

2019 April Summary

Bottom Line: Multiple agencies participated in monitoring Asian Carp (Bighead Carp, Black Carp, Grass Carp, and Silver Carp) in the upper Illinois Waterway downstream of the Electric Dispersal Barrier during April 2019. **NO LIVE BIGHEAD CARP, BLACK CARP, GRASS CARP, or SILVER CARP were found in any new locations immediately downstream of the Electric Dispersal Barrier.** Due to **FLOODING** some sampling effort had to be modified or postponed thus caution should be applied when comparing results among years within a pool.

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

Electrofishing:

- United States Army Corps of Engineers (USACE) biologists conducted boat mounted electrofishing surveys in Lower Lockport, Brandon Rd, and Dresden Island pools.
- A total of 376 fish were capture across all three pools during April.
- Common Carp made up 34% of the catch, Gizzard Shad over six inches comprised 19.7% of the catch, Bluntnose Minnow and Emerald Shiner both represented 9.6%, and Gizzard Shad under six inches were 6.6% of the total catch.
- Three Silver Carp were captured in the Dresden Island pool.
- No Asian Carp were observed in the Lower Lockport and Brandon Rd pools.

Hoop netting:

- Due to changes in the monitoring response plan these efforts did not take place in April.

Mini fyke netting:

- Due to changes in the monitoring response plan these efforts did not take place in April.

Commercial Netting:

- Contracted commercial fishers along with assisting Illinois Department of Natural Resources (IDNR) biologists set 10.8 miles of gill/trammel net at fixed and targeted sites in Lockport, Brandon Rd, and Dresden Island Pools (including Rock Run Rookery) in April.
- 824 fish representing 12 species were collected.
- Two Bighead Carp, and 2 Silver Carp were collected in Rock Run Rookery.
- No Bighead Carp, Black Carp, Grass Carp, or Silver Carp were collected in Dresden Island Pool above upstream of the I-55 bridge
- Two Bighead Carp and 43 Silver Carp were collected in the Dresden Island Pool, downstream of I-55. Mostly in the Exelon nuclear plant discharge channel.
- **No Bighead Carp, Grass Carp, or Silver Carp were captured or observed in Lockport Pool or Brandon Road Pool.**

Sampling results by pool below the electric dispersal barrier through April 2019, along with the same time period in 2017 and 2018 for comparison (caution should be applied when comparing hoop net and mini fyke results among years due to changes in protocols):

Lockport Pool

	2017	2018	2019
Yards of Net Fished	15,000	27,200	5,200
Miles of Net Fished	8.5	15.5	3.0
Hoop Net Nights	3.6	0.0	0.0
Mini Fyke Net Nights	3.6	0.0	0.0
Electrofishing Runs	24	55	24
Electrofishing Time (hrs)	6.0	13.8	6.0
Total Asian Carp (AC)	0	0	0
Tons of AC Harvested	0	0	0

Brandon Road Pool

	2017	2018	2019
Yards of Net Fished	16,900	23,000	4,200
Miles of Net Fished	9.6	13.1	2.4
Hoop Net Nights	7.6	0.0	0.0
Mini Fyke Net Nights	4.5	0.0	0.0
Electrofishing Runs	24	48	24
Electrofishing Time (hrs)	6.0	12.0	6.0
Total Asian Carp (AC)	0	0	0
Tons of AC Harvested	0	0	0

Dresden Island Pool

	2017	2018	2019
Yards of Net Fished	16,600	37,800	7,950
Miles of Net Fished	9.4	21.5	4.5
Hoop Net Nights	8.0	0.0	0.0
Mini Fyke Net Nights	8.0	0.0	0.0
Electrofishing Runs	34	43	6
Electrofishing Time (hrs)	8.5	10.8	1.5
Asian Carp (AC) upstream I-55	12	0	0
AC downstream I-55	152	416	52
Bighead Carp	70	127	3
Silver Carp	92	271	49
Grass Carp	2	18	0
Total AC	164	416	52
Tons of AC Harvested	1.5	3.0	0.6
AC/1000 yds of gill net	9.8	11.0	6.2

Rock Run Rookery

	2017	2018	2019
Yards of Net Fished	9,000	15,400	1,800
Miles of Net Fished	5.1	8.7	1.0
Pound Net nights	0	4	0
Bighead Carp	21	23	2
Silver Carp	10	50	2
Grass Carp	0	1	0
Total Asian Carp (AC)	31	73	4
Tons of AC Harvested	0.5	0.6	0.1
AC/1000 yds of gill net	3.4	4.8	2.2

Asian Carp Removal Project

Removal took place specifically in Marseilles Pool and Starved Rock Pool of the Illinois River. Below is a summary of all IDNR removal activities through April 2019, including 4 weeks of contracted fishing and two unified fishing methods (UFM). For comparison purposes, data from the same time period in 2017 and 2018 are included.

