



Invasive Species and the Chicago Area Waterway System

Kevin Irons
IDNR - Fisheries



Collaboration on Invasive Species

- Council of Great Lakes Governors (Premiers)
 - Least wanted species!
 - Mutual Aid Agreement
 - Harmonization
- Great Lakes Restoration Initiative
 - ACRCC (ANS Barrier Panel Prior)
 - MRWG
 - Technical and Policy Workgroup
 - Great Lakes/Mississippi River Interbasin Study
 - CAWS Advisory Committee



Collaboration on Invasive Species

- State of Illinois representative with ACRCC
- Co-chair ACRCC – Monitoring and Response Workgroup (Dr. Dettmers – GLFC)
- Co-chair Council of Great Lakes Governors (Premiers) (Dr. Newcomb)



Federal and Regional Partners

U. S. Fish and Wildlife Service

- Cartersville, 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, Quebec, 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

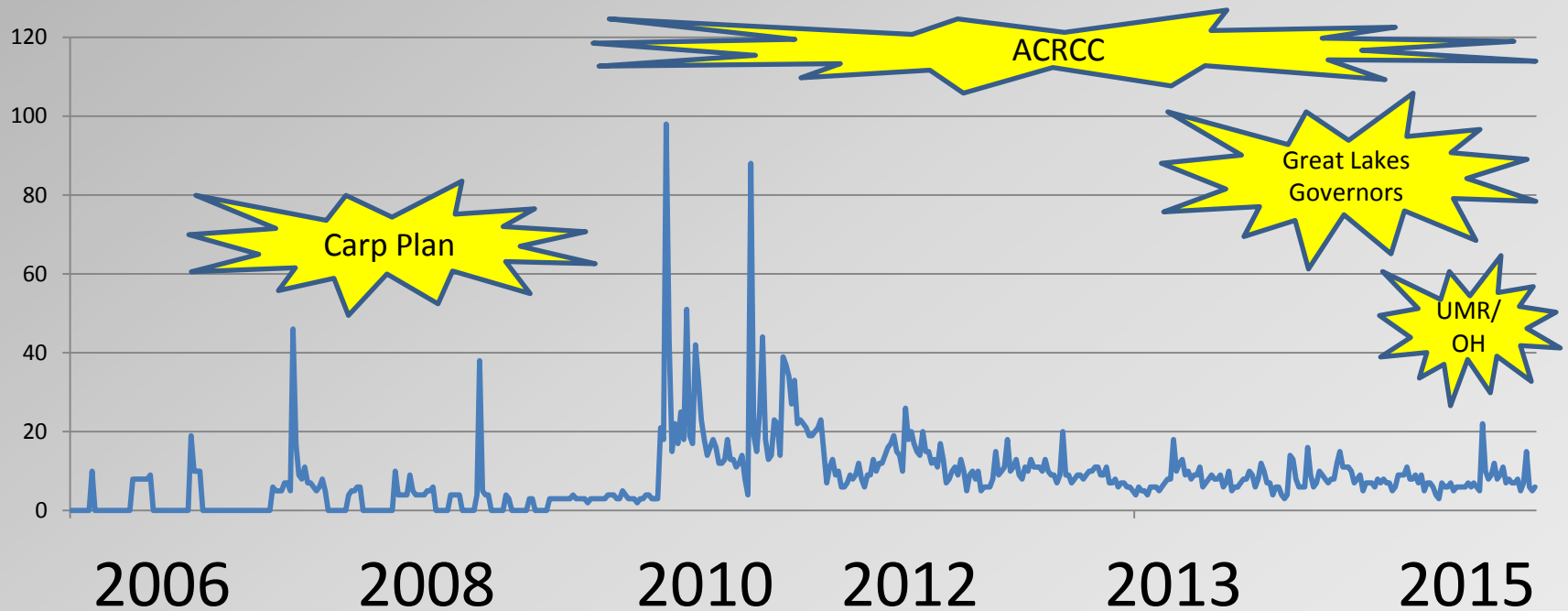
Western Illinois University

University of Notre Dame

Metropolitan Water Reclamation District



