2015 August Summary

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

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

Electrofishing:

- Crews from IDNR, USACE and USFWS completed 88 electrofishing runs at fixed and random sites (22 hours total) in the Lockport, Brandon Road, Dresden Island and Marseilles Pools during the month of August.
- Crews collected 4,015 fish of 52 species and 2 hybrid groups.
- **No Bighead Carp or Silver Carp were reported captured or observed in the Lockport, Brandon Road or Dresden Island Pools.**
- Seventy-three Silver Carp were collected and another ~ 400 were observed in the Marseilles Pool.

Commercial Netting:

- Contracted commercial fishers along with assisting IDNR biologists set 15.2 miles of net (119 sets) at fixed and targeted sites in the Lockport, Brandon Road and Dresden Island Pools (including Rock Run Rookery) during the month of August.
- Crews collected 298 fish of 11 species.
- **No Bighead Carp or Silver Carp were captured or observed in the Lockport or Brandon Road Pools.**
- Twenty-seven Bighead Carp and 10 Silver Carp were collected in Rock Run Rookery.

Hoop and Mini Fyke Netting:

- Crews from IDNR set and pulled 16 hoop nets (6' diameter) and 16 mini fykes in Lockport, Brandon Road, Dresden Island and Marseilles Pools during the week of August 10th.
- Crews collected 49 fish of 6 species during hoop net sampling and 1,202 fish of 35 species and 1 hybrid group during mini fyke sampling.
- **No Bighead Carp or Silver Carp were reported captured or observed in the Lockport, Brandon Road or Dresden Island Pools**.
- Twenty-seven Bighead Carp were collected during hoop net sampling in the Marseilles Pool.

Barrier Defense Asian Carp Removal Project

Barrier Defense occurred the weeks of August 3rd and August 24th. In addition to gill, trammel and hoops nets a 200-yd commercial seine was deployed the week of August 24th. Modified from previous years, Barrier Defense specifically takes place in the Marseilles and Starved Rock Pools. Also in 2015, contracted commercial fisherman will be deploying and fishing modified 6-foot diameter hoop nets in the main channel border and side channel habitats as conditions allow. These habitats have been difficult to fish with gill and trammel nets. Below is a summary of all Barrier Defense activities for 2015 (along with 2014 for comparison):

QUICK SUMMARY:	2014	2015
Number of Days Fished	36	48
Number of Net Crew Days	192	232
Yards of Net Fished	332,700	305,750
Miles of Nets Fished	189.0	173.7
Number of Hoop Net Sets	103	118
Number of Bighead Carp	8,128	6,421
Number of Silver Carp	34,552	71,822
Number of Grass Carp	418	544
Number of Asian Carp	43,098	78,787
Tons of Bighead and Silver Carp Harvested	216.5	271.3

Evaluation of Gear Efficiency and Asian Carp Detectability

INHS conducted pulsed DC electrofishing to monitor for the presence of age-0 and age-1 Asian carp at sites in the LaGrange, Peoria, and Starved Rock Pools of the Illinois Waterway during August 3-5. Electrofishing proved very ineffective at capturing juvenile Asian carp during these dates, as numerous age-0 Asian carp were visually observed in shallow vegetated areas in the LaGrange Pool, but were not captured by the gear. Evaluation of all sampling gears targeting age-0 and age-1 Asian carp was conducted at the Lily Lake backwater and the main channel adjacent to Lily Lake during August 10-13, and at Havana and the Matanzas Lake backwater during August 17-19. Sampling coincided with experimental trawl sampling conducted by USFWS for comparison among gears. Gears deployed included floating small-mesh gill nets, mini-fyke nets, beach seines, small-mesh purse seines, pulsed-DC electrofishing, and hydroacoustic transects. Low numbers of juvenile Asian carp were captured during these efforts (n = 23 total, 46 – 293 mm). Shoreline gears (beach seines, mini-fyke nets) were generally ineffective at capturing Asian carp (n=2), whereas gears targeting deeper habitats captured higher numbers of juvenile silver carp (gill nets: n=2; purse seines: n=12; pulsed-DC electrofishing: n=7). High water levels likely contributed to low catch rates and ineffectiveness of shoreline gears.

