

December Summary

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

Fixed and Random Site Sampling Downstream of the Dispersal Barrier

Netting:

- Contracted commercial fishing crews and assisting IDNR biologists set 1.4 miles of net (12) at the four fixed sites and 5.1 miles of net (45 sets) at random and additional sites within the Lockport, Brandon Road, and Dresden Island Pools downstream of the electric dispersal barrier during the week of 12/09/2014.
- Crews collected 39 fish of 5 species during commercial netting.
- **No Bighead or Silver Carp were captured or observed during commercial netting in the Lockport and Brandon Road Pools.**
- Four Silver Carp were collected in the Dresden Pool on 12/09/2014.

Barrier Defense Asian Carp Removal Project

In December, barrier defense occurred the weeks of the 2nd and the 8th. Modified from previous years, barrier defense specifically takes place in the Marseilles and Starved Rock Pools. Also in 2014, contracted commercial fisherman are 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. On December 12, 2014 contracted commercial fisherman made a seine haul in Starved Rock Pool near Ottawa, Illinois which yielded over 22,000 Silver Carp weighing over 110,000 lbs. The seine was a 300 yards long pulled just upstream of Ottawa Illinois- Bulls Island, at one point the contracted fisherman likely had 500,000 lbs to 1,000,000 lbs of fish in the net, there were so many fish in the net the bottom ties (strings that holds the net and lead-bottom line together) started breaking as fisherman were pulling in allowing several thousands of pounds to escape. Below is a summary of the barrier defense activities including hoop netting totals for 2014.

QUICK SUMMARY:		
Number of Days Fished	68	days
Number of Net Crews	344	crew-days
Yards of Net Fished	557500	Yards
Miles of Nets Fished	316.8	Miles
Number of Hoop Net Sets	196.0	Sets
Yards of Seine Fished	2200.0	Yards
Number of Bighead Carp	11793	Fish
Number of Silver Carp	89913	Fish
Number of Grass Carp	524	Fish
Number of Asian Carp (AC)	102230	Fish
Tons of AC Harvested	420.5	Tons



Understanding Surrogate Fish Movement with Barriers

Preliminary totals for 2014 are listed. Analysis is ongoing with the 2014 summary report in preparation.

- Bigmouth Buffalo – 47
- Black Buffalo – 18
- Common Carp – 939
- Common X Goldfish Hyb. – 8
- Goldfish – 4
- Smallmouth Buffalo – 695

Total – 1711 fish tagged

Recapture Totals

- Lockport Pool – 3 Common Carp
- Brandon Pool – 7 Common Carp
- Dresden Pool – 4 Smallmouth Buffalo, 1 Common Carp & 1 Bigmouth Buffalo
- Rock Run – 2 Smallmouth Buffalo

Total – 18 recaptures

Fish Movement

- 1 recapture (Smallmouth buffalo) had a tag and showed movement downstream through Dresden Lock and Dam
- 12 recaptures had tags but showed no movement between Barrier/Dam
- 4 recaptures by Upper Caudal Fin but didn't have tags (No data on movement)

Notable

- 1 recapture in Lockport was tagged by USFWS in 2013
- Bigmouth Buffalo Caught in Dresden Pool Traveled 9 miles down the Kankakee before captured by Bow fisherman
- Smallmouth Buffalo caught in Dresden Pool traveled downstream through the lock and dam to Material services east pit and was captured by commercial fisherman on the Barrier Defense Program

Optimal Harvest Strategies to Minimize Asian Carp Propagule Pressure on the Electric Dispersal Barrier

Hydroacoustics

No field surveys were undertaken in December. Data processing and analysis is currently ongoing.

Telemetry

All transmitters have been implanted in Asian carp for 2014. In sum, we tagged 250 fish this year. All VR2W receivers have now been downloaded for the winter. VR2W downloads will resume in March 2015. The number of fish detected during early winter was low. Analysis of fish movement data for 2014 is being compiled for the annual report.

Demographics

All post-cleithra from the 2014 standardized sampling have now been aged, and analysis is current being completed for the annual report.

Asian Carp Gear Development and Evaluation

Electric Field Mapping

Following an advanced electrofishing techniques course in October 2014 with USFWS electrofishing instructors Jan Dean and Allen Temple, staff from the Columbia FWCO saw the need to map the electric fields of experimental electrofishing gears used to sample invasive carps. Understanding the electric field will better inform biologists on anode configurations and electric gradients needed to induce taxis, immobilization, and capture of invasive carp.

In December 2014, staff from the Columbia FWCO used a custom built probe connected to an oscilloscope to measure voltage gradients for the electrified butterfly trawl net, or Paupier, in two Missouri River tributaries. The electric field size and strength of five candidate anode configurations were measured with very few differences observed. However, larger anodes, such as spheres with greater surface area, produced higher voltage gradients and contributed to heterogeneous electric fields when used in combination with anodes of various shapes and sizes.

