

## 2017 September Summary

**Bottom Line:** Monitoring occurred in the CAWS and upper Illinois Waterway upstream and downstream of the Electric Dispersal Barrier in September. **NO LIVE BIGHEAD CARP OR SILVER CARP were found in any new locations immediately upstream or downstream of the Electric Dispersal Barrier.**

### Fixed, Random and Targeted Site Sampling Downstream of the Electric Dispersal Barrier

#### *Electrofishing:*

- Crews from USACE and USFWS completed 47 electrofishing runs at fixed and random sites (11.75 hours total) in the Lockport, Brandon Road, Dresden Island and Marseilles Pools in September.
- Crews collected 4,911 fish of 57 species and 1 hybrid group.
- Fourteen Silver Carp (all adults) were collected in the Marseilles Pool.
- **No Bighead Carp or Silver Carp were reported captured or observed in the Lockport, Brandon Road or Dresden Island Pools.**

#### *Hoop and Mini Fyke Netting:*

- Crews from IDNR set and pulled 16 hoop nets and 16 mini fykes from fixed sites in Lockport, Brandon Road, Dresden Island and Marseilles Pools in September.
- Crews collected 52 fish of 8 species during hoop net sampling and 1,710 fish of 26 species during mini fyke sampling.
- **No Bighead Carp or Silver Carp were reported captured or observed with either gear in any of the pools.**

#### *Commercial Netting:*

- Contracted commercial fishers along with assisting IDNR biologists set 9.9 miles of gill net at fixed and targeted sites in the Lockport, Brandon Road and Dresden Island Pools (including Rock Run Rookery) in September.
- Crews collected 567 fish of 12 species.
- Seven Bighead Carp and 7 Silver Carp were collected in Rock Run Rookery.
- One Bighead Carp and 2 Silver Carp were collected in the Dresden Island Pool, downstream of I-55.

- **No Bighead Carp or Silver Carp were captured or observed in the Lockport or Brandon Road Pools.**

Sampling results by pool below the electric dispersal barrier through September 2017, along with same time period in 2015 and 2016 for comparison:

| <b>Lockport</b>                  |             |             |             |
|----------------------------------|-------------|-------------|-------------|
|                                  | <b>2015</b> | <b>2016</b> | <b>2017</b> |
| <b>Yards of Net Fished</b>       | 68,750      | 75,600      | 65,400      |
| <b>Miles of Net Fished</b>       | 39.1        | 43.0        | 37.2        |
| <b>Hoop Net Nights</b>           | 51.2        | 45.7        | 39.4        |
| <b>Mini Fyke Net Nights</b>      | 24.9        | 22.3        | 21.0        |
| <b>Electrofishing Runs</b>       | 96          | 91          | 104         |
| <b>Electrofishing Time (hrs)</b> | 24.0        | 22.8        | 26.0        |
| <b>Total Asian Carp (AC)</b>     | 0           | 0           | 0           |
| <b>Tons of AC Harvested</b>      | 0           | 0           | 0           |

| <b>Brandon Rd</b>                |             |             |             |
|----------------------------------|-------------|-------------|-------------|
|                                  | <b>2015</b> | <b>2016</b> | <b>2017</b> |
| <b>Yards of Net Fished</b>       | 71,100      | 72,125      | 75,600      |
| <b>Miles of Net Fished</b>       | 40.4        | 41.0        | 43.0        |
| <b>Hoop Net Nights</b>           | 51.0        | 46.0        | 42.6        |
| <b>Mini Fyke Net Nights</b>      | 25.0        | 22.5        | 22.6        |
| <b>Electrofishing Runs</b>       | 80          | 91          | 107         |
| <b>Electrofishing Time (hrs)</b> | 20.0        | 22.8        | 26.8        |
| <b>Total Asian Carp (AC)</b>     | 0           | 0           | 0           |
| <b>Tons of AC Harvested</b>      | 0           | 0           | 0           |

