

## September 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 upstream or downstream of the Electric Dispersal Barrier.**

### Seasonal Intensive Monitoring in CAWS

#### *Electrofishing:*

- Crews from IDNR, USFWS, and U.S. Army Corps of Engineers (USACE) completed 191 electrofishing runs (47.75 hrs.) upstream of the Dispersal Barrier during the weeks of September 14 and September 22.
- Crews collected 13,875 fish of 44 species during electrofishing.
- No Bighead or Silver Carp were reported captured or seen during electrofishing upstream of the barrier.

#### *Netting:*

Week of (9/15/2014).

- Contracted commercial fishing crews and IDNR biologists set 3 miles of net (27 sets) at the four fixed sites and 10 miles of net (88 sets) at random and additional sites within the North Shore Channel, North and South branches of the Chicago River, Cal-Sag River, Little Calumet River, Lake Calumet, and the Chicago Sanitary and Ship Canal upstream of the electric dispersal barrier during the week of 9/15/2014
- Crews collected 195 fish of 6 species during commercial netting.
- No Bighead or Silver Carp were reported captured or observed during commercial netting in the North Shore Channel, North and South Branches of the Chicago River, Cal-Sag River, Little Calumet River, Lake Calumet, and the Chicago Sanitary and Ship Canal.

Week of (9/15/2014).

- Contracted commercial fishing crews, IDNR and USFWS biologists set 3 miles of net (27 sets) at the four fixed sites and 9.8 miles of net (102 sets) at random

and additional sites within the North Shore Channel, North and South Branches of the Chicago River, Cal-Sag River, Little Calumet River, Lake Calumet, the Chicago Sanitary and Ship Canal, and Downtown Chicago upstream of the electric dispersal barrier during the week of 9/22/2014

- Crews collected 601 fish of 10 species and one hybrid group during commercial netting.
- No Bighead or Silver Carp were reported captured or observed during commercial netting in the North Shore Channel, North and South Branches of the Chicago River, Cal-Sag River, Little Calumet River, Lake Calumet, the Chicago Sanitary and Ship Canal, and Downtown Chicago.

### **Strategy for eDNA Monitoring in the CAWS**

Week of 9/8, FWS collected eDNA samples from the Little Calumet River (60 samples), Lake Calumet (60 samples), and the Chicago River (20 samples). Heavy rains and CSO activity prevented the collection of samples from the South Branch of the Chicago River and the North Shore Channel.

### **Fixed and Random Site Sampling Downstream of the Dispersal Barrier**

#### *Electrofishing:*

- Crews from IDNR, USFWS, and U.S. Army Corps of Engineers (USACE) completed 29\* electrofishing runs at fixed locations (7.25 hours total) and 56\* runs at randomly selected locations (14 hours total) in the Lockport, Brandon Road, Dresden Island, and Marseilles pools downstream of the Barrier during the weeks of September 2 and September 15.
- Crews collected 7402 fish of 60 species during electrofishing.
- No Bighead or Silver Carp were reported captured or seen during electrofishing in the Lockport, Brandon Road, Dresden Island. 173 Silver Carp and 1 Grass Carp were collected during sampling at fixed and random sites in the Marseilles Pool. Additionally about >100 Silver Carp were observed but not captured during electrofishing runs on 9/14 and >200 were observed on 9/4 and 9/5.
- \*Due to boat scheduling conflicts, IDNR crews were unable to complete all electrofishing runs in Dresden Island during this sampling period.

*Netting:*

- Contracted commercial fishing crews and assisting IDNR biologists set 1.8 miles of net (16) at the four fixed sites and 6.1 miles of net (54 sets) at random and additional sites within the Lockport, Brandon Road, Dresden Island and Marseilles Pools downstream of the electric dispersal barrier during the week of 9/1/2014
- Crews collected 70 fish of 9 species during commercial netting.
- No Bighead or Silver Carp were reported captured or observed during commercial netting in the Lockport and Brandon Road Pools.
- One Silver Carp was collected in the Dresden Island Pool on 9/2/2014.
- Six Silver Carp were collected in the Marseilles Pool on 9/5/2014.

