

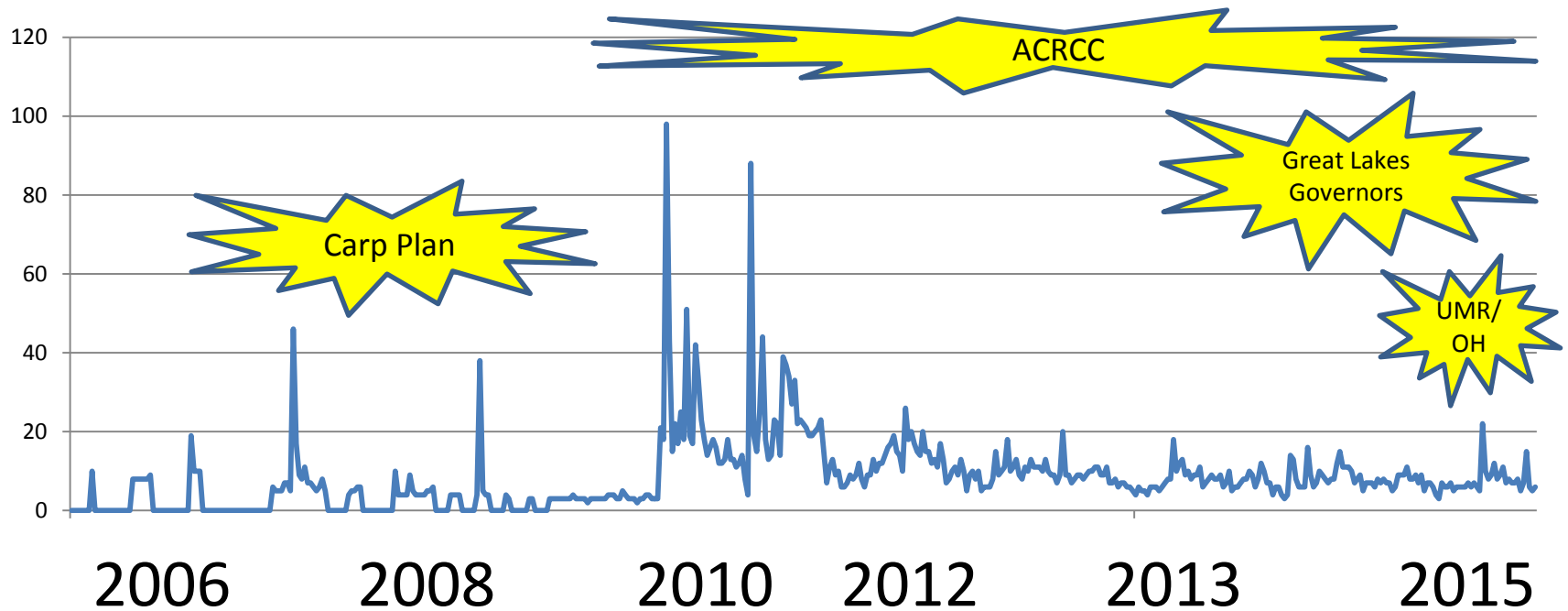
Multi-jurisdictional Approach to Asian Carp in the Upper Illinois River and Chicago Area Waterway System, Illinois, United States



Kevin Irons, IDNR
Aquatic Nuisance Species Program Manager
Aquaculture Program Manager



Google trends: Asian carp



These are just a few of many collaborations at various levels ongoing to achieve common goals.

Common carp
“grandpa’s carp”







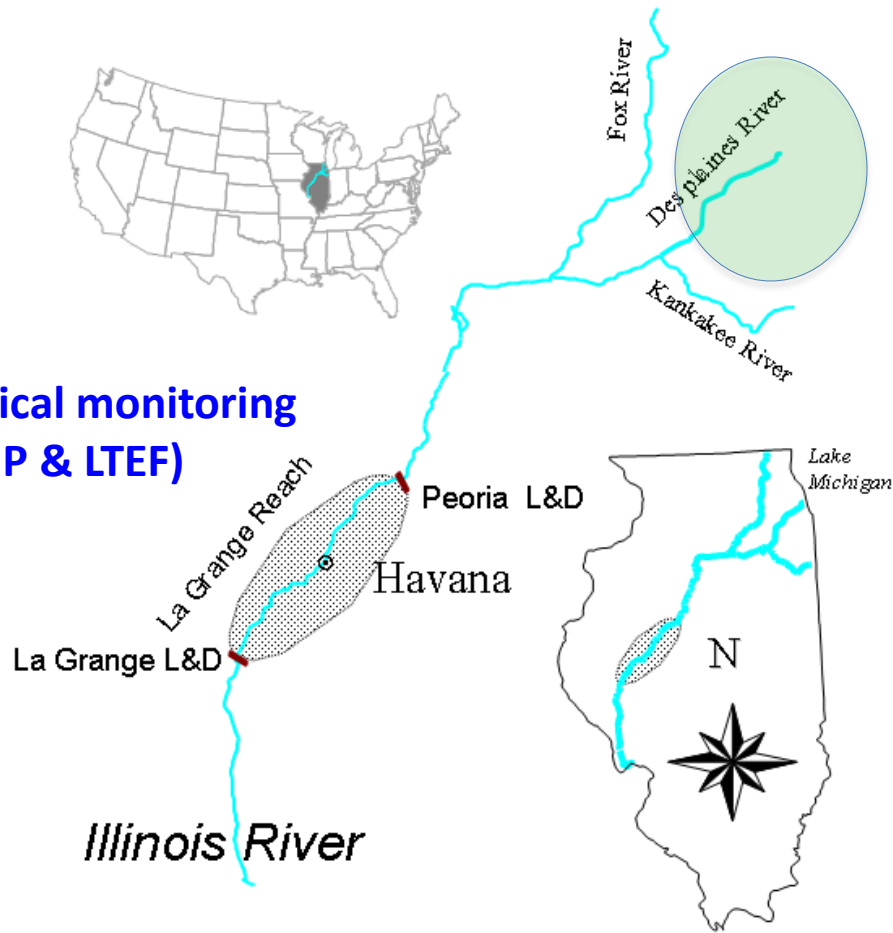
Asian carp
(primarily Bighead carp)
were introduced in US
Aquaculture in 1973



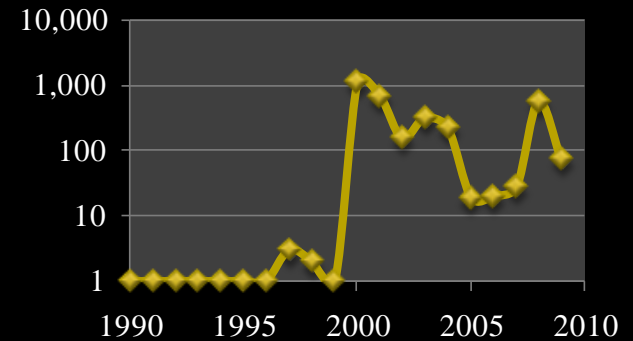
INHS used bighead and silver carp at the Sam Par Biological Station 1974 (Homer Buck)
Research was focused on waste water and sewer lagoon treatment.

Historical river monitoring has helped inform (Illinois Waterway)

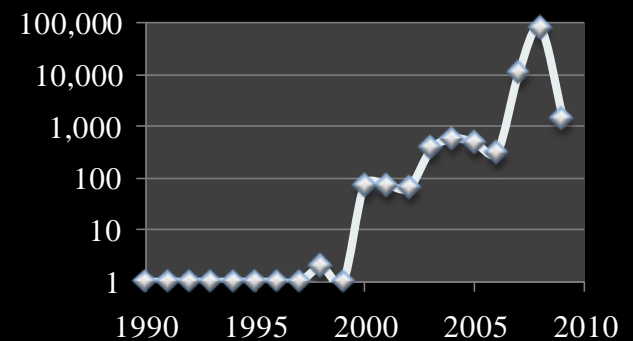
Historical monitoring
(LTRMP & LTEF)



