Monitoring and Response Workgroup (MRWG)
Monthly Activities

2022 May Summary

Bottom Line

A set of safety protocols developed during the COVID pandemic to ensure safe operations were carried over into 2022 field sampling. **NO LIVE BIGHEAD CARP, BLACK CARP, GRASS CARP, or SILVER CARP were found or observed in any new locations immediately downstream or upstream of the Electric Dispersal Barrier**.

Overall Summary

Pool specific results through May 2022 from all effort within the Upper Illinois Waterway. The same time period in 2020 and 2021 for comparison. Additional effort may not be reported due to data processing and true effort and catch could be higher. Check 2021 interim summary, published at the end of the year, for complete results

Lockport	2020	2021	2022
Yards of net	14000	24600	12200
Miles of net	8.0	14.0	6.9
Hoopnet Nights	0	0	0
MiniFyke Nights	0	0	0
Electrofishing Runs	0	28	17
Electrofishing Hours	0.0	7.05	4.25
Dozer Trawl Runs	0	38	9
Dozer Trawl Hours	0	3.15	0.25
Pound Net Night	0 days	0 days	0 days
Bighead Carp	0	0	0
Grass Carp	0	0	0
Silver Carp	0	0	0
Invasive Carp Caught	0	0	0
IC/1000 yards	0	0	0
Invasive Carp Tons	0	0	0

Brandon	2020	2021	2022
Yards of net	14600	30400	13200
Miles of net	8.3	17.3	7.5
Hoopnet Nights	0	0	0
MiniFyke Nights	0	0	0
Electrofishing Runs	0	38	21
Electrofishing Hours	0	9.5	5.2
Dozer Trawl Runs	0	30	12
Dozer Trawl Hours	0	2.53	1.0
Pound Net Night	0 days	0 days	0 days
Bighead Carp	0	0	0
Grass Carp	0	0	1
Silver Carp	0	0	0
Invasive Carp Caught	0	0	1
IC/1000 yards	0	0	0
Invasive Carp Tons	0	0	0

Dresden	2020	2021	2022
Yards of net	32800	69700	47440
Miles of net	18.6	39.6	27.0
Hoopnet Nights	0	0	0
MiniFyke Nights	0	0	0
Electrofishing Runs	0	103	12
Electrofishing Hours	0.0	10.1	3.0
Dozer Trawl Runs	0	46	10
Dozer Trawl Hours	0	3.88	0.83
Pound Net Night	0 days	3 days	0 days
Bighead Carp	5	17	3
Grass Carp	1	3	0
Silver Carp	87	74	45
Invasive Carp Caught	93	94	48
Invasive Carp Dresden Above I55	0	4	0
Invasive Carp Dresden Below I55	0	66	47
Invasive Carp Rock Run	0	24	1
IC/1000 yards	2.8	1.3	1.0
Invasive Carp Tons	0.7	0.6	0.3

Marseilles	2020	2021	2022
Yards of net	58650	29850	112500
Miles of net	33.3	17.0	63.9
Hoopnet Nights	0	0	0
MiniFyke Nights	0	0	0
Electrofishing Runs	0	0	0
Electrofishing Hours	0	0	0
Pound Net Night	0 days	0 days	0 days
Bighead Carp	360	327	237
Grass Carp	1	15	16
Silver Carp	18544	5103	13155
Invasive Carp Caught	18905	5445	13408
IC/1000 yards	322.3	182.4	119.2
Invasive Carp Tons	104.5	31.6	7.0

Starved Rock	2020	2021	2022
Yards of net	15680	142050	61850
Miles of net	8.9	80.7	35.1
Hoopnet Nights	0.0	0.0	276.5
MiniFyke Nights	0	0	0
Electrofishing Runs	0	1	0
Electrofishing Hours	0.0	0.1	0.0
Dozer Trawl Runs	0		27
Dozer Trawl Hours	0		2.25
Pound Net Night	0 days	0 days	0 days
Bighead Carp	6	428	88
Grass Carp	116	547	193
Silver Carp	18724	75589	19407
Invasive Carp Caught	18846	76564	19688
IC/1000 yards	1201.9	405.9	285.9
Invasive Carp Tons	52.8	210.3	58.3

Contracted Fishing Below the Electric Dispersal Barrier

- Contracted fishing took place in Lockport, Brandon Road, Dresden Island, Marseilles, and Starved Rock Pools of the Illinois River Waterway
- Contracted fishers set and pulled 61,700 yards of gill/trammel net during 10 days of effort
- 87 Bighead Carp, 108 Grass Carp, and 7,803 Silver Carp were removed
- 54,382 pounds of Bighead, Grass and Silver Carp were removed

Overall summary of all Illinois Department of Natural Resources (IDNR) contracted fishing activities through May 2022. The same time period of 2020 and 2021 are included for comparison.

