

Mechanical Macrophyte Harvesting, What's the Catch?

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Overview

- Status of Six T & E Fish Species in Northern Illinois Lakes – EA 2009
- Incidental Harvest Catch of Those Species – EA 2009
- Summary/Conclusions: What Have We Learned?
- How to Minimize Adverse Effects of Regular Harvesting

EA 2009 Study Objectives

- Determine status & incidental harvest catch of six T & E fish species in three northeast IL lakes:



» Pugnose shiner (*Notropis anogenus*)-E

» Blacknose shiner (*N. heterolepis*)-E



» Blackchin shiner (*N. heterodon*)-T



» Banded killifish (*Fundulus diaphanus*)-T



» Northern starhead topminnow (*F. dispar*)-T



» Iowa darter (*Etheostoma exile*)-T

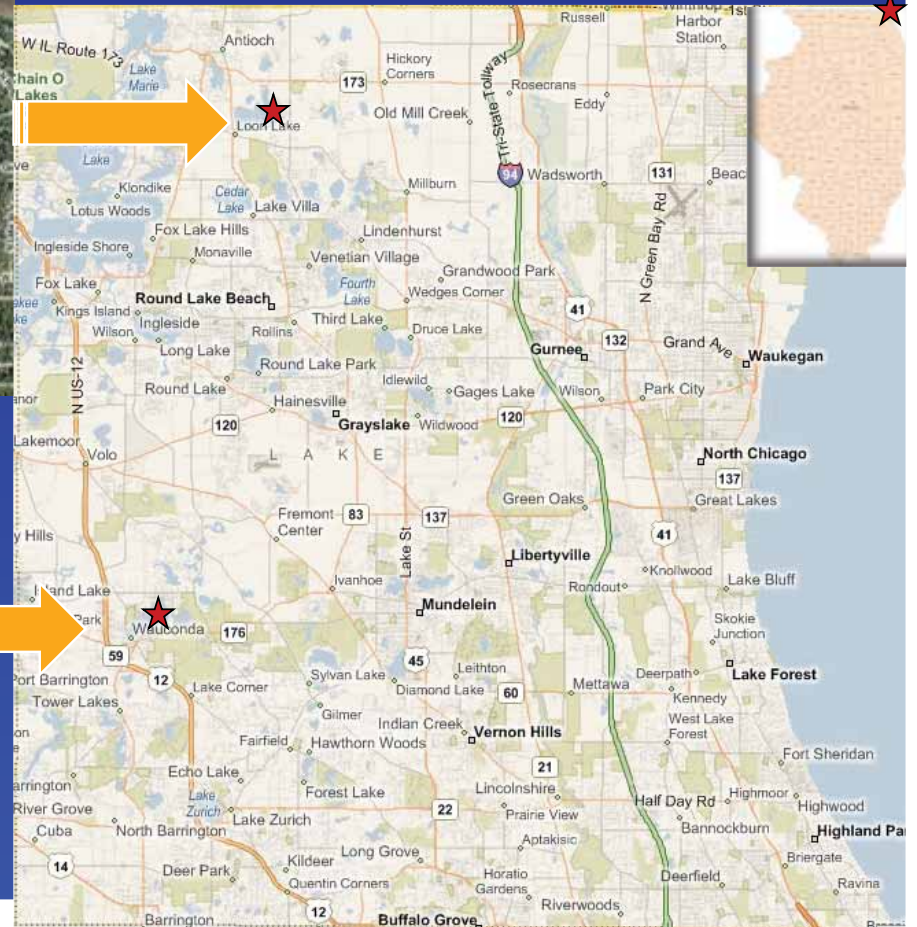
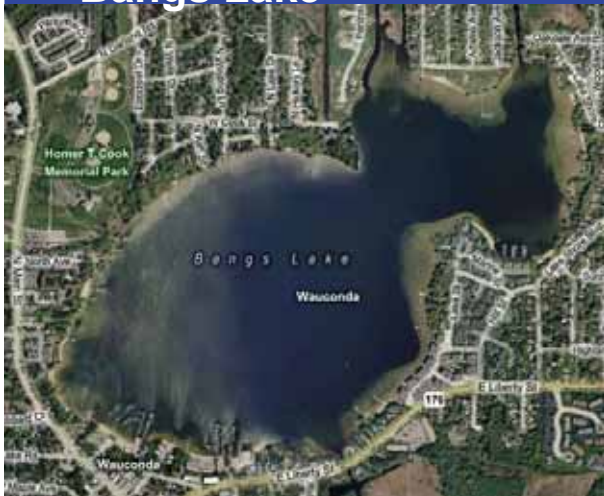


