# Beneficial Use Impairment Removal Project

# Niagara River Area of Concern
# Heron and Osprey Nesting Success and Productivity Monitoring
# Year 3 (2016) Survey Report

**December 20, 2016**

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## Year 3 (2016) Survey Report

## December 20, 2016

Prepared for:
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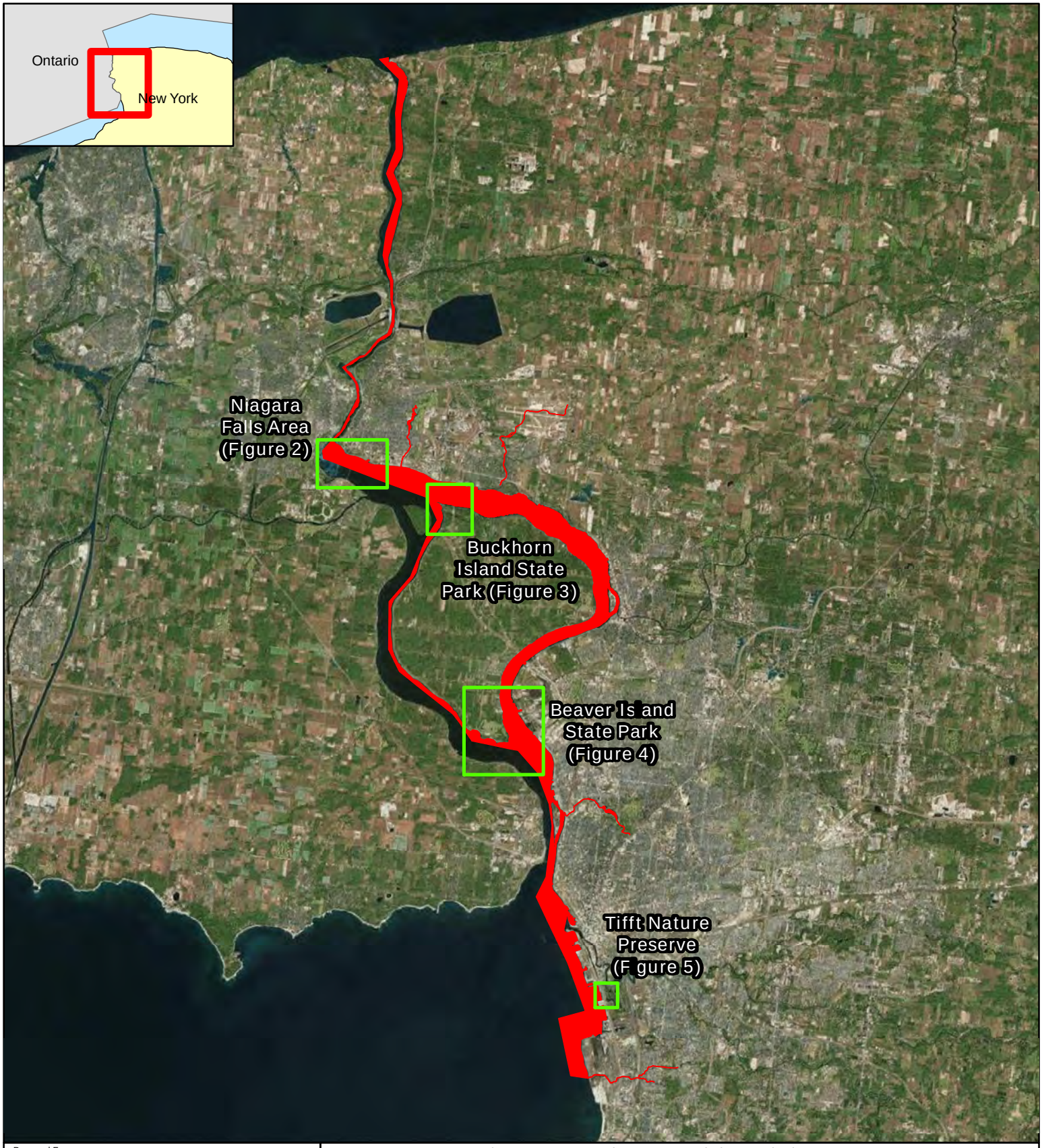
# 1.0 INTRODUCTION

## 1.1 BACKGROUND

In 1987 the governments of the United States (U.S.) and Canada identified several areas within the Great Lakes region where environmental degradation had occurred due to historic pollution and habitat degradation. 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 to remove the impairment from the list of BUIs associated with AOCs. The 37-mile long Niagara River waterway flows from Lake Erie to Lake Ontario and 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 which are managed separately; the New York portion located on the U.S. 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 in 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 U.S. 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) and 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 2012 the U.S. Fish and Wildlife Service (USFWS) New York Field Office (NYFO) was contacted by the USEPA Great Lakes National Program Office (GLNPO) to conduct assessments to evaluate trends of nesting success and productivity of NR AOC herons and Osprey (*Pandion haliaetus*) to support a determination of the status of the "Degradation of Fish and Wildlife Populations" BUI. These species are identified as sentinel native species and represent the top of the aquatic 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 Heron and Osprey Nesting Success and Productivity Monitoring (USFWS 2014). In April 2014, a plan was developed following the criteria outlined in the Scope of Work. The plan 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 2015a). The Work Plan specifically identifies methods used for monitoring nesting success and productivity of Osprey and several heron species of interest and known to occur in the NR AOC [e.g., Great Egret (*Ardea alba*), Great Blue Heron (*Ardea herodias*) and Black-crowned Night-heron (*Nycticorax nycticorax*)].

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Date: 12/5/2016

Figure 1. Heron and Osprey Population Monitoring Survey Areas

Niagara River Area of Concern
2014 - 2018
Marsh Anuran and Avian Population Monitoring
Niagara and Erie Counties, NY

**Legend**

Study Area

Potential Heron and Osprey Nesting Areas

N

0 1 2 4 Miles

This report provides a summary of the Year-3 (2016) sampling effort conducted in support of the 2014-2018 NR AOC Heron and Osprey Nesting Success and Productivity Monitoring Project (Project). Section 2.0 of this report provides a summary of the methods used, Section 3.0 provides survey results and a discussion is provided in Section 4.0. Appendices include photographs (Appendix A), completed 2016 nest monitoring data forms from heron (Appendix B) and Osprey (Appendix C) survey efforts.

### 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 heron and Osprey surveys were conducted in accordance with the approved Beneficial Use Impairment Removal Project, Niagara River Area of Concern Heron and Osprey Population Monitoring Work Plan (Work Plan) 2014-2018 (NewEarth 2015a). The Work Plan was adapted from several sources that are intensively involved in heron and raptor nest monitoring efforts applicable to the Niagara River area, including Moul et al. 2001, Steenhof and Newton 2007, Vennesland 2000, Vennesland and Butler 2004, and Vennesland and Norman 2006.

Survey efforts conducted in support of this Project were performed by biologists skilled in the identification of Osprey, heron, and due to the potential threat from this species to heron rookery nesting success, Double-crested Cormorant (*Phalacrocorax auritus*), which are also referred to as Cormorant in this report. Each biologist was well-versed on the life histories of each species as presented in Hatch and Weseloh 1999, Hothem, et al. 2010, Mccrimmon et al. 2011, Poole et al. 2002, and Vennesland and Butler 2011, and experienced in the survey of avian species. Survey 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 HERON SURVEYS

#### 2.1.1 Survey Locations

Per USFWS requirements (USFWS 2014) heron survey efforts specifically targeted three heron species; Great Egret, Great Blue Heron and Black-crowned Night-heron. Through a review of Google Earth™ imagery, coordination with NYSDEC and USFWS, and following a broad reconnaissance level survey of the NR AOC initially conducted on March 25-26, 2014 and repeated each survey season to identify new locations (Figure 1), three potential nest site (e.g., rookery) locations have been identified in the general AOC for these species. Locations included: Buckhorn Weir, which is a manmade diversion weir located to the northwest of Buckhorn Island State Park (north end of Grand Island, NY); Motor Island, also known as (aka) Pirate's Island located 1,300 feet to the east of Beaver Island State Park (south end of Grand Island, NY); and,

Strawberry Island located 3,500 feet to the southeast of Motor Island. (Table 1, and Figures 3 and 4). A fourth location along the Canadian border was identified as a potential rookery site, but was determined to be outside of the survey area and was excluded from all survey efforts (Figure 2). Each of the three sites are monitored during each annual survey for evidence of breeding activity. However as was the case in 2014 and 2015, nest monitoring data was only collected at the Motor Island site in 2016 due to lack of heron activity at other sites.

**Table 1. Location of Sites Monitored for Heron Nesting Activities-2016.**

| Site Name | Site ID | Nearest Town | Latitude | Longitude |
|---|---|---|---|---|
| Motor Island (aka Pirate's Island) | H-1 | Grand Island | 42° 57' 51.24"N | 78° 56' 03.83"W |
| Buckhorn Weir | H-2 | Grand Island | 43° 04' 03.78"N | 79° 00' 22.08"W |
| Strawberry Island | H-3 | Grand Island | 42° 57' 18.54"N | 78° 55' 27.38"W |

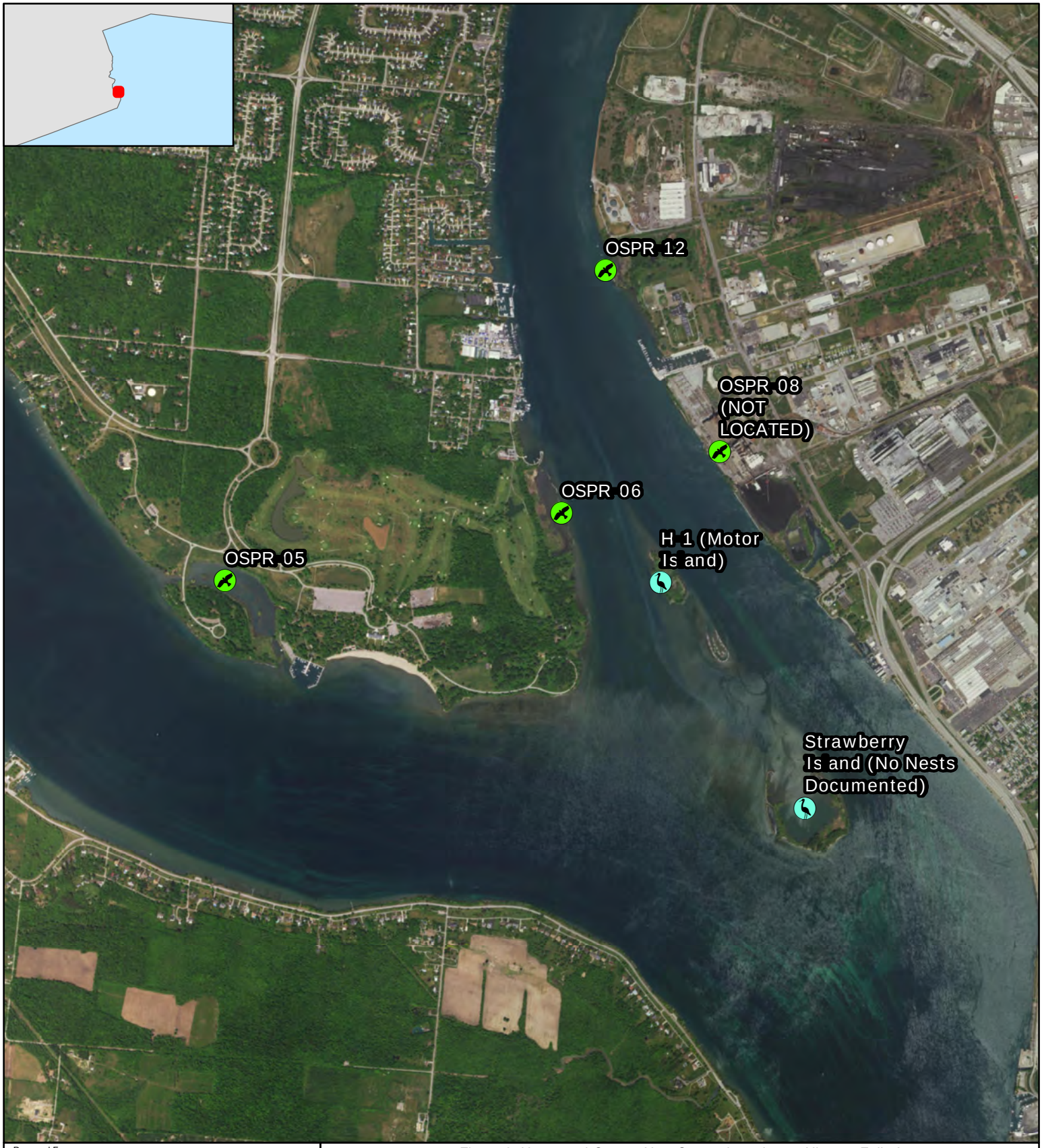
Biologists also established remote observation sites that offered views of potential rookery sites while minimizing disturbance to the birds: 1) Observation Point #1, located on a boat dock along the southeast shoreline of Grand Island (Figure 4); 2) Observation Point #2, located along the southeastern shoreline of Motor Island (Figure 4); and, Observation Point #3, located on a spit of land extending toward Buckhorn Weir (Figure 3).

### 2.1.2 Survey Periods

The primary goal of the heron nest monitoring effort was to collect information on target heron species to facilitate efforts to establish population estimates and to evaluate trends in the number of breeding adults for each species within the U.S. side of the NR AOC. Per approved survey guidelines identified in the Work Plan (NewEarth 2015a), and consistent with previous efforts, multiple surveys were completed in 2016 within the recommended survey windows and included a pre-survey site reconnaissance and five nest monitoring events as shown in Table 2. Optimal seasonal timing varies from year to year depending on weather conditions and breeding chronology of the target birds and was taken into consideration when timing survey events. Survey dates were also 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 target heron species in the NR AOC.