Telemetry Monitoring Plan

USACE biologists downloaded data from one receiver on 12 August 2015 which was unable to be retrieved in July due to high river conditions. This receiver was located just downstream of the Wilmington Dam on the Kankakee River, approximately 9.75 miles upstream of the confluence with the Des Plaines River.
Preliminary analysis of the Wilmington Dam receiver data has been completed which encompassed the period from 5 May to 12 August 2015. There were 86 detections from a total of 11 unique transmitters. All transmitters were implanted into Bighead Carp. Detections seemed to be concentrated to 6 days from 12-25 June, all of which were on the rising hydrograph according to the closest river gage.

Of the 11 fish detected, 7 were collected from Rock Run Rookery, 3 from the mouth of the Kankakee, one from Big Basin and one from the Moose Island backwater. It seems that most of the tagged Asian carp in Dresden Island are fairly active within the pool and utilize the Kankakee River routinely. Data analysis is ongoing to further understand the cues which may be drawing fish to the Kankakee River.

Fish Suppression and Clearing in Support of Barrier Maintenance

Within the Month of August the Dispersal Barrier System continuously maintained power to the water at one or more barrier arrays resulting in no direct opportunities for fish passage. There were 8 severe weather reports triggered a transfer of power from utility to generator power at Barrier IIB. A manual switch to generator power at Barrier IIB during these events includes a 30 second delay in power to the water but is a precautionary measure to ensure a longer outage time does not occur in the case of an unexpected loss of utility power.
A planned maintenance event was completed by Smith Root Inc. at Barrier IIB on 19 and 20 August. This maintenance repaired the narrow array primary pulser equipment within Barrier IIB and transferred power back to the primary pulser from the backup pulser. The backup pulser was placed into standby mode. Barrier IIA narrow array was fully operational throughout the month of August. The operational settings for Barriers IIA and IIB at the end of August were 2000 V input at the narrow array electrodes (800 V wide arrays), 34 Hz and 2.3 ms pulse duration. Heavy monitoring of the waterway continues with efforts from multiple resource agencies which indicate that Asian carp presence within Lower Lockport pool remains low.

Understanding Surrogate Fish Movement with Barriers

Current Floy Tag results

Fish Tagged & Recaptured

- Bigmouth Buffalo – 72
- Black Buffalo – 51
- Common Carp – 1091
- Common X Goldfish Hyb. – 29
- Goldfish – 4
- Smallmouth Buffalo – 769

Total – 2,016

Recapture Totals

- Lockport Pool – 11 Common Carp
- Brandon Pool – 49 Common Carp, 3 Smallmouth Buffalo & 1 Common Carp
- Dresden Pool – 23 Smallmouth Buffalo, 21 Common Carp & 3 Bigmouth Buffalo
- Rock Run – 10 Smallmouth Buffalo, 2 Bigmouth Buffalo, 1 Common Carp & 3 Black Buffalo

Total – 127 recaptures

Fish Movement

- 58 recaptures by Caudal Fin but didn't have tags (No data on movement)
- 64 recaptures had tags but showed no movement between Barrier/Dam
- 5 recaptures had tags and showed movement downstream through lock and dams

Notable

- 1 Smallmouth buffalo was tagged in Rock Run Rookery and travelled through the connection into Dresden before recaptured
- 1 Bigmouth buffalo was tagged in Rock Run Rookery and travelled through the connection and was captured by a bow fisherman upstream the Kankakee river near Wilmington
- 1 Common carp was tagged in Lockport Pool and travelled downstream through the Lockport Lock and Dam and was recaptured in Brandon Pool the next day
- 1 Common carp was tagged in Dresden Pool and travelled downstream through the Dresden Lock and Dam and the Marseilles Lock and Dam before being recaptured in Sheehan Island
- 4 fish that were tagged have been recaptured more than once

Asian Carp Gear Development and Evaluation

Two crews from the Columbia FWCO sampled the LaGrange Pool of the Illinois River for invasive carps August 10-13, 2015. Four different trawling methods (the paupier butterfly frame trawl, surface trawl, push trawl, and dozer trawl) were used to target the 2014 and 2015 year classes from Lake Chautauqua (river mile 129) downstream to the LaGrange Lock and Dam (river mile 80). The push trawl and dozer trawl sampled 15 miles while the paupier and surface trawl sampled 13 miles. All four trawling methods captured Silver Carp. A total of 1,125 juvenile Silver Carp were captured measuring 49mm-320mm, which presumably accounts for the 2014 and 2015 year classes (Fig. 1). Capture rates of juvenile invasive carps increased while moving downstream. Additionally, juvenile Silver Carp were caught in the main channel at the outflow from a floodplain lake (Fig. 2 & 3). Fish in the 2015 year class are 20-60mm larger than the 2014 year class was at this time last year, either due to an earlier spawn, optimal growing conditions, or a combination of both.

