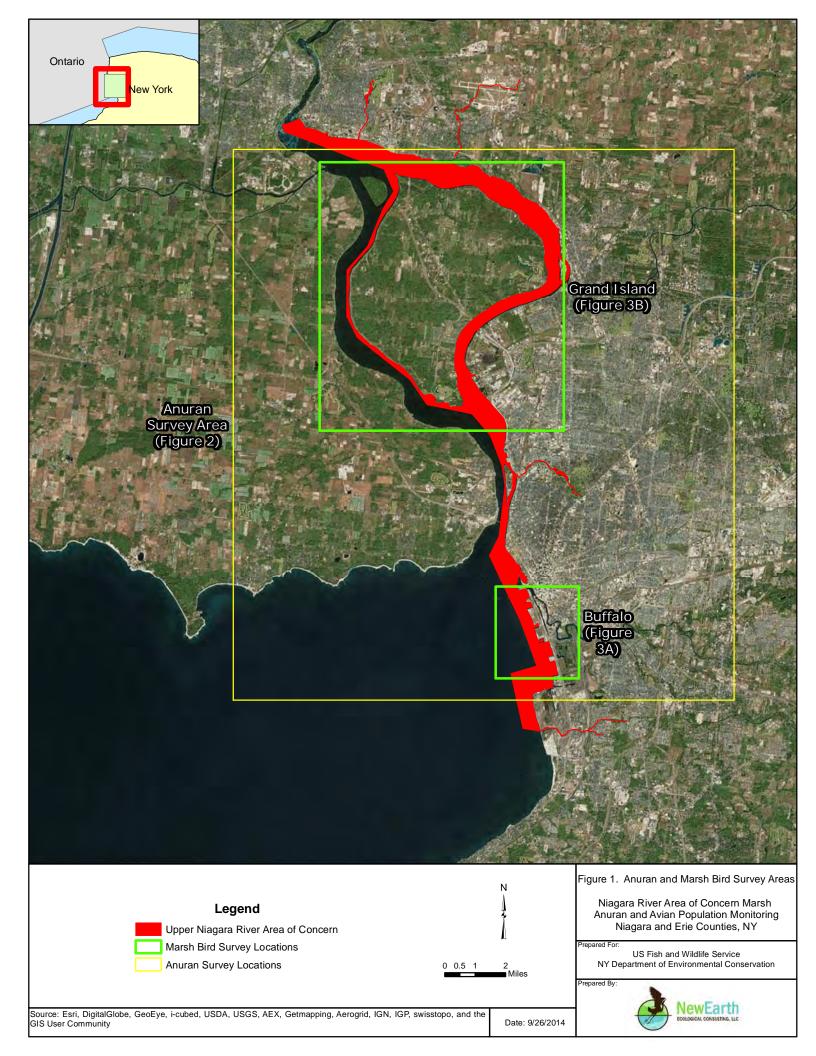
In February 2014, the NYFO and NYSDEC issued a Scope of Work for performance of NR AOC marsh anuran and avian population monitoring surveys (USFWS 2014). Following the criteria outlined in the Scope of Work, in April 2014 a Work Plan was developed, which identified the survey protocols to be used over 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 the 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 initial (Year 1) marsh anuran and avian monitoring effort are provided in Section 2.0 of this report. Results from the Year 1 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 2014 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 Smokes Creek in Buffalo Harbor north to the mouth of the Niagara River at Lake Ontario (Figure 1).



### 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).

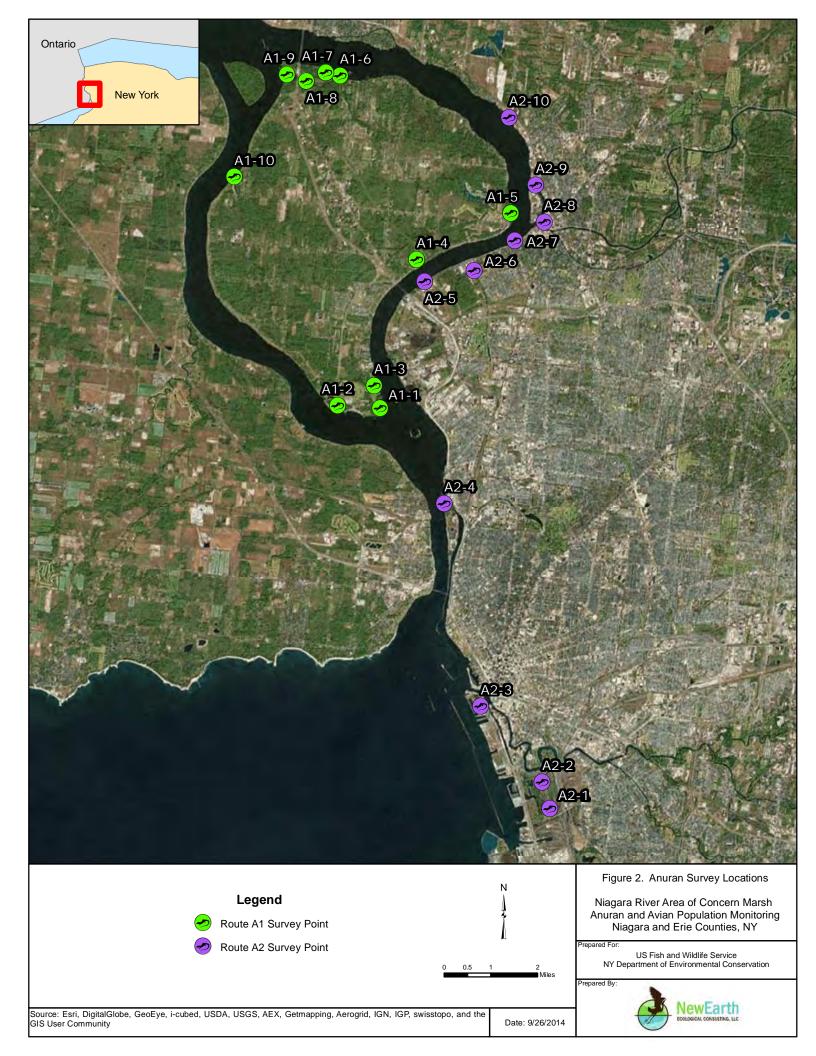
Survey routes, point locations, field methodologies and field efforts were closely coordinated with, and based upon recommendations from, USFWS representative Amy Roe, and NYSDEC representatives Connie Adams, Jennifer Tait, and Mark Filipski. The Work Plan should be referenced for additional details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

#### 2.1 MARSH ANURAN SURVEYS

## 2.1.1 Survey Routes and Points

Survey routes were established using Google Earth<sup>TM</sup> software and ground-truthed to determine suitability during broad reconnaissance level surveys conducted on March 25-26 and April 17-18, 2014. Two survey routes were established with ten survey points per route as shown in Figure 2. Five of the ten survey points on survey route A1, and five of the ten 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; A1-5; A1-8; A1-9; A2-6; A2-7; A2-8; A2-9; and, A2-10.

Survey points were located based recommendations from NYSDEC, availability of potentially suitable habitat, and in most cases spaced at least 800 meters (m) apart. 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).



### 2.1.2 Sampling Periods and Conditions

Because peak amphibian calling periods are more strongly associated with temperature and precipitation than with date (Archer and Jones 2009), visits were scheduled to occur during three separate events according to minimum night air temperatures above 41 °F, 50 °F, and 63 °F in the general NR AOC survey area for the first, second and third visits, respectively. Sampling periods were established to target peak vocalization periods for early-, mid- and late-season breeding amphibians. In an attempt to capture the vocalization periods of all target breeding amphibians, 2014 surveys were at least 15 days apart and completed between mid May and late June as shown in Table 1.

**Table 1. 2014 Anuran Survey Dates and Temperature Ranges** 

		Temperature Range During
Survey Event	Survey Dates	Surveys
Pre-breeding General Site Recon	March 25-26, 2014	14-37 °F
Pre-breeding General Site Recon	April 17-18, 2104	29-61 °F
1	May 19-21	45-71 °F
2	June 3-4	52-76 °F
3	June 24-25	67-84 °F

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.

Table 2. List of Target Marsh Anurans in the NR AOC

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

Surveys were only 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) or 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.

## 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 2014 survey period were recorded on data forms which were 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

Habitat monitoring was an important part of this study and data gathered regarding marsh habitat can facilitate management decisions. Natural changes in water levels and/or management activities (e.g. wetland restoration efforts, dredging, bank stabilization, etc.) can have significant impacts on marsh conditions (e.g. vegetation composition and structure, substrate composition and structure, water levels), thereby potentially causing significant changes to marsh anuran populations. In addition to recording the percent cover of dominant plant species within a 50 m radius of each survey point and water level, key components of the habitat data collection effort included information on natural disturbances and management activities near the site. A blank copy of the habitat data form and observer instructions for completing the form is included in Appendix E. The same form was used to document conditions at both marsh anuran and marsh bird sample points and in some instances the same locations were used for both anurans and birds.

## Date of Last Natural Disturbance

Natural disturbance was recorded on the habitat monitoring data form following the first survey. The observer recorded the month and year of the most recent natural disturbance (e.g., flood, hurricane, tornado, wild fire, etc.) that occurred within a 50 m radius of each survey point. If a natural disturbance occurs during the survey year (i.e., 15 May through 30 June) it may be necessary to record these data more than once per year.

## Date of Last Management Action

A description of the most recent wetland management actions should be recorded on the habitat monitoring data form following the first survey of each year. The observer recorded the month and year of the most recent management action (e.g., flooding, wetland restoration efforts, mowing, herbicide or insecticide use, wildlife management activities, etc.) that occurred within a 50 m radius of each survey point.

## 2.1.6 Photographic Documentation of Survey Points

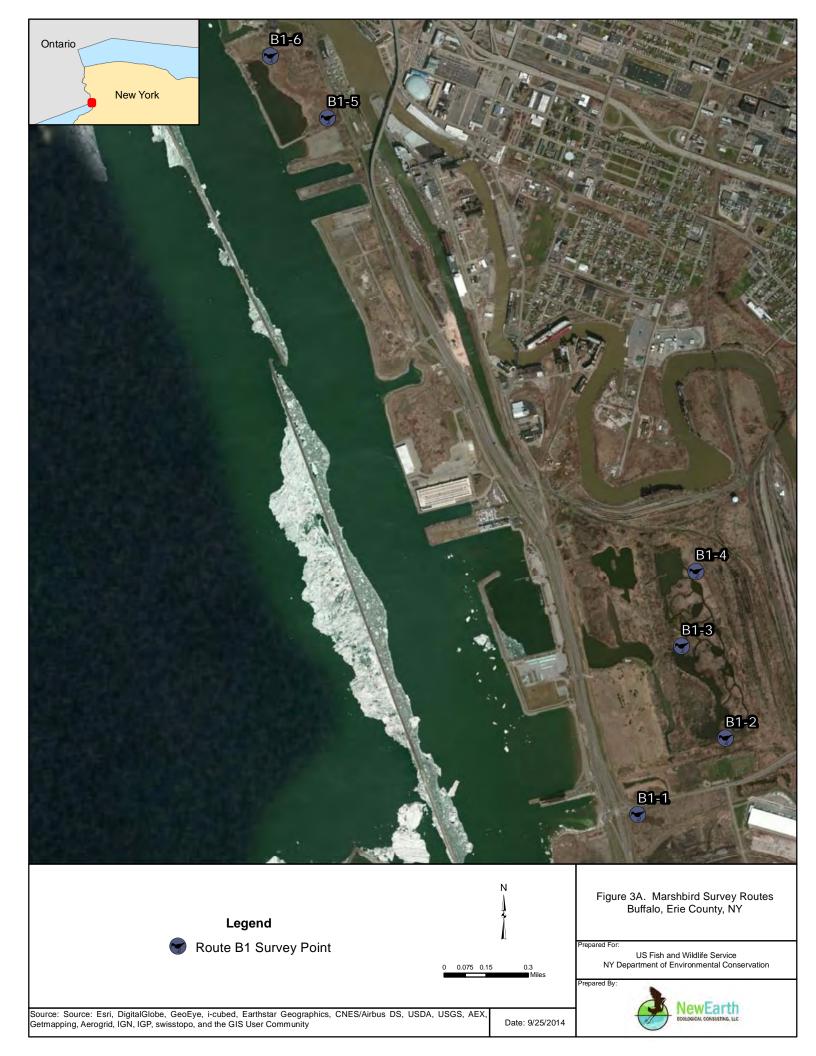
A photographic record of general habitat/site conditions at each survey point was collected concurrent to habitat measurement data collection and is presented in Appendix A.

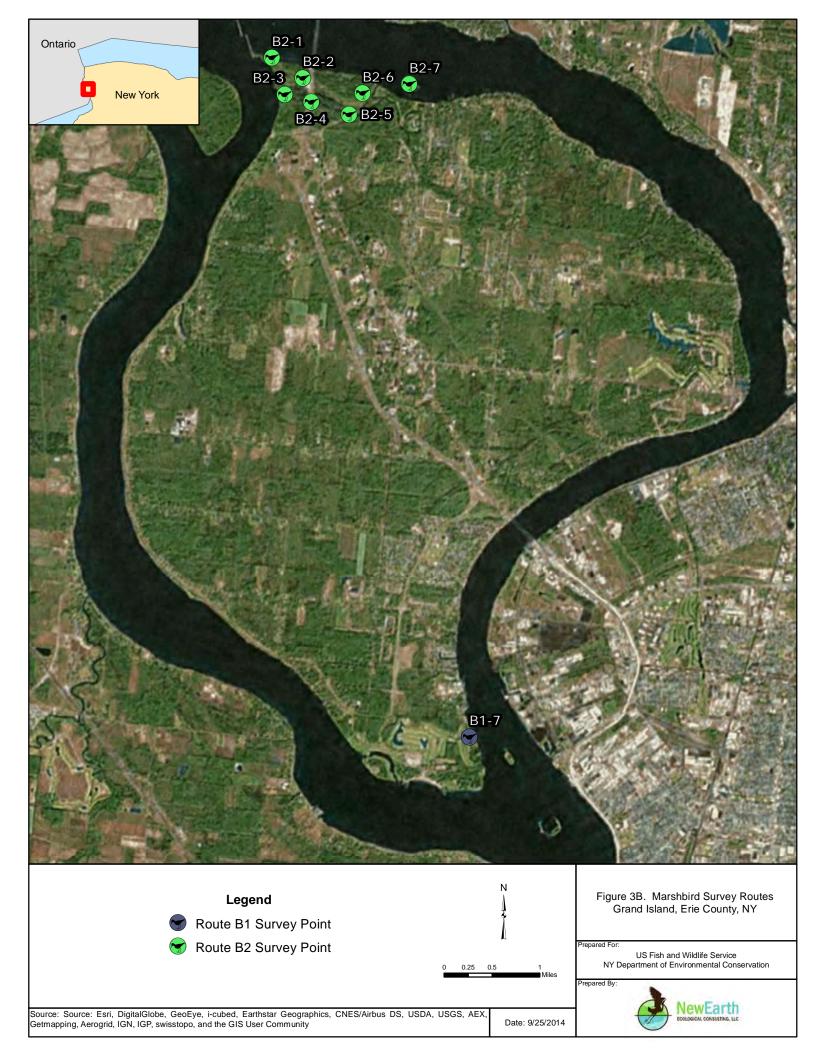
#### 2.2 MARSH BIRD SURVEYS

### 2.2.1 Survey Routes and Points

Survey route locations were initially established using Google Earth<sup>TM</sup> software and ground-truthed 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. Two survey routes were established as shown on Figures 3A and 3B; each with seven points. Seven of the fourteen survey points (four on route B1 and three on route B2) are located near previously surveyed points established by NYSDEC as part of the NR MMP and included survey points: B1-3; B1-5; B1-6; B1-7, B2-3; B2-4 and, B2-7.

Survey 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. Points 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 2014 survey effort. 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.

**Table 3. 2014 Survey Dates for Target Marsh Bird Species** 

Survey Event	Survey Dates
Pre-breeding General Site Recon	March 25-26, 2014
Pre-breeding General Site Recon	April 17-18, 2104
1	May 20-21,2014
2	June 4-5, 2014
3	June 25-26, 2014

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.

Table 4. List of Primary and Secondary Marsh Birds Targeted in the NR AOC

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				

Table 4. List of Primary and Secondary Marsh Birds Targeted in the NR AOC (continued)

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				

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 are <20 km/hr).

## 2.2.3 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 rail, 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 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.

## 2.2.4 Marsh Bird Survey Data

Field data for marsh bird species targeted within the NR AOC during the 2014 survey period (Table 4) 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 is 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 for 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.

#### 2.2.5 Marsh Bird Habitat Data

As with the anuran population monitoring, habitat monitoring was an important part of the marsh bird monitoring effort because habitat data can drive population responses and can be used to inform management decisions. 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. Habitat sampling efforts included recording the percent cover of dominant plant species within a 50 m radius of each survey point, and information on natural disturbances and management activities near the site as described in Section 2.1.5. A blank copy of the habitat data form and observer instructions for completing the form is included in Appendix E.

### 2.2.6 Photographic Documentation of Survey Points

A photographic record of general habitat/site conditions at each marsh bird survey point was collected at the time habitat measurement data was collected and is presented in Appendix A.

#### 3.0 RESULTS

#### 3.1 ANURANS

General site reconnaissance was conducted to establish survey locations on March 25-26 and April 17-18, 2014, and anuran call monitoring surveys were conducted on May 19<sup>th</sup> through 21<sup>st</sup>, June 3<sup>rd</sup> and 4<sup>th</sup>, and June 24<sup>th</sup> and 25<sup>th</sup>, 2104. 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 2014 anuran and habitat surveys.

#### 3.1.1 Anuran Surveys

Survey Route A1 was established on Grand Island and is associated with various habitats along the Niagara River shoreline. Survey Route A2 was established on the east side of the Niagara River, from near Smokes Creek at the southern extent of the NR AOC, to Gratwick Riverside Park at the northern extent of the survey route. A total of 10 points were surveyed for each survey route during the three survey periods.

Six anuran species were recorded within targeted marsh survey areas across the 60 survey events (Table 5). A seventh species (gray tree frog) was documented during a survey event, but only observed outside of the target marsh area, and an eighth species (chorus frog) was detected

during site reconnaissance efforts in the area, but prior to the 2014 survey event. Spring peepers were only recorded during the first survey event, but, were widespread across the survey area. Northern leopard frog and gray tree frog were only recorded during the second survey event. Spring peepers were heard at the highest number of locations (10 unique points), followed by bull frog and American toad which were heard at eight locations each (Table 5).

Table 5. Anuran Species Detected per Survey Event

	Number and % of	Number and % of	Number and % of	Number of	
	Points with	Points with	Points with	<b>Unique Points</b>	
	<b>Detections Event 1</b>	<b>Detections Event 2</b>	<b>Detections Event 3</b>	Species was	
Species	(May 19-21, 2014)	(June 3-4, 2014)	(June 25-26, 2014)	Heard at	
Spring Peeper	$10(50\%)^{1}$	0	0	$10(50\%)^1$	
Green Frog	0	5 (25%)	4 (20%)	5 (25%)	
Bull Frog	0	4 (20%)	8 (40%)	8 (40%)	
Pickerel Frog	3 (15%)	1 (5%)	0	3 (15%)	
Northern	0	2 (10%)	0	2 (10%)	
Leopard Frog	U	2 (1070)	U	2 (1070)	
American Toad	4 (20%) <sup>1</sup>	5 (25%) <sup>1</sup>	0	8 (40%)	
Gray Tree Frog	0	$1(5\%)^{1}$	0	1 (5%) <sup>1</sup>	

Some calls heard at a given point were from locations outside of the target marsh survey area

Spring peeper, green frog, bull frog, northern leopard frog, American toad, and gray tree frog are commonly detected on Environment Canada's MMP survey routes (on at least 10% of station-years) in this region, and similar to this study, MMP also reports the highest detections for spring peepers (Archer and Jones 2009). One species commonly heard on MMS survey routes (15% of station-years), wood frog, was not detected on this survey. A second species, pickerel frog, was uncommon (~ 2% of station-years) on MMP routes.

Of the 20 points surveyed, five had no anuran species detections: A1-1; A1-6; A1-10; A2-5; and A2-8 (Table 6). Point A2-10 had detections; but only of species located outside of the target survey marsh area.

Table 6. Anuran Species Detected per Survey Point

Table 6. Anuran Species Detected per Survey Foint								
Point	Cumulative Species Detections (within target habitat only)	Cumulative Species Detections (within and/or outside of target habitat)						
	Route 1							
A1-1	0	0						
A1-2	5	5						
A1-3	1	1						
A1-4	3	3						
A1-5	3	3						
A1-6	0	0						
A1-7	4	5						
A1-8	3	3						
A1-9	1	1						
A1-10	0	0						
	Route 2							
A2-1	7	7						
A2-2	6	6						
A2-3	2	2						
A2-4	3	3						
A2-5	0	0						
A2-6	2	2						
A2-7	1	2						
A2-8	0	0						
A2-9	3	3						
A2-10	0	2						

Calls noted inside, outside, and both inside and outside the targeted habitat at each survey point were recorded using calling code modifiers (as described in the Amphibian Calling Index portion of section 2.1.4). While the majority of the recorded calls were found to occur within the targeted habitat at survey points (82.6% or 38 of 46 recorded calls in the 5-minute survey period for both Survey Route A1 and A2), several calls were also noted outside of the targeted habitat (8.7% or 4 of 46 recorded calls in the 5-minute survey period for both Survey Route A1 and A2), or in both the targeted habitat and outside of the targeted habitat (8.7% or 4 of 46 recorded calls in the 5-minute survey period for both Survey Route A1 and A2). Summaries presented in Tables 5 and 7 include all observations heard from a point whether inside or outside of the targeted marsh area.

Data were collected in a manner that allowed for an evaluation of two widely used anuran monitoring protocols (i.e. Environment Canada Marsh Monitoring Program [MMP] 3 minute intervals vs. the North American Amphibian Monitoring Program [NAAMP] 5 minute intervals) (Table 7). As expected, the 5-minute intervals resulted in additional recordings, though the variation was slight. All species detected in the 5-minute intervals were also detected using the 3-minute interval method; however, 5-minute intervals resulted in more overall recordings per survey period (e.g. during the second survey event of Survey Route A2 four recordings of spring peepers were documented using 3-minute intervals, while six recordings of spring peepers were documented using 5-minute intervals).

Collectively a total of 47 documented call events (i.e., call of a single species at a single point) were recorded over the three survey events in the 5-minute listening period (Table 7). Sixteen call events for three different species were recorded during event 1, 18 call events for 6 species were recorded during event 2, and 12 call events were recorded for 2 species during the final event. Of the 47 call events, 42 were of call index #1 (individual calls could be distinguished), 5 were of call index #2 (some individuals could be distinguished, but some overlapping calls), and none 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 89% of the detections were of only a small number of individuals at any given station.

Table 7. Anuran Species Detected Using 3 Minute and 5 Minute Call Intervals

Table 7. Anuran Species D	Survey F		Survey Route A2			
	3-Minute	5-Minute	3-Minute	5-Minute		
	Period	Period	Period	Period		
	# of Points	# of Points	# of Points	# of Points		
Species	Recorded	Recorded	Recorded	Recorded		
		1 (May 19-21, 20	14)			
Spring Peeper	3	4	4	6		
Green Frog	0	0	0	0		
Bull Frog	0	0	0	0		
Pickerel Frog	3	3	0	0		
Northern Leopard Frog	0	0	0	0		
American Toad	0	0	4	4		
Gray Tree Frog	0	0	0	0		
Total Call Events		7		10		
	Survey Even	t 2 (June 3-4, 201	<b>(4</b> )			
Spring Peeper	0	0	0	0		
Green Frog	2	2	2	3		
Bull Frog	2	2	2	2		
Pickerel Frog	1	1	0	0		
Northern Leopard Frog	0	0	1	2		
American Toad	1	1	3	4		
Gray Tree Frog	1	1	0	0		
Total Call Events		7		11		
	Survey Event	3 (June 25-26, 20	014)			
Spring Peeper	0	0	0	0		
Green Frog	2	2	2	2		
Bull Frog	4	5	2	3		
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		
Total Call Events		7		5		

#### 3.1.2 Incidental Observations

During the three 2014 survey periods observers noted incidental observations of anurans and other wildlife. Notable observations included a large migration (> 75 individuals) of northern leopard frogs during a rainy evening on May 20<sup>th</sup> at the Tifft Nature Preserve. Surveys were not conducted on this evening due to the rain conditions; however, surveyors traveled along some of the survey route, and observed heavy frog movements throughout Tifft Nature Preserve.

