# **Beneficial Use Impairment Removal Project**

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



**January 21, 2016** 

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# **TABLE OF CONTENTS**

Sect	tion		Page
1.0	Intro	oduction1	
1	.1 Ba	ckground	1
1	.2 Stu	ıdy Area	2
2.0	Metl	hods	4
2	.1 Ma	arsh Anuran Sampling	4
	2.1.1	Survey Routes and Points	4
	2.1.2	Sampling Periods and Conditions	6
	2.1.3	Call Surveys	7
	2.1.4	Anuran Survey Data	7
	2.1.5	Anuran Habitat Data	8
	2.1.6	Photographic Documentation of Survey Points	8
2	.2 Ma	arsh Bird Sampling Design	8
	2.2.1	Survey Routes and Points	8
	2.2.2	Sampling Periods and Conditions	9
	2.2.3	Call Surveys	12
	2.2.4	Marsh Bird Survey Data	13
	2.2.5	Marsh Bird Habitat Data	14
	2.2.6	Photographic Documentation of Survey Points	14
3.0	Resu	ılts	15
3	.1 An	urans	15
	3.1.1	Anuran Surveys	15
	3.1.2	Incidental Observations	
	3.1.3	Disturbances Noted During Survey Efforts	19
	3.1.4	Habitat	20
3	.2 Ma	arsh Birds	22
	3.2.1	Marsh Bird Surveys	22
	3.2.2	Incidental Observations	
	3.2.3	Disturbances Noted During Survey Efforts	
	3.2.4	Habitat	
4.0	Disc	sussion and Conclusions	29
5.0		rature Cited	

# LIST OF APPENDICES

Appendix B: Appendix C:	Photographic Documentation Coordinates for Anuran and Marsh Bird Survey Locations 2105 Anuran Survey Data and Forms 2015 Marsh Bird Survey Data and Forms 2015 Habitat Survey Data and Forms	
	LIST OF FIGURES	
Figure 1. Niag	gara River Area of Concern (New York Portion)	3
	sh Anuran Survey Route and Point Locations	
	arsh Bird Survey Route and Point Locations	
Figure 3B. Ma	arsh Bird Survey Route and Point Locations.	11
T-1-1- 1 2015	LIST OF TABLES	6
	Anuran Survey Dates and Temperature Ranges	
	of Target Marsh Anurans in the NR AOC	
	Survey Dates for Target Marsh Bird Species	
	of Primary and Secondary Marsh Birds Targeted in the NR AOC	
	an Species Detections per Survey Eventran Species Detections per Survey Point	
	tion of Anuran Species in Relation to Survey Points	
	an Species Detected Using 3 Minute and 5 Minute Call Intervals	
	e Levels During Anuran Survey Events	
	ran Marsh Habitat Conditions	
	sh Bird Species Detections per Survey Event	
	rsh Bird Species Detections per Survey Point	
	ise Levels During Marsh Bird Survey Events.	
	sh Bird Habitat Conditions	

# 1.0 INTRODUCTION

# 1.1 BACKGROUND

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

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

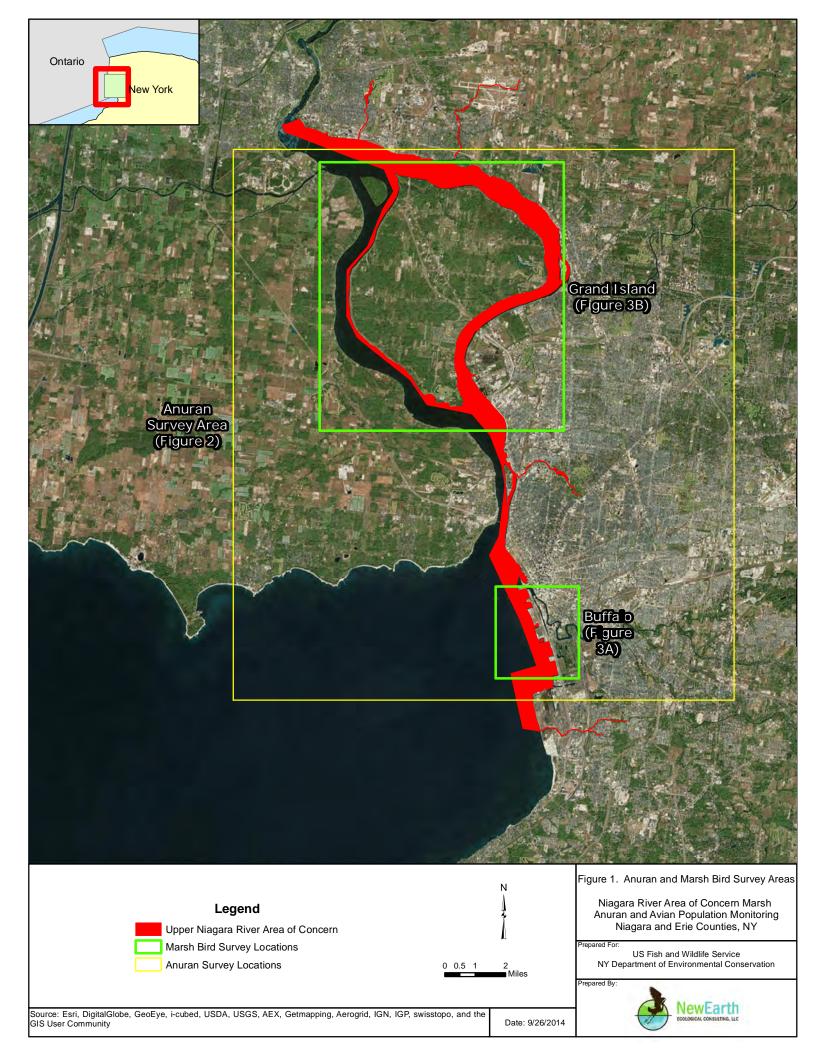
In February 2014, the NYFO and NYSDEC issued a Scope of Work for performance of NR AOC marsh anuran and avian population monitoring surveys (USFWS 2014). Following the criteria outlined in the Scope of Work, in April 2014 a Work Plan was developed, which identified the survey protocols to be used over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

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

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

# 1.2 STUDY AREA

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





#### 2.0 METHODS

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

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

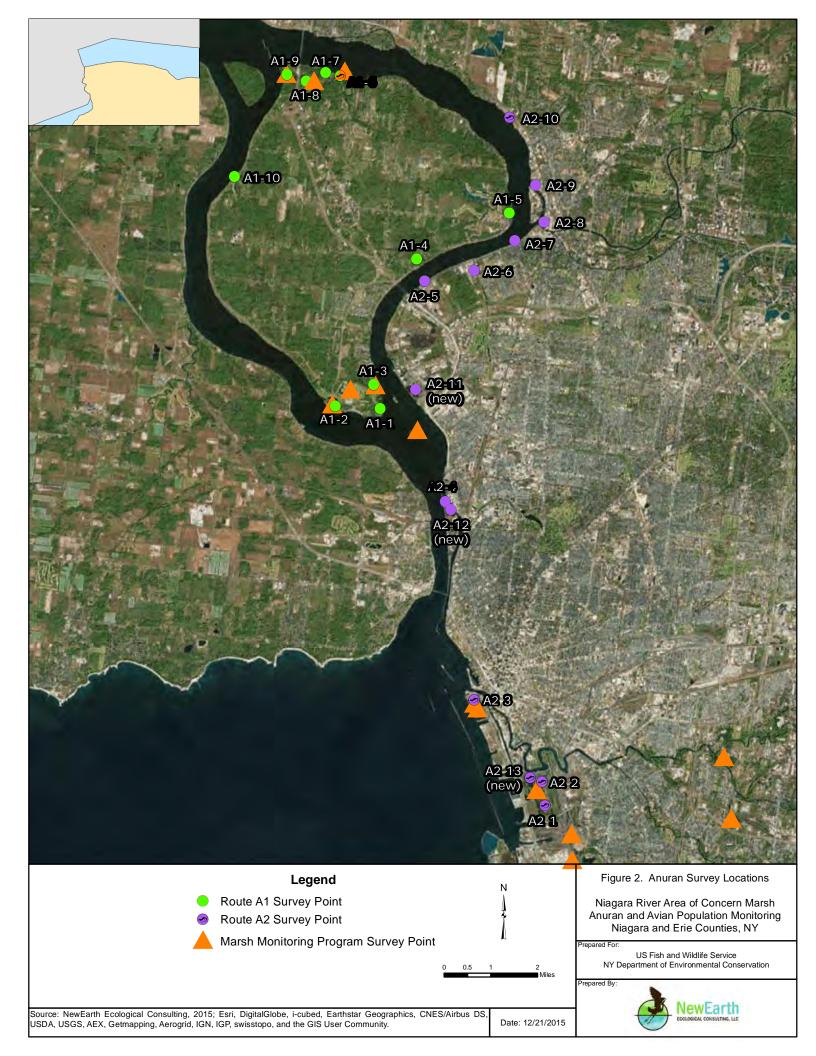
#### 2.1 MARSH ANURAN SURVEYS

#### 2.1.1 Survey Routes and Points

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

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

**Figure 2. Marsh Anuran Survey Route and Point Locations** 



#### 2.1.2 Sampling Periods and Conditions

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

**Table 1. 2015 Anuran Survey Dates and Temperature Ranges** 

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

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

Table 2. List of Target Marsh 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

# 2.1.3 Call Surveys

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

# 2.1.4 Anuran Survey Data

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

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

# **Background Noise**

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

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

#### Weather Conditions

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

#### 2.1.5 Anuran Habitat Data

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

# 2.1.6 Photographic Documentation of Survey Points

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

#### 2.2 MARSH BIRD SURVEYS

# 2.2.1 Survey Routes and Points

Survey routes and points were originally established using Google Earth<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. Following 2014 efforts, bird points B1-8 and B1-9 were added to capture two additional marsh complexes identified while on site for 2014 efforts, and point B1-1 was eliminated because of unavoidable highway noise so excessive that surveys were not possible. Two survey routes were established as shown on Figures 3A and 3B; Route B1 comprised of eight points and Route B2 comprised of seven. Thirteen of the fifteen survey points are located near previously surveyed areas established by NYSDEC as part of the NR MMP and included all points on routes B1 and B2 except B2-1, B2-2, and B1-9 (Figures 3A and 3B).

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

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

# 2.2.2 Sampling Periods and Conditions

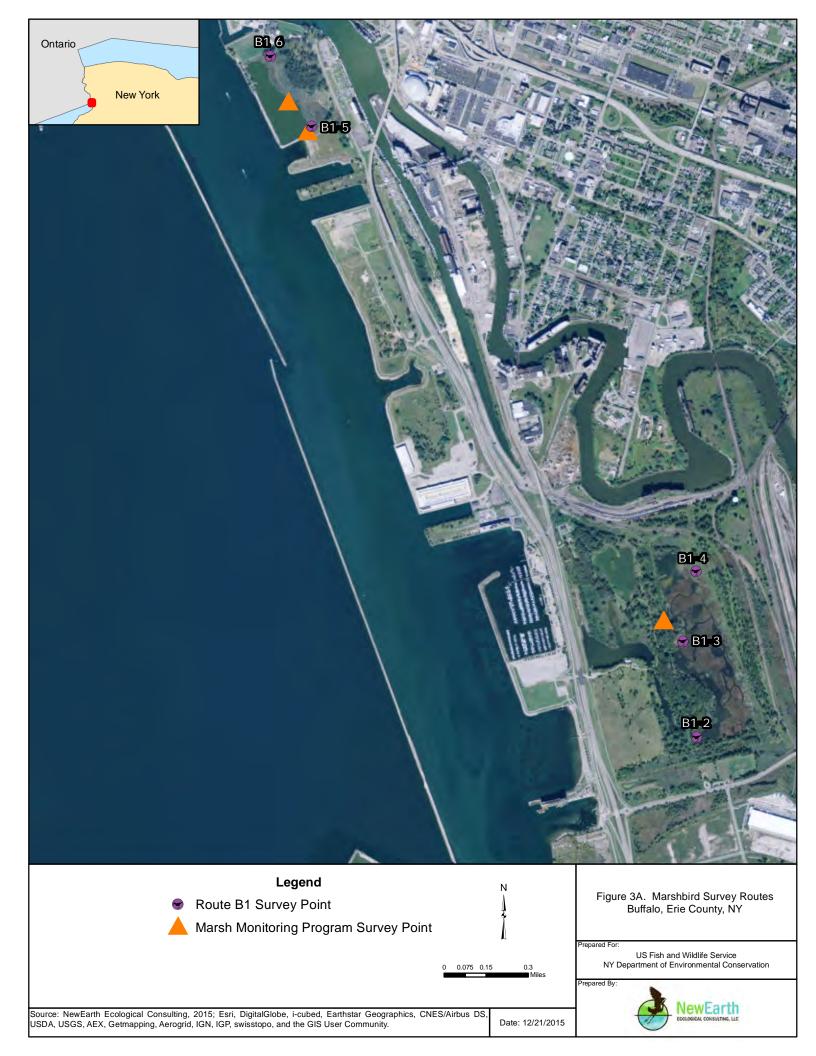
The primary goal of the marsh bird survey effort was to collect information on target primary and secondary marsh bird species to facilitate efforts to establish population estimates and to evaluate trends in the number of breeding adults for each species within the NR AOC. Per approved marsh bird survey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