Google trends: Asian carp



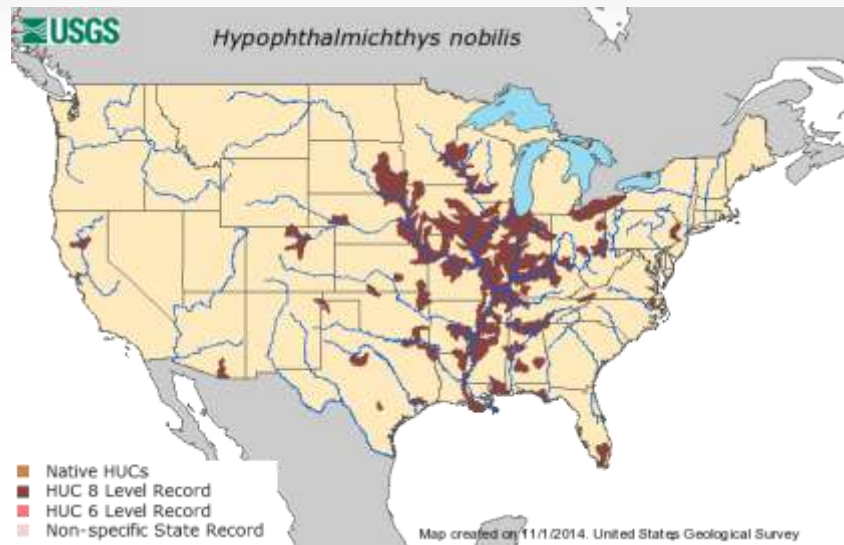
These are just a few of many collaborations at various levels ongoing to achieve common goals.



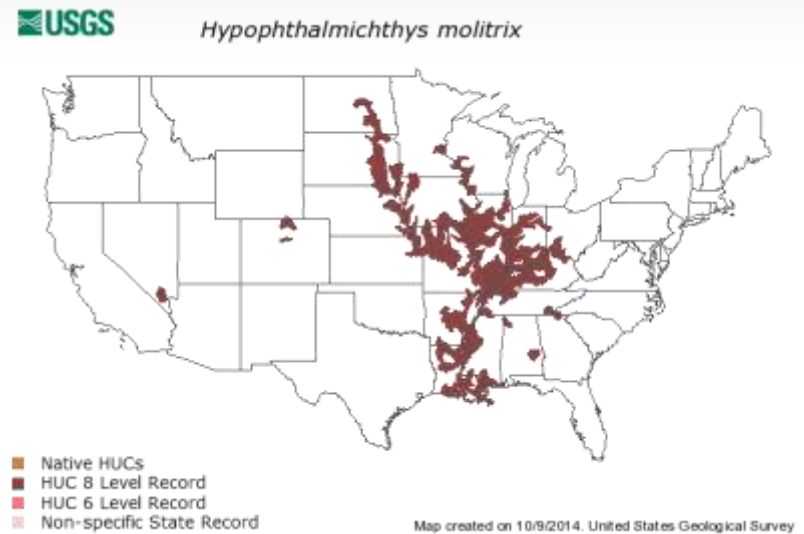


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History and Distribution



Bighead carp



Silver carp





Photo courtesy of Chris Young, IDNR

Early Barrier Panel – Monitoring 2000's

- IL DNR, MWRD, USFWS, Chicago Corps
- Monitor for presence of Asian carp



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

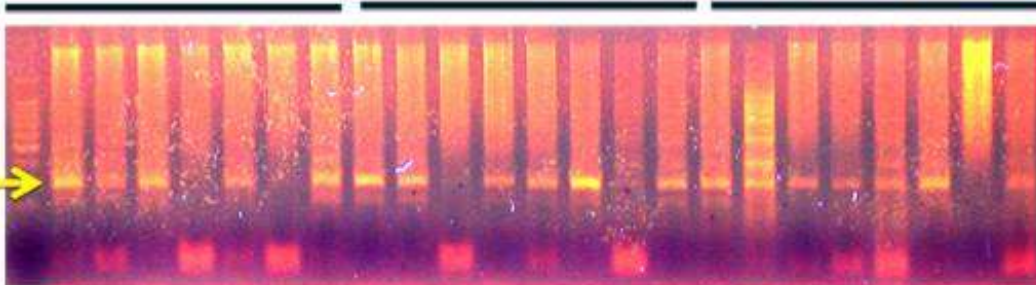


Replicates
from Site 1

Replicates
from Site 2

Replicates
from Site 3

Silver
carp



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



2009/1

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



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





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<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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Sampling Results