Study Locations

West and East Loon Lakes



Bangs Lake



Study Locations (cont.)

- Three Well Vegetated Glacial Lakes in Lake County, IL

Lake	Size (acres)	Max. Depth	Dominant Macrophyte
East Loon*	188	26	EWM
West Loon	165	38	EWM
Bangs	306	32	EWM

* Illinois Natural Areas Inventory (INAI) Site
Advanced Identification (ADID) Wetland

Threatened and Endangered Species

● Distribution

- All six listed species have been collected historically from northeast IL (including Loon Lake).
- Most species (i.e., blacknose, blackchin, banded killifish, and Iowa darter) were collected previously from Bangs Lake.
- Some species (i.e., blacknose and blackchin shiners) are locally abundant in several natural lakes in northeast IL.

● Life History & Habitat

- All species prefer clear, calm, moderately vegetated waters.
- Spawning varies, but generally occurs between April and early August.

Methods

- Study conducted in July of 2009
- Non-intensive Study
- Seining – Conducted at five to seven locations within each lake to determine status of target sp.



Methods (cont.)

- Seining (cont.)

- Two to six hauls at each location were conducted using a 30 ft bag or a 10 ft. straight seine
- Relative abundance determined for non-target species whereas target species were counted.



Methods (cont.)

● Harvesting

- 28-56 Min. of Harvesting/
Lake (4-14 runs)
- Representative of Typical
Harvesting Practices
- Typically in 3-6 ft Water
Depth
- All Aquatic Macrophytes
Collected were Examined



Harvesting - 101



Methods (cont.)



Results - Loon Lake

- Combined, 16 species were collected by seining **and** harvesting in East and West Loon Lakes:

Seining Only	Harvester Only	Both Methods
C. Mudminnow	Iowa darter	Grass pickerel
Blacknose shiner		Golden shiner
Blackchin shiner		Warmouth
Bluntnose minnow		Bluegill
Banded killifish		Largemouth bass
Lake chubsucker		Black crappie
Green sunfish		Yellow perch
Pumpkinseed		
Total Sp. 8	1	7

Results - Loon Lake (cont.)

- Species Richness and Composition Generally Similar Between East and West Loon Lakes

West Loon Only	East Loon Only	Both Lakes
Blacknose shiner	C. mudminnow	Grass pickerel
Iowa darter	Lake chubsucker	Golden shiner
Bluntnose minnow	Green sunfish	Blackchin shiner
	Pumpkinseed	Banded killifish
	Black crappie	Warmouth
		Bluegill*
		Largemouth bass*
		Yellow Perch
Total species: 11	13	16

* Dominated the catch in East and West Loon

Loon Lake Seining Results

● Status of Target Species

- Seining yielded three of the six listed species.



Species	Numbers Collected		Total
	West Loon	East Loon	
Blacknose shiner	15	0	15
Blackchin shiner	69	6	75
Banded killifish	<u>2</u>	<u>1</u>	<u>3</u>
Total	86	7	93

Loon Lake Seining Results (cont.)

- **Spatial Distribution of the Dominant T & E Species **Not** Uniform in West Loon Lake**

- Thirteen blacknose shiners (87%) were collected at Location 4.
- Forty-four blackchin shiners (64%) were collected from Locations 1 and 2 along the west shore.