| <b>Dresden Island</b>                |             |             |             |
|--------------------------------------|-------------|-------------|-------------|
|                                      | <b>2015</b> | <b>2016</b> | <b>2017</b> |
| <b>Yards of Net Fished</b>           | 82,950      | 66,900      | 79,100      |
| <b>Miles of Net Fished</b>           | 47.1        | 38.0        | 44.9        |
| <b>Hoop Net Nights</b>               | 103.0       | 46.3        | 335.3       |
| <b>Mini Fyke Net Nights</b>          | 27.1        | 24.2        | 26.9        |
| <b>Electrofishing Runs</b>           | 120         | 184         | 166         |
| <b>Electrofishing Time (hrs)</b>     | 30.0        | 46.0        | 41.5        |
| <b>Asian Carp (AC) upstream I-55</b> | 26          | 13          | 27          |
| <b>AC downstream I-55</b>            | 147         | 270         | 509         |
| <b>Total AC</b>                      | 173         | 283         | 536         |
| <b>Tons of AC Harvested</b>          | 1.3         | 1.9         | 5.4         |

| <b>Rock Run Rookery</b>      |             |             |             |
|------------------------------|-------------|-------------|-------------|
|                              | <b>2015</b> | <b>2016</b> | <b>2017</b> |
| <b>Yards of Net Fished</b>   | 30,450      | 39,075      | 30,000      |
| <b>Miles of Net Fished</b>   | 17.3        | 22.2        | 17.0        |
| <b>Bighead Carp</b>          | 173         | 131         | 163         |
| <b>Silver Carp</b>           | 36          | 34          | 33          |
| <b>Total Asian Carp (AC)</b> | 209         | 165         | 196         |
| <b>Tons of AC Harvested</b>  | 3.4         | 2.6         | 3.2         |

## Seasonal Intensive Monitoring

Seasonal Intensive Monitoring (SIM) took place above the electric dispersal barrier the weeks of September 18<sup>th</sup> and September 25<sup>th</sup>. Electrofishing and commercial netting occurred in the North Shore Channel, North and South Branches of the Chicago River, Chicago River, CSSC, Cal-Sag Channel, Little Calumet River, Calumet River and Lake Calumet.

### *Electrofishing:*

- Crews from IDNR, USACE and USFWS completed 206 electrofishing runs at fixed and random sites (51.5 hours total).
- Crews collected 13,908 fish of 45 species.

### *Commercial Netting:*

- Contracted commercial fishers along with assisting IDNR biologists set 50.2 miles of gill net (481 sets) at fixed and random sites.
- Crews collected 917 fish of 13 species and 1 hybrid group.
- A total of 14,825 fish representing 48 species and 1 hybrid group were collected in all gear types combined during the two-week SIM event.
- Gizzard Shad was the most abundant species collected comprising 55% of the total catch, followed by Common Carp (15%), Largemouth Bass (6%) and Bluegill (4%).
- **No Bighead Carp or Silver Carp were captured or observed during the September SIM event.**

## Barrier Defense Asian Carp Removal Project

Barrier Defense specifically takes place in the Marseilles and Starved Rock Pools. Below is a summary of all IDNR Barrier Defense activities through September 2017, which includes the Unified Fishing Method in HMS W Pit, along with same time period in 2015 and 2016 for comparison:

|   | 2015    | 2016    | 2017    |
|---|---------|---------|---------|
| Number of Days Fished                     | 44      | 70      | 58      |
| Number of Net Crew Days                   | 204     | 352     | 312     |
| Yards of Net Fished                       | 255,470 | 392,295 | 322,610 |
| Miles of Nets Fished                      | 145.2   | 222.9   | 183.3   |
| Number of Pound Net nights                | 24      | 67      | 74      |
| Number of Hoop Net nights                 | 163.8   | 768.7   | 871.8   |
| Number of Bighead Carp                    | 7,124   | 7,113   | 2,373   |
| Number of Silver Carp                     | 79,339  | 94,135  | 98,929  |
| Number of Grass Carp                      | 565     | 490     | 675     |
| Number of Asian Carp (AC)                 | 87,028  | 101,738 | 101,977 |
| AC/1000 yds of gill net                   | 318.8   | 244.6   | 273.4   |
| Tons of Bighead and Silver Carp Harvested | 301.7   | 362.4   | 351.9   |