Additional observations included an eastern garter snake (*Thamnophis sirtalis*) sighting, as well as pickerel frog and western/boreal chorus frog (*Pseudacris triseriata/maculatum*) calling, at Buckhorn Island State Park during pre-survey field reconnaissance efforts on April 17<sup>th</sup>.

## 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 = 3) effect on two or more survey events at 12 (60%) of the point locations (Table 8). The primary source of noise on anuran surveys was associated with vehicle traffic on roadways. Noise from boats, sirens, airplanes and those associated with construction equipment use and humans involved in recreational activities were also reported.

**Table 8. Noise Levels During Anuran Survey Events** 

Point	Noise Level Event 1 <sup>1</sup>	Noise Level Event 2 <sup>1</sup>	Noise Level Event 3 <sup>1</sup>
A1-1	2	3	1
A1-2	1	2	1
A1-3	3	2	2
A1-4	3	1	2
A1-5	2	1	3
A1-6	2	2	2
A1-7	2	2	1
A1-8	2	2	1
A1-9	2	1	2
A1-10	1	1	0
A2-1	2	1	1
A2-2	2	1	1
A2-3	3	1	2
A2-4	2	1	1
A2-5	3	2	3
A2-6	2	2	2
A2-7	2	1	2
A2-8	2	1	2
A2-9	1	1	1
A2-10	1	2	1

<sup>&</sup>lt;sup>1</sup> Effect on Sampling: 0 = none; 1 = slight; 2 = moderate; 3 = serious; 4 = profound

#### 3.1.4 Habitat

Of the 20 marshes surveyed, five are considered open water habitat (i.e., site dominated by open water and wetland/aquatic vegetation cover is less than 25%), six 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 nine 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 9). Based on an evaluation of general habitat conditions for the target species, sites A1-2, A1-6, A1-10, A2-5, A2-6, A2-7, A2-8, A2-9,

and A2-10 are of overall low quality due to poor water/vegetation interspersion, lack of water in the marsh system, lack of wetland vegetation, high energy environment (i.e., unprotected river shoreline), and/or dominance of invasive species (see photographs in Appendix A).

**Table 9. Anuran Marsh Habitat Conditions** 

			bitat Cond								
Point	General Type	Detection s <sup>1</sup>	Overall habitat Quality	% Veg Cover²	Water Depth (m)	% Typha (N) <sup>3</sup>	% Lythrum (I) <sup>3</sup>	% Phragmites (I) $^3$	% Lonicera (I) <sup>3</sup>	Open Water/Veg Interspersion	Distance to Open Water (m) <sup>4</sup>
A1-1	Marsh	0	adequate	110	0	10	10	0	0	20/80	3
A1-2	Open Water	5	poor	0	0.75	0	0	0	0	100/0	0
A1-3	Marsh	1	adequate	130	0	60	40	0	0	30/70	5
A1-4	Marsh	3	adequate	100	0.15	35	14	0	0	0/100	none
A1-5	Open Water/Marsh	3	adequate	45	0.12	30	5	0	0	70/30	3
A1-6	Open Water	0	poor	0	0.1	0	0	0	0	100/0	0
A1-7	Marsh	4	adequate	110	0	30	0	0	0	0/100	80
A1-8	Marsh	3	adequate	60	0.25	40	0	0	0	50/50	1
A1-9	Marsh	1	adequate	100	0	70	0	0	0	0/100	none
A1-10	Open Water	0	poor	0	0.6		0	0	0	100/0	2
A2-1	Open Water/Marsh	7	adequate	67	0	60	0	0	5	30/70	1
A2-2	Marsh	6	adequate	100	0	100	0	0	0	5/95	1
A2-3	Marsh	2	adequate	80	0	70	0	10	0	0/100	70
A2-4	Open Water/Marsh	3	adequate	37	0.8	20	0	0	0	80/20	2
A2-5	Marsh	0	poor	100	0		0	100	0	0/100	none
A2-6	Open Water/Marsh	2	poor	110	0	30	0	70	0	0/100	none
A2-7	Open Water	1	poor	0	0.17		0	0	0	40/0	0
A2-8	Open Water	0	poor	0	1.0		0	0	0	40/0	0
A2-9	Marsh	3	poor	45	0	20	5	20	0	40/60	10
A2-10	Open Water/Marsh	0	poor	28	0.5	10	0	0	0	80/20	5

<sup>&</sup>lt;sup>1</sup> Cumulative number of species detections for all survey events

<sup>&</sup>lt;sup>2</sup> Cover may exceed 100% due to overlap of vegetation at varying heights within a strata

<sup>&</sup>lt;sup>3</sup> (I) = New York State recognized non-native invasive species; (N) native species, but potentially noxious

<sup>&</sup>lt;sup>4</sup> 0 = open water present at point location; none = no open water within 100 m

Five marshes had no marsh vegetation (primarily because they were open water habitats). Of the 15 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 at two of the 15 sites; A2-5 and A2-6 (Table 9), and cattails (i.e., genus *Typha*) were the dominant species at seven sites. *Phragmites* and *Typha* were equally dominant at site A2-9. Other common wetland plants included species in the following genus: *Carex, Cornus, Sparganium, Eupatorium, BolboschoenusSchoenoplectus, Dispaucus, Nuphar, Decodan, and Persicaria* (Appendix E). Of these, only *Carex, Cornus, Sparganium, Eupatorium*, were found as common species in more than one marsh area surveyed.

Half (10) of the sites had no measurable surface water present at the time of survey (Table 9). Of the remaining 10 areas, water levels were greater than 0.30 m ( $> \sim 12$  inches) at five sites, between greater than 0.15 and less than 0.30 m ( $> \sim 6$  and  $\sim 12$  inches) at two sites, and between 0.1 and 0.15 m ( $\sim 4$  to  $< \sim 6$  inches) at four sites (Table 8). Although surface water was not present within the marsh habitat at 10 survey locations, open water was present within 50 meters of four 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.

#### 3.2 MARSH BIRDS

General site reconnaissance was conducted to establish survey locations on March 25-26 and April 17-18, 2014, and marsh bird monitoring surveys were conducted on May 20<sup>th</sup> and 21<sup>st</sup>, June 4<sup>th</sup> and 5<sup>th</sup>, and June 25<sup>th</sup> and 26<sup>th</sup>, 2104. Tables 10 through 13 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 2014 anuran and habitat surveys.

## 3.2.1 Marsh Bird Surveys

Survey Route B1 was established on Tifft Nature Preserve, Times Beach Nature Preserve, and Beaver Island State Park and is associated with various habitats along the Niagara River shoreline and adjacent near shore habitats. Survey Route B2 was established on Grand Island and Sunken Island, with six of the seven survey points located at Buckhorn Island State Park. A total of seven points were surveyed for each survey route during the three survey periods, resulting in 42 survey events. An eighth survey point (B1-8) was surveyed on Strawberry Island during the first survey event, but was removed from subsequent events due to low habitat suitability and access constraints. No species were detected at the location during the single survey event and the data was not included in the analysis.

## **Primary Focal Species**

Six of the eight target primary focal marsh bird species were recorded across 42 survey events (Table 10). Surveys along Route B1 resulted in the recording of four species (i.e. least bittern, common gallinule, Virginia rail, and pied-billed grebe), while surveys along Route B2 recorded

five species (i.e. Virginia rail, American bittern, pied-billed grebe, common gallinule, and sora). Virginia rail was the most commonly observed species, and was detected during 23% of the survey events (10 of 42). Pied-billed grebe had the highest number of individuals recorded at a given point (6 individuals at B2-7). Several American coot were observed while travelling to/from survey point B2-7, but were never heard during a survey. King rail, a target species, was never heard in the project area.

Virginia rail and common gallinule are also 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.

Table 10. Marsh Bird Species Detected per Survey Event

	Number and % of Points with	Number and % of Points with	Number and % of Points with	Number of Unique Points		
Cm a a≛ a a	Detections Event 1	Detections Event 2	Detections Event 3	Species was		
Species	(May 20-21, 2014)	(June 4-5, 2014)	(June 25-26, 2014)	Heard at		
Least Bittern	2 (14%)	2 (14%)	3 (21%)	3 (21%)		
Sora	0	1 (7%)	1 (7%)	2 (14%)		
Virginia Rail	5 (36%)	4 (29%)	1 (7%)	6		
American	1 (7%)	0	0	1 (70%)		
Bittern	1 (7%)	U	U	1 (7%)		
Common	3 (21%)	3 (21%)	2 (14%)	4 (29%)		
Gallinule	3 (21%)	3 (21%)	2 (14%)	4 (29%)		
American Coot	0	0	0	0		
Pied-Billed	1 (7%)	2 (140/)	1 (70/.)	2 (210/.)		
Grebe	1 (/%)	2 (14%)	1 (7%)	3 (21%)		

Of the 14 points surveyed, five had no marsh bird species detections: B1-1; B1-5; B1-6; B2-4; and B2-5 (Table 11). Point B1-3 had the highest number of species detected (least bittern, Virginia rail, common gallinule, and pied-billed grebe). Location B-7 had the highest number of individuals during a single survey event, with six pied-billed grebes and two common gallinules recorded. Sora was only observed at point B2-7, and American bittern was only documented within the target marsh at B2-2 (Table 11). An American bittern was also observed as a flyover during surveys at B2-5, but was not included in the number of detections because it could not be tied to a marsh in the NR AOC survey area.

**Table 11. Marsh Bird Species Detected per Survey Point** 

	Number of Individuals Detected								
	Least	Sora	Virginia	American	Common	American	Pied-Billed		
Point	Bittern		Rail	Bittern	Gallinule	Coot	Grebe		
Survey Event 1 (May 20-21, 2014)									
B1-1	0	0	0	0	0	0	0		
B1-2	1	0	0	0	0	0	0		
B1-3	1	0	1	0	1	0	0		
B1-4	0	0	1	0	1	0	0		
B1-5	0	0	0	0	0	0	0		
B1-6	0	0	0	0	0	0	0		
B1-7	0	0	0	0	0	0	0		
B2-1	0	0	1	0	0	0	0		
B2-2	0	0	0	1	0	0	0		
B2-3	0	0	1	0	0	0	0		
B2-4	0	0	0	0	0	0	0		
B2-5	0	0	0	0	0	0	0		
B2-6	0	0	1	0	0	0	0		
B2-7	0	0	0	0	2	0	6		
		Sı	irvey Even	t 2 (June 4-5,	2014)				
B1-1	0	0	0	0	0	0	0		
B1-2	1	0	0	0	1	0	1		
B1-3	1	0	1	0	1	0	0		
B1-4	0	0	1	0	1	0	0		
B1-5	0	0	0	0	0	0	0		
B1-6	0	0	0	0	0	0	0		
B1-7	0	0	1	0	0	0	0		
B2-1	0	0	0	0	0	0	0		
B2-2	0	0	0	0	0	0	0		
B2-3	0	0	1	0	0	0	0		
B2-4	0	0	0	0	0	0	0		
B2-5	0	0	0	0	0	0	0		
B2-6	0	0	0	0	0	0	0		
B2-7	0	1	0	0	0	0	1		

**Table 11. Marsh Bird Species Detected per Survey Point (continued)** 

Survey Event 3 (June 25-26, 2014)								
	Least	Sora	Virginia	American	Common	American	Pied-Billed	
Point	Bittern		Rail	Bittern	Gallinule	Coot	Grebe	
B1-1	0	0	0	0	0	0	0	
B1-2	1	0	0	0	0	0	0	
B1-3	1	0	1	0	1	0	1	
B1-4	1	0	0	0	1	0	0	
B1-5	0	0	0	0	0	0	0	
B1-6	0	0	0	0	0	0	0	
B1-7	0	0	0	0	0	0	0	
B2-1	0	0	0	0	0	0	0	
B2-2	0	1	0	0	0	0	0	
B2-3	0	0	0	0	0	0	0	
B2-4	0	0	0	0	0	0	0	
B2-5	0	0	0	0	0	0	0	
B2-6	0	0	0	0	0	0	0	
B2-7	0	0	0	0	0	0	1	

## Secondary Focal Species

Secondary focal species were also documented during each of the three survey events and six 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 was the swamp sparrow, recorded at 59 % (13 of 22) of survey points along Survey Route B1 across all survey events, and 86 % (18 of 21) of survey points along Survey Route B2 across all survey events. Black tern, also a secondary focal species, was seen in the project area, but never observed during a survey event. Forster's tern was not detected in the survey area.

#### 3.2.2 Incidental Observations

Three American coot were observed during the first survey event while travelling to/from survey point B2-7, and two were observed in the same vicinity during the second survey event. The birds did not vocalize and were never heard or seen during any surveys. This species is notoriously secretive and typically does not respond to broadcast calls. During the second event, four black terns were observed flying over the Niagara River approximately 300 m off the southeast shoreline of Grand Island.

#### 3.2.3 Disturbances Noted During Survey Efforts

Similar to anuran survey efforts, noise (primarily from vehicle traffic), affected the surveyors ability to detect calls during some survey events. Noise was at moderate (score = 2) to serious (score = 3) levels or two or more survey events at eight (67%) of the point locations (Table 12). In two instances (both in event 1), survey efforts were profoundly affected by noise (score = 4).

In addition, ongoing efforts to control invasive *Phragmites* at Times Beach have resulted in the loss of marsh vegetation and ongoing disturbance (i.e., noise, human activity) which have likely affected breeding activities of marsh dependent species. Marsh species are expected to colonize the site once suitable vegetation and hydrology have become reestablished.

Table 12. Noise Levels During Marsh Bird Survey Events.

Point	Noise Level Event 1 <sup>1</sup>	Noise Level Event 2 <sup>1</sup>	Noise Level Event 3 <sup>1</sup>
B1-1	2	3	3
B1-2	4	1	2
B1-3	3	1	1
B1-4	4	1	1
B1-5	2	1	1
B1-6	2	0	1
B1-7	2	2	2
B2-1	3	2	1
B2-2	3	2	3
B2-3	2	2	2
B2-4	3	3	3
B2-5	2	1	2
B2-6	2	1	1
B2-7	2	1	1

<sup>&</sup>lt;sup>1</sup> Effect on Sampling: 0 = none; 1 = slight; 2 = moderate; 3 = serious; 4 = profound

#### 3.2.4 Habitat

Of the 14 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 be present in the marsh, but any open water is 50 m or more away) (Table 13). As with the anuran habitats, some marsh bird locations included in the survey (B1-1, B1-5, B1-6, B2-1, B2-2, B2-3, and B2-5) may be of questionable suitability for breeding marsh birds based on the lack of desirable wetland vegetation, poor hydrologic conditions, and /or poor open water/marsh interspersion (see photographs in Appendix A).

**Table 13. Marsh Bird Habitat Conditions** 

Point	General Type	Detections <sup>1</sup>	Overall Habitat Quality	% Veg Cover²	Water Depth (m)	% Typha (N) <sup>3</sup>	% Lythrum (I) <sup>3</sup>	% Phragmites (I) <sup>3</sup>	% Lonicera (I) <sup>3</sup>	Open Water/Veg Interspersion	Distance to Open Water (m) <sup>4</sup>
B1-1	Marsh	0	poor	115	0	0	0	100	0	0/100	none
B1-2	Open Water/Marsh	5	adequate	67	0	60	0	0	5	30/70	1
B1-3	Open Water/Marsh	10	adequate	100	0.67	30	0	0	0	70/30	0
B1-4	Marsh	6	adequate	100	0.9	100	0	0	0	5/95	1
B1-5	Marsh	0	poor	80	0	70	0	10	0	0/100	70
B1-6	Marsh	0	poor	100	0	80	0	0	0	10/90	50
B1-7	Open Water/Marsh	1	adequate	125	0.02	50	30	0	0	30/70	3
B2-1	Marsh	1	poor	80	0	30	0	0	0	0/100	none
B2-2	Marsh	2	poor	105	0	55	0	0	0	0/100	none
B2-3	Marsh	2	poor	100	0	70	0	0	0	0/100	none
B2-4	Open Water/Marsh	0	adequate	60	0.25	40	0	0	0	50/50	1
B2-5	Marsh	0	poor	130	0	80	0	0	0	0/100	none
B2-6	Open Water/Marsh	1	adequate	90	0.23		0	0	0	25/75	1
B2-7	Open Water/Marsh	5	adequate	70	0.58	70	0	0	0	40/60	0

<sup>&</sup>lt;sup>1</sup> Cumulative number of species detections for all survey events

Thirteen of the 14 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 dominant vegetation at one site; B1-1 (Table 13), and cattails (i.e., genus *Typha*) were the dominant species at 11 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.* 

<sup>&</sup>lt;sup>2</sup> Cover may exceed 100% due to overlap of vegetation at varying heights within a strata

<sup>&</sup>lt;sup>3</sup> (I) = New York State recognized non-native invasive species; (N) native species, but potentially noxious

<sup>&</sup>lt;sup>4</sup> 0 = open water present at point location; none = no open water within 100 m

Six (43%) of the sites had measurable surface water present at the time of survey (Table 13). Water levels were greater than 0.30 m (>  $\sim$ 12 inches) at three sites, between greater than 0.15 and less than 0.30 m (>  $\sim$ 6 and  $\sim$ 12 inches) at two sites, and between 0.1 and 0.15 m ( $\sim$  4 to <  $\sim$ 6 inches) at one location. Although no surface water was present within the marsh habitat at eight 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 B1-1, B2-1, B2-2, B2-3, and B2-5.

#### 4.0 DISCUSSION

Summaries and data presented herein were collected during the initial survey effort for the Project; launched in 2014. Additional years of data collection will help to improve efforts to evaluate and assess marsh anuran and marsh bird populations and trends and habitat conditions within the NR AOC and will provide a basis for future year-year comparisons.

#### **Routes and Points**

Two survey routes with 20 points total were sampled for anurans and two routes with 14 points were sampled for marsh birds. Both survey efforts would undoubtedly benefit from the addition of more survey points to increase coverage and sample sizes. However, 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. Opportunities to expand survey coverage are limited, but several locations will be evaluated in 2015 for possible inclusion in future survey efforts, these include up to six additional anuran survey points (most will likely be placed within marshes already being surveyed, where noise may have affected the surveyor's ability to detect calling anurans across the full marsh extent), and one additional marsh bird survey point in the Beaver Island State Park marsh system.

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

This study detected six of the eight anuran species commonly documented in the region on MMP surveys (Archer and Jones 2009). A seventh species (chorus frog) was reported in April prior to the start of 2014 survey efforts, and the eighth species (wood frog) was not detected. Pickerel frog, an uncommon species on MMP events, was documented during the 2014 effort. In an effort to better target some of the species that may have been missed or underrepresented in 2014, the Work Plan for this study was revised post-2014 efforts to call for survey events in mid-

late April; mid-late May; mid-June; and mid-July for a total of four survey events instead of three as was done in 2014. The second June event was eliminated from future survey efforts because the 2014 event yielded only 2 species, and these had been reported in higher numbers on the prior June event. Although most of the common anuran species known to occur in the region were detected in this study, over 89% of the detections were of only a small number of chorusing individuals at any given station (call index #2 or less). This suggests that population numbers throughout the NR AOC are quite low. The potential addition of up to six survey points and the expanded survey window covering April and July on future surveys may help to yield higher numbers of individuals and species in areas where they were previously not documented.

Based on an evaluation of general habitat conditions at anuran survey point locations, nine of the 20 marsh sites (A1-2, A1-6, A1-10, A2-5, A2-6, A2-7, A2-8, A2-9, and A2-10) are of overall low quality primarily due to poor open water/wetland vegetation interspersion, lack of hydrology within the wetland, lack of desirable wetland vegetation, and/or poor location along the river shoreline (see photographs in Appendix A). These site conditions may help to explain the lack of anuran species observed at several sites (A1-6, A1-10, A2-5, A2-8, and A2-10), but site A1-1 (a site with overall good quality habitat) also had no detections, and sites A1-2, A2-6, A2-7, and A2-9 (poor quality sites) all had species detections. The link between marsh habitat availability and anuran populations is well documented, and some of the locations with poor habitat lack several of the basic characteristics to qualify as marsh habitat. However, the factors that determine how the various parameters within a habitat affect species use and productivity (e.g., vegetation type, percent cover, water levels in/near marsh areas, habitat size, surrounding habitats, and level of disturbance) are not well understood. In highly disturbed areas such as the NR AOC, where marsh habitat is extremely limited and threats to survival are high, even the poorest quality marshes may be of importance in sustaining breeding populations. Although few opportunities were identified to add additional marsh habitats to the survey effort to expand the pool of habitats evaluated for anurans, future replicates will help in the evaluation of how these marshes are being used by the target anuran species (for example, are poor quality marshes used consistently, were species missed in the high quality marsh), and to identify other factors that may be driving marsh site selection.

An important component of the 2014-2018 monitoring effort is to evaluate trends in populations of northern leopard frog, American toad, and bullfrog in the study area. Collectively 47 documented call events (i.e., call of a single species at a single point) were recorded over the 60 survey events that took place within the three survey periods of 2014; of these there were 22 detections for northern leopard frog, American toad, and bullfrog. 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 to 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

This study detected six of the eight target marsh bird species identified for this survey. A seventh species (American coot) was detected incidentally while on site. The eighth target species (king rail) was not detected on this study or others 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 effort and longer time spent meandering through available habitat may yield higher numbers. For example, American coot were observed while canoeing to survey locations within the marshes of Buckhorn Island State Park, but were never documented on a survey. In addition, during the 2014 survey effort a recently restored marsh system within Beaver Island State Park was identified as potential marsh bird habitat. The 2015 survey effort will include an evaluation of the area for possible inclusion in future survey efforts.

Half of the 14 marsh bird survey sites (B1-1, B1-5, B1-6, B2-1, B2-2, B2-3, and B2-5) are believed to be of overall low quality for breeding marsh birds based on the lack of water at or near the point, absence of desirable wetland vegetation, and/or poor open water/wetland vegetation interspersion (see photographs in Appendix A). These site conditions may help to explain the lack of target species observed at sites B1-1, B1-5, B1-6, and B2-5. But, site B2-4 (a site with overall good quality habitat) also had no detections, and sites B2-1, B2-2, and B2-3 (poor quality sites) all had species detections (Table 13). As with the marsh anuran habitats, the factors that determine how breeding marsh birds may be affected by the various parameters of a habitat (e.g., vegetation type, percent cover, water levels in and near marsh areas, habitat size, surrounding habitats, and level of disturbance) are not well understood. In highly disturbed areas such as the NR AOC, where marsh habitat is extremely limited and threats to survival are high, even the poorest quality marshes may be of importance in sustaining a breeding population. Although few opportunities were identified to add additional marshes to the survey effort to expand the pool of marsh bird habitats evaluated, future replicates will help in the evaluation of how these marshes are being used by the target species (for example, are poor quality marshes used consistently, were species missed in the high quality marsh), and to identify other factors that may be driving marsh site selection by the target marsh bird species.

Sunken Island (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 the 2014 study results found the highest diversity of species in these areas (collectively five or more detections). 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 2014 survey efforts. However, a grebe was also documented in Tifft Preserve on 2 out of 3 survey events, suggesting this species may also be breeding within the preserve.

Collectively a total of 32 documented marsh bird call events (i.e., call of a single species at a single point) were recorded over the 42 survey events that took place within the three survey periods. Similar to the marsh anuran effort, this small sample size 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 NY DEC in 2102 included data from nearly 1,500 call-broadcast surveys at 417 survey points (Yard et. al. 2012). 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 opportunity to increase the survey effort and sample sizes.