Chicago Area Waterway System

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



Approach and Target Areas

Illinois River

Long Term Strategy

- Independent Commercial Harvest as Control
- Assessing Population Demographics and Response



CAWS & Upper Des Plaines

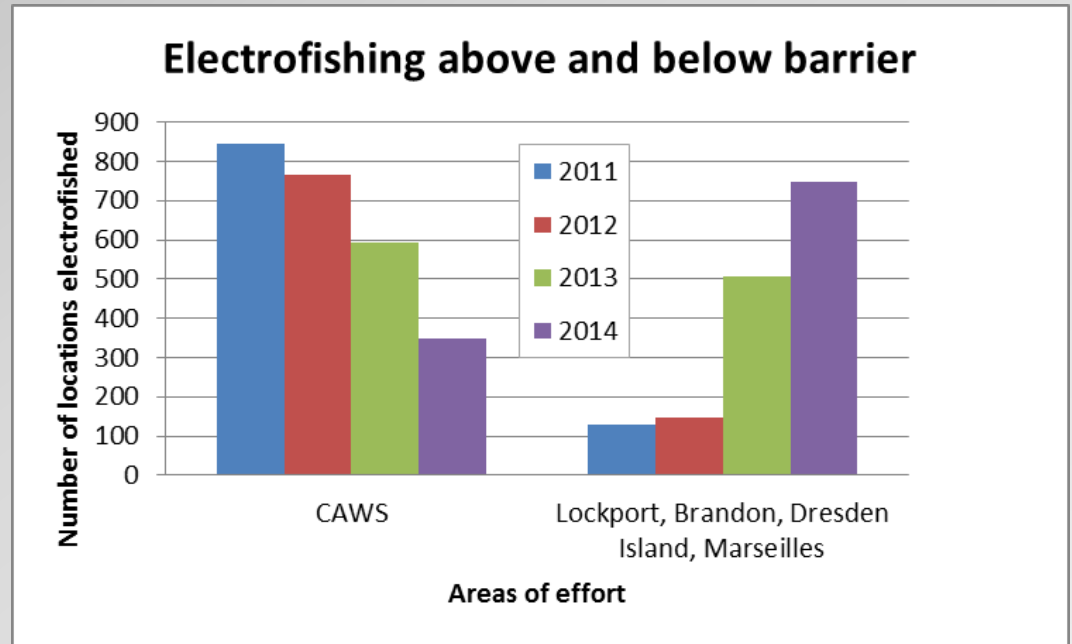
- Physical Barriers
- Monitoring
- Response actions

Upper Illinois and Lower Des Plaines

- Detectable Population Front Monitoring
- Contracted removal
- Small fish monitoring
- Telemetry
- Demographics
- Bottlenecks
- Technology

Adaptive Management Strategy

- Adaptive management approach
- Maximize information as commensurate with risk assessment needs
- Electrofishing and netting efforts both at a scale to detect rare fish above as well as inform on control needs below electric barrier system



The current Monitoring and Response Plan can be found at

<http://www.asiancarp.us/monitoring.htm>.