| Marseilles                |         |         |         |
|---------------------------|---------|---------|---------|
|                           | 2015    | 2016    | 2017    |
| Yards of Net Fished       | 153,390 | 286,675 | 203,510 |
| Miles of Nets Fished      | 87.2    | 162.9   | 115.6   |
| Pound Net nights          | 24      | 67      | 74      |
| Hoop Net nights           | 75.6    | 128.9   | 87.4    |
| Mini Fyke Net Nights      | 27.0    | 21.8    | 25.3    |
| Electrofishing Runs       | 120     | 120     | 109     |
| Electrofishing Time (hrs) | 30.0    | 30.0    | 27.3    |
| Bighead Carp              | 4,738   | 5,285   | 1,289   |
| Silver Carp               | 42,538  | 45,996  | 33,033  |
| Grass Carp                | 78      | 86      | 59      |
| Total Asian Carp          | 47,354  | 51,367  | 34,381  |
| Tons of Bighead and       | 183.2   | 222.7   | 149.3   |

|                       |  |  |  |
|-----------------------|--|--|--|
| Silver Carp Harvested |  |  |  |
|-----------------------|--|--|--|

| Starved Rock                              |         |         |         |
|---|---------|---------|---------|
|   | 2015    | 2016    | 2017    |
| Yards of Net Fished                       | 102,080 | 105,620 | 119,100 |
| Miles of Nets Fished                      | 58.0    | 60.0    | 67.7    |
| Hoop Net nights                           | 141.2   | 683.1   | 823.2   |
| Bighead Carp                              | 2,475   | 1,847   | 1,092   |
| Silver Carp                               | 37,091  | 49,037  | 66,339  |
| Grass Carp                                | 499     | 435     | 634     |
| Total Asian Carp                          | 40,065  | 51,319  | 68,065  |
| Tons of Bighead and Silver Carp Harvested | 120.2   | 143.4   | 204.6   |

## Understanding Surrogate Fish Movement with Barriers

- results for September 2017

### Fish Tagged:

Dresden Island Pool/Rock Run Rookery

- Common Carp – 3
- Bigmouth Buffalo – 2
- Smallmouth Buffalo – 21

Total – 26 fish tagged

### Recaptures:

Dresden Island Pool/Rock Run Rookery

- Smallmouth Buffalo – 17
  - **One fish tagged in the Marseilles Pool in June 2016 was recaptured in the Dresden Island Pool in September 2017**
  - **No other recaptured fish demonstrated movement between pools**

## **Barrier Maintenance & Fish Suppression**

USACE continued operation of the Electric Dispersal Barriers throughout September with minimal loss of power to the water at one or more barriers. During this time, there were one event which lead to a minor loss of power to water at Barrier IIB as power was transferred between utility and generator. The process of switching resulted in 2 minor power outages (<30 sec each) at the Barrier IIB arrays on 19 September 2017. Barrier IIA's high field array remained operational during the switches. There was one loss of utility power to the electrical grid for Barrier IIA and the Demo barriers on 22 September 2017. The generators for each barrier activated immediately and carried power until the utility power was restored. This transfer of power between utility and generators resulted in 2 minor power outages in the water (<30 sec each). Barrier IIB was active during these minor outages.

Barrier IIA was re-energized on 7 September following the quarterly maintenance activity at the end of August and beginning of September. The Barrier IIA narrow array was re-energized at 2000 V and the wide array was re-energized at 800 V following maintenance. The wide and narrow array ran continuously throughout the remainder of the month without incident.

The narrow, wide and narrow arrays of Barrier IIA, wide and narrow arrays of Barrier IIB and the demonstration barrier are currently operational.

Current operating parameters for all barriers are provided below:

Barrier IIA wide: 800 V (.75 V/in); 34 Hz, 2.3 ms  
Barrier IIA narrow: 2000 V (2 V/in); 34 Hz, 2.3 ms  
Barrier IIB wide: 800 V (.75 V/in); 34 Hz, 2.3 ms  
Barrier IIB narrow: 2200 V (2.3 V/in); 34 Hz, 2.3 ms  
Demo Barrier: 400 V (.5 V/in); 5 Hz; 4 ms

## **Distribution and monitoring of juvenile Asian carp**

Field crews sampled Starved Rock pool extensively for juvenile Asian carp (TL <160mm) during September 2017. Electrofishing was used from 9/5 to 9/7 and from 9/18 to 9/20 at a total of 31 sites (7.75 hrs fishing time) and resulted in a total of 1891 fish captured. A sum of 339 adult Silver Carp and 2 adult Grass Carp were caught with electrofishing. Mini fyke nets were deployed at 4 locations for one net night on 9/20 and resulted in a catch of 45 fish, mostly young of year Gizzard Shad. An electrified dozer trawl was used from 9/5 to 9/7 for 10 minute runs at 16 locations (3.2 hrs fishing time) and resulted in a sum of 1229 fish caught. A sum of 221 adult silver carp were captured using this gear. No juvenile Silver or Bighead Carp were captured during September.

