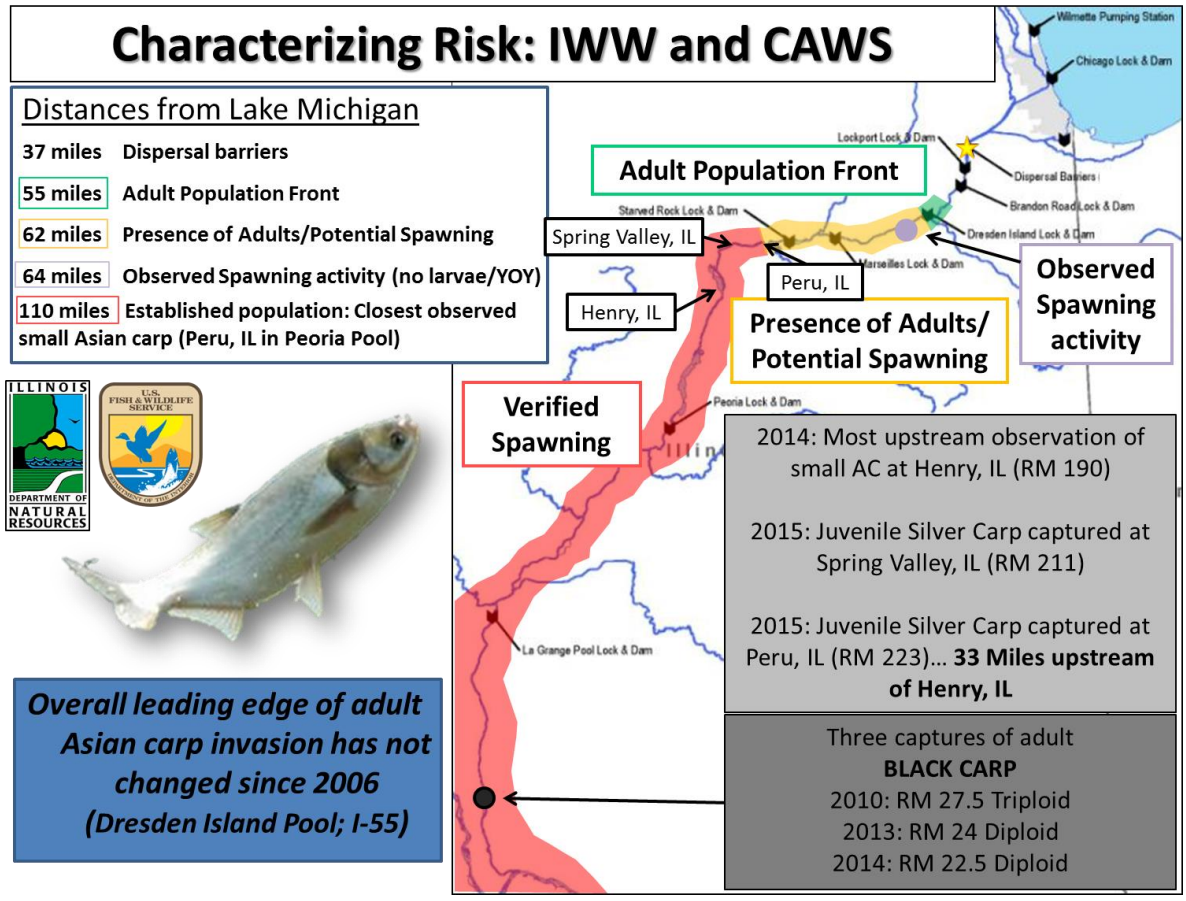
2015 April Summary

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

Based on current information the "Characterizing Risk: IWW and CAWS" map has been modified. This change is due to the presence of small Asian carp in the most recent USFWS samples in April, where silver carp < 150 mm were collected approximately 33 miles upstream of historic small fish catch locations. These fish, however, continue to remain in the Peoria Pool of the Illinois River, and have not been detected in the next upstream reach, Starved Rock Pool. Although the presence of small fish has been slightly modified, the overall distribution and risk of Asian carp in the Illinois Waterway and at the electric barriers is unchanged. Details of the small fish collection activity is found within the April summary under: Distribution and Movement of Small Asian Carp in the Illinois Waterway .



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

Electrofishing:

- Crews from IDNR, USACE and USFWS completed 96 electrofishing runs at fixed and random sites (24 hours total) in the Lockport, Brandon Road, Dresden Island, and Marseilles Pools during the weeks of March 30th, April 13th and April 27th.
- Crews collected 2,123 fish of 53 species and 1 hybrid group.
- **No Bighead Carp or Silver Carp were reported captured or observed in the Lockport and Brandon Road Pools.**
- One Bighead Carp was collected in the Dresden Island Pool, approximately 0.2 miles upstream of the Dresden Island Lock & Dam.
- Two Bighead Carp and 22 Silver Carp were collected and an additional 39 Silver Carp were observed in the Marseilles Pool.

Commercial Netting:

- Contracted commercial fishers along with assisting IDNR biologists set 15 miles of net (94 sets) at fixed and targeted sites in the Lockport, Brandon Road and Dresden Island Pools (including Rock Run Rookery) during the weeks of April 13th and April 27th.
- Crews collected 851 fish of 14 species and 1 hybrid group.
- **No Bighead Carp or Silver Carp were captured or observed in the Lockport and Brandon Road Pools**.
- One Silver Carp was collected in the Dresden Island Pool, downstream of the I-55 Bridge.
- Sixty-nine Bighead Carp and 21 Silver Carp were collected and removed from 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 April 27th.
- Crews collected 194 fish of 7 species during hoop net sampling and 348 fish of 18 species and 1 hybrid group during mini fyke sampling.
- **No Bighead Carp or Silver Carp were reported captured or observed in Lockport, Brandon Road and Dresden Island Pools.**
- Nine Silver Carp were collected during hoop net sampling in the Marseilles Pool.
- Modified hoop net designs have seen increased catches in 2015.