**Table 2. 2016 Heron Nest Monitoring Survey Dates.**

| Survey Event | Survey Dates |
|---|---|
| General Site Reconnaissance | April 16, 2016 |
| 1 | April 17, 2016 |
| 2 | May 12, 2016 |
| 3 | June 1, 2016 |
| 4 | June 25, 2016 |
| 5 | July 13, 2016 |

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Date: 12/5/2016

Figure 2. Heron and Osprey Nest Survey Locations – Niagara Falls Area

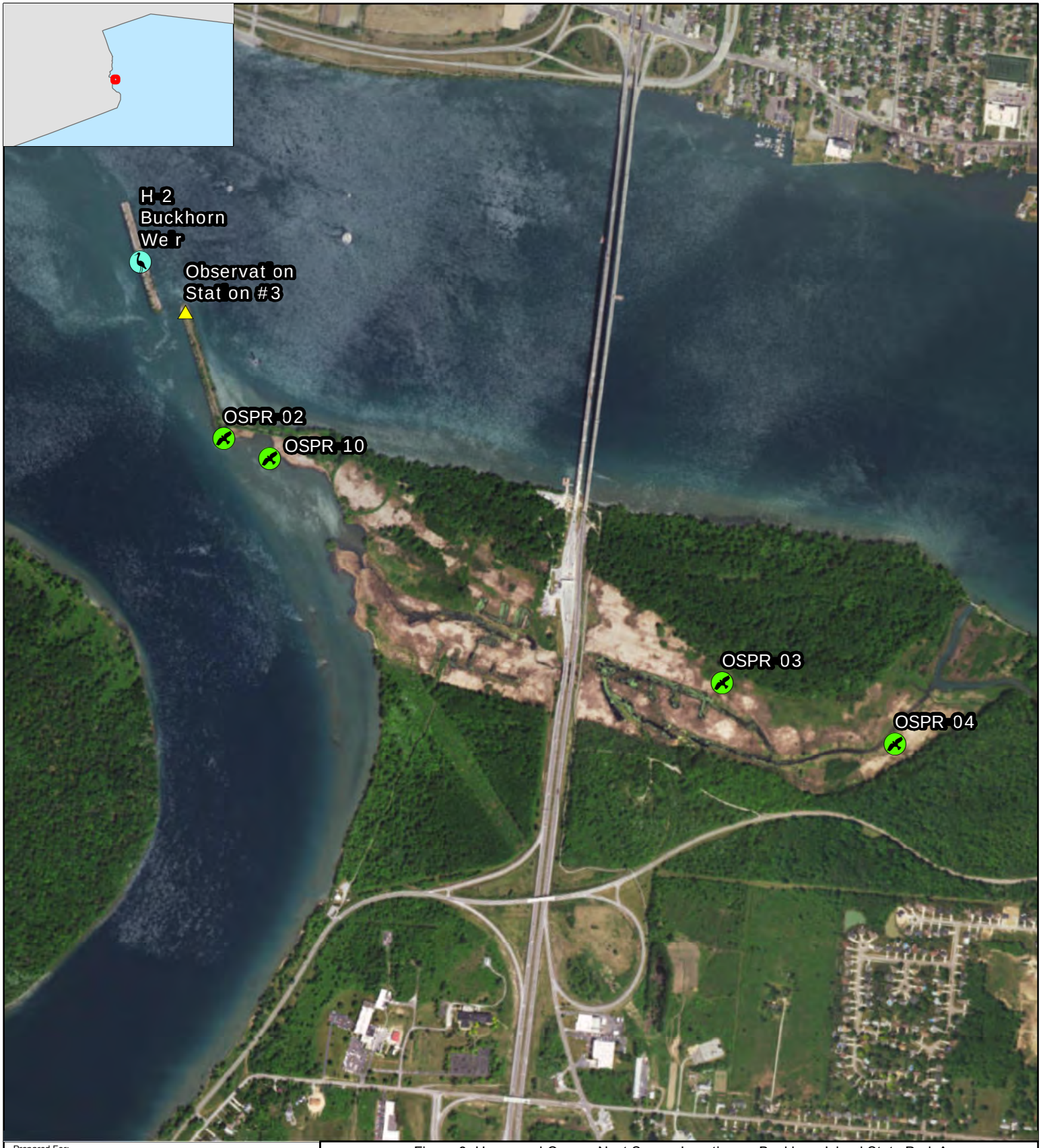
Niagara River Area of Concern
2014 - 2018
Marsh Anuran and Avian Population Monitoring
Niagara and Erie Counties, NY

**Legend**

- Potential Osprey Nest Site
- Potential Heron Nest Site

N

0 0.1 0.2 0.4 Miles

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Date: 12/5/2016

Figure 3. Heron and Osprey Nest Survey Locations – Buckhorn Island State Park Area

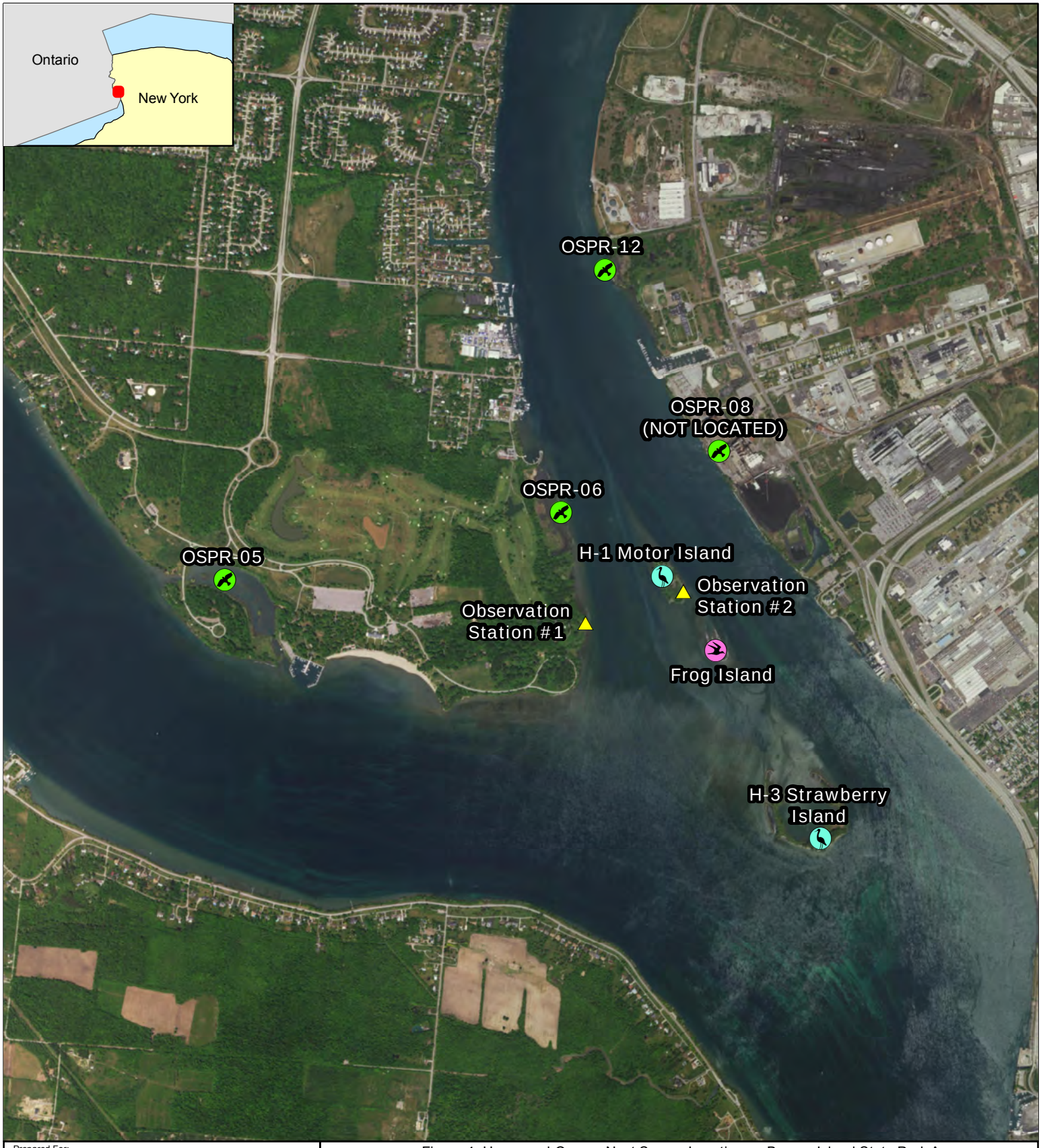
Niagara River Area of Concern
2014 - 2018
Marsh Anuran and Avian Population Monitoring
Niagara and Erie Counties, NY

**Legend**

- Potential Osprey Nest Site
- Potential Heron Nest Site
- Observation Station

N

0 0.05 0.1 0.2 Miles

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Date: 12/5/2016

Figure 4. Heron and Osprey Nest Survey Locations – Beaver Island State Park Area

Niagara River Area of Concern
2014 - 2018
Marsh Anuran and Avian Population Monitoring
Niagara and Erie Counties, NY

**Legend**

- Potential Osprey Nest Site
- Potential Heron Nest Site
- Frog Island Restoration Site
- Observation Station

N

0 0.1 0.2 0.4 Miles

### 2.1.3 Productivity Monitoring

Nest monitoring efforts in 2015 and 2016 followed a protocol that was modified slightly from the 2014 effort. The revised survey approach attempted to improve on nest detections and tracking throughout the monitoring effort by: 1) tracking productivity at a small subset of highly visible nests located along the eastern shoreline of the island; and 2) conducting the count of overall nesting activity by species during each survey event, regardless of the nest location. In addition, per USFWS and NYSDEC approval, biologists accessed portions of the island perimeter on foot to get better visibility of nests. Movements within the island tended to cause some distress to the nesting birds and thus, biologists limited activities to locations along the perimeter of the island that did not cause disturbance to the herons.

Active rookery sites were monitored five times during the breeding season. The first visit in April was conducted after many adults had arrived on the rookery site and initiated courtship/breeding activities, but before many had begun incubation. Temperatures were unseasonably warm during early season survey efforts and no ice was present on the river. For the first time since the monitoring surveys began in 2014, the April surveys were conducted from all three observation stations and biologists could access Motor and Strawberry Islands on foot (Figure 4). Subsequent events utilized all remote observation stations as well as strategic locations on Motor Island and along its perimeter.

Surveys were scheduled to maximize the probability of determining nesting success for the highest number of nests, and in general took place approximately every three weeks during the incubation and nestling periods. Monitoring was performed during the afternoon when herons were most likely to be attending their nests, and on warm windless days. All data gathered during heron survey efforts were documented on the appropriate heron monitoring data forms (Appendix B).

#### *Characterizing Nests*

For each nest biologists made note of the species occupying the nest, even if the species was not one of the focal species (e.g. if a nest was being used by Cormorants). If the nest was not occupied the nest was identified as “inactive”. Observers also made note of the nest status using the following notation scheme modified from Vennesland and Norman (2006):

AD Adult present at nest but not incubating
IN Incubating/Brooding
YN Young are visible in the nest
YB Young are present but have left nest
NV Not visible
FL Failed nest
IA Nest inactive (status unknown)

For nests that contained young the approximate age of the nestlings was recorded as follows (1 = 0-2 Weeks; 2 = 2-5 weeks; 3 = 5-8 weeks). Due to the sensitivity of colonies, observers spent the minimum amount of time necessary to accurately assess the activity at the nest. Nests were only listed as "failed" if a breeding pair was confirmed to be using the nest site then visible evidence (e.g. the nest was destroyed, dislodged or only dead birds were seen in the nest) was observed to indicate that the nest was no longer in use.

#### *Ageing Young*

During survey activities observers noted the age of nestlings so that future visits could be timed to maximize the likelihood of determining success of each nest. As detailed in the Work Plan (NewEarth 2015a) at 0-2 weeks old Great Blue Heron nestlings are still covered in down and after a two-week period feathers begin to emerge. By five weeks of age nestlings can stand erect but primary feathers are still in pins. By six weeks of age primaries should have grown, but birds may still be flightless (Vennesland et al. 2011, Baicich and Harrison 1997). In Great Egrets and Black-crowned Night-Herons the nestling period is slightly more advanced. Feathers start appearing after one week and by four weeks of age primaries have grown in (Hothem et al. 2010, Mccrimmon et al. 2011, Baicich and Harrison 1997).

#### *Determining Nesting Success*

Nests were considered to have been active if herons were seen attending the nest at least once during the breeding season. Nests were considered to have reached the incubating/brooding stage if at least one adult was present and sitting on the nest. Because of difficulty in determining nesting success once young leave the nest, young were considered to have fledged once they were seen on branches near the nest site or when they had reached fledging age (six weeks for Great Blue Heron and 4 weeks for Great Egret and Black-crowned Night-Heron). Nests were considered to have failed if incubating/brooding or nestlings were observed during at least one survey event but later never determined to have fledged; or if failure could be determined after the season had ended (e.g. predated/abandoned eggs in the nest). Nests in which adults were observed attending to a nest, but met neither the "fledged" nor "fail" conditions were considered to have uncertain status as it could not be determined whether adults ever laid in the nest or not.

### 2.1.4 Photographic Documentation

Photographs were taken throughout the nest monitoring events to document the overall rookery setting, various stages of nesting activity and general features found on the island (Appendix A).

## 2.2 OSPREY SURVEYS

### 2.2.1 Survey Locations

Based on input from NYSDEC biologists and annual site reconnaissance efforts, 12 potential Osprey nest locations have been targeted for observation during 2014-2016 surveys (Table 3) and are shown in Figures 2 through 5. These locations included all known man-made platforms whether active or not (OSPR-1, OSPR-2, OSPR-3, OSPR-4, OSPR-5, OSPR-6, OSPR-7, OSPR-

11), natural active or formerly active nest sites away from dedicated platforms (OSPR-10, OSPR-12), and sites where sources had identified Osprey activity but nests had yet to be located (OSPR-8, OSPR-9). All sites were monitored for activity during the 2016 survey effort regardless of whether Osprey were previously confirmed at the location.