Bighead carp

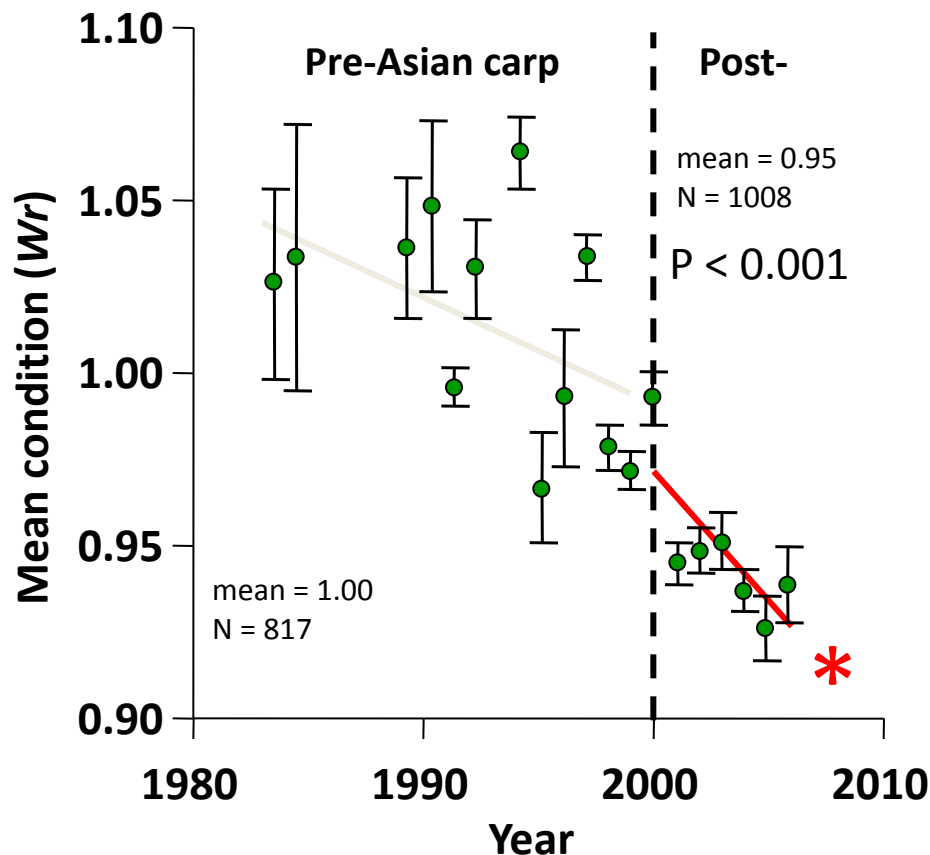


Silver carp



bigmouth buffalo

~ 5% decline
in mean condition



$$N = 20, r^2 = 0.49$$
$$Y = 0.981 - 0.004x_1 - 0.009x_2$$

Constant - $p < 0.001^*$

X_1 - $p < 0.001^*$

X_2 - $p < 0.001^*$

df = 2,17, f = 10.11, p = 0.001

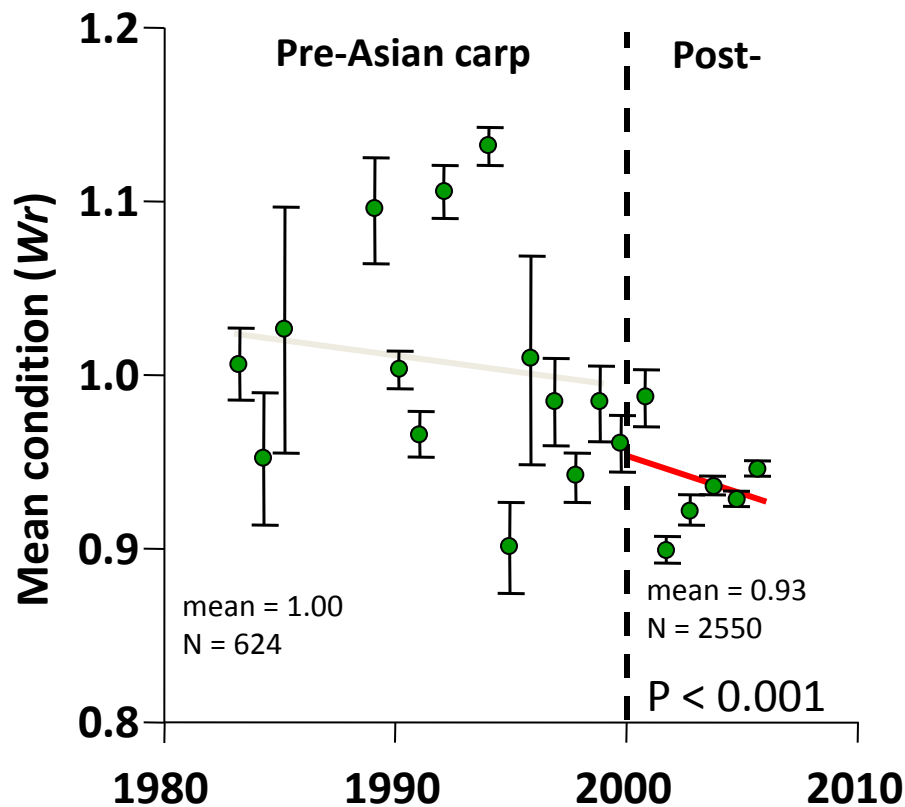
Historical monitoring
(LTRMP & LTEF)

* segmented regression
significant slope change post-Asian carp



gizzard shad

~ 7% decline
in mean condition



$$N = 20, r^2 = 0.37$$
$$Y = 0.959 - 0.006x_1 - 0.009x_2$$

Constant - $p < 0.001^*$

X_1 - $p < 0.033^*$

X_2 - $p = 0.282$

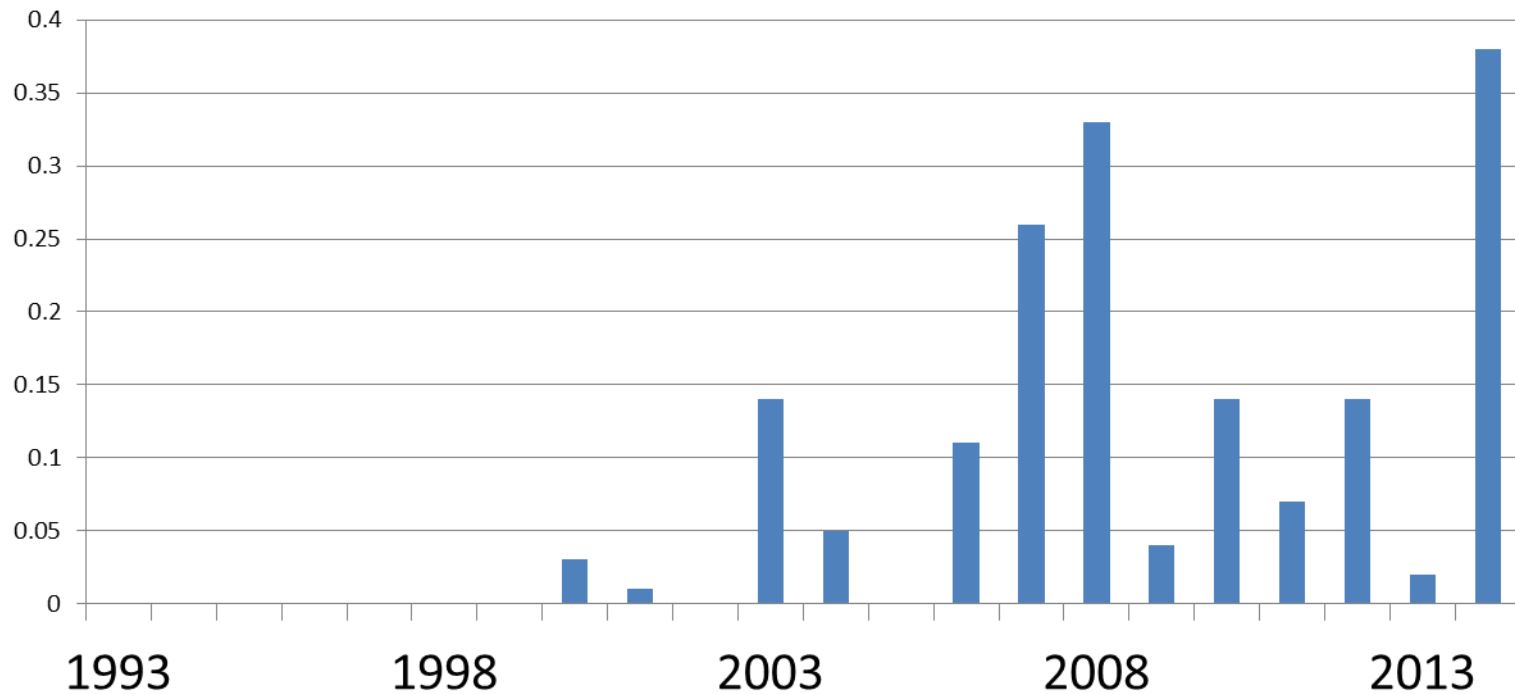
$df = 2, 17, f = 6.52, p = 0.008$

Historical monitoring
(LTRMP & LTFE)



Successful spawning and recruitment in lower Illinois River 2014

Frequency of occurrence of SVCP in minnow fyke nets, La Grange Pool, Illinois River



Surrogate for year-class strength



Photo courtesy of Chris Young, IDNR

Historical Progression Of Carp Monitoring





2009 change in concern

- Carp number increasing well downstream
- Barrier maintenance requiring shutting off power
- Lack of knowledge of Asian carp population dynamics (upper river)
- A new tool, eDNA is providing initial information (possible silver carp near barrier?)