Threatened and Endangered (T&E) Species

- IDNR collected a River Redhorse while electrofishing in the tailwaters of the Dresden Island Lock & Dam in the Marseilles Pool on April 16th. Photos were taken and the fish was released alive. The photos were verified by Chris Taylor (INHS), Phil Willink (Shedd Aquarium) and Steve Pescitelli (IDNR).

Below is the list of T&E fish species in Illinois. If crews encounter any of the fish from this list or any other fish species believed to be rare (i.e. outside of their normal range, believed to be extirpated, etc.) please document the occurrence and collect evidence. Photos of the head, mouth, and dorsal and lateral views of the whole specimen may be adequate for large fish. Smaller specimens will likely need to be preserved in 10% formalin or, in the absence of formalin, freeze it as soon as possible. Tristan Widloe is collecting specimens to forward to Chris Taylor at INHS-Champaign for identification. Feel free to contact Tristan at tristan.widloe@illinois.gov or 630-360-4184 if you have specimens to be identified. Reports of collection of T&E species to IDNR is required and should be made as soon as possible, please let Tristan know whenever one is collected.

Endangered
Acipenser fulvescens Lake Sturgeon
Ammocrypta clarum Western Sand Darter
Etheostoma camurum Bluebreast Darter
Etheostoma histrio Harlequin Darter
Hybognathus hayi Cypress Minnow
Hybopsis amblops Bigeye Chub
Hybopsis amnis Pallid Shiner
Ichthyomyzon fossor Northern Brook Lamprey
Lepomis miniatus Redspotted Sunfish
Macrhybopsis gelida Sturgeon Chub
Moxostoma valenciennesi Greater Redhorse
Nocomis micropogon River Chub
Notropis anogenus Pugnose Shiner
Notropis boops Bigeye Shiner
Notropis heterolepis Blacknose Shiner
Notropis maculatus Taillight Shiner
Notropis texanus Weed Shiner
Noturus stigmosus Northern Madtom
*Scaphirhynchus albus*** Pallid Sturgeon

Threatened
Ammocrypta pellucidum Eastern Sand Darter

Catostomus catostomus Longnose Sucker
Coregonus artedi Cisco
Erimystax x-punctatus Gravel Chub
Etheostoma exile Iowa Darter
Fundulus diaphanus Banded Killifish
Fundulus dispar Starhead Topminnow
Lampetra aepyptera Least Brook Lamprey
Lepomis symmetricus Bantam Sunfish
Moxostoma carinatum River Redhorse
Notropis chalybaeus Ironcolor Shiner
Notropis heterodon Blackchin Shiner

Barrier Defense Asian Carp Removal Project

Barrier Defense occurred the weeks of April 6th and April 20th. Commercial seine hauls were also completed the week of March 30th. 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 barrier defense activities for 2015.

QUICK SUMMARY:

Number of Days Fished	16 days
Number of Net Crews	64 crew-days
Yards of Net Fished	89,120 Yards
Miles of Nets Fished	50.7 Miles
Number of Bighead Carp	1,983 Fish
Number of Silver Carp	25,845 Fish
Number of Grass Carp	261 Fish
Number of Asian Carp	28,089 Fish
Tons of Bighead and Silver Carp Harvested	105.3 Tons