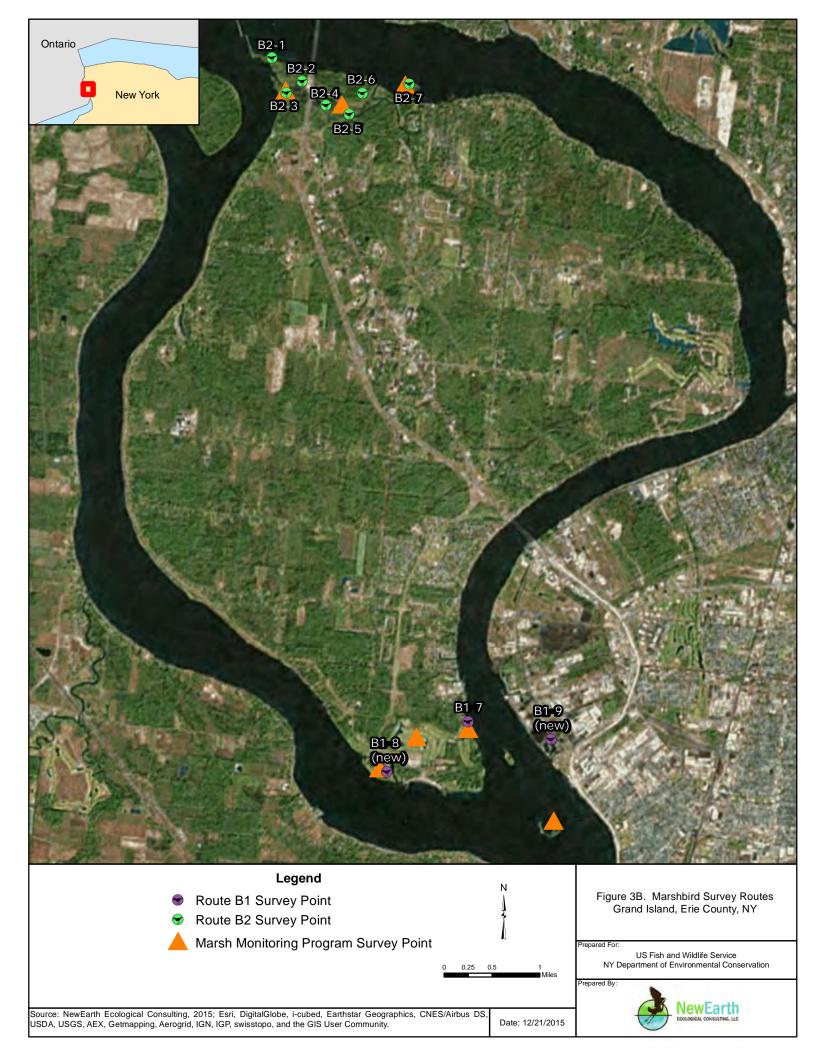
**Table 3. 2015 Survey Dates for Target Marsh Bird Species** 

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









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
<u>Primary</u>	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
Secondar	y 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 were <20 km/hr).

#### 2.2.2 Call Surveys

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

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

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

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

# 2.2.3 Marsh Bird Survey Data

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

# Primary Focal, Broadcast Species

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

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

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

# Secondary Focal, Non-Broadcast Species

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

#### 2.2.4 Marsh Bird Habitat Data

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

#### 2.2.5 Photographic Documentation of Survey Points

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

# 3.0 RESULTS

#### 3.1 ANURANS

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

# 3.1.1 Anuran Surveys

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

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

**Table 5. Anuran Species Detections per Survey Event** 

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

<sup>&</sup>lt;sup>1</sup> 23 events total

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

<sup>&</sup>lt;sup>2</sup> 92 events total

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

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

Table 6. Anuran Species Detections per Survey Point

Table 0. Anuran species Detections per survey rount															
Route A1															
													# Unique Points Species		
Species				1	2	3		4	5	6	7	8	9	10	was Detected at
Spring Peeper				X	X	X		X		X	X	X	X	X	9
Green Frog					X	X		X			X	X	X		6
Bull Frog						X						X	X		3
Pickerel Frog															0
Northern Leopar	d Fr	og						X				X			2
American Toad					X										1
Gray Tree Frog															0
Chorus Frog				X	X			X			X				4
Mink Frog	Mink Frog														0
Wood Frog															0
								F	Rou	te A2	2				
Spring Peeper	X	X	X		X						X		X		6
Green Frog	X	X	X	X							X	X	X		7
Bull Frog	X	X	X						X				X		5
Pickerel Frog															0
Northern	x	v									X		X		4
Leopard Frog X X											Λ		А		4
American Toad x						X			X						3
Gray Tree Frog	Gray Tree Frog														0
Chorus Frog	X	X				X					X		X		5
Mink Frog															0
Wood Frog															0

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

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

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

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

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

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

Table 6. Amuran Specie	Survey R			Route A2							
			3-Minute	5-Minute							
	3-Minute Period	5-Minute Period	Period	Period							
	# of Points	# of Points	# of Points	# of Points							
Species	Recorded	Recorded	Recorded	Recorded							
Survey Event 1 (April 17-18, 2015)											
Spring Peeper	9	9	3	4							
Green Frog	0	0	0	0							
Bull Frog	0	0	0	0							
Pickerel Frog	0	0	0	0							
Northern Leopard Frog	2	2	3	4							
American Toad	0	0	3	3							
Gray Tree Frog	0	0	0	0							
Chorus Frog	4	4	5	5							
	Survey Even	t 2 (May 14-15, 20	15)								
Spring Peeper	5	5	6	6							
Green Frog	0	0	0	0							
Bull Frog	0	0	0	0							
Pickerel Frog	0	0	0	0							
Northern Leopard Frog	0	0	0	0							
American Toad	1	1	0	0							
Gray Tree Frog	0	0	0	0							
Chorus Frog	0	0	0	0							
	Survey Even	nt 3 (June 12-13, 201	15)								
Spring Peeper	2	2	1	1							
Green Frog	3	3	5	6							
Bull Frog	1	1	3	4							
Pickerel Frog	0	0	0	0							
Northern Leopard Frog	0	0	0	0							
American Toad	0	0	0	1							
Gray Tree Frog	0	0	0	0							
Chorus Frog	0	0	0	0							

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

	Survey R	Route A1	Survey Route A2			
Species	3-Minute Period # of Points Recorded	5-Minute Period # of Points Recorded	3-Minute Period # of Points Recorded	5-Minute Period # of Points Recorded		
•	nt 4 (July 11-12, 201	15)				
Spring Peeper	0	0	0	0		
Green Frog	5	6	7	7		
Bull Frog	2	3	4	4		
Pickerel Frog	0	0	0	0		
Northern Leopard Frog	0	0	0	0		
American Toad	0	0	0	0		
Gray Tree Frog	0	0	0	0		
Chorus Frog	0	0	0	0		

#### 3.1.2 Incidental Observations

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

#### 3.1.3 Disturbances Noted During Survey Efforts

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

**Table 9. Noise Levels During Anuran Survey Events** 

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

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

**Table 10. Anuran Marsh Habitat Conditions** 

Point	General Type	Detection s <sup>1</sup>	% Veg Cover²	Water Depth (m)	% <b>Typh</b> a (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>									
1 0111	Jones Lype			Rou	te A1														
A1-1	Open Water/Marsh	3	110	0	10	10	0	0	20/80	3									
A1-2	Open Water	5	30	0.75	10	10	0	0	80/20	1									
A1-3	Open Water/Marsh	5	130	0	60	40	0	0	30/70	5									
A1-4	Marsh	5	100	0.15	35	14	0	0	0/100	None									
A1-5	Open Water/Marsh	0	45	0.12	30	5	0	0	70/30	3									
A1-6	Open Water	1	0	0.1	0	0	0	0	100/0	0									
A1-7	Marsh	4	110	0	30	0	0	0	0/100	80									
A1-8	Open Water/Marsh	6	60	0.25	40	0	0	0	50/50	1									
A1-9	Marsh	5	100	0	70	0	0	0	0/100	None									
A1-10	Open Water	2	0	0.6	0	0	0	0	100/0	2									
			ı	Rou	te A2		ı	ı											
A2-1	Open Water/Marsh	7	67	0	60	0	0	5	30/70	1									
A2-2	Open Water/Marsh	9	100	0	100	0	0	0	25/75	1									
A2-3	Marsh	6	80	0	70	0	10	0	0/100	70									
A2-4	Open Water/Marsh	2	37	0.8	20	0	0	0	75/25	2									
A2-5	Marsh	1	100	0		0	100	0	0/100	None									
A2-6	Marsh	2	110	0	30	0	70	0	0/100	None									
A2-7	Open Water	0	0	0.17		0	0	0	100/0	0									
A2-8	Open Water	0	0	1.0		0	0	0	100/0	0									
A2-9	Open Water/Marsh	2	45	0	20	5	20	0	40/60	10									
A2-10	Open Water/Marsh	0	28	0.5	10	0	0	0	80/20	5									
A2-11	Open Water/Marsh	5	90	1.5	0	10	75	5	75/25	3									
A2-12	Open Water/Marsh	2	95	0.8	60	15	0	0	65/35	3									
A2-13	Open Water/Marsh	9	85	1.2	30	15	0	0	75/25	2									
Cover mag $(I) = New$	y exceed 100% due York State recogniz	to overl ed non-r	ap of veg	getation at vasive spe	varying l	native spe	ecies, but p		ally noxious	Cumulative number of species detections for all survey events  Cover may exceed 100% due to overlap of vegetation at varying heights within a strata  (I) = New York State recognized non-native invasive species; (N) native species, but potentially noxious  0 = open water present at point location; none = no open water within 100 m									

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

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

#### 3.2 MARSH BIRDS

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

# 3.2.1 Marsh Bird Surveys

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

# **Primary Focal Species**

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

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

**Table 11. Marsh Bird Species Detections per Survey Event** 

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

<sup>1 15</sup> events total

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

<sup>2 45</sup> events total

Table 12. Marsh Bird Species Detections per Survey Point

	Number of Individuals Detected <sup>1</sup>									
	<b>T</b> ,		<b>T</b> 70 • •				Pied-	TD ( )		
Doi:u4	Least	Cama	Virginia Rail	American	Common	American	Billed	Total		
Point	Bittern	Sora		Bittern y Event 1 (M	Gallinule	Coot	Grebe	Detections		
B1-2	1(1)	_	1 (0)	y Event 1 (M	ay 15-10, 20	-	_	2(1)		
B1-3	0 (1)		1 (0)	-	0(1)		-	1 (3)		
B1-3	-	-	1(1)		0(1)	-		1 (2)		
B1-4 B1-5			-	-	-	-		0		
B1-6	-	-	_		_			0		
B1-0 B1-7		<u>-</u>	-	-	_	-		0		
B1-7								0		
B1-8	-	-	-	-	-	-	-	0		
B1-9 B2-1	-	-	0 (1)	-	-	-	-	0 (1)		
B2-1 B2-2	-	-	0(1)	0 (1)	-	-	-	0(1)		
B2-2 B2-3		-	- 0 (1)	` ′		-	-	\ /		
	-	-	0(1)	-	-	-	-	0 (1)		
B2-4	-	-	-	-	-	-	-	_		
B2-5	-	-	- 0 (1)	-	-	-	-	0		
B2-6	-	1 (0)	0(1)	-	1 (2)	1 (0)	-	0(1)		
B2-7	-	1 (0)	- C	y Event 2 (Ju	1 (2)	1 (0)	2 (6)	5 (8)		
B1-2	0 (1)	l	1	ĺ			0 (1)	0 (2)		
B1-2 B1-3	0 (1)	1 (0)	1 (1)	-	1 (1)	-	0 (1)	0 (2) 3 (3)		
B1-3 B1-4	0 (1)	1 (0)	1(1)	-	1(1)	-	-	` '		
B1-4 B1-5	-	-	3 (1)	-	0 (1)	-	-	3 (2))		
B1-3 B1-6	-	-	-	-	0 (1)	-	-	0 (1)		
B1-0 B1-7	-	-		-	-	-	-			
B1-7	-	-	0 (1)	-	-	-	-	0 (1)		
	-	-	- 1 (NIA)	-	-	-	-			
B1-9		-	1 (NA)			-	-	1 (0)		
B2-1	-	-	-	-	-	-	-			
B2-2	-	-	- 0 (1)	-	-	-	-	0 (1)		
B2-3	-	-	0 (1)	-	-	-	-	0(1)		
B2-4	-	-	-	-	-	-	-	0		
B2-5	-	-	-	-	-	-	-	0		
B2-6	-	-	-	-	-	-	-	0		
B2-7	-	0 (1)	-	-	-	-	2(1)	2 (2)		

Results from 2014 are indicated in parenthesis

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

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

Results from 2014 are indicated in parenthesis

# Secondary Focal Species

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

#### 3.2.2 Incidental Observations

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

# 3.2.3 Disturbances Noted During Survey Efforts

Similar to anuran survey efforts, noise (primarily from vehicle and boat traffic), had some effect on surveyor ability to detect calls. Noise was at moderate (score = 2) to serious (score = 3) levels during two or more survey events at seven (47%) of the 15 point locations (Table 13). Although not necessarily documented during actual survey event windows, boats including excessively loud high-speed jet boats, were repeatedly observed in close proximity to known nesting areas for marsh birds and herons such as point B2-7 as well as the Motor Island heron rookery and adjacent restoration site. Additionally, ongoing restoration efforts in Tifft and Times Beach nature preserves

has affected vegetation and in some cases resulted in fluctuating water levels within the marsh system. Disturbance from these activities may have a short-term direct negative affect on marsh bird breeding activities in the marsh, but efforts are likely to improve conditions for marsh species over time. Survey points that are most likely to be affected by these activities include B1-2, B1-3, B1-5 and B1-6.