#### 5.0 CONCLUSIONS

This study is the first 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 eight targeted anuran species and seven of the eight targeted heron 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 Northwest



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 Northeast



Anuran Survey Point A2-2 Facing Southwest



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



Avian Survey Point B1-1 Facing Southeast



Avian Survey Point B1-2 Facing Northwest



Avian Survey Point B1-3 Facing North



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 Northeast



Avian Survey Point B2-1 Facing South



Avian Survey Point B2-2 Facing West



Avian Survey Point B2-3 Facing West



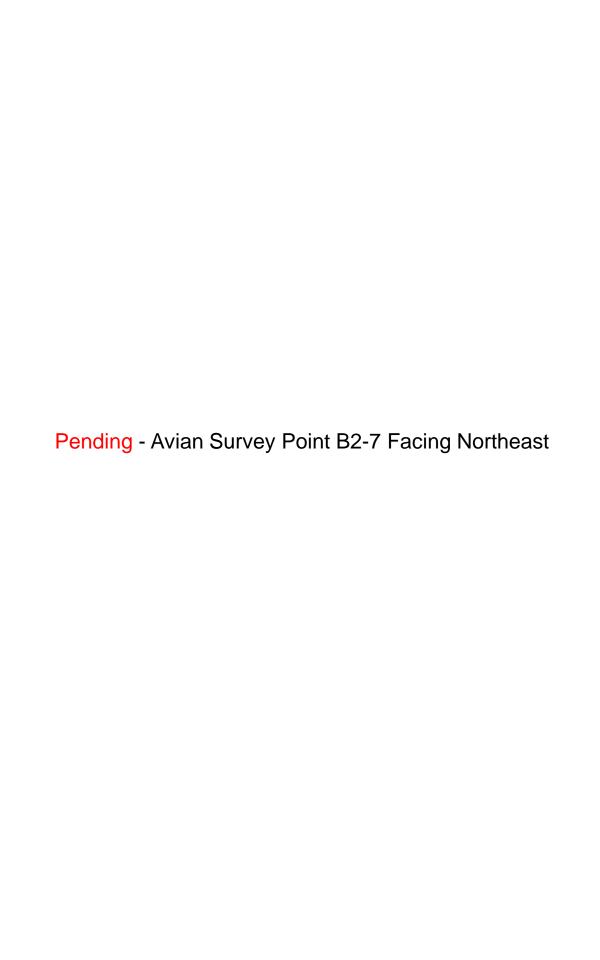
Avian Survey Point B2-4 Facing North



Avian Survey Point B2-5 Facing Northeast



Avian Survey Point B2-6 Facing South



#### **APPENDIX B**

### COORDINATES FOR ANURAN AND MARSH BIRD SURVEY LOCATIONS

2014 Anuran and Marsh Bird Survey Locations

		ANURANS	
Point ID	Route	Latitude	Longitude
A1-1	A1	42° 57' 38.110" N	78° 56' 21.060" W
A1-2	A1	42° 57' 35.240" N	78° 57' 25.250" W
A1-3	A1	42° 58' 2.172" N	78° 56' 34.155" W
A1-4	A1	43° 0' 26.892" N	78° 55' 52.793" W
A1-5	A1	43° 1' 29.949" N	78° 53' 40.131" W
A1-6	A1	43° 3' 39.138" N	78° 58' 21.097" W
A1-7	A1	43° 3' 40.725" N	78° 58' 43.212" W
A1-8	A1	43° 3' 28.714" N	78° 59' 11.113" W
A1-9	A1	43° 3' 33.745" N	78° 59' 40.817" W
A1-10	A1	43° 1' 33.738" N	79° 0' 41.622" W
A2-1	A2	42° 50′ 38.956″ N	78° 50' 55.559" W
A2-2	A2	42° 51' 7.384" N	78° 51' 11.736" W
A2-3	A2	42° 52' 22.610" N	78° 52' 57.250" W
A2-4	A2	42° 56' 1.557" N	78° 54' 28.139" W
A2-5	A2	43° 0' 3.462" N	78° 55' 36.811" W
A2-6	A2	43° 0' 22.255" N	78° 54' 24.295" W
A2-7	A2	43° 1' 0.672" N	78° 53' 28.866" W
A2-8	A2	43° 1' 24.464" N	78° 52' 48.048" W
A2-9	A2	43° 2' 4.240" N	78° 53' 7.439" W
A2-10	A2	43° 3' 15.203" N	78° 53' 59.275" W

	MARSH BIRDS										
Point ID	Route	Latitude	Longitude								
B1-1	B1	42° 50' 21.576" N	78° 51' 19.126" W								
B1-2	B1	42° 50′ 37.483″ N	78° 50' 59.472" W								
B1-3	B1	42° 50' 53.400" N	78° 51' 13.157" W								
B1-4	B1	42° 51' 7.467" N	78° 51' 11.799" W								
B1-5	B1	42° 52' 22.661" N	78° 52' 57.177" W								
B1-6	B1	42° 52' 32.820" N	78° 53' 13.264" W								
B1-7	B1	42° 57' 58.505" N	78° 56' 30.523" W								
B2-1	B2	43° 3' 50.819" N	78° 59' 54.740" W								
B2-2	B2	43° 3' 41.832" N	78° 59' 30.451" W								
B2-3	B2	43° 3' 31.893" N	78° 59' 42.139" W								
B2-4	B2	43° 3' 29.595" N	78° 59' 21.973" W								
B2-5	B2	43° 3' 25.369" N	78° 58' 53.447" W								
B2-6	B2	43° 3' 37.612" N	78° 58' 45.396" W								
B2-7	B2	43° 3' 45.515" N	78° 58' 11.930" W								

## APPENDIX C 2104 ANURAN SURVEY DATA AND FORMS

### Niagara River Area Of Concern Marsh Anuran Survey Protocol Anuran Calling Survey Data Form

Please comp	lete information be	elo	w		Dat	a co	llect	ed a	at s	tart	t of	ea	ch s	urv	еу	poi	nt			
Observer																				
Name(s):					Add	itiona	l notes	::												
Route																				
Number:																				
Survey Date (mm/dd/yyyy):																				
Window Number:					Days	since	e last i	ainfal	II:											
	1 . 1 1		Survey Point Number																	
Data collected at each point		•	1	2		3		1	5		6		7		8	3	9	)	1	0
	Start Time (military):  Air Temperature:																			
Select Scale																				
Was noise a facto																				
Did you take a bre																				
Wind (Use Wind S	,																			
Sky (Use Sky Cod																				
Moon or Moonligh	t Visible (Y or N) nat passed (within 50 m)		1																1	
Snow cover (Y or																				
Species List	,	•	1	2		3		1	5		6	•	7	7	8	3	9	)	1	0
American toad																				
Gray tree frog																				
Spring peeper																				
Western/Borea	l chorus frog																			
Mink frog																				
Wood frog																				
American bull	frog																			
Green frog																				
Northern leopa	rd frog																			
Pickerel frog																				
Comments:																				

Anuran calling survey instructions

#### Instructions:

Please be sure to complete the entire datasheet.

Each datasheet represents one person's frog call observations. If you have an assistant, he/she can assist with the environmental data (e.g. air temp, count cars, etc.) but not with what frogs are heard.

Visit stops in 1-10 order. If unforeseen circumstances require you to skip a stop, write that on the datasheet.

At the start of each survey point record the time, wind, and sky conditions (see codes to the right).

At each stop listen for 5 minutes, recording the amphibian calling index for each species heard during an initial 3 minute listening period in the first column of the survey point, followed by the findings of a subsequent 2 minute listening period in the second column of each survey point. Report only the species you are confident that you heard. If a species varies in calling intensity over the listening periods, report the highest calling index level you heard for each listening period.

At each stop, also report the environmental data requested: air temperature, noise conditions, moonlight, and number of cars that passed while listening.

There are two kinds of noise disturbance questions:

- Was noise a factor? The "Noise index" is a numerical ranking of the level of background noise disturbance encountered. See codes to the right.
- "Did you take a break?" If an unexpected noise disturbance happens (such as a train) that lasts a minute or more, you may interrupt the 5 minute listening period to ignore the sudden disturbance. Finish up the listening time after the disturbance has passed. Do not include this type of noise in the "was noise a factor" question.

	Index and Code Definitions
	phibian Calling Index
1	Individuals can be counted; there is space between calls
2	Calls of individuals can be distinguished but there is some overlapping of calls
3	Full chorus, calls are constant, continuous and overlapping
Amı	phibian Calling Index Modifiers
Α	Amphibians Calling Within Target Area Only
В	Amphibians Calling Outside Target Area Only
С	Amphibians Calling Inside and Outside of Target Area
Sky	codes
0	Few clouds
1	Partly cloudy (scattered) or variable sky)
2	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain (not affecting hearing ability)
7	Snow
8	Showers (is affecting hearing ability) do not conduct survey
Wir	nd Codes
0	Calm (<1mph) smoke rises vertically
1	Light Air (1-3 mph) smoke drifts, weather vane inactive
2	Light Breeze (4-7 mph) leaves rustle, can feel wind on face
3	Gentle Breeze (8-12 mph) leaves and twigs move around, small flag extends
4*	Moderate Breeze (13-18 mph) moves thin branches, raises loose papers  * Do not conduct survey, unless in Great Plains states
5**	Fresh Breeze (19 mph or greater) small trees begin to sway  **Do not conduct survey –ALL REGIONS
Noi	se Index
0	No appreciable effect (e.g. owl calling)
1	Slightly affecting sampling (e.g. distant traffic, dog barking, 1 car passing)
2	Moderately affecting sampling (e.g. nearby traffic, 2-5 cars passing)
3	Seriously affecting sampling

(e.g. continuous traffic nearby, 6-10 cars)

(e.g. continuous traffic passing, construction noise)

Profoundly affecting sampling

<b>Survey Date</b>	Survey Window	Route #	Point #	Latitude		1	Fime Bracket (3 or 2 min.	Air Temp. (°F)	Noise Factor	Break taken (y/n)
5/19/2014	1	A1	1	42.960586°	-78.939183°	2115	3	57	2	N
5/19/2014	1	A1	1	42.960586°	-78.939183°	2115	2	57	2	N
5/19/2014	1	A1	2	42.959789°	-78.957014°	2124	3	54	1	N
5/19/2014	1	A1	2	42.959789°	-78.957014°	2124	3	54	1	N
5/19/2014	1	A1	2	42.959789°	-78.957014°	2124	2	54	1	N
5/19/2014	1	A1	2	42.959789°	-78.957014°	2124	2	54	1	N
5/19/2014	1	A1	3	42.967270°	-78.942821°	2148	3	55	3	N
5/19/2014	1	A1	3	42.967270°	-78.942821°	2148	2	55	3	N
5/19/2014	1	A1	4	43.007470°	-78.931331°	2215	3	55	3	N
5/19/2014	1	A1	4	43.007470°	-78.931331°	2215	2	55	3	N
5/19/2014	1	A1	5	43.024986°	-78.894481°	2226	3	55	2	N
5/19/2014	1	A1	5	43.024986°	-78.894481°	2226	2	55	2	N
5/19/2014	1	A1	6	43.060872°	-78.972527°	2250	3	55	2	N
5/19/2014	1	A1	6	43.060872°	-78.972527°	2250	2	55	2	N
5/19/2014	1	A1	7	43.061312°	-78.978670°	2305	3	55	2	N
5/19/2014	1	A1	7	43.061312°	-78.978670°	2305	3	55	2	N
5/19/2014	1	A1	7	43.061312°	-78.978670°	2305	2	55	2	N
5/19/2014	1	A1	8	43.057976°	-78.986420°	2325	3	52	2	N
5/19/2014	1	A1	8	43.057976°	-78.986420°	2325	2	52	2	N
5/19/2014	1	A1	9	43.059374°	-78.994671°	2348	3	51	2	N
5/19/2014	1	A1	9	43.059374°	-78.994671°	2348	2	51	2	N
5/19/2014	1	A1	10	43.026314°	-79.011535°	10	3	51	2	N
5/19/2014	1	A1	10	43.026314°	-79.011535°	10	2	51	2	N
6/3/2014	2	A1	10	43.026314°	-79.011535°	2133	3	68	1	N
6/3/2014	2	A1	10	43.026314°	-79.011535°	2133	2	68	1	N
6/3/2014	2	A1	9	43.059374°	-78.994671°	2155	3	68	1	N
6/3/2014	2	A1	9	43.059374°	-78.994671°	2155	2	68	1	N
6/3/2014	2	A1	8	43.057976°	-78.986420°	2214	3	68	2	N
6/3/2014	2	A1	8	43.057976°	-78.986420°	2214	2	68	2	N
6/3/2014	2	A1	7	43.061312°	-78.978670°	2237	3	65	2	N
6/3/2014	2	A1	7	43.061312°	-78.978670°	2237	3	65	2	N
6/3/2014	2	A1	7	43.061312°	-78.978670°	2237	2	65	2	N
6/3/2014	2	A1	6	43.060872°	-78.972527°	2251	3	63	2	N
6/3/2014	2	A1	6	43.060872°	-78.972527°	2251	2	63	2	N
6/3/2014	2	A1	5	43.024986°	-78.894481°	2312	3	60	1	N
6/3/2014	2	A1	5	43.024986°	-78.894481°	2312	2	60	1	N
6/3/2014	2	A1	4	43.007470°	-78.931331°	2327	3	60	1	N
6/3/2014	2	A1	4	43.007470°	-78.931331°	2327	2	60	1	N
6/3/2014	2	A1	3	42.967270°	-78.942821°	2347	3	60	2	N
6/3/2014	2	A1	3	42.967270°	-78.942821°	2347	2	60	2	N

<b>Survey Date</b>	Survey Window	Route #	Point #	Latitude	Longitude	Start Time	Fime Bracket (3 or 2 min.	Air Temp. (°F)	Noise Factor	Break taken (y/n)
6/3/2014	2	A1	2	42.959789°	-78.957014°	7	3	58	2	N
6/3/2014	2	A1	2	42.959789°	-78.957014°	7	3	58	2	N
6/3/2014	2	A1	2	42.959789°	-78.957014°	7	2	58	2	N
6/3/2014	2	A1	1	42.960586°	-78.939183°	22	3	58	3	N
6/3/2014	2	A1	1	42.960586°	-78.939183°	22	2	58	3	N
6/25/2014	3	A1	1	42.960586°	-78.939183°	2129	3	69	1	N
6/25/2014	3	A1	1	42.960586°	-78.939183°	2129	2	69	1	N
6/25/2014	3	A1	2	42.959789°	-78.957014°	2141	3	69	1	N
6/25/2014	3	A1	2	42.959789°	-78.957014°	2141	2	69	1	N
6/25/2014	3	A1	3	42.967270°	-78.942821°	2203	3	69	2	N
6/25/2014	3	A1	3	42.967270°	-78.942821°	2203	2	69	2	N
6/25/2014	3	A1	4	43.007470°	-78.931331°	2222	3	68	2	N
6/25/2014	3	A1	4	43.007470°	-78.931331°	2222	2	68	2	N
6/25/2014	3	A1	5	43.024986°	-78.894481°	2235	3	68	3	N
6/25/2014	3	A1	5	43.024986°	-78.894481°	2235	2	68	3	N
6/25/2014	3	A1	6	43.060872°	-78.972527°	2251	3	67	2	N
6/25/2014	3	A1	6	43.060872°	-78.972527°	2251	2	67	2	N
6/25/2014	3	A1	7	43.061312°	-78.978670°	2302	3	67	1	N
6/25/2014	3	A1	7	43.061312°	-78.978670°	2302	2	67	1	N
6/25/2014	3	A1	8	43.057976°	-78.986420°	2318	3	67	1	N
6/25/2014	3	A1	8	43.057976°	-78.986420°	2318	3	67	1	N
6/25/2014	3	A1	8	43.057976°	-78.986420°	2318	2	67	1	N
6/25/2014	3	A1	8	43.057976°	-78.986420°	2318	2	67	1	N
6/25/2014	3	A1	9	43.059374°	-78.994671°	2334	3	67	2	N
6/25/2014	3	A1	9	43.059374°	-78.994671°	2334	2	67	2	N
6/25/2014	3	A1	10	43.026314°	-79.011535°	2351	3	67	0	N
6/25/2014	3	A1	10	43.026314°	-79.011535°	2351	2	67	0	N

Survey Window	Route #	Point #	Wind (Beaufort)	Sky (Sky Code)	Moon Light (y/n)	# of Cars	Snow Cover (y/n)	Genus	<b>Specific Epithet</b>	Calling Index
1	A1	1	1	1	N	0	N	None	None	0
1	A1	1	1	1	N	0	N	None	None	0
1	A1	2	2	1	N	0	N	Pseudacris	crucifer	1
1	A1	2	2	1	N	0	N	Lithobates	palustris	1
1	A1	2	2	1	N	0	N	Pseudacris	crucifer	1
1	A1	2	2	1	N	0	N	Lithobates	palustris	1
1	A1	3	1	1	N	0	N	None	None	0
1	A1	3	1	1	N	0	N	None	None	0
1	A1	4	1	1	N	4	N	None	None	0
1	A1	4	1	1	N	2	N	Pseudacris	crucifer	1
1	A1	5	2	1	N	0	N	Lithobates	palustris	1
1	A1	5	2	1	N	0	N	Lithobates	palustris	1
1	A1	6	1	1	N	0	N	None	None	0
1	A1	6	1	1	N	0	N	None	None	0
1	A1	7	1	1	N	0	N	Pseudacris	crucifer	1
1	A1	7	1	1	N	0	N	Lithobates	palustris	1
1	A1	7	1	1	N	0	N	Pseudacris	crucifer	1
1	A1	8	1	1	N	0	N	None	None	0
1	A1	8	1	1	N	0	N	None	None	0
1	A1	9	1	1	N	0	N	Pseudacris	crucifer	1
1	A1	9	1	1	N	0	N	Pseudacris	crucifer	1
1	A1	10	1	1	N	0	N	None	None	0
1	A1	10	1	1	N	1	N	None	None	0
2	A1	10	3	0	Y	3	N	None	None	0
2	A1	10	3	0	Y	1	N	None	None	0
2	A1	9	3	0	Y	0	N	None	None	0
2	A1	9	3	0	Y	0	N	None	None	0
2	A1	8	3	0	Y	0	N	Lithobates	clamitans	1
2	A1	8	3	0	Y	0	N	Lithobates	clamitans	1
2	A1	7	1	0	Y	0	N	Hyla	versicolor	1
2	A1	7	1	0	Y	0	N	Lithobates	catesbeianus	1
2	A1	7	1	0	Y	0	N	Lithobates	catesbeianus	1
2	A1	6	2	0	Y	0	N	None	None	0
2	A1	6	2	0	Y	0	N	None	None	0
2	A1	5	1	0	Y	0	N	Lithobates	palustris	0
2	A1	5	1	0	Y	0	N	Lithobates	palustris	0
2	A1	4	1	0	Y	1	N	Lithobates	clamitans	2
2	A1	4	1	0	Y	0	N	Lithobates	clamitans	2
2	A1	3	1	0	Y	0	N	None	None	0
2	A1	3	1	0	Y	0	N	None	None	0

Survey Window	Route #	Point #	Wind (Beaufort)	Sky (Sky Code)	Moon Light (y/n)	# of Cars	Snow Cover (y/n)	Genus	<b>Specific Epithet</b>	Calling Index
2	A1	2	1	0	Y	0	N	Anaxyrus	americanus	2
2	A1	2	1	0	Y	0	N	Lithobates	catesbeianus	2
2	A1	2	1	0	Y	0	N	Anaxyrus	americanus	2
2	A1	1	1	0	Y	0	N	None	None	0
2	A1	1	1	0	Y	0	N	None	None	0
3	A1	1	2	2	N	0	N	None	None	0
3	A1	1	2	2	N	0	N	None	None	0
3	A1	2	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	2	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	3	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	3	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	4	2	1	N	5	N	Lithobates	clamitans	1
3	A1	4	2	1	N	5	N	Lithobates	clamitans	1
3	A1	5	2	1	N	0	N	None	None	0
3	A1	5	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	6	2	1	N	0	N	None	None	0
3	A1	6	2	1	N	0	N	None	None	0
3	A1	7	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	7	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	8	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	8	2	1	N	0	N	Lithobates	clamitans	2
3	A1	8	2	1	N	0	N	Lithobates	catesbeianus	1
3	A1	8	2	1	N	0	N	Lithobates	clamitans	2
3	A1	9	2	1	N	0	N	None	None	0
3	A1	9	2	1	N	0	N	None	None	0
3	A1	10	2	1	N	0	N	None	None	0
3	A1	10	2	1	N	0	N	None	None	0

Survey Window	Route #	Point #	Index Modifier	Days Since Last Rain Event	Comments
1	A1	1		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	1		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	2	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	2	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	2	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	2	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	3		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	3		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	4		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	4	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	5	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	5	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	6		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	6		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	7	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	7	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	7	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	8		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	8		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	9	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	9	a	1 - showers on 5/18	Cold night; previous night much warmer
1	A1	10		1 - showers on 5/18	Cold night; previous night much warmer
1	A1	10		1 - showers on 5/18	Cold night; previous night much warmer
2	A1	10		1	
2	A1	10		1	
2	A1	9		1	
2	A1	9		1	
2	A1	8	a	1	
2	A1	8	a	1	
2	A1	7	b	1	
2	A1	7	a	1	
2	A1	7	a	1	
2	A1	6		1	
2	A1	6		1	
2	A1	5		1	
2	A1	5		1	
2	A1	4	a	1	
2	A1	4	a	1	
2	A1	3		1	
2	A1	3		1	

Survey Window	Route #	Point #	Index Modifier	Days Since Last Rain Event	Comments
2	A1	2	a	1	
2	A1	2	a	1	
2	A1	2	a	1	
2	A1	1		1	
2	A1	1		1	
3	A1	1		0 - showers off and on throughout the evening	
3	A1	1		0 - showers off and on throughout the evening	
3	A1	2	С	0 - showers off and on throughout the evening	
3	A1	2	С	0 - showers off and on throughout the evening	
3	A1	3	a	0 - showers off and on throughout the evening	
3	A1	3	a	0 - showers off and on throughout the evening	
3	A1	4	a	0 - showers off and on throughout the evening	
3	A1	4	a	0 - showers off and on throughout the evening	
3	A1	5		0 - showers off and on throughout the evening	
3	A1	5	a	0 - showers off and on throughout the evening	
3	A1	6		0 - showers off and on throughout the evening	
3	A1	6		0 - showers off and on throughout the evening	
3	A1	7	a	0 - showers off and on throughout the evening	
3	A1	7	a	0 - showers off and on throughout the evening	
3	A1	8	a	0 - showers off and on throughout the evening	
3	A1	8	С	0 - showers off and on throughout the evening	
3	A1	8	c	0 - showers off and on throughout the evening	
3	A1	8	С	0 - showers off and on throughout the evening	
3	A1	9		0 - showers off and on throughout the evening	
3	A1	9		0 - showers off and on throughout the evening	
3	A1	10		0 - showers off and on throughout the evening	
3	A1	10		0 - showers off and on throughout the evening	

C W/:- 1	D4 - 4	D-:4 #	T - 4.4 J -			Anuran Survey Data_I		N	D	W:1 (D
Survey Window		Point #	Latitude	Longitude		Interval (3 or 2 minute)				Wind (Beautort)
1	A2	1	42.844154°	-78.848766°	2108	3	60	2	N	1
1	A2	1	42.844154°	-78.848766°	2108	2	60	2	N	1
1	A2	2	42.852051°	-78.853260°	2130	3	60	2	N	2
1	A2	2	42.852051°	-78.853260°	2130	2	60	2	N	2
1	A2	3	42.872947°	-78.882569°	2145	3	57	3	N	1
1	A2	3	42.872947°	-78.882569°	2145	2	57	3	N	1
1	A2	4	42.933766°	-78.907816°	2209	3	57	2	N	1
1	A2	4	42.933766°	-78.907816°	2209	2	57	2	N	l
1	A2	5	43.000962°	-78.926892°	2228	3	59	3	N	1
1	A2	5	43.000962°	-78.926892°	2228	2	59	3	N	1
1	A2	6	43.006182°	-78.906749°	2240	3	59	2	N	1
1	A2	6	43.006182°	-78.906749°	2240	3	59	2	N	1
1	A2	6	43.006182°	-78.906749°	2240	2	59	2	N	1
1	A2	6	43.006182°	-78.906749°	2240	2	59	2	N	1
1	A2	7	43.016853°	-78.891352°	2252	3	59	2	N	1
1	A2	7	43.016853°	-78.891352°	2252	2	59	2	N	1
1	A2	8	43.023462°	-78.880013°	2303	3	59	2	N	1
1	A2	8	43.023462°	-78.880013°	2303	2	59	2	N	1
1	A2	9	43.034511°	-78.885400°	2314	3	59	1	N	1
1	A2	9	43.034511°	-78.885400°	2314	3	59	1	N	1
1	A2	9	43.034511°	-78.885400°	2314	2	59	1	N	1
1	A2	10	43.054223°	-78.899799°	2325	3	57	1	N	1
1	A2	10	43.054223°	-78.899799°	2325	3	57	1	N	1
1	A2	10	43.054223°	-78.899799°	2325	2	57	1	N	1
2	A2	10	43.054223°	-78.899799°	2120	3	62	2	N	1
2	A2	10	43.054223°	-78.899799°	2120	2	62	2	N	1
2	A2	9	43.034511°	-78.885400°	2132	3	62	1	N	1
2	A2	9	43.034511°	-78.885400°	2132	2	62	1	N	1
2	A2	8	43.023462°	-78.880013°	2142	3	61	1	N	1
2	A2	8	43.02 <del>3462°</del>	-78.880013°	2142	2	61	1	N	1
2	A2	7	43.016853°	-78.891352°	2155	3	61	1	N	1
2	A2	7	43.016853°	-78.891352°	2155	2	61	1	N	1
2	A2	6	43.006182°	-78.906749°	2205	3	61	2	N	1
2	A2	6	43.006182°	-78.906749°	2205	2	61	2	N	1
2	A2	5	43.000962°	-78.926892°	2205	3	60	2	N	1
2	A2	5	43.000962°	-78.926892°	2205	2	60	2	N	1
2	A2	4	42.933766°	-78.907816°	2235	3	56	1	N	1
2	A2	4	42.933766°	-78.907816°	2235	2	56	1	N	1
2	A2	4	42.933766°	-78.907816°	2235	2	56	1	N	1
2	A2	3	42.872947°	-78.882569°	2256	3	56	1	N	1