Overall

	2017	2018	2019
Number of Days Fished	25	18	30
Number of Net Crew Days	71	89	105
Yards of Net Fished	125,630	95,650	179,790
Miles of Nets Fished	71.4	54.3	102.2
Number of Pound Net Nights	74	22	26
Number of Hoop Net Nights	0.0	0.0	0.0
Number of Bighead Carp	787	750	458
Number of Silver Carp	32,329	33,169	60,799
Number of Grass Carp	61	187	843
Number of Asian Carp (AC)	33,177	34,106	62,100
Tons of AC Harvested	132.5	148.4	252.6
AC/1000 yds of gill net	257.0	344.2	343.1

Marseilles

	2017	2018	2019
Yards of Net Fished	101,230	70,100	96,950
Miles of Nets Fished	57.5	39.8	55.1
Pound Net nights	74	22	26
Hoop Net nights	7.9	0.0	0.0
Mini Fyke Net Nights	8.0	0.0	0.0
Electrofishing Runs	13	24	120
Electrofishing Time (hrs)	3.3	6.0	30.0
Bighead Carp	531	611	322
Silver Carp	18,177	22,278	25,842
Grass Carp	21	15	29
Total Asian Carp	18,729	22,904	26,193
Tons of AC Harvested	82.1	109.2	142.7
AC/1000 yds of gill net	175.6	309.8	266.0

Starved Rock

	2017	2018	2019
Yards of Net Fished	24,400	25,550	82,840
Miles of Nets Fished	13.9	14.5	47.1
Hoop Net nights	0.0	0.0	0.0
Bighead Carp	256	139	136
Silver Carp	14,207	10,897	34,957
Grass Carp	44	174	814
Total Asian Carp	14,507	11,210	35,907
Tons of AC Harvested	50.8	40.0	109.9
AC/1000 yds of gill net	594.5	438.7	433.5

Unified Fishing Method – West Pit:

The 2019 UFM in the West Pit was postponed twice and occurred on 4/1/2019 through 4/5/2019. 13.95 miles of gill/trammel net, 0.9 miles of commercial seine, and 11 pound net nights captured 6,335 Silver Carp, 66 Bighead Carp, and 1 Grass Carp (Figure 1). Those 6,402 Asian Carp resulted in an estimated 76,994 pounds (38.5 tons) of biomass being removed from the West Pit that week. Silver Carp and Bighead Carp densities decreased significantly following the UFM in the West Pit (Figure 2).

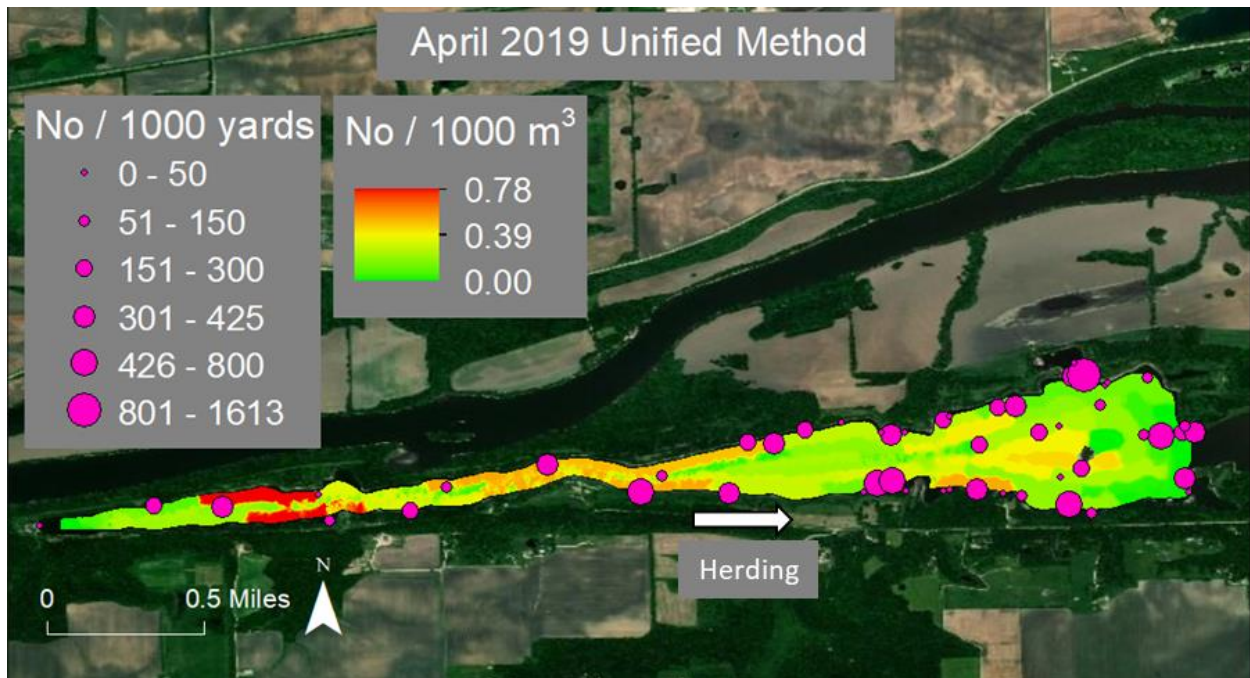


Figure 1. Asian carp (Silver Carp and Bighead Carp combined) density distributions from hydroacoustic surveys conducted in the HMS West pit backwater of Marseilles Pool on 3/22/19 prior to unified method harvest. Scaled points associated to Asian Carp harvested by contracted fishers during the unified method from 4/1/19 to 4/5/19 are overlaid. Low catches (small dots) of Asian Carp in areas in the immediate proximity of large catches (large dots) likely indicate depletion of Asian carp as those small dots were duplicate samples collected following the day of high catch. Additionally, some Asian Carp capture locations were outside the area sampled for hydroacoustics.