environmental DNA

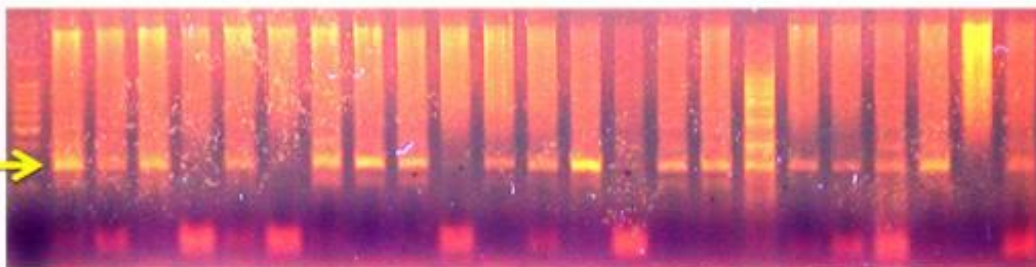


Replicates
from Site 1

Replicates
from Site 2

Replicates
from Site 3

Silver
carp →

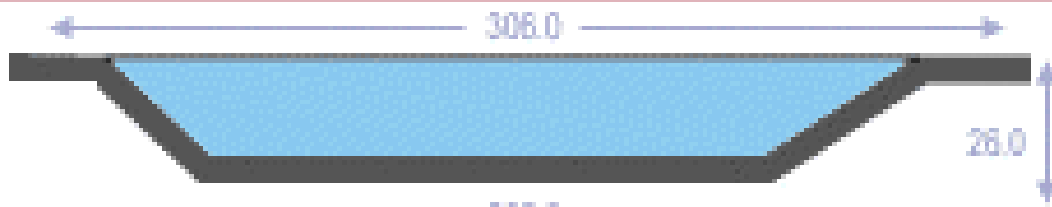


Chicago Area Waterways

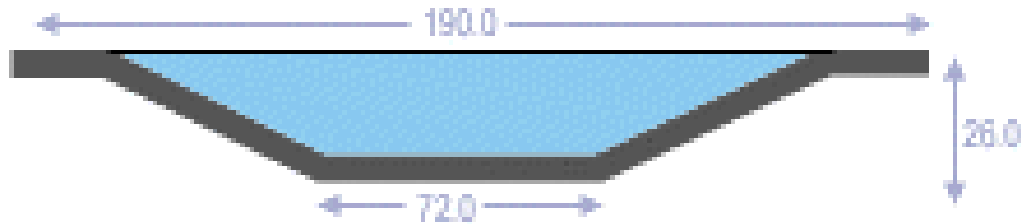
A river reversed, a problem created

The Chicago and Calumet rivers were once tiny waterways that trickled into Lake Michigan. Beginning in 1900 the city dug a series of canals that reversed their flows so they could carry the city's waste into the Mississippi River basin, and away from the lake – the city's drinking water source. A push is now under way to engineer a system to re-establish the natural hydrological divide between Lake Michigan and the Mississippi.

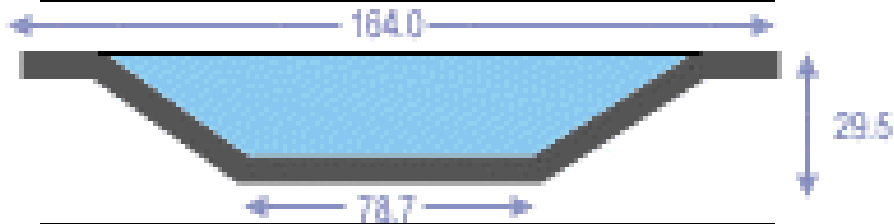




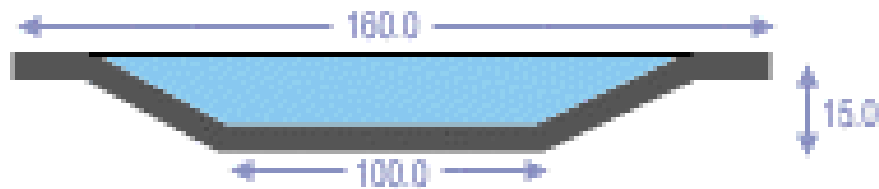
Chicago Sanitary and Ship Canal



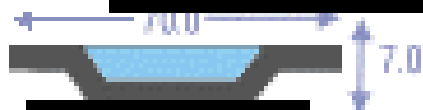
Suez Canal



Panama Canal



Welland Canal

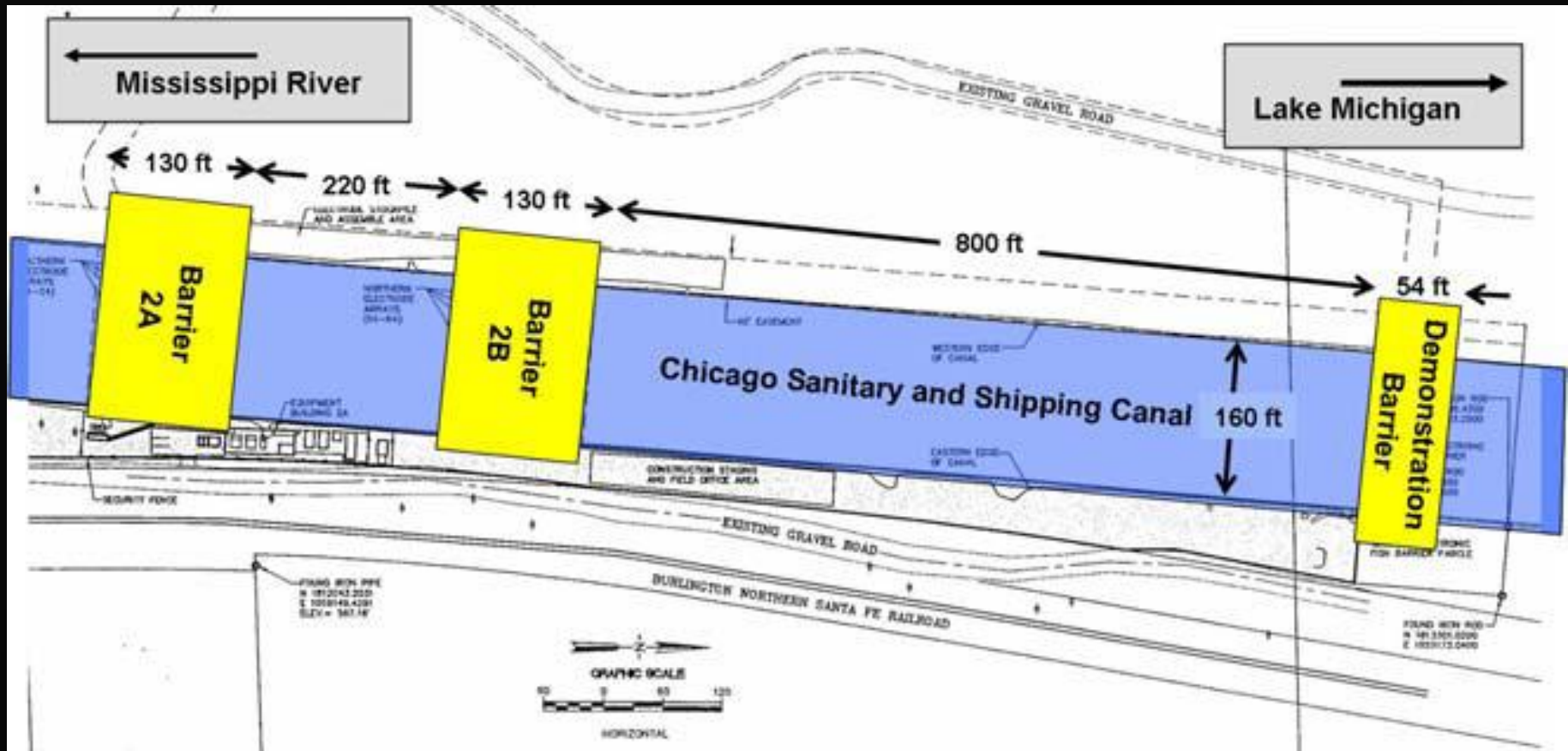


Erie Canal



Illinois and Michigan Canal

A Barrier Panel Group of state/local/ngo and concerned citizens had worked on barriers from 1990's culminating in demonstration barrier in 2002 (initially round gobies)