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

**Table 13. 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>
	Route		
B1-2	2	3	0
B1-3	2	2	1
B1-4	1	0	1
B1-5	0	0	0
B1-6	0	0	0
B1-7	1	0	1
B1-8	0	0	1
B1-9	1	0	0
	Route	e <b>B2</b>	
B2-1	1	3	2
B2-2	3	1	3
B2-3	2	2	1
B2-4	3	0	2
B2-5	1	0	1
B2-6	1	0	1
B2-7	1	3	2

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

#### 3.2.4 Habitat

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

**Table 14. Marsh Bird Habitat Conditions** 

	Maish bhu Ha									
Point	General Type	Detections <sup>1</sup>	% Veg Cover²	Water Depth (m)	% Typha (N)³	% Lythrum (I) <sup>3</sup>	% Phragmites (I)	% Lonicera (I) <sup>3</sup>	Open Water/Veg Interspersion	Distance to Open Water (m) <sup>4</sup>
B1-2	Open Water/Marsh	4	67	0	60	0	0	5	30/70	1
B1-3	Open Water/Marsh	4	100	0.67	30	0	0	0	70/30	0
B1-4	Open Water/Marsh	6	100	0.9	100	0	0	0	25/75	1
B1-5	Marsh	0	80	0	70	0	10	0	0/100	70
B1-6	Marsh	0	100	0	80	0	0	0	25/75	50
B1-7	Open Water/Marsh	0	125	0.1	50	30	0	0	30/70	3
B1-8	Open Water	0	30	0.75	10	10	0	0	80/20	1
B1-9	Open Water/Marsh	1	90	1.5	0	10	75	5	75/25	3
B2-1	Marsh	0	80	0	30	0	0	0	0/100	none
B2-2	Marsh	0	105	0	55	0	0	0	0/100	none
B2-3	Marsh	2	100	0	70	0	0	0	0/100	none
B2-4	Open Water/Marsh	0	60	0.25	40	0	0	0	50/50	1
B2-5	Marsh	0	130	0	80	0	0	0	0/100	none
B2-6	Open Water/Marsh	0	90	0.23	0	0	0	0	25/75	1
B2-7	Open Water/Marsh	10	70	0.58	70	0	0	0	40/60	0

<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

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

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

### 4.0 DISCUSSION

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

#### **Routes and Points**

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

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

### Anurans

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

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

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

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

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

### Marsh Birds

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

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

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

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

### 5.0 CONCLUSIONS

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

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

### 6.0 LITERATURE CITED

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# APPENDIX A PHOTOGRAPHIC DOCUMENTATION



Anuran Survey Point A1-1 Facing Northeast



Anuran Survey Point A1-2 Facing Southwest



Anuran Survey Point A1-3 Facing North



Anuran Survey Point A1-4 Facing North



Anuran Survey Point A1-5 Facing North



Anuran Survey Point A1-6 Facing Northeast



Anuran Survey Point A1-7 Facing East



Anuran Survey Point A1-8 Facing North



Anuran Survey Point A1-9 Facing West



Anuran Survey Point A1-10 Facing Southeast



Anuran Survey Point A2-1 Facing Southeast



Anuran Survey Point A2-2 Facing Southeast



Anuran Survey Point A2-3 Facing Northwest



Anuran Survey Point A2-4 Facing Northeast



Anuran Survey Point A2-5 Facing West



Anuran Survey Point A2-6 Facing North



Anuran Survey Point A2-7 Facing Northeast



Anuran Survey Point A2-8 Facing Southwest



Anuran Survey Point A2-9 Facing Southwest



Anuran Survey Point A2-10 Facing Northwest



Anuran Survey Point A2-11 Facing West



Anuran Survey Point A2-12 Facing Southeast



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



Avian Survey Point B1-2 Facing East



Avian Survey Point B1-3 Facing Northeast



Avian Survey Point B1-4 Facing Southwest



Avian Survey Point B1-5 Facing Northwest



Avian Survey Point B1-6 Facing South



Avian Survey Point B1-7 Facing Southeast



Avian Survey Point B1-8 Facing West



Avian Survey Point B1-9 Facing West



Avian Survey Point B2-1 Facing South



Avian Survey Point B2-2 Facing West



Avian Survey Point B2-3 Facing West



Avian Survey Point B2-4 Facing North



Avian Survey Point B2-5 Facing North



Avian Survey Point B2-6 Facing South



Avian Survey Point B2-7 Facing Northeast

### **APPENDIX B**

## COORDINATES FOR ANURAN AND MARSH BIRD SURVEY LOCATIONS

### Anuran and Marsh Bird Survey Point Locations

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

# APPENDIX C 2015 ANURAN SURVEY DATA AND FORMS

Please comp	lete information b	elo	w		D	ata	col	lec	ted	at	sta	rt o	f e	ach	sur	vey	ро	int			
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American toad																	8		9	-	0
Gray tree frog												0	9							В	B
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Mink frog																		1			
Wood frog																					
American bull f	rog																				
Green frog																					
Northern leopar	d frog							1	1	+	1					1	1				
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American toad				28							1	1							10
Gray tree frog																			
Spring peeper		1	2	2	2														
Western/Boreal	chorus frog	1	1	13	18						1	1							
Mink frog																			
Wood frog																			
American bull f	rog																	1	
Green frog					0		-												
Northern leopar	rd frog	1	1	2	9														
Pickerel frog															-				
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THE CHUNKS ON NIABARA RIVER

10 - CHURUS FROOS ACRUSS ROAD TO EAST NAY TO POINTS

4- & BUT DRY, NO POOLS STANDING HAD

2- MANY LEUPARD IN & PSEPER, TOAD, CHORUS IN & DUE EAST 150 YDS

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American toad							1	1							
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Western/Boreal	chorus frog			1 1			1	1							
Mink frog															
Wood frog															
American bull f	rog														
Green frog							1								
Northern leopar	rd frog		-	1			2	2							
Pickerel frog															
Comments: C	HURUS FROGS TO WEST O	TO	E	AST A	OF	U6	RI	VER	e R ER	019	0	VE.	RYU	HIE	
13-MOV8	ED - NO HAE	377	47	-	@ 8	R	16	INI	AL	18	OCA	ATLO.	~		
ADD 13 -	NO FROGS BU	17	PO	NO	11/1	AR	5	4							
= A	4DJ TO # 2	. P	100	A	TO	4	ve	ST					NO 1	noon	'

14 - TIFFT PARKUNA ARSA BOARDWALK TO NEND PEEPERS, CHORUS, TOAD ON MARSH EDGE TO NW LEOPARDS SURROUND BOADWALK 11 - LANDFILL -DELETE POINT Niagara River Area Of Concern Marsh Anuran Survey Protocol Anuran Calling Survey Data Form

Please comp	Observer S. GROVE	pelo	w		D	ata co	llect	ed	at sta	rt of	each	sur	vey	po	int			
Observer Name(s):	S. GROVE M. GROVE					dditiona		T										
Route Number:	Al																	
Survey Date (mm/dd/yyyy):	5/15/2015																	
Window Number:					Da	ays since	e last ra	ainfa	all: ø			.6'	or	15	115		5"	or
Data collecte	d at each point	-	1		2	1 2			vey Po	A COLUMN TWO IS NOT THE OWNER.	Num							
	Start Time (military):	22	145	2	209	2310	23		2339	210	82	055	10	8	_	9		LO
	Air Temperature:				-											-	2	
Select Scale Was noise a factor		6	3	-	3	63	60		62	65		65		55	6	54	6	4
	eak? (check if yes)		0		0	0	3		2	0		7		3		2	1	
Wind (Use Wind S			NO	_	J	N	N		N	N		N	_	N	N		1	1
Sky (Use Sky Code		1	2	-	2	2	0		0	0		2	1		C			
Moon or Moonlight	The state of the s	-	N		V	N	N		2	5	-	5	ó	X	5	-	6	1
	at passed (within 50 m)	0	_	0	0	00		3		1		N	1	10	1		1	V
Snow cover (Y or I		-	IN	V	1	N	9 1		00	ON	00	N	0	10	0	10	2	
ipecies List		_	1	_	2	3	4		5	6		7	1	8	-	9	-	0
American toad				1	-									Ī			-	
Gray tree frog		0	3	Δ	10									NB		0		
Spring peeper		2	A	1	1						- 2	200	2	2	2	2	_	_
Western/Boreal	chorus frog																	
Mink frog																		
Wood frog																		
American bull fi	rog																	
Green frog																		
Northern leopar	d frog																	
Pickerel frog																		
Comments: A	MCO/ PBGR   VIRA	6	O A	6														
PERPERS @	7,9 IN SAMI	- 1	MAR	514	51	STEN	1 8	0:	7	50	m	qwa	1					
SCAMSRED	SHOWERS 20	000	-	2:	200													
TOADS ON TH	SHOWERS 20 PAIL NEAR ALG		1	LEG	PAG	O FR	06 0	N	BERI	n 6	0 P	1-	9	)	LE	FA	26	0
IN LAWN	NEAR POINT												-1				-	
The man are a	LOUIS LALL																	

TOADS HEARP CALLING @ SEV. LOCATIONS AROUND S. END OF GRAND ISL.

Please comp	lete information b	elc	w		D	ata	col	lected	at s	tai	rt of ea	ch sur	vey po	int	
Observer Name(s):	S GROVE M GROVE							notes:							
Route Number:	A2				T										
Survey Date (mm/dd/yyyy):	05/14/2015														
Window Number:					Da	ays s	ince	last rainf	all:		3		.5"	ON 5	/11
Data collecte	d at each point			-		_				_	int Nu				
	Start Time (military):		20		2	_	3	4	5		6	7	8	9	10
	Air Temperature:		30		45	1	40	2313	23	55	2406	2418	2426	2437	2440
Select Scale	e: °C °F	3	3	5	3	5	3	53	53	3	52	53	52	51	51
Was noise a facto	r? (use index)		1	0	1	B		3	3		2	a	1	1	2
	eak? (check if yes)		-	-	_	-	_	_	-	_	-		-	-	0
Wind (Use Wind S			1	1		1		2	1		1	2	1	2	2
Sky (Use Sky Cod		Ó	X	0		1	4	Õ	2		2	a	2		
Moon or Moonlight		1	J	1	-	1	1	N	N		N	N	N	2	2
	at passed (within 50 m)	0	0	0	0	0	0	0 0	_	2	21	00	00	00	00
Snow cover (Y or	N)		1	1	1	1	1	N	N		N	N	N	N	N
Species List			1		2		3	4	5		6	7	8	9	10
American toad															
Gray tree frog															
Spring peeper		1	1	1	0	1	0		(3)	0					
Western/Boreal	chorus frog								Ì						
Mink frog						7									
Wood frog	-														
American bull f	rog														
Green frog															
Northern leopar	d frog														
Pickerel frog															
Comments:	5900 Mi.	£ £ 5	16H	T - L	POL	VF	PE	EPER	S	1 40	NON				

LONE PEEPERS PTS 1, 2, 3, 5, 11, 13

POOR HABITAT 4, 5, 8

NO 11 7, 10

Please compl	ete information b	elo	w		Data	col	ected	at sta	rt of e	ach sur	vey po	int	
Observer Name(s):	S. GROVE M. GROVE					ional r							
Route Number:	A2												
Survey Date (mm/dd/yyyy):	05/14/2015	-											
Window Number:				-	Days	since I	ast rainf	all:		*	SON	5/11	
Data collected	d at each point					7			oint Nu				
	Start Time (military):		1	232	0 1	3	4	5	6	7	8	9	10
	Air Temperature:		0.0					-					
Select Scale	· °C (F)	5	2	52		2							
Was noise a factor				2		0							
Did you take a brea Wind (Use Wind So			-	-				-	-	-			
Sky (Use Sky Code				2		2							
Moon or Moonlight	•		2	N	_								
	t passed (within 50 m)		0	00		0							
Snow cover (Y or N			N	N	_	V							
Species List		_	1	2	_	3	4	5	6	7	8	9	10
American toad													
Gray tree frog													
Spring peeper		(3)	0		1	1							
Western/Boreal	chorus frog												
Mink frog													
Wood frog													
American bull fr	og												
Green frog													
Northern leopard	d frog												
Pickerel frog													

Please comp	lete information b	elo	w	D	ata	col	lect	ted	at sta	rt of ea	ach sur	vey	poi	int			
Observer Name(s):	S. GROVE M. GROVE			А	dditio	onal r	note	5:	1002	clo	vos	R	A PI	V			
Route Number:	A-1				W	171	111	rp	AST	2 H	es of	S	UR	UE	Y .	57A	R
Survey Date (mm/dd/yyyy):	6/12/2015	-															
Window Number:	3			Di	ays s	ince	last	rainfa	all: d	RA	INW	TH	IN	P	957	ć	2
Data collecte	d at each point					_	_			oint Nu	mber		_				_
	Start Time (military):	22	56	2309	33	3		39	2353	2143	2125		59	-	9	22	0
	Air Temperature:				-	-			-								
Select Scale	e: °C (°F)	5		59	50	1	5	1.	59	58	58	S	8	5		5	_
Was noise a facto	r? (use index) eak? (check if yes)	A	00	01			0		3	0	D		5	-	3	0	
Wind (Use Wind S		_	7	a	1	)	1		1	2	1			1		1	1
Sky (Use Sky Cod		_	15	5	5	-	2		à	2	a	2	1	3	4	3	1
Moon or Moonligh		1		N	1	1	7	1	N	N	N	1	_	N	7	1	
Number of cars th	nat passed (within 50 m)	0	0	00	0	0	1	2	00	00	00	0	0	0	0	1	1
Snow cover (Y or	N)	N												-		-^	J
Species List			1	2		3		4	5	6	7		8		9	1	.0
American toad													_				
Gray tree frog																	
Spring peeper					1	1										1	
Western/Borea	chorus frog																
Mink frog																多	AAA
Wood frog																	
American bull	frog				1	1											
Green frog							2	0				1	1	1	1		
Northern leopa	rd frog																
Pickerel frog																	
Comments:	NO CHORUSING COOT (MULINO				TOP	40	-	w.	RIVE	RRI		71	NO	5 (	5/1	E	