Two silver carp (209 and 245mm) captured in the Sheehan Island backwater (Starved Rock Pool, RM 235) were aged by staff at the USGS-CERC. Using multiple hard structures including pectoral spines and vertebrate, it was determined that the fish were hatched in 2014 (Fig. 4).

Sampling was done with all four gears near Columbia, MO the weeks of August 3-7 and August 17-21 in Missouri River tributaries to continually evaluate gears and the habitat that juvenile carp are occupying. Important notes are that juvenile carp captured are much smaller than those in the Illinois River and were caught in tributaries or below wetland outflows.

Figure 1. Silver Carp captured during one paupier trawl in Lake Matanzas with the 2014 year class on the right (247-262mm) and 2015 year class on the left (90mm-130mm)

Figure 2. Silver Carp (80-120mm) captured during one dozer trawl at the outflow of a floodplain lake.

Figure 3. Water control structure where the floodplain lake outflows into the main channel of the Illinois River.

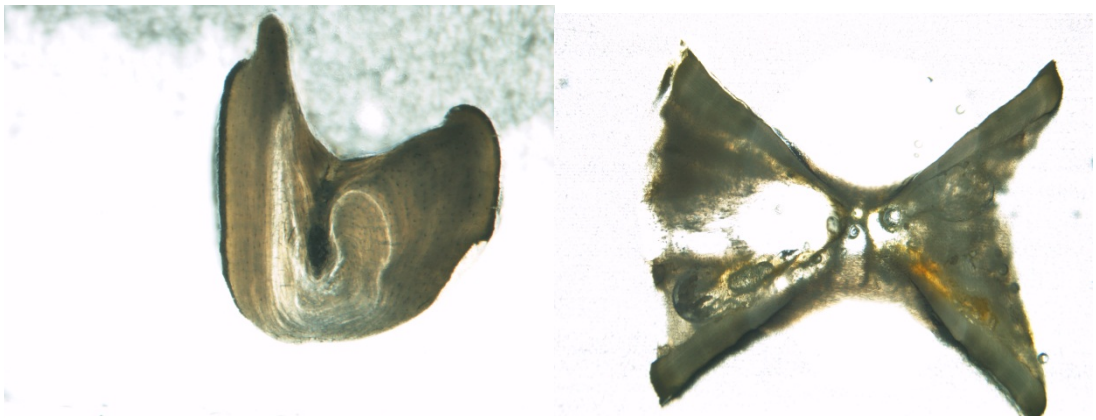

Figure 4. Pectoral spine and vertebrae from 209mm and 245mm silver carp that were hatched in 2014.

Larval Fish and Productivity Monitoring in the Illinois Waterway

INHS conducted ichthyoplankton sampling at 12 sites located throughout the Illinois Waterway during August 3-5 and August 18-20. Four larval fish samples were taken at each site, and zooplankton and water quality samples were also collected. Processing and identification of larval fish samples has now been completed for samples collected through early August. Preliminary results indicate the presence of small numbers of potential Asian carp eggs at main channel sites in the LaGrange Pool in early May, followed by extremely large numbers of potential Asian carp eggs at all sampling locations in the LaGrange, Peoria, and Starved Rock Pools in early to mid-June. High numbers of Asian carp larvae were collected in both main channel and backwater sites in the LaGrange and Peoria Pools from mid-June to early July, but no Asian carp larvae have been identified from samples collected at Spring Valley in the upper Peoria Pool, or from sites upstream of the Peoria Pool. No Asian carp eggs or larvae have been identified from any samples collected after the first week of July. Subsamples of large-diameter eggs and larvae identified as Asian carp will be submitted for genetic confirmation during September and results of these tests will be reported once available.