## **Habitat usage and movement of juvenile Asian carp (telemetry)**

Telemetry of juvenile Asian carp to study habitat usage and movement continued in the Peoria reach continued through September 2017. A total of 57 juvenile Asian carp have been implanted with transmitters and 26 hydrophones are deployed for monitoring. As of the second data download, all 57 individuals have been detected, however 21 of the tagged fish appear to have exited the study area downstream. Six of the hydrophones were relocated to the lower end of the Peoria reach in an effort to detect these fish again. Tagging of fish will continue into October as well as the deployment of radio monitoring gear.

## **Monitoring Fish Abundance, Behavior, Identification, and Fish-Barge Interactions within the Illinois Waterway**

Barge entrainment trials occurred the week of September 11 and 18 within the La Grange and Alton pools. Data collections included observations of the behavior of wild fish and small Asian carp during normal barge movement in an area with known high densities of Asian carp to look at potential entrainment of Asian carp and other wild fish. Data collected is being analyzed and results are forth coming.



## **Evaluation of Gear Efficiency**

INHS sampled for juvenile Asian carp using several gear types (mini-fyke nets, beach seines, pulsed-DC electrofishing, dozer trawl, hydroacoustic surveys) at four sites in the LaGrange Pool during the week of September 25. A total of 6,430 fish were captured during these efforts. Only 3 age-0 Silver Carp (21-44 mm TL) were captured (2 at Matanzas Lake, 1 at Lily Lake). Mini-fyke nets produced the highest numbers of fish ( $n = 4,036$ ) and were the only gear to capture juvenile Silver Carp. Beach seines ( $n = 1,390$ ), pulsed-DC electrofishing ( $n = 544$ ), and dozer trawls ( $n = 460$ ) captured fewer numbers of fish and did not detect any juvenile Asian carp. The number of age-0 Silver Carp captured during this week of sampling is substantially lower than was produced by identical efforts during July. Additionally, the small sizes of Silver Carp captured in September suggest these individuals are the product of a different cohort than those captured in July. This sampling was conducted concurrently with USFWS trawls in the LaGrange Pool. USFWS trawling data will be compared to INHS juvenile gears and results of these comparisons will be reported at a later date.

## **Larval Fish Monitoring**

INHS conducted ichthyoplankton sampling at 12 main channel and backwater sites located in the Brandon Road, Dresden Island, Marseilles, Starved Rock, Peoria, and LaGrange Pools during the weeks of September 4 and September 18. Four larval fish samples were collected at each site, and zooplankton and water chemistry samples were also collected. Additional samples were collected in Illinois River tributaries to evaluate the potential for Asian carp spawning in these rivers. Processing of samples and identification of larval fish and eggs is ongoing. Ichthyoplankton sampling will continue on a biweekly basis through October. Results, particularly regarding occurrences of Asian carp eggs or larvae, will be reported once available.

## **Strategy for eDNA Sampling in the CAWS and Refining eDNA Interpretation Below the Electric Dispersal Barrier**

The CAWS, including variations of the four traditional sites (Chicago River, North Shore Channel, Little Calumet River, and Lake Calumet) were sampled for bighead and silver carp eDNA the week of September 11th. In total, 280 samples were collected including blanks. When available, the results for this event will be shared with the state of Illinois and posted publicly sometime later in the fall.

Dresden Island Pool was sampled for bighead and silver carp eDNA the week of September 25th. A total of 276 samples were collected, including blanks. Samples are waiting to be processed at the Whitney Genetics Lab. Results for this event will not be posted on publicly, but will be reported to the MRWG in the annual report.

## **Alternate Pathway Surveillance in Illinois - Law Enforcement**

The Invasive Species Unit (ISU) attended the Great Lakes Fishery Commission Law Enforcement committee meeting in Sault Ste. Marie, Ontario and received training on invasive species enforcement to include aquatic invasive species identification and reporting.