Survey Window	Route #	Point #	Latitude			Interval (3 or 2 minute)		Noise Factor	Break taken (y/n)	Wind (Beaufort)
2	A2	3	42.872947°	-78.882569°	2256	2	56	1	N	1
2	A2	2	42.852051°	-78.853260°	2311	3	56	1	N	1
2	A2	2	42.852051°	-78.853260°	2311	3	56	1	N	1
2	A2	2	42.852051°	-78.853260°	2311	3	56	1	N	1
2	A2	2	42.852051°	-78.853260°	2311	2	56	1	N	1
2	A2	2	42.852051°	-78.853260°	2311	2	56	1	N	1
2	A2	1	42.844154°	-78.848766°	2335	3	56	1	N	1
2	A2	1	42.844154°	-78.848766°	2335	3	56	1	N	1
2	A2	1	42.844154°	-78.848766°	2335	3	56	1	N	1
2	A2	1	42.844154°	-78.848766°	2335	2	56	1	N	1
2	A2	1	42.844154°	-78.848766°	2335	2	56	1	N	1
2	A2	1	42.844154°	-78.848766°	2335	2	56	1	N	1
2	A2	1	42.844154°	-78.848766°	2335	2	56	1	N	1
3	A2	1	42.844154°	-78.848766°	2128	3	74	1	N	2
3	A2	1	42.844154°	-78.848766°	2128	2	74	1	N	2
3	A2	1	42.844154°	-78.848766°	2128	2	74	1	N	2
3	A2	2	42.852051°	-78.853260°	2149	3	69	1	N	3
3	A2	2	42.852051°	-78.853260°	2149	3	69	1	N	3
3	A2	2	42.852051°	-78.853260°	2149	2	69	1	N	3
3	A2	2	42.852051°	-78.853260°	2149	2	69	1	N	3
3	A2	3	42.872947°	-78.882569°	2227	3	68	2	N	3
3	A2	3	42.872947°	-78.882569°	2227	2	68	2	N	3
3	A2	4	42.933766°	-78.907816°	2253	3	69	1	N	2
3	A2	4	42.933766°	-78.907816°	2253	2	69	1	N	2
3	A2	5	43.000962°	-78.926892°	2312	3	69	3	N	2
3	A2	5	43.000962°	-78.926892°	2312	2	69	3	N	2
3	A2	6	43.006182°		2322	3	70	2	N	2
3	A2	6	43.006182°	-78.906749°	2322	2	70	2	N	2
3	A2	7	43.016853°	-78.891352°	2335	3	70	2	N	2
3	A2	7	43.016853°	-78.891352°	2335	2	70	2	N	2
3	A2	8	43.023462°	-78.880013°	2344	3	70	2	N	3
3	A2	8	43.023462°	-78.880013°	2344	2	70	2	N	3
3	A2	9	43.034511°	-78.885400°	2353	3	70	1	N	2
3	A2	9	43.034511°	-78.885400°	2353	2	70	1	N	2
3	A2	10	43.054223°	-78.899799°	4	3	70	1	N	3
3	A2	10	43.054223°	-78.899799°	4	2	70	1	N	3

Survey Window	Route #	Point #	Sky (Sky Code)			Snow Cover (y/n)	Genus	Specific Epithet	Calling Index	Index Modifier
1	A2	1	1	N	0	N	None	None	0	
1	A2	1	1	N	0	N	None	None	0	
1	A2	2	1	N	0	N	Pseudacris	crucifer	1	a
1	A2	2	1	N	0	N	Pseudacris	crucifer	1	a
1	A2	3	1	N	0	N	Anaxyrus	americanus	1	a
1	A2	3	1	N	0	N	Anaxyrus	americanus	1	a
1	A2	4	1	N	0	N	None	None	0	
1	A2	4	1	N	0	N	Pseudacris	crucifer	1	a
1	A2	5	1	N	10	N	None	None	0	
1	A2	5	1	N	8	N	None	None	0	
1	A2	6	1	N	3	N	Anaxyrus	americanus	2	С
1	A2	6	1	N	3	N	Pseudacris	crucifer	1	a
1	A2	6	1	N	3	N	Anaxyrus	americanus	2	С
1	A2	6	1	N	3	N	Pseudacris	crucifer	1	a
1	A2	7	1	N	12	N	None	None	0	
1	A2	7	1	N	9	N	Pseudacris	crucifer	1	a
1	A2	8	1	N	9	N	None	None	0	
1	A2	8	1	N	8	N	None	None	0	
1	A2	9	1	N	0	N	Anaxyrus	americanus	1	a
1	A2	9	1	N	0	N	Pseudacris	crucifer	1	a
1	A2	9	1	N	0	N	Anaxyrus	americanus	1	a
1	A2	10	4	N	0	N	Anaxyrus	americanus	1	b
1	A2	10	4	N	0	N	Pseudacris	crucifer	1	b
1	A2	10	4	N	0	N	Pseudacris	crucifer	1	b
2	A2	10	2	N	0	N	None	None	0	
2	A2	10	2	N	0	N	None	None	0	
2	A2	9	2	N	0	N	None	None	0	
2	A2	9	2	N	0	N	None	None	0	
2	A2	8	2	N	17	N	None	None	0	
2	A2	8	2	N	11	N	None	None	0	
2	A2	7	2	N	0	N	None	None	0	
2	A2	7	2	N	0	N	Anaxyrus	americanus	1	b
2	A2	6	2	N	2	N	None	None	0	
2	A2	6	2	N	0	N	None	None	0	
2	A2	5	1	N	9	N	None	None	0	
2	A2	5	1	N	7	N	None	None	0	
2	A2	4	2	N	0	N	Anaxyrus	americanus	1	a
2	A2	4	2	N	0	N	Anaxyrus	americanus	1	a
2	A2	4	2	N	0	N	Lithobates	clamitans	1	a
2	A2	3	2	N	0	N	Anaxyrus	americanus	1	a

Survey Window	Route #	Point #	Sky (Sky Code)	Moon Light (y/n)	# of Cars	Snow Cover (y/n)	Genus	<b>Specific Epithet</b>	Calling Index	Index Modifier
2	A2	3	2	N	0	N	Anaxyrus	americanus	1	a
2	A2	2	2	N	0	N	Lithobates	catesbeianus	1	a
2	A2	2	2	N	0	N	Lithobates	clamitans	1	a
2	A2	2	2	N	0	N	Lithobates	pipiens	1	a
2	A2	2	2	N	0	N	Lithobates	catesbeianus	1	a
2	A2	2	2	N	0	N	Lithobates	clamitans	1	a
2	A2	1	2	N	0	N	Anaxyrus	americanus	1	a
2	A2	1	2	N	0	N	Lithobates	catesbeianus	1	a
2	A2	1	2	N	0	N	Lithobates	clamitans	1	a
2	A2	1	2	N	0	N	Anaxyrus	americanus	1	a
2	A2	1	2	N	0	N	Lithobates	catesbeianus	1	a
2	A2	1	2	N	0	N	Lithobates	clamitans	1	a
2	A2	1	2	N	0	N	Lithobates	pipiens	1	a
3	A2	1	2	N	0	N	Lithobates	clamitans	1	a
3	A2	1	2	N	0	N	Lithobates	catesbeianus	1	a
3	A2	1	2	N	0	N	Lithobates	clamitans	1	a
3	A2	2	2	N	0	N	Lithobates	catesbeianus	1	a
3	A2	2	2	N	0	N	Lithobates	clamitans	1	a
3	A2	2	2	N	0	N	Lithobates	catesbeianus	1	a
3	A2	2	2	N	0	N	Lithobates	clamitans	1	a
3	A2	3	2	N	0	N	None	None	0	
3	A2	3	2	N	0	N	None	None	0	
3	A2	4	2	N	0	N	None	None	0	
3	A2	4	2	N	0	N	None	None	0	
3	A2	5	2	N	25	N	None	None	0	
3	A2	5	2	N	9	N	None	None	0	
3	A2	6	2	N	2	N	None	None	0	
3	A2	6	2	N	1	N	None	None	0	
3	A2	7	2	N	7	N	None	None	0	
3	A2	7	2	N	9	N	None	None	0	
3	A2	8	2	N	10	N	None	None	0	
3	A2	8	2	N	9	N	None	None	0	
3	A2	9	2	N	0	N	Lithobates	catesbeianus	1	a
3	A2	9	2	N	0	N	None	None	0	
3	A2	10	2	N	0	N	None	None	0	
3	A2	10	2	N	0	N	None	None	0	

[	2014 Waish Andran Survey Data_N				
Survey Window			Days Since Last Rain Event		
1	A2	1	0 - rained earlier	good night for surveys, warm and moist	
1	A2	1	0 - rained earlier	good night for surveys, warm and moist	
1	A2	2	0 - rained earlier	Virginia Rail (heard)	
1	A2	2	0 - rained earlier		
1	A2	3	0 - rained earlier	noise pollution due to power plant across rive	
1	A2	3	0 - rained earlier	noise pollution due to power plant across rive	
1	A2	4	0 - rained earlier	light and noise pollution	
1	A2	4	0 - rained earlier	light and noise pollution	
1	A2	5	0 - rained earlier	light and noise pollution	
1	A2	5	0 - rained earlier	light and noise pollution	
1	A2	6	0 - rained earlier	some American toad calls from outside of sur	
1	A2	6	0 - rained earlier		
1	A2	6	0 - rained earlier		
1	A2	6	0 - rained earlier		
1	A2	7	0 - rained earlier		
1	A2	7	0 - rained earlier		
1	A2	8	0 - rained earlier	light and noise pollution	
1	A2	8	0 - rained earlier	light and noise pollution	
1	A2	9	0 - rained earlier		
1	A2	9	0 - rained earlier		
1	A2	9	0 - rained earlier		
1	A2	10	0 - rained earlier	all calls were from outside of survey area	
1	A2	10	0 - rained earlier	all calls were from outside of survey area	
1	A2	10	0 - rained earlier	all calls were from outside of survey area	
2	A2	10	2		
2	A2	10	2		
2	A2	9	2		
2	A2	9	2		
2	A2	8	2		
2	A2	8	2		
2	A2	7	2		
2	A2	7	2	all calls were from outside of survey area	
2	A2	6	2		
2	A2	6	2		
2	A2	5	2		
2	A2	5	2		
2	A2	4	2		
2	A2	4	2		
2	A2	4	2		
2	A2	3	2		

Survey Window	Route #	Point #	<b>Days Since Last Rain Event</b>	Comments
2	A2	3	2	
2	A2	2	2	
2	A2	2	2	
2	A2	2	2	
2	A2	2	2	
2	A2	2	2	
2	A2	1	2	
2	A2	1	2	
2	A2	1	2	
2	A2	1	2	
2	A2	1	2	
2	A2	1	2	
2	A2	1	2	
3	A2	1	0 - rained earlier	
3	A2	1	0 - rained earlier	
3	A2	1	0 - rained earlier	Temperature dropped after 1st survey point du
3	A2	2	0 - rained earlier	
3	A2	2	0 - rained earlier	
3	A2	2	0 - rained earlier	
3	A2	2	0 - rained earlier	
3	A2	3	0 - rained earlier	
3	A2	3	0 - rained earlier	
3	A2	4	0 - rained earlier	
3	A2	4	0 - rained earlier	
3	A2	5	0 - rained earlier	
3	A2	5	0 - rained earlier	
3	A2	6	0 - rained earlier	
3	A2	6	0 - rained earlier	
3	A2	7	0 - rained earlier	
3	A2	7	0 - rained earlier	
3	A2	8	0 - rained earlier	
3	A2	8	0 - rained earlier	
3	A2	9	0 - rained earlier	
3	A2	9	0 - rained earlier	
3	A2	10	0 - rained earlier	
3	A2	10	0 - rained earlier	

Please comp	lete information below	Data collected	at start of each survey point
Observer Name(s):	JUSTIN SWEITZER BEN GRIFFING	Additional notes:	Need Reflective Vests for
Route Number:	Al		Roadside Surveys
Survey Date (mm/dd/yyyy):	05/19/2014		
Window		Days since last rain	fall: 1 - showers on 5/18/14

Data callegists diet and make	1					Sur	ve	y Po	int N	umb	er				
Data collected at each point	1		2	3		4		5	6		7	8		9	10
Start Time (military):	2115		24	2148		215		26	2250		05	232	5 2	348	0010
Air Temperature:	57	1	4	55	1	5		5	55	5	-				51
Select Scale: °C (°E)		1	1				2					52	-	51	01
Was noise a factor? (use index)	2	1		3	-	3		2	2	1	2	2		2	1
Did you take a break? (check if yes)															
Wind (Use Wind Scale)	l		2	-		1		2	-		1	1		1	
Sky (Use Sky Codes)	1,		1	-		1		1	1		1	1		1	
Moon or Moonlight Visible (Y or N)	N	1	V	N	-	1/		V	N	1		N		N	N
Number of cars that passed (within 50 m)	0		0	0	4		(	0	0		0	0		0	1
Snow cover (Y or N)	N	_	/	N	-	V	-	/	N	_	V	N		N	N
Species List	1		2	3		4		5	6		7	8		9	10
American toad															
Gray tree frog															
Spring peeper		1A	IA			1A				IA	IA		1	AIA	
Western/Boreal chorus frog															
Mink frog															
Wood frog															
American bull frog															
Green frog															
Northern leopard frog															
Pickerel frog		IA:	IA				IA	IA		IA					

Comments: moved Al-1 and renamed other points

Low frog activity tonight. Observed calling pickerel frogs and chorns

frogs in several of them we tlands earlier in season, but very 1. He calling traight. No chorns frogs (early season caller).

Anuran Calling Survey Data Form

Please comp	lete informat	tion b	elow		D	ata co	lle	cted	at	sta	rt o	f ea	ch	surv	/ey	poi	nt			
Observer Name(s):	JUSTEN SWE BEN GRIFF				A	dditiona	l not	es:	(50	אוטי	ni	ght	+	0-	-ru/	vey	5			
Route Number:	AZ					Nam		and.	m	Dis	(									
Survey Date (mm/dd/yyyy):	05/21/201	4																		
Window Number:	1				Da	ys since	e las	t rainf	all:	(	0 -	19	into	1 60	rlie	1	in	day		
Data collecte	d at each po	int						Sur		Po	int	Nu	mb	er						
	Start Time (mil		2108	_	2	2145	2/	4		70		6	22	7		8	-	9		10
	Air Temper		-	1				209	24.		-				23		231		232	-
Select Scale	e: °C	(F)	60	60		57	,	5/	5	1	5	2	5		5	7	50	1	5	/
Was noise a facto			2	2	-	3		2	-	3	2	7	2		2		1		1	
Did you take a bre Wind (Use Wind S		)	-	1		-	-	_	-	_	-		-		-		-	-		
Sky (Use Sky Cod			1	1		1		-		1	1		1		1		1		1	
Moon or Moonlight			N	À	7	N	+	W	1	1	6)	1	N		1	/	A	1	4	-
Number of cars th		50 m)	0	0		0		0	-	18	3	3	12	19	9		0		0	
Snow cover (Y or	N)		N	M		N		V	1		N	0	N	1	N		1		A	1
Species List			1	2	2	3		4		5	(	5 *		7	8	3	ç		1	0 %
American toad						1A 1	A				2c	20					[A		18	
Gray tree frog				1																
Spring peeper				IA	IA			1A			IA	/A		IA			1A	IA	113	18
Western/Boreal	chorus frog																			
Mink frog																				-
Wood frog																				
American bull f	rog																			
Green frog																				
Northern leopai	d frog																			
Pickerel frog																				
AZ-Z: VIR Light & noise	pollution @			4 (	Pai	h il	Un	ilan he	1)											

Moved point AZ-8 to cove by maring due to access safety
-light pollution and noise pollution @ new point AZ-8

\* AZ-10: calls from outside of target area.

\* AZ-6: some American tood calls from outside of target area.

Please complete	information below			0	Data col	ecte	ed at	sta	art o	f each	sui	rvey	po	int			
Observer Name(s):	BENJAMIN GO	RIKE	TH		Additiona		-										
Route Number:	AI																
Survey Date (mm/dd/yyyy):	06/03/13																
Window Number:	2			D	ays since	last ra	ainfall:	:									
Data collected at	each point	1		2	3	_	Sui 4	rve		oint Nu	mbe	_					
	Start Time (military):	0027	h (*	1007		3.0	327	120	5	2251	1	7	-	8	9		10
	Air Temperature:	58										237		214	2155		1/3
Select Scale: Was noise a factor? (u	°C (°F)	7		58	60	6	00	6	00	63	6	,5	(	28	68	1	58
Did you take a brea	And the second s	3	-	2	2		1		1	2		2		Z	1		11
Wind (Use Wind Sca	ale)	1	-	N	10	-	N		1	N		N		N	N		N
Sky (Use Sky Codes		0		0	0	-	1	-	1	2		7		3	3		3
Moon or Moonlight		0		Y	1	-	0	-	0	0		0	-	0	0		0
Number of cars that	passed (within 50 m)	1	0 0	10	00	1	-	0	1	/	1	1	0	7	7		7
Snow cover (Y or N)		N		N	10	1	N		N	00	0	NO	-	N	00	3	1
Species List		1		2	3	_	4		5	6	-	7		8	9	1	10
American toad			2,4	1A													
Gray tree frog											1B						
Spring peeper																	
Western/Boreal c	horus frog																
Mink frog																	
Wood frog																	
American bull fro	g		8A								IA	IA					
Green frog						2A	AÇ						14	IA			
Northern leopard	frog																
Pickerel frog								/A	IA								
	I trusting stools of	alling	1/1/	ned, d	roly of	11	9	en)	1,								

Please comp	lete info	rmation b	elo	w		D	ata	col	lect	ed	at	sta	rt o	f ea	ch :	surv	ey	poi	nt		
Observer Name(s):	5 GROVE					Ad	dditio	nal r	notes	s:											
Route Number:	A2																				
Survey Date (mm/dd/yyyy):	06/04	2014																			
Window Number:	2					Da	ys sir	nce I	last r	ainfa	all:	2									
Data collecte	d at eac	h noint								Sur	ve	/ Po	int	Nu	mb	er					
Data concerc			_	1	-	2	3	_		1		5		6		7	8		9		10
		e (military):	25	35	23	11	72	56	27	35	200	216	27	205	21	55	211	42	213	Z	2120
Select Scale		emperature:	5	6	5	6	56	9	5	6	6	0	6	1	6	1	6	1	6	2	62
Was noise a factor			1		1		N	1	1	1	_	2	2		W.	1		1	1	+	Z
Did you take a bre			1	J	1	V	-			N		N		V	1	V	1		^	1	N
Wind (Use Wind S	cale)			1		1	1			1		1		1		1	1		1		1
Sky (Use Sky Cod	es)			2		7	2		-	2		1		2	1	Z	7	7	2		2
Moon or Moonlight				1	0	1	. 1			Y	1-	1	1	+	-	1	Y		Y		Y
Number of cars th		within 50 m)	0	0	0	0	0	0	0	0	9	9	2	0	0	0	17	14	0	0	0
Snow cover (Y or	N)			7	1		1		1	/	1	V	_	V		V			N	/	N
Species List				1		2	3			1		5	(	6		7	8	3	9		10
American toad			Al	IA			1A	IA	14	/A						13					
Gray tree frog																					
Spring peeper																					
Western/Boreal	chorus fr	rog																			
Mink frog																					
Wood frog																					
American bull f	rog		IA	-		1A															
Green frog			Al	14	IA	(A				IA											
Northern leopa	rd frog			/A	1A																
Pickerel frog																				1	
Comments:																					

Anuran Calling Survey Data Form

Please comp	lete information b	elo	w		D	ata	col	lec	ted	at	sta	rt o	f ea	ch	sur	vey	poi	int			
Observer Name(s):	JUSTIN SWEITZER BENJAMIN GRIFF		ours-	ries tim t	A	dditio	onal	note	s:	IIs	, por								v(a)	0.6	doe
Route Number:	A 1	TE S	E,	3/10		19	E						8) 6								
Survey Date (mm/dd/yyyy):	06/25/2014	Total Total	0 :	AND THE	ogh																
Window Number:	3	12 mil	19.11	The same	Da	ys s	ince		rainf		0	)	381	- 1	10,41	1000	E 44	NE 13	110	(31	HILL
Data collecte	ed at each point								Sur	ve	y Po	oint	Nu	mb	er		- 60	in.	J. 10	Ep c	
Duta concete			1		2		3		4		5	150	6	100	7	hou	8		9	1	10
	Start Time (military):	31.	29	21	11	22	03	22	22	22	35	23	251	23	102	23	318	23	34	23	51
61.16.1	Air Temperature:	60	10	1	,90	1	90	1	00	Ť.	00	Toy	510	00	70				70		
Select Scale Was noise a facto		0	,	V	1	0	_				80	-	70	0	7	6	70			6	70
	eak? (check if yes)	1	1	POS.	0.		2	5	1	_	3	-	2		1		1	11.0	-		0
Wind (Use Wind S		100		_	2	1	N		2		V	-	~	-	2	-	1	1	_	-	W
Sky (Use Sky Cod			2		1		2	,	1	1	2	-	2		2	-	2		-	2	77
Moon or Moonligh		0	7	1	1		N	,	7	1	J		N		/		716	N	100	-	A COLUMN
	nat passed (within 50 m)	0	0	0	0	0		5		0	_	0	0	0	6	0	To	0		0	V
Snow cover (Y or			V		1	1	10	-	N	-	N	10	7	_	10		2	0	1	4	1
<b>Species List</b>			1		2		3	-	4	_	5	-	6	_	7	_	8	-	9		0
American toad				7 117	3/11		-			ato	luj	nune.	go.	wni	111	rigg			gus)		
Gray tree frog	agent box asvent clean I	1 8	(0.5)	rel Lay	IIA 19 Upin	0	1			offer	SUD N PA	Britin Carrier	DO T	artiri 11 an	13 TV	190	The	bn	E ID	DITA	pur
Spring peeper	d mid amon wign 52-6	5 10		HE C	910		0,6													2011	
Western/Boreal	chorus frog		1019	10-11						anid:		brista		anih			200	IN 79			
Mink frog	BETTER LIA-VALUE	LIV		150	100																
Wood frog					10 0			5	don	bru	(TIE)	1200	\a	9((1)	211	in p	Hill:	do l		(TIL)	
American bull	frog			10	10	IA	IA		arth		IA			14	IA	IA	10		Tie (		
Green frog	program and 2. Co	100	Mr. I	3=30	a bio	M		IA	IA	10/1	10.75	sax	inu	11,5		20	20	olog!	my	20	
Northern leopa	rd frog			120	1				c)li	nlou	T W	1 36	unu	SHI	Will THE I	Link	1770	111		/Oly	
Pickerel frog	Part of the state of	10 =	witten 1	ilia.					500			9/5/	NU.	6 50	(U)	ior		111	ju i	111	
													mal	hely	10	20		113	10.9/	20	7

Fireflies, Bat, Herons, Ducks, CARP, DUBSONELY, NULLATIN NEST, MUSKRAT BEAVER, SO -IL GREAT HORNED QUE, EASTERN COTTOUTAIL, SKUNK

Name(s): Be Route Number:	stin Sweitzer of Griffith 12 6/24/2014	ale on a		in d	Ad	dditio	nal r	notes:			opril :	19	Delta :	Vinc.		1001			
Number: A Survey Date (mm/dd/yyyy): O( Window	1 L	10.0		1196		1	_												
(mm/dd/yyyy): Window	LIZULZNIU				BR														
Window Number:	9/27/2017	120	Unio	TIME OF	100														
	3	16-1	17.1	TIER	Da	iys si	nce I	ast ra	_	_	100	7000	LATE OF	duri		n Jane	-	10-02	5911
Data collected a	t each point		1		2	3		9		_	Poi		lumb		-	and the			
St	art Time (military):	21;		212		22		223		2312	1	<b>6</b>	7 7	335	23		73.		240
Select Scale:	Air Temperature:	7		6	J.	68		60		69	0/10	70		70	70		70		70
Was noise a factor? (u Did you take a break?		-	,		1	2		1		3	- 1	2	100	2	2		1	,	1
Wind (Use Wind Scale		1		1 2		3		2		N		2		2	3	1000	2		3
Sky (Use Sky Codes)		2	2	1 2		2		2		2		2		2	2		2	-	7
Moon or Moonlight Visi		1	_	1	V	1	/	1	7	N		N	Her	N	1	V	N	,	N
Number of cars that pa	assed (within 50 m)	0	P	0	0	-	O	0	0 2	25 8	7 2	2	7	9	10	9	0	0	0
Snow cover (Y or N)  Species List		/	1	1	2	1		N/4		5		6		7	N	-	1	/	N
American toad					-			1		3		0			8	,	9		10
Gray tree frog	Stati James (digm )		tripo masse	riii)	71110					Difference of the second	ba ca		ALC:				DO		All I
Spring peeper	a savjun i, com NI-d				obo nun					-									nie
Western/Boreal cho	orus frog				1159										2 50				
Mink frog	MOTORIN LIN IN CO.			317	90	100													
Wood frog			olgo	X III	Cath C	11 23	D D		en l	mi ç			ayo		le p				
American bull frog	golaro	17	IA	IA	IA				mp	14	00	in the last		10			A	STOR	
Green frog	postcore (	IA	IA	IA	14				ly i k	10 34	1010	07001	u/ nu	110	(20)	E	He B	my d	150
Northern leopard fi	rog	good Se tos							111	7	0/17	TOU	1007(3)		uo/				
Pickerel frog		100			milit.		4										12		110
													400	70			0/1	EM	
Comments:																			

## APPENDIX D 2104 MARSH BIRD SURVEY DATA AND FORMS

DATE (	e.g. 15 M	lay 20	15):							MU	LTII	PLE	OB:	SER	VEF	SU	IRV	EY:	YES .	/ NO	В	OAT	ГҮРЕ:					
MARSH	NAME:									ОВ	SER	VER	NA	ME	S (L	IST	AL	<b>L)</b> : _	_								_	
WATE	R DEPTH	l (by s	tation	#):								_						_										
																_					<del></del>							
				_ ≦	B.							OBSE	ERVED	D DU	RING										□	DE _		
STATION NUMBER	START TIME (MILITARY)	TEMP. (F)	SKY	WIND (Beaufort))	BACKGROUND NOISE	SPECIES	PASS 0-1	PASS 1-2	PASS 2-3	PASS 3-4	PASS 4-5	LEBI	SORA	VIRA	KIRA	AMBI	COGA	AMCO	PBGR	OUTSIDE	CALL TYPE(S)	DIRECTION	IN TARGET AREA (Y/N)	DISTANCE (METERS)	DISTANCE AIDE	PREVIOUSLY DETECTED (Y/N)		COMMENTS
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						
																						0						

### NIAGARA RIVER MARSH BIRD SURVEY DATA FORM INSTRUCTIONS

The following instructions provide specific details for filling out the data form to provide consistency in recording survey data.