Contract Fishing	2020	2021	2022
Day Fish	20	42	32
Crew Days	130	256	241
Yards of net	135730	296600	247190
Miles of net	77.1	168.5	140.4
Hoop net Nights	0.0	0.0	276.5
Pound Net Night	0 days	3 days	0 days
Bighead Carp	371	772	328
Grass Carp	118	565	209
Silver Carp	37355	80758	32607
Invasive Carp Caught	37844	82095	33144
IC/1000 yards	278.8	213.1	126.0

USACE – traditional monitoring

During the month of May, USACE biologists conducted sixteen 15-minute electrofishing runs downstream of the barrier. Eight sites were in Lockport Pool and eight sites were in Brandon Road Pool. In Lockport Pool, a total of 465 individuals across 15 species were captured with the top five most abundant fish being emerald shiner (52.0%), common carp (16.3%), bluntnose minnow (16.1%), gizzard shad >6 inches (8.39%), and banded killifish (1.51%). In Brandon Road Pool, a total of 292 individuals across 19 species were captured with the five most abundant fish being common carp (46.2%), emerald shiner (30.5%), smallmouth bass (9.59%), gizzard shad (3.42%), and gizzard shad< 6 inches (1.71%). No invasive carp were captured or observed in these pools in the month of May.

Seasonal Intensive Monitoring

Seasonal Intensive Monitoring took place during May 16 to May 29, 2022. IDNR, INHS, USACE, USFWS, and contracted netters sampled the North Shore Channel, North and South Branches of the Chicago River, Chicago River, Chicago Sanitary and Ship Canal, Cal-Sag Channel, Little Calumet River, Calumet River, and Lake Calumet.

Overall:

- A total of 22,137 fish representing 56 species and 1 hybrid group were cumulatively collected across all capture gears
- 0 Bighead Carp, 2 Grass Carp, and 0 Silver Carp were collected

- One Grass Carp was captured in the Calumet River near T.J. Obrien Lock and Dam and one in the Cal-Sag
    - Ploidy status of the one individual in the Calumet River was diploid
- One dead Silver Carp found 3.7 miles away from Lake Michigan during an electrofishing run in the Calumet River (41.68852, -87.55290).
    - Otoliths were extracted but results have been returned yet

Commercial Seine:

- Contracted commercial fisher along with assisting agency biologists completed 4 800-yards commercial seines hauls (3200 yards) in Lake Calumet
- Crews collected 7,181 fish representing 19 species

Commercial gill netting:

- Contracted fishers along with assisting agency biologists set 46.6 miles of gill net (410 sets) at fixed and random sites
- Crews collected 963 fish representing 14 species

Electrofishing:

- Agency biologists completed 68.4 hours (277 transects) of electrofishing as fixed and random sties

Crews collected 13,993 individual fish representing 54 species

Strategy for eDNA monitoring in the CAWS

During the week of May 9, USFWS collected 400 eDNA water samples (440 including field blanks) above the electric dispersal barrier, specifically in Lake Calumet and the Marine Services marina on the Little Calumet River. Of the 300 samples collected in Lake Calumet, two samples were positive for Silver carp DNA. That is 0.6% positive detections, which is a similar detection rate to fall of 2021. In the Marine Services Marina on the Little Calumet River there were zero positive detections. In additional to the regular spring sampling, an isolated control water body was also sampled to serve as a control site and help give us insight to other potential eDNA pathways. Results from the control site are still pending and will be shared at the 2022 MRWG annual meeting.