*Hoop and Mini Fyke Netting:*

- Crews from IDNR set and pulled 16 hoop nets (6' diameter) downstream of the electric dispersal barrier in Lockport, Brandon Road, Dresden Island and Marseilles Pools during the week of 9/15/2014.
- Crews collected 7 fish of 4 species during hoop net sampling.
- No Bighead or Silver Carp were reported captured or observed during hoop net sampling in Lockport, Brandon Road, Dresden Island, and Marseilles Pools.
- IDNR crews set and pulled 16 mini fyke nets downstream of the electric dispersal barrier in Lockport, Brandon Road, Dresden Island and Marseilles Pools during the week of 9/15/2014.
- Crews collected 1,482 fish of 25 species.
- No Bighead or Silver Carp were reported captured or observed during mini fyke sampling in Lockport, Brandon Road, Dresden Island and Marseilles Pools.

## **Barrier Defense Asian Carp Removal Project**

In September barrier defense occurred the week of the 1<sup>st</sup> and 8<sup>th</sup>. 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. These habitats have been difficult to fish with gill and trammel nets. Below is a summary of the barrier defense activities including hoop netting totals for 2014.

<b>QUICK SUMMARY:</b>		
<b>Number of Days Fished</b>	43	days
<b>Number of Net Crews</b>	227	crew-days
<b>Yards of Net Fished</b>	397450	Yards
<b>Miles of Nets Fished</b>	225.8	Miles
<b>Number of Hoop Net Sets</b>	103.0	Sets
<b>Number of Bighead Carp</b>	9562	Fish
<b>Number of Silver Carp</b>	39120	Fish
<b>Number of Grass Carp</b>	421	Fish
<b>Number of Asian Carp (AC)</b>	49103	Fish
<b>Tons of AC Harvested</b>	242.9	Tons

## **Understanding Surrogate Fish Movement with Barriers**

Currently a total of 1339 surrogate fish have been captured and floy tagged while monitoring in the Lockport, Brandon Road and Dresden Pools downstream of the Electric Dispersal Barrier. A species list of floy tagged fish; 723 Common Carp, 555 Smallmouth Buffalo, 36 Bigmouth Buffalo, 17 Black Buffalo, 4 Goldfish and 4 Common carp X Goldfish hybrid. To date, thirteen recaptures (9 tagged fish and 4 marked with no tag) have occurred. Five fish were recaptured in Dresden Pool two of those being in Rock Run Rookery Lake. Five recaptures occurred in Brandon Road pool, and three recaptures in Lockport pool. With these recaptures no movement has occurred between barriers. Also 1 Common carp was captured that was tagged by USFWS in 2013. A Bigmouth Buffalo tagged in Dresden Island Pool traveled 9 miles down the Kankakee before being targeted by a bow fisherman.

## **Telemetry Monitoring Project**

Analysis of August downloads is ongoing.

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

### *Hydroacoustics Surveys*

Hydroacoustic surveys in the Dresden and Marseilles reaches were undertaken during 17-19 September and 29 September-2 October. Main channel and backwater habitat in both reaches were surveyed. Preliminary analyses suggest that high densities of large-bodied targets (presumably Asian carp, based on observations of jumping silver carp) were noted in the East and West Pit (Marseilles reach), and to a much lesser extent in the Kankakee River (Dresden reach). Detailed analysis is ongoing.

### *Acoustic Receivers, Transmitters, and Active Tracking*

Further analysis of data downloaded from acoustic transmitters was limited due to a bug in the analysis software. Analyses are now proceeding and will be completed for the summer downloads in the near future.

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

USFWS Carterville FWCO continued split beam hydroacoustic and side scan sonar data processing and analyses from surveys of the Lockport, Brandon Road, and Dresden Island pools collected during the summer.

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

Preparations continued for an extensive DIDSON sonar survey to be conducted by Carterville FWCO and an intensive fish collection effort by Columbia FWCO. These efforts are scheduled to take place at the electric dispersal barrier in October.

### **Water Gun Development and Testing**

Purchasing requests for new water guns have been processed. A total of four 100 in<sup>3</sup> water guns will be added to the existing USGS inventory and allow for expanded field tests. We are now in the process of water gun acquisition, and will hold a training session that will involve: ILWSC, USGS, and FWS employees. This training is being planned for October 9-10, 2014 at UMESC.