**Table 3. Location of Sites Monitored for Osprey Nesting Activities-2016.**

| Site ID | General Location | Latitude | Longitude |
|---|---|---|---|
| OSPR-1 | Adams Slip, Niagara Falls | 43° 04' 42.44"N | 79° 02' 46.77"W |
| OSPR-2 | Buckhorn State Park West, Grand Island | 43° 03' 50.99"N | 79° 00' 11.12"W |
| OSPR-3 | Buckhorn State Park Central, Grand Island | 43° 03' 34.50"N | 78° 59' 06.78"W |
| OSPR-4 | Buckhorn State Park East, Grand Island | 43° 03' 30.93"N | 78° 58' 44.83"W |
| OSPR-5 | Beaver Island State Park, Grand Island | 42° 57' 43.34"N | 78° 57' 36.87"W |
| OSPR-6 | East River Marsh, Grand Island | 42° 58' 00.25"N | 78° 56' 26.76"W |
| OSPR-7 | Tifft Nature Preserve, Buffalo | 42° 50' 53.68"N | 78° 51' 27.78"W |
| OSPR-8 | Niagara Power Plant, Kenmore | Vicinity of 42° 58' 12.80"N | Vicinity of 78° 55' 54.57"W |
| OSPR-9 | Sewer Plant, Wheatfield | Vicinity of 43° 04' 29.68"N | Vicinity of 78° 56' 19.69"W |
| OSPR-10 | Buckhorn State Park West-Relocation, Grand Island | 43° 03' 49.73"N | 79° 00' 05.24"W |
| OSPR-11 | Tifft Nature Preserve, Buffalo | 42° 51' 10.99"N | 78° 51' 30.03"W |
| OSPR-12 | Tonawanda Coke Plant, Kenmore | 42° 58' 39.13"N | 78° 56' 23.62"W |

To avoid disturbing Osprey during breeding/nesting activities biologists observed nest sites from remote locations that offered optimum views of the nest site rookery while minimizing disturbance to the birds. The locations were not fixed and biologists were free to select vantage points as needed for optimal views throughout the survey effort. The latitude and longitude of each potential nest site was recorded using a handheld GPS receiver and are provided in Table 3.


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Date: 12/5/2016

Figure 5. Osprey Nest Survey Locations – Tifft Nature Preserve Area

Niagara River Area of Concern
2014 - 2018
Marsh Anuran and Avian Population Monitoring
Niagara and Erie Counties, NY

**Legend**

Potential Osprey Nest Site

N

0 0.0275 0.055 0.11
Miles

### 2.2.3 Survey Periods

The primary goal of the Osprey nest monitoring effort was to collect information on nesting activities to facilitate efforts to establish Osprey population estimates, and to evaluate trends in the number of breeding adults within the NR AOC. Per the Work Plan (NewEarth 2015a) and consistent with previous survey efforts, multiple surveys were completed in 2016 within the recommended survey windows and included a pre-breeding season site reconnaissance and four nest monitoring events as shown in Table 4. Optimal seasonal timing varies from year to year depending on weather conditions and breeding chronology of the target birds and was taken into consideration when timing survey events.

**Table 4. 2016 Osprey Nest Monitoring Survey Dates.**

| Survey Event | Survey Dates |
|---|---|
| General Site Reconnaissance | April 16-17, 2016 |
| 1 | May 12-13, 2016 |
| 2 | June 1-2, 2016 |
| 3 | June 24-26, 2016 |
| 4 | July 13-14, 2016 |

### 2.2.4 Productivity Monitoring

Osprey nest sites were monitored four times during the breeding season. The first monitoring event was conducted after most adults had arrived at nest sites and initiated courtship/breeding activities, but before incubation had begun. Subsequent survey events were scheduled to maximize the probability of determination of nesting success for the highest number of nests and in general took place approximately every three weeks during the incubation and nestling periods. All data gathered during Osprey survey efforts were documented on the appropriate data forms (Appendix C). At no time were nest sites approached during the active breeding/nesting period.

#### *Characterizing Nests*

At each nest, biologists made note of the nest status using the following notation scheme modified from Vennesland and Norman (2006):

AD Adult present at nest but not incubating
IN Incubating/Brooding
YN Young are visible in the nest, or adult is seen carrying food to the nest site
NV Not visible
FL Failed nest
IA Nest inactive (status unknown)

Biologists were able to determine the status of most nests shortly after arriving at the observation site. However, when no adults or young were visible the observer waited up to one hour for adults to return to the nest. If no adults were seen the nest was listed as "inactive". Nests were only listed as "failed" if there was visible evidence that the nest is no longer in use (e.g. the nest was destroyed and/or dead birds were observed at the nest site).

#### *Ageing Young*

Attempts were made to age nestlings to better determine timing of site visits and for evaluation of nesting success. For nests that contained young, the approximate age of the nestlings was recorded as follows (1 = 0-2 Weeks; 2 = 2-5 weeks; 3 = 5-8 weeks). Generally, nestlings between 0-2 week of age are covered in down and at two weeks will begin to appear feathered. By five weeks old young are nearly full grown (Poole et al. 2002).

#### *Determining Nesting Success*

Nests were considered to have been active if Ospreys were seen attending the site at least once during the breeding season. Nests were considered to have reached the incubating/brooding stage if at least one adult was observed sitting on the nest. Because of difficulty in determining nesting success once young leave the nest, young were considered to have fledged once they had reached five weeks of age which is typically when juveniles can leave the nest site. Nests were considered to have failed if incubating/brooding or nestlings were observed at some point in the survey period but were never determined to have fledged. Nests in which adults were observed attending to a nest but did not meet neither the "fledged" nor "fail" determination, were considered to have uncertain status as it could not be determined whether adults ever laid eggs in the nest or not.

### 2.2.5 Photographic Documentation

Biologists collected photographs of each nest site throughout the nest monitoring events to document the overall nest setting and various stages of nesting activity (Appendix A).

## 2.3 OTHER SPECIES/LOCATIONS

### 2.3.1 New Restoration Sites

Work is ongoing in the AOC by the NYSDEC, the New York Power Authority (NYPA), and others to restore or create fish and wildlife habitat (NYPA 2016). Although not specifically a component of the survey protocol, two of these sites are evaluated concurrent to heron and Osprey monitoring activities to determine use by target heron species. Frog Island, constructed in the fall of 2014, is an approximately 2.6-acre roughly oval-shaped fish habitat restoration site within the Niagara River and located approximately 800 feet to the southeast of Motor Island (Figure 1). The site is comprised of rock berms and vegetative plantings. A portion of Strawberry Island is also undergoing restoration to create seven acres of diverse habitats for fish and birds (NYPA 2016). Construction was in progress at the site during 2016 heron surveys and few birds were seen.

# 3.0 RESULTS AND DISCUSSION

## 3.1 HERON

A site reconnaissance survey was performed on April 16th and 17th 2016 followed by heron nest monitoring surveys on May 12th, June 1st, June 25th and July 13th, 2016 (Table 2). Graphs 1 through 4 provide summaries of the heron survey results, and Figures 2, 3, and 4, show the locations of potential heron survey sites. Appendix A provides photographs from the survey event and Appendix B provides the raw survey data and completed data forms.

### 3.1.1 Rookery Locations

The April reconnaissance targeted the NR AOC to assess the general condition at sites identified during previous efforts and to follow up on tips regarding potential new sites (Table 1 and Figure 2). Reconnaissance also included a re-visit to the gorge of the Niagara River downstream (north) of Niagara Falls in June by NewEarth biologists. As with 2015 efforts, many foraging heron and Cormorant were observed throughout the AOC, particularly within the gorge north of Niagara Falls; however, no new heron rookery sites were identified.

Observers assessed Motor Island, Strawberry Island and Buckhorn Weir (Figures 3 and 4), as well as the general AOC, for heron nesting activity. Since the onset of the monitoring effort in 2014, heron nesting has only been confirmed at the Motor Island rookery site (identified as H-1 on Figure 4). Motor Island and nearby Strawberry Island, located 3,500 feet southeast of Motor Island, have been used as rookery sites for target heron species since at least 2002 (Adams, Personal Communication 2015a,b; Weseloh Personal Communication 2016). However, heron and Cormorant populations on Motor Island began to increase significantly in 2011 when Bald Eagles (*Haliaeetus leucocephalus*) were first sighted on Strawberry Island. Heron and cormorants have not been observed nesting on Strawberry Island since 2013 when Bald Eagles began nesting there (Adams and Walters 2014). Based on the 2016 survey, the Bald Eagle nest remains active at Strawberry Island and although numerous target heron species have been observed in habitat along the edges of the island, none appear to be nesting there. Buckhorn Weir is not known to have previously supported nesting heron species, but was once home to thousands of nesting terns and is thought to provide suitable habitat for nesting heron (Adams and Walters 2015a). Consistent with previous years, the weir site continues to be dominated by nesting ring-billed gulls and several pairs of Cormorants (Adams and Walters 2014, 2015, 2016; NewEarth 2015b, 2016).

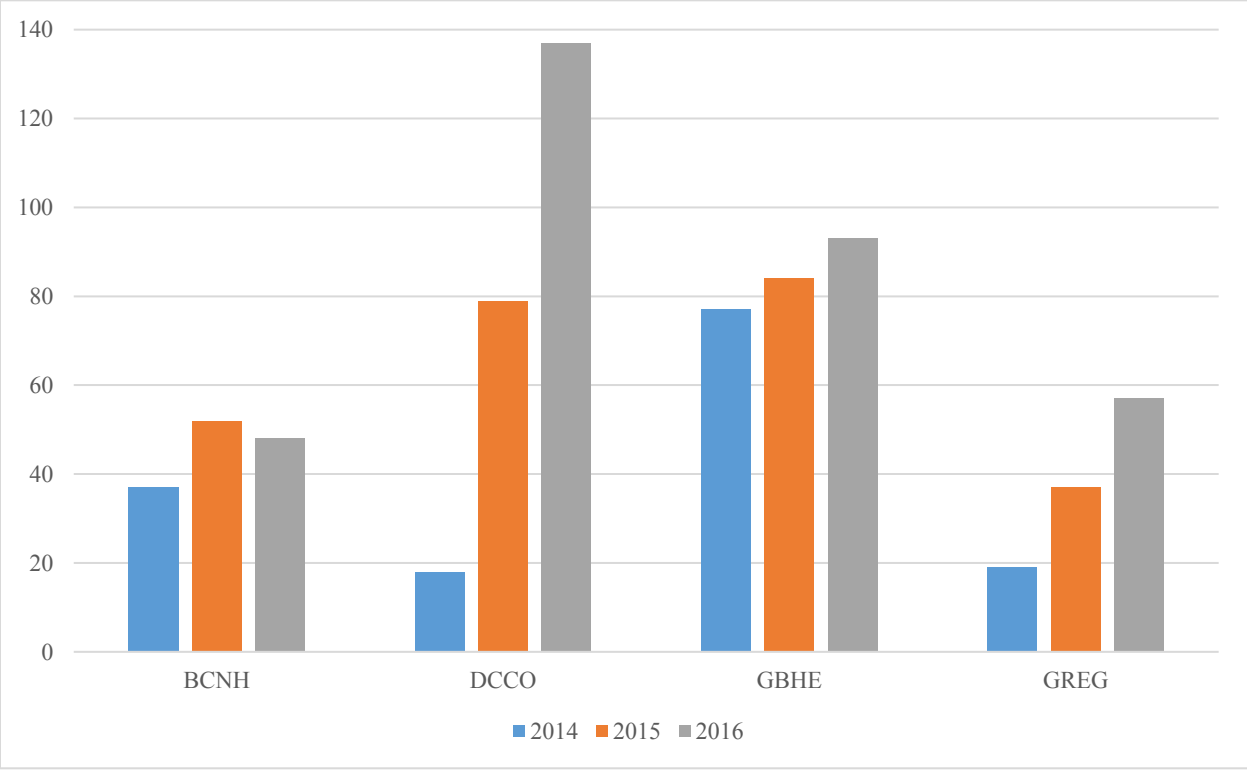
Based on current knowledge of rookery locations, this survey represents a full census of all known heron breeding sites within the U.S. side of the NR AOC, although Strawberry Island may eventually once again support heron nesting and should continue to be monitored. No obvious opportunities to increase the sample size of rookeries for the target heron species exist in the current study area without the restoration of existing areas to make them more suitable or creation of new sites. Due to the limited availability of habitat for nesting herons, populations of these target species in the NR AOC are extremely vulnerable. Identifying and protecting known nest sites and efforts to create additional sites is key in conservation efforts for these species.

### 3.1.2 Productivity Monitoring

#### *Island-wide Monitoring on Motor Island*

The highest number of nests to reach incubation noted during any one survey event, included 48 pairs of Black-crowned Night Herons, 137 pairs of Cormorants, 93 pairs of Great Blue Herons, and 57 pairs of Great Egrets; an increase from 2014 and 2015 for all species except Black-crowned Night Heron (Graph 1). Of these, the highest number of nests with confirmed young in the nest included 6 Black-crowned Night Herons (13 percent [%] of the nests believed to be active), 86 Cormorants (63% of the nests believed to be active), 58 Great Blue Herons (62% of the Great Blue Heron nests believed to be active), and 16 Great Egrets (28% of the nests believed to be active). The relatively low number of nests with confirmed young is consistent with previous surveys (NewEarth 2015b, 2016), and believed to be mostly attributed to the inability to see the young due to dense vegetation, rather than low productivity or nest failure.