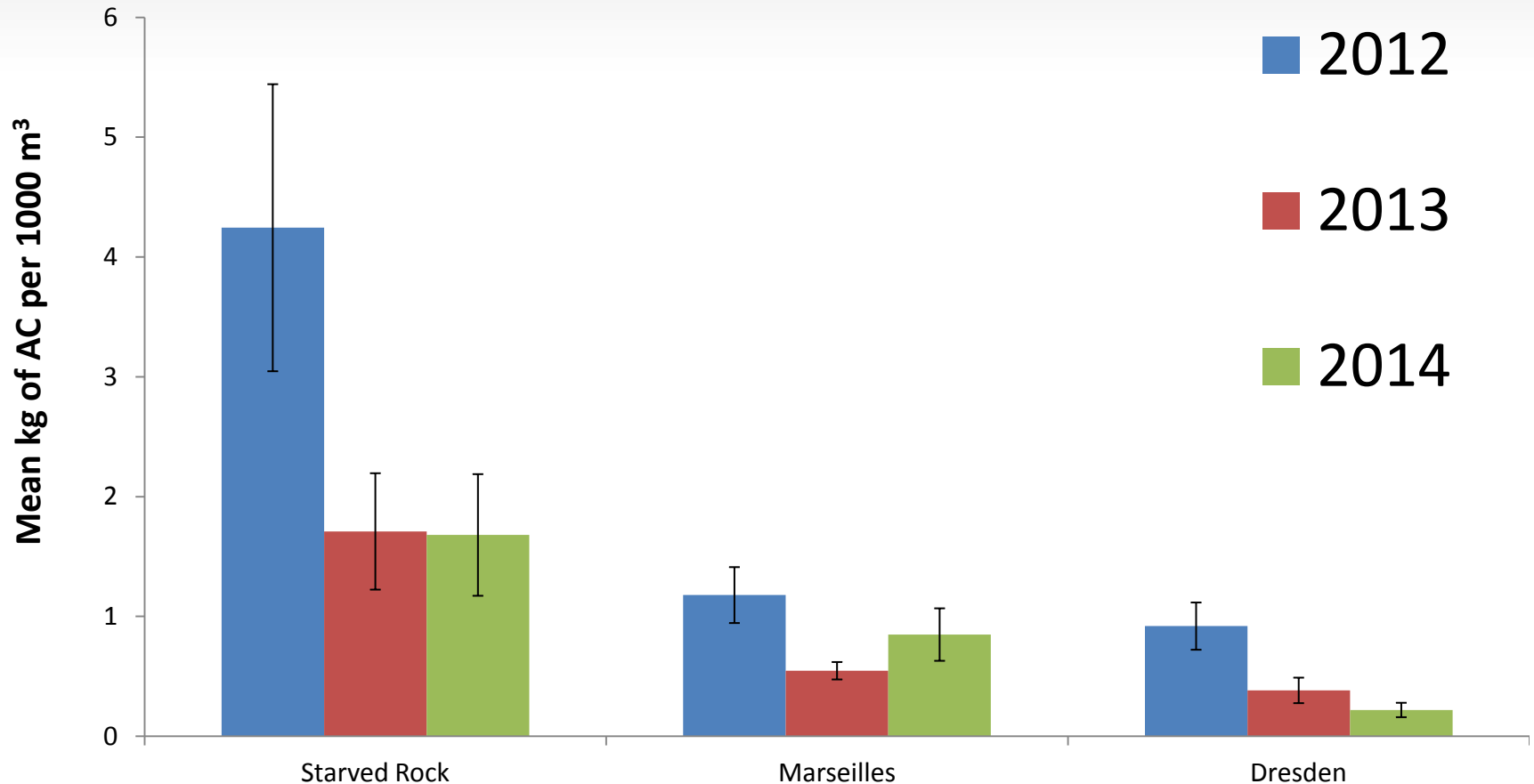
Asian carp removal (Upper Illinois Waterway)

- Contract commercial fishers for fish removal
- 3.6 Million pounds removed to date
- 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)