### **Header Information**

Date: day/month/year (e.g., 15 May 2014). To be completed prior to beginning of survey.

Multiple Observer Survey (circle one): Yes or No

Observer Names (List All): List all observer and recorder names and identify what their role is.

Marsh Name: Identify what marsh is being surveyed when the marsh is named.

Boat Type: Describe the boat being used (i.e. manufacturer, length, motor size) or write N/A if a boat was not used.

Water Depth: Record the water depth at each station number. Depth should be recorded in centimeters or meters.

### **Observation Information**

**Station Number:** Record station number (e.g. 2-1) prior to beginning passive monitoring at each station.

**Start Time:** Record the start time at the beginning of each survey. Record in military time (e.g., 0600 = 6 am, 1300 = 1 pm).

**Temp.:** Record as Fahrenheit.

**Sky:** Record sky codes as follows: 0=clear or a few clouds; 1=partly cloudy or variable sky; 2=cloudy or overcast; 3=sand or dust storm; 4=fog/smoke; 5=drizzle; 6=snow; 7=snow/sleet; 8=showers

Wind: Use the Beaufort Wind Scale below and record the average Force rating number.

**Noise:** Record noise codes as follows: 0=no noise; 1=faint noise; 2=moderate noise (probably can't hear some birds beyond 100m); 3=loud noise (probably can't hear some birds beyond 50m); 4=intense noise (probably can't hear some birds beyond 25m);

**Species:** Record each species observed using the 4-letter bird banding code system provided below (e.g. Least Bittern = LEBI). Secondary focal species should be recorded in the comments column.

**Observed During:** Record an H in the appropriate column when a species is heard, record an S in the column if the species was seen; and record an HS in the column if a species was heard and seen.

**Call Type:** Record the call type as described in Appendix D of the work plan.

**Direction:** Record the direction the bird was first observed from the surveyors position by marking on the circle provided (e.g. Q = behind the observer). The observer should be facing the direction of the speaker.

In Target Area: Record if the bird was within the targeted marsh or outside of the targeted marsh by recording Y or N, respectively.

**Distance:** Record distances in meters.

**Distance Aide:** Record the distance code used in estimating the distance to an observed bird. Distance codes are as follows: 0=none; 1=range finder; 2=distance bands on aerial photography; 3=flags tied to vegetation

Previously Detected (Y/N): Record a Y or N.

**Comments:** Use this space to record other relevant details not captured elsewhere on the data form. Other details may include behavioral notes, color band observations (recorded from top to bottom and from left to right), and documentation of any photos taken. Rare species observations can be described here as well. Use a blank sheet of paper if needed to add additional notes.

**Field Book:** Use your personal field log book to note/document all other noteworthy observations such as rare wildlife and logistical problems (copies will be requested).

PAGE \_\_ OF \_\_ Version 12/18/2014

Force		Beaufort Wind Sca	le	Name	Conditions
roice	knots	km/h	mi/h	Name	on Land
0	< 1	< 2	< 1	Calm	Smoke rises vertically.
1	1-3	1-5	1-4	Light air	Smoke drifts and leaves rustle.
2	4-6	6-11	5-7	Light breeze	Wind felt on face.
3	7-10	12-19	8-11	Gentle breeze	Flags extended, leaves move.
4	11-16	20-29	12-18	Moderate breeze	Dust and small branches move.
5	17-21	30-39	19-24	Fresh breeze	Small trees begin to sway.
6	22-27	40-50	25-31	Strong breeze	Large branches move, wires whistle, umbrellas are difficult to control.
7	28-33	51-61	32-38	Near gale	Whole trees in motion, inconvenience in walking.
8	34-40	62-74	39-46	Gale	Difficult to walk against wind. Twigs and small branches blown off trees.
9	41-47	76-87	47-54	Strong gale	Minor structural damage may occur (shingles blown off roofs).
10	48-55	88-102	55-63	Storm	Trees uprooted, structural damage likely.
11	56-63	103-118	64-73	Violent storm	Widespread damage to structures.
12	64+	119+	74+	Hurricane	Severe structural damage to buildings, wide spread devastation.

	IBP 4-LETTER SPECIES ACRONYM	AS FOR MARSH BIRDS IN THE N	NR AOC
CODE	Common Name	Scientific Name	Primary or Secondary Focal Species
AMBI	American Bittern	Botarus lentiginosus	Primary
AMCO	American Coot	Fulica americana	Primary
BLTE	Black Tern	Chlidonias niger	Secondary
COGA	Common Gallinule	Gallinula galeata	Primary
COTE	Common Tern	Sterna hirundo	Secondary
FOTE	Forster's Tern	Sterna forsteri	Secondary
GRHE	Green Heron	Butorides virescens	Secondary
KIRA	King Rail	Rallus elegans	Primary
LEBI	Least Bittern	Ixobrychus exilis	Primary
MAWR	Marsh Wren	Cistotoruus palustris	Secondary
PBGR	Pied-billed Grebe	Podilymbus podiceps	Primary
SEWR	Sedge Wren	Cistothorus platensis	Secondary
SORA	Sora	Porzana carolina	Primary
SWSP	Swamp Sparrow	Melospiza georgiana	Secondary
VIRA	Virginia Rail	Rallus limicola	Primary
WIFL	Willow Flycatcher	Empidonax traillii	Secondary
WISN	Wilson's Snipe	Gallinago delicata	Secondary

PAGE \_\_ OF \_\_ Version 12/18/2014

what bird WATER DEPTH (by station #): 12-1 = 50m ADDITIONAL NOTES:

2015 NIAGARA RIVER AREA OF CONCERN MARSH BIRD SURVEY DATA FORM

MULTIPLE OBSERVER SURVEY: YES NO

B2-3-0 B24-0, B2-5-0

82-6-05m 82-7=1. da

OBSERVER NAMES (LIST ALL): Benjamin

MARSH NAME: Buckhow

Marsh

DATE (e.g. 15 May 2015): 20 May

CHA JUNE BOAT TYPE: Swe tar

PAGE

OF

MARSH NAME: TIVIT, TEALE BEAUX, STAVER ISLAND. DATE (e.g. 15 May 2015): 21 MAY 2014 OBSERVER NAMES (LIST ALL): BENJAMIN GREETH MULTIPLE OBSERVER SURVEY: YES/ NO BOAT TYPE: SUMS WEITZER

ADDITIONAL NOTES: B1-8 Completed WATER DEPTH (by station #): BI-1 = Och need to be sowered as it's duing B1-2 = 30cm EVENIAG PERENTE. 81-3= 1.52" We 101 B1-41 = 20 cm out 815=0cm, 81-6=0cm, 81-7= time morning survey. BI-8 will

OO	OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	COO O O O O O O O O O O O O O O O O O O	TAPE(S)   TAPE	SECIES 1 2000 O O O O O O O O O O O O O O O O O	1	1								Pour Hubita			0 >	20 0 N	20 0 N MANUR SU	12 0 N	20 0 N	25 0 N 0 SE	100 O N SWITT M	Vehille took	PARTIES (A)  AIOONSTA  MIOONSTA
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ADDITIONAL NOTES: WATER DEPTH (by station #): 7-2" MARSH NAME: TIFE DATE (e.g. 15 May 2015): 4 Jun 26/4 Times Beach, Beaver Island 6-0" OBSERVER NAMES (LIST ALL): BENTALIN MULTIPLE OBSERVER SURVEY: (YES) / NO GOIFFERTH, STACIE GROVE BOAT TYPE: NONE

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PAGE\_OF

DATE (e.g. 15 May 2015): 050002014 MARSH NAME: BULKhorn

Marsh

ADDITIONAL NOTES:

WATER DEPTH (by station #): 0 7-12", 06-6"

MULTIPLE OBSERVER SURVEY: YES / NO

OBSERVER NAMES (LIST ALL): 6. GRAFFITH, S.

1. 68 BUSE

02-0

BOAT TYPE:

Canoc

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PAGE\_OF\_

MARSH NAME: DATE (e.g. 15 May 2015): 26 June TIFH / Time ) Beach 2014

MULTIPLE OBSERVER SURVEY: YES NO

BOAT TYPE:

Grithin

ADDITIONAL NOTES: Paul WATER DEPTH (by station #): B[-]: 0 Frun 131-2: 10 cm 51.50 B1-3: 67cm OBSERVER NAMES (LIST ALL): Justin 81-5:0 81-6: 0 81-7: 2 cm

ACT STORY		A IN LANGES		10 to/vs:	80 4-19	B1-6 0706	B1-5 072	Pice same	B1-4 0634	1000	(mad - b)		81-3 0604	612 05	81-1 050	(YAATIJIN NOITAT:	S
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					COTÉ	SIEC	SWSP		MAWI					MAWR		OMMENTS	CC

DATE (e.g. 15 May 2015): 25 June 2014

MULTIPLE OBSERVER SURVEY YES! NO

BOAT TYPE:

NIS

ADDITIONAL NOTES: WATER DEPTH (by station #): \$2-3:0 MARSH NAME: BULKhon Marit BZ-1: 2cm 82-2:0 OBSERVER NAMES (LIST ALL): JUST B2-4: 7cm BZ-5: 0 82-6: 30cm Sweetzy B2 -7: 58cm Gr. thh

	NOITAT: ABBMUN	22-3	82-1	82-2	82-4	82-5	82-6	F-78	0.00	2			CAR.		Stull		
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Survey	D	<b>D</b> : 4 //	a	Specific														
Window	Route #	Point #	Genus	Epithet	0-1	1-2	2-3	3-4	4-5	LEBI	SORA	VIRA	KIRA	AMBI	COGA	AMCO	<b>PBGR</b>	OUTSIDE
1	B1	1	None	None														
1	B1	2	Ixobrychus	exilis												X		
1	B1	3	Ixobrychus	exilis				X			S			S	S	S	S	
1	B1	3	Rallus	limicola								X						
1	B1	3	Gallinula	galeata									X		S/H		S/H	
1	B1	4	Rallus	limicola	X		Н	Н					H/S	H/S			H/S	
1	B1	4	Gallinula	galeata											X		Н	
1	B1	5	None	None														
1	B1	6	None	None														
1	B1	7	None	None														
1	B1	8	None	None														
2	B1	7	Rallus	limicola								X						
2	B1	6	None	None														
2	B1	5	None	None														
2	B1	4	Gallinula	galeata				X	Н	Н	Н	Н		Н	Н			
2	B1	4	Rallus	limicola							X	Н	Н	Н	Н	Н	Н	
2	B1	3	Gallinula	galeata	X								Н			Н	Н	
2	B1	3	Rallus	limicola							X		Н	Н				
2	B1	3	Ixobrychus	exilis							X					S		
2	B1	2	Ixobrychus	exilis		X												
2	B1	2	Gallinula	galeata											X			
2	B1	2	Podilymbus	podiceps													X	
2	B1	1	None	None														
3	B1	1	None	None														
3	B1	2	Ixobrychus	exilis					X									
3	B1	3	Gallinula	galeata			X	Н	Н			Н			Н	Н		Н
3	B1	3	Ixobrychus	exilis						X	S	S						
3	B1	3	Rallus	limicola							X	Н	Н	Н	Н	Н		
3	B1	3	Podilymbus	podiceps														X
3	B1	4	Gallinula	galeata							X					Н		
3	B1	4	Ixobrychus	exilis									X					
3	B1	5	None	None														
3	B1	6	None	None														
3	B1	7	None	None														

Cunyou			20		In Target	Data_Rot		<b>Previous Detection</b>	Boat
Survey Window	Route #	Point #	Call Type	Direction	Area (Y/N)	Distance	Aide	(Y/N)	Боат Туре
1	B1	1		NA	NA	NA	NA	NA	NA
	B1	2	200	None	Y	100		NA N	NA NA
1	_		COO	<del>-</del>	Y		0	<b>.</b>	
1	B1	3	NA	None	Y	25	0	N	NA NA
1	B1	3	grunt	None		20	0	N	NA
1	B1	3	wipe-out, giddy-up, keep	None	Y	15	0	N	NA
1	B1	4	grunt	None	Y	20	0	N	NA
1	B1	4	wipe-out	None	Y	15	0	N	NA
1	B1	5		NA	NA	NA	0	NA	NA
1	B1	6		NA	NA	NA	0	NA	NA
1	B1	7		NA	NA	NA	0	NA	NA
1	B1	8		NA	NA	NA	0	NA	NA
2	B1	7	kicker	120°	Y	10	0	N	NA
2	B1	6		NA	NA	NA	0	NA	NA
2	B1	5		NA	NA	NA	0	NA	NA
2	B1	4	wipe-out, giddy-up	195°	Y	25	0	N	NA
2	B1	4	grunt	195°	Y	30	0	N	NA
2	B1	3	wipe-out	32°	Y	25	0	N	NA
2	B1	3	grunt	23°	Y	15	0	N	NA
2	B1	3	NA- visual only	190°	Y	20	0	N	NA
2	B1	2	NA- visual only	25°	Y	40	0	N	NA
2	B1	2	wipe-out	11°	Y	30	0	N	NA
2	B1	2	hyena	45°	Y	50	0	N	NA
2	B1	1		NA	NA	NA	NA	NA	NA
3	B1	1		NA	NA	NA	NA	NA	NA
3	B1	2	NA - visual only	308°	Y	40	0	N	NA
3	B1	3	wipe-out, giddy-up	100°	Y	20	0	N	NA
3	B1	3	NA - visual only	121°	Y	30	0	N	NA
3	B1	3	squak, kikik, grunt	100°	Y	20	0	N	NA
3	B1	3	NA - visual only	175°	N	100	0	N	NA
3	B1	4	kak	255°	Y	50	0	N	NA
3	B1	4	keep	302°	Y	15	0	N	NA
3	B1	5		NA	NA	NA	0	NA	NA
3	B1	6		NA	NA	NA	0	NA	NA
3	B1	7		NA	NA	NA	0	NA	NA

Survey Window	Route #	Point #	2014 Marsh Bird Survey Data_Route 1  Comments
1	B1	1	Vehicle traffic
1	B1	2	Secondary Species - SWSP, WIFL, MAWR
1	B1	3	Secondary Species - SWSP, MAWR. Visual observation of LEBI only.
1	B1	3	
1	B1	3	
1	B1	4	Secondary Species - SWSP, WIFL, MAWR.
1	B1	4	
1	B1	5	Secondary Species - MAWR, COTE
1	B1	6	
1	B1	7	Secondary Species - SWSP
1	B1	8	Poor habitat, survey completed during evening because the survey crew ran out of time
2	B1	7	Secondary Species - SWSP
2	B1	6	Secondary Species - COTE
2	B1	5	Secondary Species - MAWR, COTE
2	B1	4	Secondary Species - SWSP, WIFL, MAWR, GRHE
2	B1	4	
2	B1	3	Secondary Species - SWSP, MAWR, GRHE
2	B1	3	
2	B1	3	
2	B1	2	Secondary Species - SWSP, WIFL, MAWR
2	B1	2	
2	B1	2	
2	B1	1	Secondary Species - WIFL
3	B1	1	Secondary Species - WIFL
3	B1	2	Secondary Species - SWSP, MAWR; paused survey from 0545 tp 0549 due to train
3	B1	3	Secondary Species - SWSP
3	B1	3	
3	B1	3	
3	B1	3	
3	B1	4	Secondary Species - SWSP, MAWR
3	B1	4	
3	B1	5	Secondary Species - COTE, SWSP
3	B1	6	Secondary Species - COTE, WIFL
3	B1	7	Secondary Species - SWSP, COTE

Survey	D4 - #	D-:4 #	C	Specific								Obser	ved D	uring				
Window	Route #	Point #	Genus	<b>Epithet</b>	0-1	1-2	2-3	3-4	4-5	LEBI	SORA	VIRA	KIRA	AMBI	COGA	<b>AMCO</b>	<b>PBGR</b>	OUTSIDE
1	B2	1	Rallus	limicola					X	Н	Н	H/S	H/S	H/S	H/S		Н	
1	B2	2	Botaurus	lentiginosus			X											
1	B2	3	Rallus	limicola									X	Н	Н	Н		
1	B2	4	None	None														
1	B2	5	None	None														
1	B2	6	Rallus	limicola								X						
1	B2	7	Podilymbus	podiceps		X	Н				H/S					H/S	H/S	
1	B2	7	Gallinula	galeata									X					
1	B2	7	Gallinula	galeata									X					
1	B2	7	Fulica	americana														X
2	B2	7	Podilymbus	podiceps	X	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	
2	B2	7	Porzana	carolina							X							
2	B2	6	None	None														
2	B2	5	None	None														
2	B2	4	None	None														
2	B2	2	None	None														
2	B2	1	None	None														
2	B2	3	Rallus	limicola						X			Н					
3	B2	3	None	None														
3	B2	1	None	None														
3	B2	2	Porzana	carolina							X	Н	Н					
3	B2	4	None	None														
3	B2	5	Botaurus	lentiginosus								X						
3	B2	6	None	None														
3	B2	7	Podilymbus	podiceps	X		Н		Н		Н				Н	Н	Н	Н

Survey Window	Route #	Point #	Call Type	Direction	In Target Area (Y/N)	Distance	Distance Aide	Previous Detection (Y/N)	Boat Type
1	B2	1	grunt	207°	Y	25	0	N	NA
1	B2	2	NA - visual only	311°	N	100	0	N	NA
1	B2	3	grunt	336°	Y	5	0	N	NA
1	B2	4		NA	NA	NA	NA	NA	NA
1	B2	5		NA	NA	NA	NA	NA	NA
1	B2	6	grunt	191°	Y	100	0	N	NA
1	B2	7	owhoop, hyena	197°	Y	10	0	N	Canoe
1	B2	7	wipe-out	197°	Y	50	0	N	Canoe
1	B2	7	wipe-out	197°	Y	50	0	N	Canoe
1	B2	7	NA - visual only	282°	Y	5	0	N	Canoe
2	B2	7	ow-hoop	158°	Y	20	0	N	Canoe
2	B2	7	whinny	180°	Y	5	0	N	Canoe
2	B2	6		NA	NA	NA	NA	NA	NA
2	B2	5		NA	NA	NA	NA	NA	NA
2	B2	4		NA	NA	NA	NA	NA	NA
2	B2	2		NA	NA	NA	NA	NA	NA
2	B2	1		NA	NA	NA	NA	NA	NA
2	B2	3	grunt	270°	Y	20	0	N	NA
3	B2	3		NA	NA	NA	NA	NA	NA
3	B2	1		NA	NA	NA	NA	NA	NA
3	B2	2	keep	304°	Y	50	0	N	NA
3	B2	4		NA	NA	NA	NA	NA	NA
3	B2	5	NA - visual only	358°	N	200	0	N	NA
3	B2	6		NA	NA	NA	NA	NA	NA
3	B2	7	owhoop	196°	Y	25	0	N	Canoe

Survey Window	Route #	Point #	Comments
1	B2	1	VIRA came into within 2 m of observers, Secondary Species - SWSP
1	B2	2	Secondary Species - SWSP, MAWR,
1	B2	3	Secondary Species - SWSP, MAWR
1	B2	4	Secondary Species - SWSP
1	B2	5	Secondary Species - SWSP
1	B2	6	Secondary Species - SWSP, WIFL
1	B2	7	6 individuals calling from all directions between 10 and 100 meters
1	B2	7	
1	B2	7	
1	B2	7	observed after survey when paddling back to shore
2	B2	7	
2	B2	7	
2	B2	6	Secondary Species - WIFL, SWSP
2	B2	5	Secondary Species - WIFL, SWSP
2	B2	4	Secondary Species - SWSP
2	B2	2	Secondary Species - SWSP, WIFL, MAWR
2	B2	1	Secondary Species - WIFL, SWSP
2	B2	3	Secondary Species - SWSP, WIFL, MAWR
3	B2	3	Secondary Species - SWSP
3	B2	1	Secondary Species - SWSP
3	B2	2	Secondary Species - SWSP
3	B2	4	Secondary Species - SWSP
3	B2	5	Secondary Species - SWSP
3	B2	6	Secondary Species - WIFL, SWSP
3	B2	7	Secondary Species - COTE

## APPENDIX E 2104 HABITAT MONITORING DATA AND FORMS

### **General Information**

Survey Date (DD/MM/YYYY):	
Observer(s) Name(s):	
Survey Point (complete for each point):	
How was the point accessed? (Circle one): canoe, motor boat, wal	lk, wade?
Edge Type (Circle one): roadside/marsh, parking lot/marsh, ditch o	r berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or PFO	wetland/Marsh, other (describe)
Classification & Disturbanc	e
NWI code (Record an NWI Code for the target wetland):	
NVCS Alliance (Record an NVCS Alliance code or codes for the ta	arget wetland) <sup>1</sup> :
Most dominant plant species (Record % Cover for 3-5 dominant s	pecies):
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
Natural Disturbance (circle all that apply): Fire, ice damage, anim	mal/insect damage, other:
Month/year (if known) of natural disturbance event:	
Management Actions (circle all that apply): Trail/road construction	on, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife ma	nagement, other:
Month/year (if known) of last management action:	