**Graph 1. Number of Nests of Target Species to Reach Incubation Stage Per Year, 2014-2016.**




**Sources:** NewEarth Ecological 2015b, 2016.

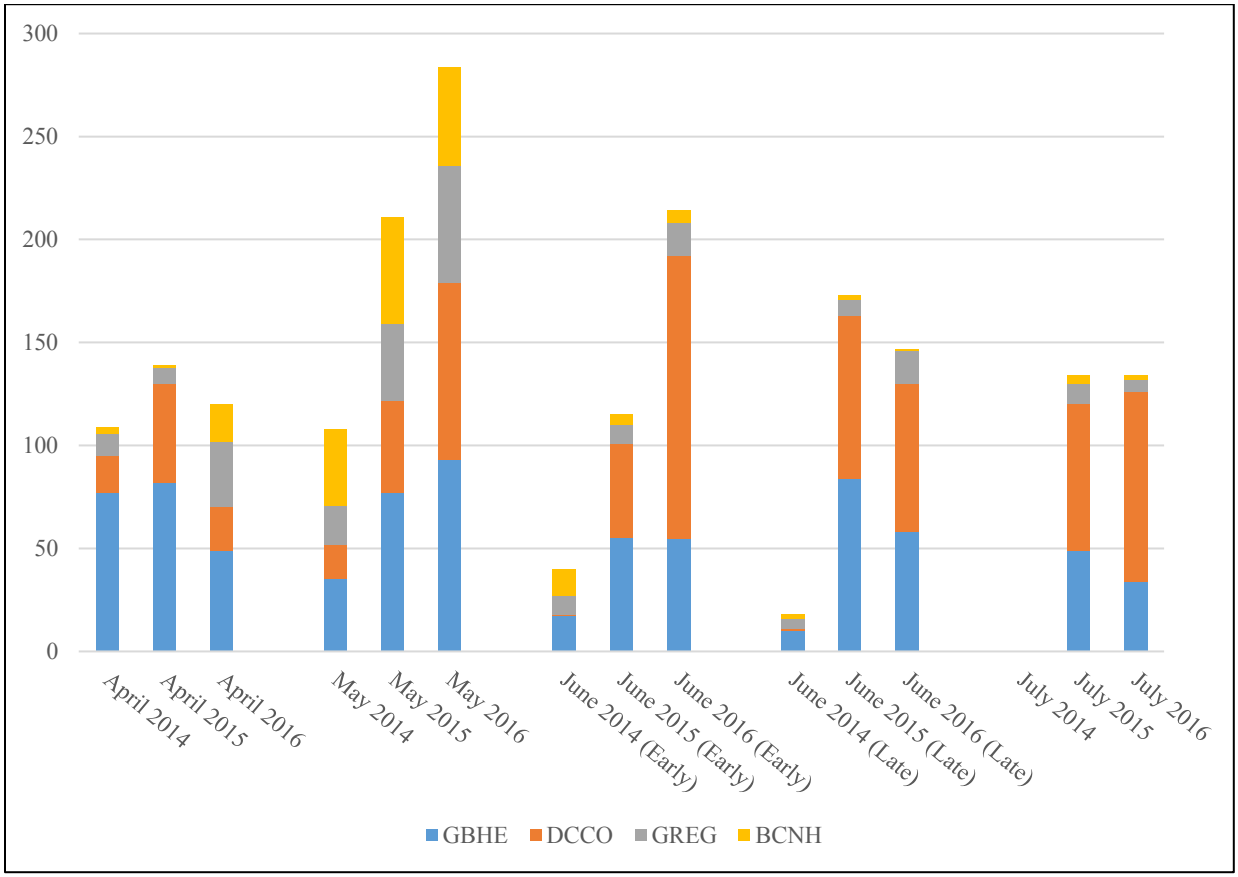
The highest count of nests to reach incubation stage for species which nest predominately in the sapling and shrub layers on the island is in May, when incubation is well underway and before full leaf out (Graph 2). The count of active nests for GBHE and DCCO is more consistent from April through late June since they tend to be tied to the nests in early spring and their overall size, long necks, and location in the upper tree level where vegetation is less dense makes them more visible from remote locations and throughout the survey season than low-shrub nesting heron. In some years April surveys are performed only from remote vantage points due to ice on the Niagara River that prevents access to Motor Island (Adams, personal communication 2016b). Thus, many nesting birds are likely missed during these remote April surveys (NewEarth 2015b, 2016). While the number of active nests tends to decrease into late June and July, DCCO do not appear to begin incubation until later in the season and based on 2016 findings can nest well into July when the young of most heron species have already fledged.

Dense vegetation is a significant factor in detectability of nesting heron and without question the number of active nests and productivity are higher than reported. Appendix A provides images of the rookery taken from April and early June showing how rapidly visibility of nests diminishes; particularly for the species nesting in the sapling-shrub layer. Despite this, vegetation conditions are similar year-to-year and therefore the estimates, even if low, provide a barometer for trends in breeding activities at the rookery.

Most heron nesting activities had been completed by late-June. Nonetheless, biologists visited the site on July 12$^{th}$ to perform a follow up count, during which they identified 34 nests with Great Blue Heron chicks (49 in 2015), 2 nests with Black-crowned Night Heron chicks (4 in 2015), 6 nests with Great Egret chicks (10 in 2015), and 92 nests with Cormorant chicks (71 in 2015) (Graph 2). All chicks were fully-developed and many were observed near the nest site, but out of the nest. Dozens of juvenile herons, representing all three of the target species, were also observed flying and foraging along the Niagara River. Numbers of active nests were not reported for July 2014, but a change in survey approach in 2015 made the July count possible in subsequent annual surveys.

Based on a fall leaf-off nest site survey on Motor Island in 2014 there are an estimated 779 existing nests available for use in the rookery (NewEarth 2015b). Annually some nests are lost and new nests are built, but assuming the 779 nests are a good estimate of potentially available nest sites, nesting activity was again low. Incubation was confirmed at 335 (43%) of the available nests in 2016; incubation was confirmed at 252 (32%) in 2015. Again, this is without question a low estimate of nest use given the poor visibility of nest sites during the peak of nesting activities. In many areas of the site, young chicks could be heard in relatively large numbers within the dense vegetation, but many were not visible despite attempts to utilize several different locations as vantage points. A wide diversity of tree species and size classes continue to be used by all target species, but anecdotal information indicates lower overall use of the shrubs and trees on the northern end of the island by Cormorant and higher use of those on the southern end in 2016 when compared to 2014 and 2015.

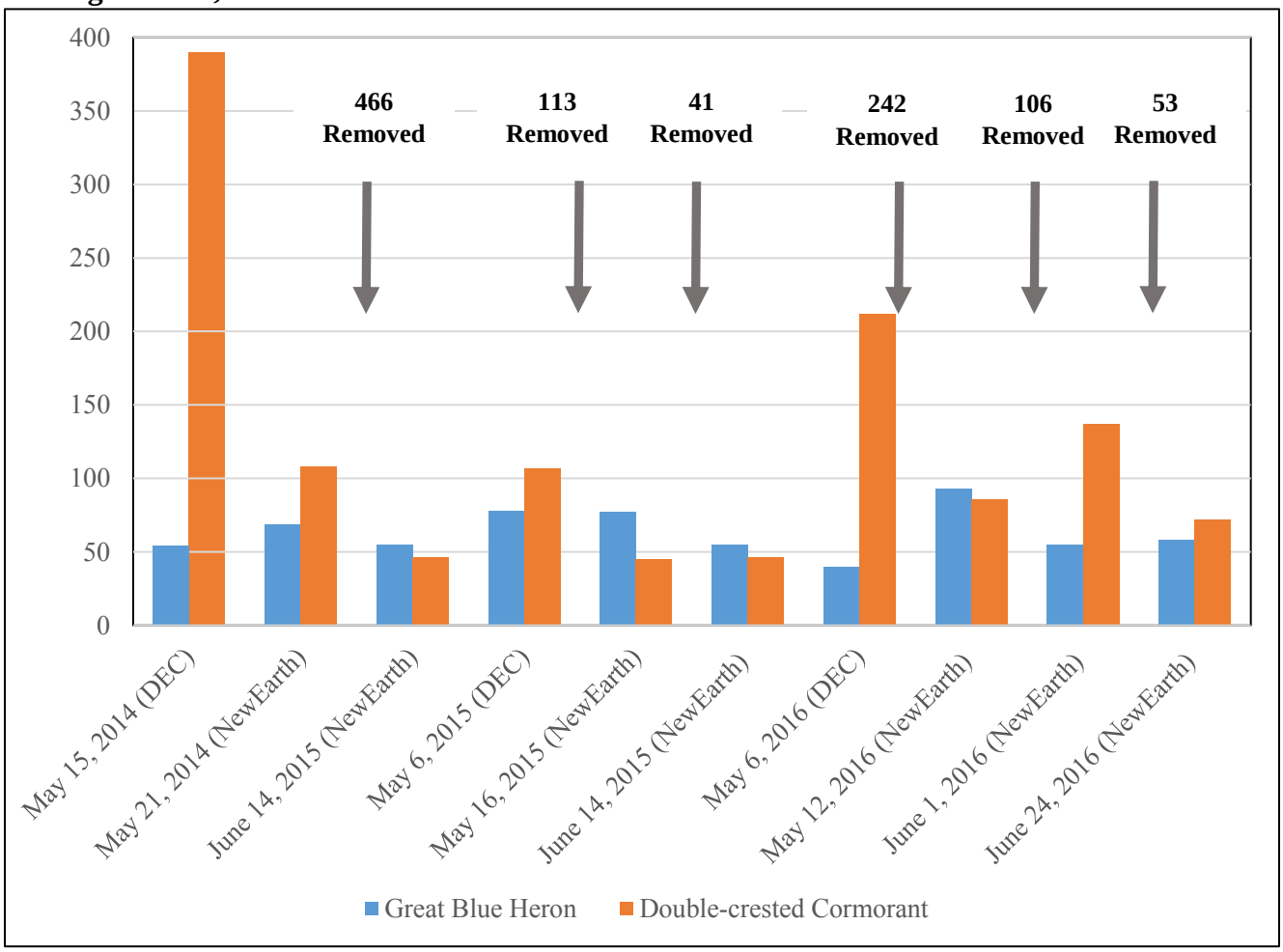
**Graph 2. Number of Nests of Target Species to Reach Incubation Stage Per Month, 2014-2016.**




**Sources:** NewEarth Ecological 2015b, 2016.

Based on NYSDEC surveys conducted on Motor Island on May 6, 2016 (Graph 3), 40 pair of Great Blue Herons (78 in 2015), 50 pair of Great Egrets (66 in 2015), 212 Cormorants (107 in 2015), and 20 Black-crowned Night Herons (41 in 2015) were using the island (Walters 2016; Adams and Walters 2014, 2015, 2016). Culling efforts, conducted annually in early May by NYSDEC do appear to lower the number of nesting DCCO (466 culled in 2014, 154 culled in 2015, 401 culled in 2016), but the species appears to re-nest and the number of active nests appears to rebound quickly after culling (Adams and Walters 2014, 2015, 2016). Results between 2014 and 2016 show a general increasing trend in Cormorant numbers on Motor Island, despite culling efforts. Factors affecting nearby Cormorant nesting activities, such as the destruction of nest sites in Hamilton, Ontario, or early migrations of Cormorant into the area form the north due to an unusually warm and dry spring and summer in the AOC, may result in an additional influx of Cormorant to the Motor Island site (Adams, Personal Communication 2016a; NOAA 2016).

**Graph 3. Number of Active Nests of Great Blue Heron and Double-crested Cormorant and Culling Efforts[1], 2014-2016[2].**




**Sources:** Adams and Walters 2014, 2015, 2016; NewEarth Ecological 2015b, 2016.

[1] DCCO culling efforts: 5/25 and 5/29, 2014 (466 individuals removed); 5/13 and 5/21, 2015 (156 removed); and, 5/6, 5/26 and 6/2 (401 removed).

2 Survey performed by NewEarth or NYSDEC as indicated in parenthesis after dates. April data is not provided since the island is not fully accessible for surveys in April during some years due to river ice.

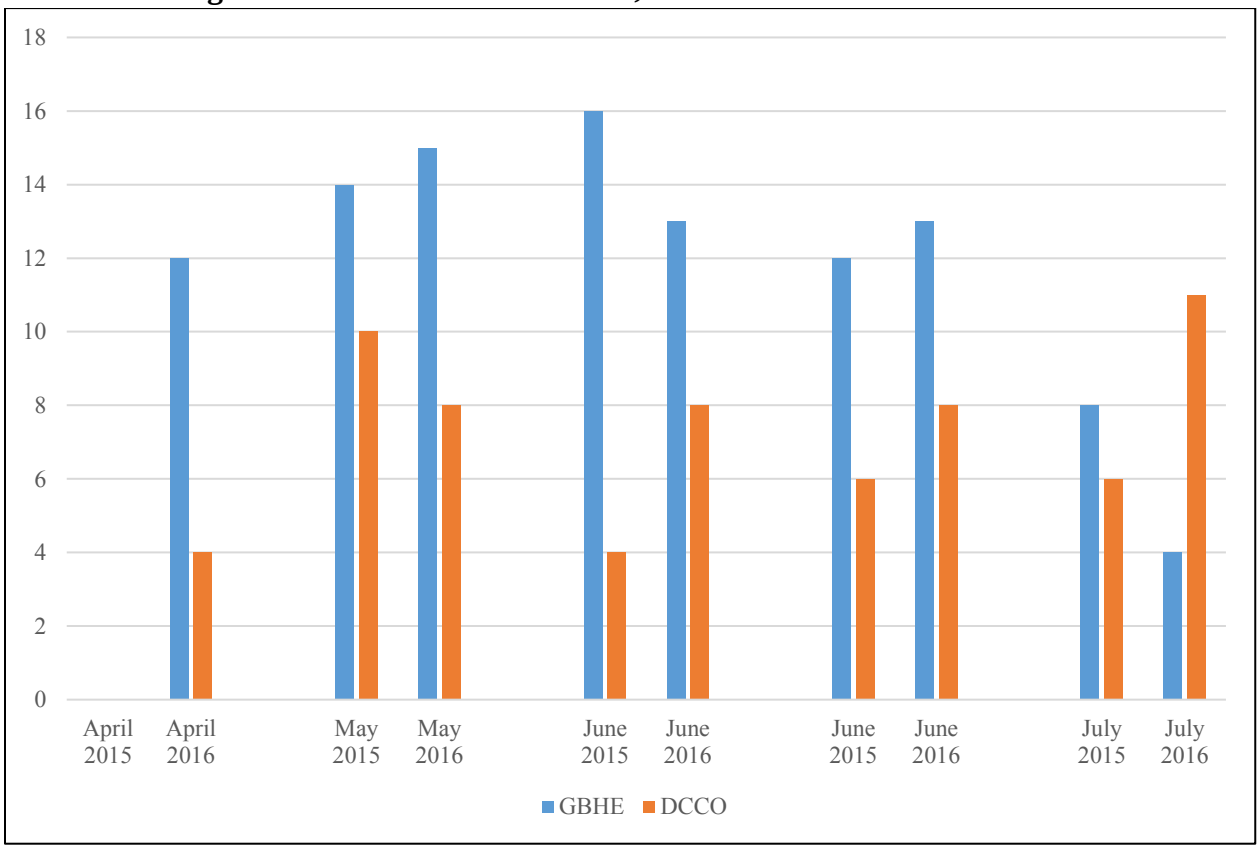
Most of the vegetation on the island continues to be in overall good health, although many bare areas and sloughing bark of trees were observed and are likely indicative of declining tree/shrub health. Beaver activity, the spread of grape vines, natural succession, and even the roosting activities themselves (particularly the highly acidic avian guano) each pose threats to the vegetation that could significantly compromise nesting opportunities for the target species. Control/prevention measures are recommended, but should be done after all nesting has been completed. Vine removal should be evaluated and focused on specific areas/vegetation since some species are using the vine habitat. Shoreline erosion poses a less significant threat, but since nearly every tree is of value, stabilization efforts may be warranted to reduce vegetation loss. Given the significance of the Motor Island rookery site for heron nesting, tree/shrub health should be assessed regularly to identify threats, and to confirm that new growth is forming to replace vegetation that ages and dies off.