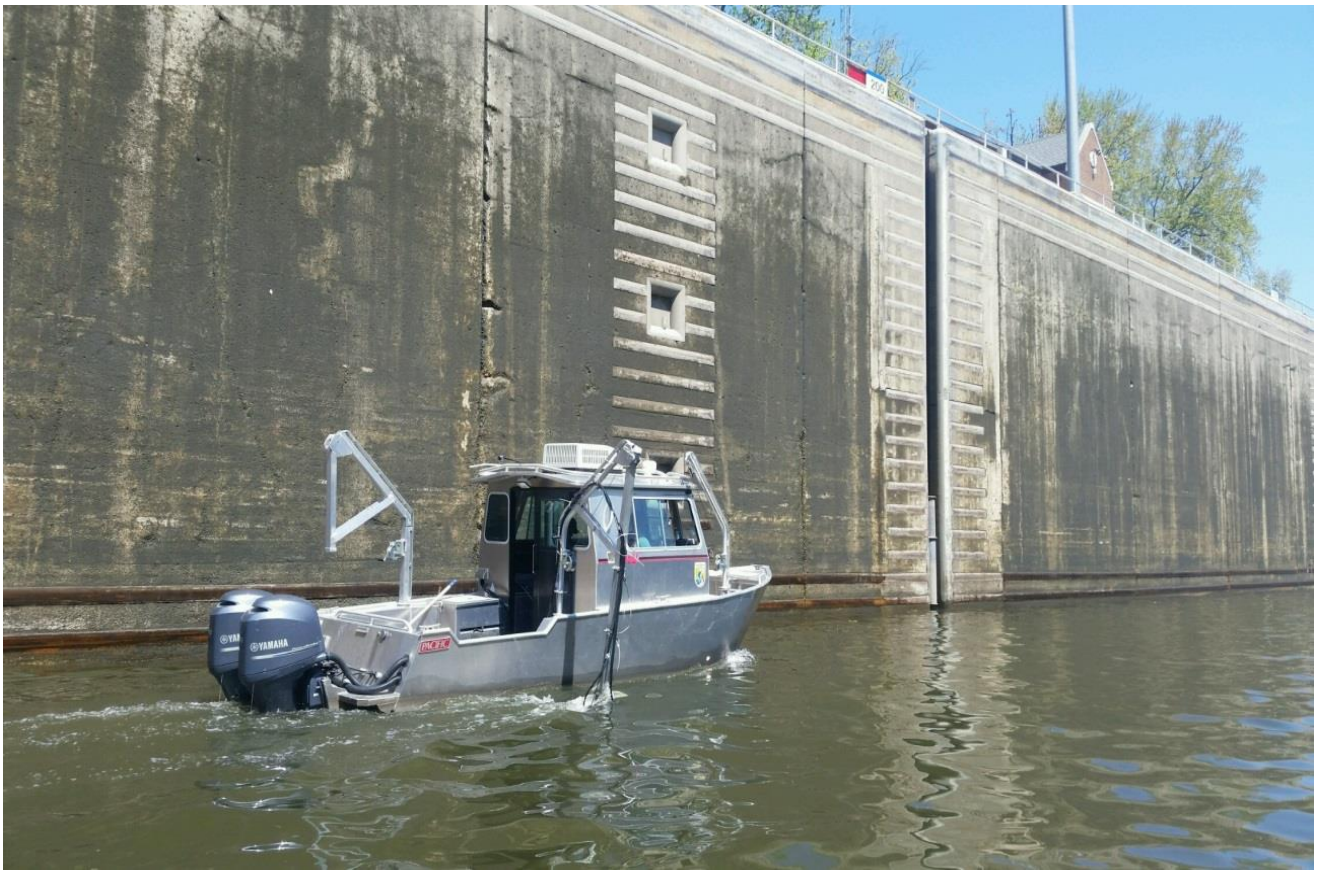
Strategy for eDNA Monitoring in the CAWS

Currently, USFWS is working on temporal quantification of eDNA below the barrier. Samples (N=362) were collected below the electric barrier in the Illinois River the week

of April 20 for the pre-spawn assessment. Samples are at the lab and currently being processed.

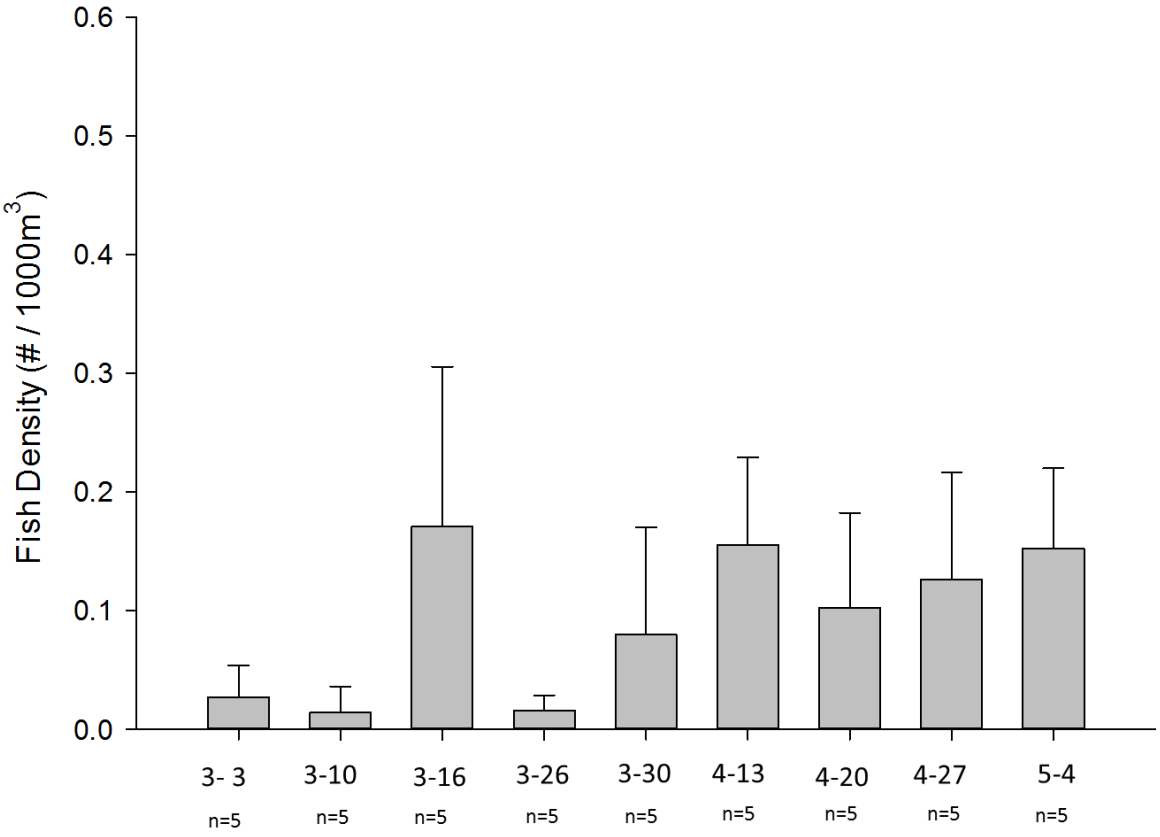
Monitoring Fish Abundance and Spatial Distribution in Lockport, Brandon Road, and Dresden Island Pools and the Associated Lock and Dam Structures

A mobile hydroacoustic survey was conducted in conjunction with a fish sampling survey in the Brandon Road Lock chamber on April 30th. Fish density observed during the hydroacoustic survey was low. Immediately after the survey 150 m of experimental gillnet was deployed on the bottom of the lock chamber (2 m deep ½" to 2" mesh) while a fifteen minute electrofishing run occurred simultaneously. Two emerald shiners (91mm and 111mm) and one Northern Pike (606 mm) were captured during these efforts. Additionally, Mobile hydroacoustic surveys of the Lockport, Brandon Road, and Dresden Island pools were completed the week of April 27th. Data processing is ongoing.