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

Please compl	lete information be	elov	N		Da	ta c	oll	ect	ed a	at star	t of	ea	ch sur	vey	poi	nt		
Observer Name(s):	S. GROVE M. GROVE				Add	dition	al n	otes	:									
Route Number:	Aa			-1														
Survey Date (mm/dd/yyyy):	6/13/2015																	
Window Number:	3				Day	s sin	ice I	ast r	ainfa	all: <	1			2"	ON	6	10	1
Data collecte	ed at each point			2	,	3		:		vey Po	int I		mber 7	T	8	9	1	10
	Start Time (military):	24		173	50	23		223	6	2218	220		2156	2		213	7 8	1126
	Air Temperature:		2	000		00	-	CLEN	3		-	7				-	7	
Select Scal		6	)	6	)	6)		6	/	67	6	1	61	6		6	/	61
Was noise a facto	r? (use index)	1		-		3				2	3		2		2	0		1
Did you take a bre	eak? (check if yes)	N	-	- )	/ _										_			N
Wind (Use Wind S		(	)	1	)	1		9	,		1			-	-	1		d
Sky (Use Sky Cod						1	,				1			-	-1	N		1
Moon or Moonligh		1	_	^		N	-	1	1	N	N	7	010	0	N	01	0 0	N
	hat passed (within 50 m)	0	0	0	0	0	0	0	0	8 5	9	d	00	0	0	016	2 0	-V
Snow cover (Y or	N)	_	1		2	3			1	5	6		7		8	9		10
Species List  American toad															Ī	1	1	
Gray tree frog														+	-		+	
Spring peeper						1	1								-		+	-
Western/Borea	l chorus frog													-	-		+	+
Mink frog												_		-	-	-	+	-
Wood frog				0	^	/	A							+	-		-	-
American bull	frog	1	1	d	d	/	1							+	+		+	
Green frog		9	9	9	9	/	1	1	1					+	-		+	
Northern leopa	ard frog													-	-		-	
Pickerel frog														-	-		-	
PT3 CITY FROM	7,10 NO HABITATI CONSIDER A NOISE MAN SS HEARD O FROG @ G	SI		101	211	3	1.	-11	100	2 0								

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

Please comp	lete information be	elow		Da	ta c	olled	ted a	at star	rt of ea	ch surv	ey poi	nt	
Observer Name(s):	S. GROVE M. GROVE			Add	ditior	nal not	es:						
Route Number:	AZ												
Survey Date (mm/dd/yyyy):	6/13/201	5											
Window Number:				Day	ys sir	nce las	rainfa	all: <					
	ed at each point	/1	12	,	/3		Sur 4	vey Po	oint Nu	mber	8	9	10
	Start Time (military):	2227	23		246								
	Air Temperature:	67	-	_	65								
Select Sca			66	0_	0)								
Was noise a facto	reak? (check if yes)	0	O			-							
Wind (Use Wind		0	1		0	)							
Sky (Use Sky Co		1	1		1								
	nt Visible (Y or N)	N	-		-								
	that passed (within 50 m)	00	0	0	0	0							
Snow cover (Y or		N.				-							10
<b>Species List</b>		1		2		3	4	5	6	7	8	9	10
American toac	i												
Gray tree frog													
Spring peeper													
Western/Bores	al chorus frog												
Mink frog													
Wood frog							1					-	
American bull	l frog				1								
Green frog			1	1	1	1							
Northern leop	ard frog									-			
Pickerel frog					-								-
Comments:	VIRA CALLI	NG	0	) 4	# (			7	±1-*				

S.GROVE M.GROVE						_						-			
M. ORUVE			A	dditi	onal	note	s:								
A-1															
7/12/2015															
4		T	Dā	ays s	ince	last	rainf	all: J	1.5	,2	6"	ON	7	9	
d at each point									_		r				
				-		_				-	,				10
						01	51	0136	0512	050		033	10	410	0301
e: °C °F	65	6	6	6	6	6	6	67	165	65		65	6	14	65
	0	0	)	(	)		1	0	0				_		0
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	1			1				1	1	7				2	
	0	0	)	0	)	(	2	0	0	-		0			0
	N	1	VI.	A	J	1	V	N	N	N		N		N	N
	() ()	.0	()	0	0	1	1	00	00	1) (	)	10	0	0	00
N)	N	-					-								
	1		2		3		4	5	6	7		8		9	10
chorus frog															
				(	-										
rog				2	2	-					(	3 1	1	1	
		0	1	1	P	3	3			1	1 -	343	3	3	
d frog															
4- MARSA TO S. O	IF eo	AD	A	10	FR	200	5	CREVI	NG						
	ed at each point  Start Time (military):  Air Temperature:  C	ed at each point  Start Time (military):  Air Temperature: e:  C	ed at each point  Start Time (military):  Air Temperature: e:  C	ed at each point  Start Time (military): Air Temperature: e: C	Days s  ed at each point  Start Time (military):  Air Temperature: e:  °C  °F r? (use index)  Pask? (check if yes)  Extraction of the control	Days since  In the dat each point Start Time (military): 0835 019 0807  Air Temperature: 65 66 66 66 66 66 66 66 66 66 66 66 66	Days since last  and at each point  Start Time (military):  Air Temperature:  C	Days since last rainfined at each point  Start Time (military):  Air Temperature:  e:   °C   °F   65   66   66   66   66   66   66   6	Days since last rainfall:  It dat each point  Start Time (military):  Air Temperature:  C	Days since last rainfall: 25	Days since last rainfall: 25 , 2   2   3   4   5   6   7   7   7   7   7   7   7   7   7	Days since last rainfall: 25 , 26   Add at each point   Survey Point Number   1	Days since last rainfall: 25 , 26 " oN	Days since last rainfall: 25 , 26 0 N 7	Days since last rainfall:   2,5   ,26   0   0   7   9

Please compl	ete information	belo	w		D	ata	col	lec	ted	at sta	art of	ea	ch sur	vey p	oin	t	
Observer Name(s):	S.GROVE M.GROVE				A	dditi	onal	note	s:								
Route Number:	A-R																
Survey Date (mm/dd/yyyy):	7/11/2015																
Window Number:	4				Da	ays s	ince	last	rainf	all: [	.5		.26'	on	71	9	
Data collected	d at each point			_	_					vey P							
	Start Time (military):	10	1		2		05		4	5	100		7	8	1	9	10
Select Scale	Air Temperature:	4.0	11		8	6	9	6		1212	6	7	1238	125		66	66
Was noise a factor		_	0	1		3		6		2	1		1	2		1	1
Did you take a brea Wind (Use Wind So		1	7	_	V	1	-	^		N	N		1	N		Y	N
Sky (Use Sky Code	The state of the s	1	/_	1	)	0	)	0	-	0	0		0	0		0	0
Moon or Moonlight		1	/	1	J	1	1	1	)	N	1	1	N	W	-	N	1
	at passed (within 50 m)		-	0	0	0	0	0	0	2 3	-	2	00	00	) (	0 0	0 6
Snow cover (Y or N		1	1	_	V		V	1	Ŭ	N	N	1	N	1	1	N	N
Species List			1		2		3	4	1	5	6		7	8		9	10
American toad						a	- OV								1		
Gray tree frog																	
Spring peeper																	
Western/Boreal	chorus frog																
Mink frog																	
Wood frog																	
American bull fr	og			1	1	2	2									1	
Green frog		2	2	9	2	1	1	2	2								
Northern leopar	d frog																
Pickerel frog																	
1 BULLFROG		URE		7/2	P	ON	D	1	21				aro r			HIS	589
6- POUL	CE AT @ 8																

SPP: DEER, OPPOSUM, MUSICRAT, FOX, RABBIT HOUSE | FERAL CATS

Please comp	lete information b	elow		D	ata	coll	ected	at sta	rt of ea	ch sur	vey po	int	1
Observer	S-GROVE			1	dditio	nal n	atas.						
Name(s):	M-GROVE			A	uultio	nai n	iotes:						
Route Number:	A-2												
Survey Date (mm/dd/yyyy):	7/11/2015												
Window Number:	Ч			Da	ys sir	nce la	ast rainf	all:					
Data collecte	d at each point	11	1	2	13		Sur 4	vey P	oint Nu				1 40
	Start Time (military):	1158	110		10		4	3	6	7	8	9	10
Select Scale Was noise a factor	Air Temperature:  C	66	6	7	6	8							
Did you take a bre		N	1		1	1							
Wind (Use Wind S		(1)	C	7	0								
Sky (Use Sky Code		Ĭ	1		1								
Moon or Moonlight		N	1	1	1	/							
	at passed (within 50 m)	00	0	0	0	0							
Snow cover (Y or I	V)	N	-	V	N								
Species List		1		2	1/3		4	5	6	7	8	9	10
American toad													
Gray tree frog													
Spring peeper													
Western/Boreal	chorus frog												
Mink frog													
Wood frog												7	
American bull f	rog				1	1							
Green frog		11	1	1	1	1							
Northern leopar	d frog												
Pickerel frog													
Comments:			A	A	A	A							
GRN FROGS	INDEX 2 IN	ОІТС	t+	TO	N	0	FP	7 A2	-18				

# APPENDIX D 2015 MARSH BIRD SURVEY DATA AND FORMS

				11	,						,	OBSERVED DURING	VED	DON	NG									)		
STATION	TART TIME (YAATIJIM	(F) (F)	SKY	VD (Beaufort))	NOIZE CKEKONND	SPECIES	1-0 SSA9	2-1 22A9	PASS 2-3	₽-£ 22A9	2-4-22A9	1837	AAOS	ARIV	KIRA	IBMA	AMCO	ьвск	BOUTSIDE	CALL TYPE(S)	DIRECTION	IN TARGET	DISTANCE (METERS)	DISTANCE AIDE	PREVIOUSLY	
81-2	25,50	51	2	)	الا	LERI		#				1	F			F		+	1	100	0	<	5			SWSP.
	0539		*		j	VIRA					F		I		_	-	-			MIPS	0	<	0	1	_	- ·
T	2090	5	-	-	2)	VIRA					-	+	土							2011	Ø	<	5 0	1	9 -	
4	11130	53		-	2	1						1	1	+	1	-	1			The state of the s	0	1	1	-		15760
H:19	8110	hs	-	-	1	URA	*					-			-					SAIM	0	<	7	1	1	Swsp, wi
9-18	0803	95	~	0	0	1															0	-				LETE
5-18	0831	95		0	0	1															0					KWDC 1
10	9480	2	-	0	-	1															0					NewData
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																					0					
																					0					
							-			_		_	-								0					

# NIAGARA RIVER AREA OF CONCERN MARSH BIRD SURVEY DATA FORM

ADDITIONAL NOTES: WATER DEPTH (by station #): \$13 MARSH NAME: BEAVER ISLAND DATE (e.g. 15 May 2015): 5/16/ BUCKHORN 00 0

CM

- 00

MULTIPLE OBSERVER SURVEY: YES / NO

BOAT TYPE:

OBSERVER NAMES (LIST ALL): 0 1 SGROVE A 0 SKONS 0 40 4 14

B2-4 81-8 2 20 NUMBER 0 NOITATS 040 2h89 6830 09 0708 0617 075062 0736 204 (MILITARY) MODED 30 START TIME 29 20 70 0 20 TEMP. (F) 333 2 D 4 5 2 SKY 08C 2 0 WIND (Beaufort)) W REQUES W NOISE 0 2 **BACKGROUND** COGA SORA AMCO VIRA HRA BER SPECIES 63 1-0 SSA9 2-1 22A9 E-5 22-3 3 PASS 3-4 30 2-4-22A9 241 OBSERVED DURING LEBI T AROS **ARIV** do KIRA 1000 IBMA COCA AMCO T PBGR OUTSIDE N BUTH GRUNT VISUAL CALL TYPE(S) 6 0 0 0 0 0 10 0 0 0 0 0 0 DIRECTION (N/Y) ABAA IN TARGET 0 3 (METERS) 0 0 U. DISTANCE 3 > DISTANCE AIDE 3 DETECTED (Y/N) 5 3 *PREVIOUSLY* OSPR MARK WSP ARW USE SWS 8 13m COMMENIS MARK SANO

W OSLHBAILUS-HOO ONRY ALONG N340 SUBJER ASTAIN

PAGE\_OF\_

ADDITIONAL NOTES: DATO 1-2 POCKETS OF U. O THENNEH " E A GONGOREN HOU
gry SIES PAND SUGES
OBSERVED DURING
TECTED (YN)  STECTED (YN)  STE
82-7 0539 59 2 3 2 PBGR H 4 PRIMARY 10 Y 10 N N
N 02 M 20 W A
0
J-5 0636 60 & 1 0
0
82-2 07 10 60 2 1 1 .
82-1081460813
81-8082561 200
7 0851 61 2 0 0
6 N C L D MUNN KXX X X X 8986 8 1 1 12 0108 LCB
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DDIT		NOTE	is:	IM a	48	3	-24	4		10	5	8 (	SERV	OBSERVED DURING	URIN	6			0		5	CM					d	
NOITATS	AMIT TAAT (YAATIJIM)	(F) TEMP.	SKY	ND (Beaufort))	NOISE	SPECIES	1-0 22A9	S-I SSA9	F-S 22-3	►E SSA9	2-+ 22A9	1837	AAOS	ARIV	KIRA	IBMA	COGA	ODMA		РВСЯ	OUTSIDE	CALL TYPE(S)	DIRECTION	IN TARGET	DISTANCE (METERS)	ISTANCE AIDE	PREVIOUSLY (Y/N)	COWMENTS
B1=1	1															-							0			-		DOIN DOING
8/2	8050	43	ی	0	w		_														-		0					-
391-3	0840	64	2		ی	SORA					<			0								CALLICE	0	Z	50	>	2	MANNE! G
						VIRA								7								GRUNT	0	<-	0		>	
						COGA								2								WIPS OUT	Q	4	8		2	
-	51,30	50	ىو	0	0	VIRA			<					(							0	Ru:	Φ	4	وو	>	2	MAWA
						VIRA							0	0				-				_	Ø	×	20	2	2	WIFE
						VIRA								0									0	<		2	5	BONH
	07:30	P	0		0																		0		1			F17 7
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																							0					MAWR
819	1690	89	ده	0	0	NAM								S	0				1			BOTH	0					100 m3N
																	7	_		-	-		0					WIFI

Version 12/18/2014

PAGE\_OF\_

# NIAGARA RIVER AREA OF CONCERN MARSH BIRD SURVEY DATA FORM

DATE (e.g. 15 May 2015): 6 27 / 2015

WATER DEPTH (by station #):

ADDITIONAL NOTES:

SCW.