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



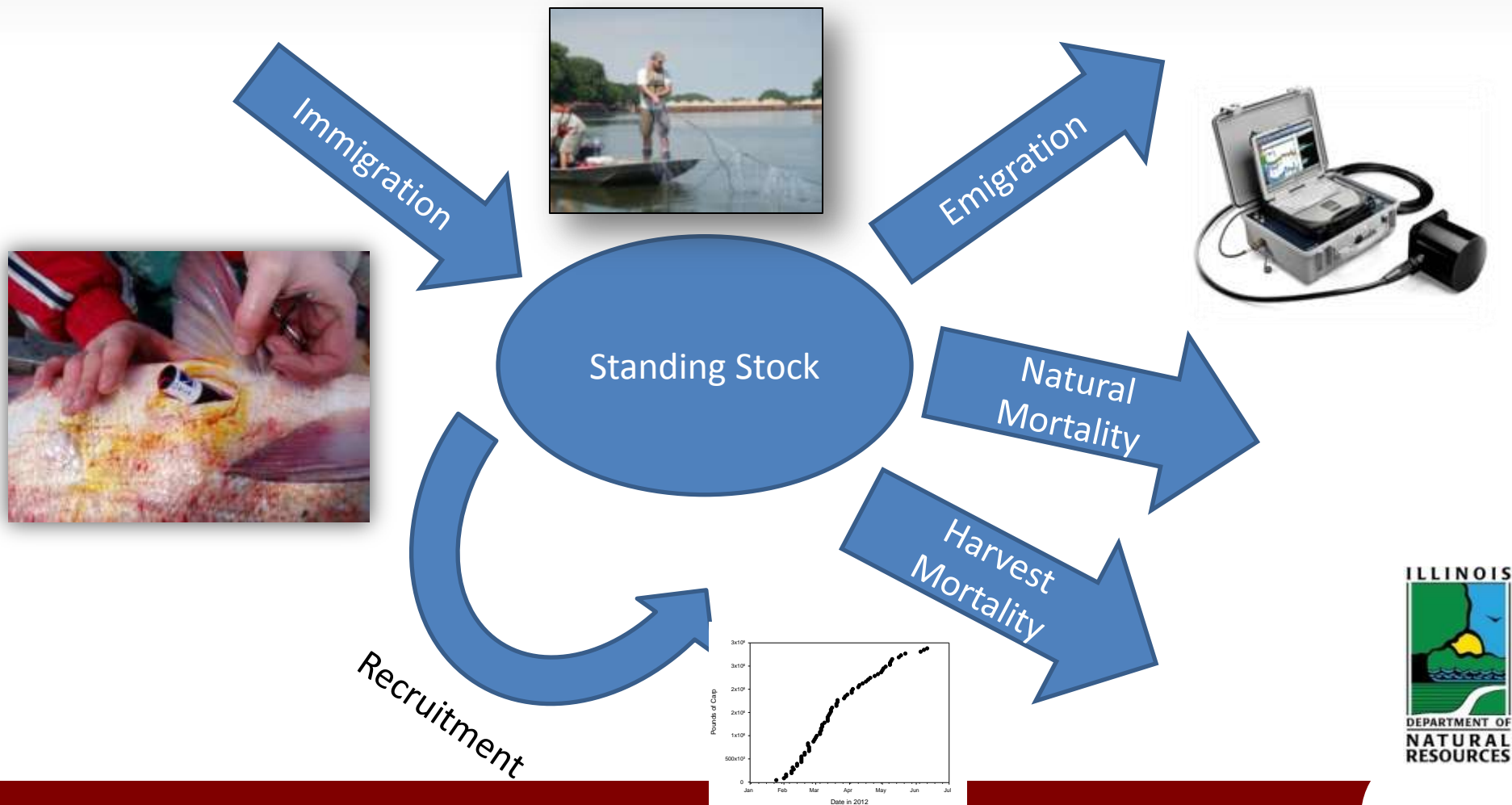
Upstream efforts
benefit from additional
information about the
fish populations from
mark-recapture studies