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

Weekly mobile split beam hydroacoustic surveys of fish density directly below the electric dispersal barrier have taken place throughout April. Fish density in the area remained low throughout the month.



Distribution and Movement of Small Asian Carp in the Illinois Waterway

USFWS Columbia FWCO joined INHS the week of April 6, 2015 to target the 2014 year class in La Grange Pool (Beardstown and Havana). Over 100 small Asian carp were encountered with multiple gear types. Gears used by USFWS included: Paupier with and without electricity, surface trawl, and push trawl.

On April 14, 2015 a crew from the USFWS Carterville Fish and Wildlife Conservation Office; Wilmington sub-station set fourteen mini-fyke style trap nets in backwater areas of the Peoria reach of the Illinois River just upstream of the town of Henry, Illinois. These sets were intended to sample small Asian carp (YOY or Age 1). The sets were left unattended for approximately 24 hours before crews returned to quantify and identify the catch. Nine sets were made in the Sawmill Lake backwater (≈41.13311 - 89.32275), three sets were made in the Senachwine Lake backwater (≈ 41.14692 - 89.34549), and two sets were made in the Mud Lake backwater (≈ 41.11275 - 89.34549). Three gill net sets were also made in the Senachwine Lake backwater. No small Asian carp were captured in the sets made in the Mud Lake backwater or the Senachwine Lake backwater. However, small Silver Carp were captured in six of nine mini-fyke net sets in the Sawmill Lake backwater (Figure 1). A total of 15 small Silver Carp were captured, these individuals ranged in size from 54-138 mm (Mean 84.73 mm, S.D. 25.00) and 1.0-21.5 g (Mean 6.36 g, S.D 5.84). The presence of Asian carp of these size classes, during this period of the year, suggests that they were spawned during the 2014 season.

On April 15, 2015 crews moved and reset the gear further upstream at backwater locations just below the town of Spring Valley, IL between river miles 209.5-214. Two sets were made in the main river channel (RM 209.5 and 214.5), four sets were made in Spring Lake backwater (RM 210), and three sets were made in the DePue Lake backwater (RM 211). On April 16, 2015 these net sets were checked after ≈ 18 hours. None of these sets captured any small Asian carp. However, four fifteen minute electrofishing runs were conducted in the DePue Lake backwater following fyke net retrieval. During the course of electrofishing sampling at the DePue Lake backwater two small Silver Carp were captured (Figure 2). The first was captured in the western portion of Depew Lake at 41.30897 -89.32593; this individual measured 106 mm. The second small Silver Carp measured 95 mm and was captured in northwestern DePue Lake at 41.31378 -89.32881.

Crews moved upstream to Starved Rock pool on April 21-22, 2015 and set 20 mini-fyke nets in backwater and side channel areas. **No small Asian carp were captured in these sets.**