April 2009

Spring 2011

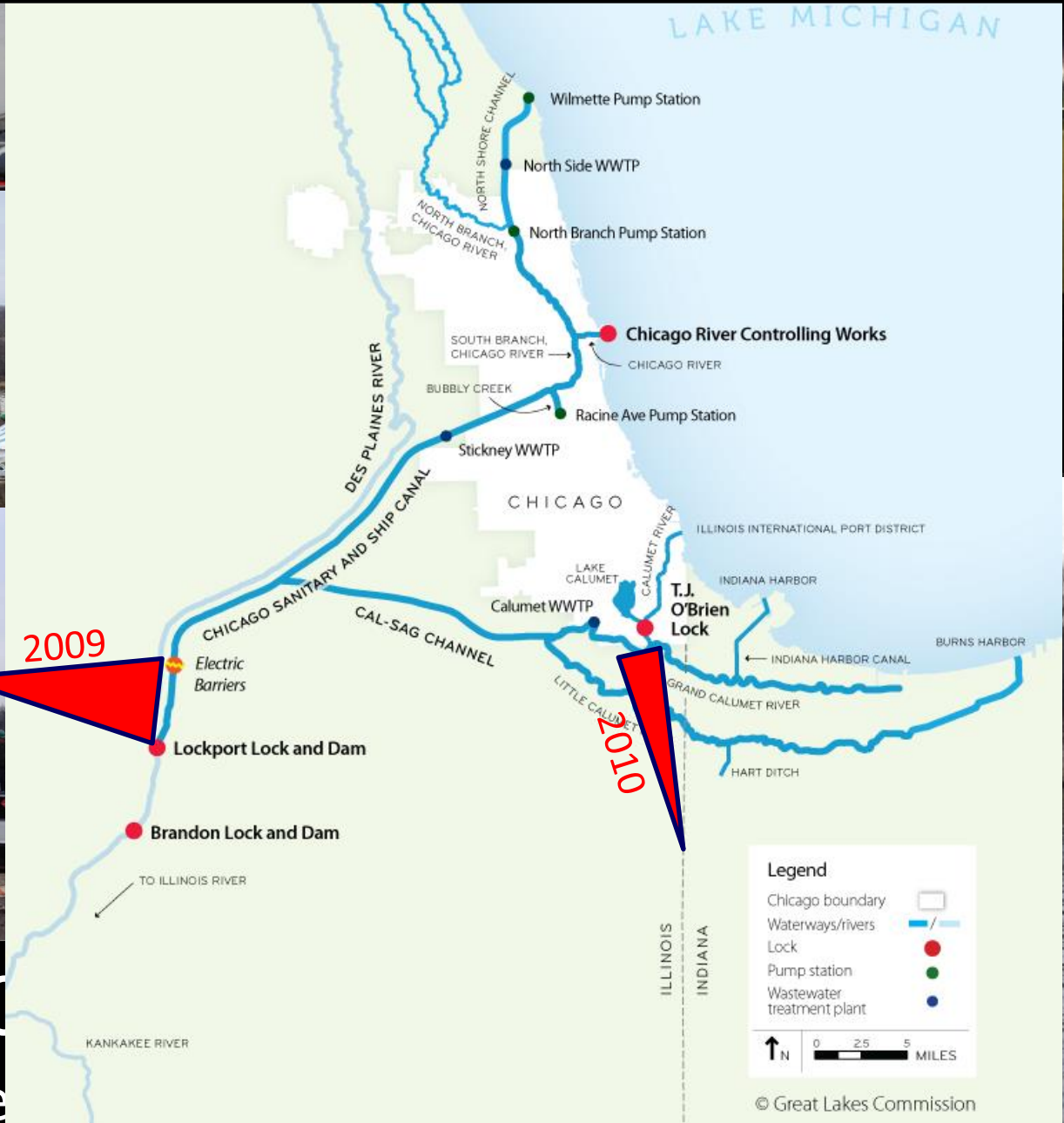
April 2002



December 2009

First of 2 rotenone operations (May 2010 second)

OVER 11% OF THE 77 MILES OF CHICAGO AREA WATERWAYS HAS BEEN ROTENONED AS OF SPRING 2010



December 20
First of 2 rotenone

2009-2010 (Lots of effort, a few fish)

- **Effort above the Electric Barrier**
 - 12,000 person-hours
 - 2.6 miles (173 acres) treated with rotenone
 - 370 hours of electrofishing
 - 45 miles of trammel/gill net; fish <139,000
- **CAWS Efforts above and below the Electric Barrier (2009-2010)**
 - Over 18,000 person-hours
 - 9.1 miles treated with rotenone
 - 386 hours of electrofishing
 - 50 miles of trammel/gill net
 - **2 bighead carp (one in Lockport Pool below the Electric Barrier and one in Lake Calumet)**
 - STILL only fish collected at or above the barrier
 - No continued rotenone actions



More informed on eDNA and what it means due to much more research



Asian Carp Regional Coordinating Committee

Leading the way in Asian carp control and management.

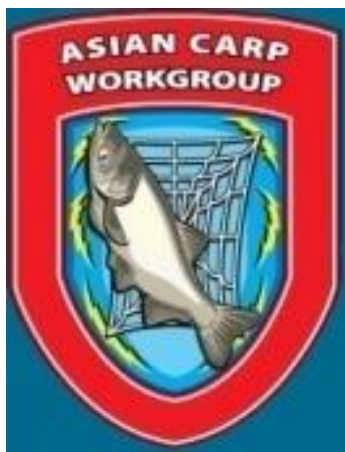
<http://asiancarp.us>

Annual Framework, Plans, and Reports



- **21(+) project plans, 75 project objectives**

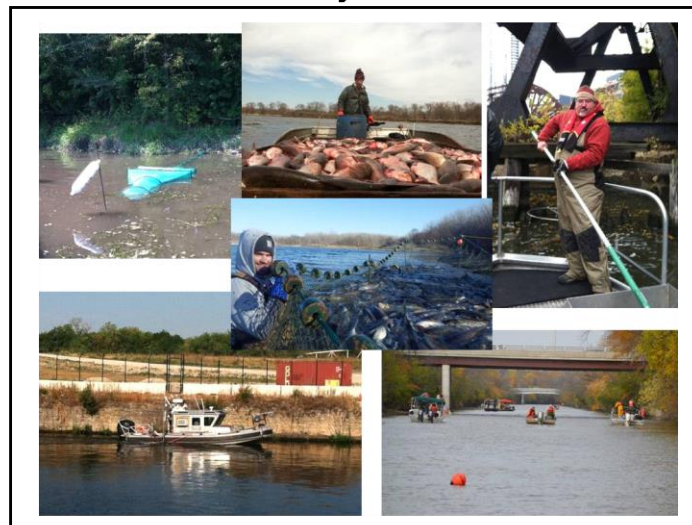
- The MRP guides monitoring, removal operations, and research



**Asian Carp Regional Coordinating Committee
Monitoring and Response Workgroup**

**Monitoring and Response Plan
for Asian Carp in the Upper Illinois River
and Chicago Area Waterway System**

May 2013



OVERALL GOAL AND OBJECTIVES OF THE MRP

Overall Goal: *Prevent Asian carp from establishing self-sustaining populations in the CAWS and Lake Michigan.*

Five objectives have been identified to accomplish the overall goal. These objectives are:

- 1) Determination of the distribution and abundance of any Asian carp in the CAWS, and use this information to inform response removal actions;
- 2) Removal of any Asian carp found in the CAWS to the maximum extent practicable;
- 3) Identification, assessment, and reaction to any vulnerability in the current system of barriers to prevent Asian carp from moving into the CAWS;
- 4) Determination of the leading edge of major Asian carp populations in the Illinois River and the reproductive success of those populations; and
- 5) Improvement of our understanding of factors behind the likelihood that Asian carp could become established in the Great Lakes.

USEPA; USFWS; USGS; USCG; USACE

UI/INHS; SIU; EIU; WIU; Loyolla; IL-IN SeaGrant

Characterizing Risk: IWW and CAWS

Distances from Lake Michigan

37 miles Dispersal barriers

55 miles Adult Population Front

62 miles Presence of Adults/Potential Spawning

64 miles Observed Spawning activity (no larvae/YOY)

91 miles Established population: Closest observed juvenile Asian carp (Heritage Harbor Marina, Starved Rock Pool)

Overall leading edge of adult Asian carp invasion has not changed since 2006 (Dresden Island Pool; I-55)

Three captures of adult **BLACK CARP**

2010: RM 27.5 Triploid
2013: RM 24 Diploid
2014: RM 22.5 Diploid

Adult Population Front

Ottawa

Henry

**Presence of Adults/
Potential Spawning**

**Verified
Spawning**

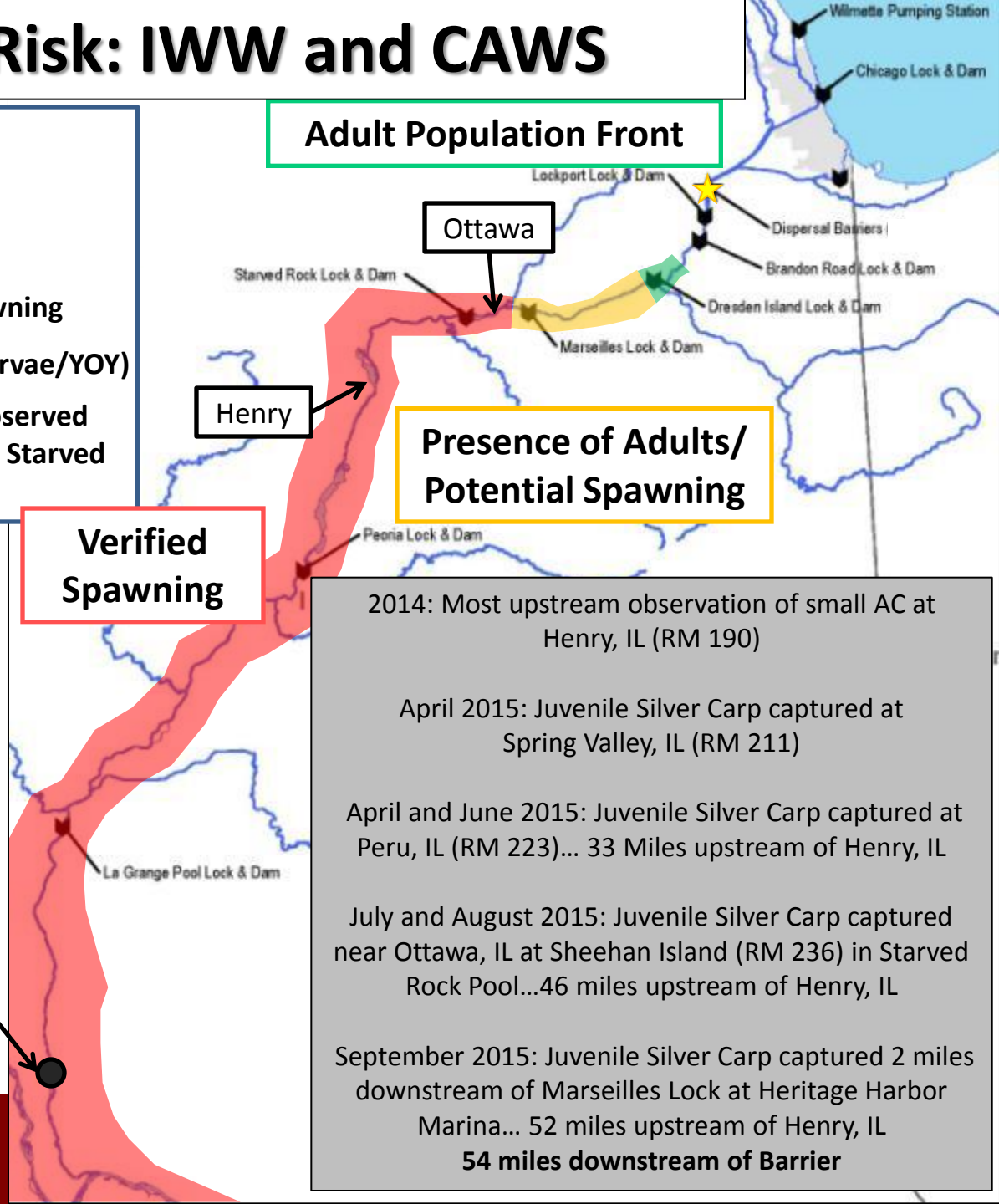
2014: Most upstream observation of small AC at Henry, IL (RM 190)