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 $<sup>^{1} \</sup> For \ NVCS \ Alliance \ codes, see \ \underline{http://www.natureserve.org/explorer/servlet/NatureServe?init=\underline{Ecol}}$ 

### 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					
Trees					
Bare soil					
Water					
Upland					
Mudflat					
Floating veg.	•				

Distance to vegetation patch edge (m):	
Type of patch (Circle one): none, tree, shrub, herb	aceous
Wetland Interspersion (%open water and %veget	ation cover):
Density of marsh vegetation <sup>2</sup> (Circle one): None,	sparse, moderate, dense
Estimated average marsh vegetation height (m):	0-1, 1-3, 3-6,>6.
Litter depth (cm): Water de	<b>pth</b> (m):
Method used for measuring water depth (Circle	one): staff gauge, meter stick, other:
Distance to Physic	eal 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):	

<sup>&</sup>lt;sup>2</sup> 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

		Date				General NWI
Site ID	General Location Name	Surveyed	Edge Type	General Type	NWI Code	Type
A1-1	Beaver Island State Park	6/25/2014	upland/marsh	Marsh	PEM1Fd	PEM
A1-2	Beaver Island State Park	6/25/2014	upland/open water	Open Water	R2UBH	OW
A1-3	Beaver Island State Park	6/25/2014	upland/marsh	Marsh	PEM1F	PEM
A1-4	Grand Island East	6/25/2014	upland/marsh	Marsh	PFO1C	PFO
A1-5	Grand Island East	6/25/2014	upland/open water/marsh	Open Water/Marsh	R2UBH/PEM	OW/PEM
A1-6	Buckhorn Island State Park	6/25/2014	upland/open water	Open Water	R2US2C/R2UBH	OW
A1-7	Buckhorn Island State Park	6/26/2014	upland/marsh	Marsh	PEM1Ed	PEM
A1-8	Buckhorn Island State Park	6/25/2014	upland/open water/marsh	Open Water/Marsh	PEM1/Ed	PEM
A1-9	Buckhorn Island State Park	6/26/2014	upland/marsh	Marsh	PEM1/Ed	PEM
A1-10	Grand Island West	6/26/2014	upland/open water	Open Water	R2UBH	OW
A2-1	Tifft Preserve	6/24/2014	upland/open water/marsh	Open Water/Marsh	PUBH/PEM1F	OW/PEM
A2-2	Tifft Preserve	6/24/2014	upland/marsh	Marsh	PUBHx/PEM1F	OW/PEM
A2-3	Times Beach Preserve	6/24/2014	upland/marsh	Marsh	PEM1Es	PEM
A2-4	Squaw Island Park	6/24/2014	upland/open water/marsh	Open Water/Marsh	PUBHx/PEM	OW/PEM
A2-5	E. Shore of Niagara	6/24/2014	upland/marsh	Marsh	PEM1Fx	PEM
A2-6	E. Shore of Niagara	6/24/2014	marsh	Marsh	PEM1A	PEM
A2-7	Niawanda Park (River shore)	6/24/2014	upland/open water	Open Water	R2UBH	OW
A2-8	Wardell Boat Yard	6/24/2014	upland/open water	Open Water	R2UBH	OW
A2-9	East Pier Marina	6/24/2014	upland/marsh	Open Water/Marsh	PEM1F	PEM
A2-10	Gratwick Waterfront Park (River shore)	6/24/2014	upland/open water/marsh	Open Water/Marsh	R2UBH/PEM	OW/PEM

### **Percent Cover**

Site ID	Total Percent Cover of	Tymbo (N)	Lythaman (I)	Dhwamitas (I)	Lanicana (I)	Snongonium	Cornus	Carex
A1-1	Wetland Species 110	<b>Typha</b> ( <b>N</b> ) 10	Lythrum (I)	Phragmites (I)	Lonicera (I)	Sparganium	Cornus	20
A1-1 A1-2	0	10	10					20
A1-2 A1-3	130	60	40					30
A1-3 A1-4	100	35	14			30	20	30
A1-4 A1-5	45	30	5			30	20	
	0	30	3					
A1-6	110	30					10	70
A1-7	60	40					10	70
A1-8 A1-9	100	70						10
A1-9	100	70						10
A1-10	0							
A2-1	67	60			5			
A2-2	100	100						
A2-3	80	70		10				
A2-4	37	20						5
A2-5	100			100				
A2-6	110	30		70				
A2-7	0							
A2-8	0							
A2-9	45	20	5	20				
A2-10	28	10				10		1

### **Percent Cover**

Site ID	Eupatorium	Bolboschoenus	Schoenoplectus	Dispaucus	Nuphar	Decodan	Persicaria	Butomus	Sambucus
A1-1	10	60							
A1-2									
A1-3									
A1-4									
A1-5							10		
A1-6									
A1-7									
A1-8					10	10			
A1-9	20								
A1-10									
A2-1									2
A2-2									
A2-3									
A2-4			10					2	
A2-5									
A2-6				10					
A2-7									
A2-8									
A2-9								_	
A2-10					7				

Site ID	Open Water interspersion	Vegetation Interspersion	Density of Marsh Veg	Avg Veg Height (m)	Litter Depth (cm)	Water Depth (m)	Distance to Open Water (m)
A1-1	20	80	Moderate	1 to 3	7.5	0	3
A1-2	100	0	None	0	0	0.75	0
A1-3	30	70	Moderate	1 to 3	1	0	5
A1-4	0	100	Moderate	1 to 3	0	0.15	none
A1-5	70	30	Moderate	1 to 3	0	0.12	3
A1-6	100	0	None	0	0	0.1	0
A1-7	0	100	Moderate	0 to 1	0	0	80
A1-8	50	50	Moderate	1 to 3	3	0.25	1
A1-9	0	100	Moderate	1 to 3	5	0	none
A1-10	100	0	None	0	0	0.6	2
A2-1	30	70	Moderate	1 to 3	0	0	1
A2-2	5	95	Moderate	1 to 3	0	0	1
A2-3	0	100	Moderate	1 to 3	10	0	70
A2-4	80	20	Moderate	1 to 3	0	0.8	2
A2-5	0	100	Dense	1 to 3	5	0	none
A2-6	0	100	Moderate	1 to 3	0	0	none
A2-7	40	0	None	0	0	0.17	0
A2-8	40	0	None	0	0	1	0
A2-9	40	60	Moderate	1 to 3	4	0	10
A2-10	80	20	Sparse	0 to 1	0	0.5	5

Site ID	Cumulative Number of Detections	Overall Habitat Quality	Reason for Poor Quality Rating
A1-1	0	adequate	
A1-2	5	poor	river shoreline, high energy, no herbaceous wetland spp
A1-3	1	adequate	
A1-4	3	adequate	
A1-5	3	adequate	
A1-6	0	poor	river shoreline, high energy, no herbaceous wetland spp
A1-7	4	adequate	
A1-8	3	adequate	
A1-9	1	adequate	
A1-10	0	poor	canal, narrow band of wetland species present in a few locations, surrounded by lawn/development
A2-1	7	adequate	
A2-2	6	adequate	
A2-3	2	adequate	
A2-4	3	adequate	
A2-5	0	poor	dry, dense invasive Phragmites, surrounded by lawn/development
A2-6	2	poor	dry, dense invasive Phragmites
A2-7	1	poor	river shoreline, high energy, no herbaceous wetland spp, surrounded by lawn/development
A2-8	0	poor	river shoreline, high energy, no herbaceous wetland spp, surrounded by lawn/development
A2-9	3	poor	dry, mostly upland species, surrounded by lawn/development
A2-10	0	poor	river shoreline, high energy, minimal herbaceous wetland spp

Site ID	General Location Name	Date Surveyed	Edge Type	General Habitat Type	NWI Code	General NWI Type
B1-1	Tifft Street Marsh	6/24/2014	upland/marsh	Marsh	PEM1Fx	PEM
B1-2	Tifft Preserve	6/24/2014	upland/open water/marsh	Open Water/Marsh	PUBH/PEM1F	OW/PEM
B1-3	Tifft Preserve	6/24/2014	open water/marsh	Open Water/Marsh	PUBH/PEM1F	OW/PEM
B1-4	Tifft Preserve	6/24/2014	upland/marsh	Marsh	PUBHx/PEM1F	OW/PEM
B1-5	Times Beach Preserve	6/24/2014	upland/marsh	Marsh	PEM1Es	PEM
B1-6	Times Beach Preserve	6/24/2014	upland/marsh	Marsh	PEM1Es	PEM
B1-7	Beaver Island State Park	6/25/2014	open water/marsh	Open Water/Marsh	PEM1F	PEM
B2-1	Buckhorn Island State Park	6/26/2014	marsh	Marsh	PEM1/Ed	PEM
B2-2	Buckhorn Island State Park	6/26/2014	upland/marsh	Marsh	PEM1/Ed	PEM
B2-3	Buckhorn Island State Park	6/26/2014	upland/marsh	Marsh	PEM1/Ed	PEM
B2-4	Buckhorn Island State Park	6/25/2014	upland/open water/marsh	Open Water/Marsh	PEM1/Ed	PEM
B2-5	Buckhorn Island State Park	6/25/2014	upland/marsh	Marsh	PEM1/Ed	PEM
B2-6	Buckhorn Island State Park	6/26/2014	open water/marsh	Open Water/Marsh	PEM1/Ed	PEM
B2-7	Sunken Island	6/25/2014	open water/marsh	Open Water/Marsh	PEM1C	PEM

				Percent Cover	•				
Site ID	Total Percent Cover of Wetland Species	Typha (N)	Lythrum (I)	Phragmites (I)	Lonicera (I)	Carex	Hibiscus	Lemna	Unkn Grass
B1-1	115			100					
B1-2	67	60			5				
B1-3	100	30						70	
B1-4	100	100							
B1-5	80	70		10					
B1-6	100	80							
B1-7	125	50	30			30			
B2-1	80	30				20	30		
B2-2	105	55				20	30		
B2-3	100	70				10			
B2-4	60	40							
B2-5	130	80							
B2-6	90					30			40
B2-7	70	70							

		Percent Cover									
Site ID	Persicaria	Impatiens	Eupatorium	Urtica	Solidago	Coronilla	Saggitaria	Nymphaea	Nuphar	Decadon	Sambucus
B1-1					5	10					
B1-2											2
B1-3											
B1-4											
B1-5											
B1-6		20									
B1-7	3						10				
B2-1											
B2-2											
B2-3			20								
B2-4									10	10	
B2-5	20			20			10				
B2-6					10			10			
B2-7											

Site ID	Open Water interspersion	Vegetation Interspersion	Density of Marsh Veg	Avg Veg Height (m)	Litter Depth (cm)	Water Depth (m)	Distance to Open Water (m)	Distance to Upland (m)
B1-1	0	100	Moderate	1 to 3	0.5	0	none	5
B1-2	30	70	Moderate	1 to 3	0	0	1	1
B1-3	70	30	Moderate	1 to 3	0	0.67	0	100
B1-4	5	95	Moderate	1 to 3	0	0.9	1	0
B1-5	0	100	Moderate	1 to 3	10	0	70	2
B1-6	10	90	Moderate	1 to 3	10	0	50	15
B1-7	30	70	Moderate	1 to 3	1	0.1	3	20
B2-1	0	100	Moderate	1 to 3	3	0	none	none
B2-2	0	100	Moderate	1 to 3	5	0	none	3
B2-3	0	100	Moderate	1 to 3	5	0	none	15
B2-4	50	50	Moderate	1 to 3	3	0.25	1	2
B2-5	0	100	Moderate	1 to 3	3	0	none	15
B2-6	25	75	Moderate	0 to 1	0	0.23	1	25
B2-7	40	60	Sparse	1 to 3	0	0.58	0	200

Site ID	Distance to Road/Dike (m)	Natural Disturbance	Manmande Disturbance	Cumulative Number of Detections	Overall Habitat Quality	Reason for Poor Quality Rating
B1-1	10	none		0	poor	Dominated by dense phrag, dry marsh and no water nearby, located next to road, noise loud and constant
B1-2	none	none		5	adequate	
B1-3	100	none		10	adequate	
B1-4	20	none		6	adequate	
B1-5	100	none	invasive species control	0	poor	dry marsh, active phrag control in some areas, dense vegetation elsewhere, water fairly far away
B1-6	none	none	invasive species control	0	poor	dry marsh, active phrag control in some areas, dense vegetation elsewhere, water fairly far away
B1-7	25	none		1	adequate	
B2-1	15	none		1	poor	dry marsh, no water nearby
B2-2	20	none		2	poor	dry marsh, no water nearby
B2-3	0	none		2	poor	dry marsh, no water nearby
B2-4	80	none		0	adequate	
B2-5	40	none		0	poor	dry marsh, no water nearby
B2-6	none	none		1	adequate	
B2-7	200	none		5	adequate	

General Information	
Survey Date (DD/MM/YYYY): 25/06/2019	a when "X" on galenty of
Observer(s) Name(s): 5 Sweizer, B. GRIFFI	TH
Survey Point (complete for each point):	No. of the last
How was the point accessed? (Circle one): canoe, motor boat, wa	alk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upla	and/marsh, open water/marsh,
interior/marsh, other (describe)	gev.yelmily
Classification & Disturbance	ce to drive materiage or as and it
NWI code (Record an NWI Code for the target wetland): PE	
NVCS Alliance (Record an NVCS Alliance code or codes for the t	arget wetland)1: _V, A.S, N. N. 33
Most dominant plant species (Record % Cover for 3 dominant sp	
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Bolboschvenus fluriatilo	60
Lythrum sulctoria	10
Typha latifulia	10
Eupatorium maculatum	10
Natural Disturbance (circle all that apply): Fire, ice damage, ani construction, invasive species control, wetlands restoration, dredging	
Month/year (if known) of natural disturbance event:	steel deal
Management Actions (circle all that apply): Trail/road construct	ion, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife ma	nagement, other:
Month/year (if known) of last management action:	
1 For NVCS Alliance codes, see	

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			X		decorate I
Trees			X		
Bare soil				-	
Water	,iuter as	Ann - Pater	~	41.500000	an interp
Upland					
Mudflat	4. 11年12月	ALL DATES	Millettewey	S SAULON I	MILE STOLE
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): Zo - 30
Density of marsh vegetation <sup>2</sup> (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):
Ditch (m): Large open-water area (m):
Mudflat (m): Small open-water area (m):
Road or dike (m):

<sup>&</sup>lt;sup>2</sup> 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	an object "A" mysisalg of their
Observer(s) Name(s): 5 Sweitzer B. GR	FFITH
Survey Point (complete for each point): A1-2	
How was the point accessed? (Circle one): canoe, motor boat,	valk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	land/marsh, open water/marsh,
interior/marsh, other (describe)	Floriding rap.
Classification & Disturban	ice in the special region of the second
NWI code (Record an NWI Code for the target wetland):	
NVCS Alliance (Record an NVCS Alliance code or codes for the	
Most dominant plant species (Record % Cover for 3 dominant s	-
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
NONE	Natal suday and mills
The state of the second spring the state of the state of the second seco	THE WILLIAM SHEET THE THE PARTY OF THE PARTY
Natural Disturbance (circle all that apply): Fire, ice damage, an	nimal/insect damage, trail/road
construction, invasive species control, wetlands restoration, dredg	-
Month/year (if known) of natural disturbance event:	
Management Actions (circle all that apply): Trail/road constructions	
control (mechanical and chemical), wetland restoration, wildlife n	
Month/year (if known) of last management action:	
(i known) of last management action.	
For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/N">http://www.natureserve.org/explorer/servlet/N</a>	atureServe?init=Ecol
Phah 4481	
I wall I was	Page 1 of 2

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		X	- dissipa	description of the sale	-Consessed to
Trees	V		-		
Bare soil	X			F Br	
Water	Charles In	THE OWNER	-2200-304	X	ON PERSON
Upland			X		
Mudflat	il aleath	ALTERNA 101.0	GAID THETOLO	SUISTED !	SIEV SIEVE
Floating veg.	X				

Distance to vegetation patc	th edge (m):
Type of patch (Circle one)	none, tree, shrub, herbaceous
Wetland Interspersion (%0	open water and %vegetation cover):
Density of marsh vegetation	n <sup>2</sup> (Circle one): None, sparse, moderate, dense
Estimated average marsh v	vegetation height (m): 0-1, 1-3, 3-6,>6.
Litter depth (cm):	Water depth (m): 0.75
Method used for measuring	g water depth (Circle one): staff gauge, meter stick, other:
Grand and a second 200	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): 30	Disserted philippy accounts business Disserted than the and seem to the
	Small open-water area (m):

<sup>&</sup>lt;sup>2</sup> 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): J. SwEMZER B. GRIFFITH	Commence Street, St.
Survey Point (complete for each point): A   -3	72,20
How was the point accessed? (Circle one): canoe, motor boat,	walk) wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, u	pland/marsh open water/marsh,
interior/marsh, other (describe)	Control of the Contro
Classification & Disturba	nce is also a surface to a second
NWI code (Record an NWI Code for the target wetland):	EMIF
NVCS Alliance (Record an NVCS Alliance code or codes for the	
TVVCS Amance (Record an IVVCS Amance code of codes for the	e target wettand):
Most dominant plant species (Record % Cover for 3 dominant	species):
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Lythrum salicaria	40
Typha enjustifolia	60
Care locustris	30
which the state garden age, make the collection of the collection and	
Natural Disturbance (circle all that apply): Fire, ice damage, a	nimal/insect damage, trail/road
construction, invasive species control, wetlands restoration, dredge	ging, other:
Month/year (if known) of natural disturbance event:	per front
Management Actions (circle all that apply): Trail/road constru	ction, 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 http://www.natureserve.org/explorer/servlet/N	Johnna Com a Sinite E - 1
	NatureServe?Init=Ecol
1 × 0 × 0 × 0 × 0	
412°58'2"N 79°56'33"W	Page 1 of 2

Photo 4451

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		(-1)	X	da an and as	
Trees	X			W. F. S.	211 JUNEAU S
Bare soil					
Water	- DOTTON	X	Name of the	-1 Th-1000	an iming
Upland			4		
Mudflat	James (	marki ha h	TOTAL CONTRACT	Description of	MIN ON THE
Floating veg.					

Distance to vegetation patch edge (m):	Chrest Chrest Chreston &
Type of patch (Circle one): none, tree, shrub, her	baceous and an abaca to the management of the
Wetland Interspersion (%open water and %vege	etation cover): 30-70
Density of marsh vegetation <sup>2</sup> (Circle one): None	s, sparse, moderate, dense
Estimated average marsh vegetation height (m	): 0-1, 1-3, 3-6,>6.
Litter depth (cm): Water d	epth (m):
Method used for measuring water depth (Circle	e one): staff gauge, meter stick, other:
Distance to Physi	cal 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):	

<sup>&</sup>lt;sup>2</sup> 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	er day placete up "X" mobile to
Observer(s) Name(s): J. SUFITZER, B. GRIFFIT	A .
Survey Point (complete for each point):	relical)
How was the point accessed? (Circle one): canoe, motor boat, v	walk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	oland/marsh, open water/marsh,
interior/marsh, other (describe)	935 millions
Classification & Disturban	nce To the way with the gap to accuse
NWI code (Record an NWI Code for the target wetland):	PFOIC PROPERTY OF
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland) . V.A.C.N.K.
Most dominant plant species (Record % Cover for 3 dominant s	species):
Most dominant plant species (Record % Cover for 3 dominant s  Plant Scientific Name (e.g., Typha domingensis)	
Most dominant plant species (Record % Cover for 3 dominant s	species):
Plant Scientific Name (e.g., Typha domingensis)	species):
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Typha labifolia  Sparganium  Lythrum Salverna  Cornus racernosa	% Cover (Absolute cover)  7 0  7 5  7 5  7 5  7 5  7 5  7 5  7 5
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Typha labifolia  Sparganium  Lythrum Salverna  Cornus racernosa	% Cover (Absolute cover)  7 0  7 5  7 5  7 5  7 5  7 5  7 5  7 5
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Typha labifolia  Spanganium  Lythrum Salura  Cornus racerusa—  Natural Disturbance (circle all that apply): Fire, ice damage, and	% Cover (Absolute cover)  7 0  7 5  7 5  7 5  7 5  7 5  7 5  7 5
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Typha labifolia  Sparganium  Lythrum Sahurum  Cornus racerusa—  Natural Disturbance (circle all that apply): Fire, ice damage, and	% Cover (Absolute cover)  7 0  7 5  7 5  7 5  7 5  7 5  7 5  7 5
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Typha labifolia  Spannium  Lythrum Saluran  Natural Disturbance (circle all that apply): Fire, ice damage, are construction, invasive species control, wetlands restoration, dredge	% Cover (Absolute cover)  7 0  7 5  7 5  7 5  7 5  7 5  7 5  7 5
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Typha labifolia  Scarganium  Lythrum Salaran  Natural Disturbance (circle all that apply): Fire, ice damage, and construction, invasive species control, wetlands restoration, dredge  Month/year (if known) of natural disturbance event:	% Cover (Absolute cover)  7 0  7 5  7 5  7 5  7 5  7 5  7 5  7 5
Typha angustifolia	% Cover (Absolute cover)  7 0  7 5  7 5  7 6  nimal/insect damage, trail/road  ging, other:  ction, dredging, invasive species

Ph.to 4476

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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		14	V.	Line and Australia	il a second
Trees			1		The same of the sa
Bare soil					
Water	E-00 = 3	AND PROPERTY.	The state of the s		THE PERSON
Upland					
Mudflat	u andan	When wit	Mill and the		arrestan
Floating veg.					

Distance to vegetation patch edge (m):	2. gartentication
Type of patch (Circle one): none, tree, shrub, her	baceous
Wetland Interspersion (%open water and %vege	etation cover): 0 - 00
Density of marsh vegetation <sup>2</sup> (Circle one): None	s, sparse, moderate, dense
Estimated average marsh vegetation height (m)	): 0-1,(1-3) 3-6,>6.
Litter depth (cm): Water d	epth (m):
Method used for measuring water depth (Circle	e one): staff gauge, meter stick, other:
Distance to Physi	cal 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):	

<sup>&</sup>lt;sup>2</sup> 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	Carlon SS' on pricely on French
Observer(s) Name(s): J. Sweitzer, B. GRIFFITM	
A CONTRACT OF STREET, MANUAL PROPERTY OF STREET, STREE	Pierre Tarcotte
Survey Point (complete for each point): Al-5	2017 (
How was the point accessed? (Circle one): canoe, motor boat, wa	lk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upla	nd/marsh, open water/marsh,
interior/marsh, other (describe)	No lay vey
Classification & Disturbanc	e in they addressed as sometile
NWI code (Record an NWI Code for the target wetland):	2208 Hardenia John In west
NVCS Alliance (Record an NVCS Alliance code or codes for the ta	proper worland)1. I/A CN/ W 33
TV CS Amanee (Record an TV CS Amanee code of codes for the te	inget wettalld) . With 1970 1971
Most dominant plant species (Record % Cover for 3 dominant spe	cies):
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha anaustible	/ 0
Typha angustifolia	Zo Ansymptos
Lythron salvaria	5
Persicaria Maculosa	Wash and John and the sent to the
Natural Disturbance (circle all that apply): Fire, ice damage, anir construction, invasive species control, wetlands restoration, dredging	-
Month/year (if known) of natural disturbance event:	100 4-00
Management Actions (circle all that apply): Trail/road construction	on, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife man	nagement, other:
Month/year (if known) of last management action:	
<sup>1</sup> For NVCS Alliance codes, see	

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

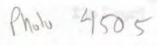
Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs		-7613	X	dans value	demond.
Trees			V		
Bare soil				Con Rel	
Water	The sales are	THE REAL PROPERTY.	X	10/1000	72210
Upland		X			
Mudflat	W. FIRST		THE PERSON	Chiletonn (	200-20-20
Floating veg.	X				

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 70 - 30
Density of marsh vegetation <sup>2</sup> (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): 20

<sup>&</sup>lt;sup>2</sup> 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	(10.740) (以来計
Survey Date (DD/MM/YYYY): 26 06 2014	elect (by placing on "X" modes o
Observer(s) Name(s): J. Sweitzer, B. GRIE	FITH
Survey Point (complete for each point): A 1-6	Marie Communication of the Com
How was the point accessed? (Circle one): canoe, motor boat, wa	ilk) wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upla	and/marsh, open water/marsh,
interior/marsh, other (describe)	By Branks
Classification & Disturbance	e a daine sallerige manage
NWI code (Record an NWI Code for the target wetland): R21  NVCS Alliance (Record an NVCS Alliance code or codes for the t	
Most dominant plant species (Record % Cover for 3 dominant species)	-
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
NONE	
Talle Alexandra April 1884 (1974) Repair	ive a galanteno en lasso ballado
Natural Disturbance (circle all that apply): Fire, ice damage, ani construction, invasive species control, wetlands restoration, dredging	g, other:
Month/year (if known) of natural disturbance event:	(a) d (a)
Management Actions (circle all that apply): Trail/road construction	on, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife ma	nagement, other:
Month/year (if known) of last management action:	

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>



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		X	Stelmer	Andrew Wood	
Trees			V		-
Bare soil					
Water	25 UN 313	CHILL SEATING	1	Ol Trasfer	an emich
Upland				X	
Mudflat	H PARIS	and the second	Salta Agentura	SI WORLING	HO TICEL
Floating veg.					