Unconventional Gear Development

INHS set pound nets at the Lily Lake backwater on August 10 in collaboration with USGS as part of the feeding attractant and sound driving studies. One net was acclimated with the attractant/sound, whereas the other net served as a control. Nets were checked daily until August 24, and all captured fish measured and weighed. Results of these efforts will be reported by USGS.

Identifying Movement Bottlenecks and Changes in Population Characteristics of Asian Carp in Illinois River

Hydroacoustics Surveys

Four hydroacoustic surveys were undertaken in the east HMS pit before and after commercial fishing occurred. Measurements of native fish and Asian carp were done on two boats during commercial fishing in the HMS pits to guide hydroacoustic analysis. Analysis of this data is still ongoing.

Acoustic Receivers, Transmitters, and Active Tracking

Analysis of 2015 telemetry data is ongoing. We plan to tag additional fish in October.

Standardized sampling

During the week of August 24th, an SIU field crew undertook the annual electrofishing survey using standardized transects in main channel and backwater habitats of the three lower reaches of the Illinois River (Alton, LaGrange, and Peoria). In total, 371 Silver Carp, Bighead Carp, and potential hybrids were collected. The majority of these individuals appeared to be Silver Carp. Until the results of genetic analyses are obtained, all of these individuals will be grouped together and referred to as Asian carp. Total length (mm), weight (g), sex, and maturation were recorded for all Asian carp. Total length (mm) and weight (g) were also taken all other species collected and native species were returned to the water as quickly as possible. Fin clips and postcleithrum bones were removed from all captured Asian carp. Fin clips will be sent to Western Illinois University for identification of hybrid individuals and postcleithrum will be processed to determine fish ages. Apparent Silver Carp YOY were captured at main channel and backwater sites in the Peoria, Alton, and LaGrange reaches. Length-frequency histograms show that smaller individuals comprised more of the catch in the LaGrange reach (Figure 1). While actual number of Asian carp collected was highest in the LaGrange reach, CPUE was slightly higher in the Alton reach (Table 1). Detailed information on Asian carp demographic is currently being compiled as postcleithrum as aged. Species composition and size structure data obtained from this standardized sampling event will be used to inform the upcoming hydroacoustic survey of the Illinois River.

Table 1. Summary of Asian carp captured during standardized sampling on the lower Illinois River in August 2015.

Reach	N	CPUE (fish/hr)	Mean TL (mm)
Peoria	*69*	*69*	*507.75*
LaGrange	*169*	*97*	*558.24*
Alton	*133*	*106*	*559.25*

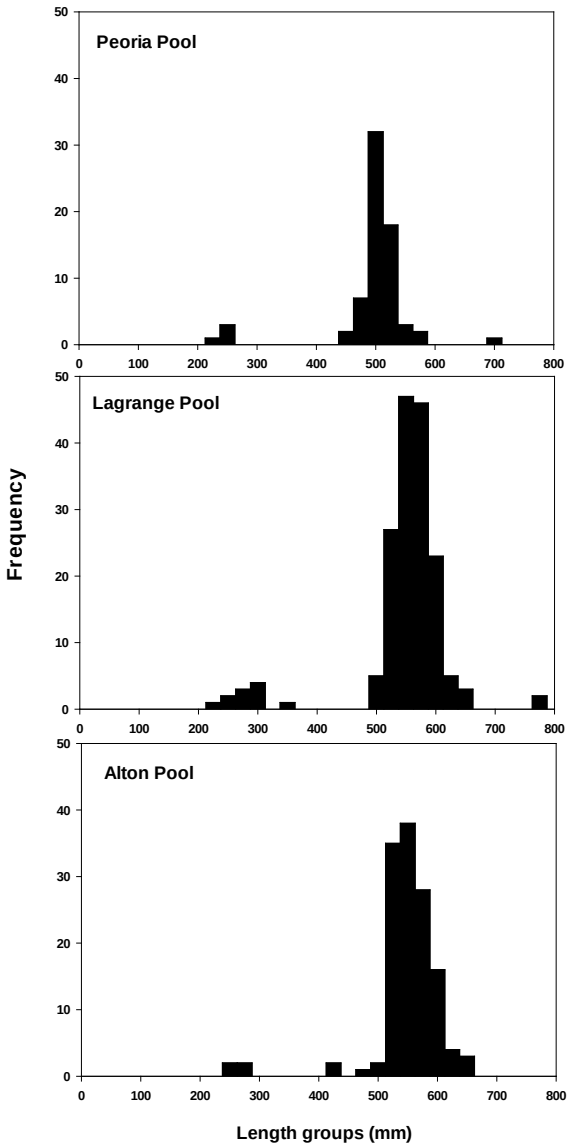

Figure 1. Length-frequency histograms of adult Silver Carp captured during SIU's annual electrofishing survey in the three lower pools of the Illinois River, August 2015.