0

16-6 WIO)

00

MULTIPLE OBSERVER SURVEY: YES / NO

BOAT TYPE: CANO

OBSERVER NAMES (LIST ALL): S.GROVE, M. GROV

6-63 1336 80 W 50 NUMBER **MOITATS** -M W 0607 0529 0545 5080 0653 (MILITARY) w START TIME 00 64 60 50 60 0 TEMP. (F) 0 9 2 90 80 W 0 SKL 0 2 W WIND (Beaufort)) w 2 NOISE 2 BACKGROUND PBGR 868 1 SPECIES 1-0 SSA9 2-1 SSA9 PASS 2-3 P-E 22A9 2-4 SSA9 OBSERVED DURING LEBI AAOS ARIV KIRA AMBI COCA AMCO PBGR OUTSIDE JASIAK 7 CALL TYPE(S) 0 0 0 0 0 0 0 0 0 DIRECTION (N/Y) A38A IN TARGET So (METERS) 0 DISTANCE DISTANCE AIDE DETECTED (Y/N) 3 *PREVIOUSLY* SWSP RWBL, SUSP RWBL, SWSP SRIE MARW, FUB WIFI, SWSP WIFL スラル SUSTO COMMENTS

PAGE OF

RWBL

3

POINTS

TURTIS SEIS (DB3 ADDITIONAL NOTES: 40 WATER DEPTH (by station #): NUMBER MOITATS RWBL ALL 0521 055 500 (MILITARY) START TIME TEMP. (F) 90 2 2 9 0 SKY N 90 2 W 2 WIND (Beaufort)) w NOISE 0 0 BACKGROUND VIRA VIRA 190 RA SPECIES BULL FROGS 1-0 SSA9 2-1 SSA9 PASS 2-3 OBSERVER NAMES (LIST ALL): 4-E 22A9 2-4 SSA9 OBSERVED DURING LEBI AAOS ARIV KIRA IBMA COCA I AMCO PBGR S. GROVE OUTSIDE CLAP / CRUTES MIDSOUT GRUNTS CALL TYPE(S) PO 0 9 0 0 0 Q 0 DIRECTION (N/Y) A38A 4 IN TARGET 00 (METERS) 0 C DISTANCE 2 DISTANCE AIDE 3 DETECTED (Y/N) 3 2 *PREVIOUSLY* CONTESING OF STANTS 3HDD MAWR. SUSP SWSP DELAYED DUE TO TEAMS MEL SWSD MAR COMMENTS

NIAGARA RIVER AREA OF CONCERN MARSH BIRD SURVEY DATA FORM

MARSH NAME:

BOAT TYPE:

Version 12/18/2014

# APPENDIX E 2105 HABITAT MONITORING DATA AND FORMS

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 of social
NWI code (Record an NWI Code for the target wetland): PEI	
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			1		december 1
Trees			X		
Bare soil				-	
Water	,iuter as	Ann - Pater	~	41.500000	an interp
Upland					
Mudflat	4-TERM	ALL DESCRIPTION OF	CHELL STIFFFEE	S SAULON I	MINT 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): 7/11/2015	
Observer(s) Name(s): S. GROUE	
Survey Point (complete for each point): A1-2	B1-8
How was the point accessed? (Circle one): canoe, motor boat,	, walk, wade?
Edge Type (Circle one): roadside/marsh, parking lot/marsh, dit	ch or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or P	PFO wetland/Marsh, other (describe)_
Classification & Disturba	ance
NWI code (Record an NWI Code for the target wetland):	PUBH/PEM
NVCS Alliance (Record an NVCS Alliance code or codes for the	
Most dominant plant species (Record % Cover for 3-5 domina	ant species):
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
TYPHA	10
LYTHRUM SALICARIA	5
CAREX SPP	5
Natural Disturbance (circle all that apply): Fire, ice damage,	animal/insect damage, other:
Month/year (if known) of natural disturbance event:	
Management Actions (circle all that apply): Trail/road constru	action, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife	The state of the s
Month/year (if known) of last management action:	
And the control of the state of	

<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					
Trees					
Bare soil					
Water		7-		X	
Upland				. 4	
Mudflat				/	
Floating veg.					

Distance to vegetation patch edge (m):	11 0 1 1 1
Type of patch (Circle one): none, tree, shrub, he	rbaceous # Perimeto
Wetland Interspersion (%open water and %veg	4
Density of marsh vegetation <sup>2</sup> (Circle one): None	e, sparse, moderate, dense  MAR6/N/I
Estimated average marsh vegetation height (m	): 0-1, 1-3, 3-6,>6.
Litter depth (cm): Water o	lepth (m):
Method used for measuring water depth (Circl	e one): staff gauge, meter stick, other:
Distance to Phys	ical 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): 25/06/2014	
Observer(s) Name(s): J. SwEMZER B. GRIFFITH	Control Vision 1
Survey Point (complete for each point): A   -3	92,20
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)	Car Mari
Classification & Disturba	nce is day 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	
Most dominant plant species (Record % Cover for 3 dominant	species):
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Lythrum salicaria	40
Typha engustifolia	60
Care locustris	30
a put it make one); shalf garage, more over, other	
Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge Manth/year (if known) of natural disturbance event:	
Month/year (if known) of natural disturbance event:	
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:	
<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>	NatureServe?init=Ecol
	the same a public and a pro-
7100147	
42°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):	28 mangarificant
Type of patch (Circle one): none, tree, shrub, he	erbaceous)
Wetland Interspersion (%open water and %veg	getation cover): 30-70
Density of marsh vegetation <sup>2</sup> (Circle one): Non	ne, sparse, moderate, dense
Estimated average marsh vegetation height (n	n): 0-1, 1-3, 3-6,>6.
Litter depth (cm): Water	depth (m):
Method used for measuring water depth (Circ	ele one): staff gauge, meter stick, other:
Distance to Phys	sical 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	ert day plantag up "X" mobre ent
Observer(s) Name(s): J. Sufitzer, B. GRIFFI	TA TOTAL TOT
Survey Point (complete for each point):	reliable to the second
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)	1935 millions
Classification & Disturba	OFOLG
NWI code (Record an NWI Code for the target wetland):	PFOIC STATE OF THE STATE OF
NVCS Alliance (Record an NVCS Alliance code or codes for the	
Most dominant plant species (Record % Cover for 3 dominant s	e target wetland) <sup>1</sup> : V.A.S.N.k.
Most dominant plant species (Record % Cover for 3 dominant species (Record % Cover for 3 dominan	e target wetland)1: V.A.S. N.K.
Plant Scientific Name (e.g., Typha domingensis)	e target wetland) <sup>1</sup> : V.A.S.N.k.
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia	e target wetland)¹: V.A.S. N.K.  species):  % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)	e target wetland) <sup>1</sup> : V.A.S.N.k.
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Typha labifolia  Sperganium  Lythrum salve on  Cornus racenosa	e target wetland) <sup>1</sup> : V.A.S. N.K.  species):     % Cover (Absolute cover)
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Typha labifolia  Sparganium  Lythrum salue (a.g., Typha domingensis)  Natural Disturbance (circle all that apply): Fire, ice damage, a	e target wetland)¹: V.A.S. N.K.  species):
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Spanganium  Lythrum Salaria  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge	e target wetland)¹: V.A.S. N.K.  species):
Plant Scientific Name (e.g., Typha domingensis)  Typha angusti folia  Sparganium  Lythrum salvera  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: V.A.S. N.K.  species):
Typha angusti to lia Typha latifolia	e target wetland)¹: V.A.S. N.K.  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.	L. Lander	il a second
Trees			1		The same of the sa
Bare soil					
Water	E-00 = 3	AND COMME	The state of the s		THE PERSON
Upland					
Mudflat	u andan	When wit	MIN SHEET	-11 -100 -11	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): 0 -   00
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): V. 15
Method used for measuring water depth (Circle one): staff gauge, meter stick, other:
Distance to Physical Characteristics
Water edge (m): Upland area (m): 3
Ditch (m): Large open-water area (m):
Audflat (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	elador "2" regitado por tras-
Observer(s) Name(s): J. Sweitzer, B. GRIPPITT	material anada pri sollo
Survey Point (complete for each point): Al-5	de in
How was the point accessed? (Circle one): canoe, motor boat, w	alk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upl	and/marsh, open water/marsh,
interior/marsh, other (describe)	For log year
Classification & Disturban	ce in taking and magazine or sometable
NWI code (Record an NWI Code for the target wetland):	R 208 Hardenial delay lower
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland)1: 1/A.S.N.H. 33
Most dominant plant species (Record % Cover for 3 dominant sp	
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha angustiblia	_ / 0
	20 1115/11111
Persicaria Maculosa	I WHEN THE THE WAY TO SEE THE THE
Natural Disturbance (circle all that apply): Fire, ice damage, an	imal/insect damage, trail/road
construction, invasive species control, wetlands restoration, dredging	ng, other:
Month/year (if known) of natural disturbance event:	101.1.101
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:	
For NVCS Alliance codes, see	

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

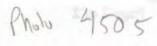
Perimeter Characteristic:	<5%	6-25%	26-50%	51-75%	>75%
Shrubs		-7613	X	done vot of	of common h
Trees			~		
Bare soil					
Water	Charles M	THE REAL PROPERTY.	X		72210
Upland		X			
Mudflat	W. FIRST		WITH THE PARTY	in Finne (	200-20-20
Floating veg.	X				

Distance to vegetation patch edge (m):
Type of patch (Circle one): none, tree, shrub, herbaceous
Vetland 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.
citter depth (cm): Water depth (m): O.1Z
Method used for measuring water depth (Circle one): staff gauge, meter stick, other:
Distance to Physical Characteristics
Vater edge (m): Upland area (m):
Ditch (m): Large open-water area (m):
Mudflat (m): Small open-water area (m):
Road or dike (m): 20 20 20 20 20 20 20 20 20 20 20 20 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	into Tablida Bi
Survey Date (DD/MM/YYYY): 26/06/2014	earthur "X" me gassify (d) buds
Observer(s) Name(s): J. Sweitzer, B. GRI	CFITAL
Survey Point (complete for each point):	Mark 10
How was the point accessed? (Circle one): canoe, motor boat, w	alk) wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upl	and/marsh, open water/marsh,
interior/marsh, other (describe)	PA DENG
Classification & Disturban	ce de la composition della com
NWI code (Record an NWI Code for the target wetland): R2  NVCS Alliance (Record an NVCS Alliance code or codes for the	
Most dominant plant species (Record % Cover for 3 dominant sp	
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
NONE	- min poptrolli
total statement with the constitution to the	down galanteen en tage but the
Natural Disturbance (circle all that apply): Fire, ice damage, an construction, invasive species control, wetlands restoration, dredging.	ng, other:
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:	

<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	Steland	Andrew Wood	
Trees			V		-
Bare soil					
Water	25 UN 313	CHILL SEATING	1	Ol Trasfer	AN ETHOR
Upland			-	X	
Mudflat	H PARIS	William Mark	Santa Aprillan	SI 2016217.4	HO TICEL
Floating veg.					