Loon Lake Harvester Results

● Target Species

- Iowa darter was the only listed species collected harvesting in 2009.
- Two specimens were collected at harvester run # 4 in WLL.
- Seining at Locs. 1 & 2 = 44 blackchin shiners

YET

3 harvester runs (22 min; >850m of shoreline) = 0 blackchin shiners

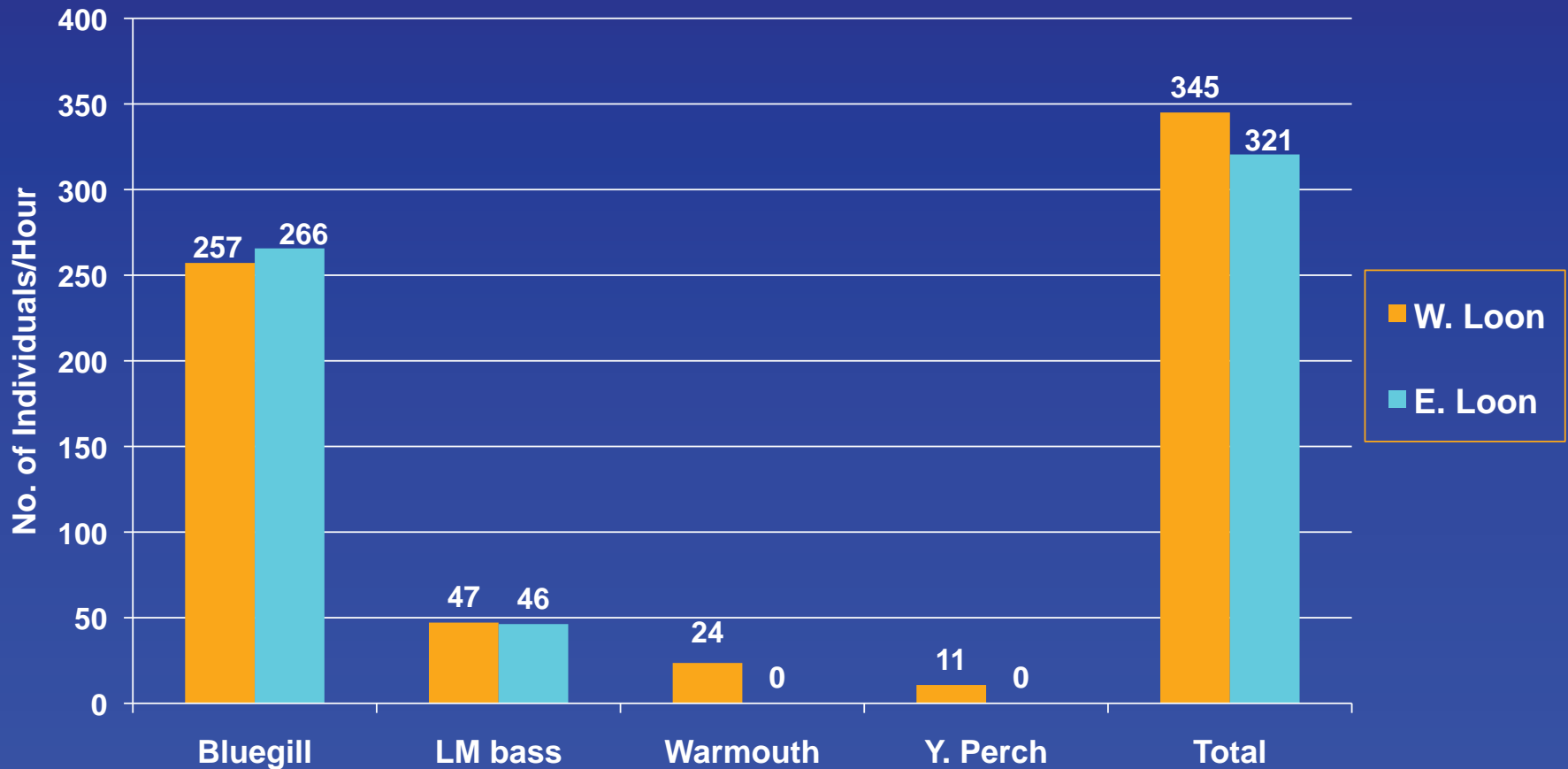


Loon Lake Harvester Results (cont.)