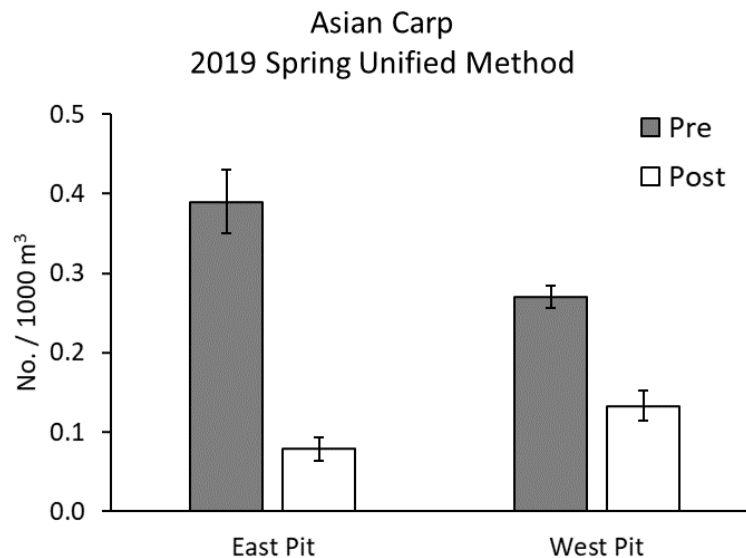


Figure 2. Mean (SE) Asian Carp (Bighead Carp and Silver Carp combined) densities from hydroacoustic surveys conducted before and after unified method harvest in the HMS East and West pit backwaters of the Marseilles Pool.

By comparison, the 2018 UFM in the West Pit occurred two weeks earlier in the year from 3/19/2018 through 3/23/2018. 13.8 miles of gill/trammel net (24,300 yards), 1.8 miles of commercial seine (3,200 yards) and 11 pound net nights captured 9,874 Silver Carp and 185 Bighead Carp and 1 Grass Carp during the 2018 UFM in the West Pit. Those 10,060 Asian carp resulted in an estimated 60,998 pounds (30.5 tons) of biomass being removed and significant reduction in densities of Asian Carp from the West Pit (Figure 3).

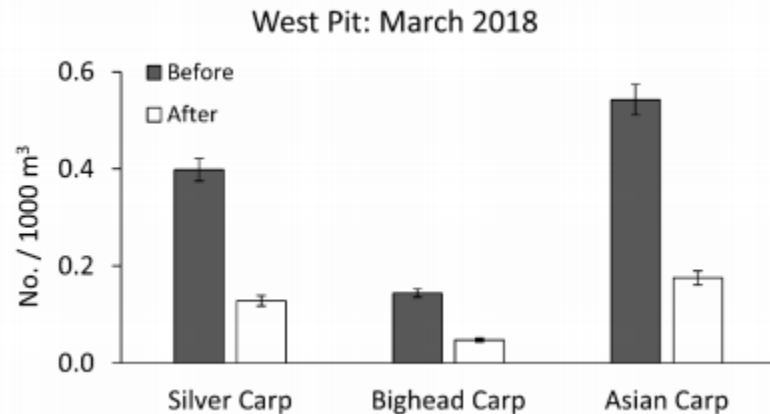


Figure 3. Mean (SE) densities from hydroacoustic surveys conducted before and after unified method harvest in the HMS West pit backwaters of the Marseilles Pool (Asian Carp: Silver Carp and Bighead Carp combined).

Strategy for eDNA Sampling in the CAWS

During the week of April 9, United States Fish and Wildlife Service (USFWS) collected 401 eDNA samples above the electric dispersal barrier (Figure 3,4,5). All samples are being processed by the Whitney Genetics Laboratory and the results will be posted later.

Target Area: Number of samples

- Chicago Sanitary Ship Canal: 31
- South Branch Chicago River: 128
- Lake Calumet: 198
- Little Calumet River: 44