Plans are being finalized to conduct water gun exposure studies with Native Mussels in a USGS test pond located at UMESC. This study is expected to help us begin to address questions that will arise regarding aquatic species of concern (relative to USFWS Section 7 ESA-consultation)

2015 Asian Carp Control Strategy Framework drafts are being written and we are currently in the planning phase to determine a priority list and proposed time-frame to complete work related to water guns in multiple locations during FY2015.

Data processing and analyses are on-going for 2013 and 2014 water gun test-pond trials and IPM demonstrations. Split-beam hydroacoustic data are processed for 2013 and are now being analyzed. 2014 data are being processed. In addition, the 2014 IPM acoustic telemetry data collections are still being processed.

### **Asian Carp Gear Development and Evaluation**

The Columbia FWCO sampled the Fox River near the Illinois River confluence in Ottawa, IL, using the butterfly frame trawl (i.e., Paupier) with pulsed DC electrofishing during barrier defense efforts on September 3-4, 2014. This was the second month to visit the Fox River to compare day versus night electrified Paupier sampling on a high density population of adult silver carp. Preliminary data indicate that adult silver carp dominated the catch (mean, 93%; SD, 10.3) and CPUE was the same during day and night sampling but more variable during the day (day mean, 126 adult silver carp/2 minutes of electrified Paupier; SD, 144.3; night mean, 126 adult silver carp/2 minutes of electrified Paupier; SD, 57.2). August results were very different with night sampling yielding higher CPUE (mean, 79 adult silver carp/2 minutes; SD, 45.6) than day sampling (mean, 9 adult silver carp/2 minutes; SD, 3.1). Overall, night sampling has yielded higher CPUE (mean, 102 adult silver carp/2 minutes of electrified Paupier; SD, 54.1) than day sampling CPUE (mean, 67 adult silver carp/2 minutes of electrified Paupier; SD, 113.3). In the combined 4 days of sampling during August and September efforts 2,067 adult silver carp ranging in length from 290 mm to 820 mm have been captured. Approximately 95% of those were 500-700 mm. No bighead carp or young-of-year Asian carp were captured during these efforts. This protocol will be repeated in October and November to further examine day versus night catchability of adult silver carp at colder water temperatures in the high density population on the Fox River.

### **Unconventional Gear Development**

INHS collaborated with the USGS to evaluate the use of food attractants to enhance catch rates in Great Lakes pound nets. Two Great Lakes pound nets were set in the East pit of Hansen Material Services backwater on Sept 15, 2014 and feeding stations were set up at the entrance to each net to habituate fish to the experimental attractant. After habituation, nets were fished with a feeding station at one net and catch rates were compared to the net with no attractant on alternating days. All fish were measured and counted by USGS crews. Nets were removed Sept 26.

### *Pound net feeding trials summary*

From 9-14-14 to 9-26-14

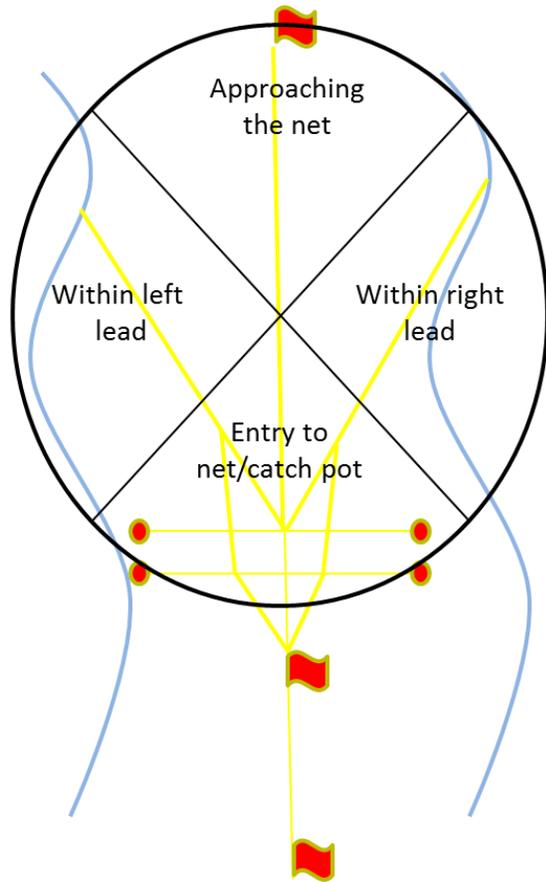
Objective: To determine if conditioning Asian Carp to an algal stimulus (food attractant) in an area where pound nets are deployed will increase fish catch rates.