The ISU provided support and security for the Aquatic Pet Surrender event held at the Waukegan Harbor where residents were encouraged to bring any unwanted aquatic pets and turn them in instead of releasing them into the wild.

ISU received a complaint of a New York company illegally importing injurious plants into Illinois by advertising the products online and shipping them through the mail. The investigation is ongoing.

ISU is investigating a complaint involving 26 sturgeon and 1 paddle fish carcass that were dumped into the Des Plaines River. The origin of the fish is unknown at this time, but they have been sent to McClelland laboratories for testing.

ISU provided information and regulatory requirements to a pond owner who wanted to stock his pond with crayfish.

ISU investigated a complaint of a company advertising and selling grass carp in Illinois.

### **Assessing Spatiotemporal Changes in Asian Carp Abundance and Density to Target Management Actions and Control Strategies**

Observed Asian carp (Silver Carp and Bighead Carp combined) densities in Dresden Island Pool decreased slightly from June to July and was due to a decrease in observed Silver Carp density and a marginal decrease in observed Bighead Carp density (Figure 1). Within Dresden Island Pool, Asian carp densities were highest in the Treats Island side-channel and Mobil Bay backwater, although Treats Island was highly variable (Figures 2 and 3). At other locations in Dresden Island Pool, densities were high in the main channel adjacent to the Rock Run Rookery backwater, near the mouth of the Kankakee River, and within the power plant effluents near the Kankakee River and just upstream from Rock Run Rookery (Figure 3). These locations were similar to high-density sites observed in early June sampling (Figure 3).

Observed Asian carp densities in late July within the Marseilles Pool were higher in July than June (Figure 1) but were comparable to densities observed in March. This was due to an increase in observed Silver Carp density from June levels. Asian carp densities remained similar to the previous survey in the HMS East Pit backwater lake and the main channel but increased at the Sugar Island side-channel and HMS West Pit backwater lake (Figure 2). Within the main channel, locations with high densities were mostly downstream, towards the Marseilles Lock & Dam (Figure 4). Densities in the East Pit were highest in the northeast cove, along the eastern shoreline, and in the north-central bay (Figure 5). Asian carp densities in the West Pit were moderate along most of the shoreline but were elevated in the west end of the lake, along the north-central shoreline, and in the northeastern cove (Figure 5).

Fall hydroacoustics surveys of the Illinois River from Dresden Island to Alton pools are currently being completed. This includes a survey of Dresden Island Pool which is currently being analyzed and provided to MRWG members to help inform the Dresden Island Pool unified fishing event that will occur in mid October.



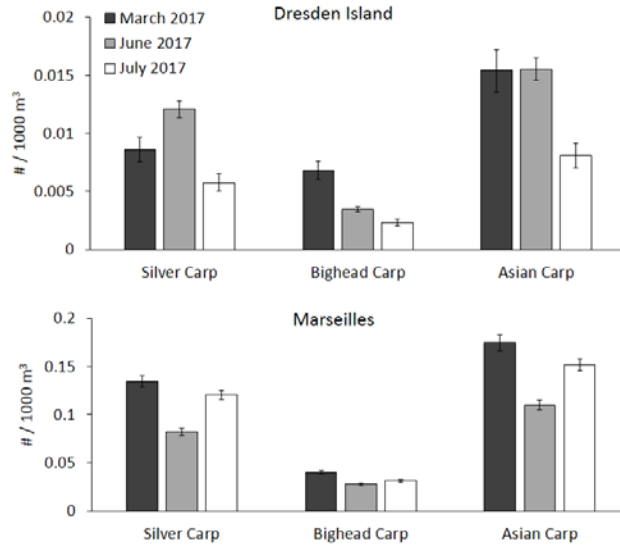


Figure 1. Mean (SE) pool-wide Silver Carp, Bighead Carp, and Asian carp (Bighead and Silver Carp combined) densities observed from mobile hydroacoustic surveys in the Dresden Island and Marseilles Pools in 2017.

