Monitoring and Removal of Asian Carp from the Illinois and Chicago Area Waterways

Vic Santucci
Illinois Department of Natural Resources
Why Are We Worried?

- Large bodied (>100 lbs)
  - Bighead: 5 feet, 90 pounds
  - Silver: 3 feet, 60 pounds

- Eating machines
  - Up to 20% of body weight/day
  - Planktivores
  - Eat same food as natives

- Reproduce, develop quickly
  - 1 female = 1-500 million eggs
  - Grow to ~10” in year 1

- Tend to jump when startled
Asian Carp Regional Coordinating Committee Structure

RCC

USEPA, USFWS, USCG, USACE, USGS, GLFC, IDNR, IEPA, InDNR, MWRD, City of Chicago

Invasion Control WG

Monitoring and Rapid Response WG

Communications WG
Asian Carp Control Strategy Framework

- **Goal:** Prevent establishment of self-sustaining carp populations in the Great Lakes
  - Integrate and unify future actions of participating agencies, develop collaborative approach
  - Transition to multi-tiered defense (beyond barriers)

- Dynamic document based on growing body of knowledge gained from research and monitoring

- **Strategy:** “…move quickly on proven solutions, and consider, develop, and test potential solutions and employ those that are most sound.”
Framework: Short-term Actions

- Carp population suppression measures
- Enhanced detection measures
  - Increased sample collection
  - eDNA indicator refinement
- Structural operation variations
- Emergency engineering measures
- Expedited biological control assessments
- Enhanced electric barrier operations
Framework: Long-term Actions

- Efficacy study
- Inter-basin feasibility study
- Ecological-separation
- Modified lock operations
- Commercial market enhancement and ongoing fish population suppression
- Biological controls
# Partners In Crime

## Federal and Regional Partners

<table>
<thead>
<tr>
<th>U. S. Fish and Wildlife Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Carterville, IL</td>
</tr>
<tr>
<td>- Lacrosse, WI</td>
</tr>
<tr>
<td>- Columbia, MO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>U. S. Army Corps of Engineers</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Chicago District</td>
</tr>
<tr>
<td>- Rock Island District</td>
</tr>
</tbody>
</table>

| U. S. Coast Guard            |

| U. S. Environmental Protection Agency |

| U. S. Geological Survey |

| Great Lakes Fishery Commission |

## State and Local Partners

| 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 |
Framework Funding

- Short-term actions
  - $38.6 million
- Long-term actions
  - $39.9 million
- Funding Sources
  - Great Lakes Restoration Initiative: $57.4 million
  - Base Program Funding: $21.1 million
Illinois River
- Commercial Harvest
- Market Development
- Native Species Restoration

CAWS & Upper Des Plaines
- Physical Barriers
- Monitoring
- Targeted Removal

Upper Illinois and Lower Des Plaines
- Invasion Front Monitoring
- Barrier Defense
Commercial Market Development

Mmm... Mmm... Good!
Invasion Front-Barrier Defense

Upper Illinois and Lower Des Plaines

• Invasion front monitoring
• Barrier defense
Invasion Front Sites

Sampling Locations

Dispersal Barrier

FIXED SITE D

FIXED SITE C

Brandon Rd. Lock

FIXED SITE B

Dresden Island Lock

Downstream Fixed Sites:
DCEL and nets – Monthly
-four 15-min. runs per site
-400 yds. net per site
eDNA – Monthly at Site D
-50 samples
Invasion Front Monitoring

DC Electrofishing
- Monthly Apr-Aug at four sites
- 4 15-minutes runs per site
- 4.0 hours total per month

Trammel Netting
- Monthly Jul-Aug
- 400-1200 yards of net per site
**DC Electrofishing**

- **Marseilles**
  - **Bighead carp**:
  - **Silver carp**:

- **Dresden**
  - **Bighead carp**:
  - **Silver carp**:

- **Brandon Road**
  - **Bighead carp**:
  - **Silver carp**:

- **Lockport**
  - **Bighead carp**:
  - **Silver carp**:

---

**Effort Each Pool**

- Monthly Apr-Aug
- 4 15-min. runs/month
- 4.0 hours total

---

- **Total Number**
- **Effort Each Pool**
- **Bighead carp**
- **Silver carp**
**Downstream Netting**

| Effort Each Pool | - Monthly Jul-Aug | - 400-1200 yds./month |

- **Marseilles**
  - Bighead carp: N/100 yards = 2.5
  - Silver carp: N/100 yards = 0.5

- **Dresden**
  - Bighead carp: N/100 yards = 0

- **Brandon Road**
  - Bighead carp: N/100 yards = 0

- **Lockport**
  - Bighead carp: N/100 yards = 0
  - Silver carp: N/100 yards = 0
Invasion Front

Invasion Front

Dispersal Barriers
RM 296.5

2009 eDNA Detection of Silver Carp in the Des Plaines River
2009 eDNA Detection of Silver Carp in the I&M Canal

Starved Rock LD
Marseilles LD
Dresden Island LD

Fox River
Des Plaines River

2007
2006 and 2008

Chicago Lock
Lockport LD
Brandon Road LD

- 2009 Positive eDNA detection of silver carp in CSSC
- 2009 Positive eDNA detection of silver carp in Des Plaines River and Illinois & Michigan Canal
 Barrier Defense

- Target Area
  - Marseilles Pool backwaters
  - Lower Dresden Pool

- Harvest Dates
  - 14 July – 11 August 2010

- Fishing Gear
  - Trammel nets
  - Gill nets

- Fishing Effort
  - 2-5 commercial/IDNR crews/day
  - 1,195 net sets
  - 68 miles of net total
Barrier Defense

Catch Rate (N/100 yards of net)

- Bighead carp
- Silver carp

Dates:
- 6/22
- 6/29
- 7/6
- 7/13
- 7/20
- 7/27
- 8/3
- 8/10
CAWS Monitoring and Targeted Removal

CAWS & Upper Des Plaines

- Monitoring
- Targeted Removal
Chicago Area Waterway System
Monitoring and Response Gears

Monitoring and Removal Gears
- Environmental DNA (eDNA)
- DC Electrofishing Gear and Commercial Nets
- Rotenone

Gears Being Evaluated for Use
- Push Nets for Larval Fish
- Mid-water Trawls, Experimental Gill Nets, Mini-fyke Nets, Purse Seines for Small Fish
- DIDSON or Side Scan Acoustics
Fixed Site and Reach Sampling

Sampling Locations Upstream of Barrier

Asian Carp Monitoring Plan

-**Fixed Sites**
  -Upstream Barrier

-**Reach 1**
-**Reach 2**
-**Reach 3**
-**Reach 4**

-**Upstream Fixed Sites:**
  - DCEL and Nets - Twice monthly
  - eDNA – Once monthly

-**Reaches:**
  - DCEL only - Seasonally three times per year
Fixed Site and Reach Summary

**Electrofishing Fixed Sites**
- >350 runs
- >87 hours effort
- 22,000 fish
- 5,200 YOY shad
- >50 species
- No Asian carp

**Contract Netting Fixed Sites**
- >200 sets
- 33,600 yards of net
- 1,900 fish
- 17 species
- 1 bighead carp

**Electrofishing Reaches**
- >300 runs
- >80 hours effort
- No Asian carp
Targeted Removal Operations

- Barrier Maintenance Rotenone – Dec 2009
- Warm water Discharge Sampling – Feb-Mar 2010
- North Shore Channel – May 2010
- Little Calumet River Rotenone – May 2010
- Bubbly Creek Response – June 2010
- Lake Calumet Response – June 2010
Operation Pelican