### *Subset Nest Site Monitoring*

Continuing with the sub-sampling approach first established in 2015, a subset of Great Blue Heron and Double-crested Cormorant nests were identified and tracked throughout the May to July period. Great Egret and Black-crowned Night Heron nests were not tracked since by May vegetation was too dense to observe from a distance and attempts to get closer agitated the birds and caused many to flush from their nests.

A total of 34 nests were included in 2016 monitoring, this included 28 nests originally identified in 2015 as well as additional nests built in 2016. Interestingly, upon first visit to the control tree, over half of the original nest sites were no longer present; presumably the result of high winds (Appendix A, Photographs). Throughout the season some of the original nests were rebuilt, new nests were added, and some nests present early in the season were again eliminated. In the end, of the 34 nests monitored, the highest number of nests to reach incubation stage observed during any one survey event included 15 active Great Blue Heron nests and 11 (79%) active Cormorant nests, compared to 16 Great Blue Heron and 10 Cormorant in 2015 (Graph 4).

**Graph 4. Number of Great Blue Heron and Double-crested Cormorant Nests to Reach Incubation Stage at Motor Island Control Site, 2015 and 2016[1,2].**




**Sources:** NewEarth Ecological 2016.

[1] Control site not monitored as part of 2014 survey protocol.
[2] Unable to access the site in April 2015 due to ice on the Niagara River (Adams, Personal Communication 2016b).

As with attempts to monitor the larger rookery, some of the active nests that were visible at the onset of monitoring were concealed as the monitoring progressed and activities at other previously undetected nests became more obvious as young grew. Of the highest number nests that were visible enough to assess productivity during a given survey event, 13 Great Blue Heron nests produced 34 young (average of 2.6 chicks per nest) and eight Cormorant nests produced 20 young (average of 2.5 chicks per nest).

Only one Cormorant nest reportedly failed after the May survey event; this despite several Cormorant culling efforts on the island (Adams and Walters 2016). It may be that Cormorant were not culled from within the control tree. Alternatively, if Cormorant were removed from the control area, the resulting failed nest sites may have been one of several nests that became concealed due to dense vegetation, or it may be that other Cormorant rapidly took over failed nests after culling and the failure was not detected during survey efforts. No actual displacements of Great Blue Heron by Cormorant were observed.

### 3.1.3 Incidental Observations

Since the 2014 survey efforts began, Bald Eagles, a state Threatened species, have been observed nesting on Strawberry Island and flying near Motor Island. Eagles are a desirable species in the NR AOC, although their presence may be detrimental to the target heron species. Heron and Cormorant reportedly nested on Strawberry Island prior to the arrival of bald eagles on the island in 2011, and their presence on the island is believed to be the reason behind large increases in the numbers of colonial waterbirds on Motor Island since 2013 (Adams and Walters 2014). Eagle nesting on Motor Island (the only known colony of Great Blue Heron, Black-crowned Night Heron, and Great Egret in the NR AOC), could be catastrophic to the NR AOC heron population.

The state Threatened Common Tern (*Sterna hirundo*), and Caspian Tern (*Hydroprogne caspia,* formerly *Sterna caspia*) also continue to be observed flying, foraging, and roosting in and along the Niagara River and using the newly established Frog Island restoration site. Many terns (as well as Cormorant) are also nesting on utility line support structures adjacent to Buckhorn Weir; where tern nested until 1987 when ring-billed gulls took over the colony site (Adams, Personal Communication 2016a). Reports by NYSDEC indicate overall increases in sightings of terns throughout the NR AOC from 1,111 pair in 2004 to 2,398 in 2016 (Adams and Walters 2016).

### 3.1.4 Disturbances Noted During Survey Efforts

The primary disruption to nesting and roosting herons and other species that utilize the river and adjacent upland areas continues to be recreational boaters; particularly large high speed jet boats. Excessive noise, wakes, and boaters that encroached close to and/or onto nesting areas disturb species and threaten productivity. Additional signage and enforcement of speed limits and resource protection zones would likely help to reduce these types of disturbances and should focus on key areas such as Motor Island as well as key marsh bird nesting areas near Buckhorn State Park that are located within the river system.

NYSDEC Cormorant removal efforts (i.e., shooting) occur on Motor Island during peak heron breeding activities. Four hundred and one (401) Cormorants were reportedly eliminated during 2016 culling efforts (Adams and Walters 2014). While the control efforts most certainly cause disturbance to all birds nesting on the island, there is high potential for Cormorant numbers to increase to the detriment of desirable target species in the rookery without lethal control measures.

## 3.2 OSPREY

Consistent with 2015, site reconnaissance surveys were performed on April 17th and 18th, and subsequent nest monitoring was performed on May 12th and 13th; June 1st and 2nd; June 24th, 25th and 26th; and July 13th and 14th, 2016 (Table 4). Graph 5 provides a summary of Osprey survey results and Figures 2 through 5 identify the locations of each survey site. Appendix A provides photographs from the survey event, and Appendix C provides the raw survey data and completed data forms from Osprey nest monitoring surveys.

### 3.2.1 Nest Site Locations and Type

Consistent with 2014 and 2015 findings, only 10 of the 12 identified potential sites (Table 3) had structures present that could be suitable for supporting nesting Osprey (Table 5). It is believed that sites #8 and #12 may be the same location and despite reports of a nest near OSPR-9, no nest sites or Osprey activity have been located to date (Figure 4). Biologists also continued to conduct reconnaissance of areas upstream (south) and downstream (north) of Niagara Falls to identify new nests; no new sites were found in the NR AOC.

Of the 10 confirmed Osprey locations, eight are man-made platforms specifically designed for nesting; the remaining two are on some type of man-made structure (Table 5). Five platforms (OSPR-1, OSPR-2, OSPR-5, OSPR-6, and OSPR-7) were installed between 2007 and 2010 as part of New York Power Authority (NYPA) Habitat Improvement Project (HIP) efforts, and two platforms (OSPR-3 and OSPR-4) were installed in the mid 1990's by NYSDEC and New York State Office of Parks, Recreation and Historic Preservation (OPRHP) (NYPA 2013). The remaining nest sites included a utility line pole (OSPR-10) and an abandoned crane (OSPR-12).

Due to interferences with power line activities, the natural nest at Site OSPR-10 was removed in 2007 and was relocated to a man-made nesting platform (OSPR-2) (Gerlach Personal Communication 2016). Osprey continue to attempt to rebuild the nest at OSPR-10 and NYPA removed it again in 2016. Table 5 shows the structure and type of nest platforms monitored during this effort and the identification code assigned to each platform by NYPA, whom conducted nest monitoring at seven locations (OSPR-1 through OSPR-7) from 2009 through 2012.

**Table 5. Osprey Nest Site Types and Corresponding New York Power Authority Identification Number.**

| Site ID | Location | Structure/Nest Site Type | Corresponding NYPA ID[1] |
|---|---|---|---|
| OSPR-1 | Adams Slip, Niagara Falls | Untreated wood pole/ manmade metal nest platform | OP-6 |
| OSPR-2 | Buckhorn State Park West-Relocation, Grand Island | Untreated wood pole/ manmade metal nest platform | OP-1, originally relocated nest from OSPR-10 |
| OSPR-3 | Buckhorn State Park Central, Grand Island | Utility pole/ manmade wood nest platform | OP-3 |
| OSPR-4 | Buckhorn State Park East, Grand Island | Utility pole/ manmade wood nest platform | OP-2 |
| OSPR-5 | Beaver Island State Park, Grand Island | H-pile, steel, & untreated wood pole/ manmade metal nest platform | OP-7 |
| OSPR-6 | East River Marsh, Grand Island | H-pile, steel, & untreated wood pole/ manmade metal nest platform | OP-4 |
| OSPR-7 | Tifft Nature Preserve, Buffalo | Untreated wood pole/ manmade metal nest platform | OP-5 |
| OSPR-8 | Niagara Power Plant, Kenmore | No structure or nest site located | NA |
| OSPR-9 | Sewer Plant, Wheatfield | No structure or nest site located | NA |
| OSPR-10 | Buckhorn State Park West, Grand Island | Steel transmission line tower/natural nest | Nest relocated to OSPR-2 but Osprey rebuilt it |
| OSPR-11 | Tifft Nature Preserve, Buffalo | Utility pole/ manmade wood nest platform | NA |
| OSPR-12 | Tonawanda Coke Plant, Kenmore | Steel abandoned crane/natural nest | NA |

While a thorough assessment of potential natural sites (i.e., stable, large diameter trees near suitable foraging habitat) was not conducted as part of this survey, there appears to be a lack of suitable natural structures available in the NR AOC. Of the 10 Osprey nest sites monitored, all were either platforms installed specifically for Osprey nesting (OSPR-2, OSPR-7) or natural nests that were built on man-made structures (OSPR-12) (i.e., utility poles, cranes, abandoned structures). This validates the usefulness of nest platform restoration efforts for this species in the NR AOC. However, there does not appear to be additional opportunity to expand nest sites to increase nesting activity in the NR AOC. Numerous nest platforms, as well as many additional man-made features (utility poles, abandoned equipment and structures), are available within suitable habitat in the NR AOC and are not being utilized. This suggests that the density of suitable structures has likely been maximized for the number of Osprey currently using the AOC.

### 3.2.2 Productivity Monitoring

Consistent with 2014 and 2015 observations (NewEarth 2015b, 2016), Osprey incubation/brooding was confirmed at three of the 10 potential nest sites located during the 2016 effort (30%). Activity was initially observed at a fourth location in Buckhorn State Park (OSPR-2), but the site was abandoned for unknown reasons before incubation was confirmed. Additionally, two potential sites (OSPR-8, OSPR-9) have never been located since NewEarth survey efforts began in 2014. Two of the same nest sites that were active in 2014 and 2015 were again active in 2016 and included one on a man-made nest platform in Tifft Nature Preserve (OSPR-7) and one on an abandoned crane in the Tonawanda Coke facility (OSPR-12) (Table 6). New for 2016, is the successful fledging of young at the platform nest located within a NYSDEC restoration area of Beaver Island State Park. The nest was installed by NYPA in 2010, but has not supported breeding osprey since installation (NYPA 2013). In 2014, the nest was unattended, in 2015 an Osprey remained at the nest site throughout the season but did not pair, and in 2016 two chicks were raised at the site (Table 6). In 2014, two of the three sites failed after incubation was confirmed but prior to fledging young. In 2015 and 2016 incubation was confirmed at three sites and young fledged at each (Table 6). Since 2014 monitoring efforts began at least 15 chicks have been produced from three active nest sites in the NR AOC (NewEarth 2015b, 2016). Twenty-one have been produced when including NYPA survey data dating back to 2008 (NYPA 2013).

Four nest locations had evidence of Osprey use early in the season; of these, three produced chicks. Nest platform OSPR-2, in Buckhorn State Park, was installed in 2007 and until the 2016 survey hosted the oldest known consistent use of a platform built specifically for nesting Osprey in the NR AOC. Osprey nesting at this relatively remote site have produced at least 10 young since 2007; including one chick in 2009, two in 2010, two in 2011, none in 2012, two in 2014, three in 2015, but was abandoned for unknown reasons before incubation could be confirmed in 2016 (NewEarth 2015b, 2016, NYPA 2013) (Graph 5). Natural nest OSPR-2 was originally located on a power line utility pole approximately 400 feet to the southeast, but was relocated to the man-made nest platform in 2007 when maintenance work was done on the power lines (Gerlach, Personal Communication 2016). Since then, Osprey have attempted to rebuild the nest on the power lines (nest OSPR-10) on several occasions, but the site has not supported Osprey since this survey began in 2014 and the nests are eventually removed from the tower by NYPA for safety reasons. Prior to, and following, the abandonment of nest OSPR-2, up to three Osprey were seen circling the general nest area or perched nearby. Three Osprey were also noted in the same general vicinity of platforms OSPR-10 and OSPR-2 during 2015 surveys.

**Table 6. Summary of 2016 Osprey Nest Status.**

| Site ID | General Location | Nest Status[1] | | | | | | 2015 Status | 2014 Status |
|---|---|---|---|---|---|---|---|---|---|
| | | April | May | June (1) | June (2) | July | 2016 Final Status | | |
| OSPR-1 | Adams Slip | IA | IA | IA | IA | IA | No activity | No activity | No activity |
| OSPR-2 | Buckhorn SP | AD | FL | FL | FL | FL | Abandoned. Osprey at nest in April, but incubation never confirmed. Herring gull in nest – May. Two adults perched in trees nearby and circling area | **At least 3 chicks fledged** | **At least 2 chicks fledged** |
| OSPR-3 | Buckhorn SP | IA | IA | IA | IA | IA | No activity | No activity | No activity |
| OSPR-4 | Buckhorn SP | IA | IA | IA | IA | IA | No activity | No activity | No activity |
| OSPR-5 | Beaver Island | AD | IN | IN | YN (2) | YN (2) | **At least 2 chicks fledged** | Adult at nest, not breeding | No activity |
| OSPR-6 | East River | IA | IA | IA | IA | IA | No activity | No activity | Osprey in area, but no use of nest site |
| OSPR-7 | Tifft[2] | AD | IN | IN | YN (1) | YN (2) | **At least 2 chicks fledged** | **At least 1 chick fledged** | **Nest active, but ultimately failed** |
| OSPR-8 | Power Plant | NA | NA | NA | NA | NA | No nest site | No nest site | No nest site |
| OSPR-9 | Sewer Plant | NA | NA | NA | NA | NA | No nest site | No nest site | No nest site |
| OSPR-10 | Buckhorn | IA | IA | IA | IA | IA | Nest removed, but Osprey in area | Nest occupied by a duck | Osprey in area, but no use of nest site |
| OSPR-11 | Tifft[2] | IA | IA | IA | IA | IA | No activity | No activity | No activity |
| OSPR-12 | Tonawanda Coke | AD | IN | IN | YN (3) | YN (3) | **At least 3 chicks fledged** | **At least 2 chicks fledged** | **Nest active, but ultimately failed** |

**Sources:** NewEarth 2015b, 2016.

[1] Nest Status Codes: AD = adult present at site, not incubating; FL = failed nest; FY = young fledged/ready to depart nest; IA = inactive (status unknown); IN = incubating/brooding; NA = no nest site located; YN = hatched young in nest.

[2] Also confirmed by refuge manager David Spiering.