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): Water depth (circle one): staff gauge, meter stick, other:  Distance to Physical Characteristics
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
Method used for measuring water depth (Circle one): staff gauge, meter stick, other:  Distance to Physical Characteristics
Method used for measuring water depth (Circle one): staff gauge, meter stick, other:  Distance to Physical Characteristics
Distance to Physical Characteristics
Water edge (m): Upland area (m):
Printe in the (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 programa 21 toute	
rvey Date (DD/MM/YYYY): 26/06/2014	Transportation of Particular and
bserver(s) Name(s): 5. Suritzer, B. GRIF	FITH
rvey Point (complete for each point): Al - 7	1600
ow was the point accessed? (Circle one): canoe, motor boat,	walk, wade?
lge Type (Circle one): roadside/marsh, ditch or berm/marsh, u	pland/marsh, open water/marsh,
erior/marsh, other (describe)	Sec Technical
Classification & Disturba	nce
Classification & Disturba	nce
	and the same
Classification & Disturba WI code (Record an NWI Code for the target wetland):	and the same
WI code (Record an NWI Code for the target wetland):	DEMIED
	DEMIED
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):	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):  WCS Alliance (Record an NVCS Alliance code or codes for the cost 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):  WCS Alliance (Record an NVCS Alliance code or codes for the cost 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):  WCS Alliance (Record an NVCS Alliance code or codes for the cost 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):  WCS Alliance (Record an NVCS Alliance code or codes for the cost 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):  WCS Alliance (Record an NVCS Alliance code or codes for the cost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Corex lacustris  Typha latifalia  Cornus Amburum	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):  WCS Alliance (Record an NVCS Alliance code or codes for the cost 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):  WCS Alliance (Record an NVCS Alliance code or codes for the cost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)    Cornus	e target wetland)¹: V. A.S. N. M. species):
WI code (Record an NWI Code for the target wetland):  WCS Alliance (Record an NVCS Alliance code or codes for the cost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)  Corex lacustris  Typha latifalia  Cornus Amburum	e target wetland)¹: V. A.S. N. M. species):
WI code (Record an NWI Code for the target wetland):  WCS Alliance (Record an NVCS Alliance code or codes for the cost dominant plant species (Record % Cover for 3 dominant plant Scientific Name (e.g., Typha domingensis)    Cornus	e target wetland)¹: V. A.S. N. species):    % Cover (Absolute cover   7 0   3 0   10   10   10   10   10   10

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		- 100	- Healman	X	1
Trees			X		TO THE PERSON NAMED IN
Bare soil	X			0.5	
Water		CALLE SOCIETY	Towns No.	AT SHARKS	an statist
Upland			V		
Mudflat	וופואת, פו	SOUTH BUT	Only Devests	Standar 1	establish E
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): 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	n som "I" – sindy Justin
Observer(s) Name(s): J. Sweitzer, B. GRIFF	1774
Survey Point (complete for each point): A 1-10	
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)	ger glant?
Classification & Disturban	ce ha davay nollataya was excessed
NWI code (Record an NWI Code for the target wetland):	220BH
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland)1:NA
Most dominant plant species (Record % Cover for 3 dominant species)	
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
NONE	Total triday and a same
The two pages like year day wanger	the period at the particular
Natural Disturbance (circle all that apply): Fire, ice damage, an	imal/insect damage, trail/road
construction, invasive species control, wetlands restoration, dredgi	
Month/year (if known) of natural disturbance event:	
Management Actions (circle all that apply): Trail/road construc	
control (mechanical and chemical), wetland restoration, wildlife m	
Month/year (if known) of last management action:	
I F. NIVOS AIV.	
<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	dana mana	Markon
Trees					
Bare soil				Ton Dec	
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	ON THE PROPERTY.
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	145 Their "X" on extends (4) In
Observer(s) Name(s): J. Sweitzer B. GRIFI	FITH
Survey Point (complete for each point): A 2 - 4	Blude
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)	The Million
Classification & Disturba	nce and dated manufacture and assets
NWI code (Record an NWI Code for the target wetland):	PUBHX MALL MANAGER
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the	
	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	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)
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> : <u>\\A\S\N\m</u> , 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)	species):    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):    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 plants for Carex vulphoides  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	species):    % Cover (Absolute cover)   20   10   5   10   5   10   5   10   10
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	species):    % Cover (Absolute cover)   20   10   5   10   5   10   5   10   10
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 with folio Schoen pleaters of Catex Vulphoide (Catex Vulphoide)  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) <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  Schoenaplectus 19  Carex vulphoidea  Butomus J Moellahus  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredgen	e target wetland)¹:\/_A_\S_\/_N_\ 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	Minima and	Second of	distance by
Trees		X			
Bare soil			X	The International	
Water	The Part of the	Marie Contract	/	7	DE PHATE
Upland				Y	
Mudflat	ar 'mager	SELLING ATA	CHAIL VERNEZA	The second of	one close
Floating veg.					

Distance to vegetation patch edge (m):	Chascingation 2 Land
Type of patch (Circle one): none, tree, shru	b, herbaceous
Wetland Interspersion (%open water and 9	%vegetation cover): 80/20
Density of marsh vegetation <sup>2</sup> (Circle one):	None, sparse, moderate, dense
Estimated average marsh vegetation heigh	ht (m): 0-1,1-3,8-6,>6.
Litter depth (cm): Wa	ater depth (m):
Method used for measuring water depth	(Circle one): staff gauge, meter stick, other:
Distance to 1	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	

<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	ing within "2" on growing of the
Observer(s) Name(s): J. Sweitzer, B. GRII	
Survey Point (complete for each point): A 2-5	Constitution but a treat
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,
nterior/marsh, other (describe) trail parking lot/+	Cail Pay Dutailly
Classification & Disturba	nce water northwester by worth
NWI code (Record an NWI Code for the target wetland):	EMIFA COMPANY OF THE PARTY OF T
NVCS Alliance (Record an NVCS Alliance code or codes for the	
Most dominant plant species (Record % Cover for 3 dominant s	species):
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Phragmites australis	100
The midst man	The second secon
neglio il finic civili dishi penga, mare scre	referred to the state of the state of
Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dredge	ging, other:
Month/year (if known) of natural disturbance event: MA	ni di
Management Actions (circle all that apply): Trail/road constru	ction, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife i	nanagement, 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 OF	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 have policied by hondress the model has been been been been been been been bee

<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	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):	
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)	
Phragmites australis	% Cover (Absolute cover)
Typha angustitulia	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	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				7070
Trees	^				langua pana
Bare soil					
Water	-	The state of the s	- 4 min (s) - 0	3) 11	THE REAL PROPERTY.
Upland					~
Mudflat	II SELECT	SERVICE OF THE	olite decini	oudside.	HO SOU
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

		this ribin "X" as yearly all to
bserver(s) Name(s): _	Justin Sweiter, Ben Frit	htt.
urvey Point (complete	for each point): A2-7	eficule
low was the point acces	ssed? (Circle one): canoe, motor bo	at, walk, wade?
dge Type (Circle one):	roadside/marsh, ditch or berm/marsh	n, upland/marsh, open water/marsh,
nterior/march other (des	cribe) upland/open water	- no marsh present
iterior/marsh, other (des	01100)	T.
nerior/marsh, other (des		
	Classification & Distur	bance
	Classification & Distur	bance
WI code (Record an N	Classification & Distur	R 2 VBH
WI code (Record an N	Classification & Distur	R 2 VBH
WI code (Record an N WCS Alliance (Record	Classification & Distur WI Code for the target wetland): an NVCS Alliance code or codes for	
WI code (Record an N WCS Alliance (Record Tost dominant plant sp	Classification & Distur WI Code for the target wetland): an NVCS Alliance code or codes for ecies (Record % Cover for 3 domina	r the target wetland) <sup>1</sup> :
WI code (Record an N WCS Alliance (Record Tost dominant plant sp	Classification & Distur WI Code for the target wetland): an NVCS Alliance code or codes for ecies (Record % Cover for 3 domina	r the target wetland) <sup>1</sup> :
WI code (Record an N WCS Alliance (Record Tost dominant plant sp	Classification & Distur WI Code for the target wetland): an NVCS Alliance code or codes for ecies (Record % Cover for 3 domina	r the target wetland) <sup>1</sup> :
WI code (Record an N WCS Alliance (Record Tost dominant plant sp	Classification & Distur WI Code for the target wetland): an NVCS Alliance code or codes for ecies (Record % Cover for 3 domina	r the target wetland) <sup>1</sup> :
WI code (Record an N WCS Alliance (Record Most dominant plant sp Plant Scientifi	Classification & Disture WI Code for the target wetland): an NVCS Alliance code or codes for ecies (Record % Cover for 3 dominates of Name (e.g., Typha domingensis)	r the target wetland)¹:ant species):    % Cover (Absolute cover)
WI code (Record an N WCS Alliance (Record Most dominant plant sp Plant Scientifi	Classification & Disture WI Code for the target wetland): an NVCS Alliance code or codes for ecies (Record % Cover for 3 dominate to Name (e.g., Typha domingensis)  rcle all that apply): Fire, ice damage	r the target wetland)¹:ant species):    % Cover (Absolute cover)

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

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	-Seekon	dama wall as	Leves
Trees	X		-		
Bare soil		X			
Water	SWIDE TO	CHE STORES	X	Therework	Art serving
Upland			X		
Mudflat	th Using	1017-101	ONC DESCRIPTION	Mulebau!	THE SEC
Floating veg.					

Distance to vegetation patch	edge (m):
Type of patch (Circle one) (no	one, tree, shrub, herbaceous
Wetland Interspersion (%ope	en water and %vegetation cover): No with d
Density of marsh vegetation <sup>2</sup>	(Circle one): None, sparse, moderate, dense
Estimated average marsh ve	getation height (m): 0-1, 1-3, 3-6,>6.
Litter depth (cm): N/A	Water depth (m):17ca
Method used for measuring	water depth (Circle one): staff gauge, meter stick, other:
D. D.	istance 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	security and the section for the section of the desirable in the section

<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)
Afrace	
1/1/1/1/	The state of the s
seller, faller visit, agent finesterne statistical	n vien nazirimen e en per les

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 SEATONS	×		AE ARION
Upland				X	
Mudflat	P-OFTER	和() ()	Jan Asmor	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	ı
Survey Date (DD/MM/YYYY): 24 /06 2014	
Observer(s) Name(s): Justin Sweitzer Ben Grit	ibth
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 lat / marsh	
Classification & Disturba	ance
NWI code (Record an NWI Code for the target wetland):	PEMIF
NVCS Alliance (Record an NVCS Alliance code or codes for the	ne 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:	
Management Actions (circle all that apply): Trail/road constru	action, 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		The Int	4Christen	dues not se	drama
Trees					
Bare soil				- ave	
Water	COLUMN TO	and the same	X	-UARROWS	AN FRANCE
Upland				×	
Mudflat	u metro	June 1, le t	Stip "Uscent	ANTENDONE !	and altali
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): 5
Water edge (m):
Mudflat (m): Small open-water area (m):/ O
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

-	-		
Gen	pral	Inforr	nation

Survey Date (DD/MM/YYYY): 24/06/2014	Select the placting of CC analysis of
Observer(s) Name(s): JUSTIN SWETTLER BEN GRIP	industrial parents par motor
Survey Point (complete for each point): A2-10	nthrop?
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 PRINCIPAL PR
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 state of the s
Natural Disturbance (circle all that apply): Fire, ice damage, as construction, invasive species control, wetlands restoration, dredge	. 1/ 2
Month/year (if known) of natural disturbance event: W/A	
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/Number-12">http://www.natureserve.org/explorer/servlet/Number-12"&gt;http://www.natureserve.o</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	DI-B	/Inlan	Asses well at	Jasanst
Trees			-		
Bare soil				excense.	
Water	MARKET FO	A ST LESSEED	X	27 162 17	THE PERSON NAMED IN
Upland			X		
Mudflat	G CONTRACT	MUDAL TUR	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): O. C
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

General Information	
Survey Date (DD/MM/YYYY): 7/12/2015	
Observer(s) Name(s):S. GROVE	
Survey Point (complete for each point): [A2-1]	81-9
How was the point accessed? (Circle one): canoe, motor boat, w	alk, wade?
Edge Type (Circle one): roadside/marsh, parking lot/marsh, ditch	or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or PFC	
Classification & Disturbance	ce
NWI code (Record an NWI Code for the target wetland):	UBHX IPEM
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland)1:
Most dominant plant species (Record % Cover for 3-5 dominant	snecies).
	species).
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
PARAGMITES AUSTRALIS	. 80
LYTHRUM SALICARIA	10
VINABLE TO ACCESS BEYOND	MARSH EDGE
BERMS / FENCE / CHAI	JANEL
Natural Distruptores (simple all that apple). Fire its demand and	
Natural Disturbance (circle all that apply): Fire, ice damage, ani	mai/insect damage, other:
INDUSTRIAL SITE PONDS/POOL	S
Month/year (if known) of natural disturbance event:	601NG
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: POSS	A RESTORATION
SITE IN SOME AREAS	
For NVCS Alliance codes, see http://www.natureserve.org/explorer/servlet/Nat	ureServe?init=Ecol
- 1000 A MADELL ADDILLA DO	Page 1 of 2
PERIMETER MARSH AROUND PO BERM JUPLAND ON PERIM	TETED DE CYSTE
BERM IUPLAND ON PERIA	utiele of siel

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			
Trees		X			
Bare soil					
Water					
Upland				×	-
Mudflat					
Floating veg.				*	

sistance to vegetation patch edge (m):
ype of patch (Circle one): none, tree, shrub, herbaceous
Vetland Interspersion (%open water and %vegetation cover): 75 - 25 MARSH ON
Vetland Interspersion (%open water and %vegetation cover): 75-25 MARSH ON ensity of marsh vegetation <sup>2</sup> (Circle one): None, sparse, moderate, dense
stimated average marsh vegetation height (m): 0-1, 1-3, 3-6>6.
itter depth (cm): 320 Water depth (m): CST 1.5
lethod used for measuring water depth (Circle one): staff gauge, meter stick, other:
Distance to Physical Characteristics
Vater edge (m): Upland area (m):
itch (m): Large open-water area (m): 3
Small open-water area (m):
oad or dike (m): 60

BERMS-SURVEYED FROM MARSH SOGE

<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): 7/12/2015		
Observer(s) Name(s): 5. 6 COVE		
Survey Point (complete for each point): A2-12	SHAW 15	LAND DY
How was the point accessed? (Circle one): canoe, motor boat, w	all, wade?	
Edge Type (Circle one): roadside/marsh, parking lot/marsh, ditch	or berm/marsh, upland/ma	arsh,
open water/marsh, interior/marsh, open water/upland, PSS or PFC	O wetland/Marsh, other (de	escribe)
Classification & Disturban	ce	
NWI code (Record an NWI Code for the target wetland):	PUB/PEM	
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland)1:	
Most dominant plant species (Record % Cover for 3-5 dominant		
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute co	over)
TYPHA LATIFOLIA / ANGUST	50	7401)
LYTHRUM SALICARIA	15	
CARSX VULPENOIDEA	10	
CORNUS RACEMOSA	10	
Natural Disturbance (circle all that apply): Fire, ice damage, an	imal/insect damage, other:	_
Month/year (if known) of natural disturbance event:		
Management Actions (circle all that apply): Trail/road construct	tion, dredging, invasive sp	ecies
control (mechanical and chemical), wetland restoration, wildlife m	anagement, other:	
Month/year (if known) of last management action:		
MOWING ALONG 1	POND EDG	& BUT
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			
Trees		4			
Bare soil					
Water					
Upland				X	
Mudflat				1	
Floating veg.					