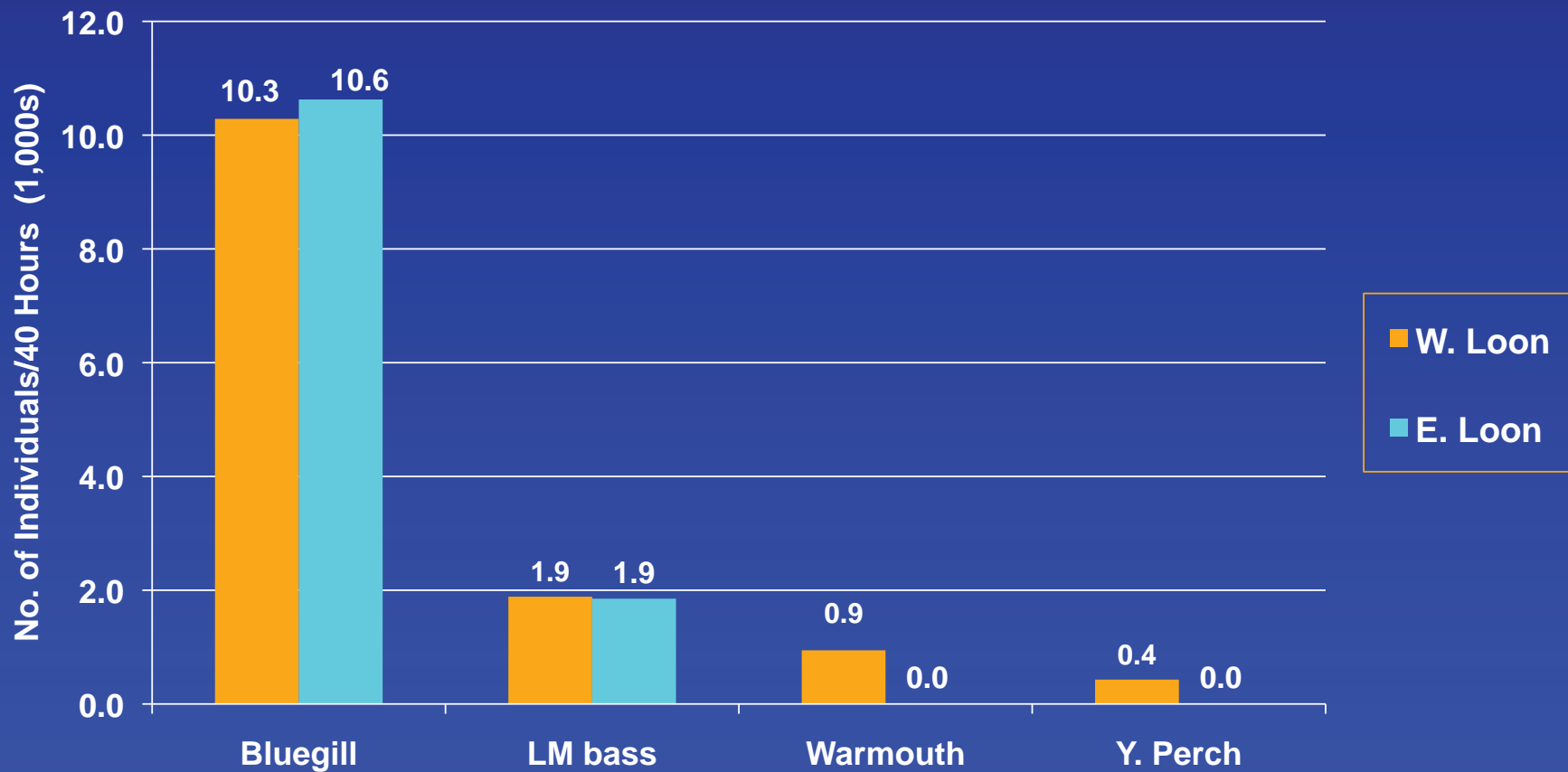
- All Species: Raw Numbers & % Abundance