Figure 1. eDNA sample sites, Lake Calumet

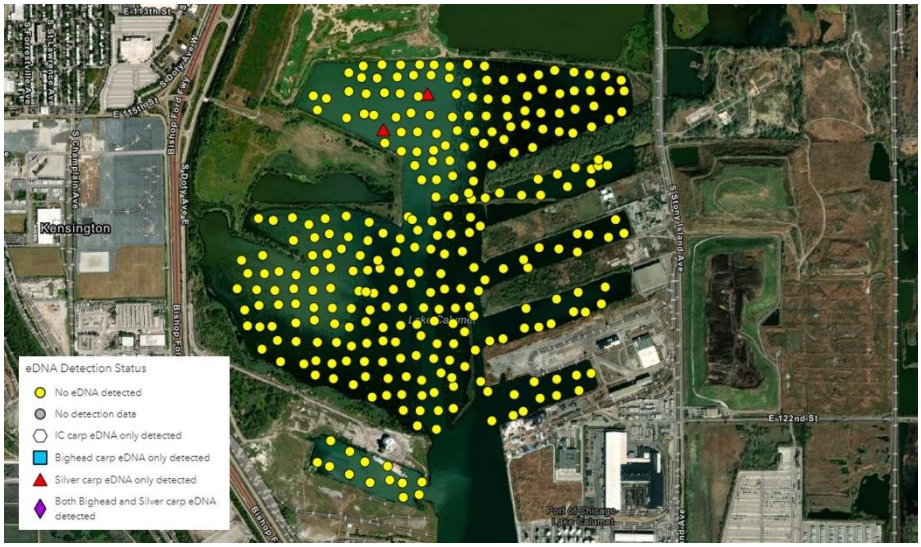
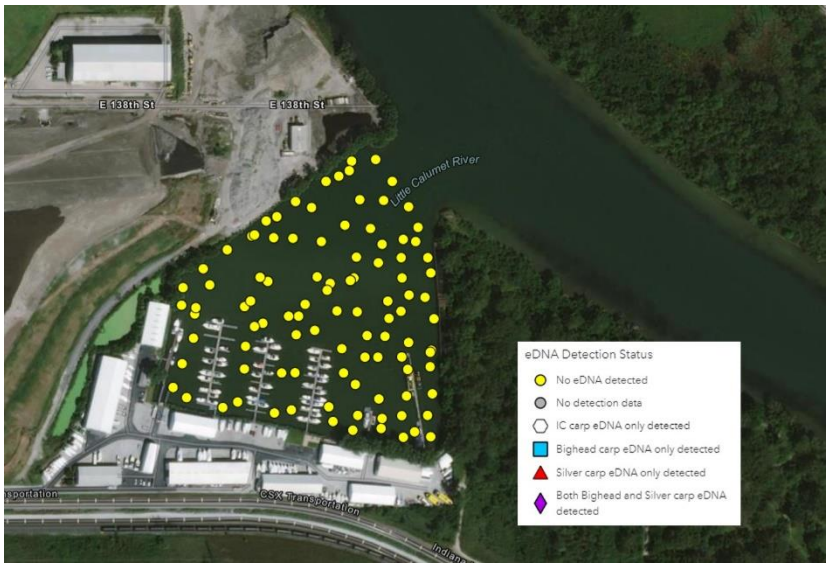


Figure 2. eDNA sample sites, Marine Services marina on Little Calumet River



Enhanced Contract Fishing

In September 2019, the Enhanced Contract Fishing Program was initiated in the Peoria Pool. The program offers Illinois-licensed commercial fishermen $.10 per pound for invasive carp caught in the Peoria Pool and sold to fish processors or other buyers for at least $.07 per pound. To date, 31 fishermen have entered into contracts to catch invasive carp from this pool. From inception through May 2022, 8,644,559 pounds of invasive carp have been caught in the Peoria Pool. Of these total catches, 5.30% are Bighead, 74.59% are Silver and 20.11% are Grass carp. **No Black carp have been reported.**

Table 1. Table of Enhanced Contract Fishing – Peoria Pool from inception, September 2019, through May 2022. **By receipt date, not catch date**

YEAR	Total Lbs.**	Bighead	Silver	Grass
2019 *	518,132	24,813	310,297	183,022
2020	2,882,724	176,195	1,980,175	726,355
2021	3,345,973	209,526	2,517,416	619,031
2022 (Jan thru May)	1,897,731	47,761	1,640,311	209,659
GRAND TOTALS	8,644,559	458,293	6,448,198	1,738,067

* September 2019 program inception.