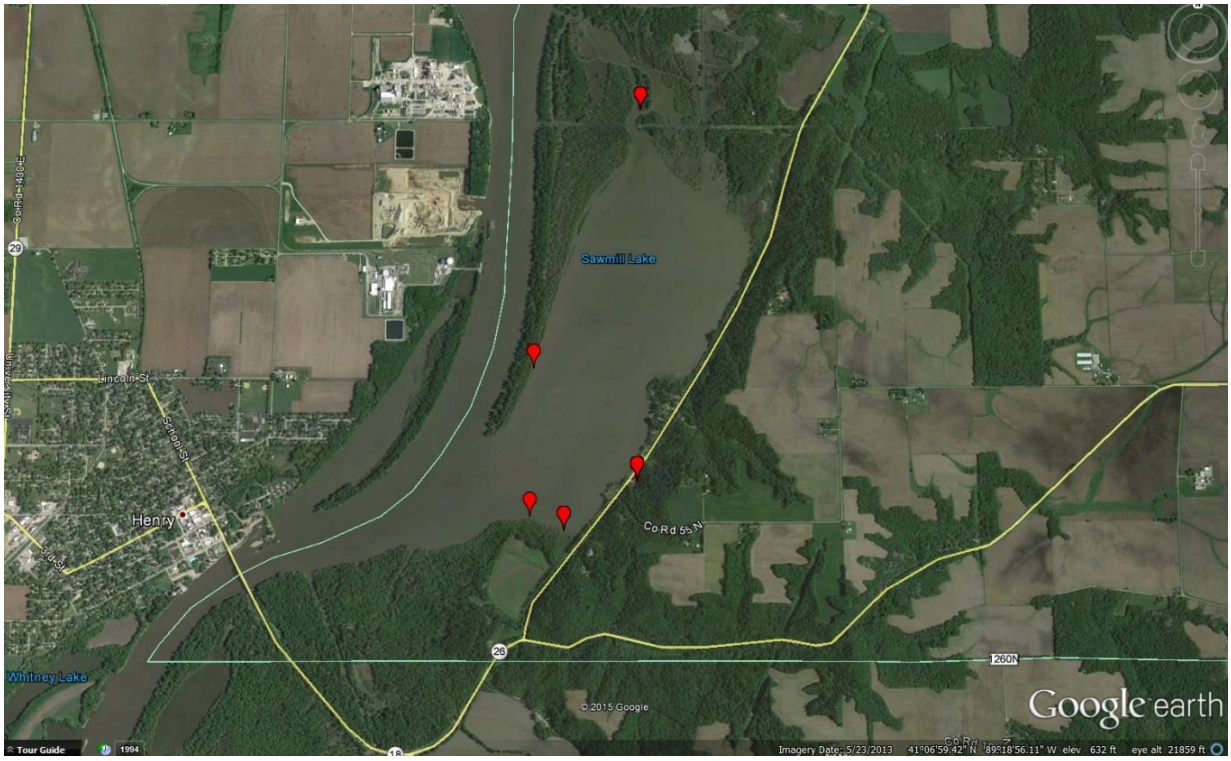


Figure 1. Locations (in red) of small Asian carp captured by mini-fykes in Sawmill Lake of Peoria pool, April 14, 2015.

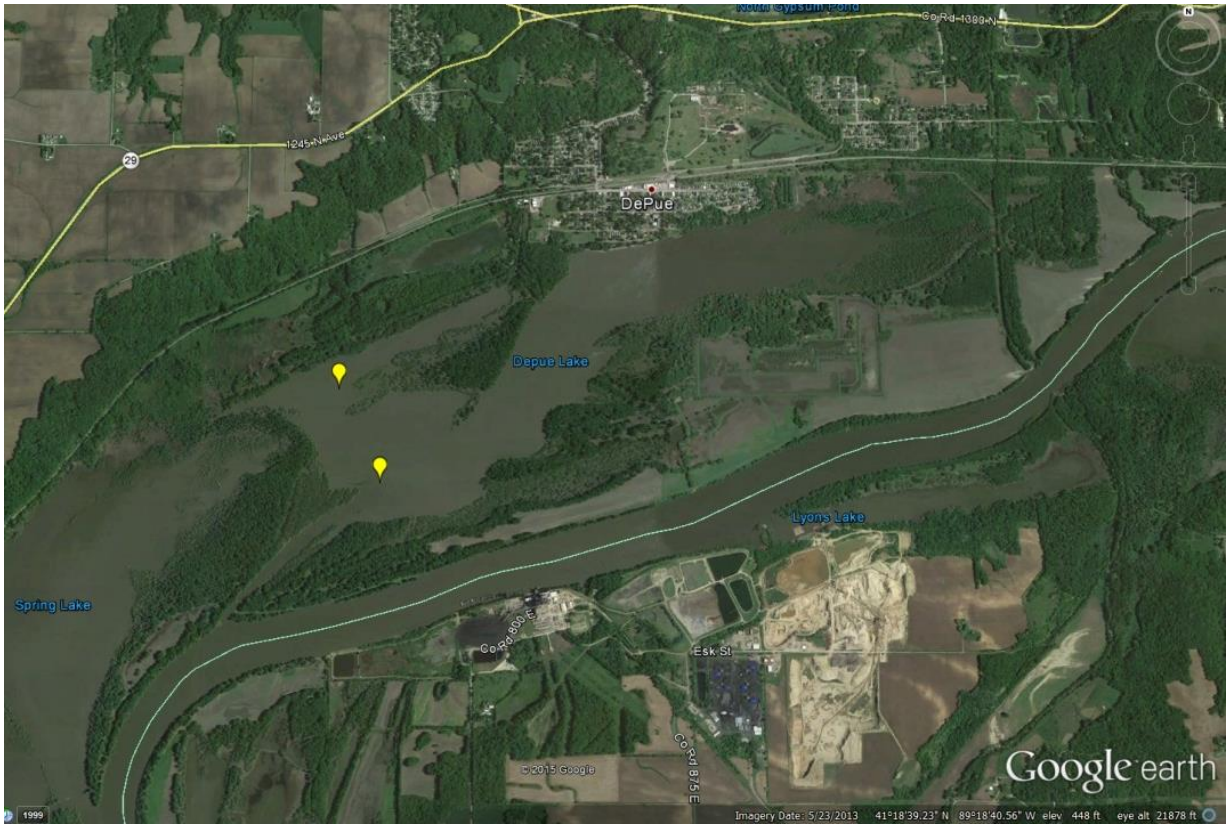


Figure 2. Locations (in yellow) of small Asian Carp captured by electrofishing in DePue Lake of Peoria pool, April 15, 2015.

On April 28-29, 2015 Columbia FWCO crews captured 106 small (<200mm) Silver Carp in upper Peoria pool. All but one of the 106 fish were captured in DePue Lake (RM 211, 41.321440,-89.293200); the same area that the Wilmington office captured small invasive carp the week of April 14, 2015. One small silver carp was also captured in a barge slip that led to the I&M canal near Peru, Illinois, at river mile 223 (41.32587, -89.09684).