Natural nest OSPR-12, on the abandoned Tonawanda Coke Plant crane, is the oldest known nest site in the Niagara AOC dating back to 2006. Although built on a manmade structure, at the time of this survey OSPR-12 is the only active nest in the AOC that is not on a platform that was built specifically for Osprey nesting. Anecdotal reports indicate that activity at the nest is inconsistent and the nest is known to fail often (NYPA 2013, Adams Personal Communication, 2015b). A pair hatched two young at the nest in 2014, but the nest ultimately failed before the chicks fledged. In 2015 and 2016 at least two young per year were produced from this location (NewEarth 2015b, 2016).

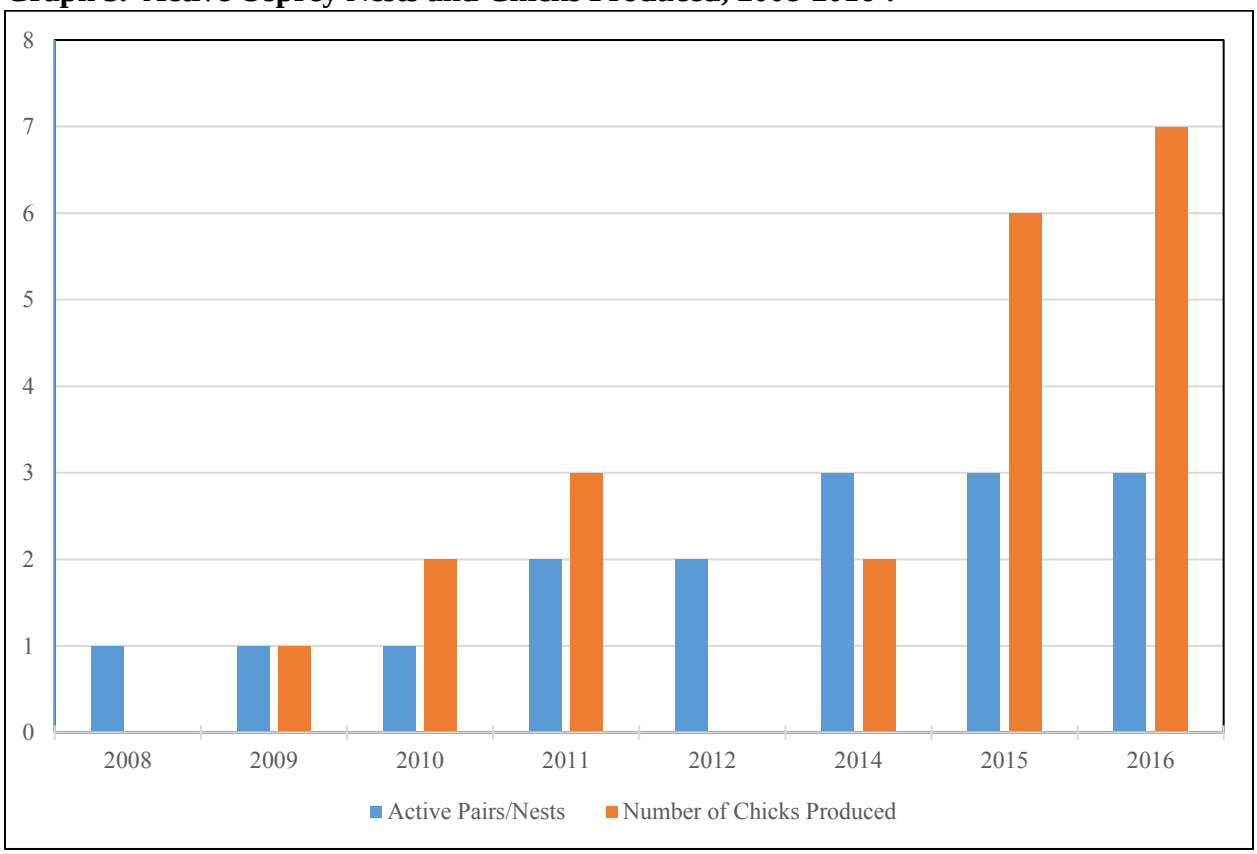
The nest platform at Tifft Nature Preserve (OSPR-7) was installed in 2007 and has also inconsistently hosted successful nesting pairs. One chick fledged at Tifft in 2011, the nest failed in 2012 and 2013, one chick fledged in 2015, and two fledged in 2016 (NewEarth 2015b, 2016, NYPA 2013, Spiering 2016).

Nest platform OSPR-5, erected in 2010 within the Beaver Island State Park NYSDEC restoration site is the newest nest to produce young. A lone Osprey was reported at the platform and tending to the nest throughout the 2015 survey season, but never paired. In 2016, at least two chicks were produced by this newly formed pair.

The mean number of young produced from the three pairs actively nesting in the area in 2016 (average of 2.3 chicks per pair) is higher than the 2.0 mean number of chicks fledged per pair in 2015 and the 1.5 per pair average from 2014 (NewEarth 2015b, 2016). Although there is some variability in which nests produce young, the results indicate an overall increase in Osprey productivity in the NR AOC (Graph 5). Results from the only known consistent nest monitoring effort in the area prior to this study found that six chicks have been fledged from the area since installation of nesting platforms in 2007, including one in 2009, two in 2010, three in 2011, and none in 2012 (NYPA 2013).

The number of nesting pairs is generally limited by the number of Ospreys using the area, and although numerous Osprey have been seen in the general NR AOC, only two to three breeding pairs have been consistently confirmed in the area since 2008 (Adams, personal communication 2016a, b; NYPA 2013). Overall, the aquatic resources available for foraging habitat for Osprey may be of low quality due to the types of prey species present (a high proportion of carp), high boating activity, shallow water depths, and fast flowing water. The high level of disturbance and noise in the general area of nesting platforms may also be a contributing factor. Nesting Osprey may be more inclined to utilize areas outside of the study area which are less developed and have deeper relatively slow moving water, and an abundance of preferred prey species.

**Graph 5. Active Osprey Nests and Chicks Produced, 2008-2016[1].**




**Sources:** NewEarth Ecological 2015b, 2016; NYPA 2013

[1] Data from 2008-2012 collected by NYPA. Data from 2014-2016 collected by NewEarth. Data was not collected in 2013.

### 3.2.3 Incidental Observations

On several survey events, bald eagles were observed flying over, or perched along the shoreline of, areas of the Niagara River to the north of Motor Island. Biologists could not confirm if the observations were of the same eagles as those nesting on Strawberry Island. Eagle activities do not appear to be affecting Osprey nesting.

### 3.2.4 Disturbances Noted During Survey Efforts

Excessively loud jet boat activity was noted during June and July Osprey survey efforts. Osprey roosting along the river shoreline flush when boats approach, but it is unknown whether the disturbances are affecting nesting activities.

## 3.3 Frog Island Restoration Site

Although the intent of the island is to provide fish habitat, this site continues to be used regularly by several bird species for loafing and foraging, including Caspian Tern, Common Tern, Herring Gull, Ring-billed Gull, Spotted Sandpiper and each of the target heron species. Excessive boat activity/noise, close encounters of boaters to the island, and high water levels would likely deter these species from nesting on the small island.

## 4.0 CONCLUSIONS

This study is the third of five annual survey events that will be conducted at an intensive level within the NR AOC and represents a full census of every known location that supports nesting Great Blue Heron, Black-crowned Night Heron, Great Egret, and Osprey species within the AOC. 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 former open space, forest, and marshes in the region no longer exist, have been significantly reduced in size, and/or have had at least some of their primary functions degraded. Despite this, all targeted heron species and Osprey were confirmed in the NR AOC during this study. Future survey efforts will help to assess their population sizes and use of the NR AOC, and may identify potential future restoration needs for the region.

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# APPENDIX A

# PHOTOGRAPHIC DOCUMENTATION

Motor Island in Leaf Off Conditions (April 2014)

Motor Island in Leaf Off Conditions (April 2015)

Motor Island in Leaf Off Conditions (April 2016)

Motor Island in Leaf Out Conditions (Early June 2016)

Boaters Moored Near Motor Island

Flushed Birds Due to Boaters on Motor Island

Great Blue Heron and Great Egret at Motor Island Rookery

Well-developed Great Blue Heron Chicks

Black-crowned Night Heron

Double-crested Cormorant and Chicks

Juvenile Black-crowned Night Heron

Great Egret and Black-Crowned Night Heron Nests in Shrub Layer

Herring Gull in Osprey Nest Platform OSPR-2 (Site Abandoned)

Osprey Nest Platform OSPR-5 (Active Pair)

Osprey Nest Platform OSPR-7 (Active Pair)

Osprey Nest Platform OSPR-12 (Active Pair)

# APPENDIX B

# 2016 HERON NEST MONITORING AND NEST SITE SURVEY DATA FORMS


Control Tree
28
1
3
5
2
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15
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Niagara River Area of Concern Heron Colony Observation Datasheet



Date 5/16/15 Start Time 1530 End Time 1545 Colony MOTOR Obs Point ON ISL. Observer(s) GROVE

Wind 2 Temp (F) 63 Clouds (%) 30 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| NEST NUMBER | SPECIES | | | | | STATUS | | | | | | | NUMBER OF ADULTS | NUMBER OF YOUNG | AGE OF YOUNG | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GBHE | BCNH | GREG | DCCO | OTHER | ADULT PRESENT | INCUBATING/BROODING | YOUNG VISIBLE IN NEST | YOUNG PRESENT/BUT HAVE LEFT NEST | NOT VISIBLE | FAILED NEST | NEST INACTIVE | | | | |
| 1 | X | | | | | X | | | | | | | | | | |
| 2 | | | | X | | | X | | | | | | 1 | | | |
| 3 | | | | | E | | | | | | | | | | | |
| 4 | X | | | | | | X | | | | | | 2 | | | |
| 5 | X | | | | | | X | | | | | | 1 | | | |
| 6 | | | | | E | | | | | | | | | | | |
| 7 | X | | | | | | | X | | | | | 1 | 2 | 1 | |
| 8 | X | | | | | | X | | | | | | 1 | | | |
| 9 | X | | | | | | X | | | | | | 1 | | | |
| 10 | | | | | E | | | | | | | | | | | |
| 11 | X | | | | | | | X | | | | | | 2 | 1 | |
| 12 | X | | | | | | X | | | | | | 2 | | | |
| 13 | X | | | | | | X | | | | | | 1 | | | |
| 14 | X | | | | | | X | | | | | | 1 | | | |
| 15 | | | | X | | | X | | | | | | 2 | | | |

Niagara River Area of Concern Heron Colony Observation Datasheet



Date 5/16/15 Start Time 1530 End Time 1545 Colony MOTOR Obs Point ON ISL Observer(s) GROVE

Wind 2 Temp (F) 63 Clouds (%) 30 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| NEST NUMBER | SPECIES | | | | | STATUS | | | | | | | NUMBER OF ADULTS | NUMBER OF YOUNG | AGE OF YOUNG | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GBHE | BCNH | GREG | DCCO | OTHER | ADULT PRESENT | INCUBATING/BROODING | YOUNG VISIBLE IN NEST | YOUNG PRESENT/BUT HAVE LEFT NEST | NOT VISIBLE | FAILED NEST | NEST INACTIVE | | | | |
| 16 | | | | X | | | X | | | | | | 2 | | | |
| 17 | | | | X | | | X | | | | | | 1 | | | |
| 18 | X | | | | | | X | | | | | | 1 | | | |
| 19 | X | | | | | | X | | | | | | 1 | | | |
| 20 | X | | | | | | X | | | | | | 2 | | | |
| 21 | | | | X | | | X | | | | | | 1 | | | |
| 22 | | | | X | | | X | | | | | | 1 | | | |
| 23 | | | | X | | | X | | | | | | 1 | | | |
| 24 | | | | X | | | X | | | | | | 1 | | | |
| 25 | X | | | | | | X | | | | | | 2 | | | |
| 26 | | | | X | | | X | | | | | | 1 | | | |
| 27 | | | | X | | | X | | | | | | 1 | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Niagara River Area of Concern Heron Colony Observation Datasheet



Date 6/14/15 Start Time 1245 End Time 1300 Colony MOTOR Obs Point ONISL Observer(s) GROVE

Wind 3 Temp (F) 75 Clouds (%) 100 Events That May Have Affected Nesting RAIN

Comments/General Assessment of Site FIVE DCCO HANGING OUT - NOT TIED TO SPECIFIC NEST

| NEST NUMBER | SPECIES | | | | | STATUS | | | | | | | NUMBER OF ADULTS | NUMBER OF YOUNG | AGE OF YOUNG | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GBHE | BCNH | GREG | DCCO | OTHER | ADULT PRESENT | INCUBATING/BROODING | YOUNG VISIBLE IN NEST | YOUNG PRESENT/BUT HAVE LEFT NEST | NOT VISIBLE | FAILED NEST | NEST INACTIVE | | | | |
| 1 | X | | | | | | | X | | | | | | 2 | 2 | |
| 2 | | | | X | | | X | | | | | | 1 | | | |
| 3 | X | | | | | | | X | | | | | | 3 | 2 | |
| 4 | X | | | | | | | X | | | | | | 2 | 2 | |
| 5 | X | | | | | | | X | | | | | | 2 | 2 | |
| 6 | X | | | | | | | X | | | | | | 2 | 2 | |
| 7 | X | | | | | | | X | | | | | | 2 | 2 | |
| 8 | X | | | | | | | X | | | | | | 2 | 2 | |
| 9 | X | | | | | | | X | | | | | | 2 | 2 | |
| 10 | | | | X | | | X | | | | | | 1 | | | |
| 11 | X | | | | | | | X | | | | | | 2 | 2 | |
| 12 | X | | | | | | | X | | | | | | 2 | 2 | |
| 13 | X | | | | | | | X | | | | | | 2 | 2 | |
| 14 | X | | | | | | | X | | | | | | 2 | 2 | |
| 15 | | | | X | | | X | | | | | | 1 | | | |

Niagara River Area of Concern Heron Colony Observation Datasheet



Date 6/14/15 Start Time 1245 End Time 1300 Colony MOTOR Obs Point ON ISL Observer(s) GROVE