- Little Calumet River Near O’Brien Lock and Dam
- Rotenone sample area = 2.6 miles of channel or 173 surface acres of water
- Water samples for eDNA analysis collected morning of May 20
- Trammel nets (total = 16,800 feet) set overnight for three days
- DC electrofishing (total = 6 hours) for sport fish and sentinel fish
Operation Pelican
### Rotenone Fish Recovery Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of individuals</td>
<td>67,224</td>
</tr>
<tr>
<td>Number of species</td>
<td>38</td>
</tr>
<tr>
<td>Hybrid groups</td>
<td>2</td>
</tr>
<tr>
<td>Total weight recovered (pounds)</td>
<td>97,720</td>
</tr>
<tr>
<td>Standing stock (lbs./acre)</td>
<td>565</td>
</tr>
<tr>
<td>Species</td>
<td>Number</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Gizzard shad</td>
<td>22298</td>
</tr>
<tr>
<td>Common carp</td>
<td>9820</td>
</tr>
<tr>
<td>Ghost shiner</td>
<td>6945</td>
</tr>
<tr>
<td>Emerald shiner</td>
<td>4342</td>
</tr>
<tr>
<td>Alewife</td>
<td>3485</td>
</tr>
<tr>
<td>Freshwater drum</td>
<td>3178</td>
</tr>
<tr>
<td>Bluntnose minnow</td>
<td>2374</td>
</tr>
<tr>
<td>Goldfish</td>
<td>2293</td>
</tr>
<tr>
<td>Round goby</td>
<td>2109</td>
</tr>
<tr>
<td>Channel catfish</td>
<td>1959</td>
</tr>
<tr>
<td>Rock bass</td>
<td>1244</td>
</tr>
<tr>
<td>Pumpkinseed</td>
<td>1098</td>
</tr>
<tr>
<td>White perch</td>
<td>1059</td>
</tr>
<tr>
<td>Bluegill</td>
<td>783</td>
</tr>
<tr>
<td>Spottail shiner</td>
<td>464</td>
</tr>
<tr>
<td>Golden shiner</td>
<td>434</td>
</tr>
<tr>
<td>Yellow bullhead</td>
<td>366</td>
</tr>
<tr>
<td>Black crappie</td>
<td>333</td>
</tr>
<tr>
<td>Fathead minnow</td>
<td>325</td>
</tr>
<tr>
<td>White crappie</td>
<td>319</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>White sucker</td>
<td>319</td>
<td>0.5</td>
</tr>
<tr>
<td>Yellow perch</td>
<td>268</td>
<td>0.4</td>
</tr>
<tr>
<td>Black bullhead</td>
<td>264</td>
<td>0.4</td>
</tr>
<tr>
<td>Largemouth bass</td>
<td>219</td>
<td>0.3</td>
</tr>
<tr>
<td>Spottail shiner</td>
<td>213</td>
<td>0.3</td>
</tr>
<tr>
<td>Black buffalo</td>
<td>205</td>
<td>0.3</td>
</tr>
<tr>
<td>Orangespotted sunfish</td>
<td>174</td>
<td>0.3</td>
</tr>
<tr>
<td>White bass</td>
<td>82</td>
<td>0.1</td>
</tr>
<tr>
<td>Goldfish x Common carp hybrid</td>
<td>53</td>
<td>0.1</td>
</tr>
<tr>
<td>Green sunfish</td>
<td>49</td>
<td>0.1</td>
</tr>
<tr>
<td>Smallmouth bass</td>
<td>45</td>
<td>0.1</td>
</tr>
<tr>
<td>Grass carp</td>
<td>43</td>
<td>0.1</td>
</tr>
<tr>
<td>Warmouth</td>
<td>18</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Smallmouth buffalo</td>
<td>12</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Yellow bass</td>
<td>10</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Brown bullhead</td>
<td>8</td>
<td>0.0</td>
</tr>
<tr>
<td>Flathead catfish</td>
<td>8</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Grass pickerel</td>
<td>2</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Hybrid sunfish</td>
<td>2</td>
<td>&lt;0.1</td>
</tr>
</tbody>
</table>
CAWS Monitoring and Targeted Removal

Over 3,200 person-hours of effort = 2 bighead carp
Need to know more?

www.asiancarp.org

Want to Comment?
Email
carpcomments@gmail.com

Thank You!