Species	West Loon		East Loon		Lakes Combined	
	#	%	#	%	#	%
Bluegill	120	75	155	83	275	79
LM bass	22	14	27	14	49	14
Warmouth	11	7	0	0	11	3
Y. Perch	5	3	0	0	5	1
Iowa darter	2	1	0	0	2	<1
G. pickerel	1	<1	1	<1	2	<1
Blk. Crappie	0	0	1	1	1	<1
Golden shiner	0	0	2	1	2	<1
Total Species	6		5		8	

Harvester Catch Rates (#/hour) for the Dominant Fish and All Fish Combined- Loon Lake



Harvester Catch Rates (#/40 hours) for the Dominant Fish Collected in Loon Lake



Results - Bangs Lake

- 16 species were collected by seining and harvesting in Bangs Lake:

Seining Only		Harvester Only	Both Methods
G. Pickerel*	Lake chubsucker*	Yellow bullhead*	Blackchin shiner
Golden shiner	Pumpkinseed	Iowa darter*	Bluegill
Blacknose shiner	Johnny darter		Largemouth bass
Bluntnose minnow	Least darter*		
Spotfin shiner	Yellow perch		
Banded killifish*			
Total Sp	11	2	3

* represented by only one or two individuals

Bangs Lake Seining Results

● Status of Target Species

- Seining yielded three of the six listed species:

Species	Total
Blacknose shiner	19
Blackchin shiner	41
Banded killifish	<u>3</u>
Total	63

- Most (52 %) were collected at Location 2, which yielded 8 of 19 blacknose shiners and 25 of 41 blackchin shiners.