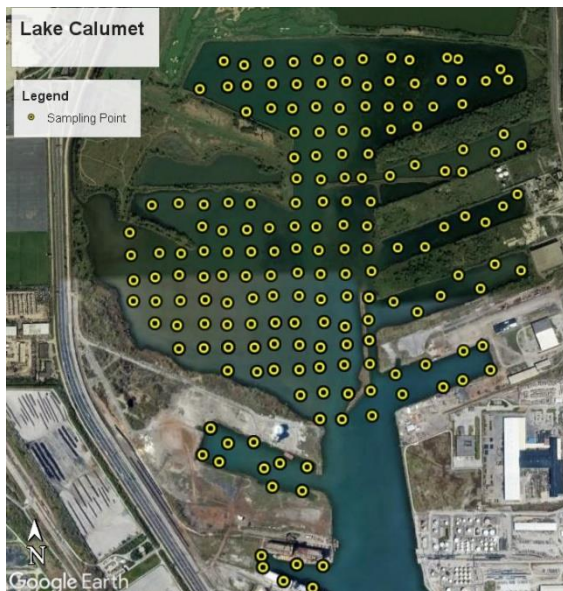


Figure 4: eDNA sample collection points within Lake Calumet

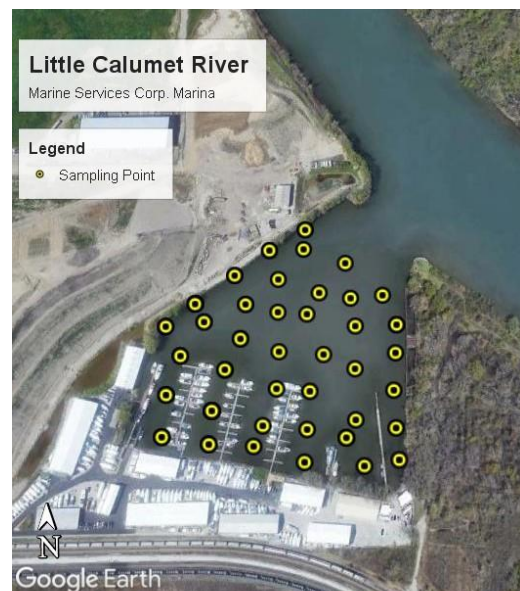


Figure 5: eDNA sample collection points within Little Calumet River

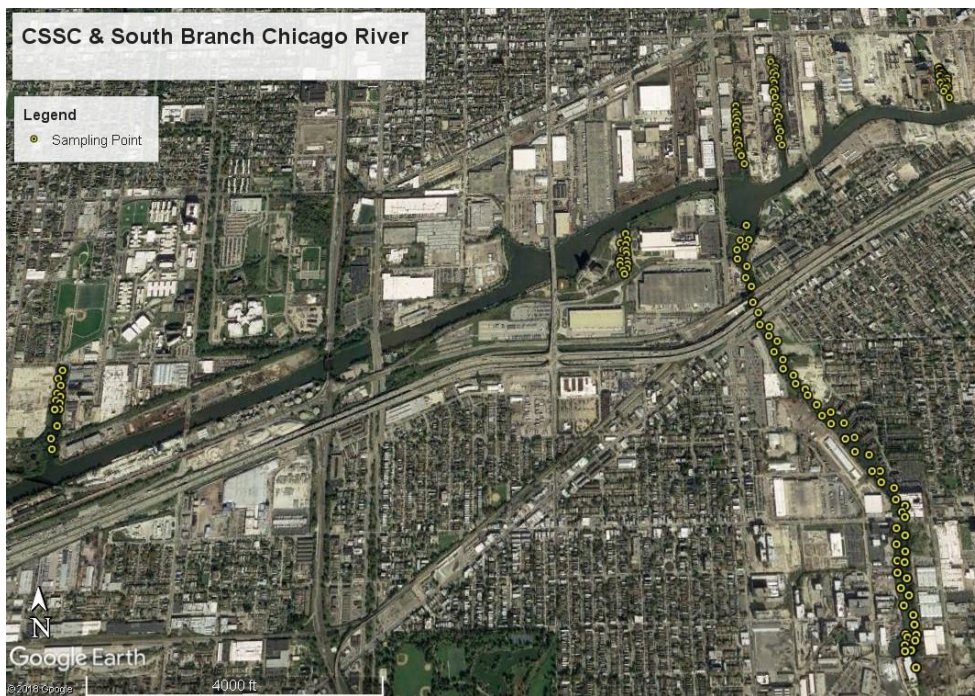


Figure 6: eDNA sample collection points within Chicago Sanitary and Ship Canal and the South Branch of the Chicago River.

Zooplankton as dynamic assessment targets for Asian carp removal

INHS collected zooplankton and water chemistry samples at 12 main channel and backwater sites located in Brandon Road, Dresden Island, Marseilles, Starved Rock, Peoria, and LaGrange Pools during the weeks of April 8 and April 22. The collected data will be combined with historical and recent data on Illinois Waterway zooplankton communities to inform management agencies of ecosystem responses to Asian carp removals and develop dynamic targets for diminishing the ecological impacts of Asian carp.

Monitoring of Asian carp reproductive productivity

INHS collected ichthyoplankton samples at 7 main channel sites located in Brandon Road, Dresden Island, Marseilles, Starved Rock, Peoria, and LaGrange Pools during the weeks of April 22 and April 29. Four larval fish samples were collected at each site. Additional samples were collected in Illinois River tributaries to evaluate the potential for Asian carp spawning in these rivers. Although water levels were high and rising during these first two weeks of sampling, water temperatures were below the threshold thought to be conducive to Asian carp spawning. No large-diameter eggs were observed upon initial inspection of all samples. However, large aggregations of adult Silver Carp were observed by field personnel at tributary mouths. Ichthyoplankton sampling will continue on a weekly basis through May and June, and will occur biweekly from July to October. Processing of samples and identification of larval fish and eggs is ongoing. Ichthyoplankton data will be used to evaluate changes in the reproductive front of Asian carp populations in the Illinois Waterway, identify reproductive hotspots, and quantify the relationship between Asian carp stock abundance and reproductive output. Results, particularly regarding occurrences of Asian carp eggs or larvae, will be reported as soon as they are available.