Distance to vegetation patch edge (m):	b moderalisad V
Type of patch (Circle one) none, tree, shrub, her	paceous and an arrangement of the second sec
Wetland Interspersion (%open water and %vege	tation cover): / 00- O
Density of marsh vegetation <sup>2</sup> (Circle one): None	, sparse, moderate, dense
Estimated average marsh vegetation height (m)	:(0-1), 1-3, 3-6,>6.
Litter depth (cm): Water de	epth (m):
Method used for measuring water depth (Circle	one): staff gauge, meter stick, other:
Distance to Physic	cal 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):	

<sup>&</sup>lt;sup>2</sup> 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

De Opaniana 21 forland	
rvey Date (DD/MM/YYYY): 26/06/2014	Transport of the Particular of the State of
bserver(s) Name(s): 5. Suritzer, B. GRIF	FITH
rvey Point (complete for each point): Al - 7	alia (h
ow was the point accessed? (Circle one): canoe, motor boat,	walk, wade?
dge Type (Circle one): roadside/marsh, ditch or berm/marsh, uj	pland/marsh, open water/marsh,
terior/marsh, other (describe)	St. Titledg.
Classification & Disturba	nce
Classification & Disturba	nce
	and State 1
Classification & Disturba WI code (Record an NWI Code for the target wetland):	and State 1
WI code (Record an NWI Code for the target wetland):	DEMIED
	DEMIED
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the	e target wetland)1: V, A.S.N. k
WI code (Record an NWI Code for the target wetland):	e target wetland)1: V, A.S.N. k
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant species)	e target wetland) <sup>1</sup> : V, A.S.N.k.
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	e target wetland)1: V, A.S.N. k
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	e target wetland) <sup>1</sup> : V, A.S.N.k.
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	e target wetland) <sup>1</sup> : V, A.S.N.k.
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	e target wetland) <sup>1</sup> : V, A.S.N.A.
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	e target wetland) <sup>1</sup> : <u>V, A, S, N, A</u> species):
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)  Corex lacustris  Typha latifalia  Corous Amountm	e target wetland)¹: V.A.S.N.A. species):   Cover (Absolute cover)  7 0  30  10
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	e target wetland)¹: V. A.S. N. A. species):   Cover (Absolute cover)  7 0  30  10
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)  Corex lacustris  Typha latifalia  Corous Amountm	e target wetland)¹: V. A.S. N. M. species):     % Cover (Absolute cover)   7 0   3 0   10    nimal/insect damage, trail/road
WI code (Record an NWI Code for the target wetland):  VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)  Cornus Amanum  atural Disturbance (circle all that apply): Fire, ice damage, a	e target wetland)¹:_V, A.S.N.A.  species):   Cover (Absolute cover)  30  10  nimal/insect damage, trail/road  ging, other:

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

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

Photo 4506

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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		F1 - 13V	- Healman	X	
Trees			X		TO THE SEC
Bare soil	X			0.5	
Water		CALLE SOCIETY	Towns No.	AT A PLANTED	an statist
Upland			V		
Mudflat	וופואת, פו	SOUTH BUT	Only Devests	Standar t	establish in
Floating veg.					-

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover):
Density of marsh vegetation <sup>2</sup> (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): Vpland area (m):
Ditch (m): Large open-water area (m): 80
Mudflat (m): Small open-water area (m):
Road or dike (m): 150

<sup>&</sup>lt;sup>2</sup> 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): 2406/2114	non "P" a sing dand
Observer(s) Name(s): J. Sweitzer, B. GRIFFI	TH
Survey Point (complete for each point): A 1-10	
How was the point accessed? (Circle one): canoe, motor boat wa	Ik, wade?
Edge Type (Circle one) roadside/marsh, ditch or berm/marsh, upla	nd/marsh, open water/marsh,
interior/marsh, other (describe)	gw gamil?
Classification & Disturbance	e ha dawn nollatoyus na szarce
NWI code (Record an NWI Code for the target wetland):	20BH
NVCS Alliance (Record an NVCS Alliance code or codes for the ta	arget wetland)¹:NA
Most dominant plant species (Record % Cover for 3 dominant spe	
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
NONE	Torsy pagell Tales
राज्य त्यांने राज्य <sub>अ</sub> कृत्युत्व विश्वर अक्षण क्रीलामा स्थापीर र	Name State Contract C
Natural Disturbance (circle all that apply): Fire, ice damage, anir	nal/insect damage, trail/road
construction, invasive species control, wetlands restoration, dredging	g, other:
Month/year (if known) of natural disturbance event:	along the state
Management Actions (circle all that apply): Trail/road construction	on, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife man	nagement, other:
Month/year (if known) of last management action:	
<sup>1</sup> For NVCS Alliance codes, see	

Phoho 4512

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	X	X	- Maniner	dans and a	Markon
Trees					
Bare soil				Ton De	
Water	THEOR OF	PART PERTIE	X	1 1 1 1 1 1 1 1 1	7- Inter
Upland			/	1.5	
Mudflat	11 312 611	AMES 10.1	CARD COUNTY	COLUMN TO A PARTY	
Floating veg.					

Distance to vegetation patch edge (m):	sets 26 subjection(1)
Type of patch (Circle one) (none) tree, shru	ib, herbaceous
Wetland Interspersion (%open water and	%vegetation cover): 100 -0
Density of marsh vegetation <sup>2</sup> (Circle one):	None, sparse, moderate, dense
Estimated average marsh vegetation heig	tht (m)(0-1, 1-3, 3-6,>6.
Litter depth (cm):W	ater depth (m): O.60
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):	

<sup>&</sup>lt;sup>2</sup> 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	HO THINK "A" OF ENTHAL OF THE
Observer(s) Name(s): J. Sweitzer B. GRIFF	
Survey Point (complete for each point): A 2 - 4	Shruba Shruba
How was the point accessed? (Circle one): canoe, motor boat,	walk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, u	pland/marsh, open water/marsh,
interior/marsh, other (describe)	TO MILEON
Classification & Disturba	nce on design maturings are more
NNN LOD I NNNG LO I	2021
NWI code (Record an NWI Code for the target wetland):	- BHX
NVCS Alliance (Record an NVCS Alliance code or codes for the	
	e target wetland) <sup>1</sup> : $\sqrt{A_1 S_1 N_1 m_1}$
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant)	e target wetland) <sup>1</sup> : \(\lambda  \lambda  \lambda \
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	species):  Cover (Absolute cover)
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	e target wetland) <sup>1</sup> : \(\lambda  \lambda  \lambda \
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	species):    We Cover (Absolute cover)   20
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha an wat folia	species):    We Cover (Absolute cover)   20
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha angustifolia  Schoen plactos 19  Corex vulphoodia  Butomus umbellatus	e target wetland) <sup>1</sup> :
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha anastriolia  Schoen plectos species spe	e target wetland) <sup>1</sup> :
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha angustifolia  Schoen plactos 19  Corex vulphoodia  Butomus umbellatus	e target wetland)¹:
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha angustifolia  Schoena plectos 10  Carex vulphoidia  Buto mus umbellatus  Natural Disturbance (circle all that apply): Fire, ice damage, a	e target wetland)¹:
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha angustifolia  Schoena pleates 10  Corex vulphoodia  Buto mus umbellatus  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredgenerally.	e target wetland)¹:\/_\/_\/_\/_\/_\/_\/_\/_\/\/\/\/\/\/\
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha angustifolia  Schoen pleates 16  Catex vulphoides  Butomus Jambellanus  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge  Month/year (if known) of natural disturbance event:	e target wetland)¹:\/_A_\S_\/_M species):     % Cover (Absolute cover)   20   10

Photos 4437-4438

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

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

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		X	Marine I am	Second of	distance by
Trees		X			
Bare soil			X	The IDE	
Water	The Part of the	Marie Contract	/	7	DE PHATE
Upland				Y	
Mudflat	ar 'mager	SELLING ATS	CHAIL VERNEZA	The second of	and of the
Floating veg.					

Distance to vegetation patch edge (m):	Chasellization &
Type of patch (Circle one): none, tree, shrub, her	paceous A and a super travel and a super travel
Wetland Interspersion (%open water and %vege	tation cover): 80/20
Density of marsh vegetation <sup>2</sup> (Circle one): None,	sparse, moderate, dense
Estimated average marsh vegetation height (m)	: 0-1,1-3,3-6,>6.
Litter depth (cm): Water de	epth (m):
Method used for measuring water depth (Circle	one): staff gauge, meter stick, other:
Distance to Physi	cal 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): 30	

<sup>&</sup>lt;sup>2</sup> 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	o when "X" or postured to
Observer(s) Name(s): J. Sweitzer, B. GRIE	
Survey Point (complete for each point): A 2-5	Sheet more built a special
How was the point accessed? (Circle one): canoe, motor boat,	alk wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	and/marsh, open water/marsh,
nterior/marsh, other (describe) trail parking lot +1	a.   gov gottally
Classification & Disturban	ce saling military and small
WWI code (Record an NWI Code for the target wetland):	MFx commendation loss
NVCS Alliance (Record an NVCS Alliance code or codes for the	
Most dominant plant species (Record % Cover for 3 dominant species)	pecies):
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Phragmites australis	100
The aid a street	
meth it time men shift parts, mare see.	principles of the last here
Natural Disturbance (circle all that apply): Fire, ice damage, an	imal/insect damage_trail/road
construction, invasive species control, wetlands restoration, dredgi	ng, other:
Month/year (if known) of natural disturbance event: M/A	
Management Actions (circle all that apply): Trail/road construc	tion, dredging, invasive species
ontrol (mechanical and chemical), wetland restoration, wildlife m	anagement, other:
Month/year (if known) of last management action:	

Photo 4436

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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			- Haminer	days missi	
Trees					
Bare soil				Prov. 14	
Water	March 311	CORE - AREA	1000000	M. CHICAGO	The State of the S
Upland				148	X
Mudflat	U TIKIBIL	MOTES TO E	DATE TRANSPORT	CONTRACTOR	plife there
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover):
Density of marsh vegetation <sup>2</sup> (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): Z
Ditch (m): Large open-water area (m):
Mudflat (m): Small open-water area (m):
Road or dike (m): 3 management still he policetes to the best still be best and best still be to be the best still be the best still be to be the best still be th

<sup>&</sup>lt;sup>2</sup> 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 Informatio	n
Survey Date (DD/MM/YYYY): 24/06/2014	
Observer(s) Name(s): Sustin Sweetzer, 3- Gri	AH
Survey Point (complete for each point): A2-6	
How was the point accessed? (Circle one): canoe, motor boat	, walk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, interior/marsh, other (describe)	
Classification & Disturba	ance
NWI code (Record an NWI Code for the target wetland):	PEMIA
NVCS Alliance (Record an NVCS Alliance code or codes for the	
Most dominant plant species (Record % Cover for 3 dominant	
Plant Scientific Name (e.g., Typha domingensis) Phragmits australia	% Cover (Absolute cover)
Typha angustifulia	30
Dipsacus sylvestris	10
Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge Month/year (if known) of natural disturbance event:  Management Actions (circle all that apply): Trail/road construction (mechanical and chemical), wetland restoration, wildlife in the control (mechanical and chemical).	ction, dredging, invasive species
Month/year (if known) of last management action:	

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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	Y				1010
Trees	^				langua pana
Bare soil					
Water	-	The state of the s	- 4 m (a) (a)	3) 11	THE REAL PROPERTY.
Upland					~
Mudflat	II SELECT	STEED WIT	vitte de com	othebus i	HO Short
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 10% Vegetation
Density of marsh vegetation <sup>2</sup> (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): 5
Ditch (m): Large open-water area (m):
Mudflat (m): Small open-water area (m):
Road or dike (m):

<sup>&</sup>lt;sup>2</sup> 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

Survey Date (DD/MM/YYYY): 24/06/2014	their the present as "X" ander out
Observer(s) Name(s): Juth Sweiter, Ben fithit	
Survey Point (complete for each point): A2-7	
How was the point accessed? (Circle one): canoe, motor boat,	0
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, uninterior/marsh, other (describe)	
Classification & Disturba	
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant)	R 2 V B H  ne target wetland) 1:
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the target wetland):	R 2 V B H  ne target wetland) 1:  species):
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant plant species)	R 2 VBH  ne target wetland)¹:  species):  % Cover (Absolute cover)
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant Plant Scientific Name (e.g., Typha domingensis)	R 2 V B H  ne target wetland)¹: species):    % Cover (Absolute cover)     animal/insect damage, trail/road

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

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

Page 1 of 2

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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		X	-Stelan	dama wall at	Leves
Trees	X		-		
Bare soil		X			
Water	SWIDE TO	CHE SHOW	X	Therework	Art serving
Upland			X		
Mudflat	th Using	1017-101	ONC DESCRIPTION	Mulebau!	THE SECOND
Floating veg.					

Distance to vegetation patch	edge (m):
Type of patch (Circle one) (n	one, tree, shrub, herbaceous
Wetland Interspersion (%op	en water and %vegetation cover): No witte d
Density of marsh vegetation	<sup>2</sup> (Circle one): None, sparse, moderate, dense
Estimated average marsh ve	egetation height (m): 0-1, 1-3, 3-6,>6.
Litter depth (cm): N/A	Water depth (m): 17cm
Method used for measuring	water depth (Circle one): staff gauge, meter stick, other:
I I	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): 20	mental in constant and comment and a second wildlife and a second and a second and a second and a second and a

<sup>&</sup>lt;sup>2</sup> 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 Sucition Ben wiffith

Survey Point (complete for each point): A2-8

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) grave | derveway / marsh

### Classification & Disturbance

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

RZUBH

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

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

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
NINACE	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1/1/1/1/	
seller, faller as \$1, april files state sent at the	n view or grid market and respect to

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:

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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	X	19111	riberies.	days and of	decrees
Trees					
Bare soil				The fel	
Water	-Accept	UZET SZUMIA	×		AP ARION
Upland				X	
Mudflat	P-OFTER	和() ()	Jan Halmon	The Most	are stan
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one) none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): No Wetland
Density of marsh vegetation <sup>2</sup> (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

<sup>&</sup>lt;sup>2</sup> 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	1
Survey Date (DD/MM/YYYY): 24 /06 2014	
Observer(s) Name(s): Justin Sweitzer Ben Grif	6Hz
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, ditch or berm/marsh, u	upland/marsh, open water/marsh,
interior/marsh, other (describe) parking lot / marsh	
Classification & Disturba	ince
NWI code (Record an NWI Code for the target wetland):	PEMIF
NVCS Alliance (Record an NVCS Alliance code or codes for th	ue target wetland)1: V,A 5,N 1, 4/9
Most dominant plant species (Record % Cover for 3 dominant	
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Phraymites australia	20
Typha latitolia	10
Lythrum Salilana	5
Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dred	
Month/year (if known) of natural disturbance event: NA	
Management Actions (circle all that apply): Trail/road constru	ction, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife	management, other Mowing
Month/year (if known) of last management action: 06/2014	

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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		- Production	4Christen	dues and w	drama
Trees					-
Bare soil				200	
Water	COLUMN TO	and the same of	X	- I A E-CO	AR FRANCE
Upland				×	
Mudflat	u metro	JIMSI TO I	Stip "Uscent	AN USBERT	MO DIVI
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 40/60
Density of marsh vegetation <sup>2</sup> (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): O
Method used for measuring water depth (Circle one): staff gauge, meter stick, other:
Distance to Physical Characteristics
Water edge (m): / O Upland area (m):
Water edge (m): Upland area (m): Large open-water area (m): /O
Mudflat (m): Small open-water area (m):/ O
Road or dike (m): 10

<sup>&</sup>lt;sup>2</sup> 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

-	-		
Gen	pral	Infor	mation

Survey Date (DD/MM/YYYY): 24/06/2014	Select the planting of CC analysis of
Observer(s) Name(s): JUSTIN SWETTLER BEN GRIP	cardon and characteristics
Survey Point (complete for each point): A2-10	nchr of S
How was the point accessed? (Circle one): canoe, motor boat v	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	oland/marsh, open water/marsh,
interior/marsh, other (describe)	ALL PARKETS
Classification & Disturban	nce the property of the second
NWI code (Record an NWI Code for the target wetland):	2V8H
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland). V.C. 2.N. g. /V.A.S.N.
TVVCS Amance (Record an IVVCS Amance code of codes for the	target wettaria)
Most dominant plant species (Record % Cover for 3 dominant s	pecies):
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Sparganium androcladum	10
Typha angustifolia	10
Nuphar variegatum	7
Carex scoparia	The last that I have a second to the
Natural Disturbance (circle all that apply): Fire, ice damage, as construction, invasive species control, wetlands restoration, dredg	. 1/ 2
Month/year (if known) of natural disturbance event: W/A	Leaf-British
Management Actions (circle all that apply): Trail/road constructions	ction, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife n	nanagement, other:
Month/year (if known) of last management action: Unknown	date for intellation of
boot down, bout ramp, walking trail.	
<sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/N">http://www.natureserve.org/explorer/servlet/N</a>	latureServe?init=Ecol

Page 1 of 2

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	X	DIEB	/Inlan	Asses well at	Jasansk
Trees			-		
Bare soil				excense.	
Water	MARKE PO	THE RESIDENCE	X	27 162 17	No. of Concession,
Upland			X		
Mudflat	G SECTION.	SECOND TO THE	onto alexante	Shiel But	THE SU
Floating veg.		X			

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 80/20
Density of marsh vegetation <sup>2</sup> (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):
Mudflat (m): Small open-water area (m):
Road or dike (m): 30

<sup>&</sup>lt;sup>2</sup> 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

|--|

Survey Date (DD/MM/YYYY): 24/06/2014	a ratio (12° ar produce)
Observer(s) Name(s): J. Sweitzer, B. GRIFFIT	
Survey Point (complete for each point): B  -	edunibe
How was the point accessed? (Circle one): canoe, motor boat, w	valk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	and/marsh, open water/marsh,
interior/marsh, other (describe)	And Services A
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the  Most dominant plant species (Record % Cover for 3 dominant species)	target wetland) <sup>1</sup> : V.A. 5. W. a
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Phragaites australis	100
Colonilla Jan-	10
Solidajo sp	5
Natural Disturbance (circle all that apply): Fire, ice damage, and construction, invasive species control, wetlands restoration, dredge Month/year (if known) of natural disturbance event:  Management Actions (circle all that apply): Trail/road construction (mechanical and chemical), wetland restoration, wildlife mechanical and chemical), wetland restoration, wildlife mechanical and chemical).	rtion, dredging, invasive species nanagement, other:

Photo 4449

 $<sup>^{1} \</sup> For \ NVCS \ Alliance \ codes, see \ \underline{http://www.natureserve.org/explorer/servlet/NatureServe?init=\underline{Ecol}}$ 

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	X		- of the bose		Marine of
Trees		X			
Bare soil			Anton attack	The fire	
Water	1		- Announ		COL SOCION
Upland			X		
Mudflat	Ualou,	WILLIAM VITTO	THE THEIR WAY	CHARLES TO	and state
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover):
Density of marsh vegetation <sup>2</sup> (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):

<sup>&</sup>lt;sup>2</sup> 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

General Inioi mation
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
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): PEMIF / PVBH

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

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

Plant Scientific Name (e.g., Typha domingensis) % Cover (Absolute cover)

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha angustitolia	60
Londera tataria	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:
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:
Month/year (if known) of last management action: W/A

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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	E-VIII		×	A	
Trees		×	- I Name		- Canal
Bare soil					
Water	No.	State Committee	X	- 1	en interp
Upland			×		_
Mudflat	N. PIETENT	ZA100 10 1	ATTACAMENTAL	Strebear N	BIN CHARLE
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 30/70
Density of marsh vegetation <sup>2</sup> (Circle one): None, sparse, moderate, dense
Estimated average marsh vegetation height (m): 0-1, (-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):

<sup>&</sup>lt;sup>2</sup> 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

Observer(s) Name(s): Justin Swe	eitzer Ro- Coi	F4.4L
	C-07   August   W.C.	The County County
Survey Point (complete for each point	nt):B1-3	-046
How was the point accessed? (Circle	one): canoe, motor boat	, walk wade?
Edge Type (Circle one): roadside/mars	sh, ditch or berm/marsh,	upland/marsh, open water/marsh,
interior/marsh, other (describe)		Ony 1, 200m 5
Class	sification & Disturb	ance washing manufacture at most
NWI code (Record an NWI Code for the	he target wetland): Pf	EMIF/PUBH
NVCS Alliance (Record on NVCS All	iance code or codes for t	he target wetland)1. VA.S.N.19
NVCS Alliance (Record an NVCS All	iance code or codes for t	the target wetland) <sup>1</sup> : V.A.S.N.1.9
NVCS Alliance (Record an NVCS Alli Most dominant plant species (Record		
Most dominant plant species (Record	% Cover for 3 dominan	
Most dominant plant species (Record Plant Scientific Name (e.g.,	% Cover for 3 dominan	t species):
Most dominant plant species (Record	% Cover for 3 dominan	t species):  % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha angustifolia	% Cover for 3 dominan	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha angustifolia Lenna sp.	1 % Cover for 3 dominant	% Cover (Absolute cover) 30 70
Plant Scientific Name (e.g., Typha angustifolia Lenna sp.  Natural Disturbance (circle all that a	Typha domingensis)  Typha domingensis)	% Cover (Absolute cover)  30  70  animal/insect damage, trail/road
Plant Scientific Name (e.g., Typha angustifolia Lenna sp.	Typha domingensis)  Typha domingensis)	% Cover (Absolute cover)  30  70  animal/insect damage, trail/road
Plant Scientific Name (e.g., Typha angustifolia Lenna sp.  Natural Disturbance (circle all that a	Typha domingensis)  Typha domingensis)  apply): Fire, ice damage, wetlands restoration, dre	% Cover (Absolute cover)  30  70  animal/insect damage, trail/road
Plant Scientific Name (e.g., Typha angustifolia Lenna sq.  Natural Disturbance (circle all that a construction, invasive species control, when the square of	Typha domingensis)  apply): Fire, ice damage, wetlands restoration, dre urbance event:	% Cover (Absolute cover)  30  70  animal/insect damage, trail/road dging, other:
Plant Scientific Name (e.g., Typha angustifolia Lenna sp.  Natural Disturbance (circle all that a construction, invasive species control, sp.)	Typha domingensis)  Typha domingensis)  apply): Fire, ice damage, wetlands restoration, dre urbance event: ///A  apply): Trail/road const	% Cover (Absolute cover)  30  70  animal/insect damage, trail/road dging, other:

 $<sup>^{1} \</sup> For \ NVCS \ Alliance \ codes, see \ \underline{http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol}$ 

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			crolos	Constant in	Annual I
Trees		X			The state of
Bare soil					
Water	The same of the	97117	Turke Sico		NE SERIOR
Upland					
Mudflat	d History	Property of the	Stella Beat of		8511 A T
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 70 /30
Density of marsh vegetation <sup>2</sup> (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): 67
Method used for measuring water depth (Circle one): staff gauge, meter stick, other:
Distance to Physical Characteristics
Water edge (m): 50 Upland area (m): 100
Ditch (m): Large open-water area (m):
Mudflat (m): Small open-water area (m):
Road or dike (m): 100