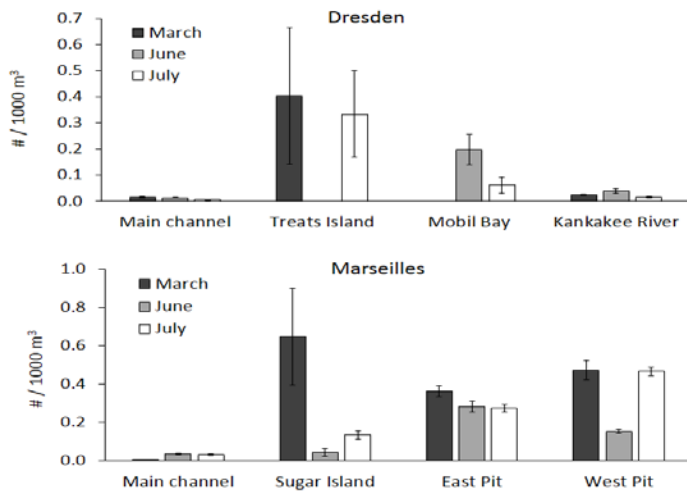


Figure 2. Mean (SE) site-specific Silver Carp, Bighead Carp, and Asian carp (Bighead and Silver Carp combined) densities observed from mobile hydroacoustic surveys in the Dresden Island and Marseilles pools in 2017.

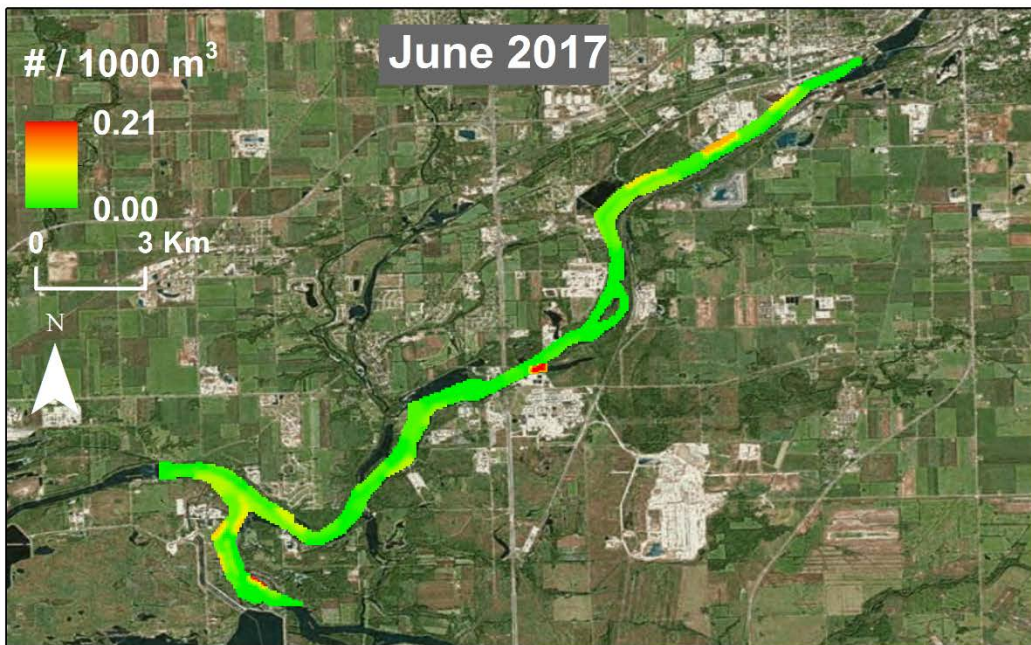
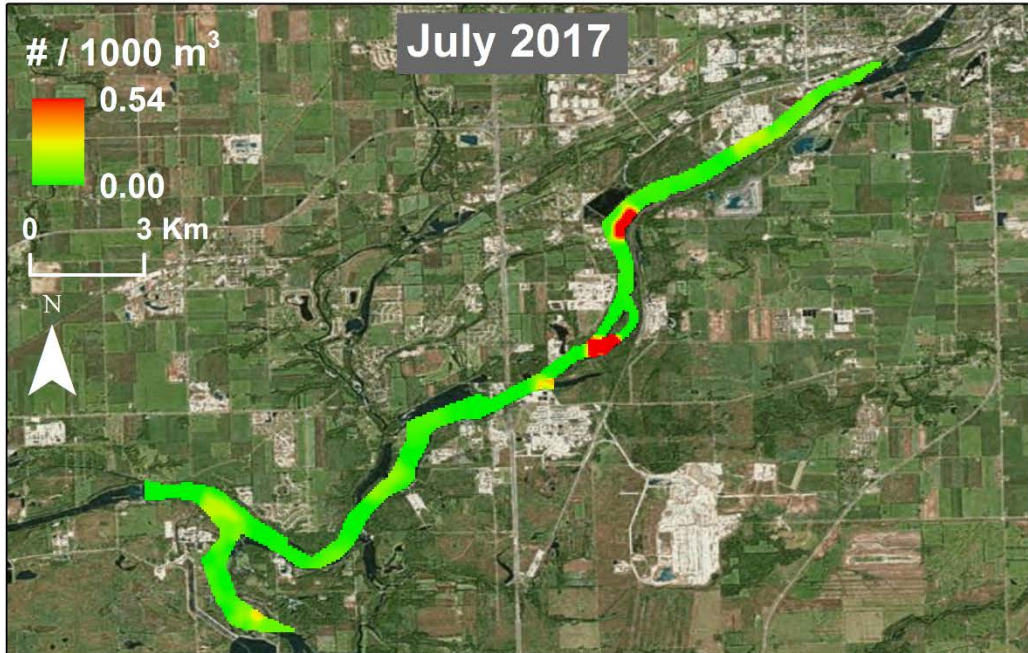