** No Black carp reported.

Invasive Carp Early Detection Monitoring in the Upper Illinois Waterway: Lockport, Brandon Road, Dresden Island, and Marseilles Pools, and the Lower Kankakee River

U.S. Fish and Wildlife Service (USFWS) conducted invasive carp (Bighead Carp, *Hypophthalmichthys nobilis*; Silver Carp, *H. molitrix*; Black Carp, *Mylopharyngodon piceus*; Grass Carp, *Ctenopharyngodon idella*) Early Detection Monitoring (EDM) to detect these fishes in novel areas of the upper Illinois Waterway (IWW) below the Romeoville, IL Electric Dispersal Barrier System (EDBS). Lockport Pool sampling was completed on May 9th, 2022 between the EDBS and Lockport Lock and Dam; ~ 5 river miles. Brandon Road Pool sampling was completed on May 5th, 2022 between Lockport Lock and Dam and Brandon Road Lock and Dam; ~ 4.25 river miles. Dresden Island Pool sampling was completed on May 11th,2022 and covered the area between Brandon Road Lock and Dam and Dresden Island Lock and Dam; ~ 13.5 river miles. Lower Kankakee River sampling was completed on May 12th, 2022 between the first railway bridge above Kankakee Conservation Area Boat Launch and the Kankakee's confluence with the Illinois Waterway; ~ 4.25 river miles.

Where possible, EDM surveys consisted of traditional boat electrofishing, electrified dozer trawling, and mini-fyke net sets in a combination of main-channel border, side-channel, and backwater habitats. Electrofishing was performed in 15-minute sampling periods consisting of repeated passes perpendicular to and toward shore, with two crewmates collecting fishes with a handheld dip net. Dozer trawling was conducted in 5-minute sampling periods moving upstream and parallel to shore, and with fishes collected by a net supported by a rigid frame at the boat's bow. Wisconsin-type mini-fyke nets with 24' leads and 1/8" mesh were staked against the shoreline, stretched perpendicular to shore, and fished overnight.

Highlighted Results:

• No small-bodied (< 153 mm total length; TL) invasive carp were captured by EDM in May 2022.
• No large-bodied (≥ 153 mm TL) invasive carp were captured outside their known range by EDM in May 2022.

Table 2. Summary of USFWS invasive carp early detection monitoring preliminary results from May 2022. "Location" is the section of IWW sampled. "Electrofishing effort" reports completed hours of two-person traditional boat electrofishing and n_e is the number of surveys completed. "Dozer effort" reports completed hours of electrified dozer trawling and n_d is the number of surveys completed. "Mini-fyke effort" reports the number of overnight net sets completed and n_n is net nights. "Small carp captured" is the number of invasive carp with total length (TL) < 153 mm captured. "Large carp captured" reports the number of invasive carp with total length ≥ 153 mm captured. "Total Catch (N)" reports the total number (N) of individual fishes (all species) captured. "Species richness" reports the count of species captured. "Most abundant species" reports the common name of the fish species that was the largest proportion of total fish captured (N) and n_i is the number of individuals of that species captured.

Location	Electrofishing Effort (h; n_e)	Dozer Effort (h; n_d)	Minifyke Effort (nn)	Small carp captured	Large carp captured	Species Richness	Total Catch (N)	Most abundant species
Lockport	2.25h; n_e=9	0.25h; n_d=9	nn=0	0	0	13	143	Emerald shiner, n_i=94
Brandon Road	2.2h; n_e=9	1h; n_d=12	nn=0	0	0	20	178	Emerald shiner, n_i=60
Dresden Island	3h; n_e=12	0.83h; n_d=10	nn=0	0	2 carp captured: Silver carp, 746 mm; Grass carp, 985 mm	36	643	Gizzard shad, n_i=126
Kankakee	3.75h; n_e=15	1.28h; n_d=15	nn=0	0	5 carp captured: Silver carp, 855 mm; Silver carp, 883 mm; Silver carp, 816 mm; Silver carp, 854 mm; Silver carp, 840 mm	42	463	Emerald shiner, n_i=70

Invasive Carp Demographics

In May 2022, the U.S. Fish and Wildlife Service – Columbia Fish and Wildlife Conservation Office began the fifth year of a fisheries-independent protocol. Data collections include Silver Carp length and sex structure, maturity status, and relative abundance during spring and fall in six pools of the Illinois River: Alton, LaGrange, Peoria, Starved Rock, Marseilles, and Dresden Island. During the weeks of May 9th, and 23rd, electrified dozer trawl crews deployed to the Alton, LaGrange, Peoria, and Starved Rock pools. A total of 921 Silver Carp were captured in in these four pools, and sizes ranged from 70mm-820mm TL in May (Table 3). Sex and maturity were evaluated on all Silver Carp captured and data is pending.