Monitoring Fish Abundance and Spatial Distribution in Lockport, Brandon Road, and Dresden Island Pools and the Associated Lock and Dam Structures

A stationary split beam hydroacoustic system utilizing 420kHz and 120 kHz transducers has been collecting data on fish density and movement directly above the Brandon Road Lock chamber 24 hours a day throughout August.

Monitoring Fish Abundance, Behavior, Identification, and Fish-Barge Interactions at the Electric Dispersal Barrier, Chicago Sanitary and Ship Canal, Illinois

Bi-weekly mobile split beam hydroacoustic surveys of fish density directly below the electric dispersal barrier have taken place throughout August.

An additional 171 ten minute data collections were made with the shore based dual DIDSON deployment from the west bank of the canal over barrier IIB during August. Data processing is underway.

Studies of barge fish interactions focused on rates of fish entrainment and retention in barge junction spaces took place during August. Trials occurred at the electric dispersal barrier from Aug. 4-14. Trials also took place at the Brandon Road lock Aug 17-21 and in the Starved Rock pool Aug. 24-28. Preliminary results will be compiled and presented to partners as soon as possible.

Distribution and Movement of Small Asian Carp in the Illinois Waterway

During the month of August, USFWS Wilmington sub-office conducted the following efforts, using push trawls (PT), mini-fykes (MF), and boat electrofishing (EF), to search for small Asian carp (<200mm) in the Illinois River. Five small Asian carp were captured in Starved Rock pool (Figure 1).

Pool	Gear	Effort
Marseilles		
	Mini-fykes (net nights)	10
	Push trawl (runs (meters))	4 (512)
	Electrofishing (runs(hours))	5 (0.73)
Starved Rock		
	Mini-fykes (net nights)	24
	Push trawl (runs(meters))	9 (1030)
	Electrofishing (runs(hours))	11 (1.35)

On August 19, an electrofishing crew from Wilmington FWS captured a 140mm (mislabeled in picture) silver carp in Starved Rock pool (41.31814, -88.89654). On August 26, two more small silver carp in were captured in Starved Rock pool via electrofishing (TL: 150mm; 41.32299, -88.94753 and TL: 131mm; 41.32229, -88.94646). These were captured in Starved Rock Marina, which is a different location than the one from August 19. Additionally, on August 28 two small silver carp were captured in Starved Rock pool using a push trawl. They were captured in a different location than the previous three, and also with different gear (TL: 128mm and 133mm; 41.31945, -88.95489). All specimens will be sent to Duane Chapman for aging.

Figure 1. Small silver carps captured by boat electro fishing (A-C) and push trawling (D) in Starved Rock pool during August 2015.

Alternate Pathway Surveillance in Illinois - Law Enforcement

A McHenry County Aquaculture permit holder was cited for failure to maintain aquaculture facility records after an investigation determined she provided false information to investigators during an inspection of her facility. The permit holder purchased Tilapia from a non-permitted facility and also sold Tilapia to an unlicensed aquatic life dealer who had previously been cited for selling aquatic life without a license.

The Invasive Species Unit inspected a fish truck delivering live fish in Chicago's Chinatown. The company had previously been cited for several violations related to importing fish into Illinois including selling aquatic life without a non-resident aquatic life dealer's license. The owner of the company received a citation for selling aquatic life without a non-resident aquatic life dealer's license for the second time.

The Invasive Species Unit inspected a Chicago business and found live Asian Swamp Eels. It was determined the origin of the eels is New York. The New York business does not have a license or import permits for Illinois. The investigation is on-going. The Invasive Species Unit is investigating reports of live Rusty Crayfish being imported into Illinois. The investigation is on-going.