Figure 3. Mean Asian carp (Silver and Bighead Carp combined) densities in the Dresden Island Pool observed using mobile hydroacoustic sampling in early June and late July, 2017.



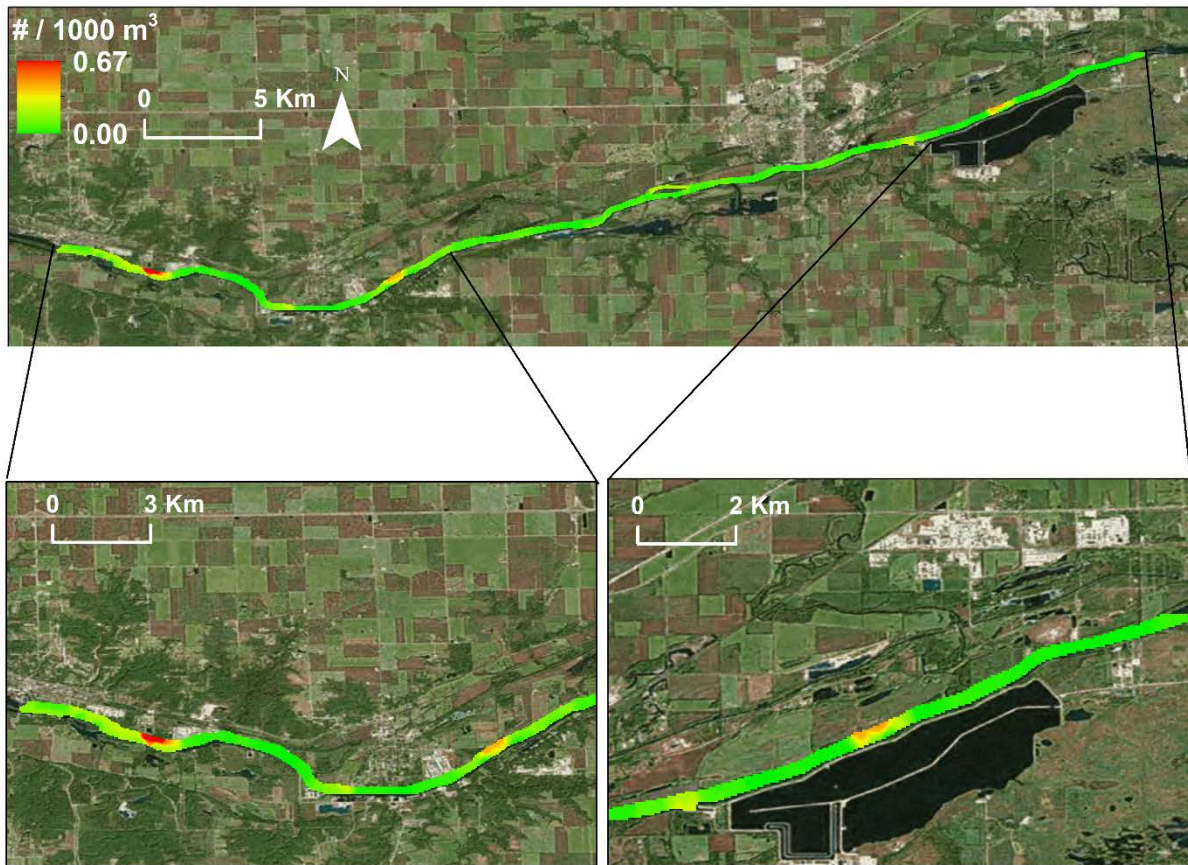


Figure 4. Mean Asian carp (Silver and Bighead Carp combined) densities in the Marseilles Pool main channel observed