Distance to vegetation patch edge (m	):
Type of patch (Circle one): none, tree,	4 /
Wetland Interspersion (%open water	and %vegetation cover): 65/35
Density of marsh vegetation <sup>2</sup> (Circle	
Estimated average marsh vegetation	height (m): 0-1, 1-3, 3-6,>6.
Litter depth (cm): 6.0	_ Water depth (m): 8
Method used for measuring water de	pth (Circle one): staff gauge, meter stick, other:
Distance	to Physical Characteristics
Water edge (m): 3	Upland area (m):
Ditch (m):	Large open-water area (m):
Mudflat (m):	Small open-water area (m):
Road or dike (m): 15	

<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

*
POND IN TIFF
alk, wade?
or berm/marsh, upland/marsh,
wetland/Marsh, other (describe)_
ee
UBH + I PEM
arget wetland)1:
species):
% Cover (Absolute cover)
. 10
00
20
10
mal/insect damage, other:
on, dredging, invasive species
nagement, other:

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

# Habitat Monitoring Data Form For NR AOC Marsh Bird and Anuran Surveys

# 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, her	baceous
Wetland Interspersion (%open water and %vege	etation cover): 75)25 Perimete,
Density of marsh vegetation <sup>2</sup> (Circle one): None	
Estimated average marsh vegetation height (m)	0: 0-1, 1-3, 3-6,>6.
Litter depth (cm): W3 Water de	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): 75 COIRT BU RAILROAD GROAD	) .
FRINGE MARSH ALON	VG POND EDGE

<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

|--|

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		- Chalon		Access of
Trees		X			
Bare soil			Anton attack	The fire	
Water	1		- Almonio		COL SOCION
Upland			X		
Mudflat	Waltella L	WILLIAM VITTO	THE THEIR WAY	CHARLES TO	MCI 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): 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

<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
Loniera 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		×	- Contract		- Canal
Bare soil		-			
Water	No.	State Commission	X	-1	en inten
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 Sweitze	, P.	Criffit	
	4-5-1	Gilling	Septimental Commission
Survey Point (complete for each point):_	B1-3		-tres
How was the point accessed? (Circle one):	canoe, mot	or boat, walk	wade?
Edge Type (Circle one): roadside/marsh, dit	tch or berm/i	marsh, uplan	d/marsh, open water/marsh,
interior/marsh, other (describe)	4		Only a dornar
Classifica	ation & Di	isturbance	the distance of the state of th
NWI code (Record an NWI Code for the tar	rget wetland	E PEM I	F/PUBH
<b>NVCS Alliance</b> (Record an NVCS Alliance	code or cod	es for the tar	get wetland)1: V.A.S.N.1.9
NVCS Alliance (Record an NVCS Alliance			
NVCS Alliance (Record an NVCS Alliance  Most dominant plant species (Record % C			
	over for 3 de	ominant spec	% Cover (Absolute cover)
Most dominant plant species (Record % C	over for 3 de	ominant spec	% Cover (Absolute cover)
Most dominant plant species (Record % C	over for 3 de	ominant spec	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha Angustifolia	over for 3 de	ominant spec	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typh Typha angustifolia Lemna Sp.	over for 3 do	ominant spec	% Cover (Absolute cover)
Plant Scientific Name (e.g., Typha angustifolia Lenna Sp.  Natural Disturbance (circle all that apply)	ha domingen  The property of the control of the con	ominant spec sis)	% Cover (Absolute cover)  30  70  nal/insect damage, trail/road
Plant Scientific Name (e.g., Typh Typha angustifolia Lemna Sp.	ha domingen  The property of the control of the con	ominant spec sis)	% Cover (Absolute cover)  30  70  nal/insect damage, trail/road
Plant Scientific Name (e.g., Typha angustifolia Lenna Sp.  Natural Disturbance (circle all that apply)	ha domingen  The property of the control of the con	amage, anim	% Cover (Absolute cover)  30  70  nal/insect damage, trail/road
Plant Scientific Name (e.g., Typha Angystifolia Lenna Sp.  Natural Disturbance (circle all that apply construction, invasive species control, wetland	c): Fire, ice dands restoration	amage, animon, dredging	% Cover (Absolute cover)  30  70  nal/insect damage, trail/road  g, other:
Plant Scientific Name (e.g., Typh Typha angustifolia Lenna sp.  Natural Disturbance (circle all that apply construction, invasive species control, wetland Month/year (if known) of natural disturbance	cover for 3 de la domingen  c): Fire, ice de la de restoration de event:  cy): Trail/road	amage, animon, dredging	cies):  % Cover (Absolute cover)  30  70  mal/insect damage, trail/road  s, other:  ///  n, dredging, invasive species

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

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			resolve	Cann will in	American I
Trees		×			
Bare soil					
Water	The same of the	97117	Tuno Sico		NE SERIOR
Upland					
Mudflat	O Harding	The second	mele meat of		8311 A - 5
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

General Information	
Survey Date (DD/MM/YYYY): 24/06/2014	on the plant of "T" make for
Observer(s) Name(s): J. Sweitzer, B. GRIEF	
Survey Point (complete for each point): A2-2 / B1-4	edante.
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,
interior/marsh, other (describe)	gor units ( i
Classification & Disturba	nce to thing nationals at male
NWI code (Record an NWI Code for the target wetland):  NVCS Alliance (Record an NVCS Alliance code or codes for the	e target wetland)1: V.A.S.N.1,9
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)	e target wetland)1: V.A.S.N.I.A
NVCS Alliance (Record an NVCS Alliance code or codes for th	e target wetland)1: V.A.S.N.I.A
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> :
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):    Was Noted to the content of the conten
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):    Was Note   Market   Market
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 angustionia  Natural Disturbance (circle all that apply): Fire, ice damage, a	e target wetland)¹:\A.S.W.I. A species):    % Cover (Absolute cover)     0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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 angusticolic  Natural Disturbance (circle all that apply): Fire, ice damage, a construction, invasive species control, wetlands restoration, dred	e target wetland)¹:\A.S.W.I. ¶ species):     % Cover (Absolute cover)     0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Photo 4448

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

<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 or	abor porces
Trees			-		
Bare soil				-	
Water	Apr 1 (1)	COURT PRESIDENT	-10450 1944	No. 1 Week	JA THUUT
Upland			×		
Mudflat	D. T. POLIT	CITED TO E	DUSIN SOMETHER	AT LOSSIES IN	आत जोळा
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): 20 million and a million 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): 24/56/2614	makes file to galady of make
Observer(s) Name(s): 5 Sweitzer	Softening straight
Survey Point (complete for each point): A2-3 / B1-5	dyolo
How was the point accessed? (Circle one): canoe, motor boat, was	alk wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upla	and/marsh, open water/marsh,
interior/marsh, other (describe)	
Classification & Disturban	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)	target 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.	No il goli di cost del lesti familia
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: Zor/	

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		wholes.	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	G1109 101	City Selfor	STEEDED!	RULDINE
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 when the last the l

<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	da miristofii
Survey Date (DD/MM/YYYY): 24/06/2014	and the photograp "X" molecule
Observer(s) Name(s): J. Sweitzer B GRIF	
Survey Point (complete for each point): B1-6	acity.
How was the point accessed? (Circle one): canoe, motor boat, was	ilk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upla	hours ( )
interior/marsh, other (describe) board wall /Marsh	gre to the T
Classification & Disturbance	ce is debug asital community
NVCS Alliance (Record an NVCS Alliance code or codes for the t  Most dominant plant species (Record % Cover for 3 dominant sp	
Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)
Typha angustifolia	80
Importions capensis	20
pater great them, spring that many district angel	WHEN THE STATE OF THE STATE OF
Natural Disturbance (circle all that apply): Fire, ice damage, and construction, invasive species control, wetlands restoration, dredging	ng, other:
Month/year (if known) of natural disturbance event:	100
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	

Photo 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			n testano	description of	I manual
Trees		X			
Bare soil				C-1 44	
Water		X	7.00	J. 4200000	-
Upland			X		
Mudflat	U JE DES	THE SE I	DIED RESIDE	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	
	(90)
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 E 1 E 1
Classification & Disturban	ice
	10 15
WI code (Record an NWI Code for the target wetland): PE	A 1 Feet and the disting loss
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): PEV NVCS 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., N.</u>
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.5`, N  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)  Plant Scientific Name (e.g., Typha domingensis)  Typha latible.	target wetland)¹:V.A.5`, N  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) <sup>1</sup> : <u>V.A.S., W.</u> 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)  Plant Scientific Name (e.g., Typha domingensis)  Typha latific	target wetland)¹:V.A.S, N.apecies):    % Cover (Absolute cover)   50   30
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 Salvina Salvina Salvina Latification Latification Salvina Latification	target wetland)¹:V.A.S, N.apecies):    % Cover (Absolute cover)   50   30
Plant Scientific Name (e.g., Typha domingensis)  Typha latiblica  Signification labblica	target wetland)¹: _V.A.S., N  pecies):   Cover (Absolute cover)  30  10  30
Plant Scientific Name (e.g., Typha domingensis)  Typha latible  Signification  Si	target wetland)¹: _V.A.S., N  pecies):   Cover (Absolute cover)  30  nimal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Typha latifalia  Lythrum sahrana  Sagithus latifalia  Lersiana  Carex Stricta	target wetland)¹: _V.A.S., N  pecies):   Cover (Absolute cover)  30  nimal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Plant Scientific Name (e.g., Typha domingensis)  Typha latific  Sagithura latific  Latification  Sagithura latific	target wetland)¹: _V.A.S., N  pecies):   Cover (Absolute cover)  30  nimal/insect damage, trail/road
Plant Scientific Name (e.g., Typha domingensis)  Typha latible  Signification  Si	target wetland)¹: _V.A.S., N  pecies):   Cover (Absolute cover)  30  nimal/insect damage, trail/road
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., N  pecies):     % Cover (Absolute cover)

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	rive low	day with all	Marian I
Trees		X			-
Bare soil	X				
Water	AND DE	1	A Control dates		30 770000
Upland			X		
Mudflat	D. Heinid	WITTER TO ST	CHIE TESMIN	STREET L	81/4 2020
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): 7/11/2015	
Observer(s) Name(s): S. GROUE	
Survey Point (complete for each point): A1-2	B1-8
How was the point accessed? (Circle one): canoe, motor boat,	, walk, wade?
Edge Type (Circle one): roadside/marsh, parking lot/marsh, dit	ch or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or P	PFO wetland/Marsh, other (describe)_
Classification & Disturba	ance
NWI code (Record an NWI Code for the target wetland):	PUBH/PEM
NVCS Alliance (Record an NVCS Alliance code or codes for the	
Most dominant plant species (Record % Cover for 3-5 domina	ant species):
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
TYPHA	10
LYTHRUM SALICARIA	5
CAREX SPP	5
Natural Disturbance (circle all that apply): Fire, ice damage,	animal/insect damage, other:
Month/year (if known) of natural disturbance event:	
Management Actions (circle all that apply): Trail/road constru	action, dredging, invasive species
control (mechanical and chemical), wetland restoration, wildlife	The state of the s
Month/year (if known) of last management action:	
And the control of the state of	

<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					
Trees					
Bare soil					
Water		7-		X	
Upland				. 4	
Mudflat				/	
Floating veg.					