Immigration variable

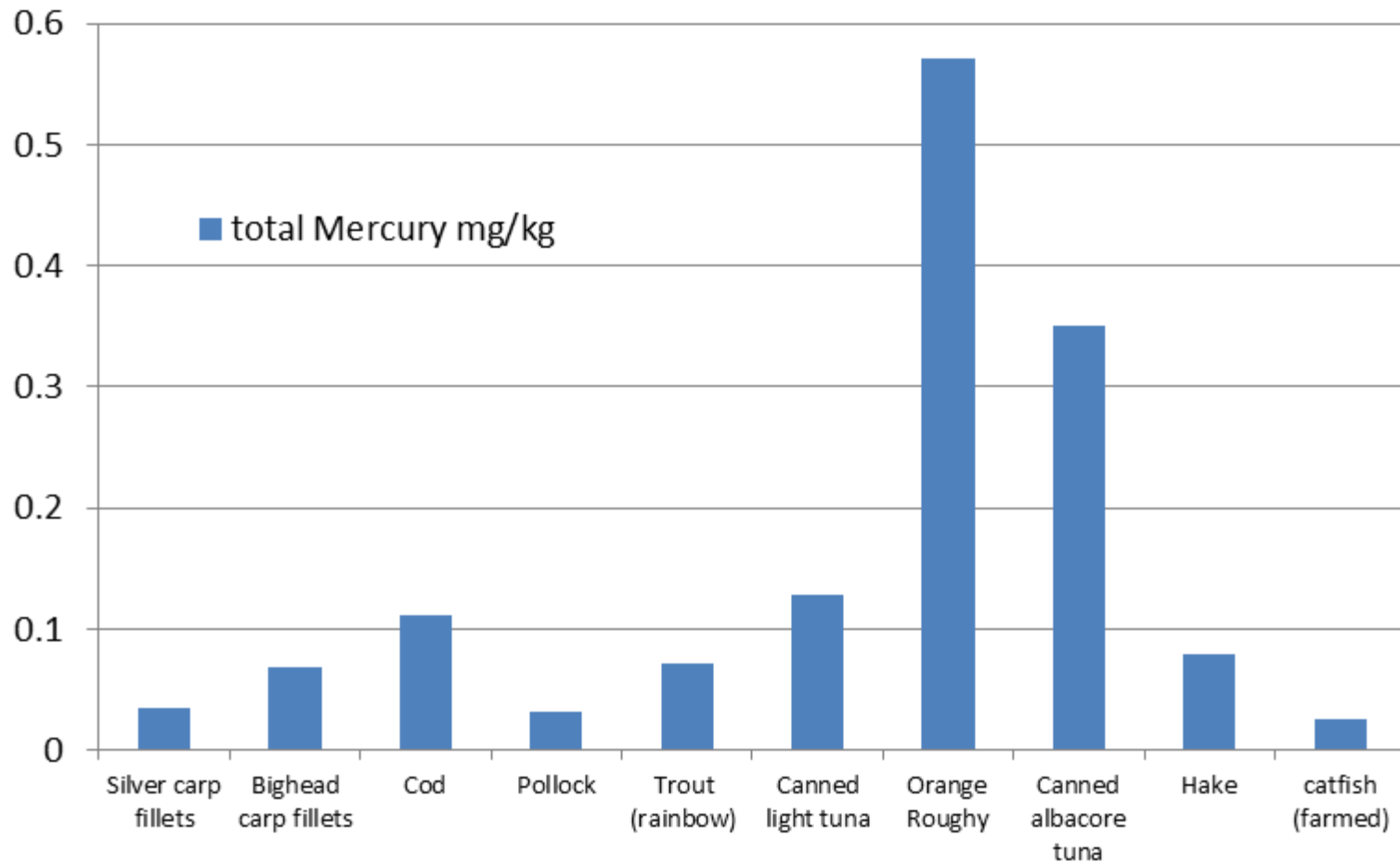
High vulnerability



Anatomy of Populations



Where to apply removal pressure? Data intensive



Integrated Pest Management – USGS

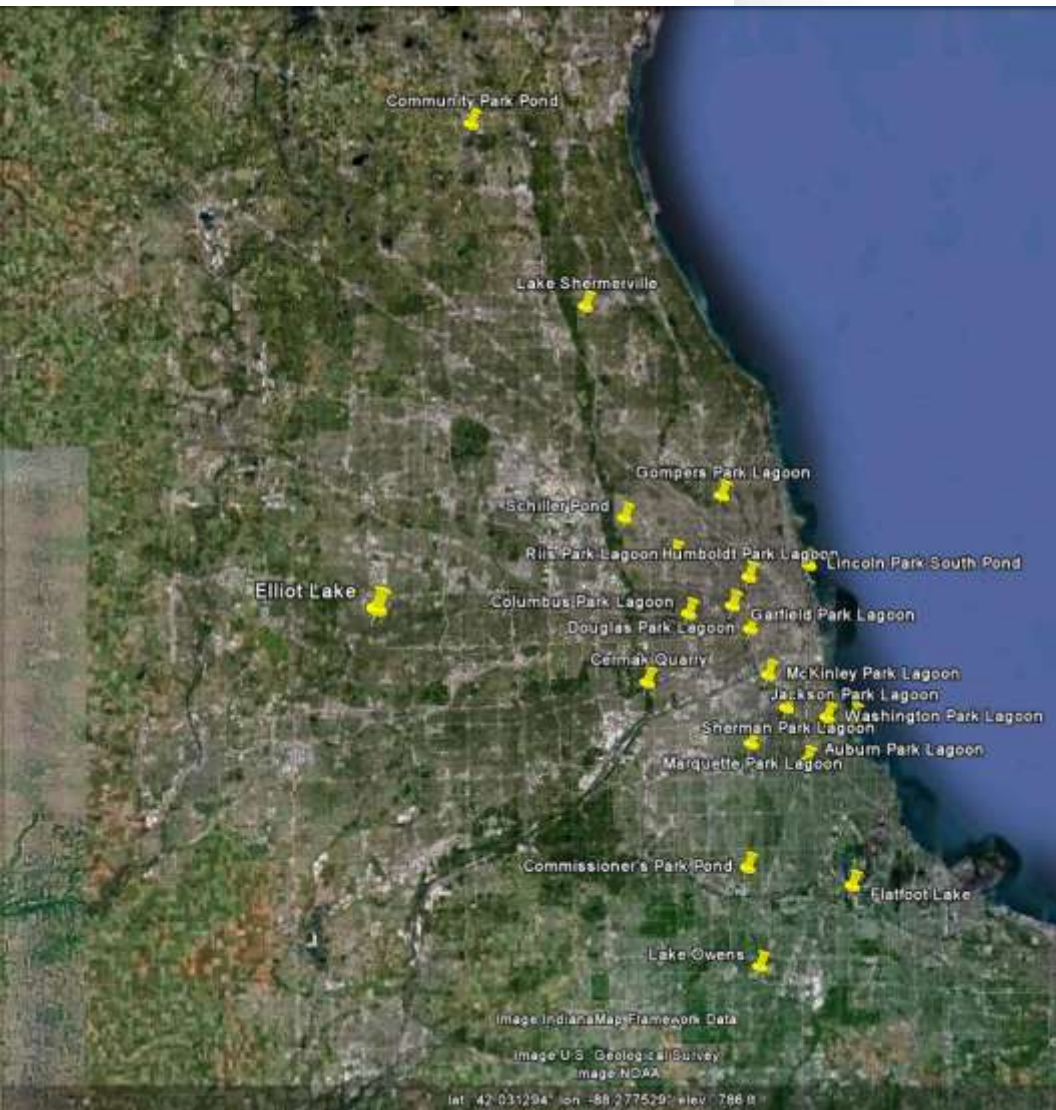
(contracted fishing, water guns, sound/complex sound assessments)



Retail Live Bait Surveys



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

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 –
 - 1 case despite countless investigations
- 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.



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 (9 years)
- Results suggest that we CAN influence larger populations (downstream)
- 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

Novel technologies

- **USFWS** – additional small fish gears, surveillance
- **USACE** – telemetry array/intense monitoring/barrier array
- **USGS** – control agents, deterrents, telemetry (WIU – real time/satellite)
 - Water quality as deterrent (Uof I/USGS)
- Outreach education – new branding
- **IDNR** – Fyke/pound nets, seines (bagged)
- Response planning and training (ICS)
- COMMUNICATION/COLLABORATION

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

La Grange Pool Lock & Dam

Peoria Lock & Dam

Marseilles Lock & Dam

Dresden Island Lock & Dam

Brandon Road Lock & Dam

Dispersal Barriers

Lockport Lock & Dam

Chicago Lock & Dam

Winnetka Pumping Station





Danny Brown