using mobile hydroacoustic sampling in late July, 2017.

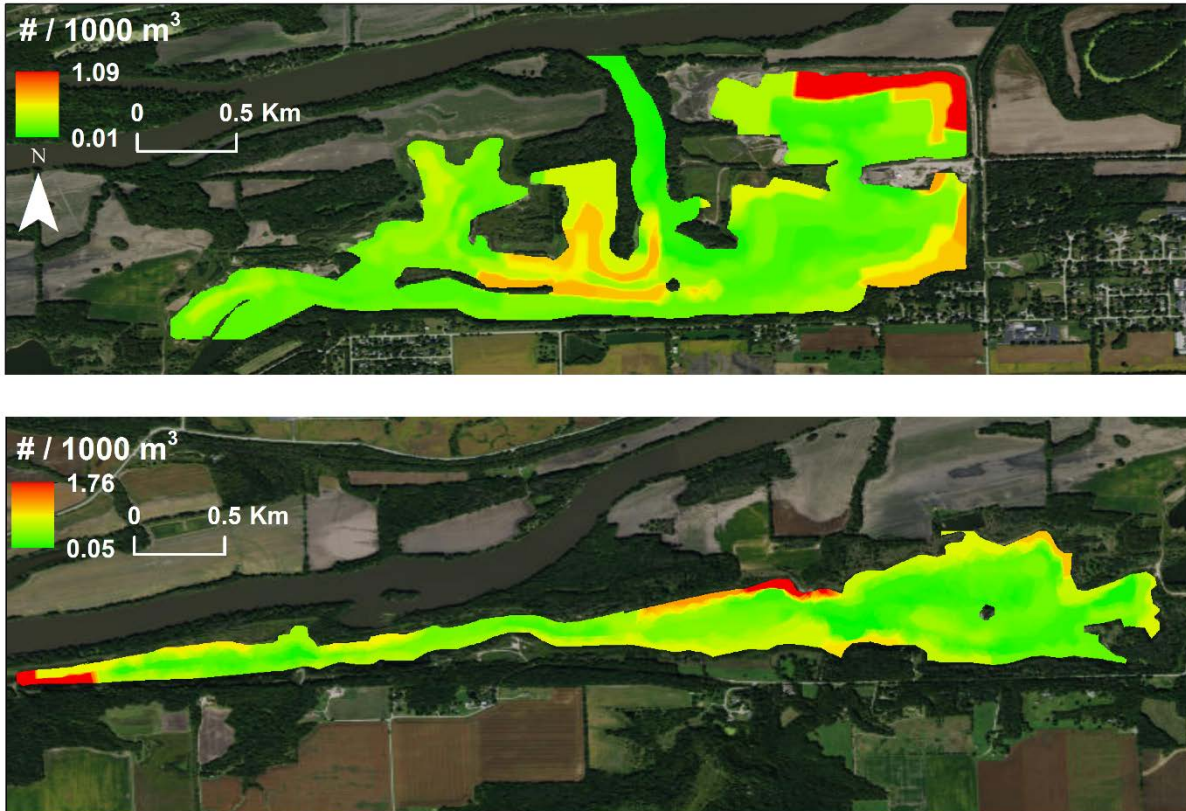


Figure 5. Mean Asian carp (Silver and Bighead Carp combined) densities in the HMS East Pit (top) and West Pit (bottom) backwater lakes in the Marseilles Pool. Densities were observed from mobile hydroacoustic sampling in late July, 2017.