Two of the five candidate anode configurations strategically place anodes in front of the trawl net opening to concentrate the electric field with the goal of increased fish capture. During preliminary sampling, immobilization of silver carp in this targeted area was correlated with anode configurations causing the increased voltage gradients. Future research will compare invasive carp captures with candidate configurations and determine voltage gradients necessary to invoke specific behaviors (i.e., jumping, forced swimming, immobilization).

Equipment updates

Non-conductive paint was applied to the prototype boat used for electrified Paupier. This will facilitate multiple crews operating during field season and allow testing of equipment on different boats.

After months of design and development, construction on a new shallow water boat with a mud motor began in December 2014. This new boat will be used to access the off-channel shallow water habitats frequently encountered in the Illinois River system.

Evaluation of Gear Efficiency

Field sampling for the evaluation of sampling gears has concluded for the year. Work performed during December included additional analysis of data collected during 2014. Pulsed-DC electrofishing that occurred across the Illinois River in July and August 2014 captured juvenile Asian carp in the LaGrange (1,343 per hour of electrofishing) and Peoria Pools (18 per hour of electrofishing), but none in the Starved Rock or Marseilles Pool. Other gear types targeting juvenile Asian carp in 2014 were found to capture different size distributions of these fish. Beach seines captured the smallest juvenile Asian carp (mean = 38.0 mm), and captured the highest proportion of Asian carp in the 20-29 mm (38% of catch) and 30-39 mm (23% of catch) size ranges. Purse seines captured the largest of the juvenile Asian carp (mean = 52.5 mm) and were particularly effective for juveniles larger than 50 mm (66% of catch). Cast nets (mean = 40.6 mm), pulsed-DC electrofishing (mean = 48.1 mm), and mini-fyke nets (mean = 48.6 mm) were more effective for the intermediate sizes of juveniles, capturing primarily 30 – 50 mm Asian carp.

Larval Fish Monitoring

Larval fish sampling for 2014 concluded during the month of October. Work performed during December included additional examination and verification of larval specimens previously identified as Asian carp larvae, as well as exploratory analyses of revised larval fish data from 2014. Upon further examination, larval fish collected from the Starved Rock pool that had initially been identified as Asian carp larvae were determined to be other Cyprinid species. However, numerous larvae collected from the LaGrange and Peoria Pools were determined to indeed be Asian carp. Asian carp appear to have had multiple spawning events in 2014, as indicated by the timing of larval occurrences. The first observations of significant numbers of Asian carp larvae occurred at multiple sites in the LaGrange Pool on June 18. None were collected at these same sites during the week of June 23. However, at that time, extremely large numbers of Asian carp larvae appeared in the Peoria Pool. During the following week (June 30 – July 4), large numbers of Asian carp larvae were again collected from main channel sites in the LaGrange Pool, and then large numbers of Asian carp larvae appeared in LaGrange Pool backwater sites during the week of July 7. These occurrences of Asian carp larvae coincided with three distinct rises in the hydrograph that occurred between mid-June and mid-July, as well as water temperatures continuously above 23°C. The continued presence of small numbers of Asian carp

larvae from mid-July to early August in both the LaGrange and Peoria Pools suggests that additional, although less prolific spawning activity continued to occur during the summer in 2014.

Unconventional Gear Development

Field activities for 2014 pound net evaluations concluded in September. Work performed during December included comparison of catch rates from pound nets to those from traditional entrapment gears. During 2013 and 2014, pound nets consistently captured higher numbers of fish, including Asian carp taxa, than concurrently set hoop nets and fyke nets set in backwater habitats. Pound nets, on average, captured 134 times as many fish (all species) than hoop nets, and 5-6 times as many fish as fyke nets. Overnight catch rates of bighead carp were 113 times higher in pound nets than in hoop nets, and 41 times higher than in fyke nets. Average silver carp catch rates were 3200 times higher in pound nets than in hoop nets, and 360 times higher in pound nets than in fyke nets. Additional ongoing analyses include estimation of personnel costs (number of person-hours) required to capture a given number of fish with each gear type based on these catch rates.

Alternate Pathway Surveillance in Illinois - Law Enforcement

- On Dec 2014 a commercial fisherman investigated by the Invasive Species Unit for residency fraud plead guilty to 3 counts falsifying records, paid \$5000 to the Illinois Conservation Police Operations Assistance Fund, and paid a \$300 fine.
- On December 01, 2014 Farm Cat Incorporated and the owner company plead guilty to importing live VHS susceptible species into Illinois w/o permits. He paid a \$2,500 fine and **\$22,500** to the Illinois Conservation Police Operations Assistance Fund
- The Invasive Species Unit inspected two intrastate wholesale minnow dealers as part of the random commercial inspection procedures.
- The Invasive Species Unit participated in the Attorney General's Office Environmental Crimes Task Force and discussed activities related to invasive species enforcement within the Unit.

Strategy for eDNA Monitoring in the CAWS

<http://www.fws.gov/midwest/fisheries/eDNA.html>.