Distance to vegetation patch edge (m):	11 0 1 1 1
Type of patch (Circle one): none, tree, shrub, he	rbaceous # Perimeto
Wetland Interspersion (%open water and %veg	4
Density of marsh vegetation <sup>2</sup> (Circle one): None	e, sparse, moderate, dense  MAR6/N/I
Estimated average marsh vegetation height (m	): 0-1, 1-3, 3-6,>6.
Litter depth (cm): Water o	lepth (m):
Method used for measuring water depth (Circl	e one): staff gauge, meter stick, other:
Distance to Phys	ical 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): 7/12/2015	
Observer(s) Name(s):S. GROVE	
Survey Point (complete for each point): [A2-1]	81-9
How was the point accessed? (Circle one): canoe, motor boat, w	alk, wade?
Edge Type (Circle one): roadside/marsh, parking lot/marsh, ditch	or berm/marsh, upland/marsh,
open water/marsh, interior/marsh, open water/upland, PSS or PFC	
Classification & Disturbance	ce
NWI code (Record an NWI Code for the target wetland):	UBHX IPEM
NVCS Alliance (Record an NVCS Alliance code or codes for the	target wetland)1:
Most dominant plant species (Record % Cover for 3-5 dominant	snecies).
	species).
Plant Scientific Name (e.g., Typha latifolia)	% Cover (Absolute cover)
PARAGMITES AUSTRALIS	. 80
LYTHRUM SALICARIA	10
VINABLE TO ACCESS BEYOND	MARSH EDGE
BERMS / FENCE / CHAI	JANEL
Natural Distruptores (simple all that apple). Fire its demand and	
Natural Disturbance (circle all that apply): Fire, ice damage, ani	mai/insect damage, other:
INDUSTRIAL SITE PONDS/POOL	S
Month/year (if known) of natural disturbance event:	601NG
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: POSS	A RESTORATION
SITE IN SOME AREAS	
For NVCS Alliance codes, see http://www.natureserve.org/explorer/servlet/Nat	ureServe?init=Ecol
- 1000 A MADELL ADDILLA DO	Page 1 of 2
PERIMETER MARSH AROUND PO BERM JUPLAND ON PERIM	TETED DE CYSTE
BERM IUPLAND ON PERIA	utiele of siel

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			
Trees		X			
Bare soil					
Water					
Upland				×	-
Mudflat					
Floating veg.				*	

sistance to vegetation patch edge (m):
ype of patch (Circle one): none, tree, shrub, herbaceous
Vetland Interspersion (%open water and %vegetation cover): 75 - 25 MARSH ON
Vetland Interspersion (%open water and %vegetation cover): 75-25 MARSH ON ensity of marsh vegetation <sup>2</sup> (Circle one): None, sparse, moderate, dense
stimated average marsh vegetation height (m): 0-1, 1-3, 3-6>6.
itter depth (cm): 320 Water depth (m): CST 1.5
lethod used for measuring water depth (Circle one): staff gauge, meter stick, other:
Distance to Physical Characteristics
Vater edge (m): Upland area (m):
itch (m): Large open-water area (m): 3
Small open-water area (m):
oad or dike (m): 60

BERMS-SURVEYED FROM MARSH SOGE

<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 gridely (d) hole
Observer(s) Name(s): J. Swerzer, B. GRIEFITH	The state of the s
Survey Point (complete for each point): B 2 - 1	odani-
How was the point accessed? (Circle one): canoe, motor boat, walk, wade?	P I Was Sup 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 locustris	20
Hibiscus macheulos	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. UEMIN	VITE OF TO S	outh destern	A LANGESTICA	The series
Floating veg.					

Distance to vegetation patc	h edge (m):
Type of patch (Circle one):	none, tree, shrub, herbaceous
Wetland Interspersion (%0	pen water and %vegetation cover):
Density of marsh vegetation	n <sup>2</sup> (Circle one): None, sparse, moderate, dense
Estimated average marsh v	regetation height (m): 0-1, 1-3) 3-6,>6.
Litter depth (cm):	Water depth (m):
Method used for measuring	g water depth (Circle one): staff gauge, meter stick, other:
Language tree	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): / 5	transferred for the state of the party of the second or 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 Information	resta natida R
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Observer(s) Name(s): 5. Sweitzer B. Geiffil	- 1
Observer(s) Name(s): 31 20E/12E/2 B. GE/FFI)	Marries and A William 34
Survey Point (complete for each point): B2-2	117.9
How was the point accessed? (Circle one): canoe, motor boat, w	alk wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upl	and/marsh, open water/marsh,
nterior/marsh, other (describe)	and activates
Classification & Disturban	ce a real politica and a real
NWI code (Record an NWI Code for the target wetland): PE	MIEd (mo later dates to
NVCS Alliance (Percent on NVCS Alliance code or codes for the	target watland) . V 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)  Hibiscus moscheubys  Typha labblia	% 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)  Hibiscus moscheubes  Typha labla and folder  Carex lacustris  Natural 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 in the	% 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		Bains	days not at	slavnost.
Trees	X				100
Bare soil					
Water	TIN 21 10	DEP CONTE	MAN - IN	- Continue	ab receil
Upland					
Mudflat	H ; Unint	-11/6/K 20 B	STAND TO SATERAL	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	Market Strangelish police
Observer(s) Name(s): 5. Sweitzer B. GRIE	
Survey Point (complete for each point): 82-3 A1-	9
low was the point accessed? (Circle one): canoe, motor boat, v	valk, wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, up	land/marsh, open water/marsh,
nterior/marsh, other (describe)	Spy grutnin y
Classification & Disturbat	nce or then hollabyyy bl warm
NWI code (Record an NWI Code for the target wetland):	PEMIEd
NWI code (Record an NWI Code for the target wetland):	PEMIEd
	PEMIEd
NWI code (Record an NWI Code for the target wetland):	e target wetland)1: V, A.S. N.m.
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 sections)	e target wetland) <sup>1</sup> : V, A. S. N. m., 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 species)  Plant Scientific Name (e.g., Typha domingensis)	e target wetland)¹: V, A. S, N, M, 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 species)  Plant Scientific Name (e.g., Typha domingensis)	e target wetland)¹: V, A. S, N, M, species):  % Cover (Absolute cover)
WVCS 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)	retarget wetland) <sup>1</sup> : V, A. S, N, M, species):    % Cover (Absolute cover)
WI code (Record an NWI Code for the target wetland):  WCS Alliance (Record an NVCS Alliance code or codes for the  Most dominant plant species (Record % Cover for 3 dominant second s	retarget wetland) <sup>1</sup> : V, A. S, N, M, species):    % Cover (Absolute cover)
WI code (Record an NWI Code for the target wetland):  WCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant services)  Plant Scientific Name (e.g., Typha domingensis)	retarget wetland) <sup>1</sup> : V, A. S, N, M, especies):    % 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 section of the Plant Scientific Name (e.g., Typha domingensis)  Typha tagys Naliance (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant section of the M	retarget wetland) <sup>1</sup> : V, A. 5, N, m, 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 section of the Plant Scientific Name (e.g., Typha domingensis)  Typha tagys Naliance (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant plant species (Record % Cover for 3 dominant section of the Most dominant section of the M	e target wetland) <sup>1</sup> : V, A. S, N, M, especies):    % 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)	retarget wetland)¹: V, A.S. N.m., species):    % Cover (Absolute cover)   70   10   10   10   10   10   10   10
WVCS 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 frags While  Experience (and the species)  Natural Disturbance (circle all that apply): Fire, ice damage, and several	target wetland)¹: V, A.S.N.m.  pecies):  % Cover (Absolute cover)  20  10  nimal/insect damage, trail/road  ting, other:

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

Photo 4711

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		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	IC TROUGH	WITH TO SI	THE PERSON	Present II	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

Point (complete for each point): 37-4 / A1-8	
r(s) Name(s): 5. Sweetzer	
Point (complete for each point): B7-4 / A1-8	
s the point accessed? (Circle one): canoe, motor boat, walk, wade?	
pe (Circle one): roadside/marsh, ditch or berm/marsh, upland/marsh, ope	en water/marsh
narsh, other (describe)	
Classification & Disturbance	
CASSITUATION & DISTUIDANCE	
e (Record an NWI Code for the target wetland): PEMIEd	
ninant plant species (Record % Cover for 3 dominant species):  Plant Scientific Name (e.g., Typha domingensis)  % Cover (A. Co	
Typh = angustificial = 40	Absolute cover
Decodon Verhallatus	0
Nupher Vallegation 10	2
	nage trail/road
Disturbance (circle all that apply): Fire, ice damage, animal/insect dam	nage, trail/road
	nage, trail/road
Disturbance (circle all that apply): Fire, ice damage, animal/insect dam	
Disturbance (circle all that apply): Fire, ice damage, animal/insect damon, invasive species control, wetlands restoration, dredging, other:	

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

Phoho 4480

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

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	4.20	423	Course wall and	
Trees	X				
Bare soil				Con principal	
Water	X	CHO PUBLISH	White sec	100000	217 12101
Upland			X		
Mudflat	OF WHITE	THANK BY	ond bearing	Selzino: a	ALL VERY
Floating veg.	X				

Distance to vegetation	patch edge	(m): Transplant   Marie   Mari
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	course) (mechanical and absorbed), centural presention, wildlice 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): 25/06/2014	
	SENDAMBANAD LATE
Observer(s) Name(s): 5 WEITZER	To Mondana d Taglow 27
Survey Point (complete for each point): B2-5	Naurio
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 Permit
Classification & Disturba	nce
NWI code (Record an NWI Code for the target wetland):	PEMIED
	1/10/1/
	e target wetland) <sup>1</sup> : $\sqrt{A.5.N.1}$
NVCS Alliance (Record an NVCS Alliance code or codes for th	
NVCS Alliance (Record an NVCS Alliance code or codes for th	
NVCS Alliance (Record an NVCS Alliance code or codes for th	
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant	% 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):
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 aggraficial applications and the formula and the formula applications.	% 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)	% 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 angustificial labelian fersions.  Natural Disturbance (circle all that apply): Fire, ice damage, a	% Cover (Absolute cover)  80 70 20 20 animal/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 angust followed to the second	% Cover (Absolute cover)  80  70  20  20  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 angust follow  Successful and the line fersion and the line fers	% Cover (Absolute cover)  80 /0 20 20 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 aggree follow  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follow  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follow  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follow  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follow  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follows  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follows  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follows  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follows  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follows  Suggistation labelies  Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha aggree follows  Record follows  R	% Cover (Absolute cover)  80  10  20  20  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 again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)  Typha again to hallow Record % Cover for 3 dominant  Plant Scientific Name (e.g., Typha domingensis)	% Cover (Absolute cover)  80  10  20  animal/insect damage, trail/road ging, other:

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			×		
Trees		X		Part Hat his	and the same of
Bare soil					
Water	Zakal (e		7. VIII VIII	-	on faring
Upland			X		
Mudflat	o hismili	STATE DESCRIPTION	Will Je Will	BODES / ST	Mile Simil
Floating veg.					

Distance to vegetation patch edge (m):	Chasticulina
Type of patch (Circle one): none, tree, shrub, herba	ceous
Wetland Interspersion (%open water and %vegeta	tion cover): 0 -/ 0 0
Density of marsh vegetation <sup>2</sup> (Circle one): None, s	parse, moderate, dense
Estimated average marsh vegetation height (m): (	0-1, (1-3) 3-6,>6.
Litter depth (cm): Water dep	th (m):
Method used for measuring water depth (Circle o	
Distance to Physica	l Characteristics
Water edge (m):	Upland area (m):/5
Ditch (m):50	Large open-water area (m):
Mudflat (m):	Small 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	a rahea "J" in intelligible for
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	ralk) wade?
Edge Type (Circle one): roadside/marsh, ditch or berm/marsh, upl	and/marsh, open water/marsh,
interior/marsh, other (describe)	
Classification & Disturban	CP.
Classification & Distarban	cc
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)1: V, A, S, N, K, I
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, I
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) <sup>1</sup> : V.A.S.N.k.l
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)¹:V.A.S.N.k.l  becies):  % 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   Acres   Acres	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.l  pecies):   Cover (Absolute cover)  40  30

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 o	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 dep	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

THE RESERVE OF THE PARTY OF THE	Constant Type (9)
urvey Point (complete for each point): 82-7	adumita
low 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,
nterior/marsh, other (describe)	Was purinted
Classification & Disturba	nce la delag guilataga e de
INVI I- (DI NIVII C-I- CII- I II- II- II- II- III- II-	DEMI
NVCS Alliance (Record an NVCS Alliance code or codes for the	e target wetland)1: V,A,S,N,
NVCS Alliance (Record an NVCS Alliance code or codes for the	e 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)	e target wetland) <sup>1</sup> : 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)  Plant Scientific Name (e.g., Typha domingensis)	e target wetland) <sup>1</sup> : V, A, S, N,   species):  % Cover (Absolute cover)
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)	e target wetland) <sup>1</sup> : V, A, S, N,   species):  % Cover (Absolute cover)
Typha angutifalea	e target wetland) <sup>1</sup> :V,A,S,N,  species):    % Cover (Absolute cover)   70
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)	e target wetland) <sup>1</sup> :V,A,S,N,  species):    % Cover (Absolute cover)   70
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species (Record	e target wetland)¹:V,A,S,N,  species):     % Cover (Absolute cover)   7 0     nimal/insect damage, trail/road
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species (Record	e target wetland)¹:V,A,S,N,  species):     % Cover (Absolute cover)   7 0     nimal/insect damage, trail/road
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species (Record	e target wetland)¹:V,A,S,N,  species):     % Cover (Absolute cover)   7 0     nimal/insect damage, trail/road
NVCS Alliance (Record an NVCS Alliance code or codes for the Most dominant plant species (Record % Cover for 3 dominant species (Record	e target wetland)¹:V,A,S,N,  species):     % Cover (Absolute cover)   7 0

<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	A. C.	
Trees			4 1 1 1 1 1		A POST AND LAND	THURST AND
Bare soil				Tenan India		
Water	M. Springer	ment feat	STORE ST	X	san tures	SIL CELL
Upland						
Mudflat	TOTAL PROPERTY.	What so =	CHILD IDEAL	graditation	Name of the	STATE OF THE STATE OF
Floating veg.						

Distance to vegetation p	eatch edge (m):
	e): none, tree, shrub, herbaceous
Wetland Interspersion (	(%open water and %vegetation cover): 40/60
Density of marsh vegeta	ation <sup>2</sup> (Circle one): None, sparse, moderate, dense
Estimated average mars	sh vegetation height (m): 0-1 (1-3,)3-6,>6.
Litter depth (cm):	O Water depth (m): 0.58
Method used for measu	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	Overgraphed and characters, writered restoration, within a careered 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