April 2015: Juvenile Silver Carp captured at Spring Valley, IL (RM 211)

April and June 2015: Juvenile Silver Carp captured at Peru, IL (RM 223)... 33 Miles upstream of Henry, IL

July and August 2015: Juvenile Silver Carp captured near Ottawa, IL at Sheehan Island (RM 236) in Starved Rock Pool...46 miles upstream of Henry, IL

September 2015: Juvenile Silver Carp captured 2 miles downstream of Marseilles Lock at Heritage Harbor Marina... 52 miles upstream of Henry, IL
54 miles downstream of Barrier





Asian Carp Regional Coordinating Committee

Leading the way in Asian carp control and management.


<http://asiancarp.us>

- <http://www.asiancarp.us/sampling/results.htm>

Monthly updates!

Home The Problem Current Actions Multimedia Newsroom About Us

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Leading the way in Asian carp control and management.

Sampling Results

Chicago Area Waterway System

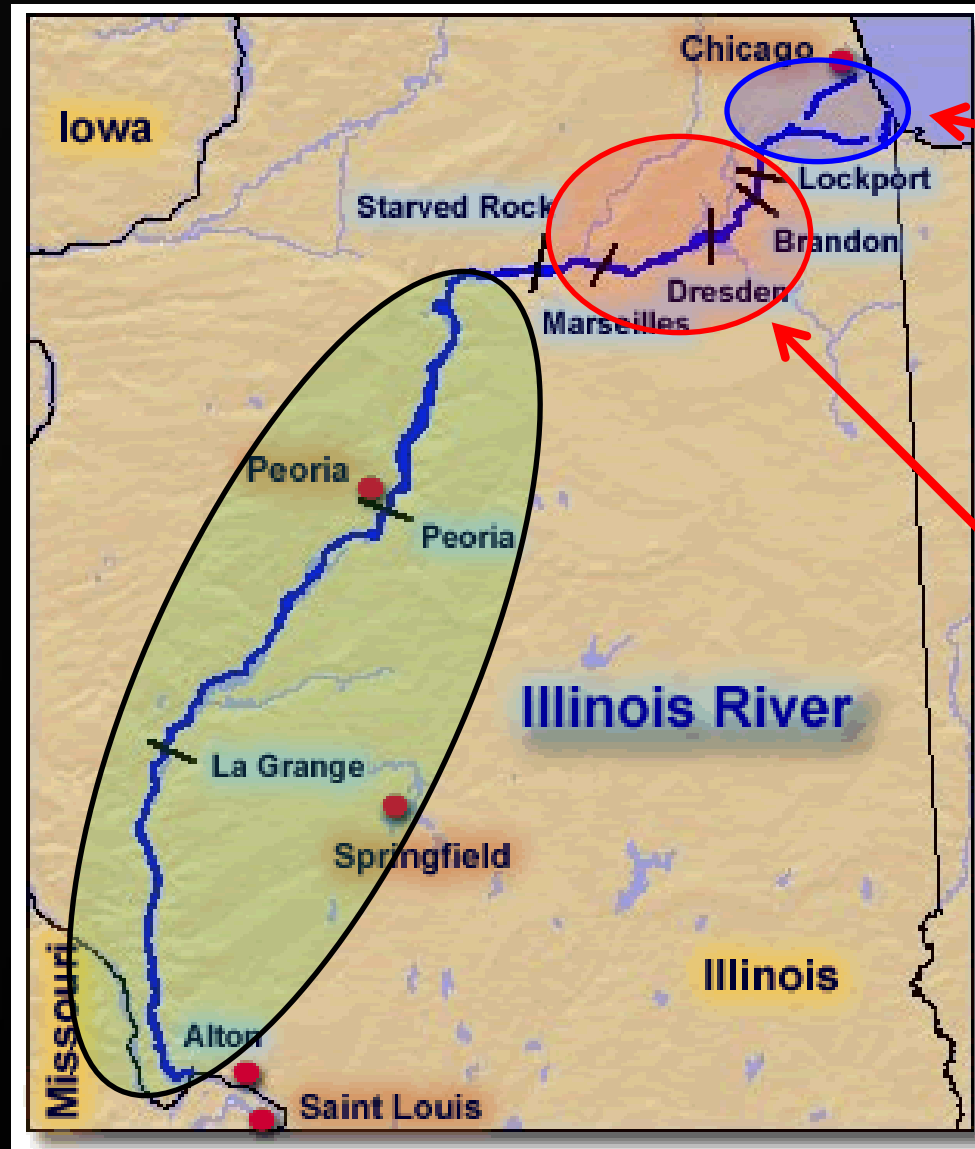
2014	2012	2011
<ul style="list-style-type: none">September 2014August 2014July 2014June 2014May 2014April 2014March 2014	<ul style="list-style-type: none">December 3, 2012November 26, 2012November 19, 2012November 12, 2012November 5, 2012October 29, 2012October 22, 2012October 15, 2012October 8, 2012October 1, 2012September 24, 2012September 17, 2012September 10, 2012September 3, 2012August 27, 2012August 20, 2012	<ul style="list-style-type: none">December 12, 2011November 14, 2011November 7, 2011October 17, 2011September 5, 2011August 29, 2011August 15, 2011July 11, 2011June 27, 2011June 20, 2011May 15, 2011May 9, 2011April 11, 2011April 4, 2011



Approach and Target Areas

Illinois River

- Independent Commercial Harvest as Control
 - China-US (TNC) partnership may help increase
 - Business development
 - Market driven
- Assessing Population Demographics and Response
- Content/contaminant



CAWS & Upper Des Plaines

- Physical Barriers
- Monitoring
- Response actions

Upper Illinois and Lower Des Plaines

- Detectable Population Front Monitoring
- Contracted removal
- Small fish monitoring
- Telemetry
- Demographics
- Modeling
- Integrated Pest Management

Asian carp removal (Upper Illinois Waterway)

- Contract commercial fishers for fish removal
- 3.6 million lbs removed
- Use gill/trammel nets, hoop nets, Great Lakes pound nets, and commercial seine hauls
- Little impact to native fishes (< 1% of total catch is game fish, mostly catfishes and put back into waters immediately)

GOOD NEWS: Leading edge has not moved since 2006 (9 years)



Large Great Lakes Pound/ Fyke nets and Commercial Seines

These surface to bottom traps can be fished for extended times and extended across large areas



- Nets have been successfully fishing in Material Service area at Morris.