Wind 3 Temp (F) 75 Clouds (%) 100 Events That May Have Affected Nesting RAIN

Comments/General Assessment of Site

| NEST NUMBER | SPECIES | | | | | STATUS | | | | | | | NUMBER OF ADULTS | NUMBER OF YOUNG | AGE OF YOUNG | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GBHE | BCNH | GREG | DCCO | OTHER | ADULT PRESENT | INCUBATING/BROODING | YOUNG VISIBLE IN NEST | YOUNG PRESENT/BUT HAVE LEFT NEST | NOT VISIBLE | FAILED NEST | NEST INACTIVE | | | | |
| 16 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 17 | | | | | | | | | | X | | | | | | " |
| 18 | X | | | | | | | X | | | | | | 2 | 2 | |
| 19 | X | | | | | | | X | | | | | | 1 | 2 | |
| 20 | X | | | | | | | X | | | | | | 2 | 2 | |
| 21 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 22 | | | | | | | | | | X | | | | | | " |
| 23 | | | | X | | | X | | | | | | 1 | | | |
| 24 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 25 | X | | | | | X | | X | | | | | 1 | 1 | 2 | |
| 26 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 27 | | | | | | | | | | X | | | | | | " |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Niagara River Area of Concern Heron Colony Observation Datasheet



Date 6/28/15 Start Time 1320 End Time 1340 Colony MOTOR Obs Point ON ISL. Observer(s) GROVE

Wind 3 Temp (F) 59 Clouds (%) 100 Events That May Have Affected Nesting RAIN

Comments/General Assessment of Site

| NEST NUMBER | SPECIES | | | | | STATUS | | | | | | | NUMBER OF ADULTS | NUMBER OF YOUNG | AGE OF YOUNG | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GBHE | BCNH | GREG | DCCO | OTHER | ADULT PRESENT | INCUBATING/BROODING | YOUNG VISIBLE IN NEST | YOUNG PRESENT/BUT HAVE LEFT NEST | NOT VISIBLE | FAILED NEST | NEST INACTIVE | | | | |
| 1 | X | | | | | | | X | | | | | | 2 | 3 | |
| 2 | | | | | | | | | | X | | | | | | |
| 3 | X | | | | | | | X | | | | | | 2 | 2 | |
| 4 | X | | | | | | | X | | | | | | 1 | 2 | |
| 5 | X | | | | | | | X | | | | | | 1 | 2 | |
| 6 | X | | | | | | | X | | | | | | 2 | 2 | |
| 7 | | | | | | | | | | | | X | | | | |
| 8 | X | | | | | | | X | | | | | | 1 | 2 | |
| 9 | | | | | | | | | | | | X | | | | |
| 10 | | | | X | | | | X | | | | | | 1 | 1 | |
| 11 | X | | | | | | | X | | | | | | 2 | 3 | |
| 12 | X | | | | | | | X | | | | | | 2 | 2 | |
| 13 | X | | | | | | | X | | | | | | 2 | 3 | |
| 14 | | | | | | | | | | X | | | | | | |
| 15 | | | | | | | | | | X | | | | | | |

Niagara River Area of Concern Heron Colony Observation Datasheet



Date 6/28/15 Start Time 1320 End Time 1340 Colony MOTOR Obs Point ON ISL Observer(s) GROVE

Wind 3 Temp (F) 59 Clouds (%) 100 Events That May Have Affected Nesting RAIN

Comments/General Assessment of Site

| NEST NUMBER | SPECIES | | | | | STATUS | | | | | | | NUMBER OF ADULTS | NUMBER OF YOUNG | AGE OF YOUNG | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GBHE | BCNH | GREG | DCCO | OTHER | ADULT PRESENT | INCUBATING/BROODING | YOUNG VISIBLE IN NEST | YOUNG PRESENT/BUT HAVE LEFT NEST | NOT VISIBLE | FAILED NEST | NEST INACTIVE | | | | |
| 16 | | | | | | | | | | X | | X | | | | |
| 17 | X | | | | | | | X | | | | | | 2 | 2 | |
| 18 | | | | | | | | | | X | | | | | | |
| 19 | X | | | | | | | X | | | | | | 2 | 2 | |
| 20 | | | | | | | | | | | | X | | | | |
| 21 | | | | | | | | | | X | | | | 1 | 1 | |
| 22 | | | | X | | | | X | | | | | | 1 | 1 | |
| 23 | | | | X | | | | X | | | | | | 2 | 2 | |
| 24 | | | | | | | | | | X | | | | | | |
| 25 | X | | | | | | | X | | | | | | 2 | 3 | |
| 26 | | | | X | | | | X | | | | | | 2 | 1 | |
| 27 | | | | | | | | | | X | | | | | | |
| 28 | | | | X | | | X | | | | | | 1 | | | New NEST |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Niagara River Area of Concern Heron Colony Observation Datasheet



Date 7/12/15 Start Time 1455 End Time 1515 Colony MOTOR Obs Point ON ISL Observer(s) GRONE

Wind 2 Temp (F) 75 Clouds (%) 50 Events That May Have Affected Nesting _____

Comments/General Assessment of Site DENSE VEG, CHICKS & ADULTS MOVING THROUGHOUT AREA, FEW TIED TO NESTS

| NEST NUMBER | SPECIES | | | | | STATUS | | | | | | | NUMBER OF ADULTS | NUMBER OF YOUNG | AGE OF YOUNG | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GBHE | BCNH | GREG | DCCO | OTHER | ADULT PRESENT | INCUBATING/BROODING | YOUNG VISIBLE IN NEST | YOUNG PRESENT/BUT HAVE LEFT NEST | NOT VISIBLE | FAILED NEST | NEST INACTIVE | | | | |
| 1 | | | | | | | | | | | | X | | | | |
| 2 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 3 | X | | | | | | | | X | | | | | 1 | 3 | CHICK NEXT TO NEST |
| 4 | X | | | | | | | X | | | | | | 1 | 3 | |
| 5 | X | | | | | | | | X | | | | | 1 | 3 | CHICK NEXT TO NEST |
| 6 | X | | | | | | | X | X | | | | | 2 | 3 | 1 CHICK IN NEST, 1 NEXT TO IT |
| 7 | | | | | | | | | | | | X | | | | |
| 8 | X | | | | | | | | X | | | | | 1 | 3 | CHICK ON EDGE OF NEST |
| 9 | | | | | | | | | | | | X | | | | |
| 10 | | | | X | | | | | X | | | | 1 | 1 | 2 | CHICK NEXT TO NEST |
| 11 | | | | | | | | | | | | X | | | | |
| 12 | X | | | | | | | | X | | | | | 1 | 3 | CHICK NEXT TO NEST |
| 13 | | | | | | | | | | | | X | | | | |
| 14 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 15 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |

Niagara River Area of Concern Heron Colony Observation Datasheet



Date 7/12/15 Start Time 1455 End Time 1515 Colony MOTOR Obs Point ON ISL Observer(s) GROVE

Wind 2 Temp (F) 75 Clouds (%) 50 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| NEST NUMBER | SPECIES | | | | | STATUS | | | | | | | NUMBER OF ADULTS | NUMBER OF YOUNG | AGE OF YOUNG | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GBHE | BCNH | GREG | DCCO | OTHER | ADULT PRESENT | INCUBATING/BROODING | YOUNG VISIBLE IN NEST | YOUNG PRESENT/BUT HAVE LEFT NEST | NOT VISIBLE | FAILED NEST | NEST INACTIVE | | | | |
| 16 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 17 | X | | | | | | | | X | | | | | 1 | 3 | CHICK NEXT TO NEST |
| 18 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 19 | X | | | | | | | | X | | | | | 1 | 3 | CHICK NEAR NEST |
| 20 | | | | | | | | | | | | X | | | | |
| 21 | | | | X | | | X | | | | | | 1 | | | |
| 22 | | | | X | | | | | X | | | | 1 | 1 | 2 | CHICK NEXT TO NEST |
| 23 | | | | X | | | | X | | | | | 1 | 1 | 2 | |
| 24 | | | | | | | | | | X | | | | | | |
| 25 | | | | | | | | | | | | X | | | | |
| 26 | | | | X | | X | | X | | | | | 1 | 2 | 2 | |
| 27 | | | | | | | | | | X | | | | | | UNABLE TO LOCATE |
| 28 | | | | X | | | X | | | | | | 1 | | | NEW NEST |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Niagara River Area of Concern Heron Colony Observation Datasheet Page 1 of 1

Date 4/18/15 Start Time 1000 End Time 1100 Colony Motor Island Obs Point #1 Observer(s) GROVE

Wind 2 Temp (F) 65 Clouds (%) 10 Events That May Have Affected Nesting _____

Comments/General Assessment of Site LEAF-OFF CONDITIONS, COUNT FROM OBSV. STA 1 ONLY

| Species | Nests Adult Tending | Nests Adult Incubating[1] | Nests With Chicks[2] | Adults Not Tied To Nest | Dead | Empty |
|---|---|---|---|---|---|---|
| GBHE 117 | 35 | 82 | NONE | 28 | ϕ | 23 |
| DCCO 87 | 39 | 48 | NONE | 48 | ϕ | ϕ |
| GREG 21 | 13 | UNABLE TO SEE MOST OF THE AREA 8 | NONE | 18 | ϕ | ϕ |
| BCNH 8 | 7 | 1 UNABLE TO SEE MOST OF THE AREA | NONE | 13 | ϕ | ϕ |

[1] Indicates # of nests where incubation is taking place (each entry is the number of nests noted); [2] Indicates the # chicks visible per each nest (each entry is for 1 nest)

23

Niagara River Area of Concern Heron Colony Observation Datasheet



Date 5/16/15 Start Time 1417 End Time 1805 Colony Motor Island Obs Point 1, 2, ON ISLAND Observer(s) GROVE

Wind 2 Temp (F) 63 Clouds (%) 30 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| Species | Nests Adult Tending | Nests Adult Incubating[1] | Nests With Chicks[2] | Adults Not Tied To Nest | Dead | Empty |
|---|---|---|---|---|---|---|
| GBHE | 10 | 42 | 1,2,1,2,2,1,2,3 2,1 1 2 2 1 1 2 2 1 2 3 2 1 2 1 2 1 2 1 1 1 2 2 2 3 1 35 NESTS / 58 CHICKS | 14 | ∅ | 17 |
| DCCO | 19 | 45 | ∅ | 22 | | |
| GREG | 4 | 19 | 18 | 13 | | |
| BCNH | 5 | 18 | 34 | 7 | | 17 |

[1] Indicates # of nests where incubation is taking place (each entry is the number of nests noted); [2] Indicates the # chicks visible per each nest (each entry is for 1 nest)

Niagara River Area of Concern Heron Colony Observation Datasheet Page 1 of 1

Date 6/14/15 Start Time 1025 End Time 1415 Colony Motor Island Obs Point 2, ON ISLAND Observer(s) GROVE

Wind 3 Temp (F) 75 Clouds (%) 100 Events That May Have Affected Nesting RAIN INTERMITENT THROUGHOUT SURVEY

Comments/General Assessment of Site

| Species | Nests Adult Tending | Nests Adult Incubating[1] | Nests With Chicks[2] | Adults Not Tied To Nest | Dead | Empty |
|---|---|---|---|---|---|---|
| GBHE 55 | ϕ | 5 5 5 5 4 (24) | 2, 2, 2, 2, 2, 2, 1, 2, 1, 2, 1, 1, 1, 2, 1, 1, 2, 1, 1, 2, 2, 2, 1, 2 1, 2, 1, 3, 1, 3, 1 31 NESTS / 50 CHICKS | 5 5 4 | | 5 5 5 |
| DCCO 62 | 5 5 1 (16) | 5 5 5 5 5 5 5 5 1 (46) | ϕ | 5 5 5 5 4 | 3 | 5 5 5 5 |
| GREG 9 | ϕ | 5 (5) | 4 (4) | 5 5 3 | | 2 |
| BCNH 8 | 3 (3) | 3 (3) | 1, 1 (2) | 5 5 2 | | (32) |

[1] Indicates # of nests where incubation is taking place (each entry is the number of nests noted); [2] Indicates the # chicks visible per each nest (each entry is for 1 nest)

Niagara River Area of Concern Heron Colony Observation Datasheet Page 1 of 1

Date 6/28/15 Start Time 1125 End Time 1540 Colony Motor Island Obs Point 2, ON ISLAND Observer(s) GROVE

Wind 3 Temp (F) 59 Clouds (%) 100 Events That May Have Affected Nesting OCCASIONAL DRIZZLE

Comments/General Assessment of Site

| Species | Nests Adult Tending | Nests Adult Incubating[1] | Nests With Chicks[2] | Adults Not Tied To Nest | Dead | Empty |
|---|---|---|---|---|---|---|
| GBHE | ϕ | ϕ | 2,1,1,2,3,1,2,1,2,2,2<br>3,2,3,3,1,2,3,3,2,2,2<br>1,2,2,3,1,2,1,2,2,2<br>2,1,2,1,2,1,1,1,1,1,2,2<br>2,1,1,3,2,2,2,1,1,1<br>2,2,2,2,2,2,2,2,2,2,1,1 | IIII IIII<br>IIII IIII<br>IIII IIII<br>IIII | III | IIII<br>IIII<br>IIII |
| DCCO | ϕ (2) | II | 1,1,1,1,1,2,2,2,1,2,1,<br>2,2,1,2,2,2,2<br>2,1,1,2,1,1,1,2,1,1,1,1,1,<br>1,1,1,2,1,1,2,2,2,1,1,1,1<br>1,1,1,1,1,2,1,1,1,1,1,1,1,1<br>2,1,1,1,1,2,2,1,1,2,1, | IIII IIII<br>IIII IIII<br>IIII | 1 | IIII<br>IIII<br>IIII |
| GREG | ϕ | ϕ | 1,1,1,2,1,1,1,1,2,2,1,2<br>2,2,1,1,1,1,2,2,2,1,1<br>1,1,1<br>2,1,2,3,2,2,2,1 (8 NESTS/15 CHICKS) | IIII IIII<br>III | | IIII<br>IIII |
| BCNH | ϕ | ϕ | 2,2<br>(2 NESTS/4 CHICKS) | IIII IIII<br>IIII IIII<br>IIII | | ↓ |

[1] Indicates # of nests where incubation is taking place (each entry is the number of nests noted); [2] Indicates the # chicks visible per each nest (each entry is for 1 nest)

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Niagara River Area of Concern Heron Colony Observation Datasheet Page 1 of 1

Date 7/12/15 Start Time 1250 End Time 1610 Colony Motor Island Obs Point 2, ON ISLAND Observer(s) GROVE