Table 3. Sampling effort and preliminary results, May 2022.

Pool	Total Silver Carp Captured	Sample Size (# of 5 min trawls)	Mean CPUE (Silver Carp /5 min trawl)	Standard Error	Silver Carp Size Range (mm)
Alton	460	13	22.9	7.3	70-785
LaGrange	23	10	2.5	0.9	135-770
Peoria	109	28	5.2	0.9	130-785
Starved Rock	329	27	11.2	1.9	142-820

Telemetry Support for the Spatially Explicit Invasive Carp Population Model (SEiCarP)

SIU retrieved and downloaded stationary telemetry receivers in Starved Rock, Marseilles, and Dresden Island pools. The resulting detection data were processed for QA/QC.

USACE – Telemetry

During the month of May USACE downloaded all receivers within the Lockport, Brandon Road, and Dresden Island Pools. Post download analysis of the 28 receivers in the network indicated that no fish transited between navigation pools or past the electric dispersal barrier between receiver deployment and downloads in May. There was no indication that any Bighead or Silver carp approached Brandon Road Lock or transited upstream of it. The next download of the full receiver network will be in July.

Hydroacoustic Fish Surveys of the Upper Illinois Waterway: Dresden Island, Brandon Road, and Lockport Pools

The U.S. Fish and Wildlife Service conducted mobile hydroacoustic fish surveys in Lockport and Brandon Road pools from May 18-19, 2022. These pool surveys were designed to monitor for the abundance of large fishes—potentially Bighead or Silver Carp— with target strength (TS) greater than -28.7 dB (theoretical side-aspect TS of a 12” (30.5 cm) total length fish) within the upper Illinois Waterway. The hydroacoustic survey in Lockport Pool covered the area between the Hanson Material Services Corporation docking slip and Lockport Lock & Dam (6.5 km). The hydroacoustic survey in Brandon Road Pool covered the area between Lockport Lock & Dam and Brandon Road Lock & Dam (7.2 km). Dresden Island Pool was not sampled in May 2022 to avoid duplication of hydroacoustic sampling effort with Southern Illinois University. In all pools, surveys were conducted with paired 200-kHz, side-facing transducers and consisted of one continuous

transect along each shoreline with the boat following the contour of the main channel edge and the transducers pointed outwards towards the navigation channel.

Results:

Lockport Pool:

Six (6) fish tracks corresponding to fish > 12” were detected in Lockport Pool in 1,396,210 m^3 of water on May 18, 2022. Mean target strength of fish targets was -25.3 dB (SE = 0.96).

Brandon Road Pool:

Two fish tracks corresponding to fish > 12” were detected in Brandon Road Pool in 1,016,156 m^3 of water on May 19, 2022. Target strength of fish targets ranged from -23.27 to -20.83 dB.

Hydroacoustic Fish Surveys at the Electric Fish Dispersal Barrier System, Romeoville, IL