Hydroacoustic Fish Surveys at the Electric Fish Dispersal Barrier System

The U.S. Fish and Wildlife Service conducted three mobile hydroacoustic fish surveys at the Electric Dispersal Barrier System (EDBS) during April 2019. Surveys were completed on April 1, April 16, and April 26, 2019 to monitor for the presence and distribution of large fishes greater than 12 inches (30.5 cm) total length near the EDBS. The purpose of these hydroacoustic surveys is to aide in assessing the risk of fish detected near the EDBS being either Bighead or Silver Carp prior to or during barrier operational changes and/or maintenance. Hydroacoustic surveys covered the area between Hanson Material Services Corporation (HMSC) docking slip, approximately 1.3 km below the Romeo Road Bridge, to the upstream side of the Demonstration Barrier (0.6 km above Romeo Road Bridge). For reporting purposes, Romeo Road Bridge is treated as the dividing line between the areas referred to as “within the EDBS” and “downstream of the EDBS.”

Preliminary Results:

April 1, 2019: No large fish targets were detected within the EDBS. Two large fish targets were detected at approximately 0.9 km and 1.2 km downstream of the EDBS near the Hanson Material Services Corporation (HMSC) docking slip.

April 16, 2019: No large fish targets were detected within the EDBS. Six large fish targets were detected downstream of the EDBS between approximately 0.1 km and 0.7 km.

April 26, 2019: No large fish targets were detected either within or downstream of the EDBS.

Monitoring Bigheaded Carp Movement and Density in the Illinois River

SIU conducted mobile hydroacoustic surveys in Marseilles and Dresden Island pools during mid-April. Density heatmaps (Figure 7) were created and shared with MRWG agencies involved with contracted removal. These surveys also assessed Asian carp (Bighead Carp and Silver Carp combined) densities in the HMS East and West pits after spring Unified Methods, where densities in both pits were significantly reduced compared to densities before harvest (Figure 2).

A collaborative project between Southern Illinois University (SIU) and USACE to compare the movements and habitat use of Common Carp, which are used as behavioral surrogates for bigheaded carps (Bighead Carp and Silver Carp) in areas bigheaded carps have not yet invaded, began in and around Starved Rock Pool of the Illinois River. During the week of April 22nd, 2019, 50 Common Carp (25 in Starved Rock Pool and 25 within 4 km downstream of Starved Rock Lock and Dam) were implanted with Vemco V16 acoustic tags. Additionally, 7 Silver Carp and 7 Common Carp were implanted with Vemco V16 temperature sensor tags in Starved Rock Pool. Tagged fish were given external tags (jaw tag – Silver Carp, floy tag – Common Carp) and this information was distributed to the MRWG. The movements of these fishes will be monitored with an array of stationary receivers in and just downstream of Starved Rock Pool. Graduate student lead on this

project is Alexander Catalano (Figure 8). Information regarding these newly tagged fishes will be added to the FishTracks database.

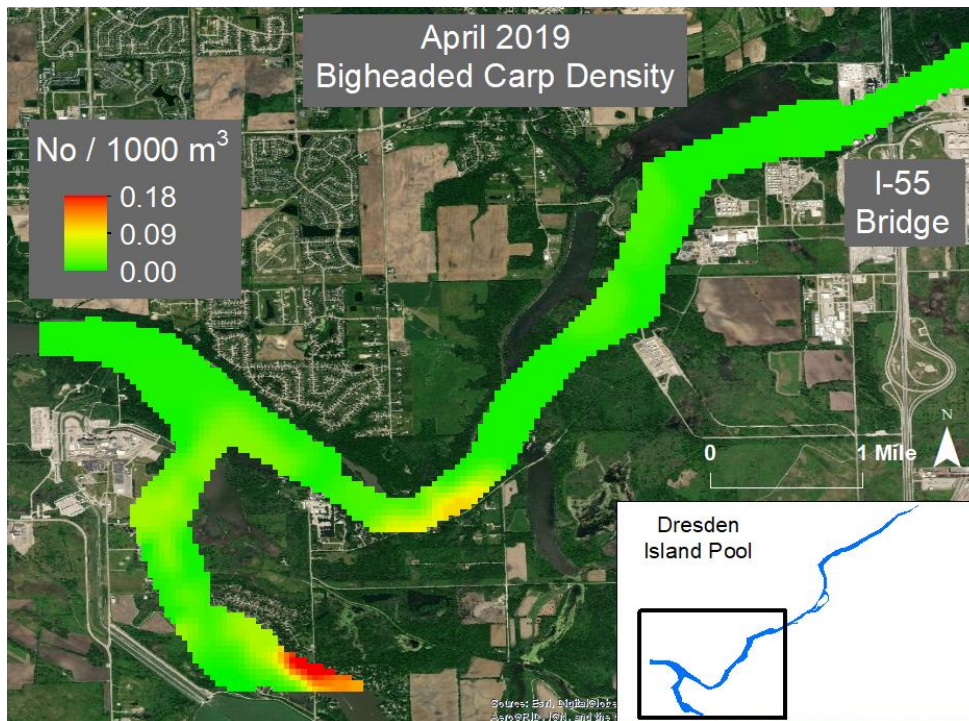


Figure 7. Example spatial distributions of Asian carp (Silver Carp and Bighead Carp) densities from mobile hydroacoustic surveys in the downstream half of Dresden Island Pool.