Wind 2 Temp (F) 75 Clouds (%) 50 Events That May Have Affected Nesting _____

Comments/General Assessment of Site EXTREMELY DENSE VEG, CHICKS & ADULTS MOVING THROUGHOUT AREA, JUMPING FROM NEST - NEST - LIMBS

| Species | Nests Adult Tending | Nests Adult Incubating[1] | Nests With Chicks[2] | Adults Not Tied To Nest | Dead | Empty |
|---|---|---|---|---|---|---|
| GBHE | ϕ | ϕ | 2 1 2 1 2 2 2 3 3 1 1<br>1 2 2 2 1 2 1 1 1 1 1 1 1<br>2 1 1 1 1 2 1 1 1 1 1<br>1 1 2 2 1 1 3 1 1 1 1 1 1<br>49 NESTS / 70 CHICKS | DOZENS<br>16 CHICKS | | 4 |
| DCCO | ϕ | ϕ | 1 2 1 2 2 1 2 2 2 2 2 2<br>1 1 2 2 1 1 1 2 2 2 2 2 2<br>1 2 1 1 1 1 2 2 2 2 2 2 2<br>2 2 2 2 2 2 2 1 2 1 2 2 1<br>2 2 2 1 2 2 2 2 2 1 1 2 2 2<br>1 3 1 2 1 1 2 1 2 2 2<br>71 NESTS / 112 CHICKS | DOZENS<br>0 CHICKS | | 4 |
| GREG | ϕ | ϕ | 3, 2, 2, 2, 2, 2, 1,<br>3, 2, 2<br>10 NESTS / 21 CHICKS | DOZENS<br>(?)<br>19 CHICKS | | 3 |
| BCNH | ϕ | ϕ | 2, 2, 2, 2<br>4 NESTS / 8 CHICKS | DOZENS<br>(?)<br>22 CHICKS | | 4 |

[1] Indicates # of nests where incubation is taking place (each entry is the number of nests noted); [2] Indicates the # chicks visible per each nest (each entry is for 1 nest)

VERY CHALLENGING TO GET # GREG/BCNH CHICKS, ADULT + CHICKS MOVING

# APPENDIX C

# 2016 OSPREY NEST MONITORING SURVEY DATA FORMS

Niagara River Area of Concern Osprey Nest Observation Datasheet

Date 4/18/2015 Start Time 1132 End Time 1815 Observer(s) S.GROVE / M.GROVE Wind 3 - 7 ALONG RIVER

Temp (F) 67 Clouds (%) 0 Events That May Have Affected Nesting _____

Comments/General Assessment of Site OSPR SEEN FLYING TO SE OF VANTAGE PT FOR 2/10 NEAR MARSH OF NYA OSPR 3, 4

| Start Time | End time | nest ID | nest status | # of adults | # of young | age of young | Comments |
|---|---|---|---|---|---|---|---|
| 1139 | 1159 | OSPR5 | AD | 1 | 0 | 0 | SOME STICKS ON PLATFORM ADULT ON PLATFORM EATING FISH |
| 1300 | 1320 | OSPR6 | IA | 0 | 0 | 0 | NO ACTIVITY A FEW STICKS |
| 1320 | 1340 | 12 | IA | 0 | 0 | 0 | NO ACTIVITY NEST PRESENT |
| 1340 | 1400 | 08 | NA | 0 | 0 | 0 | UNABLE TO LOCATE |
| 1445 | 1505 | 02 | IA | 0 | 0 | 0 | STICKS NO BIRDS |
| 1445 | 1505 | 10 | IA | 0 | 0 | 0 | STICKS NO BIRDS |
| 1550 | 1605 | 04 | IA | 0 | 0 | 0 | PLATFORM LEANING NO BIRDS |
| 1550 | 1605 | 03 | IA | 0 | 0 | 0 | NO STICKS NO BIRDS |
| 1620 | 1640 | 01 | IA | 0 | 0 | 0 | STICKS NO BIRDS |
| 1805 | 1815 | 09 | NA | 0 | 0 | 0 | NOT FOUND |
| 1720 | 1740 | 011 | IA | 0 | 0 | 0 | OSPR FLYING TO N/TO SW |
| 1640 | 1700 | 07 | IA | 0 | 0 | 0 | OSPR FLYING TO N/SE BETWEEN 7/11 |
| | | | | | | | |
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Nest Status: AD = Adult Present at Nest, Not Incubating; IN = Incubating/Brooding; YN = Young are visible in the nest; NV = Not Visible; FL = Failed Nest; IA = Nest Inactive (Status Unknown)

Nestling Age: 1 = 0-2 Weeks; 2 = 2-5 Weeks; 3 = 5-8 weeks

1-800-472 3272
444 - 7728

Niagara River Area of Concern Osprey Nest Observation Datasheet

Date 5/15/2015 Start Time 0630 End Time 0720 Observer(s) S. GROVE Wind 0-1

Temp (F) 59-61 Clouds (%) 2 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| Start Time | End time | nest ID | nest status | # of adults | # of young | age of young | Comments |
|---|---|---|---|---|---|---|---|
| 0630 | 0640 | 7 | IN | 1 | 0 | 0 | ADULT ON NEST |
| 0700 | 0720 | 11 | IA | 0 | 0 | 0 | 3 OSPR FLYING ALONG SW SHORELINE |
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Nest Status: AD = Adult Present at Nest, Not Incubating; IN = Incubating/Brooding; YN = Young are visible in the nest; NV = Not Visible; FL = Failed Nest; IA = Nest Inactive (Status Unknown)

Nestling Age: 1 = 0-2 Weeks; 2 = 2-5 Weeks; 3 = 5-8 weeks

Niagara River Area of Concern Osprey Nest Observation Datasheet

Date 5/16/2015 Start Time 0545 End Time 1440 Observer(s) S. GROVE Wind 1-2

Temp (F) 57-73 Clouds (%) 2 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| Start Time | End time | nest ID | nest status | # of adults | # of young | age of young | Comments |
|---|---|---|---|---|---|---|---|
| 0545 | 0605 | 5 | AD | 1 | 0 | 0 | OSPR STANDING ON PLATFORM |
| 0620 | 0640 | 6 | IA | 0 | 0 | 0 | |
| 0755 | 0820 | 3 | IA | 0 | 0 | 0 | |
| 0820 | 0840 | 4 | IA | 0 | 0 | 0 | |
| 1030 | 1100 | 2 | IN | 1 | 0 | 0 | |
| 1030 | 1100 | 10 | IA | 0 | 0 | 0 | NEST OCCUPIED BY DUCK SPP - INCUBATING |
| 1205 | 1215 | 9 | NA | 0 | 0 | 0 | NEST NOT FOUND |
| 1230 | 1240 | 8 | NA | 0 | 0 | 0 | NEST NOT FOUND |
| 1315 | 1347 | 12 | IN | 2 | 0 | 0 | |
| 1420 | 1440 | 1 | IA | 0 | 0 | 0 | |
| | | | | | | | |
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Nest Status: AD = Adult Present at Nest, Not Incubating; IN = Incubating/Brooding; YN = Young are visible in the nest; NV = Not Visible; FL = Failed Nest; IA = Nest Inactive (Status Unknown)

Nestling Age: 1 = 0-2 Weeks; 2 = 2-5 Weeks; 3 = 5-8 weeks

Niagara River Area of Concern Osprey Nest Observation Datasheet

Date 6/13/2015 Start Time 0600 End Time 0905 Observer(s) S.GROVE / M. GROVE Wind 2

Temp (F) 59-75 Clouds (%) 2-3 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| Start Time | End time | nest ID | nest status | # of adults | # of young | age of young | Comments |
|---|---|---|---|---|---|---|---|
| 0600 | 0605 | 03 | IA | 0 | 0 | 0 | NO NEST MATERIAL -NO ACTIVITY |
| 0605 | 0610 | 04 | IA | 0 | 0 | 0 | NO NEST NO ACTIVITY |
| 0735 | 0750 | 02 | NV | 2 | 0 | 2 | ADULT ON NEST, SECOND DELIVERING FOOD, CHICKS NOT VISIBLE |
| 0740 | 0805 | 10 | IA | 0 | 0 | 0 | NO "DUCK", SOME STICKS APPEAR TO BE MISSING FROM NEST |
| [illegible] | | | | | | | |
| 0851 | 0905 | 06 | IA | 0 | 0 | 0 | STICKS PRESENT (POSS PARTIAL NEST) NO BIRDS |
| 0851 | 0905 | 05 | IA | 1 | 0 | 0 | STICKS, ONE ADULT PERCED ON POLE |
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Nest Status: AD = Adult Present at Nest, Not Incubating; IN = Incubating/Brooding; YN = Young are visible in the nest; NV = Not Visible; FL = Failed Nest; IA = Nest Inactive (Status Unknown)

Nestling Age: 1 = 0-2 Weeks; 2 = 2-5 Weeks; 3 = 5-8 weeks

Niagara River Area of Concern Osprey Nest Observation Datasheet

Date 6/14/2015 Start Time 0600 End Time 1738 Observer(s) S. GROVE, M. GROVE Wind 2

Temp (F) 65-75 Clouds (%) 2-3 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| Start Time | End time | nest ID | nest status | # of adults | # of young | age of young | Comments |
|---|---|---|---|---|---|---|---|
| 0600 | 0620 | OSPR 7 | IN | 2 | — | — | 1 ADULT ON NEST, 2ND PERCHED @ TOP OF NEST POLE |
| 0635 | 0640 | OSPR 11 | IA | — | — | — | NO NEST |
| 1550 | 1615 | OSPR 12 | YN | 2 | 1 | 1 | POSS 2ND CHICK IN NEST |
| — | — | 08/09 | — | — | — | — | NEST LOCATIONS NOT FOUND |
| 1720 | 1738 | 01 | — | — | — | — | NO NEST, NO ACTIVITY |
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Nest Status: AD = Adult Present at Nest, Not Incubating; IN = Incubating/Brooding; YN = Young are visible in the nest; NV = Not Visible; FL = Failed Nest; IA = Nest Inactive (Status Unknown)

Nestling Age: 1 = 0-2 Weeks; 2 = 2-5 Weeks; 3 = 5-8 weeks

Niagara River Area of Concern Osprey Nest Observation Datasheet

Date 6/27/2015 Start Time _____ End Time _____ Observer(s) S. GROVE Wind 1-3

Temp (F) 59-64 Clouds (%) 100 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| Start Time | End time | nest ID | nest status | # of adults | # of young | age of young | Comments |
|---|---|---|---|---|---|---|---|
| 0500 | 0505 | 03 | IA | | | | NO NEST ON PLATFORM |
| 0550 | 0555 | 04 | IA | | | | NO NEST ON PLATFORM |
| 0700 | 0725 | 02 | YN | ≥2 | 1 | | 1 ADULT IN NEST, 1 ON SIDE THEN FLEW, JUV STRETCHING WINGS |
| 0700 | 0725 | 10 | IA | | | | NEST PRESENT FORMERLY OCCUPIED BY A DUCK SPP |
| 0735 | 0740 | 06 | IA | | | | |
| 0750 | 0805 | 12 | YN | 2 | 1 | | 1 ADULT FEEDING, ONE ON NEST EDGE |
| | | | | | | | JUV STRETCHING WINGS |
| 0820 | 0835 | 05 | IA | 1 | | | ADULT ON ROOST POLE |
| | | | | | | | |
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Nest Status: AD = Adult Present at Nest, Not Incubating; IN = Incubating/Brooding; YN = Young are visible in the nest; NV = Not Visible; FL = Failed Nest; IA = Nest Inactive (Status Unknown)

Nestling Age: 1 = 0-2 Weeks; 2 = 2-5 Weeks; 3 = 5-8 weeks

Niagara River Area of Concern Osprey Nest Observation Datasheet

Date 6/28/2015 Start Time 0455 End Time _____ Observer(s) SGROVE Wind 2-3

Temp (F) 57 - Clouds (%) 100 Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| Start Time | End time | nest ID | nest status | # of adults | # of young | age of young | Comments |
|---|---|---|---|---|---|---|---|
| 0455 | 0510 | 11 | IA | — | — | — | MAP HAS NEST @ WRONG LOCATION |
| 0637 | 0701 | 07 | YN | 2 | 1 | | 1 ADULT ON NEST, 1 COMING-GOING (NO food) |
| | | 08 | | | | | 1 CHICK BEGGIN — HUNKERED DOWN RAIN |
| | | 08 | | | | | UNABLE TO LOCATE |
| | | 09 | | | | | UNABLE TO LOCATE |
| | | 01 | | | | | |
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Nest Status: AD = Adult Present at Nest, Not Incubating; IN = Incubating/Brooding; YN = Young are visible in the nest; NV = Not Visible; FL = Failed Nest; IA = Nest Inactive (Status Unknown)

Nestling Age: 1 = 0-2 Weeks; 2 = 2-5 Weeks; 3 = 5-8 weeks

Niagara River Area of Concern Osprey Nest Observation Datasheet

Date 7/12/2015 Observer(s) S. GROVE Wind 2

Temp (F) 68-82 Clouds (%) 2 (50%) Events That May Have Affected Nesting _____

Comments/General Assessment of Site _____

| Start Time | End time | nest ID | nest status | # of adults | # of young | age of young | Comments |
|---|---|---|---|---|---|---|---|
| 1050 | 1144 | 2 | YN | 1 | 2(3?) | 3 | ADULT ON PERCH BAR, YOUNG IN NEST (3?) |
| | | | | | | | STRETCHING, PREENING, CALLING |
| | | | | | | | EXTREMELY LOUD JET BOATS BIRDS AGITATED |
| 1200 | 1230 | 5 | IA | 0 | 0 | | NO OSPR - NO CHANGE IN NEST |
| | | | | | | | SIZE / SHAPE |
| | | | | | | | |
| 1510 | 1530 | 12 | YN | 1 | 2 | 3 | ADULT PERCHED NEAR NEST ON |
| | | | | | | | CRANE YOUNG PREENING, STRETCHING |
| | | | | | | | SIGNIFICANT BOAT TRAFFIC |
| 1710 | 1735 | 7 | YN | 1 | 1 | 2 | |
| | | | | | | | |
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Nest Status: AD = Adult Present at Nest, Not Incubating; IN = Incubating/Brooding; YN = Young are visible in the nest; NV = Not Visible; FL = Failed Nest; IA = Nest Inactive (Status Unknown)

Nestling Age: 1 = 0-2 Weeks; 2 = 2-5 Weeks; 3 = 5-8 weeks