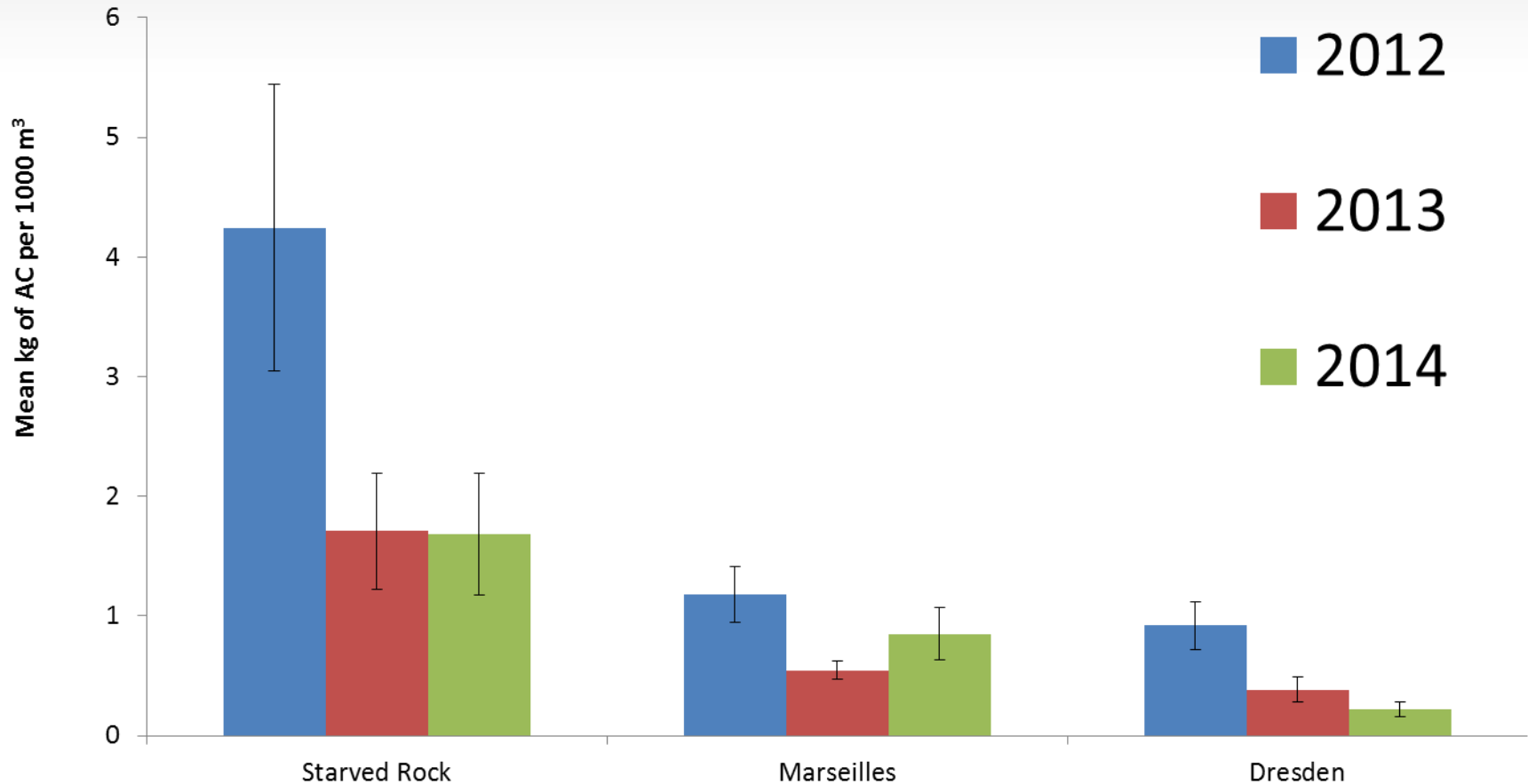
Commercial Seines



- Seine potentially had 1,000,000 lbs of AC

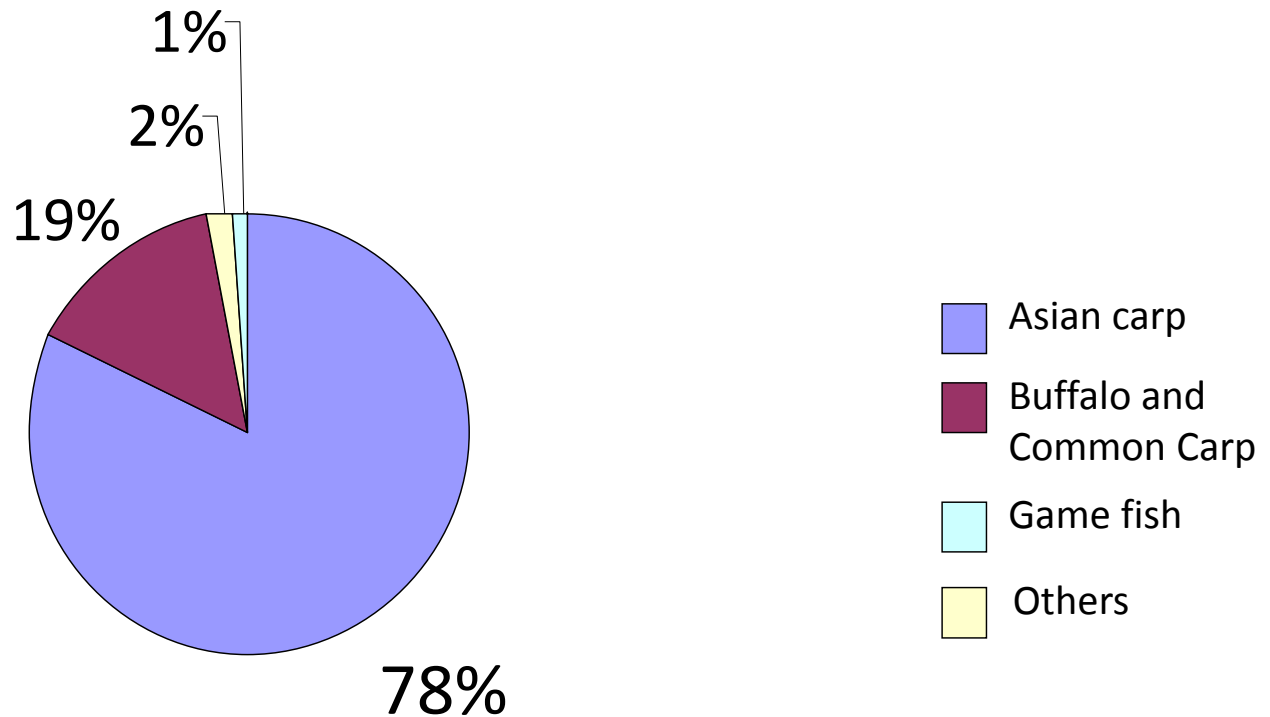


SIU Hydroacoustic estimates of Asian carp in upper Illinois Waterway 2012 - 2014

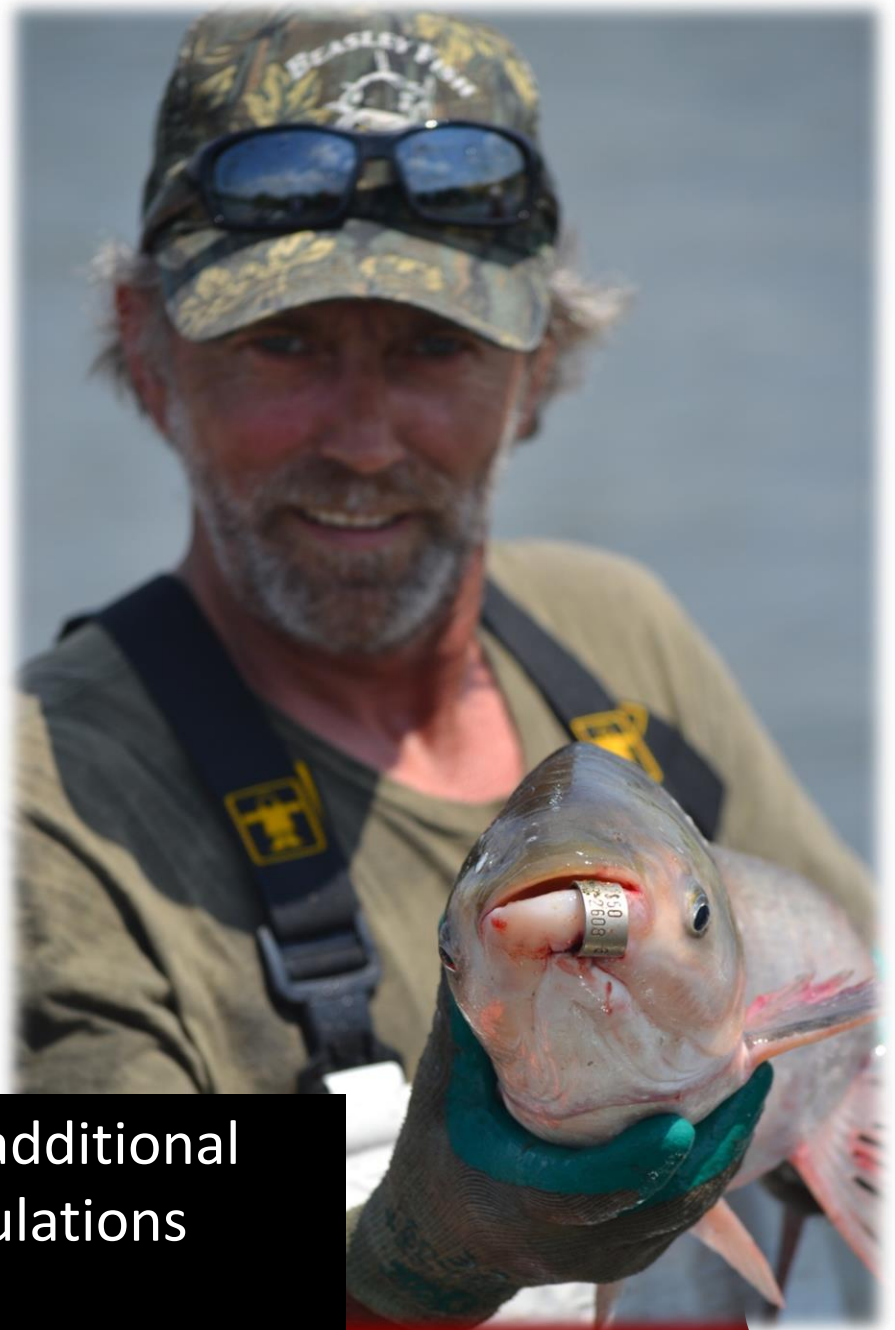


Contracted Fishing for Removal (barrier defense)