<sup>&</sup>lt;sup>2</sup> 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

Survey Date (DD/MM/YYYY): 24/06/2014	the places of a major said
Observer(s) Name(s): 5. Sweitzer, B. GRICE	ITH
Survey Point (complete for each point): A2-2   B1-4	
How was the point accessed? (Circle one): canoe, motor boat,	
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, u	pland/marsh, open water/marsh,
nterior/marsh, other (describe)	Sou many a
	nce to disting not arrays at the
NWI code (Record an NWI Code for the target wetland):	EMIF/PUBAX
Wice in the state of the state	VASNI
NVCS Alliance (Record an NVCS Alliance code or codes for the	e target wetland)1:
NVCS Alliance (Record an NVCS Alliance code or codes for th	e target wetland)1:
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant	e target wetland)1:
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant Plant Scientific Name (e.g., Typha domingensis)	species):    % Cover (Absolute cover)
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant Plant Scientific Name (e.g., Typha domingensis)	species):    % Cover (Absolute cover)
Most dominant plant species (Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)	species):    % Cover (Absolute cover)
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant Plant Scientific Name (e.g., Typha domingensis)  Typha angus hoova	e target wetland) <sup>1</sup> :
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant Plant Scientific Name (e.g., Typha domingensis)  Typha angus hoova	e target wetland) <sup>1</sup> :
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant Plant Scientific Name (e.g., Typha domingensis)	species):    % Cover (Absolute cover)   1000     minimal/insect damage, trail/road
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha angusticalia  Natural Disturbance (circle all that apply): Fire, ice damage, a	e target wetland)¹:\A.S.N.I. species):    % Cover (Absolute cover)   0 0   animal/insect damage, trail/road ging, other:
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha angus hoova  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dred	e target wetland)¹:
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha angus hoova  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dred Month/year (if known) of natural disturbance event:  Management Actions (circle all that apply): Trail/road constructions	species):    % Cover (Absolute cover)   1000   mimal/insect damage, trail/road ging, other:   action, dredging, invasive species
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha angus horizo  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dred Month/year (if known) of natural disturbance event:  Management Actions (circle all that apply): Trail/road construction (mechanical and chemical), wetland restoration, wildlife	species):    % Cover (Absolute cover)   100     minimal/insect damage, trail/road ging, other:   action, dredging, invasive species

Photo 4448

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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	X	1-11-11	W. Alba Eman	days and on	abor porces
Trees			-		
Bare soil				-	
Water	Apr 11 (1)	Court Sections	-10450 1944	No. of the last	JA THUUT
Upland			×		
Mudflat	TE YEAR	citize in c	DESIR SOMETHER	AT ISTREAM IN	आत जाला
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 5-95
Density of marsh vegetation <sup>2</sup> (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): 2 2

<sup>&</sup>lt;sup>2</sup> 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): 24/56/2614	embre 72° to galady of residen
Observer(s) Name(s): 5 Sweitzer	Softening and Street
Survey Point (complete for each point): A2-3 / B1-5	dyolo
How was the point accessed? (Circle one): canoe, motor boat, was	wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upla	and/marsh, open water/marsh,
interior/marsh, other (describe)	
Classification & Disturbance	ce
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the total Most dominant plant species (Record % Cover for 3 dominant species)	rarget wetland)1:_V,A,S,N,1,A
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
	70
Phragmles australis	10
THE REAL PROPERTY OF THE PERSON NAMED IN COLUMN PARTY.	NEW CONTRACTOR OF THE PARTY OF
Natural Disturbance (circle all that apply): Fire, ice damage, and construction, invasive species control, wetlands restoration, dredgin Month/year (if known) of natural disturbance event:	
Management Actions (circle all that apply): Trail/road construct	ion, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife ma	anagement, other:
Month/year (if known) of last management action: 2014	

Phsts 4446

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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	1		winday.	days and at	demand .
Trees		X			
Bare soil				Carlo Mari	
Water	Trees as	Carried Control		11/25-04/	de testing
Upland				×	1
Mudflat	in training	CLID9 10/	The season	ALIEUTO L	RULEDITIE
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 0-160
Density of marsh vegetation <sup>2</sup> (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): 70 Upland area (m): 2
Ditch (m): Large open-water area (m): 70
Mudflat (m): Small open-water area (m):
Road or dike (m): / O O more with the second control of the second

<sup>&</sup>lt;sup>2</sup> 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	make restricted.
Survey Date (DD/MM/YYYY): 24/06/2014	ne olom "X" mphrep eti ing
Observer(s) Name(s): J. Sweitzer B GRI	
Survey Point (complete for each point): 81-6	witte.
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) board wall /Marsh	279 25 LTMLT
	nce by the market service and the
NWI code (Record an NWI Code for the target wetland): PEI	
NVCS Alliance (Record an NVCS Alliance code or codes for the	e target wetland)':
Most dominant plant species (Record % Cover for 3 dominant s	species):
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
	80
Typha angustifelia Impations capensis	20
The first case where some than the some	THE BUILDING OF THE TAIL OF
Natural Disturbance (circle all that apply): Fire, ice damage, a	nimal/insect damage, trail/road
construction, invasive species control, wetlands restoration, dredge	ging, other:
Month/year (if known) of natural disturbance event:	distribution of the state of th
Management Actions (circle all that apply): Trail/road constru	ction, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife i	management, other:
Month/year (if known) of last management action: 2014	

Phoho 4443-4444

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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		0.11	of believe	descent of	dan en
Trees		X			
Bare soil				C-1 445	
Water		X	400000	31 41/2000	-
Upland			X		
Mudflat	U JE DE	THE PERSON NO. 1	Die Renes	N Tomasilia	-
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 10 - 90
Density of marsh vegetation <sup>2</sup> (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):

<sup>&</sup>lt;sup>2</sup> 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

0	TC	
General	Informa	tion

Survey Point (complete for each point): 81-7	
	(2011)
How was the point accessed? (Circle one): canoe, motor boat, w	valk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	land/marsh, open water/marsh,
nterior/marsh, other (describe)	10 a tool 1
Classification & Disturban	ce
Classification & Disturban	
	1015
WI code (Record an NWI Code for the target wetland): PE	N I F
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland)1: V.A.S. N.
NWI code (Record an NWI Code for the target wetland): PEYNVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species)	target wetland)1: V.A.S. N.
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species)	target wetland) <sup>1</sup> : <u>V.A.S.</u> N.
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)	target wetland) <sup>1</sup> :
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)  Typha latible.	target wetland) <sup>1</sup> :
VCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species (Plant Scientific Name (e.g., Typha domingensis)  Typha latification salvanta	target wetland) <sup>1</sup> :
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species (Record	target wetland)¹:_V.A.5, W.  pecies):   Cover (Absolute cover)
VCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species (Plant Scientific Name (e.g., Typha domingensis)  Typha latification salvanta	target wetland)¹:_V.A.5, W.  pecies):   Cover (Absolute cover)
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species (Record	target wetland)¹: _V.A.S., N.  pecies):   Cover (Absolute cover)  30  10  30
Plant Scientific Name (e.g., Typha domingensis)  Typha latible  Signific Scientific Name (e.g., Typha domingensis)  Lythrum Salvaria  Signific Scientific Name (e.g., Typha domingensis)  Ratural Disturbance (circle all that apply): Fire, ice damage, and	target wetland)¹:V.A.S., N  pecies):     % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)  Typha latible  Lythrum sahrana  Sogithme latible  Lerser Stricta	target wetland)¹:V.A.S., N  pecies):     % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)  Plant Scientific Name (e.g., Typha domingensis)  Typha latific  Significant Schools  Significant Schools  Interest Strick  Statural Disturbance (circle all that apply): Fire, ice damage, and construction, invasive species control, wetlands restoration, dredging the strick of the structure of the strick	target wetland)¹:V.A.S., N  pecies):     % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)  Typha latiblica  Lythrum salvania  Sagithus a labblica  Lythrum salvania	target wetland)¹:V.A.S., N  pecies):     % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)  Plant Scientific Name (e.g., Typha domingensis)  Typha latific  Signification  Signification  Jerricana  Jatural Disturbance (circle all that apply): Fire, ice damage, and construction, invasive species control, wetlands restoration, dredging and construction, invasive species control, wetlands restoration, dredging and construction, invasive species control, wetlands restoration, dredging and construction in the construction in	target wetland)¹:V.A.S., W.  pecies):     % Cover (Absolute cover)   \$0   30   10   30   aimal/insect damage, trail/road   ing, other:

Photo 4454

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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		X	renton	day with all	Marian I
Trees		X			-
Bare soil	X				
Water	AND DE	1	Month days		30 770000
Upland			X		
Mudflat	D. Heinid	WITTER BY ST	SHE SERVED	STREET L	BILL PIST
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): 30-70
Density of marsh vegetation <sup>2</sup> (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): O. 0 2
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): 3
Mudflat (m): Small open-water area (m):
Road or dike (m):

<sup>&</sup>lt;sup>2</sup> 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	2" or grining (d) hole
Observer(s) Name(s): J. Swertzer, B. GRIEFITH	The state of the s
Survey Point (complete for each point): B 2 - 1	udan)-1
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	There are P
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh	, open water/marsh,

#### 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)<sup>1</sup>: 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 latifolia	30		
Corex locustria	20		
Hibiscus moucheulos	30		

Proh 4508

interior/marsh, other (describe)\_

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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		X	namina.	dron and al	Manual Control
Trees		X			
Bare soil				PAR DE	
Water	SUBSIDE TO	HOUS PROPERTY	21000 200	- 100cm	No Pleni
Upland			1		
Mudflat	M. UEIMI	VITE OF TO S	outh destern	A LANGESTICA	The series
Floating veg.					

Distance to vegetation patch ed	lge (m):
Type of patch (Circle one): none	e, tree, shrub, herbaceous
Wetland Interspersion (%open	water and %vegetation cover): 0-/00
Density of marsh vegetation <sup>2</sup> (C	Circle one): None, sparse, moderate, dense
Estimated average marsh vege	tation height (m): 0-1, 1-3) 3-6,>6.
Litter depth (cm): 3	Water depth (m):
Method used for measuring wa	ater depth (Circle one): staff gauge, meter stick, other:
Dis	tance 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):/ 5	many dilates and assessment bed on the beautiful bases of bottom

<sup>&</sup>lt;sup>2</sup> 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	Subitor chart
---------------------	---------------

Observer(s) Name(s): 5. Sweitzer B. Geiffil	- 1
Observer(s) Name(s). 3. 2001/2812 B. GEIFFI	Marriagad J. Managar
Survey Point (complete for each point): B2-2	11179
How was the point accessed? (Circle one): canoe, motor boat,	alk wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upl	and/marsh, open water/marsh,
nterior/marsh, other (describe)	and additional to
Classification & Disturban	ce a salay addition of the
NWI code (Record an NWI Code for the target wetland): PE	MIEd (mo Into doing to
NVCC Alliance (Percent on NVCC Alliance and are and are for the	target watland) 1. 1/ A. S. N
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland)1:_V, A, S, N,
Most dominant plant species (Record % Cover for 3 dominant sp	pecies):
Most dominant plant species (Record % Cover for 3 dominant species (Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Hibiscus moscheutors Typha latifalia	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)  30  40  20  imal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Hibiscus moscheuby  Typha latticlia  Typha	% Cover (Absolute cover)  30  40  20  imal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Hibiscus moscheubes  Typha lables  Angult 61-2  Carex lacustris  Natural Disturbance (circle all that apply): Fire, ice damage, and construction, invasive species control, wetlands restoration, dredgit  Month/year (if known) of natural disturbance event:	% Cover (Absolute cover)  30  15 40 20  imal/insect damage, trail/road ing, other:
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)  30  40  20  imal/insect damage, trail/road  ng, other:  tion, dredging, invasive specie

Photo 4510

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

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	X		10 minor	days not at	slavnost.
Trees	X				100
Bare soil					
Water	TIN 21 10	DES CONTRA	MAN - IO	- Continue	ab receil
Upland					
Mudflat	H ; Unint	-11/6/K 20 B	STAND IT SAFERA	apre sys	and sealing
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover):
Density of marsh vegetation <sup>2</sup> (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): O
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): 20

<sup>&</sup>lt;sup>2</sup> 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	Carrystein points
Observer(s) Name(s): 5. Sweitzer B. GRIEFITH	Luberruse only painted
Survey Point (complete for each point): 82-3 A1-9	odami?
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	The own

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)

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

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

Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Tuph- transitalia	70
Euphlorism maculatum	20
Carex lacustris	10

Photo 471

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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		X		Commence of the last	drawnin's
Trees		X			art and a second
Bare soil					
Water		mail (mailte)	- Factor atory	4140000	th inveg
Upland		V			
Mudflat	P. TRUMB	WITH TO SI	THE PERSON	PERSONAL PROPERTY.	EL SINT
Floating veg.					

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Wetland Interspersion (%open water and %vegetation cover): O _ /O D
Density of marsh vegetation <sup>2</sup> (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): 50 Upland area (m): /
Ditch (m): Large open-water area (m):
Mudflat (m): Small open-water area (m):
Road or dike (m):

<sup>&</sup>lt;sup>2</sup> 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	
rvey Date (DD/MM/YYYY): 25/56/2014/	
oserver(s) Name(s): J. Sweetzer	
rvey Point (complete for each point): 37-4 / Al-	8
w was the point accessed? (Circle one): canoe, motor boat,	walk, wade?
ge Type (Circle one): roadside/marsh, ditch or berm/marsh, u	ipland/marsh, open water/marsh
erior/marsh, other (describe)	
Classification & Disturba	ance
Classification & Distui ba	ince
CS Alliance (Record an NVCS Alliance code or codes for the st dominant plant species (Record % Cover for 3 dominant	ne target wetland) <sup>1</sup> :/, A , S, N species):
VCS Alliance (Record an NVCS Alliance code or codes for the ost dominant plant species (Record % Cover for 3 dominant Plant Scientific Name (e.g., Typha domingensis)	species):  % Cover (Absolute cover)
Typhe angusticolie	species):  % Cover (Absolute cover)
CS Alliance (Record an NVCS Alliance code or codes for the est dominant plant species (Record % Cover for 3 dominant Plant Scientific Name (e.g., Typha domingensis)	species):    % Cover (Absolute cover)
CS Alliance (Record an NVCS Alliance code or codes for the est dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha across (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha across (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	species):    % Cover (Absolute cover)   46   6   70   70   70   70   70   70   70
CS Alliance (Record an NVCS Alliance code or codes for the est dominant plant species (Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha and stiffer  Decodon Verbulatus  Nugran Variantus  Tural Disturbance (circle all that apply): Fire, ice damage, a	species):  % Cover (Absolute cover)  46  animal/insect damage, trail/road
CS Alliance (Record an NVCS Alliance code or codes for the est dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha analysis (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Typha analysis (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)	species):  % Cover (Absolute cover)  46  animal/insect damage, trail/road
CS Alliance (Record an NVCS Alliance code or codes for the st dominant plant species (Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha and stiffed and Verhallatus  Decodon Verhallatus  Variantim  Tural Disturbance (circle all that apply): Fire, ice damage, a	species):    % Cover (Absolute cover   46   6   6   6   6   6   6   6   6

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

Phoho 4480

 $<sup>^{1} \</sup> For \ NVCS \ Alliance \ codes, see \ \underline{http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecolege \ and \ and \ another \ anoth$ 

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	- X	4.20	and the same of	Commence of the last	
Trees	X				
Bare soil				Con pre-	
Water	X	CHO POPULAR	White sec	10000	217 121011
Upland			X		
Mudflat	OF WHITE	THANK BY	ond bearing	Selvinor a	ALL VER
Floating veg.	X				

Distance to vegetation	patch edge	(m): Transplant   Marie   (m)
Type of patch (Circle	one): none, ti	ree, shrub, herbaceous
Wetland Interspersion	n (%open wa	ter and %vegetation cover): 50-50
Density of marsh vege	tation <sup>2</sup> (Circ	cle one): None, sparse, moderate, dense
Estimated average ma	rsh vegetati	ion height (m): 0-1, 1-3) 3-6,>6.
Litter depth (cm):	3	Water depth (m): 25
Method used for meas	uring water	depth (Circle one): staff gauge, meter stick, other:
	Distar	nce to Physical Characteristics
Water edge (m):	Into ap	Upland area (m):
Ditch (m):		,
Mudflat (m):	inidadi asi	Small open-water area (m):
Road or dike (m):	30	county (coerbicates) and elecades)s, centured presention, set Mice me

<sup>&</sup>lt;sup>2</sup> 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

Survey Date (DD/MM/YYYY): 25/66/2614	
	antional property and party
Observer(s) Name(s): 5 WEITZER	To Manufacture of Tanton and I
Survey Point (complete for each point): B2-5	Industrial State of the Admits
How was the point accessed? (Circle one): canoe, motor boat,	walk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh u	pland/marsh, open water/marsh,
interior/marsh, other (describe)	207 E6 100 F
Classification & Disturba	nce de la
NWI code (Record an NWI Code for the target wetland):	PEMIED
()	
	1/1/2/1/
NVCS Alliance (Record an NVCS Alliance code or codes for the	e target wetland) <sup>1</sup> : $V_{\ell}A_{\ell}S_{\ell}N_{\ell}I_{\ell}$
Most dominant plant species (Record % Cover for 3 dominant	species):  % Cover (Absolute cover)
Most dominant plant species (Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)	species):
Plant Scientific Name (e.g., Typha domingensis)  Typha angustificial lahfilia	species):  % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)  Typha again labeling  Persitaria  Rettle  Natural Disturbance (circle all that apply): Fire, ice damage, a	% Cover (Absolute cover)  % Cover (Absolute cover)  % O  ZO  ZO  animal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Typha and the land land land land land land land land	species):    % Cover (Absolute cover)   80
Plant Scientific Name (e.g., Typha domingensis)  Typha any Molla  Sugitaria lahfelia  Persuana  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dred  Month/year (if known) of natural disturbance event:	species):    % Cover (Absolute cover)   80   70   20   20   20   animal/insect damage, trail/road   ging, other://A
Plant Scientific Name (e.g., Typha domingensis)  Supplied to the second of the second	% Cover (Absolute cover)  80 10 20 20 animal/insect damage, trail/road ging, other:
Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dred	species):    % Cover (Absolute cover)   80

Photo 4478

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		2.0	×		
Trees		X		Part Hat his	and the same of
Bare soil					
Water	Zakal (e	The state of	7.940 HO	-	on faring
Upland			X		
Mudflat	o hismili	the heart	All Je Will	BODES / ST	Mile Simil
Floating veg.					

Distance to vegetation patch edge (m):	Chastileptin
Type of patch (Circle one): none, tree, shrub, herbace	ous ) - I was elected the sense that the
Wetland Interspersion (%open water and %vegetation	on cover): 0 -/ 0 0
Density of marsh vegetation <sup>2</sup> (Circle one): None, spa	rse, moderate, dense
Estimated average marsh vegetation height (m): 0-	, (-3)3-6,>6.
Litter depth (cm): Water depth	(m):
Method used for measuring water depth (Circle one	
Distance to Physical	Characteristics
Water edge (m): 00	oland area (m):/5
Ditch (m): 50 La	rge open-water area (m):
Mudflat (m):Sn	all open-water area (m):
Road or dike (m): 4 U	

<sup>&</sup>lt;sup>2</sup> 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

Survey Date (DD/MM/YYYY): 26/06/2014	lens to public or "I" produced
Observer(s) Name(s): 5 Swettzer B. GRIFFI	TH
Survey Point (complete for each point): 82-6	
How was the point accessed? (Circle one): canoe, motor boat, w	valk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upl	land/marsh, open water/marsh,
interior/marsh, other (describe)	
Classification & Disturban	ICO
NWI code (Record an NWI Code for the target wetland):  PE  NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland)1: V.A.S.N.K.
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the  Most dominant plant species (Record % Cover for 3 dominant species)	target wetland) <sup>1</sup> : V.A.S.N.K.
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the  Most dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)	target wetland)¹:V,A,S,N,k,l pecies):  % Cover (Absolute cover)
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the  Most dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)	target wetland)¹: V.A.S.N.K.l  pecies):   Cover (Absolute cover)
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)  Gress  Garry   Acceptable	target wetland)¹:V,A,S,N,k,l  pecies):   Cover (Absolute cover)  40  30
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the  Most dominant plant species (Record % Cover for 3 dominant species)  Plant Scientific Name (e.g., Typha domingensis)	target wetland)¹:V.A.S.N.k.  pecies):   Cover (Absolute cover)

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

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



4507

 $<sup>^{1} \</sup> For \ NVCS \ Alliance \ codes, see \ \underline{http://www.natureserve.org/explorer/servlet/NatureServe?init=\underline{Ecol}}$ 

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			Y		
Trees			V		
Bare soil			^		
Water		V			
Upland		9			
Mudflat					
Floating veg.		Y			-

Distance to vegetation patch edge (m	):
Type of patch (Circle one): none, tree,	shrub, herbaceous
Wetland Interspersion (%open water	and %vegetation cover): 25 - 75
Density of marsh vegetation <sup>2</sup> (Circle of	one): None, sparse, moderate, dense
Estimated average marsh vegetation	height (m) (0-1), 1-3, 3-6,>6.
Litter depth (cm):	Water depth (m): 0.23
Method used for measuring water de	pth (Circle one): staff gauge, meter stick, other:
Distance	to Physical Characteristics
Water edge (m):	Upland area (m): 25
Ditch (m):/	Large open-water area (m):
Mudflat (m):	Small open-water area (m):
Road or dike (m):	

<sup>&</sup>lt;sup>2</sup> 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

Observer(s) Name(s): B. GRIFFITH J. SWEITZER	TOWNSHIELD TURNSHIP
urvey Point (complete for each point): 82-7	adumita
low was the point accessed? (Circle one): canoe, motor boat,	valk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	oland/marsh, open water/marsh,
nterior/marsh, other (describe)	The Author
Classification & Disturbat	nce the Arlan guillateness is a
NWI code (Record an NWI Code for the target wetland):	
WIGG AND OR I ANYON AND I I I I I I	
NVCS Alliance (Record an NVCS Alliance code or codes for the	e target wetland)1: V,A,S,N,
Most dominant plant species (Record % Cover for 3 dominant s	species):
Most dominant plant species (Record % Cover for 3 dominant s Plant Scientific Name (e.g., <i>Typha domingensis</i> )	species):  % Cover (Absolute cover)
Most dominant plant species (Record % Cover for 3 dominant s Plant Scientific Name (e.g., <i>Typha domingensis</i> )	species):  % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)  Typha angutifal a  Natural Disturbance (circle all that apply): Fire, ice damage, a	% Cover (Absolute cover)  70  nimal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Typha angut fol a  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge	% Cover (Absolute cover)  70  nimal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Typha angutifal a  Satural Disturbance (circle all that apply): Fire, ice damage, a onstruction, invasive species control, wetlands restoration, dredge	% Cover (Absolute cover)  70  nimal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Typha angut follow  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge Month/year (if known) of natural disturbance event:	% Cover (Absolute cover)  70  nimal/insect damage, trail/road ging, other:
Plant Scientific Name (e.g., Typha domingensis)  Typha angut fall a  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge  Month/year (if known) of natural disturbance event:	% Cover (Absolute cover)  70  nimal/insect damage, trail/road ging, other:
	% Cover (Absolute cover)  70  nimal/insect damage, trail/road ging, other:  ction, dredging, invasive species
Plant Scientific Name (e.g., Typha domingensis)  Typha angutifal a  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge  Month/year (if known) of natural disturbance event:  Management Actions (circle all that apply): Trail/road construction	% Cover (Absolute cover)  70  nimal/insect damage, trail/road ging, other:  ction, dredging, invasive species management, other:

<sup>&</sup>lt;sup>1</sup> For NVCS Alliance codes, see <a href="http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol">http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol</a>

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			All Andrew	Consessable of		
Trees			4 1 1 1 1 1		A POST AND LAND	THURST AND
Bare soil				Term to be		
Water	M. Same	country (see	STORE OF	X	1998 Inter	SIL CELL
Upland						
Mudflat	IGH WEST	WINE SOLE	CHILD IDEAL	graditation	Name of the	1 3 7 7 7 1
Floating veg.						

Distance to vegetation p	atch edge (m):
	e): none, tree, shrub, herbaceous
Wetland Interspersion (	%open water and %vegetation cover): 40/60
Density of marsh vegeta	tion <sup>2</sup> (Circle one): None, sparse, moderate, dense
Estimated average mars	h vegetation height (m): 0-1 (1-3,)3-6,>6.
Litter depth (cm):	O Water depth (m): 0.58
Method used for measur	ring water depth (Circle one): staff gauge, meter stick, other:
	Distance to Physical Characteristics
Water edge (m):	Upland area (m): Zoo
Ditch (m):	Large open-water area (m):
Mudflat (m):	Small open-water area (m):
Road or dike (m): 2	O Description and Street only westered restoration, with the paragraph of O

<sup>&</sup>lt;sup>2</sup> 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