Two Columbia FWCO crews and two staff from the Wilmington sub-office sampled the lower 11 miles of the Starved Rock Pool on Thursday, April 30, 2015. **No small (<200 mm) invasive carp were captured.**

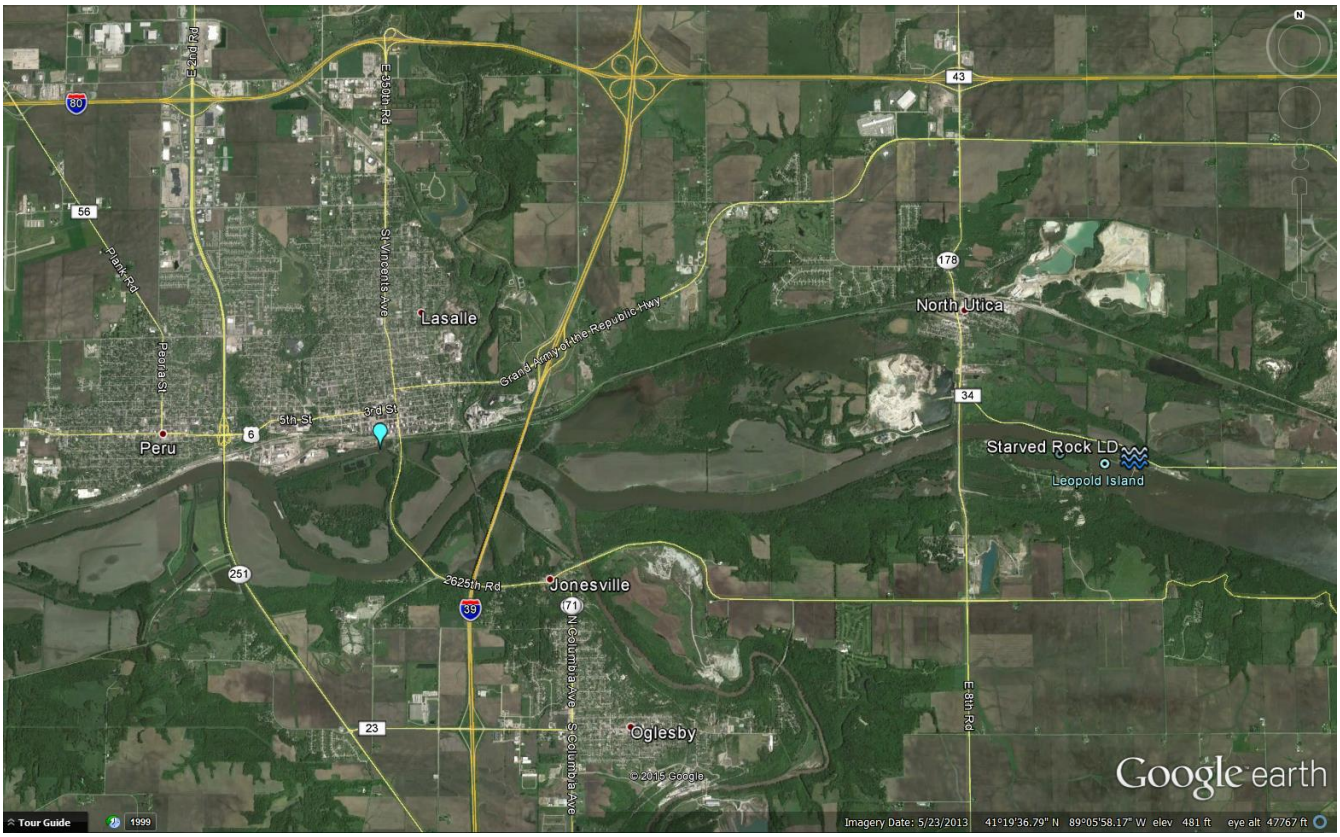


Figure 3. Location (in blue) of small silver carp captured by push trawl near Peru, Illinois on April 29, 2015. This is currently the farthest upstream record for small Silver Carp.

Understanding Surrogate Fish Movement with Barriers

A total of 967 surrogate fish were captured and floy tagged while conducting fixed, random and targeted monitoring in the pools downstream of the Electric Dispersal Barrier. Below are the current fish tag totals, recaptures and fish movement summary.

Fish Tagged

- Bigmouth Buffalo – 24
- Black Buffalo – 34
- Common Carp – 485
- Common X Goldfish Hyb. – 21
- Smallmouth Buffalo – 439

  Total – 967 fish tagged

Recapture Totals

- Lockport Pool – 1 Common Carp
- Brandon Pool – 8 Common Carp, 1 Smallmouth Buffalo
- Dresden Pool – 9 Smallmouth Buffalo, 3 Common Carp
- Rock Run – 6 Smallmouth Buffalo, 1 Bigmouth Buffalo & 3 Black Buffalo

  Total – 32 recaptures

Fish Movement

- 20 recaptures had tags but showed no movement between Barrier/Dam
- 12 recaptures by Caudal Fin but didn't have tags (No data on movement)

Notable

- 12 recapture from fish that were tagged in 2014

Asian Carp Gear Development and Evaluation

- In March 2015, Columbia Fish and Wildlife Conservation Office staff spent six days sampling tributaries of the Missouri River with the electrified Paupier. Sampling goals included targeting the 2014 year class, testing a new anode configuration, and recording fish response data to electrical settings.

- Over 700 invasive carps were captured during March 2015 sampling efforts. Twelve bighead carp were captured but silver carp dominated the catch at 696 fish. Silver carp ranged from 72 to 866 mm with 24 measuring less than 300 mm. Water temperatures fluctuated from a low of 5°C (41°F) to a high of 13.9°C (57°F).

- A new anode design was built and tested in the electrified Paupier and compared with previously developed configurations. The new design is suspended in the net frame and concentrates the electrical field in front and inside nets to reduce escape during sampling. Since it is attached to the net frame, it can be lowered with the nets to fish deeper water. The electrical field was mapped for comparison with other anode designs completed in December 2014. Results are still being analyzed.