Figure 8. SIU graduate student Alexander Catalano implants an acoustic telemetry tag into a Common Carp.

Telemetry

USACE biologists visited Lockport, Brandon Road, and Dresden Island Pools on 28-29 March to download and deploy receivers for the 2019 season. Biologists downloaded 12 VR2W receivers that had been deployed over the winter months and deployed an additional

16 VR2W receivers at established station positions per the 2019 MRP. Preliminary screening of the downloaded data indicated approximately 1 million detections in the Lower Lockport Pool, 16,000 detections in the Brandon Road Pool, and half million detections in the Dresden Island Pool. Data indicates no tagged fish passage upstream through the Electric Dispersal Barrier System (EDBS) and no tagged Asian carp movements through the Lockport or Brandon Road Lock and Dams.

USACE implanted new transmitters into 20 Common Carp within the Lower Lockport Pool on 12 April 2019. Total lengths ranged from 454 to 795 mm. All carp were collected from the Upper Lockport Pool near the Cal-Sag Confluence and released at the Cargill boat launch approximately 5 miles south of the EDBS. Detections of the tagged Common Carp indicated barrier challenges within 24 hours of release.

Real Time Telemetry

Eight bigheaded carp (5 bighead, 2 silver, and 1 hybrid) and one grass carp were detected at the real-time receiver above Dresden Island Lock and Dam (at Minooka) from 1 March – 29 April 2019 (Figure 9). Eleven Common Carp were detected at Romeoville and 2 Common Carp were detected Above Brandon Road Lock and Dam (BRLD) at Rockdale (Figure 10). One common carp and four grass carp were detected in the lock chamber below BRLD, and nine fish (5 bighead, 2 silver, 1 hybrid Asian carp, and 1 grass carp) were detected above Dresden Island Lock and Dam at Minooka (Figure 10).

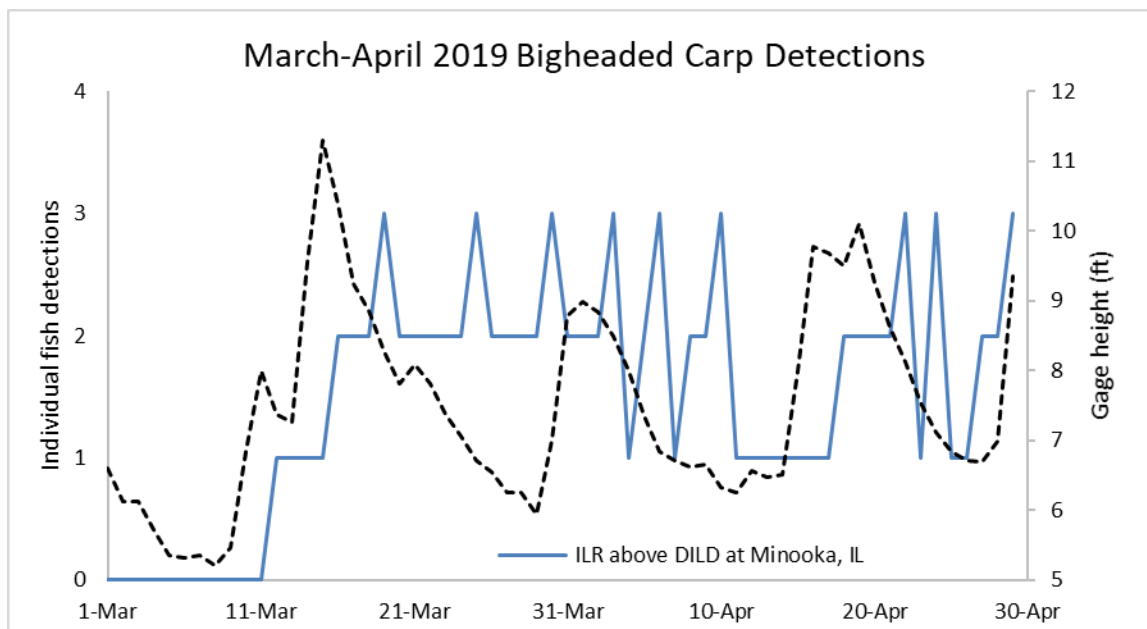


Figure 9. Fish detections for 1 March – 29 April 2019 at Utica, Minooka, and Rockdale receivers. The black dotted line is average daily gage height (ft) at Morris (USGS 05542500). No bigheaded carp were detected at any other receivers.