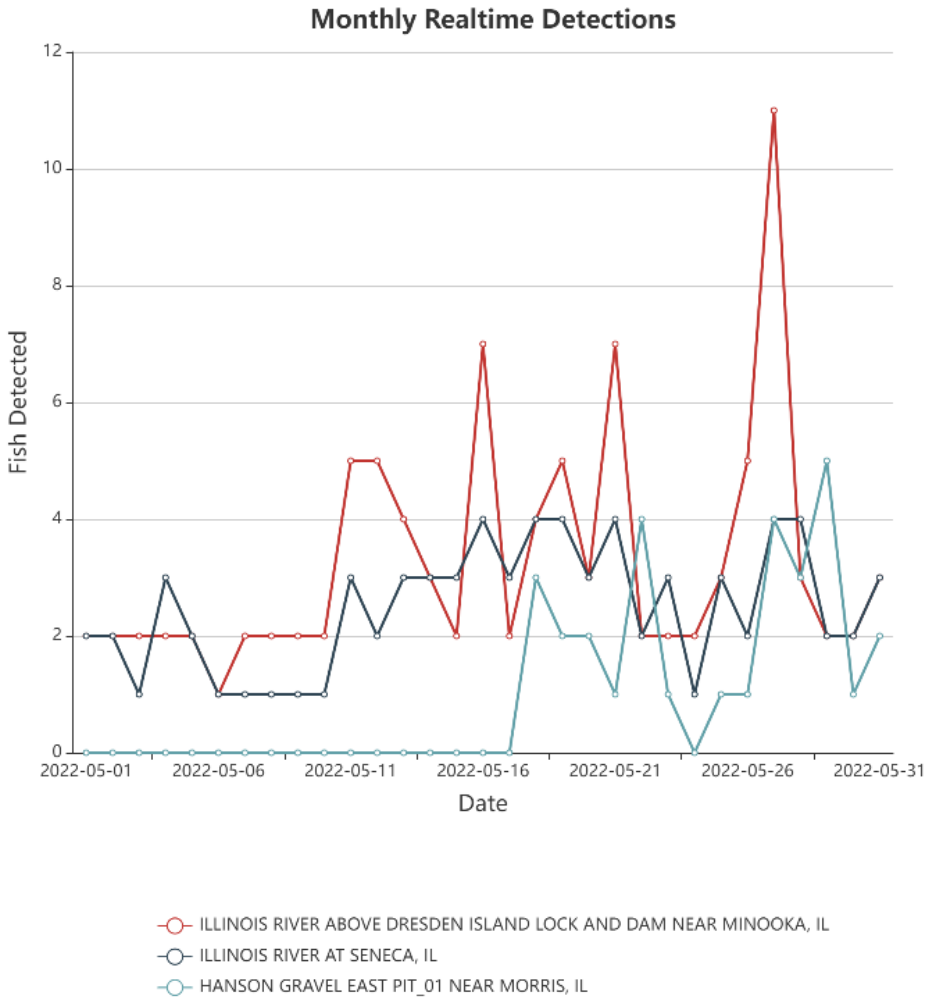
The U.S. Fish and Wildlife Service conducted two mobile hydroacoustic fish surveys in May 2022 at the Electric Dispersal Barrier System (EDBS) on May 17 and May 31. The surveys were conducted to monitor for the presence and distribution of fishes greater than 12” (30.5 cm) total length in the vicinity of the EDBS to aide in assessing the risk of large fish—and potentially Bighead or Silver Carp—passing through the EDBS during barrier operational changes and/or maintenance. However, it is important to note that hydroacoustic technology does not distinguish or identify fish species, and therefore fish detected should not be assumed to be a particular species. Hydroacoustic surveys consisted of three replicate passes along an upstream and downstream transect with paired, side-facing 200-kHz transducers. Each replicate covered the area between Hanson Material Services Corporation 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”. Results are reported as a sum of all fish tracks detected across replicate surveys; therefore, some may represent the same fish.

Results:

May 17, 2022: Eleven large fish tracks ≥ -28.7 dB were detected within the EDBS on May 17, 2022, with all fish targets aggregated downstream of Barrier IIB. Two were detected in Replicate Survey #1, four in Replicate Survey #2, and five in Replicate Survey #3. It is important to note that due to the results being reported as a sum of all fish targets detected, and that sampling within a survey is conducted on both sides of the channel, allowing for overlap, it is likely that many of these targets were from the same few individuals being pinged multiple times. It is also important to note that since these targets were detected in a similar area over the course of a 3-hour sampling event, it is unlikely that they are false detections (i.e., debris) floating downstream. Five large fish tracks were also detected downstream of the EDBS. These results revealed substantially higher abundance in the vicinity of the EDBS than previous surveys, particularly within the EDBS, for which this was the highest aggregate number of large targets detected since 2018.