- Video recordings of electrified Paupier sampling are being evaluated to determine invasive carp behavioral responses to electrofishing. Following field capture, videos are viewed in the office and fish behavior is characterized as jumping, taxis, or immobilization. This process will identify electrical settings eliciting desired responses in various environmental conditions and habitats.

Evaluation of Gear Efficiency and Asian Carp Detectability

INHS began evaluation of sampling gears for targeting age-1 Asian carp from the 2014 year class at the Lily Lake backwater and the main channel adjacent to Lily Lake during April 13-16. The Illinois River at Havana and the Matanzas Lake backwater were also sampled during April 21-24. Gears deployed included floating small-mesh gill nets, mini-fyke nets, beach seines, cast nets, small-mesh purse seines, pulsed-DC electrofishing, and hydroacoustic transects. This sampling took place in conjunction with U.S. Fish and Wildlife Service personnel evaluating the use of a Mamou trawl and a Paupier net for sampling juvenile Asian carp as part of the Gear Development and Evaluation project. Data entry and summarization from these sampling efforts is ongoing and will be reported once available.

Larval Fish and Productivity Monitoring in the Illinois Waterway

INHS began 2015 ichthyoplankton sampling at 11 sites located throughout the Illinois Waterway during April 27-28. Four larval fish samples were taken at each site, and zooplankton and water quality samples were also collected. Processing of larval fish samples is ongoing and results will be reported once available.

Unconventional Gear Development Project

Great Lakes trap (pound) nets were set at Lily Lake during April 15-27 in collaboration with USGS as part of the feeding attractant study. One net was acclimated with the attractant, whereas the other net served as a control. Nets were checked daily and all fish were measured and weighed. Data is being summarized and results will be reported once available.

Telemetry Monitoring Plan

One additional VR2W receiver was deployed within the month of April approximately .8 miles below the Wilmington Dam on the Kankakee River. This location is approximately 5.8 miles upstream of previously deployed receivers and will provide detection data on Asian carp movements in areas not currently included within the MRP fixed/random site monitoring plan below the barriers. Detection data at this location will also help support recent eDNA sampling below the Wilmington Dam.

USACE tagged and released 15 Common Carp above 300mm in TL within the Lower Lockport Pool in April. An additional 3 Common Carp are expected to be tagged and released at the barriers in early May. All Common Carp were implanted with V13P transmitters which contain a built in pressure sensor to record depth at the time of each detection. All fish were released in groups of three on 5 separate days from 30 March to 29 April. The first three fish (486, 539, 614mm TL) were released on 30 March between Barriers IIA and IIB. Approximately 2 hours after release USFWS Carterville performed a hydroacoustics monitoring run between the barriers and detected one target between 439-473mm TL. A follow up mobile track of the barriers safety zone on 2 April indicated that all three fish were still within the vicinity of the barriers. Further analysis of fine scale movements will be completed after positioning data is returned by Vemco to determine how long large bodied Common Carp can reside between Barriers IIA and IIB. This information will also provide insight into the ability of hydroacoustics surveys to accurately detect fishes between the barriers.

VR4 data downloads were completed in the month of April and all data has been sent to Vemco for processing. Positioning data for the barriers VPS array will be processed for the detections from November 2014 through March 2015.

Fish Suppression and Clearing in Support of Barrier Maintenance

Within the Month of April 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 7 severe weather reports in April which 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. On 10 April, the pulse frequency of Barriers IIA and IIB was changed from 33 Hertz to 30 Hertz in coordination with the BNSF railroad to reduce crossing interference. Construction operations for Permanent Barrier I in April required the shutdown of the Demo Barrier for safety reasons during normal working hours (0700-1500) for a total of 5 days (April 7, 8, 17, 20 and 21). The demonstration barrier was also offline from 22 April to 29 April for maintenance. All operational changes were communicated to core members of the MRWG to relay information as quickly as possible and to discuss the need for clearing actions. No clearing actions were deemed necessary but increased surveillance of the barriers and lower Lockport Pool was continued. Additional monitoring includes targeted commercial netting near the barriers location and weekly sonar surveys by USFWS using side scan sonar and split-beam hydroacoustics. Monitoring actions revealed no reason to initiate further clearing actions for removal of fish between the barriers. Current operating conditions at the barriers are as follows:

Demo Barrier: Pulsers 1, 3, 4 - Active - 5 Hz, 4 ms, 1 V/in
Pulser 2 – Inactive

Barrier IIB: Narrow Array – Active – 30 Hz, 2.3 ms, 1.7 V/in
Wide Array – Active – 30 Hz, 2.3 ms, 1 V/in

Barrier IIA: Narrow Array – Active – 30 Hz, 2.3 ms, 1.7 V/in
Wide Array – Inactive

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

Hydroacoustics

During the Monitoring, Control, and Response Work Group in Starved Rock in early April, SIU researchers undertook a demonstration hydroacoustic survey near Starved Rock Lock and Dam for meeting attendees. No other hydroacoustic surveys have been undertaken in 2015; we anticipate our first survey will be in the upper Illinois River in May (depending on river conditions). Processing and analysis of hydroacoustic data collected during previous years is currently ongoing.

Telemetry

Acoustic receivers were downloaded on the lower Illinois River, from LaGrange Lock and Dam downstream to Grafton. Three receivers were installed downstream of Starved Rock Lock and Dam (SR L&D); two receivers between Plum Island and Starved Rock State Park, and one receiver on the south side of Leopold Island. Currently, we have seven receivers installed within one mile downstream of Starved Rock L&D. We anticipate installing three receivers in the lock channel approach (downstream) and two receivers within one mile upstream of SR L&D.