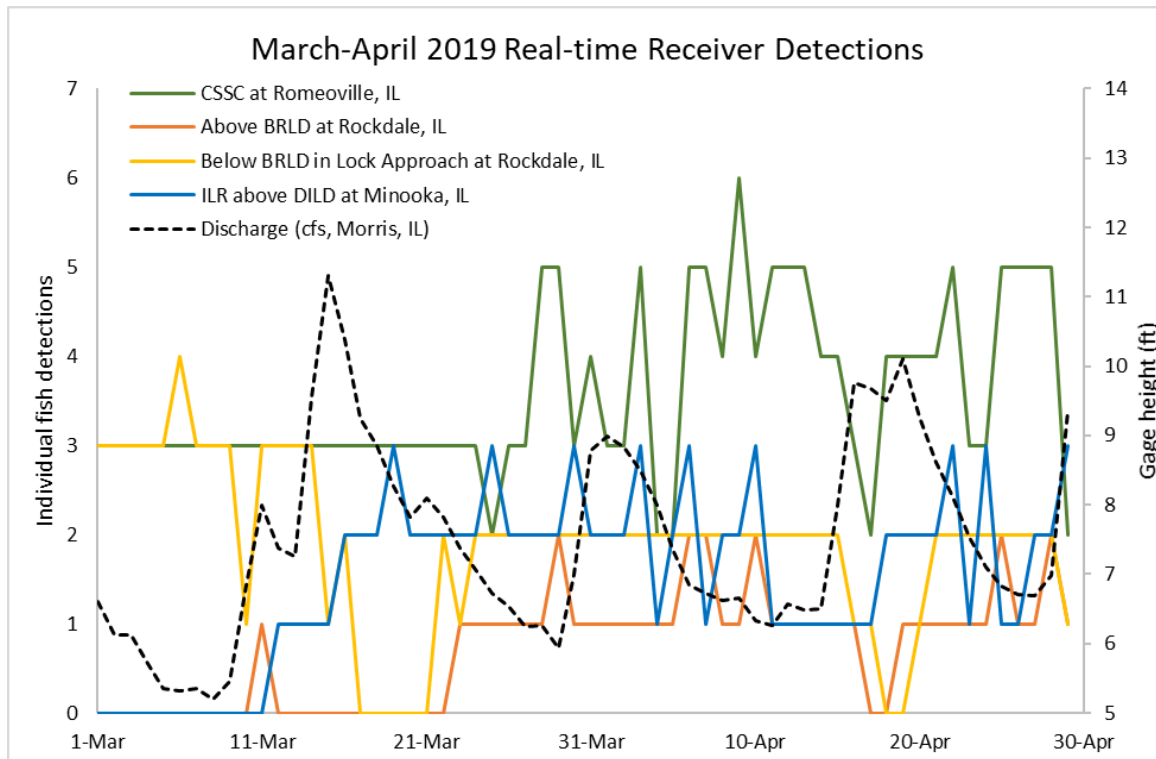


Figure 10. Detections of all fish at all real-time receivers from 1 March – 29 April 2019. All fish at Romeoville (green, N = 11) and Above BRLD at Rockdale (orange, N = 2) were common carp. One common carp and four grass carp were detected in the lock chamber below BRLD (yellow), and nine fish (5 bighead, 2 silver, 1 hybrid Asian carp, and 1 grass carp) were detected above Dresden Island Lock and Dam at Minooka (blue). The black dotted line is average daily gage height (ft) at Morris (USGS 05542500).

These data are preliminary or provisional and are subject to revision. They are being provided to meet the need for timely best science. The data have not received final approval by the U.S. Geological Survey (USGS) and are provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the data. For additional details, on the hydrographs figure please contact Marybeth Brey (mbrey@usgs.gov).

Telemetry to Support SEAcARP Model (Peoria Pool)

The U.S. Fish and Wildlife Service (USFWS) implanted 20 adult Silver Carp with acoustic telemetry tags in the Peoria Pool the week of April 29 to May 1, 2019. Fish were captured using boat electrofishing and tagged with either V9 or V13 acoustic tags. Depending on location of capture, fish were released at either Coopers Park in Peoria, IL (n = 16) or Wightman Lake in Lacon, IL (n = 4).

This work was completed in support of state and federal agencies and academic institutions conducting Silver Carp movement studies to inform the Spatially Explicit Asian carp Population model (SEAcARP) developed to inform management decisions that minimize abundance of Asian carp in the upper Illinois River Waterway reducing risk of population

expansion toward the Great Lakes. The spatial structure of the SEAcARP model allows for movement of Asian carp among six pools of the Illinois River, which will affect how strongly Asian carp respond to management actions.