Approach: Matt Diana and his crew from the Illinois Natural History Survey set out two pound nets of equal mesh size (2.5") in two channels of the East Pit of the Hansen Material Services site adjacent to the Illinois River. See photo below.



The strategy consisted of introducing an algal stimulus in the area of the pound nets in both channels using a floating platform and conditioning fish for a period of seven days. Feeding times were frequent (approximately every 4 hours) with 15 liters of algae being released at each feeding time every day. The nets were checked each day (in the morning) and the number of fish and species of fish were recorded. Any Asian Carp caught in the net were sacrificed and not returned to the system. Once the stimulus had been introduced for the duration of seven days, intensive monitoring with the use of Humminbird 360 sonar was conducted. Release of the algal stimulus in both channels was discontinued. In order to eliminate the bias of one pound net fishing more effectively than the other, one channel was randomly selected as the “test” site

where the algal attractant was released with the other channel serving as the control site. Intensive monitoring took place over a period of 4 days and random selection of a channel was done each day to serve as trial replicates. Monitoring times targeted the crepuscular hours and possibly other discrete times. Desired endpoints included quantifying number of fish in and around pound net in each of the transects defined by the 360 sonar view quadrants, quantifying number of fish that actually enter/leave the mouth of the net, characterizing the fish response to the algal stimulus when released near the net, characterizing fish behavior in response to the pound net, quantify fish activity and abundance within 50 ft. of feeding platforms.



Two days prior to intensive monitoring, platforms were moved further into the entry of the net in order to release the algal stimulus within the mouth of the catch pot in an effort to attract and entrap fish

The release of the stimulus at the north and south feeding station platforms followed the same procedure. Monitoring remained the same whether the platform served as a control (no algae released) or experimental (algae released) during the second week of observations.

Procedure for monitoring feeding stations/nets with Humminbird 360.

1. Secure boat with motor turned off.
2. Start the Humminbird 360 and set range at 50 ft.
3. Note site characteristics measurements and record in notebook
  - a. Arrival time
  - b. Water temp
  - c. DO and conductivity
  - d. Quick weather assessment (cloudy, windy, sunny, etc.)
  - e. Note unusual aspects of the site (lots of debri, surface film, boating activity, etc.)
4. Conduct a 5 minute pre-feed observation. Take a screenshot of the Humminbird sonar image every minute during the 5 minute observation.
5. Record feeding start time when TurboRain releases algal stimulus. Take a screenshot of the Humminbird sonar image every minute for the next 30 minutes.

Feeding times for Station 1 (north channel platform) were as follows:

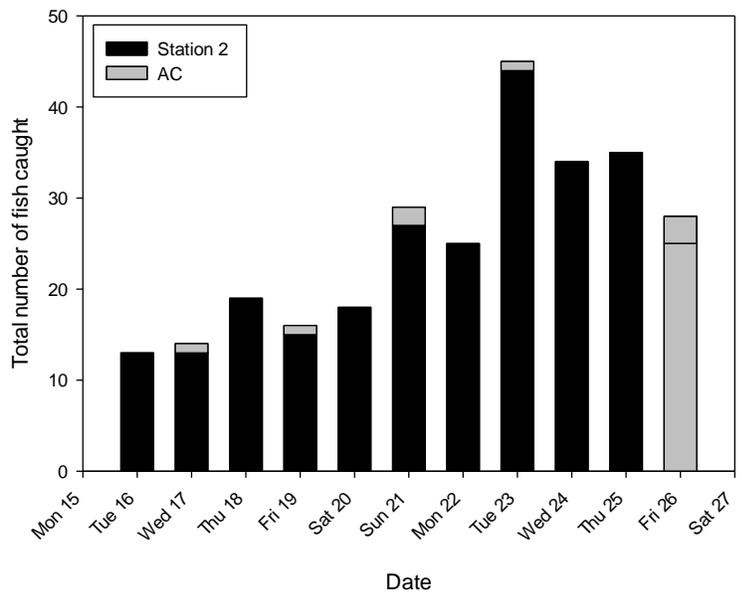
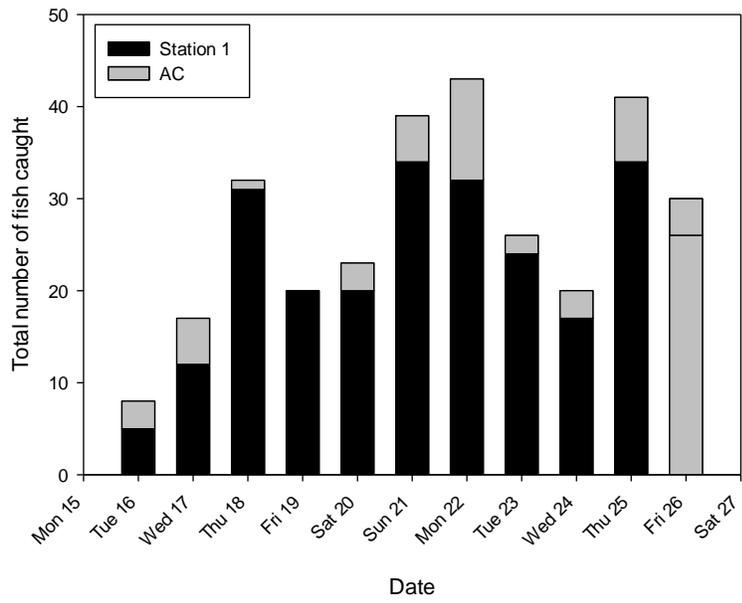
7 am (monitor this time period)  
11 am  
5 pm (monitor this time period)  
9 pm  
1 am  
5 am

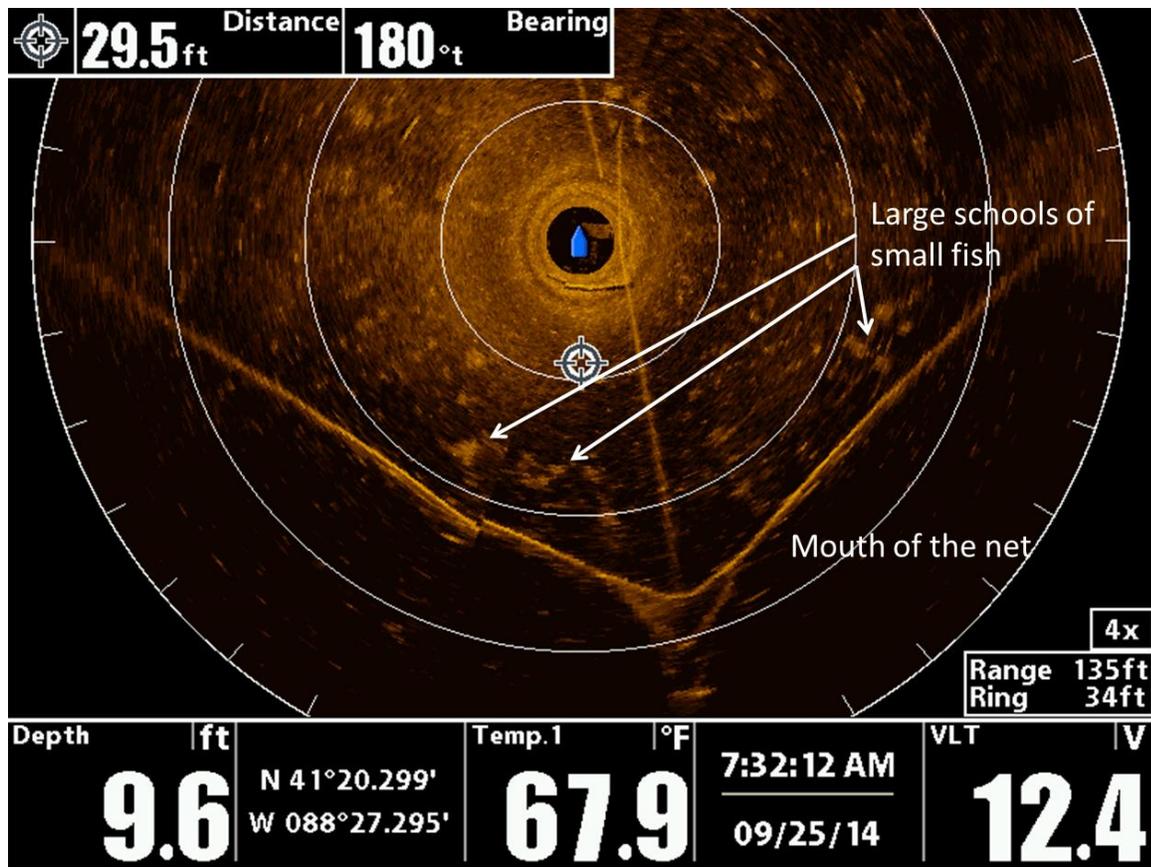
Feeding times for Station 2 (south channel platform) were as follows:

8 am (monitor this time period)  
12 pm  
6 pm (monitor this time period)  
10 pm  
2 am  
6 am

### **Preliminary Results:**

Over the duration of the two weeks it was evident that the algal stimulus increased the number of fish species in the area of the net as demonstrated by the total number of fish caught. However, Asian carp numbers were variable but overall fish catch rates increased over time. We believe this may be due to the fact that there was extensive barge traffic and mining activity going on in the East Pit during our netting trials. On two occasions the south channel was blocked by a barge with limited passage available. A large number of predatory species (white bass and largemouth bass) were caught in the nets. This observation might reflect the attraction of predators to large schools of small fish that were feeding on the algal stimulus in the area of the net as depicted by sonar. Sonar screenshots are currently being sorted and downloaded but have not been processed yet.





This is a sonar screen shot showing numerous schools of small fish at the mouth of the net.

### Evaluation of Gear Efficiency

INHS used multiple gear types (pulsed-DC electrofishing, mini-fyke nets, small-mesh purse seine, cast nets, small-mesh gill nets, hydroacoustic transects) to target juvenile Asian carp at Lily Lake during the week of Sept 22nd. Only a few juvenile Asian carp were collected in purse and beach seines. Purse seines collected between 0 and 1 juveniles per pull. Beach seines collected between 0 – 8 juveniles per pull. No juveniles were collected during cast net sampling. Mini-fyke nets collected between 0 – 22 juvenile silver carp per night. Small-mesh gill nets collected no Asian carp. Electrofishing CPUE (# per hr) of Silver carp ranged from 12 - 28 for adults and 0 - 60 of juveniles. Hydroacoustic data is currently being analyzed.

### Larval Fish Monitoring

Larval fish samples were collected at 42 sites in the Illinois River and backwaters from the Lagrange pool through CAWS on Sept 2 and 3, 2014 and again on September 29

and 30. Zooplankton, productivity, and larval fish samples were conducted at the same 42 sites again on September 16 and 17, 2014. A total of 126 larval fish samples were collected in the month of September. Larval fish numbers have decreased in the river throughout the month. Sample processing of larval fish is ongoing and results will be reported once available.

### **Distribution and Movement of Small Asian Carp in the Illinois Waterway**

Columbia FWCO Push Trawled Dresden Island, Marseilles and Starved Rock pools the week of 8 Sept as part of the small Asian carp movement study with Carterville FWCO. A 3-person crew deployed 10 trawls (25 - 150 meters) in each pool. No YOY Asian carps were captured. Preserved fish have not been processed - no summaries by pool are available.

### **Alternate Pathway Surveillance in Illinois - Law Enforcement**

Invasive Species Unit (ISU) attended the Great Lakes Law Enforcement Committee meeting in Huron, Ohio. Topics included: commercialization of the resources, commercial fishing trends, wanton waste, baitfish collection and sales, marketing of live Snakeheads and other invasive species, Grass and Black Carp risk assessments, and the development of a joint invasive species enforcement plan.

ISU completed a 35 hour detective and criminal investigator course in Coon Rapids, Minnesota.

ISU identified 28 retail aquatic life dealers without licenses, 3 wholesale aquatic life dealers without licenses, and 1 non-resident aquatic life dealer without a license. All companies purchased the licenses and are now in compliance. No live Asian Carp were being sold.