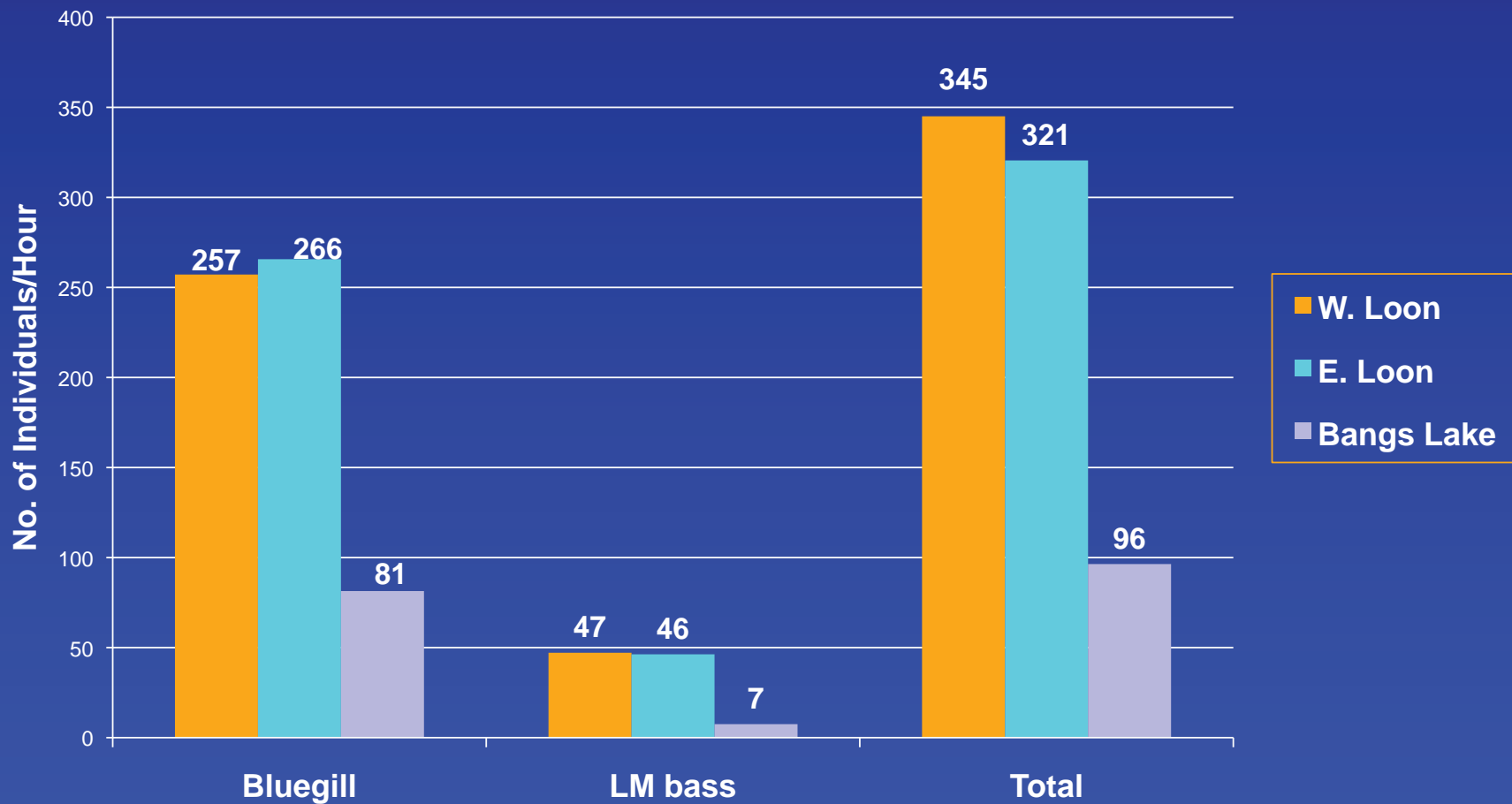
Bangs Lake Harvester Results

- All Species: Raw Numbers (56 min) and Percent Abundance

Species	#	%
Bluegill	76	84
LM bass	7	8
Blackchin shiner	5	6
Yellow bullhead	1	1
Iowa darter	<u>1</u>	<u>1</u>
Total	90	100

- Again, Few T&E Fish Collected Harvesting Compared to Seining

Harvester Catch Rates (#/hour) for the Dominant Fish and All Fish Combined- Bangs and Loon Lakes



Summary/Conclusions

- Diverse, Healthy Fish Communities in all Lakes
- 30 to 50 % of All Species Encountered were Collected by Harvesting
- Two of Six Listed Species (i.e., Iowa Darter and Blackchin Shiner) Collected Harvesting
- Iowa Darter Only Listed Species Collected Exclusively by Harvesting
- Bluegill & Largemouth Bass Dominated the Harvest Catch in all Lakes
- Harvester Avoidance of Some Listed Species Likely Based on Catch Data **and** Field Observations
- Harvesting Practices May Effect Catch Rates

Summary/Conclusions (cont.)

- It is apparent that some T & E species are susceptible to harvesting, BUT....



Limiting Negative Effects of Harvesting

- Know What's in Your Lake and Where!
- Know When and Where Species of Concern Spawn and Limit Harvesting During Those Times
- Limit Harvesting in Densely Populated Areas or Areas of Preferred Habitat
- Incorporate Least Impact Harvesting Practices

The Bottom Line....

The list of pros and cons of harvesting is long and well documented, lake managers may need to consider species composition and life history of species of concern before implementing a management plan.

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Questions or Comments?