Habitat Use and Movement of Juvenile Silver Carp

The USFWS is continuing a telemetry study on juvenile Silver Carp in the Peoria Pool to determine habitat usage and movement rates in correlation with environmental variables. The results of this study will help understand the potential for juvenile Silver Carp dispersing upstream towards the EDDBS and what habitats to sample to effectively monitor for their presence in upstream pools. Telemetry data is collected using 28 stationary receivers positioned from Hennepin, IL to Peoria, IL. River discharge rate and temperature (°C) are collected from the following USGS- and USACE-managed stream gauges: Illinois River at LaSalle; Illinois River at Henry; and the Illinois River at Peoria. Stream gauge data is supplemented by field crews taking YSI water quality measurements (temperature, flow velocity, dissolved oxygen, conductivity, secchi, and pH) at ten sites within the study area on a bi-weekly basis.

To capture juvenile Silver Carp for implantation of telemetry tags, mini-fyke nets were deployed for 18 nights in backwater areas from April 8 to April 11, 2019. No juvenile Silver Carp were captured during this sampling. Stationary telemetry receivers were checked and downloaded, however, only nine of the stations were successfully downloaded due to high river conditions. Future efforts will continue capture of juvenile Silver Carp for tag implantation and maintenance on stationary telemetry receivers.

Des Plaines River and Overflow Monitoring

USFWS samples the Des Plaines River to assess risk of Asian carp bypassing the EDDBS in the event of a high water event where water flows laterally from the upper Des Plaines River into the Chicago Sanitary and Shipping Canal upstream of the EDDBS. This sampling is conducted multiple times each year from pre-spawn to post-spawn periods to monitor for Bighead Carp, Grass carp, and Silver Carp since there could be potential for interbasin transfer during flood events.

USFWS field crews sampled this area during April 22 - 24, 2019. A total of 13 boat electrofishing runs (3.25 hrs fishing time) were conducted in main channel and backwater habitats from the Jeans Rd. boat launch to the 135th Street bridge in Romeoville, a stretch of about 8 miles. Additionally, 300 yards of gill net were deployed in the entrance of backwater areas to capture large-bodied fish. A total of 369 fish representing 35 species were captured as a result of this effort. No Bighead Carp, Grass Carp or Silver Carp were captured during sampling.

No overflow events occurred during the month of April so requiring no additional sampling outside of planned sampling.

Barrier Operational and Maintenance Status

Status as of 30 April 2019

- Demo – Full water (5 Hz, 4 ms, 400 V = 1.0 V/in) & benthic (5 Hz, 4 ms, 100V) operational
- IIA – Off line, locked out for cooling system upgrades and repairs
- IIB –Online; Narrow (34 Hz, 2.3 ms, 2000 V = 2.3 V/in) & wide (34 Hz, 2.3 ms, 800 V= ~1.0 V/in) arrays operational
- Des Plaines By-Pass Fence - Fully Operational; Turtle Gates are Open

Barrier IIA remains in lock out / tag out (LOTO) status in support of cooling system upgrades and repair work. Cooling system upgrades to Barrier IIA are expected to be completed by 15 May 2019. Annual maintenance will be scheduled to occur following all repair and upgrade work.

Barrier IIB annual maintenance is complete and both wide and narrow arrays returned to service on 30 March 2019.

Demo Barrier remains active and will be powered down for annual maintenance AFTER Barrier IIA annual maintenance. Exact schedule is TBD and pending repair completions at Barrier IIA and contractor availability.

The Des Plaines Bypass Barrier is fully functional. Turtle gates were opened on 15 March 2019 for the season to allow for passage of amphibians and reptiles.

Alternate Pathway Surveillance in Illinois - Law Enforcement

The Invasive Species Unit (ISU) attended the Great Lakes Fishery Commission Law Enforcement Committee meeting in Ypsilanti, Michigan and gave a presentation on invasive species enforcement. ISU also presented on commercial fishing enforcement; aquaculture, fish truck and aquatic life dealer inspections; and aquatic invasive species enforcement at the Illinois Conservation Police Academy in Decatur, IL and the Commercial Fishing Enforcement training course in Havana, IL.

ISU met with a Professor at Loyola University who does extensive research on crayfish to discuss how ISU and the University can assist one another in the goal of preventing the spread and Illegal trade of crayfish.

ISU assisted local Conservation Police Officers with the investigation of an Illinois resident who was advertising live red swamp crayfish for sale on his Facebook page. The individual would transport the crayfish from Louisiana to Illinois in his truck and sell them to customers. He was cited for possessing a non-approved species without authorization from the IDNR.

ISU assisted Wisconsin DNR with obtaining sales records and interviewing personnel at an Illinois pet supply warehouse that was selling and shipping live crayfish to Wisconsin pet stores in violation of Wisconsin DNR regulations.

ISU inspected an aquaculture facility in DuPage county that was established to raise a restricted species for aquaponics purposes. No violations or illegal species were detected.

An out-of-state fish hauling company, under investigation by ISU, was charged in Will County court for unlawfully importing and stocking VHS species without permits and selling aquatic life without a license.

ISU collaborated with Illinois Department of Natural Resources Fisheries Division to enhance required commercial fishing reports and enforcement efforts.

ISU assisted United States Fish and Wildlife Service by conducting background investigations on subjects illegally selling fish parts.

ISU participated in an Environmental Crimes Task Force meeting with IL AG, United States Environmental Protection Agency, and Illinois Environmental Protection Agency.