Percentage of Asian Carp to Other Species



Data from 2011 collections



Upstream efforts benefit from additional information about the fish populations from mark-recapture studies

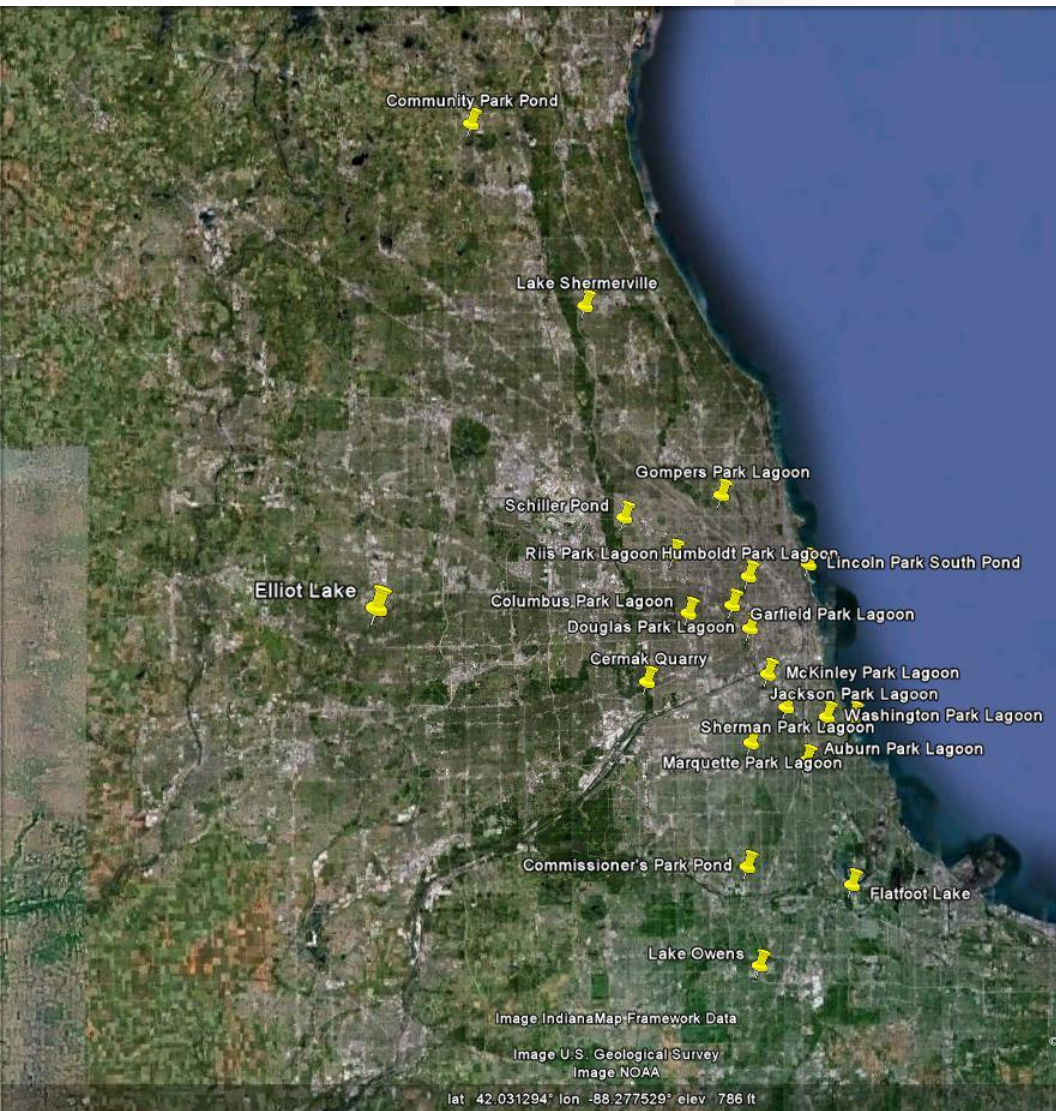
Additional benefit from
international collaborations



Ultimate results

- Catch rates decreasing for Bighead Carp
- Catch rates seasonally decreasing for Silver Carp (smaller sizes)
- Little evidence leading edge has changed since 2006 (8 years)
- Results suggest that we CAN influence larger populations
- No fish above electric barrier detected since lone capture by commercial fisher in 2010 (first day these efforts were used for sampling)
- No Bighead Carp or Silver Carp captured in Lake Michigan

Monitoring at urban fishing ponds



21+ ponds identified and sampled

- Four ponds sampled in late summer/fall 2011; 20 large bighead carp removed
- Two ponds no longer a threat due to rehab or severe winterkill
- Garfield Park Lagoon sampled in 2012; 2 large bigheads removed
- Documents historical stocking/contamination and non-aquatic pathways

82 lb bighead carp in Urban pond



Community Action Initiatives to Increase Awareness, Surveillance, and Enforcement of Unlawful Live Asian Carp

- Investigation including markets and wholesale locations in and around Chicago dealing in live fish produced NO LIVE Bighead or Silver Carp.
- Several location are selling frozen or fresh fish/heads.
- Fish importation
- Live fish sales
- Injurious species



Live fish in Markets

Education, Outreach, and Enforcement

FACT SHEET

While both Bighead and Silver Carp (Asian carp) are listed under the Lacey Act as illegal to transport alive, many local communities and/or markets have a desire to acquire Asian carp for consumption. If fish are alive, there is a risk of unintentional or intentional release into the wild according to proximity to local water bodies, ethnic customs or traditions, or purposeful releases. IL DNR has increased officer presence, friendly enforcement activities, and communications related to Asian carp. Since 2005 when a ban of live bighead and silver carp went into effect in Illinois, the Department has communicated with local management and regulatory entities such as the City of Chicago, Department of the Environment as well as industry representatives of the live fish market and suppliers. This has proved successful in promoting open dialogue between store owners, the public, and enforcement officials.



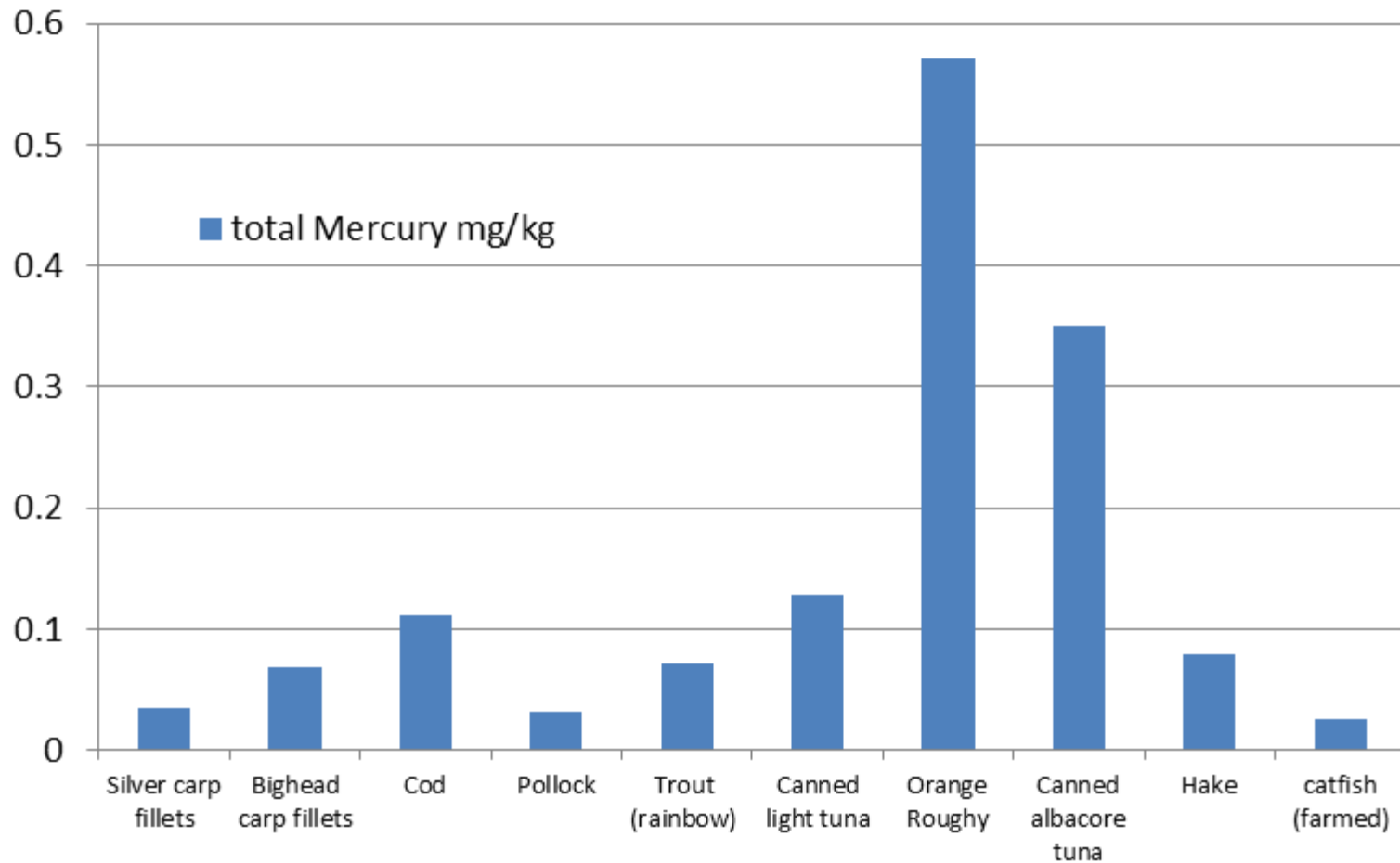
Recently, multiple, and repeated attempts in transportation of live Bighead and Silver Carp into Ontario Canada from the US has heightened concern of these species to be found alive in Northeast Illinois area fish markets. The desire for this fish stems from cultural familiarity with Asian carp in areas such as China and other areas around the world. These Asian carp are some of the most cultured fish in the world and can be found in food markets widely as well. Until the Lacey Act listed these as injurious, Toronto Ontario Canada had a live market estimated at \$5 million for Bighead Carp alone. Highly sought after for its food value, the head makes a high quality fish soup base.