On April 6, with assistance from IDNR, we implanted transmitters in 21 silver carp immediately downstream of Starved Rock L&D. Within the next few months, we anticipate tagging an additional 77 AC in the Peoria Pool, 25 AC in the Marseilles Pool, 25 AC in the Dresden Pool, 25 AC in the LaGrange Pool, and 25 AC in the Alton Pool.

Asian Carp Gear Development and Evaluation

In April 2015, Columbia Fish and Wildlife Conservation Office staff evaluated techniques for the capture of small (<200 mm) Asian carp and hosted net maker Greg Faulkner of Innovative Nets to assist with evaluation and modifications of trawling techniques targeting Asian Carp.

April 7-10, 2015, five staff from the Columbia FWCO continued collaborative efforts with INHS in the LaGrange Pool to compare techniques for the capture of small (<200 mm) invasive carp. Techniques being evaluated include the Paupier electrified, Paupier non-electrified, two types of surface trawls, and large mesh benthic push trawl. Sampling was conducted in Lily Lake just upstream of the LaGrange Lock and Dam, Quiver Lake, Bath Chute, and a side channel in Havana, IL. Data is still being analyzed.

Greg Faulkner, master trawler and net maker of Innovative Nets out of Milton, Louisiana, visited Columbia FWCO April 20-24, 2015, to modify and evaluate experimental trawling techniques being used to target invasive carps. Trawl techniques were evaluated for their ability to fish in various depths and speeds. A new door design was tested on the surface trawls and proved to be promising. The light-weight aluminum doors were able to open a 35’ surface trawl at speeds up to 4 miles per hour. The combination of a light-weight mesh surface trawl and aluminum doors show great promise for catching small invasive carp in open water habitats.

Caption: Surface trawl with experimental aluminum doors being deployed off the back of a boat.

Another experimental gear showing promise to sample backwater habitats for young of year to 1+ invasive carp is a 7' net with 35mm mesh at the opening reducing to 4 mm mesh in the body and 450 micron mesh in the cod. This versatile net can be attached to a rigid frame mounted to the front of a boat and used as a dozer trawl or attached to a lightweight PVC frame and towed from a boat. In addition to the new net designs and deployments modifications, time was spent evaluating currently used techniques such as the Paupier butterfly trawl and benthic push trawl.

Caption: Greg Faulkner, netmaker with Innovative Nets, evaluates experimental 7' trawl net attached to a PVC frame and towed behind a boat on a tributary of the Missouri River.

Two Columbia FWCO crews captured 106 small (<200 mm) silver carp in the upper Peoria pool April 28-29, 2015. All but one of the 106 fish were captured in Lake DePue (RM 211, 41.321440,-89.293200) – the same area that the Wilmington USFWS office captured small invasive carp the week of April 20, 2015. One small silver carp was captured in a barge slip that led to the I&M canal near Peru, Illinois, at river mile 223 (41.32587, -89.09684).

Caption: Silver Carp captured in a barge slip near Peru, IL, measured 114 mm.

Following is a breakdown of the location, technique, captures and deployments.

Lake DePue (4/28/2015)

- Dozer trawl - 3 silver carp/5 deployments
- Push trawl - 1 silver carp/5 deployments
- Paupier – 31 silver carp/6 deployments
- Surface Trawl –70 small silver carp/5 deployments

Peru to Starved Rock Dam (4/29/2015)

- Dozer trawl –0 silver carp/4 deployments
- Push trawl – 1 silver carp /7 deployments
- Surface Trawl –0 silver carp/14 deployments

Two Columbia FWCO crews and two staff from the Wilmington office sampled the lower 11 miles of the Starved Rock Pool on Thursday, April 30, 2015. No small (<200 mm) invasive carp were captured. Following is a summary of effort in the 10 miles upstream of Starved Rock Dam (RM 232 to RM 242):

- Push trawl - 22 deployments sampled approximately 2 miles (average 150 meter trawls) targeting shallow off channel habitats found in backwater lakes, tributaries, and marinas
- Paupier & surface trawl – 16 deployments (8 of each technique) sampled approximately 4 miles (average 400 meter trawls) targeting island side channels (Delbridge Island, Sheehan Island, and Bulls Island)
- In summary, 7 staff in 2 boats trawled 6 miles in 8 hours on the river

Alternate Pathway Surveillance in Illinois - Law Enforcement

- The Invasive Species Unit attended and gave a presentation at the 6 State Border Conference in Makanda, IL on invasive species enforcement in Illinois.

- The Invasive Species Unit inspected a fish truck delivering live Tilapia to a fish market in the Chicago area and found the truck to be in compliance after inspecting the load and required permits.

- The Invasive Species Unit followed an out-of-state wholesale minnow dealer delivery truck delivering minnows to local bait dealers in Illinois. The truck was found in compliance and the on-site inspection of one bait dealer and online inspection of 7 additional bait dealers found all businesses in compliance with regulations.

- The Invasive Species Unit identified live Red Swamp Crayfish for sale in a fish market near Chicago and enforcement action will be taken after an ongoing investigation into other matters is complete.

- The Invasive Species Unit developed an aquaculture facility inspection plan and identified 5 licensed aquaculture facilities to be inspected in Northern Illinois in 2015. The plan will be submitted for approval to be used throughout the State.

- The Invasive Species Unit inspected an Illinois grocery chain and found they were operating without a retail aquatic life dealer's license. ISU assisted company headquarters in getting all stores into compliance.