May 31, 2022: Seven large fish tracks ≥ -28.7 dB were detected within the EDBS on May 31, 2022, with all fish targets aggregated between Barrier IIA and IIB or near the downstream end of Barrier IIA. Two were detected in Replicate Survey #1, two in Replicate Survey #2, and three in Replicate Survey #3. It is important to note that due to the results being reported as a sum of all fish targets detected, and that sampling within a survey is conducted on both sides of the channel, allowing for overlap, it is likely that these targets were from the same few individuals being pinged multiple times. Five large fish tracks were also detected downstream of the EDBS along the western canal wall. These results revealed similar distribution of fish targets within the EDBS to the previous survey on May 17 and continued to show above-average abundances compared to past years.

USGS Invasive Carp Database Management and Integration Support



There were 13 bigheaded carp (3 Bighead Carp and 10 Silver Carp) detected at ILLINOIS RIVER ABOVE DRESDEN ISLAND LOCK AND DAM NEAR MINOOKA, IL during the month of May 2022. The maximum number of bigheaded fish detected on one day was 11 and the minimum was 1.

There were 10 bigheaded carp (0 Bighead Carp and 10 Silver Carp) detected at HANSON GRAVEL EAST PIT_01 NEAR MORRIS, IL during the month of May 2022. The maximum number of bigheaded fish detected on one day was 5 and the minimum was 0.

There were 4 bigheaded carp (0 Bighead Carp and 4 Silver Carp) detected at ILLINOIS RIVER AT SENECA, IL during the month of May 2022. The maximum number of bigheaded fish detected on one day was 4 and the minimum was 1.

Monitoring of invasive carp reproductive productivity

INHS collected ichthyoplankton samples at 7 main channel sites located from the Brandon Road to LaGrange navigation pools during every week of May. A minimum of four ichthyoplankton samples were collected at each site. Additional samples were collected in Illinois River tributaries to evaluate the potential for invasive carp spawning in these rivers.

A peak in water levels occurred in the Illinois River during the first week through early in the second week of May. However, water temperatures remained below the threshold thought to be conducive for invasive carp spawning until the middle of the second week in May. Water temperatures remained above 18°C after this time, and water levels declined or remained stable through the end of May. Despite the conditions being largely unfavorable for invasive carp spawning, moderate numbers of large-diameter eggs and invasive carp larvae were observed in the LaGrange Pool during the third week of May. A single large-diameter egg was collected at Henry in the Peoria Pool at this time, but no invasive carp eggs or larvae were observed upstream of the Peoria Pool. Invasive carp larvae continued to be observed in the lower LaGrange Pool through the end of May. Full processing of all ichthyoplankton samples and identification of larval fish and eggs is ongoing. Occurrences of invasive carp eggs or larvae, particularly upstream of Starved Rock L&D, will be reported as soon as this information is available.

Zooplankton as dynamic assessment targets for invasive carp removal

INHS collected zooplankton and water chemistry samples at 7 main channel sites located in the Brandon Road to LaGrange navigation pools during the weeks of May 2, May 16, and May 30. The collected data will be combined with historical and recent data on Illinois Waterway zooplankton communities to assess the influence of environmental factors and invasive carp densities on zooplankton abundances. This information will inform management agencies of the ecosystem responses to invasive carp removals and develop dynamic targets for diminishing the ecological impacts of invasive carp.

Barrier Operational and Maintenance Status

The barriers are currently operating at the following parameters:

IIA – Narrow & wide arrays off for controls replacement
IIB – 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
Barrier I – 1D (Full water - 5 Hz, 4 ms, 400 V = ~1.0 V/in & benthic 5 Hz, 4 ms, 100V) and 1N (34 Hz, 2.3 ms, 1700 V = ~2.3 V/in) operational

The unscheduled outages that occurred during May 2022 are as follows:

5/1/22 – 2B narrow array – 1 minute – fault and failed auto restart of narrow array, wide array active
5/9/22 – 2B narrow array – 126 minutes – fault and failed auto restart of narrow array, wide array active
5/31/22 – 1D power outage – 92 minutes – total power and pulser outage.1N and 2B active

Alternate Pathway Surveillance in Illinois - Law Enforcement

ISU investigated a complaint of a Louisiana company illegally importing live Red swamp crayfish into Illinois. The owner who was interviewed admitted to recently shipping the live crawfish into Illinois because he didn't know it was illegal. His business only recently started selling live crayfish in addition to frozen crayfish and will only sell frozen products in the future. Market inspections throughout the Chicagoland area did not locate any live invasive species.