In April 2012, IL DNR law enforcement and biologists visited live fish markets across Northeast Illinois (Chicago-land) to follow up on tips from concerned citizens regarding the sale of protected species of aquatic life and the sale of endangered and/or invasive species. Transportation and source of these species is also a concern. IL DNR law enforcement routinely inspects facilities such as these every few years to maintain vigilance in this matter.



Over two days 32 businesses were visited in the Chicago-land area. Several had minor permit violations for not having an Aquatic Life Retail/Wholesale license with 25 written warnings issued and 3 citations written. A host of aquatic species were found in these markets (Table 1) they included numerous fish, turtle, frog, and crustacean species. No Federal or Illinois endangered or threatened species were discovered. Only freshwater aquatic species fall under the IL DNR enforcement mandate, but other salt water species of fish, crustaceans, and mussels were noted and a plethora of frozen products were also seen.





Unknown: resiliency of native ecosystems



Danny Brown

Federal and Regional Partners

U. S. Fish and Wildlife Service

- Carterville, IL
- Lacrosse, WI
- Columbia, MO

U. S. Army Corps of Engineers

- Chicago District
- Rock Island District

U. S. Coast Guard

U. S. Environmental Protection Agency

U. S. Geological Survey

Great Lakes Fishery Commission

All Great Lakes States

Ontario and Canada

State, Local, and Research

Illinois Department of Natural Resources

Illinois Natural History Survey

Illinois Environmental Protection Agency

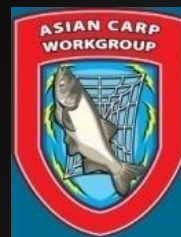
University of Illinois

Southern Illinois University

Western Illinois University

University of Notre Dame

Metropolitan Water Reclamation District



Local and Regional partnerships are valuable and necessary,

specifically for economic development.

(local efforts supported by State and Federal programs)

Leigh Ann Brown

City of Pekin

Economic Development/Tourism Coordinator

labrown@ci.pekin.il.us



EAST PEORIA, ILLINOIS

JULY 11, 2015

5 A.M. - 1 P.M.

WEIGH IN 2 P.M. AT BASS PRO SHOPS

\$120/TEAM OF UP TO FOUR

OPTIONAL BIG FISH POT \$25

\$7,500
CASH PRIZE MONEY

SAVE THE DATE

JULY 9-11, 2015

PEORIA, ILLINOIS

**SEIZE THE DAY...SEIZE THE CARP!
INTERNATIONAL CONFERENCE**

JULY 9

WELCOME RECEPTION

JULY 10

CONFERENCE 8 A.M. - 5 P.M.

KEYNOTE SPEAKERS

NATIONAL EXPERTS ON ASIAN CARP

PUBLIC/PRIVATE PARTNERSHIPS

SUPPLY/DEMAND

**INNOVATION & MARKET CONDITIONING
APPROACHES**

VISION OF OPPORTUNITY

**NEW & INNOVATIVE APPROACHES TO USE
OF ASIAN CARP**

**FISHING METHODS & CHALLENGES
STRATEGIES**

JULY 11

FLYING FISH FESTIVAL

10 A.M. - 3 P.M. - BASS PRO SHOPS

BOWFISHING TOURNAMENT

Mark Your Calendar

More Information

will be sent in February 2015!

peorianfishing@gmail.com



Council of Great Lakes Governors

Aquatic Invasive Species

News

Governors of Michigan and Ohio and Premier of Ontario commit to harmonize programs to combat Aquatic Invasive Species

On June 13, 2015 at the Leadership Summit of the Conference of Great Lakes and St. Lawrence Governors and Premiers, the Governors of Michigan and Ohio and the Premier of Ontario committed to the development of a pilot project to harmonize approaches to address Aquatic Invasive Species and further cooperation among their three jurisdictions. A copy of the full resolution that was signed at the Summit can be found [here](#).

Governors' and Premiers' Mutual Aid Agreement Protects Region from Aquatic Invaders

In April 2014, the Governors and Premiers announced a Mutual Aid Agreement that empowers the States and Provinces to work together to address a serious regional threat from aquatic invasive species (AIS). As of March, 2015, all of the States and Provinces are moving forward to implement this agreement and better protect the Great Lakes and St. Lawrence River.

- In September 2014, Michigan and Ohio led a joint exercise targeting grass carp in Lake Erie. Illinois, New York and Ontario assisted in this exercise.
- In May 2014, Illinois and Indiana led a joint exercise targeting Eurasian ruffe in Lake Michigan's Calumet Harbor. Michigan and Minnesota also participated in this exercise.

The image features a close-up, slightly blurred view of the American and Chinese national flags. The American flag, with its blue field of white stars and red and white stripes, is in the upper left. The Chinese flag, with its red field and five golden-yellow stars, is in the lower right. The flags appear to be waving, creating a sense of movement. The text "Science Catch Economics" is overlaid on the right side of the image, in a white, sans-serif font.

Science
Catch
Economics

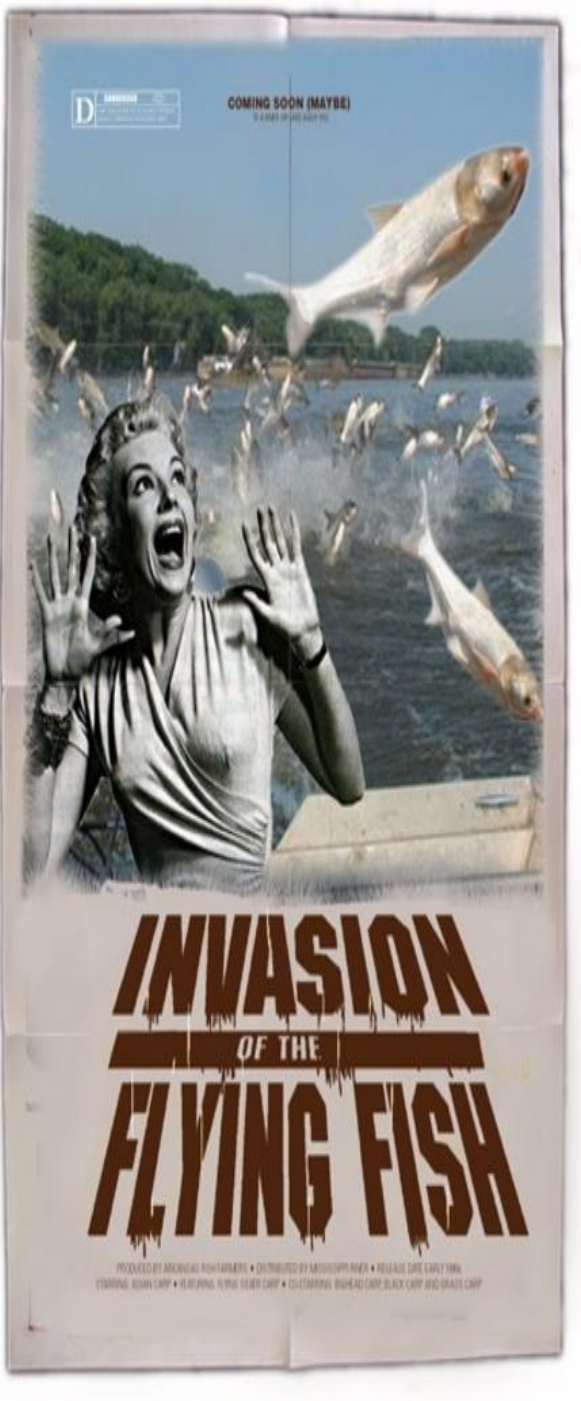


Photo by
Thad Cook